DOMINATOR
T-REX 300X RTF
READY TO FLY
INSTRUCTION MANUAL
使用說明書

ALIGN

RH30E01XT
RH30E02XT

READY FOR ANY SKILL LEVEL

Much precise control
feeling for more fun.

Mini Compact **GRS**
FLYBARLESS SYSTEM

3S
POWER SYSTEM

A10
2.4GHz 10 Channel
Radio Control System

HELICOPTER   MULTICOPTER   AIRPLANE

Thank you for purchasing Align products. Please read the manual carefully before installing and be sure to retain the manual for future reference. All pictures shown are for illustration purpose only. Actual product may vary due to product enhancement. Specifications, contents of parts and availability are subject to change, ALIGN RC is not responsible for inadvertent errors in this publications.

承蒙閣下選用亞拓遙控世界系列產品，謹表謝意。
使用前，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，也請您妥善保管這本說明書，以做為日後參考。本公司將不對此印刷物之異動負責，也無法主動通知消費者任何更新或異動。所有圖片僅用於展示目的。產品可能因改良而有些不同。本說明書內記載的材質、規格或零件包裝之內容物如有異動，請依亞拓官網公告為主。

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Thank you for buying ALIGN Products. The T-REX 300X RTF 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 300X RTF is a new product developed by ALIGN. It features the best design available on the R/C helicopters market to date, providing flying stability for beginners, full aerobatic capability for advanced fliers, and unsurpassed reliability for customer support.

感謝您選購亞拓產品,為了讓您容易方便的使用 T-REX 300X RTF 直昇機、請您詳細的閱讀完這本說明書之後再進行組裝以及操作這台直昇機,同時請您妥善的保存這本說明書、作為日後進行調整以及維修的參考。 T-REX 300X RTF 是由亞拓自行研發的新產品,不論您是需求飛行穩定性的初學者或是追求性能的飛行愛好者。 T-REX 300X RTF 將是您最佳的選擇。

WARNING LABEL LEGEND 標誌代表涵義

⊘ FORBIDDEN 禁 止	Do not attempt under any circumstances. 在任何禁止的環境下,請勿嘗試操作。
⚠ WARNING 警 告	Mishandling due to failure to follow these instructions may result in damage or injury. 因為疏忽這些操作說明,而使用錯誤可能造成財產損失或嚴重傷害。
⚠ CAUTION 注 意	Mishandling due to failure to follow these instructions may result in danger. 因為疏忽這些操作說明,而使用錯誤可能造成危險。

IMPORTANT NOTES 重要聲明

R/C helicopters, including the T-REX 300X RTF 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.

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.

T-REX 300X RTF 遙控直昇機並非玩具,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傷害甚至死亡,使用之前請務必詳讀本說明書,勿輕忽並注意自身安全。注意! 任何遙控直昇機的使用,製造商和經銷商是無法對使用者於零件使用的損耗異常或組裝不當所發生之意外負任何責任,本產品是提供給有操作過模型直昇機經驗的成人或有相當技術的人員在旁指導於當地合法遙控飛行場飛行,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性能與安全責任。

做為本產品的使用者,您,是唯一對於您自己操作的環境及行為負全部的責任之人。

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. T-REX 300X RTF 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 warrantee 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. As Align Corporation Limited has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

模型商品屬於需高操作技術且為消耗性之商品,如經拆裝使用後,會造成不等情況零件損耗,任何使用情況所造成商品不良或不滿意,將無法於保固條件內更換新品或退貨,如遇有使用操作維修問題,本公司全省分公司或代理商將提供技術指導、特價零件供應服務。對使用者的不當使用、設定、組裝、修改、或操作不良所造成的損損或傷害,本公司無法控制及負責。任何使用、設定、組裝、修改、或操作不良所造成的破損、意外或傷害,使用者應承擔全部責任。

⚠ CAUTION 注 意

· 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 of 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, ensure they are firmly secured.

· 遙控模型飛機、直昇機屬高危險性商品,飛行時務必遠離人群,人為組裝不當或機件損壞、電子控制設備不良,以及操控上的不熟悉、都有可能 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,並需了解自負疏忽所造成任何意外之責任。
· 每趟飛行前須仔細檢查,主旋翼夾座橫軸螺絲、尾旋翼夾座螺絲,以及機身各部位球頭、螺絲,確實上膠鎖緊才能升空飛行。

⊘ FORBIDDEN 禁 止   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.

直昇機飛行時具有一定的速度，相對的也潛在著危險性，場地的選擇也相對的重要，請需遵守當地法規到合法遙控飛行場地飛行。務必選擇在空曠合法專屬飛行場地，並必須注意周遭有沒有人、高樓、建築物、高壓電線、樹木等等，避免操控的不當造成自己與他人財產的損壞。請勿在下雨、打雷等惡劣天候下操作，以確保本身及機體的安全。

⊘ FORBIDDEN 禁 止   NOTE ON LITHIUM POLYMER BATTERIES 鋰聚電池注意事項

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.

鋰聚電池跟一般在RC使用的鹼性電池、鎳鎘電池、鎳氫電池比較起來是相對危險的。請嚴格遵守鋰聚電池說明書之使用注意事項。不恰當使用鋰聚電池，可能造成火災並傷及生命財產安全，切勿大意！

⊘ FORBIDDEN 禁 止   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.

直昇機內部也是由許多精密的電子零組件組成，所以必須絕對的防止潮濕或水氣，避免在浴室或雨天時使用，防止水氣進入機身內部而導致機件及電子零件故障而引發不可預期的意外！

⊘ FORBIDDEN 禁 止   PROPER OPERATION 勿不當使用本產品

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

請勿自行改造加工，任何的升級改裝或維修，請使用亞拓產品目錄中的零件，以確保結構的安全。
請確認於產品限界內操作，請勿過載使用，並勿用於安全、法令外其它非法用途。

⚠ WARNING 警 告   OBTAIN THE ASSISTANCE OF AN EXPERIENCED PILOT 避免獨自操控

Before turning on your model and transmitter, check to make sure 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.)

至飛行場飛行前，需確認是否有相同頻率的同好正進行飛行，因為開啟相同頻率的發射器將導致自己與他人立即干擾等意外危險。遙控飛機操作技巧在學習初期有著一定的難度，要盡量避免獨自操作飛行，需有經驗的人士在旁指導，才可以操控飛行，否則將可能造成不可預期的意外發生。(勤練電腦模擬器及老手指導是入門必要的選擇)

⚠ WARNING 警 告   SAFE OPERATION 安全操作

Make sure to always be aware to keep your eyes and body away from blades rotation. Do not attempt to grab or make contact with the helicopter while the main blades are in motion. During take-off, landing, and flight, be sure to keep the helicopter away from all obstacles. Operators must stand at least 10 meters away from the helicopter. Never take your eyes off the model or leave it unattended while it is turned on, and Immediately turn off the model and transmitter when you have landed the model. Operate this unit within your ability, do not fly under tired condition, improper operation may cause in danger, and always to avoid injury caused by loose parts due to improper assembly or any unforeseen dangers.

請隨時注意，無論在任何時候，都不能將運轉中的旋翼對著眼睛，嚴禁用手抓取運行中的直昇機，當主旋翼轉動後，或起飛/試飛時，務必遠離障礙物，站立位置也需距離10公尺以上，不可在視線範圍外進行飛行，降落後也請馬上關掉直昇機和遙控器電源。操作這台直昇機需要一定操控技術及能力，避免因人為組裝不當造成零件脫落，而引發不可預期的財物及人員損傷，並請衡量自身情況，過於疲勞、精神不佳或不當操作，都可能引講不可預期的意外發生。

⚠ CAUTION 注 意   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.

直昇機主旋翼與尾旋翼運轉時會以高轉速下進行，在高轉速下的旋翼會造成自己與他人在身體上或環境上的嚴重損傷，請勿觸摸運轉中的主旋翼與尾旋翼，並保持安全距離以避免造成危險及損壞。

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 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.

遙控飛機多半是以 PA 纖維或聚乙烯、電子商品為主要材質，因此要盡量遠離熱源、日曬，以避免因高溫而變形甚至熔毀損壞的可能。
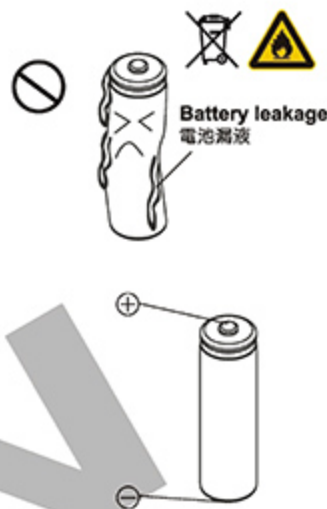
SAFETY ON THE USE OF DRY CELL BATTERIES 乾電池使用安全

The AA carbon-zinc batteries are one time use, they should not be charged for repetitive use. Please read and follow the guidelines below prior to use. The manufacturer cannot be held liable for accidents and damages as result of improper usage.

· These are one time use battery, and should not be recharged.

· Ensure proper polarity and installation method during use.

· Do not mix battery of different age or different model. Doing so may affect battery life, and even cause fire danger.

· If the product is not used for long period of time, please remove the batteries to prevent damaged caused by battery leaks. Do not use batteries which exhibits symptoms of leaks.

· Please follow local law and ordinances when disposing used batteries. Do not dispose them improperly.

Battery leakage 電池漏液

3號(AA)碳鋅電池，不可重覆充電使用，使用碳鋅電池前請務必詳讀並遵照下列事項，本公司將不對任何不當使用所造成的損害及意外負責。

· 碳鋅電池為一次性電池，嚴禁重覆充電使用。

· 安裝使用時，請確認電池正負極位置及安裝方式。

· 嚴禁新舊或不同型號電池混用，以免影響電池使用壽命，甚至造成電池起火燃燒的危險。

· 產品長時間不使用時，請取出電池，以免造成電池電力流失或電池漏液而損壞主機。若電池已經有漏液情況，請勿再繼續使用。

· 廢棄電池，請依照該使用國家或地區的廢棄物清理法令回收，切勿任意丟棄以免汙染環境。

SAFETY ON THE USE OF LITHIUM POLYMER (LIPO) BATTERIES 鋰聚電池使用安全

Lithium batteries have higher degree of risk when compared to other batteries. Please read and follow the guidelines below prior to use. The manufacturer cannot be held liable for accidents and damages as result of improper usage.

· Do not charge past 4.2v/cell; do not discharge past 3.0v/cell.

· Avoid over charging/discharging lipo batteries. Doing so may cause internal damages and affect the battery's discharge performance.

· Avoid continuous use under high temperature environment, or when battery exhibits high temperature. Doing so may shorten battery life, causing puffing of battery, or even danger of explosion.

· Discharge the batteries to 60-70% of full capacity for long term storage. Too low of voltage may result in over-discharging over time. Therefore, we recommend periodic charge of battery in long term storage, this will reduce chance of over-discharge damage.

· To avoid the danger of explosion and fire, use of third party charger to charge these batteries are prohibited.

· Avoid impact, disassembly, incorrect polarity, and burning of batteries. Avoid shorting of battery terminal by metallic objects. Avoid puncture of battery with sharp material.

· Charging error could result in battery explosion, fire, and other unexpected danger or property loss. Please always charge batteries with equipment in sight, do not leave charger unattended. Should you need to leave the charging area, please remove the battery and abort charging process.

· Should the battery exhibit excessive heat after use, do not charge immediately. Doing so may cause battery to puff, deform, explode, or even start a fire.

· Please follow local law and ordinances when disposing used batteries. Do not dispose them improperly.

鋰聚電池較其他電池有更高的危險性，使用前請務必遵照下列注意事項，本公司將不對任何不當使用所造成的損害負責。

· 充電時不得高於最大充電電壓4.2V/cell，放電時不得低於最低放電電壓3.0V/cell。

· 鋰聚電池要避免過充與過放的情形發生，過充或過放會對電池內部造成損傷並影響電池放電性能。

· 避免在高溫的環境或電池已經產生高溫而繼續使用，還會使電池壽命減短，嚴重者可能會使電池膨脹甚至爆炸的危險。

· 如果長期不用時，請以60%～70%的充電量儲存。電量過低時，可能因自放電導致過放，因此，存放不使用的鋰聚電池時，建議定期充電，以防止自放電低於最小工作電壓而老化，避免電池充飽存放。充飽存放常會導致電池的膨脹。

· 嚴禁使用原廠以外的充電器進行充電，以免發生爆炸起火的危險。

· 嚴禁撞擊、拆解、正負極反接、焚燒電池，避免金屬品碰觸電池正負極造成短路。並請防止尖銳的物品刺穿電池，以避免電池起火的危險。

· 充電時務必在視線範圍內進行，不可在無人看管的情形下充電，以避免因充電異常造成電池爆裂、燃燒甚至引發火災等不可預期的危險及損失。若需離開看管範圍時請將電池取出，停止對電池充電。

· 電池使用後如有發熱情況，嚴禁充電。否則會造成電池膨脹、變型、爆炸甚至起火燃燒，危害生命財產的安全。

· 廢棄電池，請依照該使用國家或地區的廢棄物清理法令回收，切勿任意丟棄以免汙染環境。
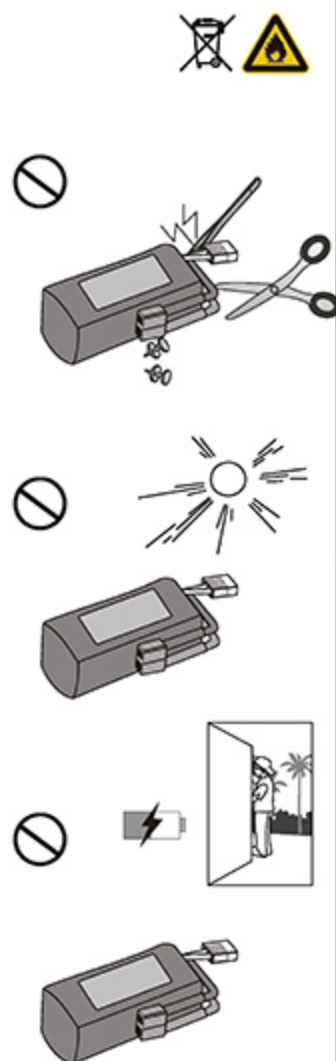
BALANCE CHARGER SAFETY PRECAUTIONS 充電器使用注意事項

· ALIGN RCC-3SX battery charger is suitable to 2-3cell, 1000mAh and more lithium batteries. Please do not dismantle or change it for other purpose.

· If there is any unusual deformation of the surface of battery, please do not charge it anymore. If the battery becomes hot while charging, stop charging and check if the battery is broken.

· Do not let this machine drench to the rain/water or uses under the heavy moisture, in order to avoid the interior short-circuits and accidents.

· For short-circuits battery, the indicating light of the charger will be off, so please stop charging.

· Charging error could result in battery explosion, fire, and other unexpected danger or property loss. Please always charge batteries with equipment in sight, do not leave charger unattended. Should you need to leave the charging area, please remove the battery and abort charging process.

· 亞拓RCC-3SX充電器適用2-3cell，容量1000mAh以上之鋰電池，請勿自行拆卸，改裝或作為其他用途。

· 外觀已膨脹的電池不可再充電使用；損壞的電池於充電過程中會有發熱的情形，應停止對該電池進行充電。

· 勿讓本機淋到雨水或在重濕氣下使用，以免內部發生短路等不可預期的故障及意外。

· 內部短路的電池，當接上充電器時指示燈會熄滅予以警示，應停止對該電池進行充電。

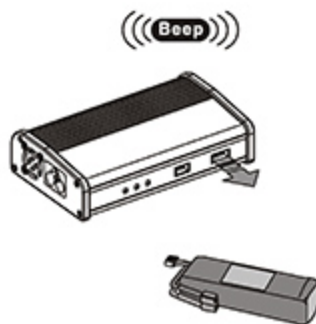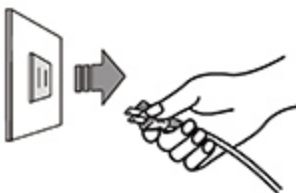· 充電時務必在視線範圍內進行，不可在無人看管的情形下充電，以避免因充電異常造成電池爆裂、燃燒甚至引發火災等不可預期的危險及損失。若需離開看管範圍時應將電池取出，停止對電池充電。
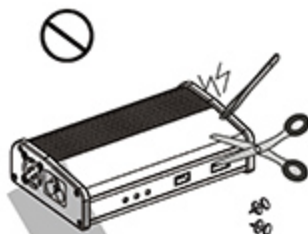
· Do not use the charger at place near heater or expose of sunshine.

· Keep the vent unimpeded.

· While using, put the charger at a stable place and avoid falling down or colliding.

· 避免靠近熱源或電器產品或在陽光直射環境下使用。
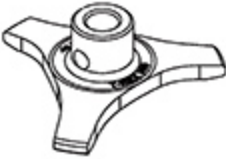
· 散熱口須保持暢通不可堵塞，以免影響散熱效果。

· 使用時請放置於平穩的場所並避免摔落或受到外力撞擊。
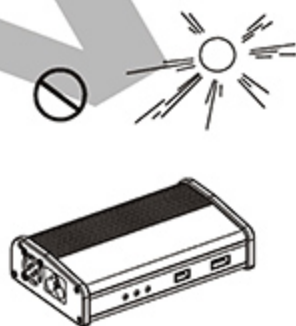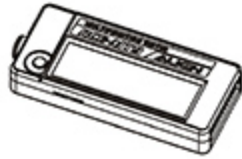
· The battery being in use may be a little hot. Please do not charge the battery right away. It might cause the battery broken, even an accident.

· Prevent liquid and anything into the device. If so, please unplug the charger and take out the battery and send it to our distributors to repair.

· Before connecting the charge to batteries, please notice the positive and negative pole of the battery. When the reverse polarity protection beeps, please take out the battery immediately. (The beeps should be stopped in 15 seconds, or the charger will be broken.)

· If there is an unusual temperature increase, swell, or other unusual occurrences, please unplug the battery and AC plug immediately.

· The electronic components of RCC-3SX can withstand a maximum input current of 0.4Amps, excess current may burned the charger and even cause a fire.

· 當電池剛使用過且表面溫度尚未冷卻時，請勿立即充電，否則將造成電池損壞，甚至引發意外。

· 不要讓異物或任何液體進入機體，如有尖細異物或任何液體進入機體時，請儘快將電源及電池拔除，並送至經銷商或本公司處理。

· 連接電池與充電器之前，請確認電池與充電器的極性是否相符，若極性錯誤將啟動鳴叫警示，此時應立即將電池拔下〈鳴叫時間勿超過15秒，以避免充電器損壞〉。

· 當充電過程中發生電池溫度升高、電池膨脹或其他異常情形時，請立即拔除電池與充電器電源插頭。

· 本產品能夠承受的最大輸入電流為0.4安培，如果電流超過可能導致本產品燒毀。

ADDITIONAL TOOLS REQUIRED FOR ASSEMBLY 自備工具

[H30H008XXT] Swashplate Leveler 十字盤校正器	[HET80001] AP800 Digital Pitch Gauge AP800 數位螺距規	[HETMT901] Multi-function Tester 多功能檢測計	[H25074] Ball Link Plier 拔豆鉗

Philips Screw Driver 十字螺絲起子 φ 3.0/ φ 1.8mm	Cutter Knife 刀子	Hexagon Screw Driver 六角螺絲起子 3mm/2.5mm/ 2mm/1.5mm	Needle Nose Pliers 尖嘴鉗	Oil 潤滑油	CA Glue 瞬間膠	Grease 潤滑油	Anaerobic Retainer (R48) 缺氧膠 (R48)

Quick Finder
零件快速購

Option Equipment
選購品

● MiniGRS Flybarless System x 1
MiniGRS無平衡翼系統組 x 1

● A.BUS Receiver x 1
A.BUS接收機

Already Assembled
已組裝

T-REX 300X Kit x 1 set
T-REX 300X 空機套件組 x 1組

● 300MX(3700KV/2216)Brushless Motor x 1
300MX(3700KV/2216)無刷馬達 x 1

● DS455 Digital Servo x 1
DS455 數位伺服器 x 1

● DS450 Digital Servo x 3
DS450 數位伺服器 x 3

● RCE-BL25A Brushless ESC x 1
RCE-BL25A 無刷定速調速器 x 1

Option Equipment
選購品

[RH30E01XT] T-REX 300X RTF (AC)
Balance Charger RCC-3SX(North American) x 1
分壓充電器 RCC-3SX(美規) x 1

[RH30E03XT] T-REX 300X RTF (AC)
Balance Charger RCC-3SX(Europlug) x 1
分壓充電器 RCC-3SX(歐規) x 1

[RH30E04XT] T-REX 300X RTF (DC)
Lithium Battery Charger RCC-3SD x 1
分壓充電器 RCC-3SD x 1

Option Equipment
選購品

A10 Radio Control System x 1 set
A10 遙控器 x 1組

Option Equipment
選購品

3S1P 11.1V 1300mAh Li-Po Battery x 1
11.1V 3S 1300mAh
Li-Po 電池 x 1

There are many versions of T-REX 300X for your choice. The RTF includes additional electronics and other equipment. The Instruction Manual will refer to the T-REX 300X RTF. You may purchase any additional items referenced in the instruction manual or any spare parts for other 300X RTF version by referring to more product information in this manual.

T-REX 300X系列商品有多種版本可作為選擇，除標準配備會因您購買的商品版本
而有些微不同，在組裝、設定上都是一致的，在此我們以 **RTF** 作為操作範例，您也
可依照書面上的商品資訊來增添其他選購商品。

T-REX 300X (RTF) STANDARD EQUIPMENT　　T-REX 300X (RTF) 標準配備　[RH30E01XT]

T-REX 300X KITx 1	300MX Brushless Motor 300MX無刷馬達(3700KV/2216) x 1	RCE-BL25A Brushless ESC RCE-BL25A無刷定速調速器 x 1	DS450 Digital Servo DS450數位伺服器 X 3	DS455 Digital Servo DS455數位伺服器 X 1
MiniGRS Flybarless System MiniGRS無平衡翼系統組 x 1	A10 Radio Control System A10遙控器 x 1	Mini A.BUS Receiver Mini A.BUS 接收器	11.1V 1300mAh Li-Po Battery Li-Po 電池 x 1	AA Carbon-zinc Batteries 3號(AA)碳鋅電池 x 4
Lithium Battery Charger RCC-3SX 分壓充電器 x 1	OR 或 **Lithium Battery Charger** RCC-3SD 分壓充電器 x 1	**Option Equipment** 選購品 North American Power Cord 美規電源線 x 1	**Option Equipment** 選購品 Europlug Power Cord 歐規電源線 x 1	**Option Equipment** 選購品 Charger DC Power Cord DC充電器電源線 x 1

T-REX 300X COMBO STANDARD EQUIPMENT　　T-REX 300X COMBO 標準配備　[RH30E02XT]

T-REX 300X KITx 1	300MX Brushless Motor 300MX無刷馬達(3700KV/2216) x 1	RCE-BL25A Brushless ESC RCE-BL25A無刷定速調速器 x 1	DS450 Digital Servo DS450數位伺服器 X 3	DS455 Digital Servo DS455數位伺服器 X 1

CAREFULLY INSPECT BEFORE REAL FLIGHT 請嚴格執行飛行前之檢查義務

· 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 unit, please follow the power on/off 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 servos 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 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 if the battery and power plug are fastened. Vibration and violent flight may cause the plug loose and result in out of control.

· 每次飛行前應先確認所使用的頻率是否會干擾他人，以確保您自身與他人的安全。

· 每次飛行前確定您發射器與接收器電池的電量是在足夠飛行的狀態。

· 開機前確認油門搖桿是否位於最低點，熄火降落開關，定速開關(IDLE)是否於關閉位置。

· 關機時必須遵守電源開關機的程序，開機時應先開啟發射器後，再開啟接收器電源；關機時應先關閉接收器後，再關閉發射器電源。不正確的開關程序可能會造失控的現象，影響自身與他人的安全，請養成正確的習慣。

· 開機請先確定直昇機的各個動作是否順暢，及方向是否正確，並檢查伺服器的動作是否有干涉或崩牙的情形，使用故障的伺服器將導致不可預期的危險。

· 飛行前確認沒有缺少或鬆脫的螺絲與螺帽，確認沒有組裝不完整或損毀的零件，仔細檢查主旋翼是否有損壞，特別是接近主旋翼夾座的部位。損壞或組裝不完整的零件不僅影響飛行，更會造成不可預期的危險。注意：每次飛行前的安全檢查、保養、及更換損耗零件，請確實嚴格執行以確保安全。

· 檢查所有的連桿頭是否有鬆脫的情形，過鬆的連桿頭應先更新，否則將造成直昇機無法操控的危險。

· 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，可能造成電源接頭鬆脫而造成失控的危險。

When you see the marks as below, please use relative glue or grease to ensure flying safety.
標有以下符號之組裝步驟，請配合上膠或上油，以確保鎖附零件使用之可靠度。

· CA : Apply small amount of CA Glue to fix.
瞬間膠：使用適量瞬間膠固定

· R48 : Apply small amount of Anaerobic Retainer to fix.
缺氧膠：使用適量缺氧膠固定

· T43 : Apply small amount of Thread Lock to fix.
螺絲膠：使用適量螺絲膠

· OIL : Add small amount of OIL.
潤滑油：添加適量潤滑油

· Grease : Add small amount of Grease.
潤滑油：添加適量潤滑油

When assembling ball links, make sure the "A" character faces outside.
各項塑膠製連桿頭扣接時，"A"字請朝外。

⚠ CAUTION 注意 Keep plastic parts away from heat.
塑膠件避免接近熱源。

CA	R48	T43	Grease	Oil	T43
CA Glue 瞬間膠	Anaerobic Retainer 缺氧膠	Thread Lock 螺絲膠	Grease 潤滑油	Oil 潤滑油	T43 Glue width : approx. 1mm T43 上膠寬度約 1mm
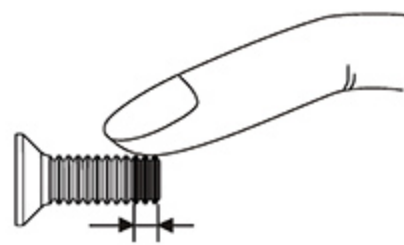
1. Anaerobic Retainer (R48)is green penetrating threadlocker and is used to fix the metal tube before assembly at temperatures up to +180°C。

2. Thread Lock(T43) is blue low strength threadlocker and is applied to the small screw(threads) or metal parts before assembly to prevent loosening. Ensure to apply only a small amount and wipe surplus off. When disassembling, recommend to heat the metal joint about 15 Seconds.

3. Grease is kind of lubricant additive which is applied to the one-way bearings or thrust bearing.

◎Based on parts physical attributes, please apply small amount of the relative glue or grease accordingly to prevent any parts damage or loosening or unexpected danger happened.

1.缺氧膠 (R48) 為綠色高強度快速固化的缺氧膠，適合於金屬管狀固定用，可耐高溫至 180 °C。

2.螺絲膠 (T43) 為藍色低強度螺絲膠，適合小型螺絲；使用於金屬內外徑或膠合螺絲時，請務必適量使用，必要時請用手去除多餘膠量，欲拆卸時可於金屬接合部位熱烤約 15 秒。

3.潤滑油 (Grease) 為膏狀潤滑油，適用於單向軸承或止推軸承。

◎上述各類功能膠(油)請依零件屬性需求自行準備並斟酌其用量，以達到最佳組裝狀態，避免因使用不當造成零件損壞或不可預期的意外發生。

T-REX 300X RTF is assembled completely at factory. Please refer to the manual instruction before flying and follow local rules. The helicopter and equipment require routine maintenance. Be sure to retain the manual for future reference.

T-REX 300X RTF 出廠前已組裝調整完成，飛行前請詳閱操作說明，並遵守當地法規。飛行機及相關設備均需定期維護保養，請妥善保管這本說明書，以做為日後參考。

Washer
華司
φ 4 φ 6x0.5mm

DFC Metal Main Rotor Holder
DFC 主旋翼夾座

Thrust Bearing
止推軸承
φ 2.5x φ 6x.3mm

Bearing
軸承
φ 2.5x φ 6x2.6mm

Bearing
軸承
φ 2.5x φ 6x2.5mm

⚠ CAUTION 注意

THRUST BEARING 止推軸承

Metal Main Rotor Holder
金屬主旋翼夾座

Apply Grease On Thrust Bearing.
止推軸承塗上潤滑油

"IN" Mark Faces Inside
"IN" 字請朝內

Thin (Larger ID)
(內徑較大)

Thick (Smaller ID)
(內徑較小)
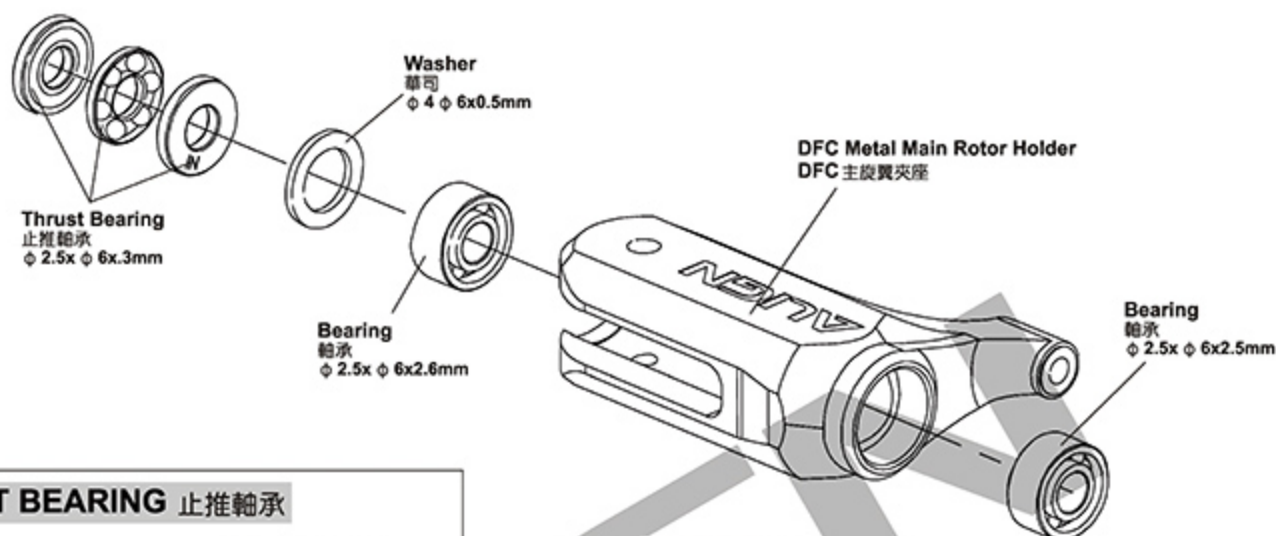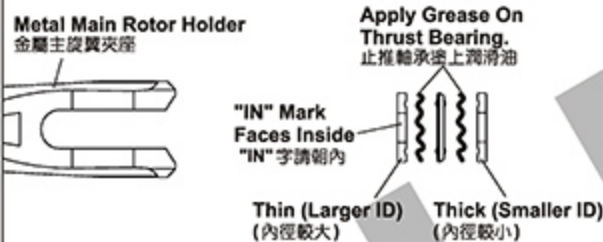
⚠ CAUTION 注意

Thrust bearing and washer for radial bearing are wear items; therefore, it is recommended to inspect after every 20 flights and replaced as necessary. For flights with high headspeed, the inspection interval should be reduced to ensure flight safety.

止推軸承及橫軸墊圈屬於飛行消耗品，建議每20趟定期檢查及更換，高主旋翼轉速飛行時，請縮短定期檢查之趟數，以確保飛行安全。
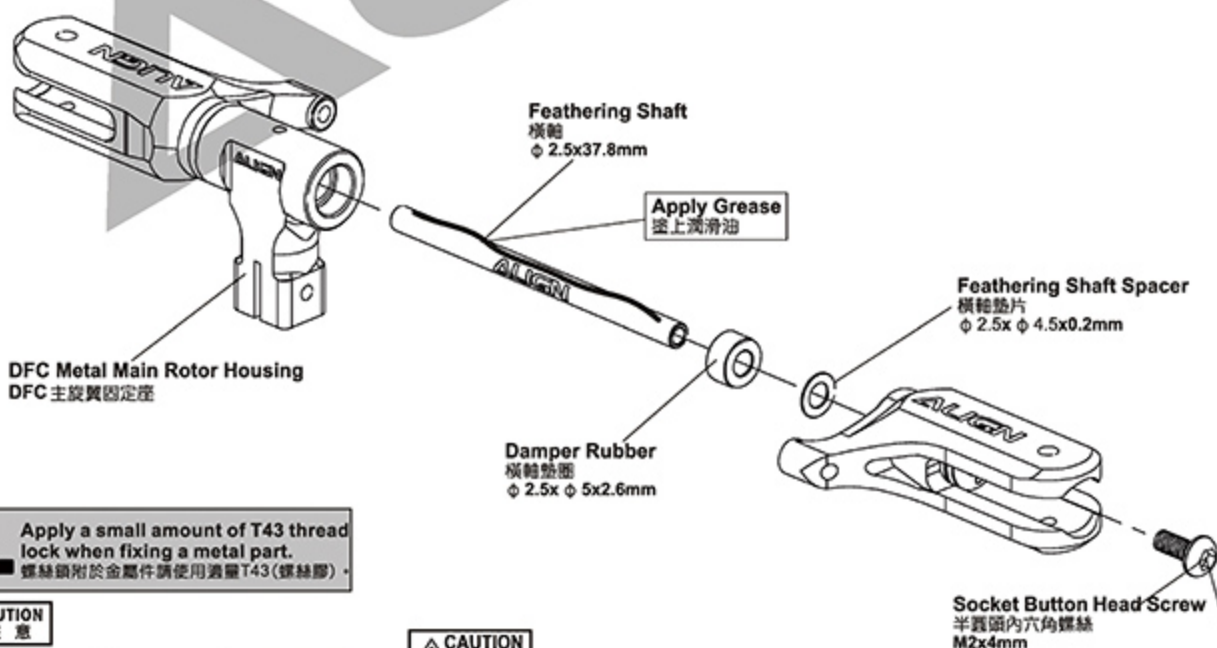
Feathering Shaft
橫軸
φ 2.5x37.8mm

Apply Grease
塗上潤滑油

Feathering Shaft Spacer
橫軸墊片
φ 2.5x φ 4.5x0.2mm

DFC Metal Main Rotor Housing
DFC 主旋翼固定座

Damper Rubber
橫軸墊圈
φ 2.5x φ 5x2.6mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x4mm

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

⚠ CAUTION 注意

Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.

原裝零件出廠包裝如果是組裝品，請需再確認各螺絲是否鎖緊上膠，請注意T43不可塗在任何的塑膠材質上。

⚠ CAUTION 注意

Please apply a small amount of T43 when tightening the feathering shaft socket screws and make sure to tighten firmly, but not over tighten. Suggest using a torque wrench or torque lock when tightening screws. Torque value 5.0kg.cm

橫軸螺絲鎖附時需注意鎖附之緊度與使用適量的螺絲膠，建議搭配扭力扳手或扭力機鎖附螺絲，鎖定扭力值為 5.0kg.cm。

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲頭附於金屬件請使用適量T43(螺絲膠)。

⚠ CAUTION
注意

Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.

原裝零件出廠包裝如果是組裝品，請需再確認各螺絲是否鎖緊上膠。請注意T43不可塗在任何的塑膠材質上。

300 Linkage Ball A
300 球頭A(0#x2)
φ 3.5x5.8mm

300 Linkage Ball B
300 球頭B(0#x1.8)
φ 3.5x8.1mm

300 Linkage Ball B
300 球頭B(0#x1.8)
φ 3.5x8.1mm

300 Long Linkage Ball
300 導板長球頭 (0#x2)
φ 3.5x16.5mm

300 Metal CCPM Swashplate
300 金屬 CCPM 十字盤組

300 Linkage Ball A
300 球頭A(0#x2)
φ 3.5x5.8mm

Washer
華司 φ 2x φ 3.6x0.2mm

Socket Collar Screw
圓頭內六角頭輪套螺絲
M2x10mm

Bearing
軸承 φ 2x φ 4.5x2mm

DFC Linkage Bearing Sleeve
DFC 連桿軸承套
φ 2x φ 3.2x φ 3mm

Main Rotor Grip Arm Integrated Control Link
主槳翼夾座連桿

Bearing
軸承
φ 2x φ 4.5x2mm

300 DFC Link
300 DFC 連桿

Socket Screw
圓頭內六角螺絲
M2x8mm

DFC Ball Link
DFC 連桿頭

T43
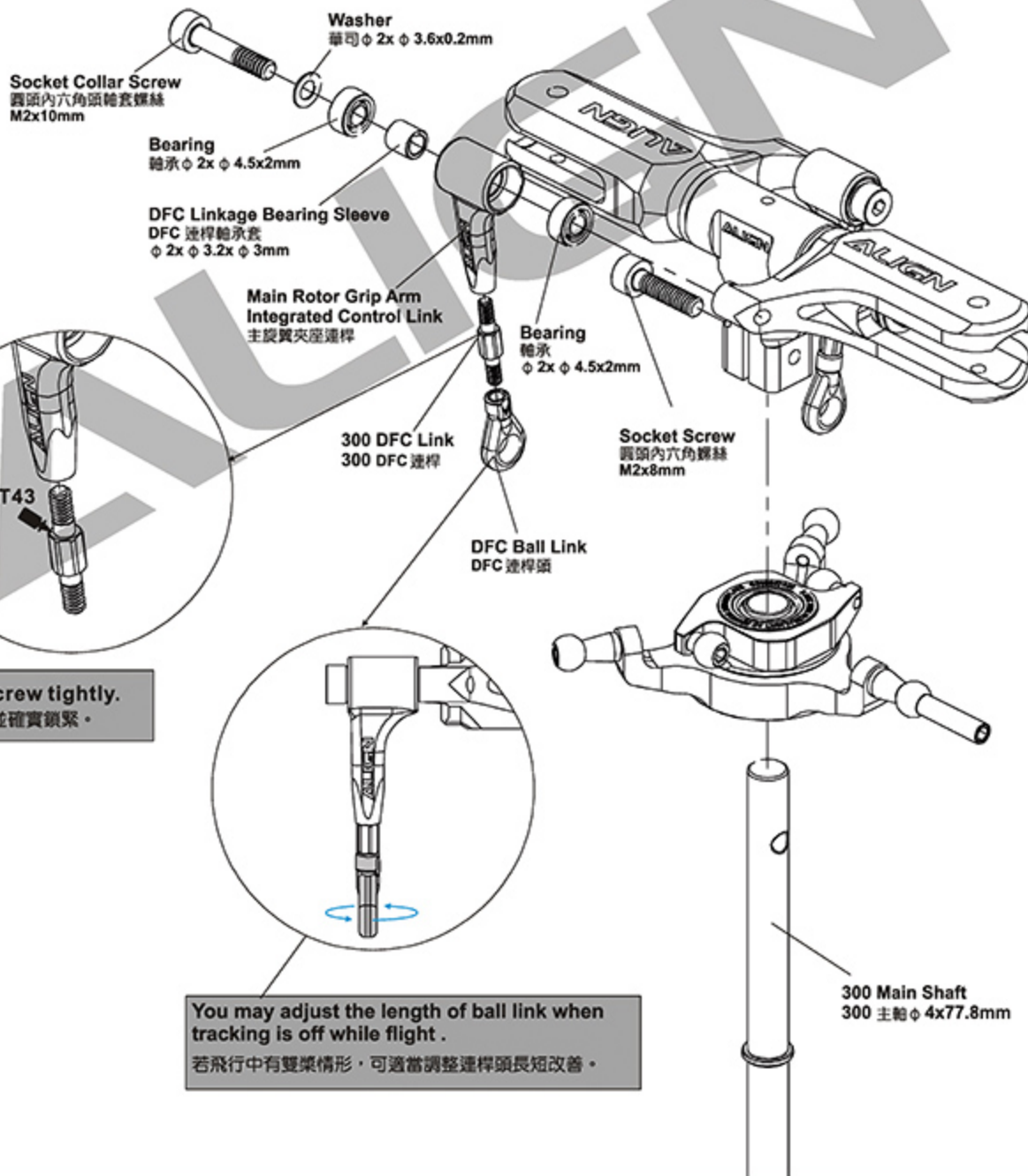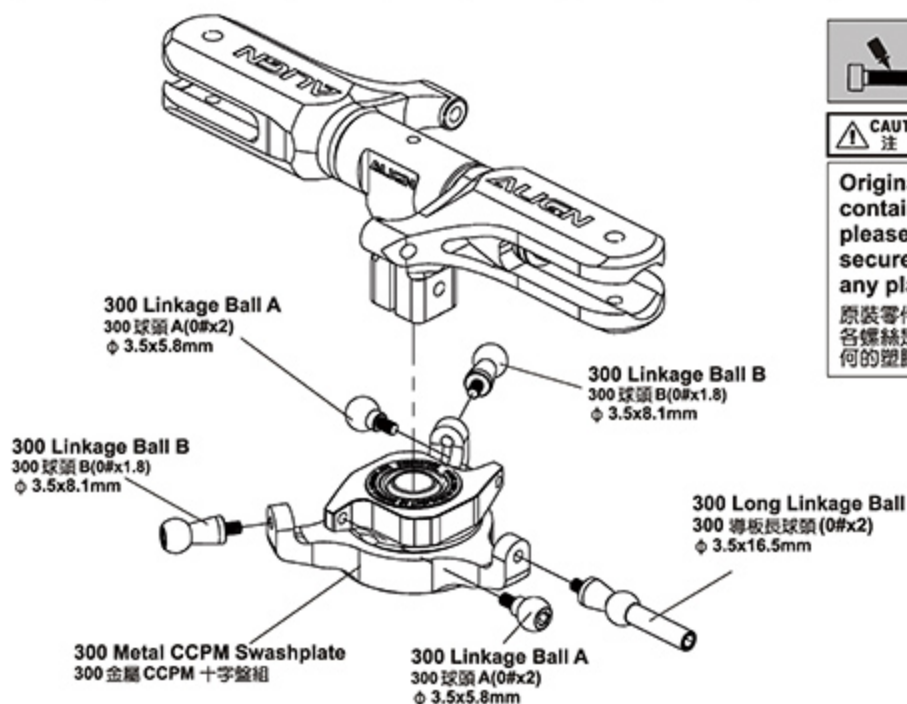
Glue and screw tightly.
此處請點膠，並確實鎖緊。

You may adjust the length of ball link when tracking is off while flight .
若飛行中有雙槳情形，可適當調整連桿頭長短改善。

300 Main Shaft
300 主軸 φ 4x77.8mm

9

Socket Button Head Screw
半圓頭內六角螺絲
#0-80x6mm

Socket Screw
圓頭內六角螺絲
M2x8mm

Bearing
軸承 φ 1.5x φ 4x2mm

Tension Spring
皮帶輪彈簧 φ 3.2x φ 4.4x8.5mm

Belt Pulley
皮帶輪 φ 4.5x φ 8x6.2mm

Washer
華司 φ 2x φ 4.8x0.6mm

Socket Button Head Screw
半圓頭內六角螺絲
#0-80x4mm

Hex Mounting Bolt
六角鋁柱 M2x14mm

Belt Pulley Case
皮帶輪座

Bearing
軸承 φ 4x φ 8x3mm

Tail Boom Mount
尾管固定座

Tail Servo Mount
尾陀伺服器固定座

300 Bearing Holder
300 主軸固定座

Socket Screw
圓頭內六角螺絲
M2x4mm

Bearing
軸承 φ 4x φ 8x3mm

300 Frame Mounting Bolt
300 機身鋁柱
M2x30mm

300 Gyro Mount
300 陀螺儀固定座

Socket Button Head Screw
半圓頭內六角螺絲
M2x3mm

Battery Latch
電池卡扣

300 Lower Main Frame
300 下側板

Socket Screw
圓頭內六角螺絲
M2x4mm

Socket Screw
圓頭內六角螺絲
M2x8mm
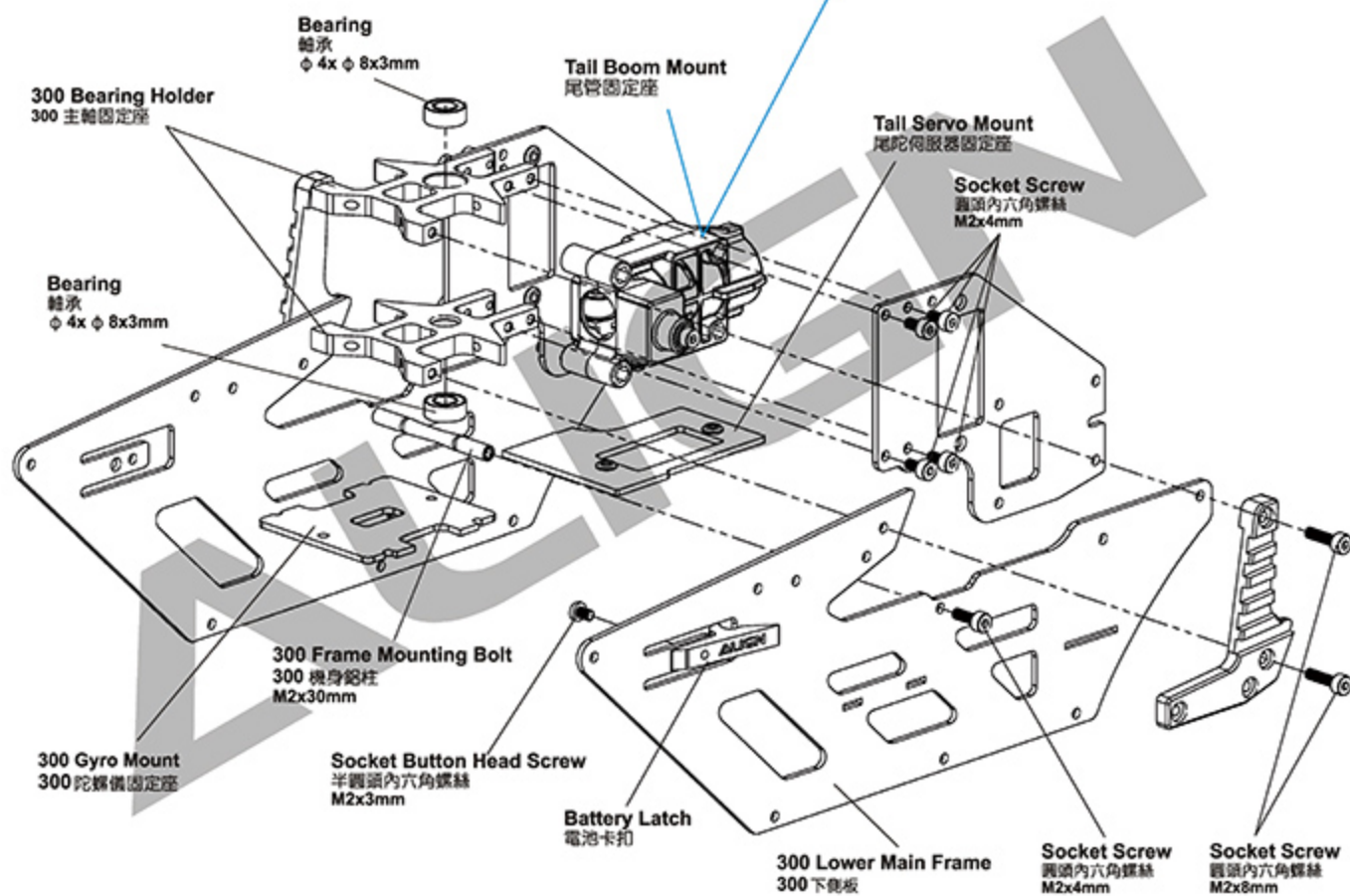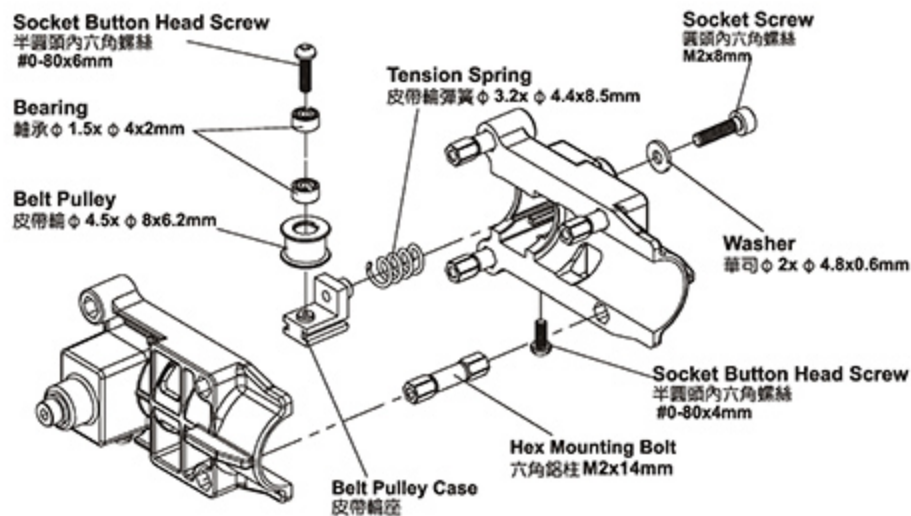
Landing skid is tilted 5 degree forward which improves crashworthiness.

新型腳架質輕耐撞擊，為前傾5度俯衝設計。

Frame mount
機身固定座

Socket Screw
圓頭內六角螺絲
M2x6mm

Socket Screw
圓頭內六角螺絲
M2x6mm

Main frame assembly key point :
First do not fully tighten the screws of main frames
and put two 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.

機身側板組立重點：
側板螺絲先不完全鎖緊，放入主軸貫穿二顆軸承確認上下移動
必需滑順，主體底板必須與水平桌面 (玻璃平面)踏實緊貼；請
保持主軸滑順與底板平行桌面後慢慢鎖緊螺絲。正確側板的組
裝對動力與飛行性能有顯著幫助。
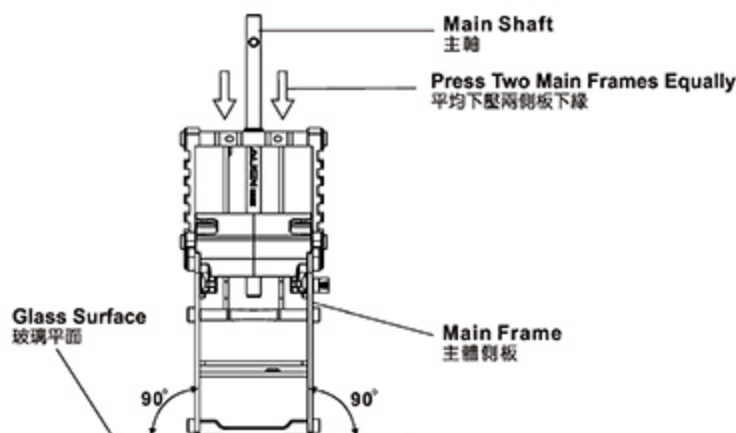
Main Shaft
主軸

Press Two Main Frames Equally
平均下壓兩側板下緣

Glass Surface
玻璃平面

Main Frame
主體側板

90°   90°

Apply a small amount of T43 thread
lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

Original manufactory packages
contains product already assembled,
please confirm every screw is firmly
secured with T43. Do not use T43 on
any plastic part.
原裝零件出廠包裝如果是組裝品，請需再確認
各螺絲是否鎖緊上膠。請注意 T43不可塗在任
何的塑膠材質上。

Recommend sanding the marked position with a waterproof abrasive paper (#800-1000)
as below illustration to avoid the wires of electric parts to be cut.
建議於下圖色塊標示處，可使用 #800～1000 水砂紙打磨，
可防止電子設備電線被割破。

Waterproof Abrasive Paper
水砂紙

300 Receiver Mount
300 接收器座

Hex Mounting Bolt
穴角鋁柱

Socket Screw
圓頭內穴角螺絲
M2x4mm

⚠ CAUTION
注 意

Socket Screw
圓頭內六角螺絲
M2x4mm

DS450 Digital Servo
DS450 數位伺服器

Servo Horn
伺服臂

Use The Outer Second Hole.
鎖附於外側第二孔位

Linkage Ball A(0#x2)
球頭A(0#x2)
φ 3.5x5.3mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x4mm

DS450 Digital Servo:
1. 1520 μs standard band /1520 μs 寬頻系統
2. Stall Torque/ 輸出扭力:3.0kg.cm(6.0V)
   4.0kg.cm(8.4V)
3. Motion Speed/ 動作速度:0.06sec/60˚ (6.0V)
   0.05sec/60˚ (8.4V)
4. Dimension/尺寸:23 x 12 x 31.3mm
5. Weight/ 重量:17.5g

Socket Button Head Screw
半圓頭內六角螺絲
M2x4mm

Servo Horn
伺服臂

DS450 Digital Servo
DS450 數位伺服器

Socket Screw
圓頭內六角螺絲
M2x6mm

Linkage Ball A(0#x2)
球頭A(0#x2)
φ 3.5x5.3mm

12

Motor
馬達

Motor Mount
馬達固定座

Motor Pinion Gear 14T
馬達齒輪 14T

Socket Screw
圓頭內六角螺絲
M2.5x6mm

R48

Motor
馬達

Socket Screw
圓頭內六角螺絲
M2x8mm

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

Socket Screw
圓頭內六角螺絲
M2x4mm

Socket Collar Screw
圓頭內六角軸套螺絲
M2x12mm

Tail Drive Belt
尾傳動皮帶

Gently pull belt through the tail boom in the direction from the tail to nose of the helicopter.
請將皮帶由尾管固定座後方空入機身內。

Anti Rotation Bracket
十字盤導板

Canopy Mounting Bolt
機頭罩固定柱

Use The Outer Hole
請鎖附於外孔

Linkage Ball B(0#x1.8)
球頭 B(0#x1.8)
φ 3.5x7.32mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x4mm

Servo Horn
伺服臂

DS455 Digital Servo
DS455 數位伺服器

Socket Screw
圓頭內六角螺絲
M2x4mm

DS455 Digital Servo:
1.1520 μ s standard band /1520 μ s 寬頻系統
2.Stall torque/ 輸出扭力 :2.2kg.cm(6.0V)
　　　　　　　　　　　2.9kg.cm(8.4V)
3.Motion speed/ 動作速度 :0.05sec/60° (6.0V)
　　　　　　　　　　　　0.04sec/60° (8.4V)
4.Dimension/尺寸 :23 x 12 x 31.3mm
5.Weight/ 重量 :17.3g

Cross Screw
皿頭十字螺絲
M2x8mm

Metal Main Drive Gear
金屬主傳動輪 40T

Metal Main Drive Gear Cover
金屬主傳動輪蓋 40T-上

Metal Main Drive Gear Cover
金屬主傳動輪蓋 40T-下

Cross Screw
皿頭十字螺絲
M2x4mm

One-way Bearing
單向軸承
φ 6x φ 10x12mm

R48

Main Drive Gear
主齒輪 115T

Main Gear Case
主齒中心座

Bearing
軸承
φ 4x φ 8x3mm

You may adjust the length of ball link when tracking is off while flight .

若飛行中有雙槳情形，可適當調整連桿頭長短改善。

For installation, make sure the "Check Point" is face upward, then use plier or wrench grasp the center of hexagonal rod to adjust its suitable length, turns clockwise to decrease the length, turns counter clockwise to increase the linkage length.

組裝時請將連桿中間有溝槽辨識端朝上。請使用尖嘴鉗或扳手轉動連桿中間六角柱部位調整適當長度，順時針轉動為調短連桿長度；逆時針轉動則為調長連桿長度。
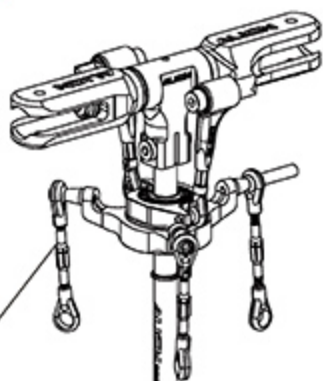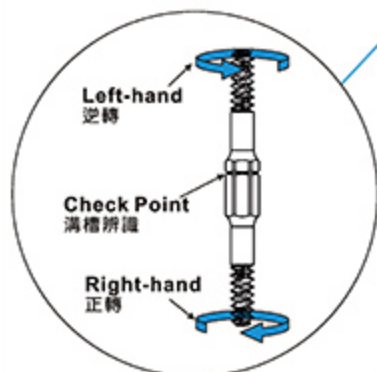
Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

Left-hand
逆轉

Check Point
溝槽辨識

Right-hand
正轉

Linkage Rod (A)
Approx. 24.3mm x 3
連桿(A)約24.3mm x 3

12.5mm
18mm

[H30H008XXT]
Swashplate Leveler
十字盤校正器
Optional Equipment
另購品

Main Shaft
主軸

Horizontally Level
水平

Swashplate
十字盤

While using Flybarless system, please use the swashplate leveler to calibrate swashplate. Adjust the length of servo linkage rod to make sure the swashplate is leveled before start setting up to ensure the gyro provides the best performance.

使用無平衡系統，請務必使用十字盤調整器校正十字盤，調整伺服器連桿長度，確保十字盤達到水平狀態，再進基本機體設定，這樣才能確保飛行性能達到最佳效果。

Collar
橫軸鋁套
φ 4x φ 5.6x1mm

Main Drive Gear
主齒輪組

Washer
華司
φ 2x φ 4.8x0.6mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x4mm

The lower edge of main gear need to be lined up with lower edge of pinion gear. This will ensure smooth meshing, and avoid interference between pinion's base and main gear which can lead to unusual wear.

馬達齒下緣必須與主齒盤下緣水平切齊，如此才能確保齒輪傳動順暢，避免馬達主齒根部與新型斜主齒輪產生異常干涉磨損。
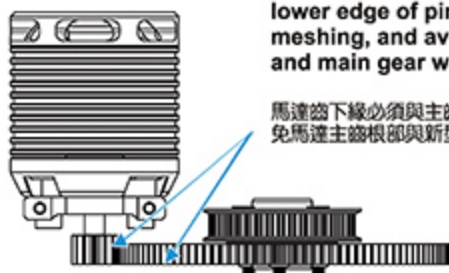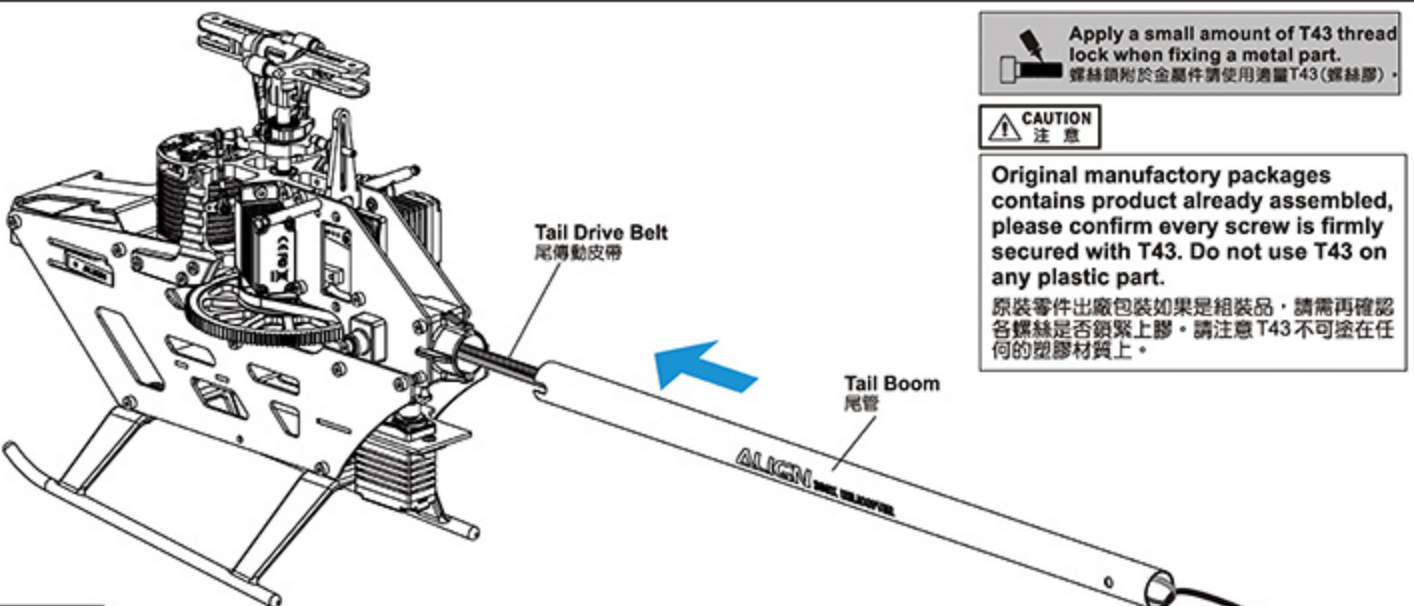
Tail Drive Belt
尾傳動皮帶

Tail Boom
尾管

⚠ Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

⚠ **CAUTION** 注意

Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.
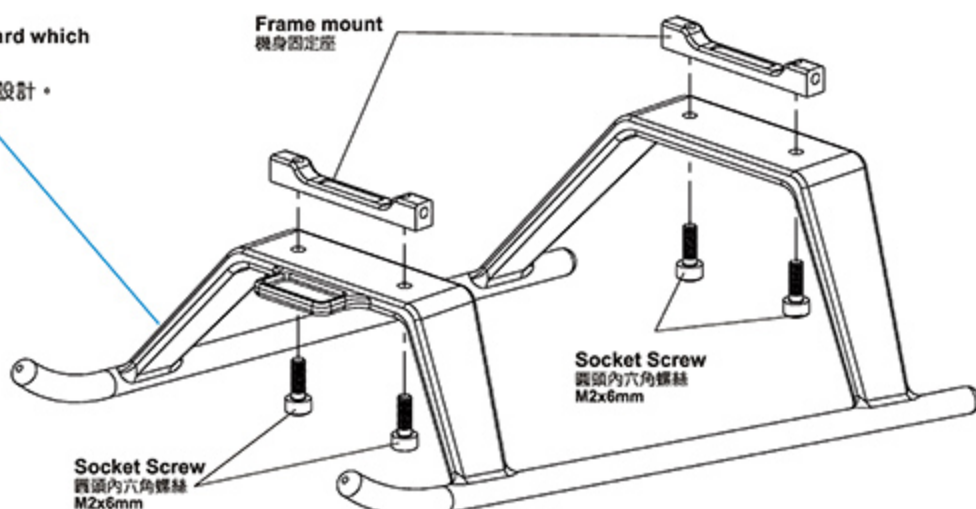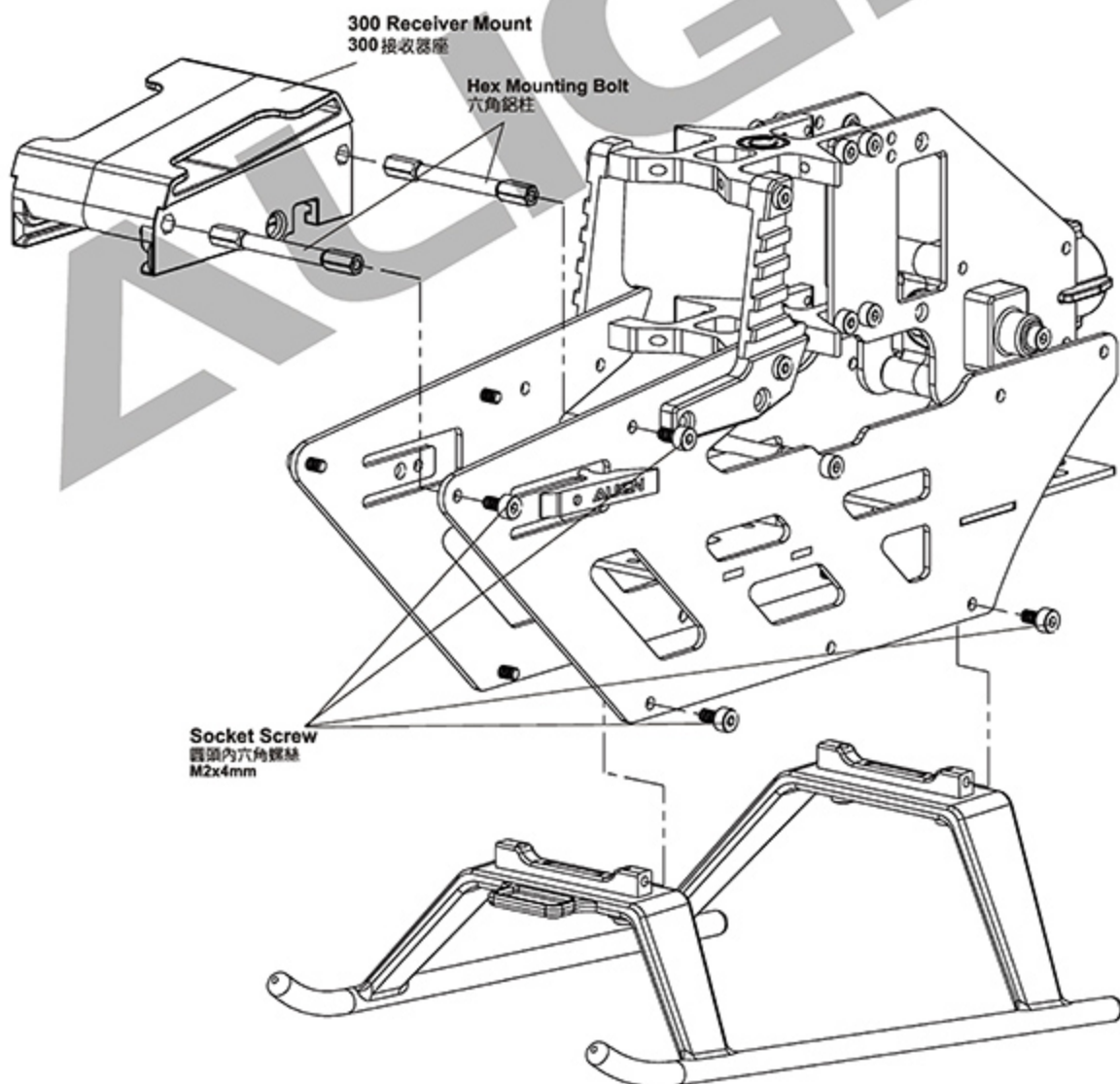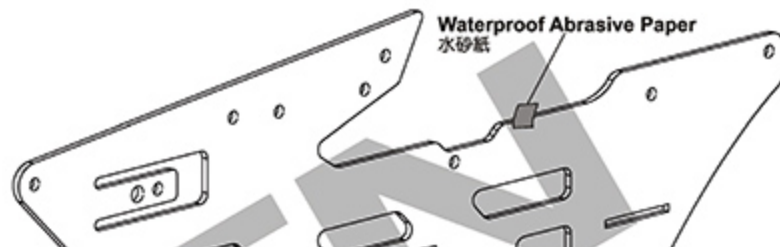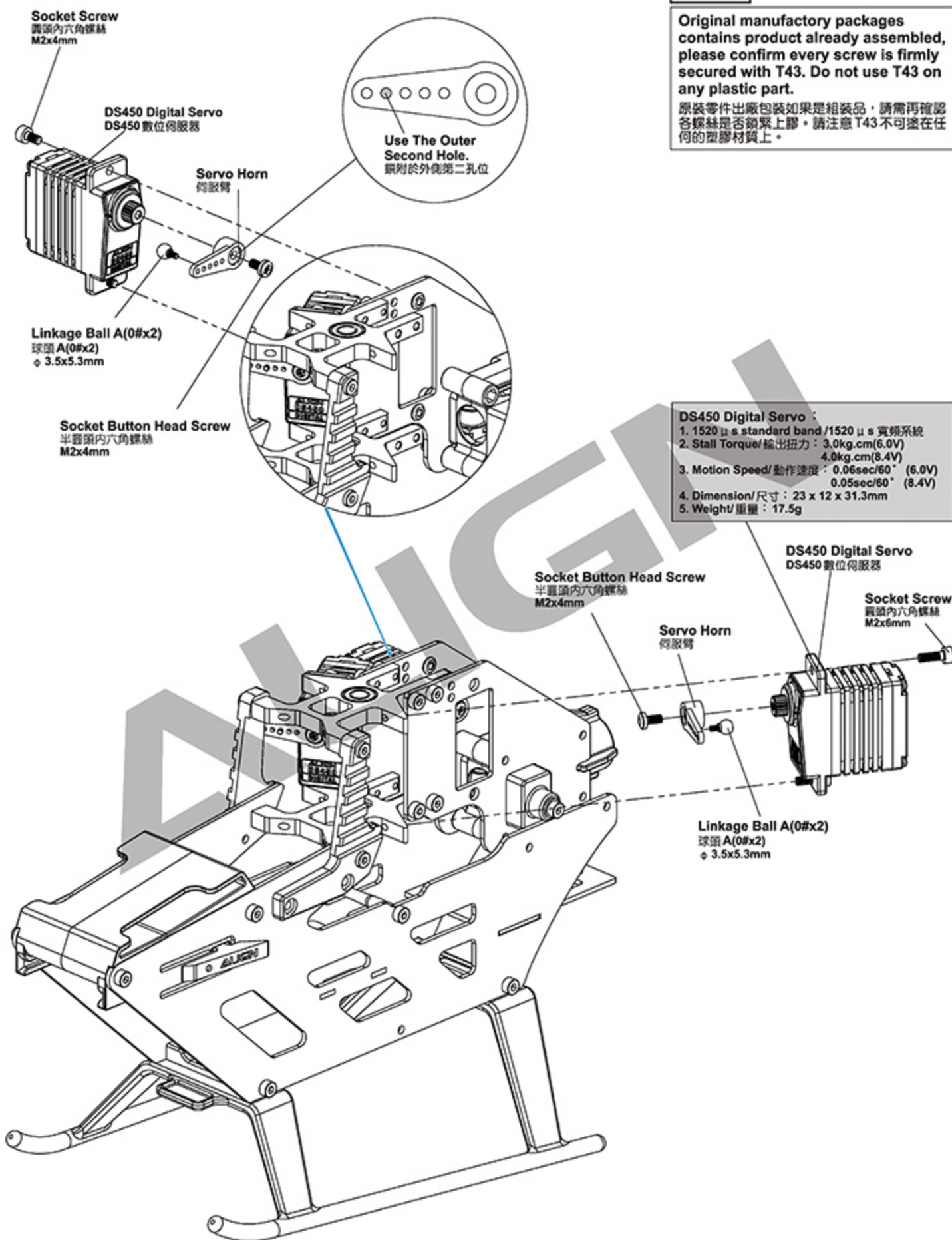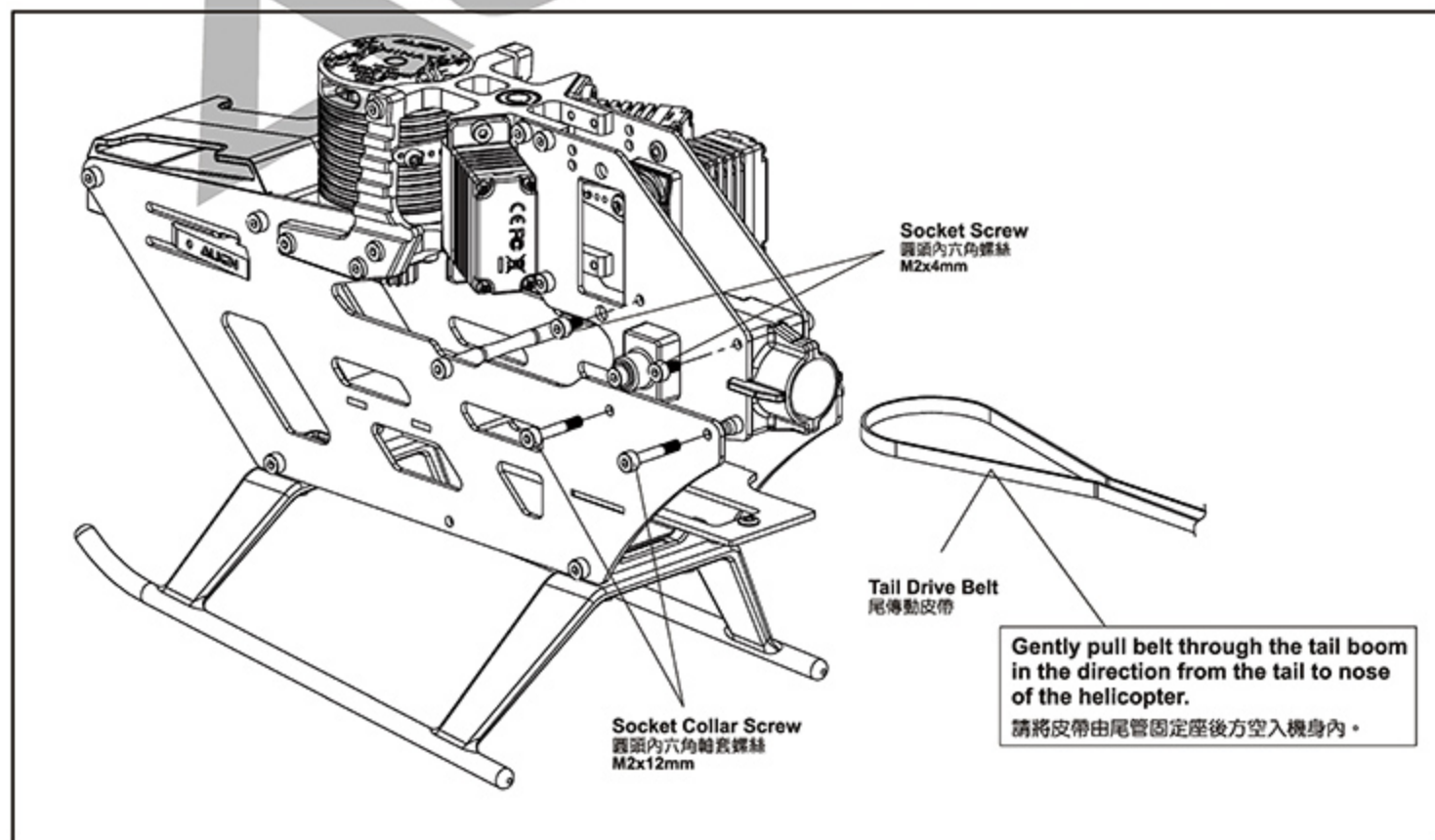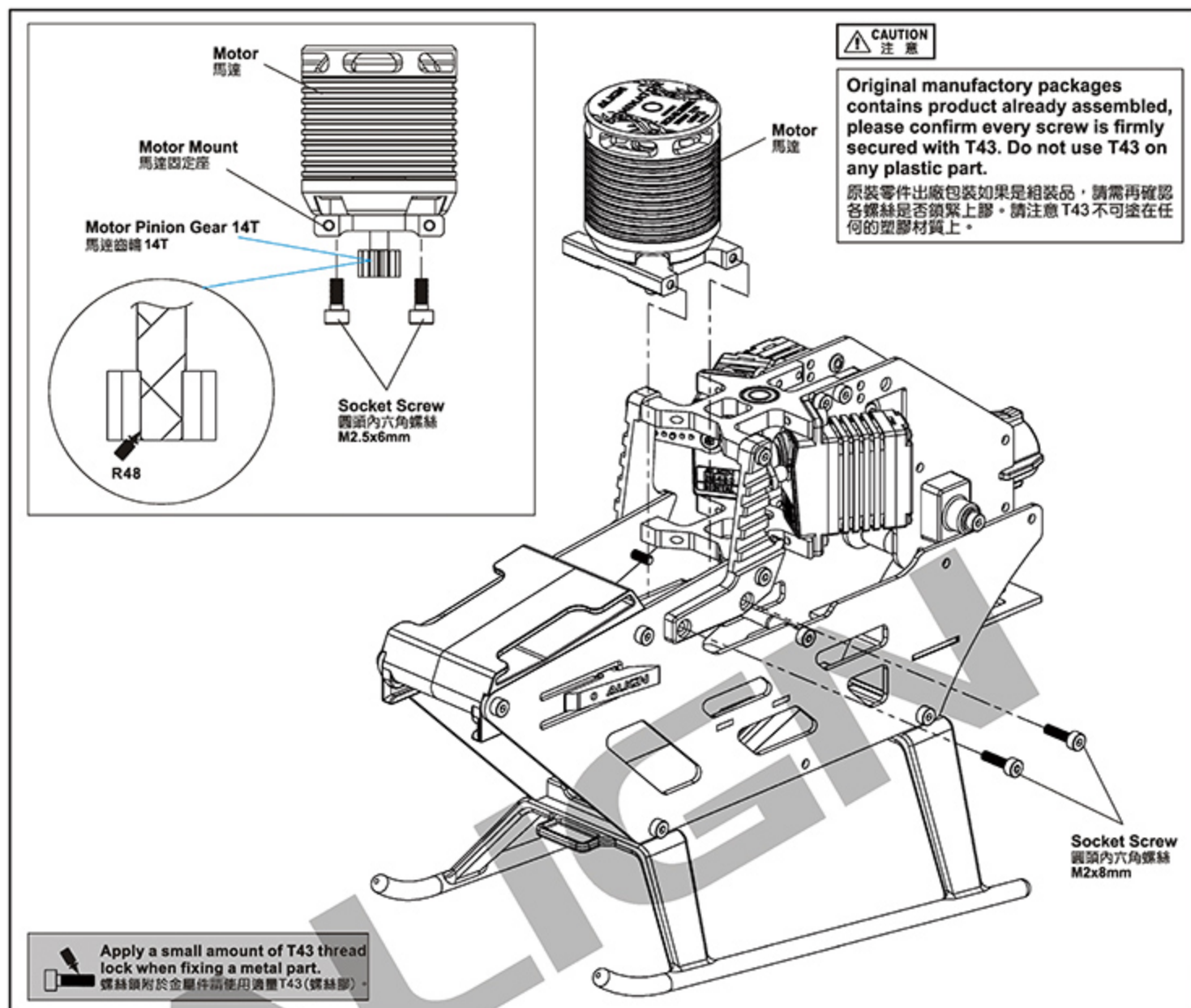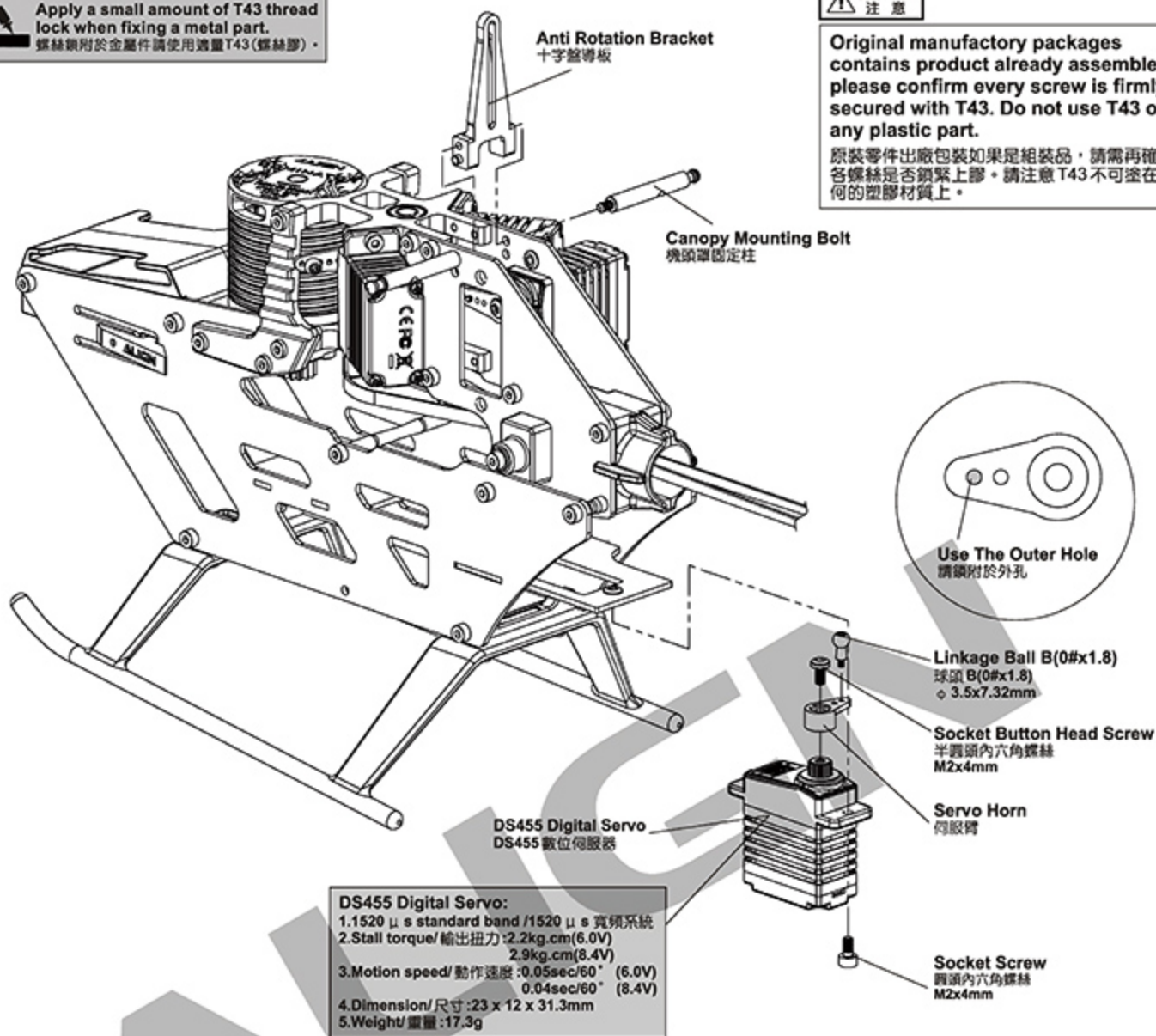原裝零件出廠包裝如果是組裝品，請需再確認各螺絲是否鎖緊上膠。請注意T43不可塗在任何的塑膠材質上。

⚠ **CAUTION** 注意

1. Use a string or flexible wire to pull the belt through the boom. Feed one end through the boom, loop through belt and feed back through the boom. Gently pull both ends of the string or wire until the belt is completely pulled through the boom. Please refer to the diagram below. Confirm the belt is installed correctly. Improper installation of the belt can result in serious damage to the helicopter or people.
2. When assembling the tail boom ensure the boom is properly installed in the tail boom mount and check to make sure belt is in the correct position.

1. 建議使用鐵絲或繩子拉緊皮帶的另一端將皮帶穿過尾管，皮帶組裝方向請依下方尾傳動皮帶裝配圖示安裝，確認皮帶組裝方向正確，否則將發生不可預期的危險。
2. 尾管組裝時必須確實頂住尾管固定座，以確保皮帶調整位置正確。

DRIVE BELT ILLUSTRATION
尾傳動皮帶裝配圖示

Tail belt must have a 90 degree counterclockwise turn from the front tail assembly to the rear tail assembly.
皮帶尾部組裝應逆時針90度旋轉。

Front
前

Back
後

-90°

⚠ **WARNING** 警告
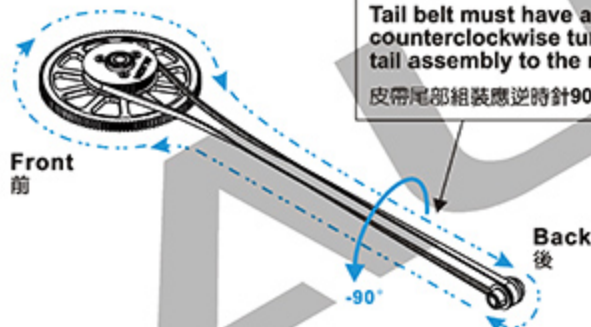
The belt must be kept in parallel when assembled. Do not be crisscross.
皮帶組裝時須保持平行，嚴禁重疊交錯。

❌
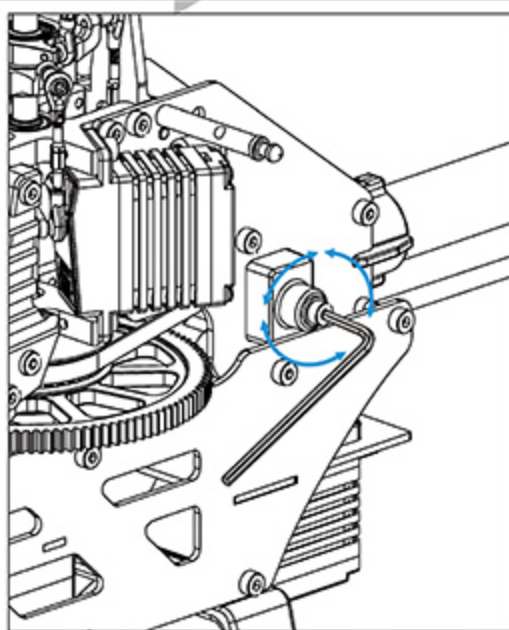
BELT TENSION ADJUSTMENT SUGGESTION:
1. Adjust belt tension to ensure proper power transfer to the tail. To prevent excessive power consumption DO NOT over tighten belt.
2. Adjust both screws equally to tighten or loosen belt tension to achieve the appropriate belt tension. Both sides must be rotated equally.
3. Make sure to check belt tension prior to each flight and adjust accordingly. To loosen belt tension, turn clockwise. To tighten belt tension, turn counterclockwise.

皮帶鬆緊調整建議：
1. 正確的調整皮帶鬆緊度，以確保飛行動力確實傳遞至尾部；皮帶不宜過緊，以免動力損耗。
2. 鎖緊兩側皮帶壓輪的調整螺絲後為最佳的皮帶鬆度，調整時務必將兩側的調整螺絲同時放鬆或鎖緊。
3. 每趟飛行前，請務必檢查調整螺絲的鬆緊度，順時針旋轉可將皮帶調鬆；逆時針旋轉則將皮帶調緊。
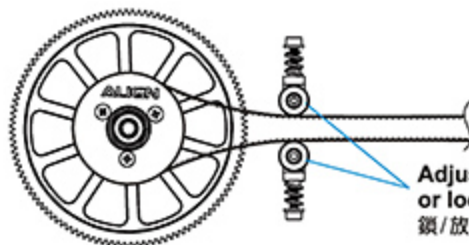
Adjust the belt tension by tightening or loosening the screw.
鎖/放螺絲來調整皮帶鬆緊
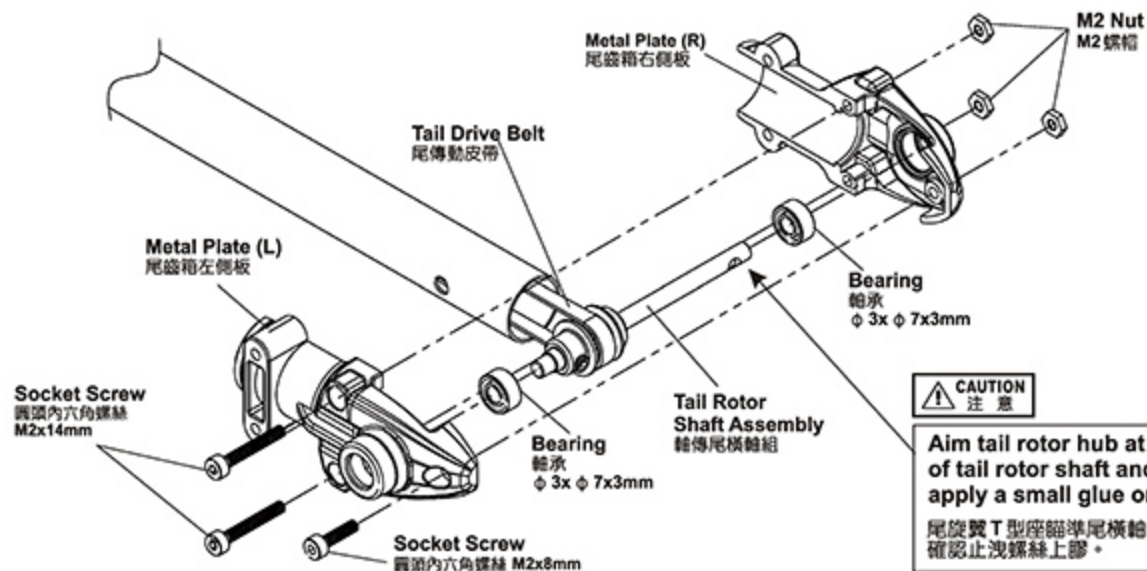
Metal Plate (R)
尾盜箱右側板

M2 Nut
M2螺帽

Tail Drive Belt
尾傳動皮帶

Metal Plate (L)
尾盜箱左側板

Bearing
軸承
φ 3x φ 7x3mm

Socket Screw
圓頭內穴角螺絲
M2x14mm

Tail Rotor
Shaft Assembly
軸傳尾橫軸組

Bearing
軸承
φ 3x φ 7x3mm

Socket Screw
圓頭內六角螺絲 M2x8mm

Apply a small amount of T43 thread
lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

Original manufactory packages contains product
already assembled, please confirm every screw is firmly
secured with T43. Do not use T43 on any plastic part.

原裝零件出廠包裝如果是組裝品，請再確認各螺絲是否鎖緊上膠。
請注意 T43 不可塗在任何的塑膠材質上。

50 Tail Blade
50 尾旋翼

M2 Nut
M2防鬆螺帽

Socket Screw
圓頭內六角螺絲
M2x12mm

⚠ CAUTION
注 意

1. The Metal Tail Rotor Holder must be completely disassembled, make sure to apply a little
T43 on screws before tighten them in place prior to fly. It is recommended to use a torque
wrench or torque lock for tightening screws. Torque value 3.0kg.cm.

2. Make sure to tighten the screws on each side with equal average strength, equal torque,
or there may be imbalance during rotation.

1.尾旋翼夾座出廠為假組裝，螺絲必須使用適量螺絲膠重新鎖附，鎖附需注意適當緊度即可，建議搭配扭力或扭力
機鎖附，扭力值為3.0kg.cm。

2.組裝尾控制組時，上、下螺絲必須平均力道鎖附，不可單邊過緊，否則會造成干涉滑動不順暢。

Thrust Bearing
止推軸承
φ 3x φ 6x2.8mm

OUT

Washer
華司
φ 4x φ 5.8x0.3mm

IN

Bearing
軸承
φ 3x φ 6x2.5mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x6mm

Collar
尾翼軸承座墊片
φ 4x φ 5.1x1.6mm

Bearing Holder
尾翼控制軸承套

T43

Metal T Type Arm
金屬尾T型控制臂

Metal Tail
Rotor Holder
金屬尾旋翼夾座

Control Link
尾控制連桿頭

Slide Shaft
尾軸滑套
φ 4x φ 4.8x10.8mm

Bearing
軸承
φ 3.5x φ 7x2.5mm

Bearing
軸承
φ 4x φ 7x2.5mm

M3 Set Screw
M3 止淺螺絲
M3x3mm

Collar B
尾連桿頭銅套 B
φ 2x φ 3x2.5mm

Tail Rotor Hub
尾旋翼T型座
φ 8x29.2mm

Collar Screw
軸套螺絲
M2x6mm(牙長2.2)

Round Head Wood Screw
圓頭木工螺絲
T2x6mm

Socket Button Head Screw
半圓頭內六角螺絲
#0-80x4mm

Tail Pitch Bellcrank
尾控制工字臂

Bearing
軸承
φ 1.5x φ 4x φ 5x2mm

Washer
華司
φ 2.6x φ 4x0.5mm

Tail Belt Brace
尾盜箱牙套
M2x5mm

Bearing
軸承
φ 2x φ 5x2.3mm

Socket Button Head Screw
半圓頭內六角螺絲
M2x5mm

Linkage Ball C
球頭C(M2x2.5) φ 3.5x5.8mm

Socket Button Head Self Tapping Screw
半圓頭內六角自攻螺絲
T1.5x4mm

15

The main blades is prohibited to be screwed too tightly. Try to use hands to bend main blades after screw it, it's better to have slight damping and the tightness of two-blade must be same. Uneven tightness or overtight will cause body shake and sudden high/low or right/left in flight, and may be out of control. Please be careful and make sure to do preflight check and maintenance regularly.

主旋翼鎖附，絕對不能鎖太緊，鎖緊後需用手折彎主旋翼，要有輕量阻尼感為佳，兩支主旋翼的緊度要一致。緊度不平均或過緊會造成機體震動導致飛行時會不穩定，嚴重可能導致失控，請務必小心注意，並養成飛行前檢查與定期保養。

When installing, facing ALIGN LOGO of main blades upward. 230 main blades are symmetric airfoil. The leading edge of the airfoil is rounder and the trailing edge is sharper. The rotation of blades is clockwise direction. When the main blades are installed, the leading edge of the main blades must be installed in clockwise direction of the rotor head.

安裝時，主旋翼上ALIGN LOGO字樣朝上。
230主旋翼為對稱翼型，翼型前緣較為圓潤，後緣較為尖銳。亞拓直昇機旋翼頭轉動為順時針方向，主旋翼安裝時，主旋翼前緣必須朝旋翼頭順時針轉動方向安裝。

Each set of main blades have been balance and marked with serial number before they go out of factory. If some blades are used at the same time, it's prohibited to be mixed use. If main blades are mixed use, it will cause helicopter unstable flying or even out of control.

每組主旋翼組，出廠時已完成平衡校正及標示序號，當同時有多組主旋翼時，不可多組混搭使用。主旋翼組若混搭使用，會造成直昇機飛行不穩異常震動，嚴重者可能會失控。

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.

鎖緊主旋翼螺絲須注意適當緊度即可，過緊可能導致主旋翼夾座受損，飛行意外發生。

230 Carbon Fiber Blades
230 碳纖主旋翼

Socket Collar Screw
圓頭內六角軸套螺絲
M2x10mm

Socket Collar Screw
圓頭內六角軸套螺絲
M2x15mm

M2 Nut
M2 螺帽

Ball Link
連桿頭

Tail Control Rod Sleeve
尾控制桿套
φ 3x φ 3.6x6mm

Tail Control Rod
尾控制桿

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

A MOUNTING ORIENTATION OF MINIGRS FLYBARLESS SYSTEM
MINIGRS無平衡翼系統的安裝方向

Please visit Align download area to get the completed instruction manual at Align website.

更多詳細的設定操作說明請至官網下載專區下載。

http://www.align.com.tw/download-en/minigrs/
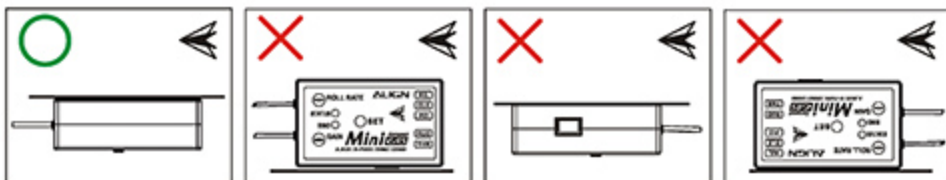
1. MiniGRS Flybarless System can only be installed face down, with antenna point towards front of the helicopter.
2. Incorrect installation will cause incorrect compensation of the helicopter swashplate. Flying with incorrect installation will result in crash.

1. MiniGRS 無平衡翼系統的安裝方式只有一種，必須為面板朝下且天線朝向機頭方向。
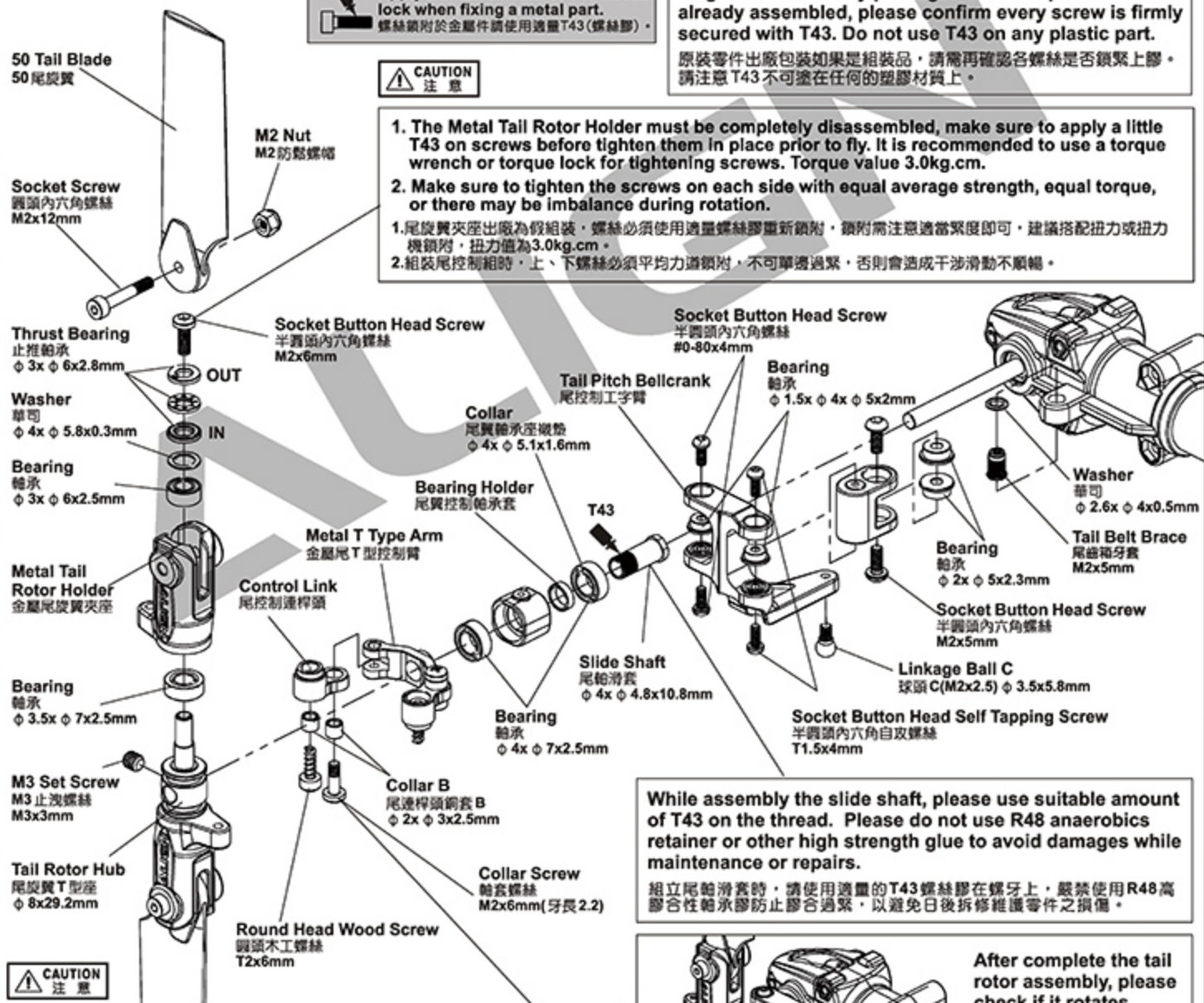2. 安裝錯誤會造成直昇機十字盤修正錯誤，強行飛行會有墜機的危險。

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件請使用適量T43(螺絲膠)。

⚠ CAUTION 注 意

Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.
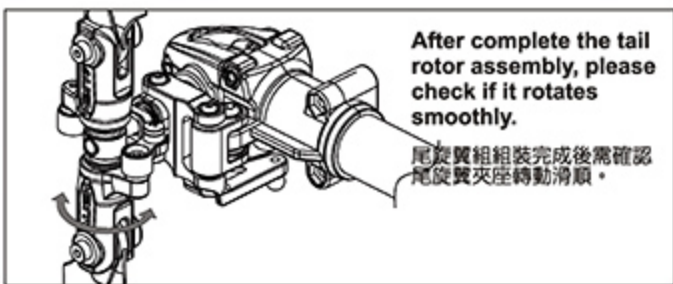
原裝零件出廠包裝如果是組裝品，請需再確認各螺絲是否鎖緊上膠。請注意T43不可塗在任何的塑膠材質上。

⚠ WARNING 警 告

When installing the speed controller, please keep a distance at least 5cm from the receiver to avoid any interference.

安裝調速器時請與接收器保持至少5cm 以上的距離，避免干擾接收器。

RCE-BL25A Brushless ESC
RCE-BL25A
無刷定速調速器
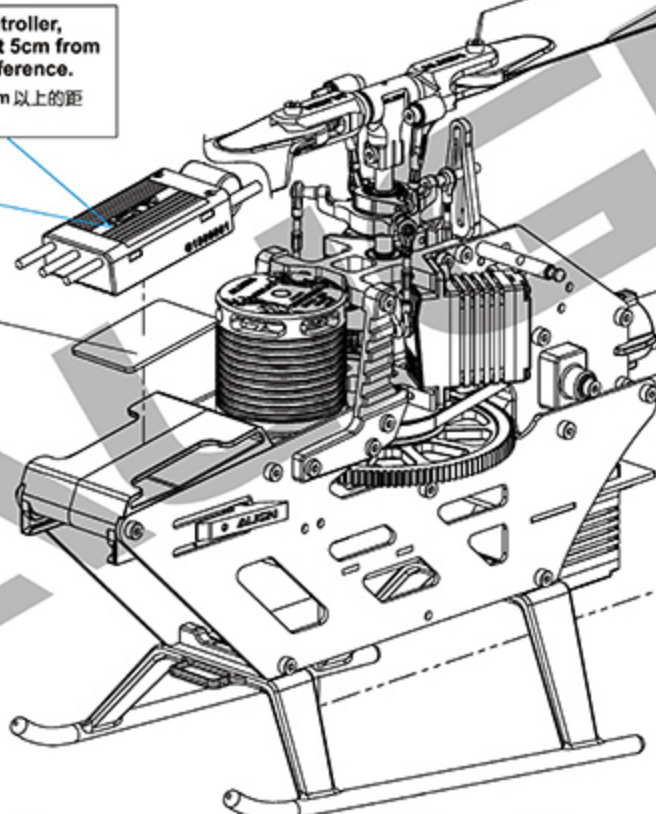
Foam Tape
泡棉

Foam Tape
泡棉

MiniGRS Flybarless System
MiniGRS 無平衡翼系統

⚠ WARNING 警 告

MiniGRS must face down, antenna point forward.
MiniGRS 面板必須朝下，天線朝前安裝
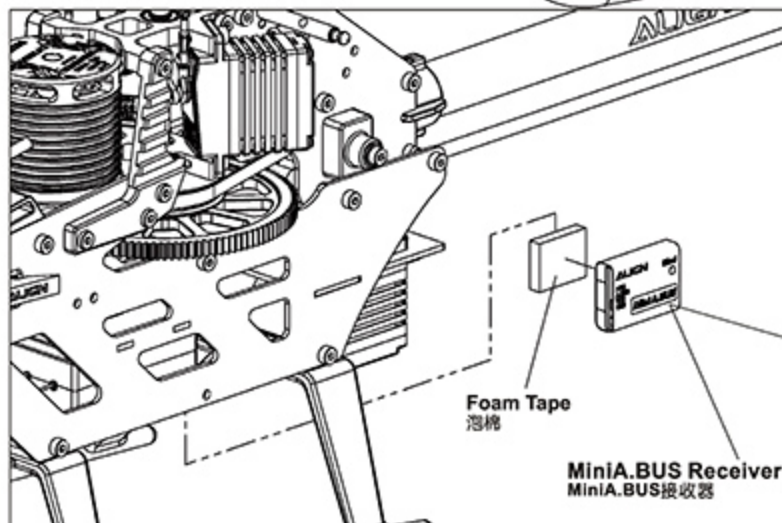
Foam Tape
泡棉

MiniA.BUS Receiver
MiniA.BUS接收器
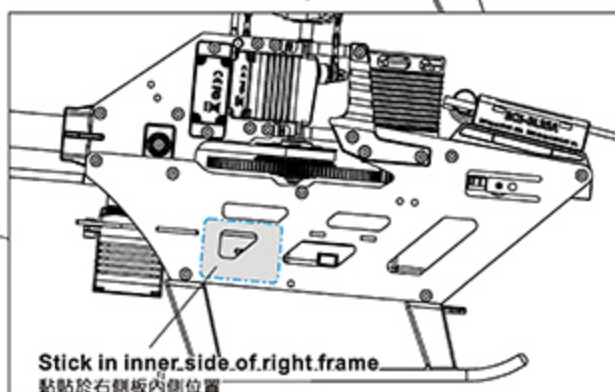
Stick in inner side of right frame
黏貼於右側板內側位置

Please attach the hook & loop tape to narrow side of battery.
魔術沾請黏貼在電池的較窄面。
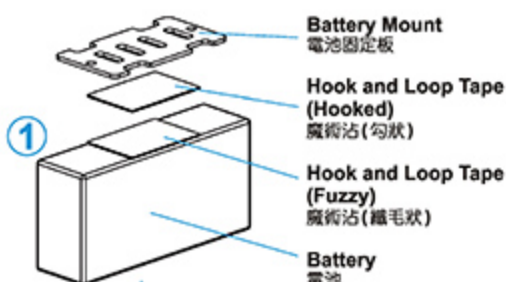
Battery Mount
電池固定板

Hook and Loop Tape (Hooked)
魔術沾(勾狀)

Hook and Loop Tape (Fuzzy)
魔術沾(纖毛狀)

Battery
電池

① ②
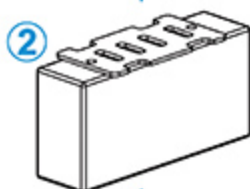
Use the included hook & loop strap to fix the battery in place.
以附剔的魔術束帶來固定電池。

③ Hook and Loop Strap
魔術帶

Slide the battery mounting plate along the rail until a "click" is heard to make sure the battery mounting plate is latched.
將電池固定板順著電池滑軌裝入至發出"咯答"聲響，使電池固定板卡入卡榫。
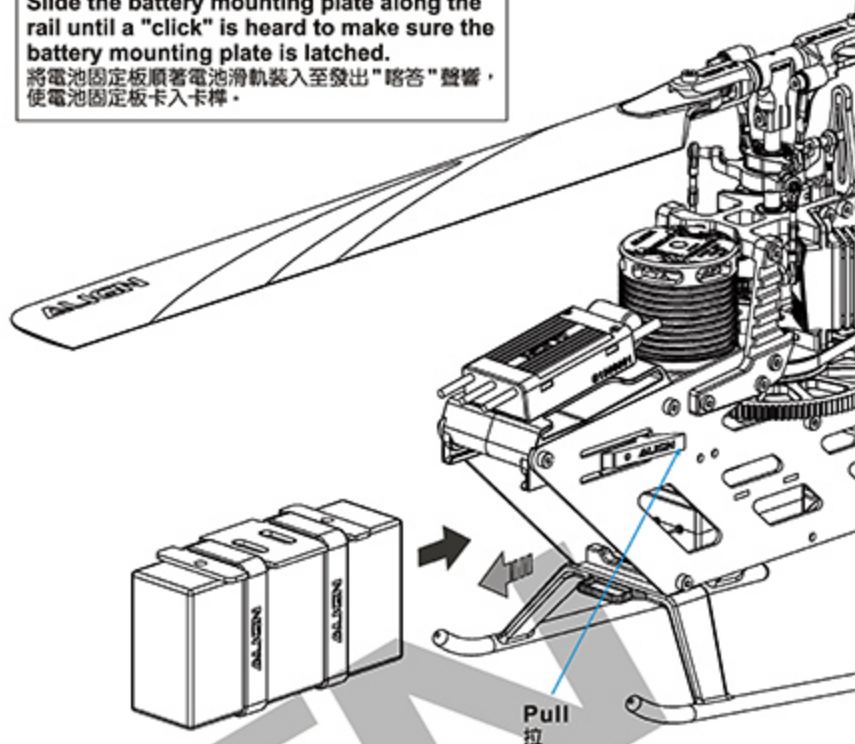
Pull
拉

While drawing out the battery, pull this latch out to allow the battery to slide out along the rail.
電池抽出時，請先將拉扣往外拉，順著滑軌抽出。

Canopy Nut
機頭罩墊圈

Canopy
機頭罩

Foam Tape
泡棉

RCE-BL25A Brushless ESC
RCE-BL25A 無刷定速調速器

Motor
馬達

Servo
伺服器

Tail Servo
尾舵伺服器

ALIGN 300X HELICOPTER

MiniGRS Flybarless System
MiniGRS 無平衡翼系統

Mini A.BUS Receiver
Mini A.BUS 接收器

Rudder control rod
尾舵控制連桿

Quick Finder
零件快速購

237

249

MINI A.BUS RECEIVER USER MANUAL　MINI A.BUS接收器使用說明　ALIGN ///
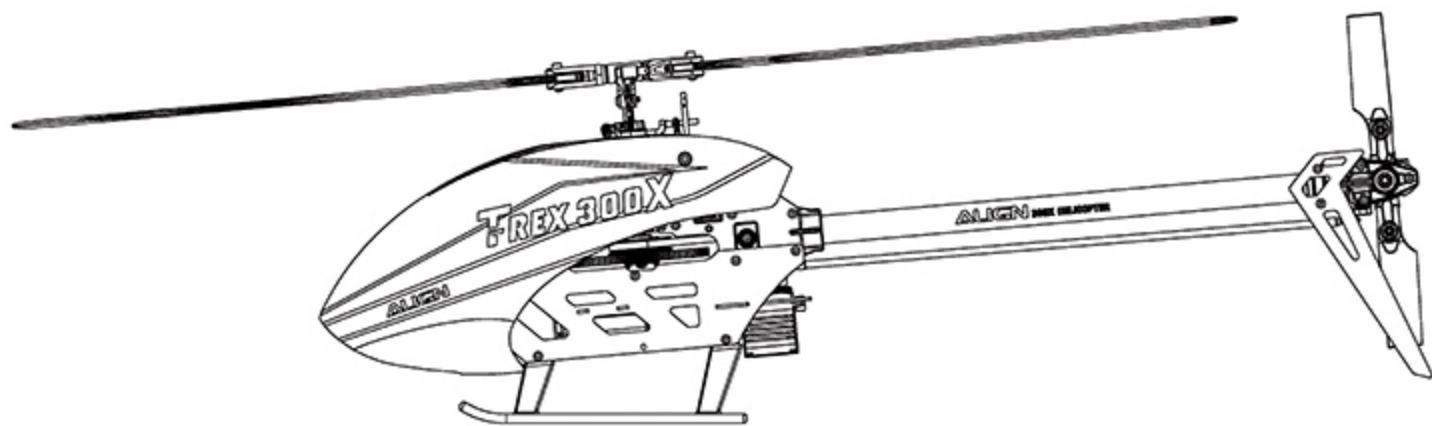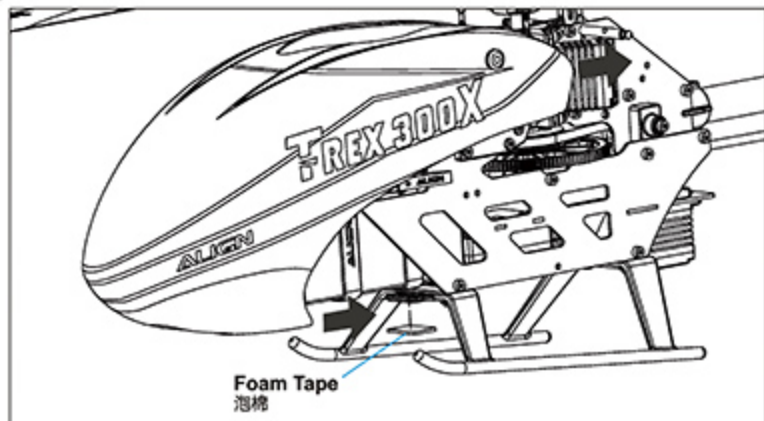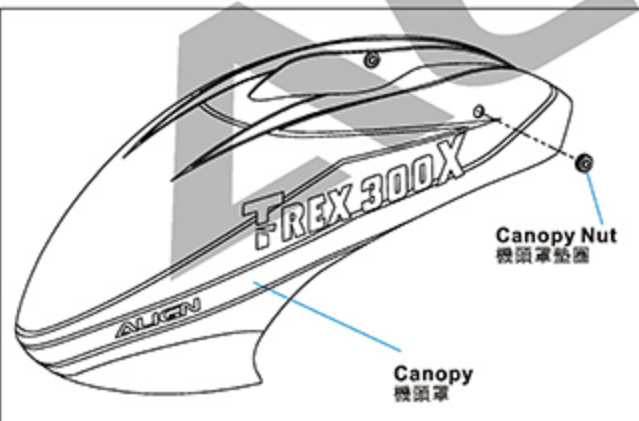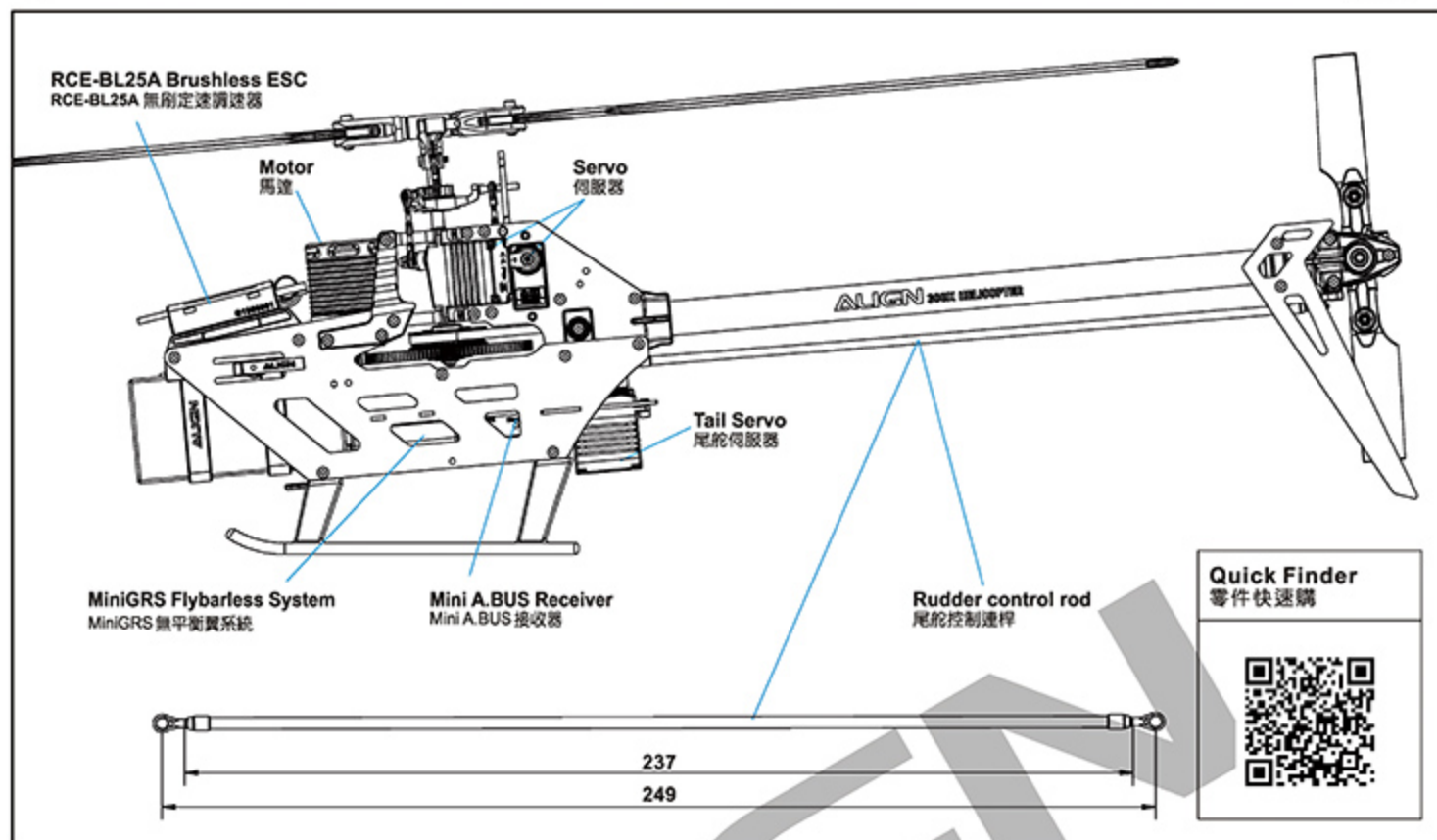
RECEIVER SETUP INDICATORS
接收器各部位名稱

A.BUS Interface
A.BUS連接口

Binding button
對頻鈕

ALIGN　Bind

PPM
A.BUS
VCC
GND

Antenna
天線

Mini A.BUS

STATUS INDICATOR
狀態指示燈
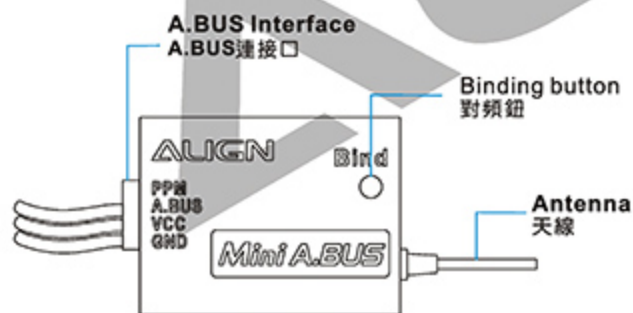
The status indicator showes current battery voltage and work status of the receiver.
狀態指示燈用於指示接收器電源以及工作狀態

LED Off 燈號熄滅	**Power disconnected.** 接收器電源未連接
Red Solid Light 紅燈恆亮	**Power on and working.** 接收器已連接電源，並正常運作。
Fast Flashing 快速閃爍	**Binding** 接收器處於對頻狀態。
Flashing Slowly 慢速閃爍	**The pairing transmitter is off or loss of signal.** 已配對的遙控器未開機，或訊號遺失。

USER NOTICE　使用注意事項

1. After the binding is done, please power on receiver again and check if receiver is bound with transmitter correctly.
2. Please do not connect motor power when binding as it may result in serious injury.
3. To ensure signal recieption quality, please make sure to keep electronics governor and other metal parts away when installing receiver.

1. 完成對頻後，請重開接收器電源，並確認接收器是否與遙控器完成正確對頻。
2. 在對頻的過程中，請勿將馬達主電源接上，馬達可能會意外運轉造成嚴重傷害。
3. 為確保訊號質量，安裝接收器時請盡量避開電子調速器及其他金屬零件。

ALIGN A10 TRANSMITTER、MINIGRS FLYBARLESS SYSTEM WIRING & A6B RECEIVER WIRING
ALIGN A10遙控器、Mini A.BUS接收器與MINIGRS無平衡翼系統接收器接線示意圖

AIL 副翼
ELE 升降舵
PIT 螺距
RUD 方向舵

ROLL RATE ALIGN AIL
STATUS ELE
BIND PIT
SET
GAIN RUD
Mini GRS THR
A.BUS/S-FHSS/DSM2/DSMX

ALIGN Bind
MINI A.BUS RECEIVER
PPM
A.BUS
VCC
GND
Mini A.BUS MINI A.BUS接收器
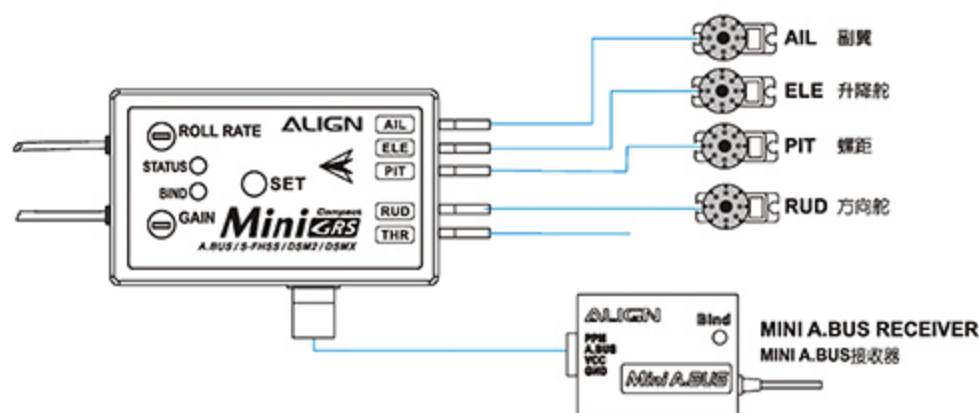
FUTABA TRANSMITTER、REMOTE RECEIVERS & MINIGRS FLYBARLESS SYSTEM WIRING DIAGRAM
FUTABA遙控器、衛星天線與MINIGRS無平衡翼系統接收器接線示意圖
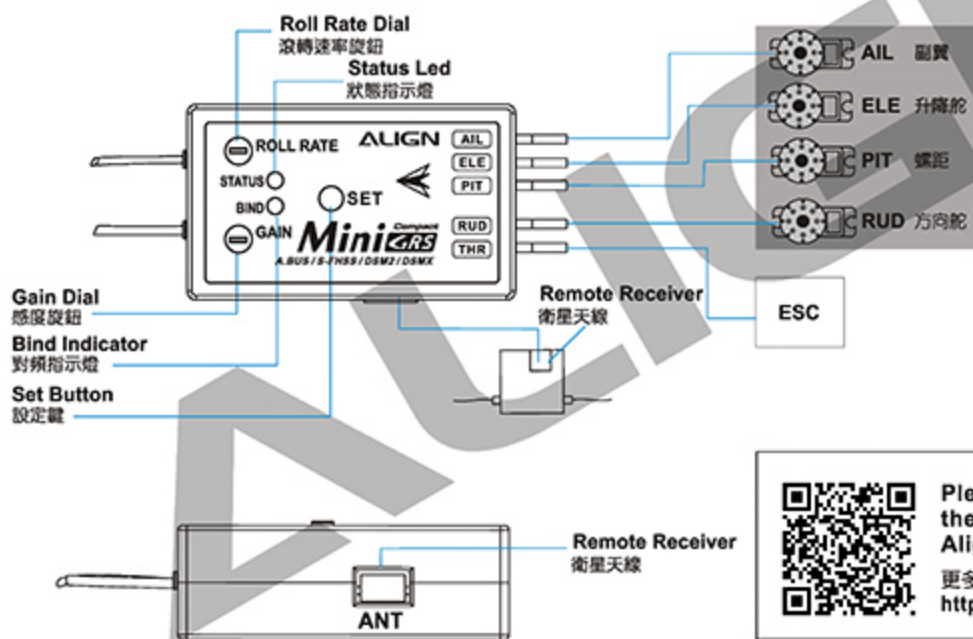
Roll Rate Dial
滾轉速率旋鈕
Status Led
狀態指示燈

ROLL RATE ALIGN AIL
STATUS ELE
BIND PIT
SET
GAIN RUD
Mini GRS THR
A.BUS/S-FHSS/DSM2/DSMX

Gain Dial
感度旋鈕
Bind Indicator
對頻指示燈
Set Button
設定鍵

AIL 副翼
ELE 升降舵
PIT 螺距
RUD 方向舵

Remote Receiver
衛星天線

ESC

Remote Receiver
衛星天線

ANT

Please visit Align download area to get the completed instruction manual at Align website.
更多詳細的設定操作說明請至官網下載專區下載。
http://www.align.com.tw/download-en/minigrs/

USER NOTICE 使用注意事項

⚠️ WARNING 警告

1. Gain rate dial is set to 50% as factory default (dial at 12 o'clock position ; 6 o'clock position for the antenna). Roll rate dial is set to minimum value (dial at 7 o'clock position). Should there be any oscillation on aileron or elevator during flight, reduce the gain by turning the dial counter-clockwise approximately 10 degrees at a time.

2. Should there be any drift front/rear/left/right during flight, increase the gain by turning the dial clockwise approximately 10 degrees at a time.

3. Roll rate dial is used to adjust the roll rate of helicopter's elevator and aileron; turning clockwise will increase roll rate, with faster elevator and aileron response; turning counter-clockwise will decrease roll rate, with slower elevator and aileron response. We recommend novice pilots to fly with lower roll rate.

4. Any over use, incorrect setup, missassembly, incorrect modification or misuse will lead to abnormal voltage, electronic devices damage, structural interference, and insufficient power supply. Make sure to carefully check every assembly and setup refer to the manual instruction prior to every flight to prevent any unforeseen danger.

1. 感度旋鈕出廠設定值為50%(旋鈕指向12點鐘方向、天線位置為6點鐘方向)，滾轉速度旋鈕出廠設定值為最小(旋鈕指向7點鐘方向)，飛行時若機體有左右或前後抖動，表示感度偏高，請逆時針調整感度旋鈕，以每次調整約10度方式，調整至適當位置。

2. 飛行時若機體有左右或前後飄移時，表示感度偏低，請順時針調高感度旋鈕，以每次10度方式調整至適當位置。

3. 滾轉速率旋鈕為調整直昇機升降、副翼滾轉速率，往順時針調大滾轉速率，升降與副翼反應會變快，往逆時針調低滾轉速率，升降與副翼反應會變慢，初階入門者建議把滾轉速率調低飛行。

4. 任何電子配件、零件的設定、組裝、修改或操作不良所造成的電壓異常、電子零件損壞，即可能造成供電不穩定等問題，每趟飛行前須注意仔細檢查，防止機件及電子零件故障而引發不可預期的意外。

FEATURES 產品特色

3Axis 3-axis gyroscopic flybarless system to simulate the stability of mechanical flybar system, yet at the same time achieving agile 3D performance.
3 軸陀螺儀無平衡翼系統，可模擬有平衡翼系統的穩定性，更有靈活的 3D 性能。

MEMS Utilizes MEMS gyro sensors, which feature small footprint, high reliability, and excellent stability.
採用 MEMS（Micro Electro Mechanical Systems）微機電系統技術感測器，具有體積小、可靠性高、穩定性佳的優點。

12bit Sensor with 12 bit ultra high resolution, resulting in highly precise controls.
感測器 12 位元，超高解析度，控制細膩精準。

S-FHSS Supports Futaba S-FHSS 2.4GHz transmission protocol.
支援 Futada S-FHSS 2.4GHz 傳輸系統。

[icon] Supports ALIGN A10 Radio Control System.
支援 ALIGN A10 遙控器。

[icon] Supports Spektrum and JR satellite receivers.
支援 SPEKTRUM 與 JR 衛星天線。

Easy Simplistic setup process without the need of external devices. Setup is done through 6 steps and 2 sensitivity adjustments.
設定簡單不需額外的介面，只需六個步驟、兩個感度調整即可完成所有設定。

Energy Flybarless system dramatically improves 3D power output and efficiency, resulting in reduced fuel or electricity consumption.
無平衡翼系統，可大幅降低 3D 大動作飛行能量消耗，提供直昇機更大的動力輸出且更加節省燃油或電力。

Stable Highly sensitive gyroscopic sensors combined with advanced control detection routine providing higher hovering and aerobatic stability than other flybarless system.
高感度陀螺感測器及先進環路設計，可提供比一般平衡翼系統更佳的靜態及動態穩定性。

[icon] 250~500 Designed specifically for T-REX 250、T-REX 300、T-REX 450、T-REX 470and T-REX 500, contains optimal flight parameters, no adjustments is needed out of the box to achieve superior flight performance.
針對 T-REX 250、T-REX 300、T-REX 450、T-REX 470、T-REX 500 設計，內建最佳飛行參數，不需調整即有優異性能表現。

[icon] 3.5V~8.4V Capable to operate between 3.5V to 8.4V, compatible with high voltage servos.
適用電壓 3.5V～8.4V，支援高電壓伺服器。

[icon] Small footprint, light weight, minimalists and reliable design.
體積小、重量輕、構造簡單可靠，提供操控者高性能的飛行樂趣。

RoHS RoHS certified.
符合 RoHS 限用規章。

MINIGRS FLYBARLESS SYSTEM SETUP INDICATORS   MINIGRS 無平衡翼系統功能設定指示燈說明
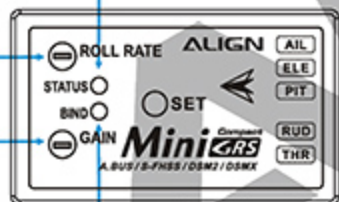
FLYBARLESS SYSTEM SETUP MODE 無平衡翼系統設定模式

Flash 1 time: Aileron neutral point	閃爍頻率一次：副翼伺服器中立點設定
Flash 2 times: Elevator neutral point	閃爍頻率二次：升降伺服器中立點設定
Flash 3 times: Pitch neutral point	閃爍頻率三次：螺距伺服器中立點設定
Flash 4 times: Rudder neutral point	閃爍頻率四次：尾舵陀螺儀正反向設定
Flash 5 times: Rudder left travel limit setting	閃爍頻率五次：尾舵左舵行程設定
Flash 6 times: Rudder right travel limit setting	閃爍頻率六次：尾舵右舵行程設定

BIND LED 對頻燈號

STEADY LIT GREEN LED :Radio binding successfully	綠燈恆亮：對頻成功
FLASHING GREEN LED : Radio binding failed	綠燈閃爍：對頻失敗
STEADY LIT RED LED : No signal detected	紅燈恆亮：無發射訊號

ROLL RATE ADJUSTMENT DIAL   滾轉速率調整鈕

Roll Rate Dial 滾轉速率旋鈕

Roll rate dial is used to adjust the roll rate of helicopter's elevator and aileron; turning clockwise will increase roll rate, with faster elevator and aileron response; turning counter-clockwise will decrease roll rate, with slower elevator and aileron response. We recommend novice pilots to fly with lower roll rate.

滾轉速率旋鈕為調整直昇機升降、副翼滾轉速率，往順時針調大滾轉速率，升降與副翼反應會變快，往逆時針調低滾轉速率，升降與副翼反應會變慢，初階入門者建議把滾轉速率調低飛行。

GAIN ADJUSTMENT DIAL   感度調整旋鈕

Gain Dial 感度旋鈕

Should there be any oscillation on aileron or elevator during flight, reduce the gain by turning the dial counter-clockwise approximately 10 degrees at a time.
Should there be any drift front/rear/left/right during flight, increase the gain by turning the dial clockwise approximately 10 degrees at a time.

飛行時若機體有左右或前後抖動，表示感度偏高，請逆時針調整感度旋鈕，以每次調整約 10 度方式，調整至適當位置。飛行時若機體有左右或前後飄移時，表示感度偏低，請順時針調高感度旋鈕，以每次 10 度方式調整至適當位置。

SETUP PRE-CHECK 設定前注意事項

1. During pre-flight check, please ensure MiniGRS Flybarless System is securely mounted, and there are sufficient battery in the transmitter.

2. There is only one way to mount MiniGRS Flybarless System on the helicopter. Do not alter the mounting direction, otherwise incorrect compensation may result in danger of crashing.

3. After MiniGRS Flybarless System has bounded with transmitter, please ensure MiniGRS Flybarless System power indicator is lit correctly, and that swashplate and rudder is compensating the correct direction.

4. To ensure proper initialization of MiniGRS Flybarless System, please keep the helicopter stationary during power up, do not move any transmitter sticks.

5. Please ensure the swashplate setting in transmitter is set to H-1 prior to making any setting changes.

6. While setting neutral position of servos, all steps must be completed before power is turned off, otherwise servos neutral setting will fail. To ensure optimal flight performance, please ensure swashplate is level during swashplate neutral setting.

7. Adjustment of elevator and aileron roll rate must be done with the dials on MiniGRS Flybarless System, do not adjust elevator and aileron travel end points on transmitter. On the other hand, rudder speed is adjusted through rudder end points.

8. To achieve optimal flight performance, pitch (CH6) and rudder (CH4) travel can be adjusted on the transmitter, but do not adjust elevator and aileron end points on transmitter.

9. Elevator and Aileron gyro gain must be adjusted through the dials on MiniGRS unit. Rudder gyro gain is adjusted through transmitter's GYRO SENS function.

10. To ensure optimal signal reception, MiniGRS Flybarless System antennas should be at least 1/2 inch away from conductive material, and should not be bent excessively. Try to keep the transmitter close to MiniGRS Flybarless System during binding. Should it unintentionally bind to another transmitter, just perform binding process again.

1. 在每次飛行之前，請確認 MiniGRS 無平衡翼系統是否固定良好，並且檢查發射器電力是否足夠。

2. MiniGRS 無平衡翼系統安裝在直昇機上的方式只有一種，請勿任意更改安裝方向，以免修正錯誤造成危險。

3. 發射器和 MiniGRS 無平衡翼系統完成對頻後，請確認 MiniGRS 無平衡翼系統開機燈號以及十字盤和尾舵的修正是否正確。

4. 開機時請保持直昇機靜止，且不要動發射器任何搖桿，避免 MiniGRS 無平衡翼系統初始化錯誤。

5. 在進入所有設定之前，請確認發射器的十字盤類型須為 H-1 模式。

6. 在設定伺服機中立點位置時，必須把全部步驟完成才可將電源關閉，否則設定值將不被記憶。設定伺服器中立點位置時請將十字盤調成水平以 獲得最佳飛行性能。

7. 調整升降及副翼的滾轉速率時只能用 MiniGRS 無平衡翼系統上的旋鈕來調整，不可利用發射器上的升降和副翼行程選項來調整。調整尾舵速率時則必須利用發射器上的尾舵行程來調整。

8. 為獲得最佳飛行性能，可以調整發射器上的螺距 (CH6) 以及尾舵 (CH4) 的行程，但不可調整發射器上的升降和副翼行程。

9. 升降及副翼的陀螺感度必須用 MiniGRS 無平衡翼系統上的旋鈕調整，尾舵的陀螺感度請利用發射器的 GYRO SENS 選項來調整。

10. MiniGRS 無平衡翼系統的天線位置應遠離導電材料至少半英吋的距離，且不要過度彎曲，以獲得最佳的射頻信號。發射器和 MiniGRS 無平衡翼系統對頻時，請盡量靠近。若對到別組發射器時，重新對頻即可。

MINIGRS FLYBARLESS SYSTEM INSTALLATION　　MINIGRS 無平衡翼系統接線方式
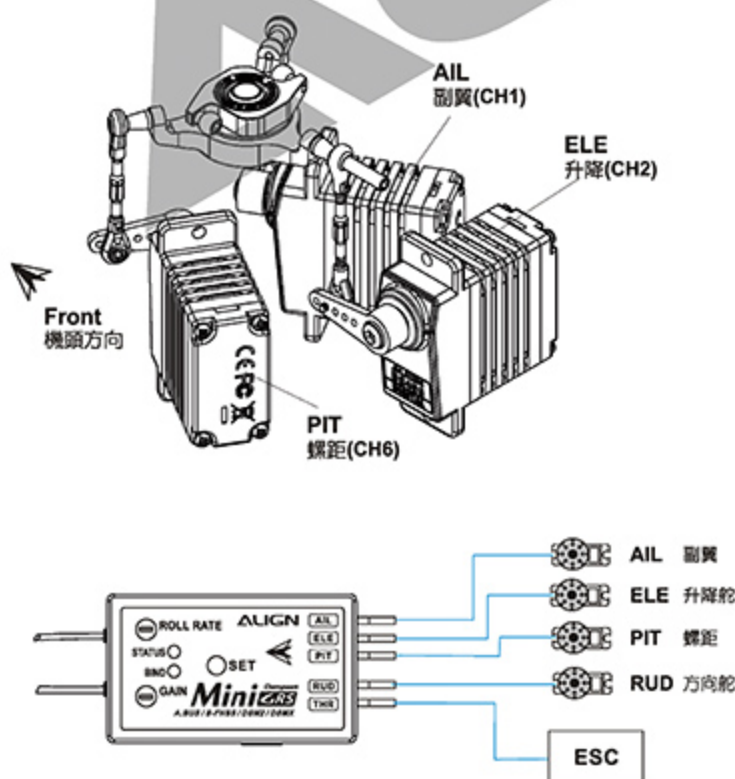
AIL 副翼(CH1)
ELE 升降(CH2)
Front 機頭方向
PIT 螺距(CH6)

AIL 副翼
ELE 升降舵
PIT 螺距
RUD 方向舵
ESC

⚠ CAUTION 注意

Please ensure the swashplate setting in transmitter is set to H-1 prior to making any setting changes.
請確認發射器的十字盤類型須為 H-1 模式。

1. Servo can only be installed in this orientation when MiniGRS Flybarless System is used: with head point forward, right forward is aileron (CH1), left forward is pitch (CH6), mid-rear is elevator (CH2). CH1 and CH6 cannot be interchanged, otherwise helicopter will not function correctly.

2. Swashplate type setting on the transmitter should be set to H1 traditional swashplate type.

3. If swashplate movement is incorrect after assembly per instruction, please double check to see if MiniGRS Flybarless System model setting is set to T-REX 300X.

4. To avoid damages to system, digital servos must be used for swashplate. Recommend servo specification: speed of 0.09s/60 degrees; torque 2.2kg or more.

1. 使用 MiniGRS 無平衡翼系統 伺服器的安裝方式只有一種。當機頭朝前時，右前為副翼 (CH1)；左前為螺距 (CH6)；中後為升降 (CH2)。CH1、CH6 不可換。如果沒依照圖示連結，直昇機動作會不正確。

2. 遙控器十字盤類型，必須選擇 H1 十字盤模式。

3. 依照圖式安裝完畢，如果十字盤動作不正確，請檢查 MiniGRS 無平衡翼系統機型設定是否為 T-REX300X。

4. 十字盤必須安裝數位伺服器，否則會造成損壞。
建議規格：速度 0.09 秒 /60 度以內；扭力 2.2kg 以上。

MODEL SELECTION　機型選擇

MiniGRS is a Flybarless Stabilization System designed specifically for Align's smaller helicopters, with integrated basic setup parameters for T-REX 250/T-REX 300, T-REX 450 SPORT/PLUS DFC, T-REX 450 PRO/T-REX 450LP/T-REX 470L/T-REX 500X and T-REX 500. The MiniGRS Flybarless System unit bundled with T-REX 300X RTF comes already configured for the specific helicopter, If you wish to use the MiniGRS Flybarless System in other ALIGN helicopters, follow the steps below to reconfigure the helicopter type.

MiniGRS是特別針對亞拓小型直昇機設計的無平衡翼系統，內建T-REX 250/T-REX 300、T-REX 450 SPORT/PLUS、T-REX 450 PRO/T-REX 450LP/T-REX 470L/T-REX 500X、T-REX 500機型的基本參數設定，並為此四種機型專用的無平衡翼系統。T-REX 300X RTF出廠時MiniGRS無平衡翼系統已經為該機型的參數設定，如果您要將MiniGRS無平衡翼系統使用到其他機型時，可以參照下列方式來做機型更改。

STEP1. MODEL DISPLAY　步驟1.機型顯示

Binding Plug
對頻金鑰

1. Red LED lit
亮紅燈

Status LED indicator for the existing model.
STATUS 燈號顯示目前的機型

4.8V~6.0V power input
輸入4.8V~6.0V 電源

Hold Set Button.
按SET鍵不放

Insert binding plug into AIL port, press and hold SET, then insert 4.8~6.0V power into RUD of THR port.

對頻金鑰接上 AIL 端，按著 SET 鍵不放。
接著從 RUD 或 THR 端送入 4.8V~6.0V 電源。

2. Release SET button
放開SET鍵

When STATUS LED is lit steady red, release SET button and MiniGRS Flybarless System will display current model.

當STATUS 燈呈現紅燈恆亮後，放開SET 鍵 MiniGRS 無平衡翼系統就會開始顯示目前機型。

STATUS LED flashes RED once, T-REX 250 /300
STATUS LED flashes RED twice, T-REX 450SPORT/PLUS
STATUS LED flashes RED thrice, T-REX 450PRO/ 470L/ 500X
STATUS LED flashes RED four times, T-REX 500
STATUS 紅燈閃爍頻率1次，T-REX 250 / 300
STATUS 紅燈閃爍頻率2次，T-REX 450 SPORT / PLUS
STATUS 紅燈閃爍頻率3次，T-REX 450 PRO/ 470L/ 500X
STATUS 紅燈閃爍頻率4次，T-REX 500

STEP2.MODEL SELECTION　步驟2.選擇機型

Choose heli model and hold the set button
選擇機型後，按SET鍵不放

1. Flash alternately in red and green, model changing
紅、綠交錯閃爍，更改機型中

Status LED indicator for the existing model.
STATUS 燈號顯示目前的機型

T-REX 300X

Pull out the binding plug, connect to the channel corresponding to the model.
AIL :T-REX 250/300
ELE:T-REX 450SPORT / PLUS DFC
PIT :T-REX 450 PRO/470L /500X
RUD :T-REX 500

將對頻金鑰拔下，接到對應機型的頻道上。
AIL :T-REX 250 /300
ELE:T-REX 450SPORT / PLUS DFC
PIT :T-REX 450 PRO/ 470L/ 500X
RUD :T-REX 500

2. Release Set Button
放開SET鍵

When STATUS and BIND LED's flash alternately in red and green, release the SET button.

選擇好機型後按SET 鍵不放，當STATUS 與 BIND 燈紅、綠交錯閃爍，表示更改機型設定完成，設定完成後就可放開SET 鍵。

STATUS LED flashes RED once, T-REX 250 /300
STATUS LED flashes RED twice, T-REX 450SPORT/PLUS
STATUS LED flashes RED thrice, T-REX 450PRO/ 470L/ 500X
STATUS LED flashes RED four times, T-REX 500
STATUS 紅燈閃爍頻率1次，T-REX 250 / 300
STATUS 紅燈閃爍頻率2次，T-REX 450 SPORT / PLUS
STATUS 紅燈閃爍頻率3次，T-REX 450 PRO/ 470L/ 500X
STATUS 紅燈閃爍頻率4次，T-REX 500

STATUS LED will flash to indicate the selected model type. Pull out power and binding plugs to complete setting.

此時STATUS 燈就會呈現所選機型的燈號，最後拔掉電源與對頻金鑰就完成設定。

TRANSMITTER BINDING　遙控器對頻

The MiniGRS Flybarless System in the T-REX 300X RTF contains a built in S-FHSS 2.4 GHz receiver, support ALIGN A10 transmitter. Also, support Spektrum DSM2/DSMX/JR DSM2 satellite receiver. Please follow the instruction below to bind your radio to the MiniGRS Flybarless System.

T-REX 300X RTF 版本直昇機，採用最新款MiniGRS無平衡翼系統，支援亞拓A10遙控器，此外內建S-FHSS 2.4 GHz系統接收，可以搭配S-FHSS SPEKTRUM DSM2/ DSMX與JR DSM2衛星天線跟遙控器使用。您可以依照下列說明來與MiniGRS無平衡翼系統對頻。

USING ALIGN A10 TRANSMITTER　使用 ALIGN A10 遙控器

POWER ON
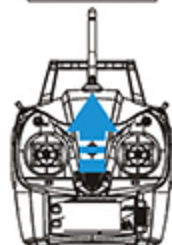
Press "confirm".
點按 "confirm" 鍵

A10

STEP 1. 步驟1.

Turn on transmitter while simultaneously pressing "Confirm" button to enter the bind process.

打開遙控器電源，同時長按住 "confirm" 鍵，遙控器則自動進入對頻程序。

ALIGN　Bind
PPM
A.BUS
VCC
GND
Mini A.BUS

Binding button
對頻鈕

ALIGN　Bind
PPM
A.BUS
VCC
GND
Mini A.BUS
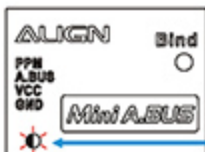
The LED light of A.BUS receiver is flashing quickly and start binding.
A.BUS 接收機LED燈快速閃爍，開始對頻

ALIGN　Bind
PPM
A.BUS
VCC
GND
Mini A.BUS
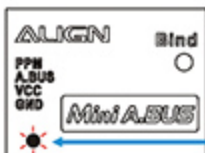
The LED light of A.BUS receiver is solid light and finish binding.
A.BUS 接收器LED燈恆亮，對頻完成

STEP 2. 步驟2.

1. Press binding button and install battery.
2. The LED light of A.BUS receiver is flashing quickly and start binding.
3. Remove battery.
4. Power on A10 transmitter again.
5. Install battery again.
6. The LED light of A.BUS receiver is solid light and finish binding.

1. 按住對頻鈕後，接上直昇機電池
2. A.BUS 接收機LED燈快速閃爍，開始對頻
3. 拔除直昇機電池
4. A10遙控器重新開機
5. 重新接上直昇機電池
6. A.BUS 接收器LED燈恆亮，對頻完成。

USING FUTABA S-FHSS SATELLITE RECEIVERS 使用 FUTABA S-FHSS 衛星天線

STEADY LIT GREEN LED : Radio binding successfully
FLASHING GREEN LED : Radio binding failed
STEADY LIT RED LED : No signal detected
綠燈恆亮：對頻成功
綠燈閃爍：對頻失敗
紅燈恆亮：無發射訊號

ROLL RATE　**ALIGN**　AIL
STATUS　　　　　　　ELE
　　　　　SET　　　　PIT
BIND
GAIN　*Mini GRS*　RUD
A.BUS / S-FHSS / DSM2 / DSMX　THR

POWER ON

STEP 1. 步驟1.

Turn on transmitter, connect MiniGRS Flybarless System to power source. If signal is detected, BIND LED will flash green. If transmitter is turned on, but BIND is still steady red, then power cycle MiniGRS Flybarless System so it will restart transmitter signal search.

打開遙控器，將 MiniGRS 無平衡翼系統接上電源後，若偵測到遙控器訊號，但未完成對頻 BIND 燈號會綠燈閃爍。若已開啟發射器，但 BIND 燈為紅燈恆亮，請將 MiniGRS 無平衡翼系統重新給電源，重新尋找遙控器訊號。

⚠ **CAUTION**
注意

If the LED status appears steady lit green, it means the binding is successful. Please skip Step 2.
If the LED status appears flashing green or steadies lit red, it means the binding is failed. Please proceed Step 2 for rebind.

若燈號為綠燈恆亮，代表對頻成功，不須進行步驟2重新對頻；
若燈號為綠燈閃爍或紅燈恆亮，代表對頻失敗，則進行步驟2重新對頻。

---

1. Press and hold SET button
長按 SET 鍵不放

ROLL RATE　**ALIGN**　AIL
STATUS　　　　　　　ELE
　　　　　SET　　　　PIT
BIND
GAIN　*Mini GRS*　RUD
A.BUS / S-FHSS / DSM2 / DSMX　THR

POWER ON

2. LED status changes from flashing red into constant green.
燈號由紅燈閃轉為綠燈恆亮

STEP 2. 步驟2.

Press and hold SET button, at this time BIND LED will be flashing red, hold the SET button until BIND LED shows steady green, then release SET button to complete binding.

按著 SET 鍵不放，此時 BIND 燈號會紅燈閃爍，直到 BIND 燈號顯示綠燈恆亮後，放開 SET 鍵即完成對頻。

USING DSM2 SATELLITE RECEIVERS 使用 DSM2 衛星天線

4.8V-6.0V power input
輸入 4.8V~6.0V 電源輸入

Remote Receiver
衛星天線

Binding Plug
對頻金鐘

Blinking red LED
紅燈閃爍

STEP 1. 步驟 1.

1. Plug the satellite receiver into ANT port, and the binding plug on THR channel.
2. After feeding 5-6V power through RUD or any other channels, BIND LED will turn steady red, while satellite LED flashes red.

1. 先將衛星天線接到 ANT 插槽，並且把對頻線接在 THR 通道。
2. 由 RUD 或其於通道供給 5~6V 電源後，此時 BIND 燈為紅燈恆亮，衛星天線為紅燈閃爍。

Press and hold BIND button while powering up.
按著BIND鈕開機

Remote Receiver
衛星天線

Steady red LED indicates successful binding.
紅燈恆亮表示對頻完成

STEP 2. 步驟 2.

1. Press and hold the BIND button on Spektrum/JR transmitter, power on the transmitter, wait for transmitter to display inding "Binding" then release BIND button.
2. When satellite receiver LED shows steady lit RED, remove the binding plug from THR channel.
3. When STATUS and BIND LEDs turn into steady green, this indicates binding complete and MiniGRS Flybarless System is initialized successfully. The system is ready for use.

1. 壓住 SPEKTRUM/JR 發射器的 BIND 按鈕後，打開發射器電源，直到發射器面板上 顯示 Binding 字樣，在放開 BIND。
2. 等到衛星天線為紅燈恆亮後，將接在 THR 通道的對頻線移除。
3. 等到 STATUS 和 BIND 燈為綠燈恆亮時，表示對頻已完成且 MiniGRS 無平衡翼系統開機成功，可正常執行功能。

USING DSMX SATELLITE RECEIVERS 使用 DSMX 衛星天線

4.8V-6.0V power input
輸入 4.8V~6.0V 電源輸入

Binding Plug
對頻金鐘

Remote Receiver
衛星天線

Blinking red LED
紅燈閃爍

Press and hold BIND button while powering up.
按住SET鍵不放，然後輸入電源
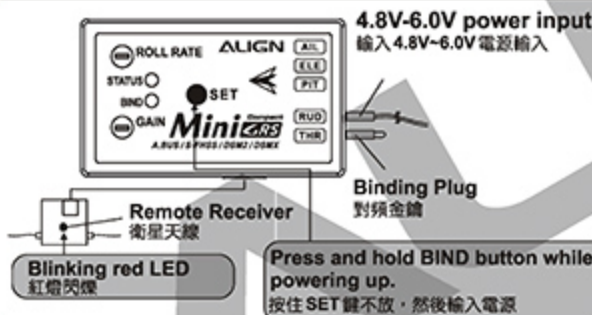
STEP 1. 步驟 1.

1. Plug the satellite receiver into ANT port, and the binding plug on THR channel.
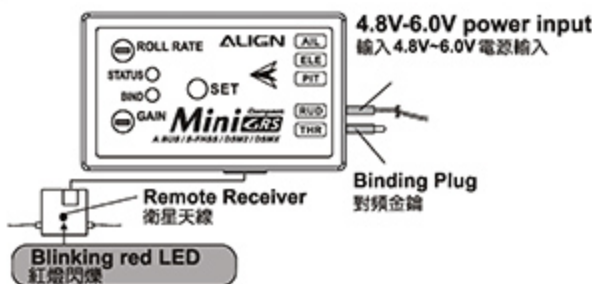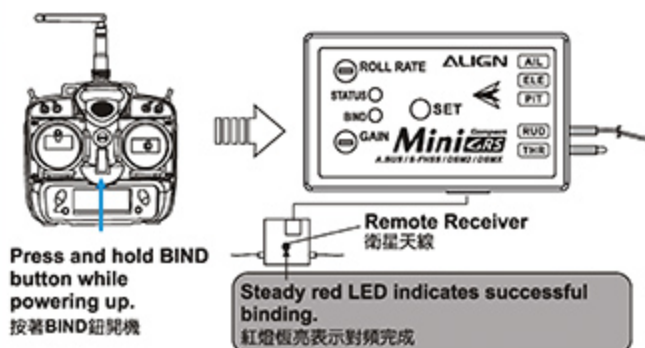2. Press and hold the SET button on MiniGRS Flybarless System , and feed 5-6V power through RUD or any other channels, BIND LED will turn steady red, while satellite LED flashes red.

1. 先將衛星天線接到 ANT 插槽，並且把對頻線接在 THR 通道。
2. 按著 MiniGRS 無平衡翼系統的 SET 鍵後，再由 RUD 或其餘通道供給 5~6V 電源，此時 BIND 燈為紅燈恆亮，衛星天線為紅燈閃爍。
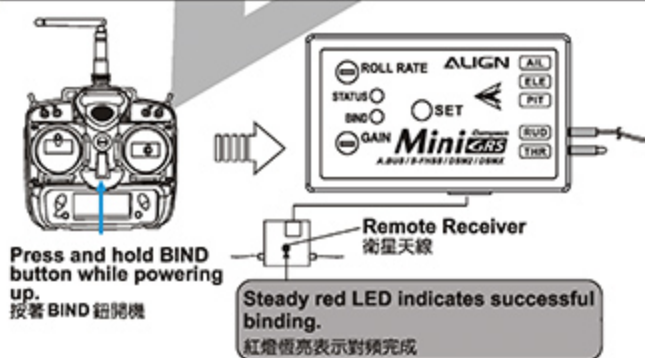
Press and hold BIND button while powering up.
按著 BIND 鈕開機

Remote Receiver
衛星天線

Steady red LED indicates successful binding.
紅燈恆亮表示對頻完成

STEP 2. 步驟 2.

1. Press and hold the BIND button on Spektrum/JR transmitter, power on the transmitter, wait for transmitter to display "Binding" then release BIND button.
2. When satellite receiver LED shows steady lit RED, remove the binding plug from THR channel.
3. When STATUS and BIND LEDs turn into steady green, this indicates binding completely and MiniGRS is initialized successfully. The system is ready for use.

1. 壓住 SPEKTRUM/JR 發射器的 BIND 按鈕後，打開發射器面板上顯示 Binding 字樣，在放開 BIND。
2. 等到衛星天線為紅燈恆亮後，將接在 THR 通道的對頻線移除。
3. 等到 STATUS 和 BIND 燈為綠燈恆亮時，表示對頻已完成且 MiniGRS 無平衡翼系統開機成功，可正常執行功能。

⚠ CAUTION 注 意

1. If both Spektrum and Futaba transmitters are powered up (both have previously bound to MiniGRS), and a satellite receiver is connected to MiniGRS, the MiniGRS will select Spektrum system after power up. If no satellite receivers are connected, MiniGRS will select Futaba system.
2. If a satellite receiver is connected to MiniGRS, and only Futaba transmitter is powered up, MiniGRS will select Futaba system after power up. Even if Spektrum transmitter is powered up afterwards, MiniGRS will not switch over to Spektrum system.
3. On the other hand, if Spektrum transmitter is powered up and MiniGRS has already selected Spektrum system, subsequent power up of Futaba transmitter will not cause MiniGRS to switch over to Futaba system.

1. 如果 Spektrum 發射器和 Futaba 發射器都在開啟狀態(先前都已經和 MiniGRS 對頻)，且 MiniGRS 有接衛星天線，若此時將 MiniGRS 開機，MiniGRS 會選擇 Spectrum 系統。如果沒有接衛星天線，MiniGRS 會選擇 Futaba 系統。
2. 如果 MiniGRS 有接衛星天線，且只有 Futaba 發射器先開啟，若此時將 MiniGRS 開機後，MiniGRS 會選擇 Futaba 系統。即便後來 再將 Spektrum 發射器開啟，MiniGRS 也不會轉到 Spektrum 系統上。
3. 反之，若 Spektrum 發射器先開啟，MiniGRS 選擇 Spektrum 系統後，即便再將 Futaba 發射器開啟，MiniGRS 也不會轉到 Futaba 系統上。

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. Please refer to binding method, and perform radio binding steps.
3. After successful binding, do not power off the MiniGRS, unplug the binding plug and allow MiniGRS to enter initializing process. The last position hold function will be active after the MiniGRS 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.

在此模式下，若您的直昇機與遙控器失連，除油門頻道為預設位置，其餘頻道皆為最後指令位置。

1. 將油門搖桿放置於您所需要的預設安全位置。
2. 依照對頻方式，執行與遙控器的對頻動作。
3. 與遙控器完成對頻動作後，不要關閉MiniGRS無平衡翼系統電源。先將對頻接頭拔除，MiniGRS會進入開機狀態，待MiniGRS無平衡翼系統開機完成後，即完成保留最後指令設定。
4. 測試方法：將遙控器關機，除了油門頻道為預設安全位置外，其餘頻道都為失連前的最後命指令位置。

FAILSAFE(PRE-SET POSITION HOLD)　失控保護 (回復預設值)

When helicopter lost connectivity with your radio under this setting, all channels will move to the pre-set position.

1. Please refer to P.26 binding method, and power up the MiniGRS. 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 MiniGRS Flybarless System goes through initializing process. The failsafe position will be set after the MiniGRS Flybarless System initializes.
5. Test Method: Power off transmitter, and all channels should move to the pre-set failsafe position.

在此模式下，若您的直升機與遙控器失連，所有頻道為預設安全位置。

1. 依照26頁的對頻方式，先開啟MiniGRS無平衡翼系統電源，待衛星天線上LED快速閃爍後，將對頻接頭拔除。
2. 開啟遙控器電源，執行與遙控器的對頻動作，對頻完成瞬間衛星天線上LED會由快速閃爍狀態熄滅，之後再亮起改為慢速閃爍。
3. 在慢速閃爍狀態時，將遙控器上的所有搖桿放置於您所需要的預設安全位置。
4. 5秒後衛星天線LED燈為恆亮，MiniGRS無平衡翼系統進入開機狀態，待MiniGRS無平衡翼系統開機完成後，即完成失控保護設定。
5. 測試方法：將遙控器關機，所有頻道為預設安全位置。

MINIGRS SETTINGS　MINIGRS 設定

⚠ **WARNING 警告** In order for the settings to stick, all 6 setting parameters for MiniGRS Flybarless System must be completed followed with a press of SET button, regardless if any changes are made for each settings.

MiniGRS無平衡翼系統的六項設定，不論有無更動，皆須逐一完成，並按下SET鍵退出設定，否則MiniGRS無平衡翼系統將不會記憶設定。
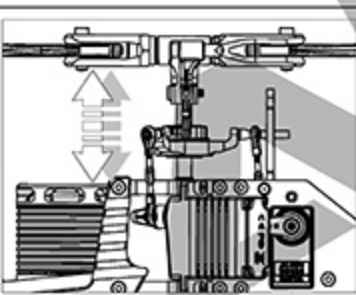
Status LED steady lit
狀態燈恆亮

Swashplate jumps up/down 3 times
十字盤跳三下
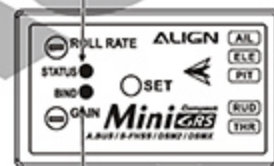
Binding green LED steady lit
對頻燈綠燈恆亮

MINIGRS FLYBARLESS SYSTEM INITIALIZATION
MINIGRS 無平衡翼系統開機

Connect power, if transmitter binding is successful, BIND LED will light solid green; otherwise it will flash green. At this time, STATUS LED lights green indicates successful power up, steady green means rudder is in heading lock mode; steady red means rudder is in non-heading lock mode. Swashplate will jump up and down 3 times after power up.

接上電源，若和遙控器對頻成功後，BIND燈為綠燈恆亮，否則綠燈閃爍。此時STATUS燈號亮起代表開機成功，綠燈恆亮，代表尾舵為鎖定。紅燈恆亮，代表尾舵為非鎖定。開機完成時，十字盤會跳三下。

Power up transmitter, connect power to MiniGRS Flybarless System. When STATUS and BIND LEDs are light steady green, SET button is used to enter setup mode.

先打開遙控器，將MiniGRS無平衡翼系統接上電源後，當STATUS和BIND燈號為綠燈恆亮時，表示開機完成，此時按SET鍵一次即可進入設定。

Press SET button to enter Setup
按SET鍵進入設定

ENTERING MINIGRS FLYBARLESS SYSTEM SETUP
進入 MINIGRS 無平衡翼系統 設定

After system initializes, press SET once to enter MiniGRS setup mode. While in setup mode, STATUS LED will flash a number of times indicating the current setting selection. Press SET button to skip to next setting selection. MiniGRS must complete all 6 setting selections before the settings are memorized.

開機完成後，按SET鍵一次就會進入MiniGRS無平衡翼系統設定。進入設定後STATUS燈會以閃爍次數代表所進入的設定選項。接續按SET鍵就會跳往下個設定選項。MiniGRS無平衡翼系統必須完成6項設定才會記憶設定內容。

Flash 1 times: Aileron neutral point	閃爍頻率一次：副翼伺服器中立點設定
Flash 2 times: Elevator neutral point	閃爍頻率二次：升降伺服器中立點設定
Flash 3 times: Pitch neutral point	閃爍頻率三次：螺距伺服器中立點設定
Flash 4 times: Rudder neutral point	閃爍頻率四次：尾舵陀螺儀正反向設定
Flash 5 times: Rudder left travel limit setting	閃爍頻率五次：尾舵左舵行程設定
Flash 6 times: Rudder right travel limit setting	閃爍頻率六次：尾舵右舵行程設定

1. Disconnect motor to ESC to prevent accidental start-up during setup.
2. The throttle stick must remain in center position during setup(or Switch HOLD), pitch curve must be at 50% position and remain fixed.

1. 設定前先拔除馬達線，避免設定中使馬達運轉造成危險。
2. 設定時油門搖桿需置於中間，螺距曲線50%輸出的位置(或切入HOLD模式)，不可再移動。

Throttle Stick Fixed Position
油門搖桿固定

THRO

MODE 1　　MODE 2

Aileron Servo
副翼伺服器

Adjust the servo arm to level position
將伺服器擺臂調整至水平

0°
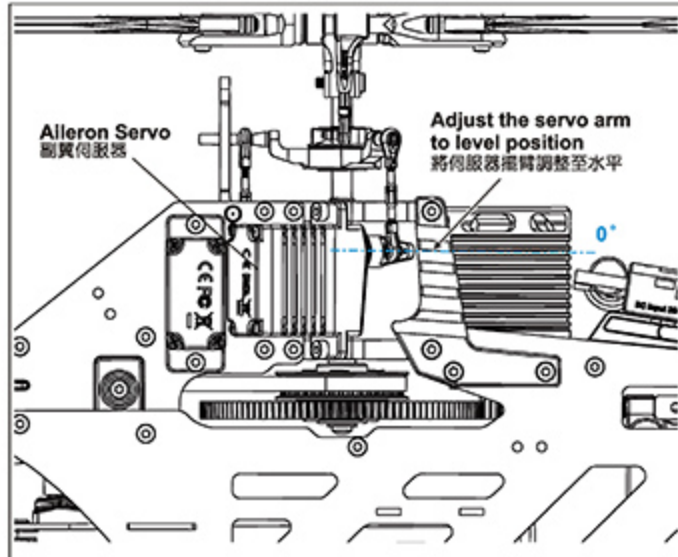
1. AILERON SERVO NEUTRAL POINT SETTING
副翼伺服器中立點設定

Momentarily press SET button first time, if STATUS LED flashes once continuously and BIND LED is off, this indicates you are in neutral setting mode of servo 1. At this time you can use RUD on transmitter to trim the neutral position of servo 1. After completing this setting it will proceed into next step.

進入MiniGRS設定的第一個設定為副翼伺服器中立點設定，STATUS燈為持續閃爍綠燈一次且BIND燈號為恆暗。此時可用遙控器尾舵搖桿微調副翼伺服器中立點位置，完成後進入下個步驟。

Flash green once
閃爍綠燈一次

Elevator servo
升降伺服器

Adjust the servo arm to level position
將伺服器擺臂調整至水平

0°
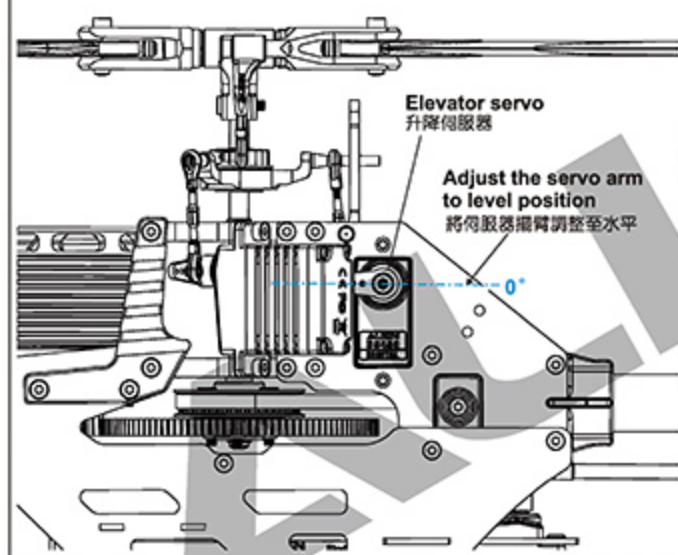
2. ELEVATOR SERVO NEUTRAL POINT SETTING
升降伺服器中立點設定

Momentarily press SET button second time, if STATUS LED flashes twice continuously and BIND LED is off, this indicates you are in neutral setting mode of servo 2. At this time you can use RUD on transmitter to trim the neutral position of servo 2. After completing this setting it will proceed into next step.

接著按SET鍵一次進入升降伺服器中立點設定，STATUS燈號為持續閃爍綠燈二次且BIND燈號為恆暗。此時可用遙控器尾舵搖桿微調升降伺服器中立點位置，設定完成後進入下個步驟。

Move Rudder Stick to Adjust
撥動尾舵調整

RUD

MODE 1　　MODE 2

Flash green twice
閃爍綠燈二次

Pitch Servo
螺距伺服器

Adjust the servo arm to level position
將伺服器擺臂調整至水平

0°
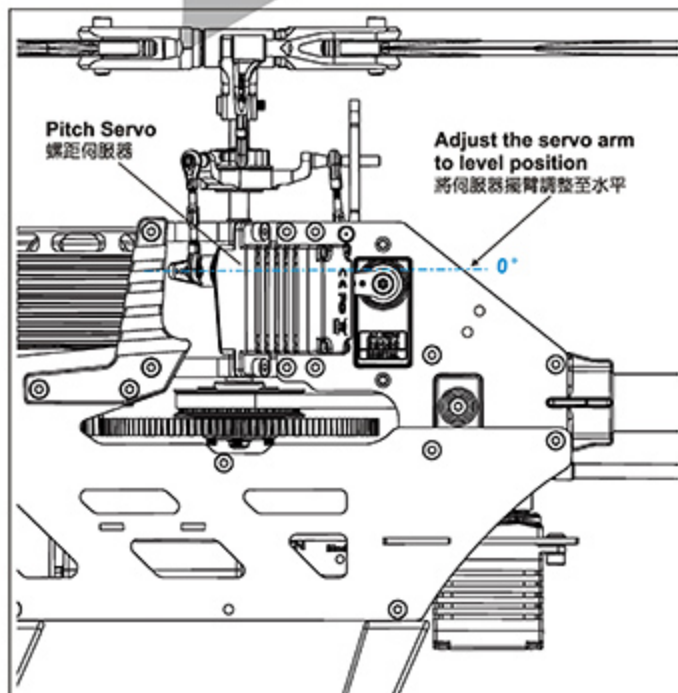
3. PITCH SERVO NEUTRAL POINT SETTING
螺距伺服器中立點設定

Momentarily press SET button third time, if STATUS LED flashes three times continuously and BIND LED is off, this indicates you are in neutral setting mode of servo 3. At this time you can use RUD on transmitter to trim the neutral position of servo 3. After completing this setting it will proceed into next step.

接著按SET鍵一次進入螺距伺服器中立點設定，STATUS燈號為持續閃爍綠燈三次且BIND燈號為恆暗。此時可用遙控器尾舵搖桿微調螺距伺服機中立點位置，設定完成後進入下個步驟。

Adjust aileron, elevator, and pitch servos' neutral point so that servo arms and swashplate remain horizontal (with throttle stick at 50% position). How level your swashplate is will directly affect how well the flight characteristic of MiniGRS is.

調整副翼、升降、螺距伺服器中立點，使伺服器擺臂與十字盤皆保持水平位置（此時油門搖桿須置於50%位置），十字盤的水平與與否將會直接影響MiniGRS的飛行表現與穩定性。

Move Rudder Stick to Adjust
撥動尾舵調整

RUD

MODE 1　　MODE 2

Flash green thrice
閃爍綠燈三次

4. RUDDER GYRO DIRECTION SETTING
尾舵陀螺儀修正方向設定

Momentarily press SET button fourth time, if STATUS LED flashes four times continuously and BIND LED is steady lit green, this indicates you are in rudder compensation direction setting mode. If compensation direction is correct, then skip this step. If compensation direction is reversed, use RUD on transmitter to reverse the direction, and BIND LED will change to steady lit red. After completing this setting it will proceed into next step.

接著按 SET 鍵一次進入尾舵陀螺儀修正方向設定，STATUS 燈號為持續閃爍綠燈四次且 BIND 燈號為綠燈恆亮。修正方向錯誤，利用遙控器尾舵搖桿改變陀螺儀修正方向，此時 BIND 燈號改變為紅燈恆亮，設定完成後進入下個步驟。

Tail Moving Direction
搖動尾部方向

Trim Direction for Tail Servo Horn.
尾伺服臂修正方向

⚠ **CAUTION 注意**

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

尾舵陀螺儀修正方向錯誤：當手搖直昇機尾部朝逆時鐘方向移動時，尾舵伺服臂應往逆時鐘修正，修正錯誤時，撥動尾舵搖桿改變尾舵陀螺儀修正方向。

Move Rudder Stick to Adjust
撥動尾舵調整

RUD

MODE 1 MODE 2

Flash Green 4 times
閃爍綠燈四次
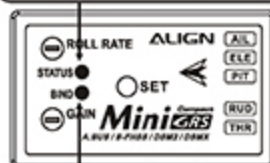
Green LED : normal direction
Red LED : reverse direction
T-REX 300X is Green Light
綠燈：正向   紅燈：反向
T-REX 300X 為綠燈

---

5. RUDDER LEFT TRAVEL LIMIT SETTING
尾舵左舵行程設定

Momentarily press SET button fifth time, if STATUS LED flashes five times continuously and BIND LED is off, this indicates you are in left rudder end point adjustment mode. At this time rudder will drift to one side. Use RUD on transmitter to set the maximum end point on left side. After completing this setting it will proceed into next step.

接著按 SET 鍵一次進入尾舵左舵行程設定，STATUS 燈號為持續閃爍綠燈五次且 BIND 燈號為恆暗。此時尾舵會偏向單邊，利用遙控器尾舵搖桿設定尾舵伺服器向左最大的行程，設定完成後進入下個步驟。

⚠ **CAUTION 注意**

Adjust the rudder travel limit to the maximum without mechanical binding will result in better rudder gyro compensation effect.

在機構不干涉的情形下，設定較大的尾舵行程可使尾舵陀螺儀有較好的修正反應。

Move Rudder Stick to Adjust
撥動尾舵調整

RUD
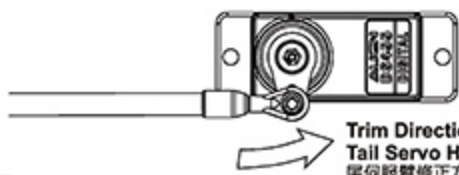
MODE 1 MODE 2

Flash Green 5 times
閃爍綠燈五次

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6. RUDDER RIGHT TRAVEL LIMIT SETTING
尾舵右舵行程設定

Momentarily press SET button sixth time, if STATUS LED flashes six times continuously and BIND LED is off, this indicates you are in right rudder end point adjustment mode. At this time rudder will drift to one side. Use RUD on transmitter to set the maximum end point on right side. After completing this setting it will proceed into next step.

再按 SET 鍵一次進入尾舵右舵行程設定，STATUS 燈號為持續閃爍綠燈六次且 BIND 燈號為恆暗。此時尾舵會偏單邊，利用遙控器尾舵搖桿設定尾舵伺服機向右最大的行程，設定完成後按 SET 鍵完成 MiniGRS 無平衡翼系統設定。

⚠ **CAUTION 注意**

Adjust the rudder travel limit to the maximum without mechanical binding will result in better rudder gyro compensation effect.

在機構不干涉的情形下，設定較大的尾舵行程可使尾舵陀螺儀有較好的修正反應。

Move Rudder Stick to Adjust
撥動尾舵調整

RUD

MODE 1 MODE 2

Flash Green 6 times
閃爍綠燈六次

⚠ **WARNING 警告**

In order for the settings to stick, all 6 setting parameters for MiniGRS must be completed followed with a press of SET button, regardless if any changes are made for each settings.

MiniGRS 無平衡翼系統的六項設定，不論有無更動，皆須逐一完成，並按下 SET 鍵退出設定，否則 MiniGRS 無平衡翼系統將不會記憶設定。

MAIN ROTOR PITCH ADJUSTMENT 主旋翼螺距調整

Pitch 0°

DFC Linkage Rod
DFC 連桿

Keep Parallel
保持平行
0°

Servo arm
centering position
伺服器中立點
0°
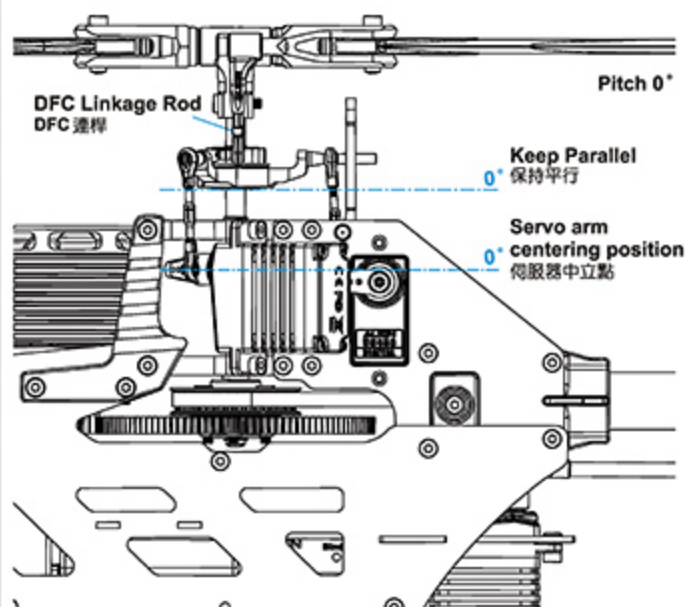
1. Press SET button to enter MiniGRS Flybarless System setup mode. This setting will eliminate any swashplate interaction which may affect pitch precision.
2. Move throttle stick to enter, pitch curve at 50% position. Pitch should be at 0 degrees during this setting.
3. If servo arms and swashplate is already level at 0 degrees, but main rotor blades pitch is not at 0 degree, please adjust the length of DFC linkage rods to achieve 0 degrees pitch.

1. 按 SET 鍵進入 MiniGRS 無平衡翼系統設定，此時會關閉 MiniGRS 無平衡翼系統的陀螺儀，以避免對十字盤的修正而影響螺距的量測。
2. 將油門搖桿置中，螺距曲線 50% 輸出位置，請調整主旋翼螺距為 0 度。
3. 如果伺服器擺臂及十字盤已經是水平 0 度，但主旋翼螺距不為 0 度時，請調整 DFC 連桿長度使螺距為 0 度。

⚠ CAUTION 注意 Disconnect motor from ESC prior to setup.
設定前，請先將馬達線拔除。

THRO

MODE 1   MODE 2

COLLECTIVE PITCH ADJUSTMENT 集體螺距調整

The collective pitch for MiniGRS Flybarless System must be adjusted in radio's EPA (End Point) function.
MiniGRS 無平衡翼系統集體螺距必須從遙控器 CH6 (PIT) 通道的 EPA(END POIND) 功能中調整。

ALIGN DIGITAL PITCH GAUGE
09.0
POWER HOLD ZERO AP800

[HET80001]
AP800 Digital Pitch Gauge
AP800 數位螺距規
Optional Equipment
另購品
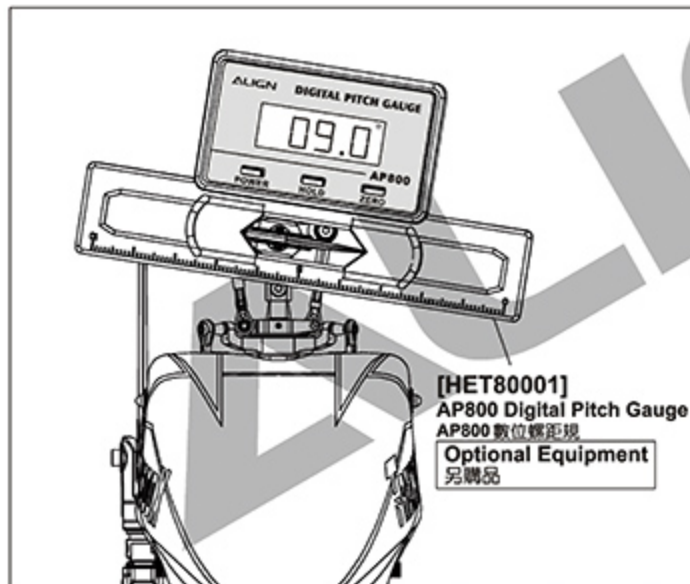
1. MAX. COLLECTIVE PITCH ANGLE 最大集體螺距角度

Push the throttle stick to the maximum, adjust maximum collective pitch value through radio's EPA function on CH6.
將遙控器油門遙桿推至最高，使用 EPA 功能調整 CH6 (PIT) 通道的最大集體螺距角度。

⚠ CAUTION 注意 Disconnect motor from ESC prior to setup.
設定前，請先將馬達線拔除。

THRO

MODE 1   MODE 2

AUTOMATIC FREQUENCY HOPPING DIGITAL SYSTEM
END POINTS   A10

CH1 ➜ 100%	100%
CH2	100%	100%
CH3	100%	100%
CH4	100%	100%
CH5	100%	100%
CH6	60%	60%

ALIGN DIGITAL PITCH GAUGE
-09.0
POWER HOLD ZERO AP800

2. MIN. COLLECTIVE PITCH ANGLE 最小集體螺距角度
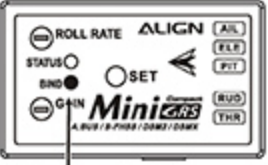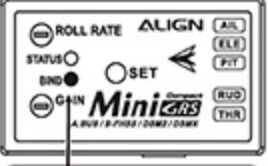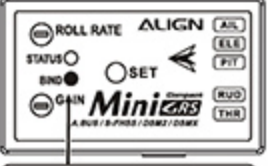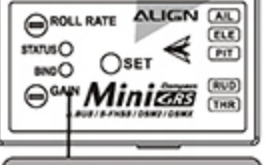
Push the throttle stick to the minimum, adjust minimum collective pitch value through radio's EPA function on CH6.
將遙控器油門遙桿推至最低，使用 EPA 功能調整 CH6 (PIT) 通道的最小集體螺距角度。

⚠ CAUTION 注意 Disconnect motor from ESC prior to setup.
設定前，請先將馬達線拔除。

THRO

MODE 1   MODE 2

AUTOMATIC FREQUENCY HOPPING DIGITAL SYSTEM
END POINTS   A10

CH1 ➜ 100%	100%
CH2	100%	100%
CH3	100%	100%
CH4	100%	100%
CH5	100%	100%
CH6	60%	60%

MINIGRS FLYBARLESS SYSTEM INDICATOR LED   MINIGRS無平衡翼系統指示燈說明

STATUS / BIND	STATUS Constant Green STATUS 綠燈恆亮	STATUS Constant Red STATUS 紅燈恆亮	STATUS Off STATUS 不亮
BIND Constant Green BIND 綠燈恆亮	Successful initialization and radio bounded, rudder in heading lock mode. 完成對頻且開機成功，尾舵為鎖定狀態	Successful initialization and radio bounded, rudder in non-heading lock mode. 完成對頻且開機成功，尾舵為非鎖定狀態	▁▁▁
BIND Flashing Green BIND 綠燈閃爍	Revert back to original transmitter signal that was lost during usage, rudder is in head locking mode, and detected other transition signals. 使用過程中失去原本發射器訊號，尾舵為鎖定狀態，且偵測到其它發射訊號	Revert back to original transmitter signal that was lost during usage, rudder is in non-head locking mode, and detected other transition signals. 使用過程中失去原本發射器訊號，尾舵為非鎖定狀態，且偵測到其它發射訊號	MiniGRS Flybarless System detects radio signal, but is not bound to the radio. MiniGRS 無平衡翼系統偵測到發射器訊號，但未完成對頻
BIND Constant Red BIND 紅燈恆亮	Successful initialization but radio binding failed, rudder in heading lock mode. MiniGRS無平衡翼系統對頻失敗，但開機成功，尾舵為鎖定	Successful initialization but radio binding failed, rudder in non-heading lock mode. MiniGRS無平衡翼系統對頻失敗，但開機成功，尾舵為非鎖定	No signal detected from radio, please check if transmitter is powered on. MiniGRS 無平衡翼系統未偵測到發射訊號，請確認發射器是否開啟
BIND Flashing Red BIND 紅燈閃爍	▁▁▁	▁▁▁	Signal detected from radio, and set button was pressed for binding. MiniGRS 無平衡翼系統偵測到發射器訊號，且使用者正按SET鍵對頻中
BIND Off BIND 不亮	▁▁▁	▁▁▁	No power connecting to MiniGRS Flybarless System MiniGRS無平衡翼系統 未連接電源

SPECIFICATIONS 產品規格

1. Operating voltage range：DC 3.5 ~ 8.4V
2. Operating current consumption：<100mA @ 4.8V
3. Rotational detection rate：±300°/sec
4. Rudder yaw detection rate：±600°/sec
5. Sensor resolution：12 bit
6. Operating temperature：-20℃ ~ 65℃
7. Operating humidity：0% ~ 95%
8. Swashplate support：Mode H-1
9. Receiver support：
   ALIGN A.BUS、FUTABA S-FHSS 、DSM2 / DSMX

1. 操作電壓範圍：DC 3.5 ~ 8.4V
2. 工作電流：<100mA @ 4.8V
3. 側滾及前滾角速度範圍：±300°/sec
4. 尾舵角速度範圍：±600°/sec
5. 感測器解析度：12 bit
6. 操作溫度：-20℃ ~ 65℃
7. 操作濕度：0% ~ 95%
8. 支援十字盤類型：Mode H-1
9. 支援發射機類型：
   ALIGN A.BUS、FUTABA S-FHSS 、DSM2 / DSMX

To set this option is to turn on the transmitter and connect to BEC power.
Note: For the safety, please do not connect ESC to the brushless motor in order to prevent any accident caused by the motor running during the setting.

此項設定只要開啟發射器，接上BEC電源即可進行操作。
注意：為了安全起見，設定前請先不要將無刷調速器與無刷馬達三條線接上，以免調整時啟動馬達而發生危險。

FUTABA/ALIGN A10 TRANSMITTER/SERVO　FUTABA/ALIGN A10 遙控器對應伺服器關係

Following the servo configuration diagram on right, plug the servos to Gyro.
請依照右圖圖示的伺服器名稱，將伺服器接到陀螺儀。

⚠ CAUTION
注 意

1. Servo can only be installed in this orientation when MiniGRS Flybarless System is used: with head point forward, right forward is aileron (CH1), left forward is pitch (CH6), mid-rear is elevator (CH2). CH1 and CH6 cannot be interchanged, otherwise helicopter will not function correctly.
2. Swashplate type setting on the transmitter should be set to H-1 traditional swashplate type. If swashplate movement is incorrect after assembly per instruction, please double check to see if MiniGRS Flybarless System model setting is set to T-REX 300.

1. 使用MiniGRS無平衡翼系統伺服器的安裝方式只有一種。當機頭朝前時，右前為副翼(CH1)；左前為螺距(CH6)；右後為升降(CH2)。CH1、CH6不可換。如果沒依照圖示連結，直昇機動作會不正確。
2. 遙控器十字盤設定，必須選擇H-1傳統十字盤模式。依照圖示安裝完畢，如果十字盤動作不正確，請檢查MiniGRS無平衡翼系統機型設定是否為T-REX 300。

AIL
副翼(CH1)

ELE
升降(CH2)

Front
機頭方向

PIT
螺距(CH6)
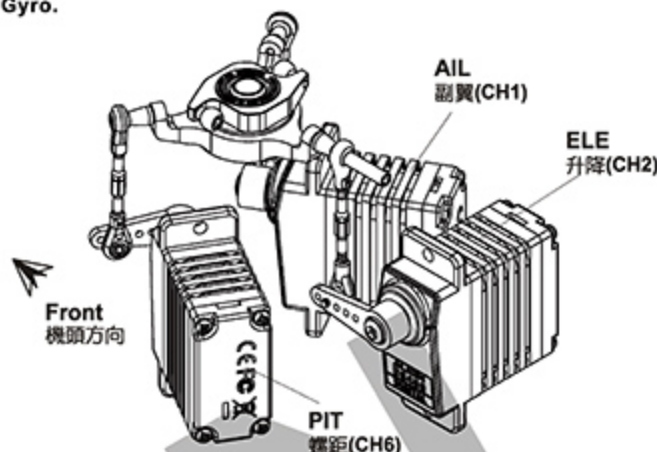
ADJUSTMENTS FOR GYRO AND TAIL NEUTRAL SETTING　陀螺儀與尾翼中立點設定調整

Turn off Revolution mixing (RVMX) mode on the transmitter, then set the gain switch on the transmitter and the gyro to non-head lock mode, or disable gain completely. After setting the transmitter, connect the helicopter power and proceed with rudder neutral point setting.

Note：When connecting to the helicopter power, please do not touch tail rudder stick and the helicopter, wait for 3 seconds for gyro to enable, and the rudder servo horn should be 90 degrees to the tail control pushrod. Tail pitch slider should be halfway on the tail output shaft. This will be the standard rudder neutral point. After completing this setting, set the gain switch back to heading lock mode, with gain at around 70%.

發射器內陀螺儀設定請關閉根軸混控模式，並將發射器上的感度開關與陀螺儀切至"非鎖定模式"或將陀螺儀感度關閉。發射機設定完成後接上直昇機電源，即可進行尾舵中立點設置。

注意：當接上直昇機電源時請勿撥動尾舵搖桿或碰觸機體，待3秒陀螺儀開機完成後，尾伺服臂需與尾伺服器約成90度，尾槳翼控制組須正確置於尾橫軸約中間位置，即為標準尾舵中立點設定，設定完成後，切換至"鎖定模式"，感度設約70%左右。

TAIL NEUTRAL SETTING 尾中立點設定

After the gyro is enable and under non-head lock mode, correct setting position. If the tail pitch assembly is not in the middle position, please adjust the length of rudder control rod to trim.

陀螺儀開機後，在非鎖定模式下，尾伺服器與尾Pitch控制組正確擺置位置。若尾Pitch控制組未置中時請調整尾控制連桿的長度來修正。

Approx. 4mm
約4mm

Tail Servo Horn
尾伺服臂

Tail Case Set
尾齒輪組

10mm

90°
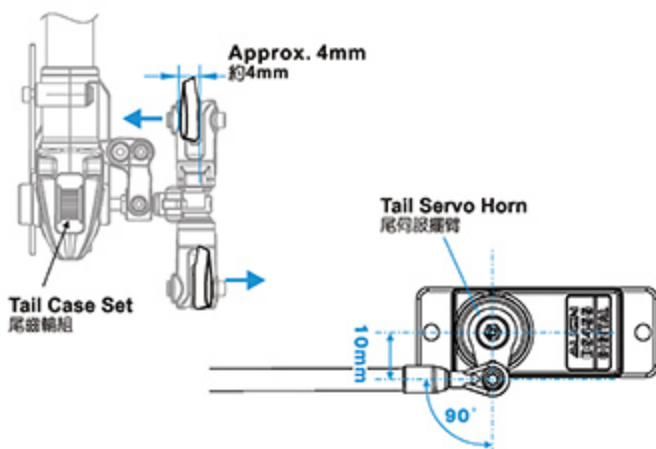
HEAD LOCK DIRECTION SETTING OF GYRO 陀螺儀鎖定方向設定

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".

陀螺儀鎖定方向確認，當手搖尾部反時鐘擺動，尾伺服臂應反時鐘修正，反向時請切換陀螺儀上"鎖定反向"開關修正。

Tail Moving Direction
搖動尾部方向

Trim Direction for Tail Servo Horn.
尾伺服臂修正方向
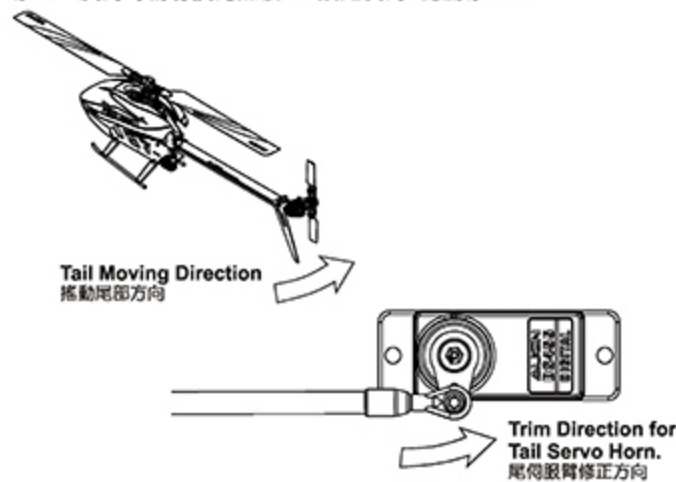
GENERAL FLIGHT 一般飛行模式
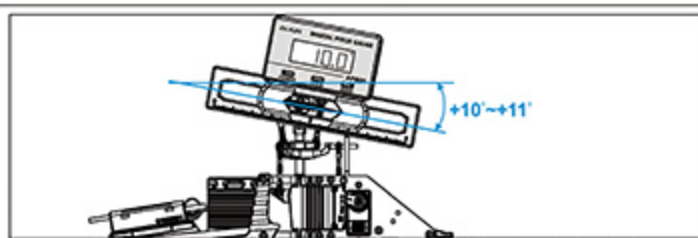
Stick Position at High/Throttle100%/Pitch+10˚~+11˚
搖桿高速/油門100%/Pitch+10˚~ +11˚
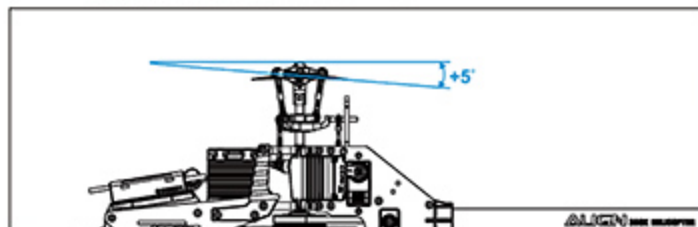
Stick Position at Hovering/Throttle 65%~70%/ Pitch+5˚
搖桿停懸/油門65%~70%/Pitch+5˚
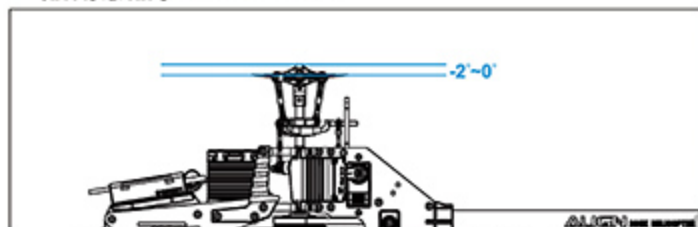
Stick Position at Low/Throttle 0%/Pitch -2˚~0˚
搖桿低速/油門0%/Pitch -2˚~0˚

3D FLIGHT 3D特技飛行模式
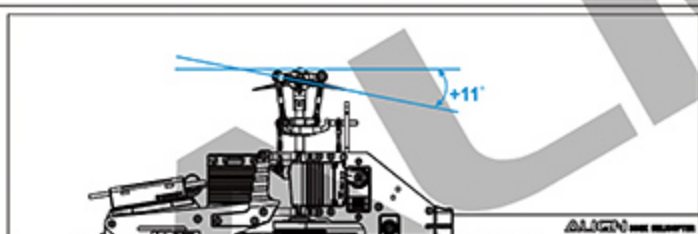
Stick Position at High/Throttle100%/Pitch+11˚
搖桿高速/油門100%/Pitch+11˚
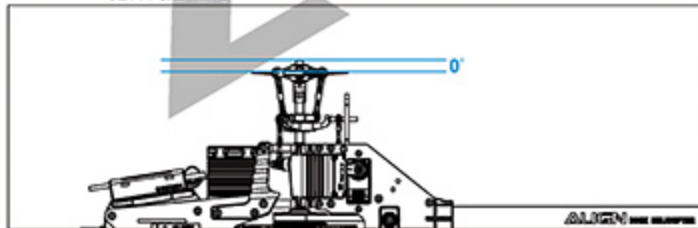
Stick Position at Middle/Throttle 90%/Pitch 0˚
搖桿中速/油門90%/Pitch 0˚
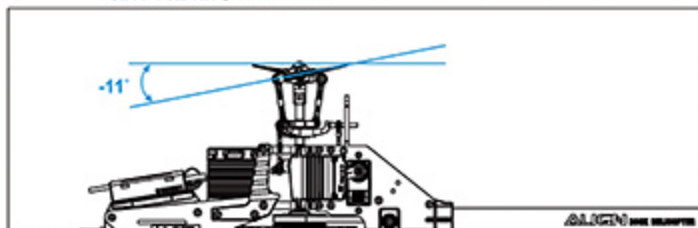
Stick Position at Low/Throttle 100%/Pitch-11˚
搖桿低速/油門100%/Pitch-11˚

⚠ CAUTION 注 意
1. Pitch range: Approx. 25 degrees.
2. If the pitch is set too high, it will result in shorter flight duration and poor motor performance.
3. Setting the throttle to provide a higher speed is preferable to increasing the pitch too high.

1. 螺距(Pitch)總行程約25˚
2. 過大螺距設定，會導致動力與飛行時間降低。
3. 動力提昇以較高轉速的設定方式，優於螺距調大的設定。

GENERAL FLIGHT 一般飛行模式

	Throttle 油門	Pitch 螺距
5	100%High Speed 100%高速	+10~+11˚
4	85%	
3	65%~70%Hovering 65%~70%停懸	+5˚
2	40%	
1	0% Low Speed 0%低速	-2˚~0˚
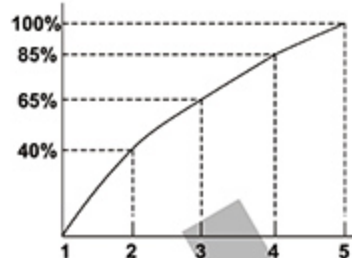
Throttle Curve(Hovering Flight)
停懸模式油門曲線

IDLE 1:SPORT FLIGHT

	Throttle 油門	Pitch 螺距
5	100%	+11˚
4	85%	
3	80%	0˚
2	85%	
1	90%	-11˚
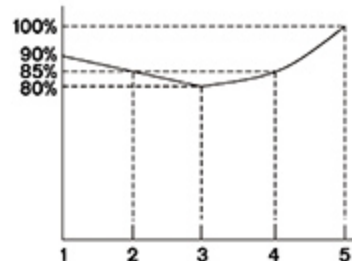
Throttle Curve(Simple Aerobatic Flight)
空中飛行模式油門曲線

IDLE 2:3D FLIGHT

	Throttle 油門	Pitch 螺距
5	100% High 100%高	+11˚
3	90% Middle 90%中	0˚
1	100% Low 100%低	-11˚
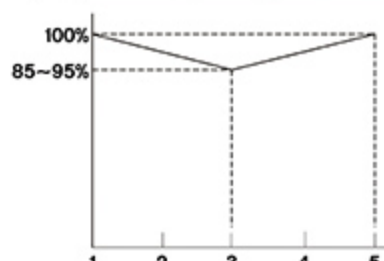
Throttle Curve(3D Flight)
特技飛行模式油門曲線

T-REX 300X RTF complete package was assembled and tuned at the factory, including all parameters in the MiniGRS Flybarless System. Just use your capable of binding with ALIGN A10(A.BUS)transmitter 、 FUTABA S-FHSS 2.4GHz transmitter or Spektrum DSM2/DSMX and JR DSM2 radios, complete the following transmitter settings, and bind it to start flying.

T-REX 300X RTF 整機全部是由原廠組裝調整完成，其中包括 MiniGRS 無平衡翼系統所有的參數設定。您只要搭配 ALIGN A10(A.BUS) 遙控器、 FUTABA S-FHSS 2.4GHz 系統遙控器或 SPEKTRUM DSM2/DSMX 、 JR DSM2 衛星天線跟遙控器，並完成下列遙控器設定以及對頻就可以飛行了。

1. COMPATIBLE TRANSMITTER 適用遙控器

The MiniGRS Flybarless System in the T-REX 300X RTF contains a built in S-FHSS 2.4 GHz receiver, support ALIGN A10 transmitter. Also, support Spektrum DSM2/DSMX/JR DSM2 satellite receiver. Please follow the instruction below to bind your radio to the MiniGRS Flybarless System.

T-REX 300X RTF 版本直昇機，採用最新款 MiniGRS 無平衡翼系統，支援 亞拓 A10 遙控器，此外內建 S-FHSS 2.4 GHz 系統接收，可以搭配 S-FHSS Spektrum dsm2/ dsmx 與 jr dsm2 衛星天線跟遙控器使用。您可以依照下 列說明來與 MiniGRS 無平衡翼系統對頻。

Uae ALIGN A10(A.BUS) transmitter
使用 ALIGN A10(A.BUS) 遙控器

Using FUTABA S-FHSS 2.4GHz transmitter 、 Spektrum DSM2/DSMX and JR DSM2 Radio's Satellite Receivers
使用 FUTABA S-FHSS 2.4GHz 系統、 SpektrumDSM2/DSMX 、 JR DSM2 衛 星天線遙控器

2. SELECT SWASHPLATE TYPE 選擇十字盤類型

MiniGRS Flybarless System supports H-1 type swashplate layout. Set the swashplate mode to H-1 in the transmitter's setting. ALIGN A10 transmitter select "VARIABLE PITCH". If swashplate type is not setup properly, the control movement will not be correct, making the helicopter unflyable.

MiniGRS 無平衡翼系統支援 H-1 十字盤。請將遙控器的十字盤選項，設定為 H-1 十 字盤類型；ALIGN A10 遙控器請選擇 "VARIABLE PITCH"。若十字盤選擇錯誤， 會造成直昇機動作不正確無法飛行。

```
== TYPE SELECT ==
    MODEL 01
    ALIGN 01
➡  HELICOPTER
➡  VARIABLE PITH
```

3.TRANSMITTER SETUP PARAMETERS DIAGRAM 遙控器設定表

T-REX 300X RTF already has all MiniGRS Flybarless System parameters configured at the factory. Just follow the diagram below and enter all parameters into the transmitter and bind the radio, the helicopter will be ready to fly. The parameters in diagram below is suitable for beginners and general 3D flying, but can be adjusted to suit personal flying preference.

T-REX 300X RTF 出廠時已經完成 MiniGRS 無平衡翼系統所有設定，只要將下表的遙控器各項參數輸入到遙控器中，以及完成對頻動作就可以進行飛行。 下表參數適用初學基礎飛行以及一般 3D 飛行使用，您也可以依照個人飛行習慣來調整遙控器參數。

ALIGN A10 TRANSMITTER SYSTEM ALIGN A10 遙控器系統

	AIL 副翼	ELE 升降	THR 油門	RUD 尾舵	GYRO 感度	PIT 螺距
Servo Reverse 伺服器正反轉	Normal 正向	Reverse 反向	Normal 正向	Normal 正向	Normal 正向	Reverse 反向
D / R 雙重比率	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %		▲ 100 % ▼ 100 %		
EXP 動作曲線	▲ -30 % ▼ -30 %	▲ -30 % ▼ -30 %		▲ -15 % ▼ -15 %		
End Point Adjust 伺服器行程量	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 60 % ▼ 60 %

Swash Type 十字盤類型	VARIABLE PITCH				
Gyro Gain 尾舵感度	Normal Flight / 一般飛行			3D Fight / 3D 飛行	
	80 %			78 %	
Normal Throttle Curves 一般飛行油門曲線	P1	P2	P3	P4	P5
	0 %	65 %	65 %	65 %	65 %
Normal Pitch Curves 一般飛行螺距曲線	P1	P2	P3	P4	P5
	40 %	55 %	65 %	75 %	100 %
IDLE-UP Throttle Curves 3D 飛行油門曲線	P1	P2	P3	P4	P5
	90 %	90 %	90 %	90 %	90 %
IDLE-UP Pitch Curves 3D 飛行螺距曲線	P1	P2	P3	P4	P5
	0 %	25 %	50 %	75 %	100 %

FUTABA SYSTEM   FUTABA 系統

	AIL 副翼	ELE 升降	THR 油門	RUD 尾舵	GYRO 感度	PIT 螺距
Servo Reverse 伺服器正反轉	Normal 正向	Normal 正向	Reverse 反向	Normal 正向	Normal 正向	Normal 正向
D / R 雙重比率	▲ 100 %	▲ 100 %		▲ 100 %		
	▼ 100 %	▼ 100 %		▼ 100 %		
EXP 動作曲線	▲ -30 %	▲ -30 %		▲ -15 %		
	▼ -30 %	▼ -30 %		▼ -15 %		
End Point Adjust 伺服器行程量	▲ 100 %	▲ 100 %	▲ 100 %	▲ 100 %	▲ 100 %	▲ 60 %
	▼ 100 %	▼ 100 %	▼ 100 %	▼ 100 %	▼ 100 %	▼ 60 %

Swash Type 十字盤類型	H-1				
Gyro Gain 尾舵感度	Normal Flight / 一般飛行			3D Fight / 3D 飛行	
	45 % (AVCS)			40 % (AVCS)	
Normal Throttle Curves 一般飛行油門曲線	P1	P2	P3	P4	P5
	0 %	44 %	65 %	85 %	100 %
Normal Pitch Curves 一般飛行螺距曲線	P1	P2	P3	P4	P5
	44 %	52 %	74 %	84 %	93 %
IDLE-UP Throttle Curves 3D 飛行油門曲線	P1	P2	P3	P4	P5
	90 %	90 %	90 %	90 %	90 %
IDLE-UP Pitch Curves 3D 飛行螺距曲線	P1	P2	P3	P4	P5
	0 %	25 %	50 %	75 %	100 %

SPEKTRUM SYSTEM　SPEKTRUM 系統

	THR 油門	ELE 升降	AIL 副翼	RUD 尾舵	GYRO 感度	PIT 螺距
Servo Reverse 伺服器正反轉	Normal 正向	Reverse 反向	Reverse 反向	Reverse 反向	Normal 正向	Reverse 反向
D / R 雙重比率		▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %		
EXP 動作曲線		▲ 30 % ▼ 30 %	▲ 30 % ▼ 30 %	▲ 15 % ▼ 15 %		
End Point Adjust 伺服器行程量	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 60 % ▼ 60 %

Swash Type 十字盤類型	1-Servo-Normal				
Gyro Gain 尾舵感度	Normal Flight / 一般飛行 55 %			3D Flight / 3D飛行 50 %	
Normal Throttle Curves 一般飛行油門曲線	P1 0 %	P2 42 %	P3 65 %	P4 78 %	P5 100 %
Normal Pitch Curves 一般飛行螺距曲線	P1 44 %	P2 52 %	P3 74 %	P4 84 %	P5 93 %
IDLE-UP Throttle Curves 3D飛行油門曲線	P1 90 %	P2 90 %	P3 90 %	P4 90 %	P5 90 %
IDLE-UP Pitch Curves 3D飛行螺距曲線	P1 0 %	P2 25 %	P3 50 %	P4 75 %	P5 100 %

⚠ CAUTION 注意
These are the standard channel mapping when satellite receivers are used.
（1）THR（2）AIL（3）ELE（4）RUD（5）GAIN（6）PIT
使用衛星天線時，內部通道已指定為：（1）THR（2）AIL（3）ELE（4）RUD（5）GAIN（6）PIT

JR SYSTEM　JR 系統

	THR 油門	ELE 升降	AIL 副翼	RUD 尾舵	GYRO 感度	PIT 螺距
Servo Reverse 伺服器正反轉	Normal 正向	Reverse 反向	Reverse 反向	Reverse 反向	Normal 正向	Reverse 反向
D / R 雙重比率		▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %		
EXP 動作曲線		▲ 30 % ▼ 30 %	▲ 30 % ▼ 30 %	▲ 15 % ▼ 15 %		
End Point Adjust 伺服器行程量	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 100 % ▼ 100 %	▲ 60 % ▼ 60 %

| **Swash Type** 十字盤類型	1-Servo-Normal				
Gyro Gain 尾舵感度	Normal Flight / 一般飛行 75 %			3D Flight / 3D飛行 70 %	
Normal Throttle Curves 一般飛行油門曲線	P1 0 %	P2 42 %	P3 65 %	P4 78 %	P5 100 %
Normal Pitch Curves 一般飛行螺距曲線	P1 44 %	P2 52 %	P3 74 %	P4 84 %	P5 93 %
IDLE-UP Throttle Curves 3D飛行油門曲線	P1 90 %	P2 90 %	P3 90 %	P4 90 %	P5 90 %
IDLE-UP Pitch Curves 3D飛行螺距曲線	P1 0 %	P2 25 %	P3 50 %	P4 75 %	P5 100 %

⚠ CAUTION 注意
These are the standard channel mapping when satellite receivers are used.
（1）THR（2）AIL（3）ELE（4）RUD（5）GAIN（6）PIT
使用衛星天線時，內部通道已指定為：（1）THR（2）AIL（3）ELE（4）RUD（5）GAIN（6）PIT

RCM-BL300MX MOTOR 無刷馬達

This new Brushless motor developed by the ALIGN POWER R&D TEAM, is packed with the latest, cutting edge technology available today. It features exceptional levels of high-torque power. The 300MX utilizes an 6-pole outrunner stator-rotor and unrivaled Ndfeb extra strong magnets that traditional magnets cannot compare to. Also included is a high temperature, wear-resisting, low friction, double ZZ high efficiency bearing. The 300MX will be the most revolutionary motor operating on low current amperage, and delivering high torque to RC models.

由亞拓動力團隊獨家研發出新款的無刷馬達，具有超高扭力特色，採用9槽矽鋼片、6極外轉子以及傳統磁鐵無法比擬的釹鐵錋超強磁鐵，搭配高溫耐磨的雙ZZ超高效能精密軸承設計，電流低、扭力強，將是下一波動革命中的最具代表性的一顆星。

SPECIFICATION 尺寸規格

(Unit單位/:mm)
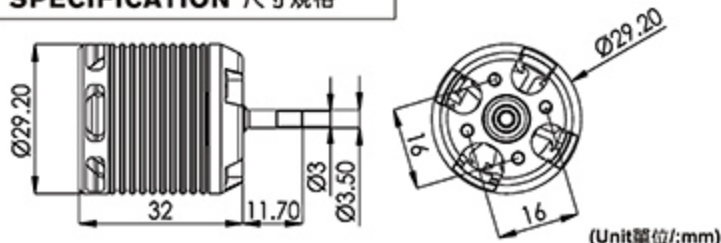
WIRING ILLUSTRATION 接線示意圖
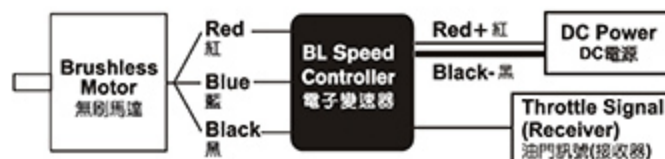
KV	KV值	3700KV(RPM/V)	Input Voltage	輸入電壓	3S
Stator Diameter	定子外徑	21.9 mm	Stator Thickness	定子高度	16mm
Stator Arms	矽鋼片槽數	9	Magnet Poles	磁鐵極數	6
Max Continuous Current	最大持續電流	24A	Max Instantaneous Current	最大瞬間電流	36A(5sec/5秒)
Max Continuous Power	最大持續功率	260W	Max Instantaneous Power	最大瞬間功率	400W(5sec/5秒)
Dimension	尺寸	Shaft 軸 φ 3.5x29.2x43.7mm	Weight	重量	Approx. 70g

The motor rotates in different direction with different brand ESCs. If the wrong rotating direction happens, please switch any two cables to make the motor rotates in right direction.

由於各品牌電子變速器的馬達啟動轉向不盡相同，若發生轉向錯誤時，請將馬達與電子速器的接線任兩條對調即可。

RCE-BL25A BRUSHLESS SPEED CONTROLLER INSTRUCTION MANUAL 無刷調速器使用說明 ALIGN ///

PRODUCT FEATURES 產品特色

RCE-BL25A Brushless ESC can be set up by ALIGN ASBOX Multifunction Programmer. So please scan QR code for ALIGN website start downloading for more information: http://www.align.com.tw/download-en/asbox/

RCE-BL25A無刷調速器可透過ALIGN ASBOX 多功能設定盒進入參數設定，請掃描QR Code 連結亞拓網站下載相關資訊；http://www.align.com.tw/download-en/asbox/

- High performance microprocessor for excellent motor speed-governing and super soft start-up.
- Microprocessor powered by independent IC regulator has better anti-interference performance, which greatly reduces the risk of losing control.
- DEO (Driving Efficiency Optimization) Technology adopted greatly improves throttle response & driving efficiency, reduces ESC temperature.
- New switch-mode BEC with adjustable output voltage ranges from 6V to 7.4V and continuous/peak current of 7A.
- BEC is separated from other circuits of the ESC, it may keep normal output even when MOSFET board of the ESC is burnt or breakdown.
- Multiple flight modes: Fixed-wing, Helicopter (Linear Throttle), Helicopter (Elf Governor), Helicopter (Store Governor).
- New governor program with adjustable governor parameter brings excellent speed-governing function, keep the propeller revs stability when the load changes dramatically.
- Data logging records the standardized RPM, minimum voltage and maximum temperature of the flight.
- "Auto restart function" can manually interrupt the auto rotation and quickly restart the motor to avoid crashes caused by incorrect operations.
- Independent output port for RPM (that is: motor speed) signals. • Separate programming port for ESC parameter setup through ALIGN ASBOX Multifunction Programmer.
- WIFI module for programming the ESC wirelessly with your smart phone (IOS or Android).
- Allow for data checking, ESC programming, speed curve checking, and firmware upgrade online. (ALIGN ASBOX Multifunction Programmer or WIFI Express is needed)

- 使用高性能微處理器，相容多種無刷馬達，具備優異的定速和緩啟動性能
- 微處理器採用獨立的穩壓IC給供電，具有更好的抗干擾能力，降低失控的可能性。
- 採用同步整流驅動效率優化技術（DEO，Driving Efficiency Optimization），油門回應更快，驅動效率更高，無刷調速器溫度更低。
- 使用新的大功率開關穩壓BEC，輸出電壓在6V-7.4V之間可調，瞬間輸出電流提升至7A。
- BEC模組和電子調速器其他電路相互獨立，當無刷調速器功率板出現燒毀等故障時，最大限度保證BEC正常輸出，提供救機機會；
- 具有"固定翼模式/直昇機線性油門模式/直昇機定速模式/直昇機存儲定速模式"4種飛行模式。
- 使用新的直昇機定速程式，定速感度可調，易於操作；具有優異的定速效果，在負荷急劇變化的情況下，保證螺旋槳轉速穩定。
- 具有飛行資料記錄功能，可記錄當次飛行的最低電壓、最高溫度資料、最大電流、標定轉速。
- 具有熄火降落保護功能，在保護時間內可手動中斷熄火降落過程並快速重新啟動馬達，避免因失控而墜機。
- 具有轉速（RPM）訊號輸出介面。
- 具備獨立參數設定介面，用於連接多功能LCD專業程式設計ALIGN ASBOX 多功能設定盒進行參數設定。
- 支援WIFI無線設定，通過手機端(IOS或Android)軟體可完成所有參數設置（需要WIFI模組）。
- 支援線上讀取、設定電設定數，查看速度曲線表（存儲模式下），升級電子調速器固件（需要LCD參數設定盒或WIFI模組）。

USER GUIDE 使用說明

⚠ CAUTION 注意 The default throttle range of this ESC is from 1100μs to 1940μs, so you need to re-calibrate the throttle range when the first time you use this ESC or after you replace the transmitter.

無刷調速器的油門行程出廠預設值為1100μs~1940μs，當首次使用無刷調速器或者更換其他遙控器使用時，均應重新設定油門行程。

I.Connections 接線示意圖

1. **Throttle Signal Wire (White/Red/Black):** plug it into the throttle channel on the receiver or the corresponding channel on the FBL system. For which channel you should plug it in, it depends on what kind of receiver and FBL system you use. The White wire is for transmitting throttle signals, the Red & Black cables are parallely connected in the BEC output wire, which means BEC voltage output wire and ground cable.

2. **RPM Signal Wire(Yellow):** plug it into the RPM input channel on the flybarless system. (This wire can be used for provide RPM signal data when using external speed-governing device.)

3. **Individual Parameter Programming Interface** (short white, red and black): for connect ASBOX Multifunction Programmer

1. 油門信號線 (白、紅、黑)：插入接收機油門通道或無平衡翼系統對應通道，具體視接收機類型及無刷翼系統類型而定。其中白線用於傳送油門信號，而紅線和黑線分別並聯在內部BEC的輸出端 (即BEC電壓輸出線和地線)。

2. RPM信號線 (黃)：插入無平衡翼系統轉速輸入通道；(當使用外部定速時，可使用RPM信號線提供轉速信號輸入)

3. 獨立參數編程接口 (短的白、紅、黑)：用於連接ASBOX多功能設定盒。
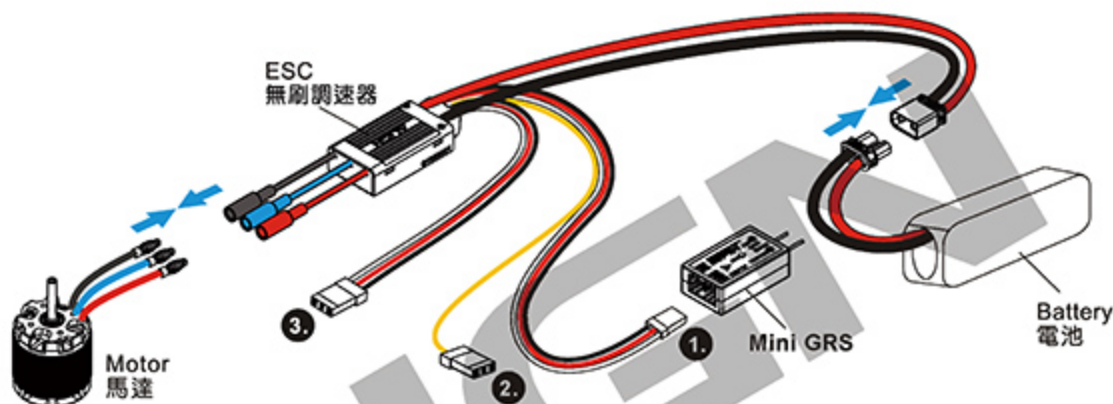
II.Throttle Range Calibration 油門行程校準操作方法

⚠ CAUTION 注意 During the throttle range calibration, please set the throttle curve to NORMAL and ensure the corresponding throttle amounts to the maximum throttle endpoint and the minimum throttle endpoint on your transmitter are respectively 100% and 0%.

進行油門行程校準時，請將油門曲線設置為NORMAL，並確保遙控器油門最高點對應的油門值為100%，油門最低點對應的油門值為0%

1. Turn on the transmitter and move the throttle stick to the top position.
開啟遙控器，將油門打到最高點

2. Connect the ESC to a battery. The motor will emit ♪♪123" indicating the ESC is powered on normally.
無刷調速器接電池，馬達鳴叫" 123 "提示音，表示供電正常

3. 5 seconds later, the motor will emit two short beeps indicating the maximum throttle position has been successfully calibrated and accepted.
等待5秒，馬達發出"嗶-嗶-"雙短鳴音，表示油門最高點校準成功

4. Move the throttle stick to the bottom position. 1 second later, a short beep will emit indicating the minimum throttle position has been accepted.
將油門搖杆推到最低，等待1秒，油門最低點校準成功

5. The ESC will keep beeping indicating the number of LiPo cells you have plugged in.
馬達發出N聲鳴音，表示鋰電池Cell數

6. A long beep represents system is well done, ready to fly.
馬達發出"嗶"一聲長音表示系統準備就緒，可隨時起飛

SPECIFICATIONS 產品規格

Model 型號	RCE-BL25A Brushless ESC RCE-BL25A 無刷調速器	Cont./Peak Current 持續/瞬間電流	25A/40A
Input Voltage 輸入電壓	3~6S LiPo Battery(11.1V~22.2V) 3~6S鋰電池(11.1V~22.2V)	Size/Weight 尺寸/重量	47x22x10mm/27g
BEC Voltage BEC 電壓	Switch-mode, 6V~7.4V Adjustable Voltage ,3A/7A Cont./Peak Current 開關穩壓BEC，輸出電壓6V~7.4V可調，輸出電流持續3A，瞬間7A		
Main Applications 應用範圍	For 250-300 Class Helicopter (Propeller: 150~300mm) 250-300級電動直昇機 (槳長：150~300mm)		

ILLUSTRATION 各部名稱

Cooling Fan
冷卻風扇

Polar Arrangement Schematic
極性排列示意圖

12.6V 8.4V 4.2V 0V

3 Cell Balance Socket
3 Cell分壓充插座

2 Cell Balance Socket
2 Cell分壓充插座

AC Power Input
AC電源輸入座

Indicating Light For
Charging Status(3 Independent Units)
充電狀態指示燈(三組獨立)

Option Equipment
選購品

EC3SXB3

North American Power Cord
美規電源線

or 或

Option Equipment
選購品

EC3SXB4

Europlug Power Cord
歐規電源線
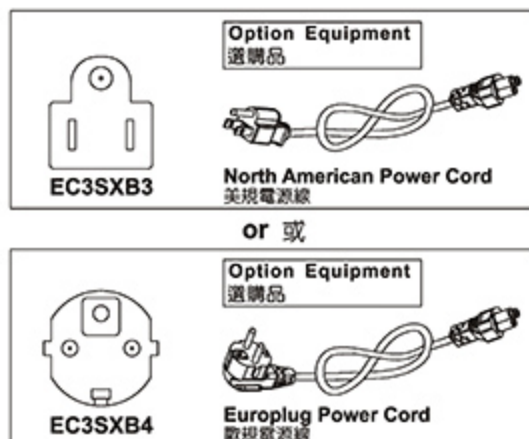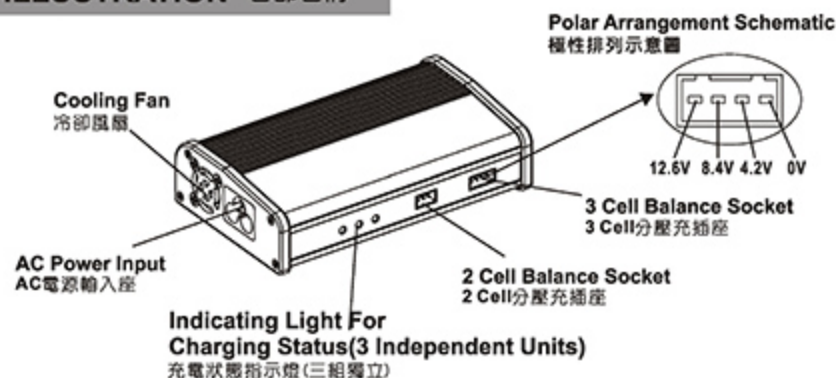
FEATURES 功能介紹

1. AC 100-240V exchange switch for international specification.
2. Apply to 3.7V/3.6V 2-3 Cell Li-polymer/Li-ion batteries.
3. Balance charging is good to prevent the situation of over-charging or under-charging for a single Cell.
4. Auto-detected charge status display. (Red light: while charging/Green light: end of charging).
5. Cooling fan and multi-circuit protection to avoid the dangerous of charging.
6. The auto-detected function of low voltage for power storage.
7. Reverse polarity protection and short circuit protection.

1. 採用AC 100-240V交換式國際通用電源，輸入電壓世界通用。
2. 適用3.7V/3.6V規格之 2-3Cell Li-polymer/Li-ion充電電池。
3. 分壓採平衡充電，有效防止單Cell過充危險或充電不足情況。
4. 自動偵測充電狀態燈號顯示。(充電中顯示紅燈，待充/充電完成顯示綠燈)。
5. 內置整合式冷卻風扇及多迴路保護設計，可有效避免充電危險發生。
6. 具自動偵測電壓不足補償充電功能，有效發揮電池最大蓄電功能。
7. 具電池極性錯誤與短路保護功能。

INSTRUCTIONS 使用說明

1. Connect the power cord to AC power input on the main body and the power supply socket on the wall. (Apply to 100-240V alternating current)
2. Once the power is on, the three indicating lights will turn green. The waiting mode shows ready to charge.
3. Charging for DC 11.1V/10.8V 3-Cell Li-ion/Li-polymer batteries: Insert the adapters of Li-ion batteries for balance charging to 3-Cell sockets in correct directions. The 3 indicating lights will be red, showing charging status of each Cell.
4. Charging for DC 7.4V 2-Cell Li-polymer batteries:

   Insert the adapters of Li-polymer batteries for balance charging to 2-Cell sockets in correct directions. The 2 indicating lights on the side will be red showing "on charging".
5. When the indicating lights turn green, it means charging completed. Please remove the batteries.
6. If the lights are still green when the batteries connect to the charger, it means the batteries are full of electricity. The charger will not work on the batteries.
7. Standard charging methods:

   (1)Charge one set of 3-Cell Li-polymer battery each time; Fully changed battery voltage: 12.6V

   (2)Charge one set of 2-Cell Li-polymer battery each time; Fully changed battery voltage: 8.4V
8. The charger has the function of supply. After the lights turn green, the charger will detect voltage of the batteries, and give a few more time of charging, until the power is full.

1. 依所附的電源線一端連接在機電的AC電源輸入做：另一端插在牆壓的電源插座上（適用100-240V交流電）。
2. 當電源接入時，機體的三顆充電狀態指示燈會顯示綠色，進入待機狀態。
3. 使用DC 11.1V/10.8V 3Cell Li-ion/Li-polymer充電：將鋰電池分壓充電線的接頭，依防呆缺口的方向插入標示3Cell的分壓充插座上，此時二個只足燈顯示紅色，分別代表每Cell充電的狀態。
4. 使用DC 7.4V 2Cell Li-ion/Li-polymer充電：將鋰電池分壓充電線的接頭，依防呆缺口的方向插入標示2Cell的分壓充插座上二個顯示燈會顯示紅色，進入充電狀態。
5. 當充電狀態指示燈逐一顯示為綠燈時，表示電池以充飽電，即可將電池取下。
6. 若電池連接製充電器仍為飽電狀態，此時充電器不會對電池進行充電。
7. 標準充電方式：
   (1)每次僅充一組3Cell的鋰電池;電池充飽後的電壓為12.6V
   (2)每次僅充一組2Cell的鋰電池;電池充飽後的電壓為8.4V
8. 本充電器距充電補償功能，當充電顯示至顯示綠燈後，充電器會自動偵測電池電壓，若不足時將自動給予短時間的充電補償，使電池完全充飽電。

CHARGING COMBINATION 充電組合方式

Charging Combination 每次充電組合方式	3 Cell Balance 3 Cell分壓充	2 Cell Balance 2 Cell分壓充	Charging Time 充電所需時間
Standard Mode 1 標準 Mode 1	○		Battery capacity： ÷2000mA(Approx.)
Standard Mode 2 標準 Mode 2		○	充電時間約： 電池容量 ÷2000mA

SPECIFICATION 規格表

Model 型號	Voltage Input 輸入電壓	Voltage Output 輸出電壓	Current Output 輸出電流
RCC-3SX	AC 100-240V 50-60Hz	2 Cell DC 7.4V 3 Cell DC 11.1V	2000 mA

ILLUSTRATION　各部名稱

3cell Balance Socket
3 Cell分壓充插座

Polar Arrangement Schematic
極性排列示意圖

Red Cable:Positive
紅線:正極

Cooling Fan
冷卻風扇

2 Cell Balance Socket
2 Cell分壓充插座

Black Cable:Negative
黑線:負極

DC Power Input
DC電源輸入座

Indicating light for charging status
(3 independent units)
充電狀態指示燈(三組獨立)

Power Cord
電源線

12.6V　8.4V　4.2V　0V

FEATURES　功能介紹

1. Suitable for DC 10V~15V power input .
2. Apply to 3.7V/3.6V 2-3 cell Li-polymer/Li-ion batteries.
3. Balance charging is good to prevent the situation of over-charging or under-charging for a single cell.
4. Auto-detected charge status display. (Red light: while charging/Green light: end of charging).
5. Cooling fan and multi-circuit protection to avoid the dangerous of charging.
6. The auto-detected function of low voltage for power storage.
7. Reverse polarity protection and short circuit protection.

1. 適用DC 10V~15V輸入電源。
2. 適用3.7V/3.6V規格之 2-3cell Li-polymer/Li-ion 充電電池。
3. 分壓採平衡充電，有效防止單cell過充危險或充電不足情況。
4. 自動偵測充電狀態燈號顯示。(充電中顯示紅燈，待充/充電完成顯示綠燈)。
5. 內置整合式冷卻風扇及多迴路保護設計，可有效避免充電危險發生。
6. 具自動偵測電壓不足補償充電功能，有效發揮電池最大蓄電功能。
7. 具電池極性錯誤與短路保護功能。

INSTRUCTIONS　使用說明

1. Connect the included power cord between DC power input on the main body and the polarized power supply socket on DC power (Suitable for 10V~15V DC power).
2. Once the power is on, the three indicating lights will turn green. The waiting mode shows ready to charge.
3. Charging for DC 11.1V/10.8V 3-cell Li-ion/Li-polymer batteries: Insert the adapters of Li-ion batteries for balance charging to 3-cell sockets in correct directions. The 3 indicating lights will be red, showing charging status of each cell.
4. Charging for DC 7.4V 2-cell Li-polymer batteries: Insert the adapters of Li-polymer batteries for balance charging to 2-cell sockets in correct directions. The 2 indicating lights on the side will be red showing "on charging".
5. When the indicating lights turn green, it means charging completed. Please remove the batteries.
6. If the lights are still green when the batteries connect to the charger, it means the batteries are full of electricity. The charger will not work on the batteries.
7. Standard charging methods:
   (1)Charge one set of 3-cell Li-polymer battery each time; Fully changed battery voltage: 12.6V
   (2)Charge one set of 2-cell Li-polymer battery each time; Fully changed battery voltage: 8.4V
8. The charger has the function of supply. After the lights turn green, the charger will detect voltage of the batteries, and give a few more time of charging, until the power is full.

1. 依所附的電源線一端連接在機體的DC電源輸入座；另一端依極性接上DC電源（適用10V-15V直流電）。
2. 當電源接入時，機體的三顆充電狀態指示燈會顯示綠色，進入待機狀態。
3. 使用DC 11.1V/10.8V 3cell Li-ion/Li-polymer充電：將鋰電池分壓充電線的接頭，依防呆缺口的方向插入標示3cell的分壓充插座上，此時三個指示燈顯示紅色，分別代表每cell充電的狀態。
4. 使用DC 7.4V 2cell Li-polymer充電：將鋰電池分壓充電線的接頭，依防呆缺口的方向插入標示 2cell的分壓充插座上，此時二個顯示燈會顯示紅色，進入充電狀態。
5. 當充電狀態指示燈逐一顯示為綠燈時，表示電池已充飽電，即可將電池取下。
6. 若電池連接至充電器時仍然顯示綠燈，表示電池仍為飽電狀態，此時充電器不會對電池進行充電。
7. 標準充電方式：每次僅充一組3cell的鋰電池；電池充飽後的電壓為12.6V每次僅充一組2cell的鋰電池；電池充飽後的電壓為 8.4V。
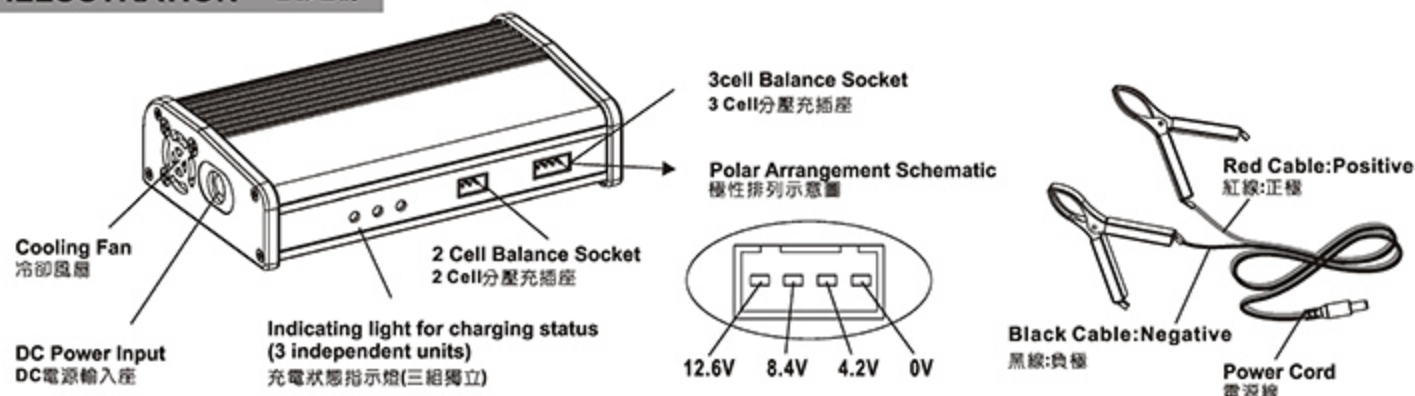8. 本充電器具充電補償功能，當充電至顯示綠燈後，充電器會自動偵測電池電壓，若不足時將自動給予短時間的充電補償，使電池完全充飽電。

CHARGING COMBINATION　充電組合方式

Charging Combination 每次充電組合方式	3 Cell Balance 3 Cell分壓充	2 Cell Balance 2 Cell分壓充	Charging Time 充電所需時間
Standard Mode 1 標準 Mode 1	○		Battery capacity： ÷2000mA(Approx.)
Standard Mode 2 標準 Mode 2		○	充電時間約： 電池容量 ÷2000mA

SPECIFICATION　規格表

Model 型號	Voltage Input 輸入電壓	Voltage Output 輸出電壓	Current Output 輸出電流
RCC-3SD	DC 10V-15V	2 Cell DC 7.4V 3 CCell DC 11.1V	2000 mA

Recommend you to use a multi-function tester to measure the cell voltage, total voltage, and remaining capacity before each flight; also ensure to test other electric device function for safety flight.

建議您飛行前使用多功能檢測計去量測電壓、總電壓與剩餘容量並檢測其他電子產品的功能是否正常，確保您有良好的飛行。

Please check ALIGN Website for more multi-function tester detail.
更多多功能檢測計詳細說明請上官網
Instruction Manual Download
多功能檢測計說明書下載

[HETMT901]
Multi-function Tester
多功能檢測計
Optional Equipment
另購品

FEATURES 功能介紹

1. With 3A BEC Output.
2. For RC model electrical equipment diagnostic and measurement use.
3. High precision display of individual cell voltage for 2 to 8S lithiumpacks. In addition to individual cell voltage, it also displays total pack voltage as well as percentage of pack's remaining capacity.
4. Displays serial cell count in a pack, as well as highest and lowest cell voltage, and the voltage difference.
5. Servo diagnostic feature. Displays BEC output voltage and receiver signal output.
6. Digital tachometer to display 2 to 7 propeller rotating speed as well as memory for highest RPM attained.
7. Reverse polarity protection for cell input.

1. 具備3A BEC輸出
2. 整合遙控模型系列商品量測與檢測之多功能產品。
3. 高精度顯示2~8S電池組每CELL電壓、總電壓與剩餘容量百分比。
4. 顯示電池之串聯數量與最高、最低CELL電壓、壓差值。
5. 具有伺服機測試器功能，亦可量測BEC輸出電壓與接收機輸出訊號。
6. 量測2到7槳的螺旋槳轉速並記憶最高轉速值。
7. CELL電壓輸入反接保護。

Swashplate jumps up/down 3 times horizontally
十字盤水平跳動三下
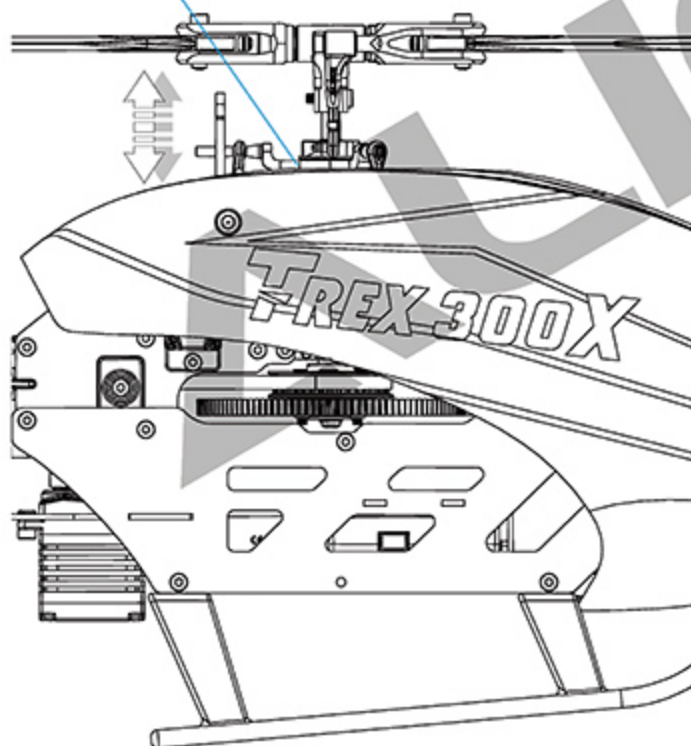
STEP1 步驟1

Turn on Transmitter, and then MiniGRS Flybarless System power.
先開啟遙控器電源，再開啟MiniGRS無平衡翼系統電源。

STEP2 步驟2

At this time, MiniGRS Flybarless System BIND LED will lit steady green, and STATUS will be lit steady green or steady red.
此時MiniGRS無平衡翼系統 BIND燈會綠燈恆亮，STATUS會綠或紅燈恆亮。

STEP3 步驟3

As shown in diagram to the left, the swashplate will jump up and down 3 times after initialization to signal successful startup. If swashplate jump up and down 3 times with swashplate tilted, check for correct servo installation as per instruction.

The pitch of helicopter will remain locked until successful initialization. If the initialization process is unable to complete, with STATUS LED blinking red, recheck 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.

如左圖示，初始化完成後，十字盤會保持水平行下小幅跳動三下，表示完成開機程序，如十字盤為傾斜跳動三次，請檢查伺服器是否依照指示安裝。

完成開機前直昇機螺距被固定無法動作，如果一直無法完成開機程序STATUS紅燈閃爍，請檢查開機時直昇機是否靜止或訊號線未接妥，確認後重新開機。正常開機後，STATUS亮綠燈表示尾舵為鎖定模式，亮紅燈為非鎖定模式。
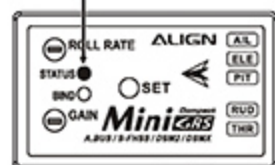
Swashplate jumps up and down 3 times horizontally represents successful initialization.
十字盤水平跳動三次代表正常開機
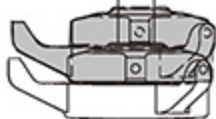
Swashplate jumps up and down 3 times tilted represents setup error.
十字盤傾斜跳動三次代表伺服器安裝錯誤

Green LED indicates rudder lock mode
Red LED indicates non-rudder lock mode
綠燈為尾舵鎖定模式
紅燈為尾舵非鎖定模式

STEP4　步驟4

Tilt the helicopter forward and swashplate should tilt back to compensate. If reversed, please check for the correct installation direction of MiniGRS Flybarless System.

將直昇機往前傾，陀螺儀應將十字盤向後修正，如果反向，請檢查 MiniGRS 無平衡翼系統是否依照指示安裝。

Swashplate Correction Direction
十字盤修正方向

Helicopter Tilting Direction
機體傾斜方向

Helicopter Tilting Direction
機體傾斜方向

Helicopter Tilting Direction
機體傾斜方向

STEP5　步驟5

Tilt the helicopter right, gyro should tilt the swashplate left to compensate. If reversed, please check for the correct installation direction of MiniGRS Flybarless System.

將直昇機往右傾，陀螺儀應將十字盤往左修正，如果反向，請檢查 MiniGRS 無平衡翼系統是否依照指示安裝。

Swashplate Correction Direction
十字盤修正方向

Helicopter Tilting Direction
機體傾斜方向
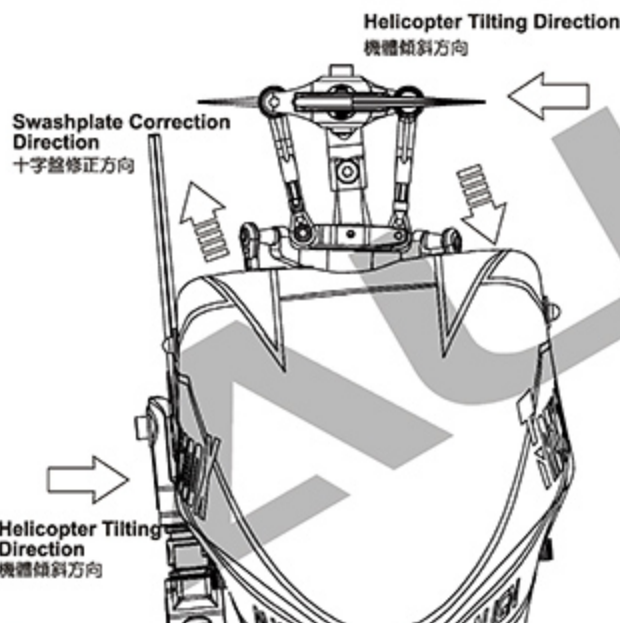
STEP6　步驟6

Check for proper CG location. CG needs to be at the center point below the main shaft.

檢視直昇機重心是否適當，請先調整直昇機重心位置至主軸中心線下方位置。

STEP7　步驟7

Confirm all functions are normal, power cycle the system, and begin flight test after initialization.

確定所有功能正常，重新開機，完成開機程序後進入飛行測試。

HELICOPTER CG CHECK PROCEDURE　直昇機機體重心檢視方式

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.

電池固定後，將直昇機如圖示舉起，等待直昇機停止轉動後檢視機頭方向，正確重心應落在機身（主軸附近）位置。

Adjust the frame's CG within +/- 60 degrees from level.
以水平線上下夾角 60° 內為適當的範圍來調整機體的重心。

60°
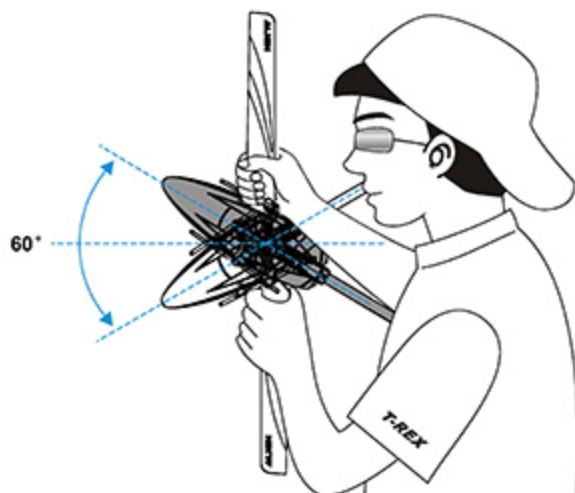
PLEASE PRACTICE SIMULATION FLIGHT BEFORE REAL FLYING 飛行前請事先熟練電腦模擬飛行

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.

在還沒瞭解直昇機各動作的操控方式前，嚴禁實機飛行，請先進行電腦模擬飛行的練習，一種最有效、最安全的練習方式，就是透過市面販售的模擬軟體，以遙控器在電腦上模擬飛行，熟悉各種方向的操控，並不斷的重複，直到手指可熟練的控制各個動作及方向。

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搖桿(各動作的操作方式如下圖)，並反覆練習雷油門高/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，手指能自然隨著喊出的指令移動控制。

Mode 1	Mode 2	Illustration 圖示	
Aileron 副翼		Move Left 左移	Move Right 右移
		Rotate Left 左翻	Rotate Right 右翻
Elevator 升降/前後		Fly Forward 前進	Fly Backward 後退
		Forward Rotate 前翻	Backward Rotate 後翻
Throttle 油門			Ascent 上升
			Descent 下降
Rudder 方向		Turn Right 右舵	
		Turn Left 左舵	

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.
◎再次確認→螺絲是否鎖固？
◎發射器和接收器電池是否足夠。

· When arriving at the flying field.
· 當抵達飛行場

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.
假使飛行場有其他遙控飛機，請確認他們的頻率，並告知他們您正在使用的頻率，相同的頻率會造成干擾導致失控和大大地增加風險。

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搖桿推到低點。

⚠ CAUTION 注意

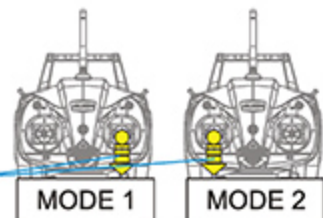Check if the throttle stick is set at the lowest position.
確認油門搖桿是在最低的位置。

MODE 1   MODE 2

◎Are the rudders moving according to the controls?
◎Follow the transmitter's instruction manual to do a range test.
◎方向舵是否隨著控制方向移動？
◎根據發射器說明書進行距離測試。

· Check the movement.
· 動作確認

ON! Step1
First turn on the transmitter.
先開啟發射器

ON! Step2
Connect to the helicopter power
接上直昇機電源

OFF! Step3
Reverse the above orders to turn off.
關閉電源時請依上述操作動作反執行。

This procedure is best performed on soft surfaces such as grass.
The prevent vibration feedback from the ground to Gyro, resulting in over-corrections.

將直昇機置於柔軟地面上，避免升空前腳架與過硬的地面震動太大反饋至機身上的陀螺儀，影響無平衡翼系統升空前過度修正。

⚠ CAUTION 注 意

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 Gyro, and will disappear once helicopter lifts off the ground. If manual trim is applied, helicopter will tilt immediately after liftoff.

直昇機離地前，十字盤可能因陀螺儀受震動的反饋，使十字盤有傾斜的情形，此時請勿刻意將十盤修正為水平狀態，此現象只要離地升空時立即解除，可平穩升空；若刻意將十字盤修正為水平時，反而會造成感應器過度修正，一離地即偏往修正方向的危險。

MAIN ROTOR ADJUSTMENTS   主旋翼雙槳平衡調整

1. Before adjusting, apply a piece of red 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.

1. 調整前先在其中一支主旋翼的翼端，貼上有顏色的貼紙或畫上顏色記號，方便雙槳調整辨識。
2. 機機的推起油門搖桿到高點並且停止，在飛機離開地面前，從飛機側邊觀察主旋翼轉動。
3. 仔細觀察旋翼軌跡(假如兩支旋翼移動都是相同軌跡，則不需要調整；可是如果一支旋翼較高或較低產生 "雙槳" 的情形時，則必須立刻調整軌跡)。

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

a. 旋翼轉動時較高軌跡的主旋翼表示螺距(PITCH)過大，請調短DFC連桿頭修正。
b. 旋翼轉動時較低軌跡的主旋翼表示螺距(PITCH)過小，請調長DFC連桿頭修正。

⚠ CAUTION 注 意

Tracking adjustment is very dangerous, so please keep away from the helicopter at a distance of at least 10m.
調整軌跡非常危險，請於距離直昇機最少10公尺的距離。

Color Mark 有標示記號的主旋翼

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.
不正確的旋翼軌跡會導致震動，請不斷重複調整軌跡，使旋翼軌跡精準正確。
在調整軌跡後，確認一下Pitch角度在停旋時應為大約+5~6°。

FLIGHT ADJUSTMENT AND NOTICE FOR BEGINNERS   初學飛行調整與注意

🚫 FORBIDDEN 禁 止

◎Do not attempt to grab or make eye contact with the helicopter while the main blades are in motion and keep your eyes away from the helicopter. During take-off, landing, and flight, be sure to keep the helicopter away from all obstacles. Operators must stand at least 10 meters away from the helicopter to avoid injury caused by loose parts due to improper assembly or any unforeseen dangers.

◎嚴禁用手抓取運行中的直昇機，並禁止將直昇機對著眼睛，當主旋翼轉動後，或起飛／試飛時，務必遠離障礙物，站立位置必需距離10公尺以上，避免因人為組裝不當造成零件脫落，而引發不可預期的財物及人員損傷。

⚠ CAUTION 注 意

◎Make sure that no one or obstructions in the vicinity.
◎For flying safety, please carefully check if every movement and directions are correct when hovering.
◎確認鄰近地區沒有人和障礙物。
◎為了飛行安全，您必須先確認停懸時各項操控動作是否正常。

⚠ CAUTION 注 意

Do not attempt to fly until you have some experiences with the operation of helicopter.
嚴禁無熟練操控飛行經驗者操控飛行。

✕   Beginner may install a training landing gear to avoid any crash caused by offset effect while landing.
必要時初學者可以在腳架下方安裝練習架，可避免降落時因重心偏移導致主旋翼或直昇機損毀。

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.

◎當直昇機開始離地時，慢慢降低油門將飛機降下。 持續練習飛機從地面上升和下降直到您覺得油門控制很順。

MODE 1   MODE 2
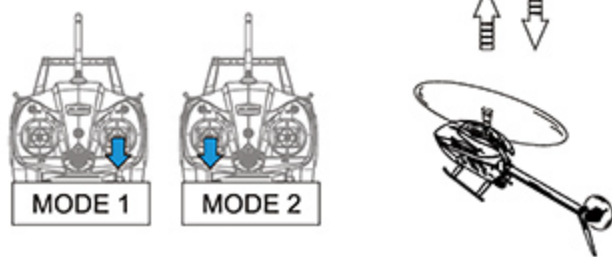
STEP 2 AILERON AND ELEVATOR CONTROL PRACTICE 副翼和升降控制練習

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.

1.慢慢升起油門搖桿。
2.使直昇機依指示:移動向後/向前/向左/向右，慢慢的反向移動副翼和升降搖桿並將直昇機開回到原來位置。

MODE 1   MODE 2

⚠ CAUTION 注意
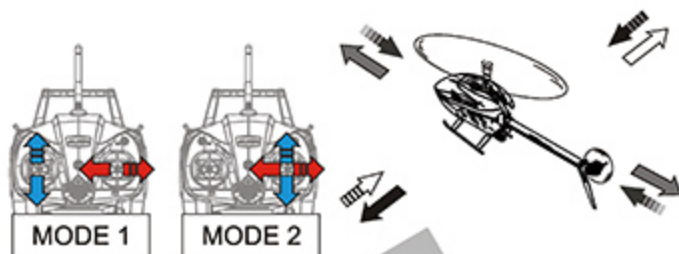
◎If the nose of the helicopter moves, please lower the throttle stick and land the helicopter. Then move your position diagonally behind the helicopter 10M and continue practicing.
◎If the helicopter flies too far away from you, please land the helicopter and move your position behind 10M and continue practicing.

◎當直昇機機頭偏移時，請降低油門並且降落，然後移動自己的位置到直昇機的正後方10公尺再繼續練習。
◎假如直昇機飛離你太遠，請先降落直昇機，並到直昇機後10公尺再繼續練習。

STEP 3 RUDDER CONTROL PRACTICING 方向舵操作練習

1.Slowly raise the throttle 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.慢慢升起油門搖桿。
2.將直昇機機頭移動左或右，然後慢慢反向移動方向舵搖桿並將直昇機飛回原本位置。

MODE 1   MODE 2
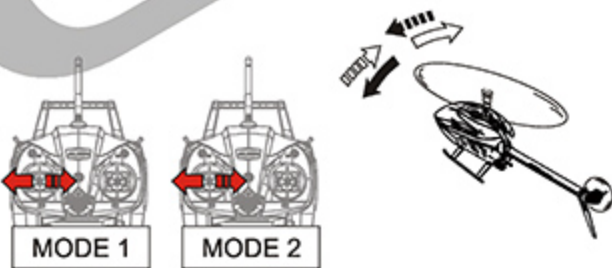
STEP 4

After you are familiar with all actions from STEP1 to 3, draw a circle on the ground and practice within the circle to increase your accuracy.

當你覺得 STEP1~3 動作熟悉了，在地上畫圈圈並在這個圈圈的範圍內練習飛行，以增加你操控的準確度。

◎You can draw a smaller circle when you get more familiar with the actions.
◎當你更加習慣操作動作，你可以畫更小的圈圈。

Narrow the circle
縮小範圍
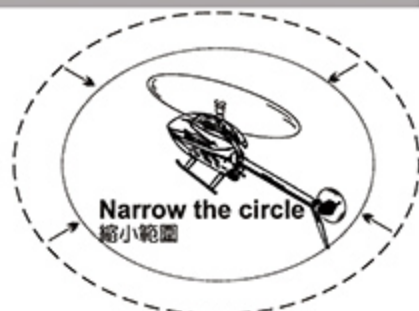
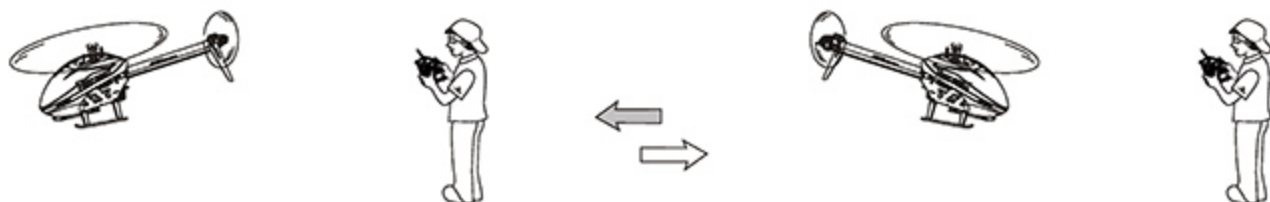## STEP 5 DIRECTION CHANGE AND HOVERING PRACTICE 改變直昇機方向和練習停旋

After you are familiar with STEP1 to 4, stand at side of the helicopter and continue practicing STEP1 to 4. Then repeat the STEP1 to 4 by standing right in front of the helicopter.

當你覺得STEP1~4動作熟悉了，站在面對直昇機側邊並繼續練習STEP1~4。之後，站在直昇機機頭右邊重複步驟練習。

## ELEVATOR AND AILERON GAIN ADJUSTMENT　升降及副翼陀螺儀感度調整

Hover the helicopter and observe if there are any left / right or forward / backward fast oscillation. If oscillation exists, turn the gain dial counter-clockwise to reduce the gyro gain.

先將直昇機以停懸飛行，觀察直昇機左右及前後是否有不正常快速抖動現象，如果前後或左右有抖動，請將感度旋鈕逆時鐘調低，以減少陀螺儀修正感度。

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

Gain adjustment dial
感度調整旋鈕
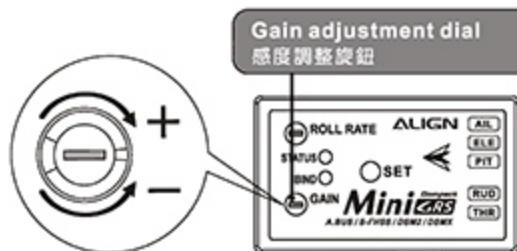
Decrease lock gain sensitivity
調降鎖定感度
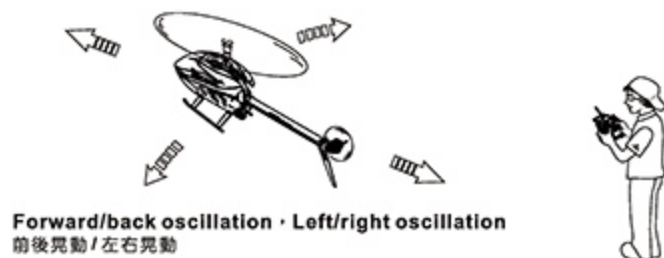
Forward/back oscillation，Left/right oscillation
前後晃動 / 左右晃動

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 gain. Should the helicopter pitch up or experience slow response during flight, increase elevator gain. Repeat this process until ideal gain value is achieved. After adjusting gyro gains, adjust the roll rate In MiniGRS Flight Mode settings based on your preference. Higher the roll rate, the faster the roll/flips are. Pilot can also adjust the cyclic EXP setting for the preferred stability. After all adjustments are completes, the pilot can enjoy the stability of slow flight and the fast agility from flybarless system.

停懸完後可快速前進飛行，同樣的如果有不正常抖動時，請將感度調小，飛行時如果有機頭向上仰起或反應緩慢現象時，請將感度調大，重複測試將感度調整至最理想值。調整完陀螺儀感度，可依據飛行習慣調整滾轉速率，調整越大，前後及左右滾轉速度越快，使用者也可依據個人經驗調整舵面 EXP 以增加停旋穩定性。完成所有調整後，就可享受 Flybarless 所提供低速飛行的穩定性及高速時的靈活性。

Forward Flight
前進飛行

ROLL RATE ADJUSTMENT　滾轉速率調整

Roll rate dial is used to adjust the roll rate of helicopter's elevator and aileron; turning clockwise will increase roll rate, with faster elevator and aileron response; turning counter-clockwise will decrease roll rate, with slower elevator and aileron response. We recommend novice pilots to fly with lower roll rate.

滾轉速率旋鈕調整升降，副翼滾轉速率，往順時針調大滾轉速率，升降與副翼動作反應會變快，往逆時針調低滾轉速率，升降與副翼動作反應會變慢，初接入者建議把滾轉速率調低飛行。
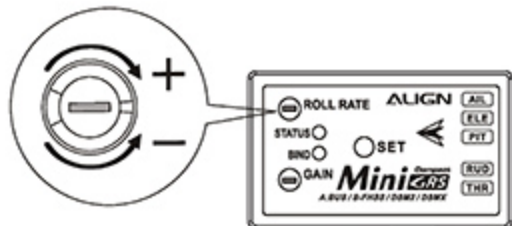
Adjust Counter-clockwise for less sensitive response
逆時針調整，直昇機反應較緩和

RUDDER SENSITIVITY ADJUSTMENT　尾舵感度調整

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 45~50% for hovering, 40~45% for IDLE-UP.
Value should be tuned under actual flight conditions by increasing to the maximum gain without tail hunting.

感度值的大小會隨著伺服器與直昇機的不同而有所差異，一般而言，在不產生追蹤現象（直昇機尾部出現左右搖擺的情況）的前提下感度值愈高愈好，所以只能透過實際飛行的狀況來進行調整。

進入遙控器感度設定的選項，剛開始停懸時建議先設定在 45~50% 左右，IDLE UP 飛行時設定在 40~45% 左右，之後再依實際飛行的狀態再行修正，如果沒有追蹤現象發生時可再調整高感度，若發生追蹤現象時，則調低感度。

		Problem 狀況	Cause 原因	Solution 對策
Blade Tracking 雙槳平衡		Tracking is Off 雙槳	DFC linkage rods are not even length DFC連桿長度調整不平均	Adjust length of pitch linkage rods (A) 調整DFC連桿頭長度
Hover 停懸		Headspeed too low 主旋翼轉速偏低	Excessive pitch 主旋翼的PITCH偏高	Adjust pitch linkage rods (A) to reduce pitch by 4 to 5 degrees. Hovering headspeed should be around 3200RPM. 調整連桿頭調低Pitch約＋4~5度 (停懸時主旋翼需為約3200RPM)
			Hovering throttle curve is too low 停懸點油門曲線過低	Increase throttle curve at hovering point on transmitter (around 65%) 調高停懸點油門曲線 (約65%)
		Headspeed too high 主旋翼轉速偏高	Not enough pitch 主旋翼的PITCH偏低	Adjust pitch linkage rods (A) to increase pitch by 4 to 5 degrees. Hovering headspeed should be around 3200RPM. 調整連桿頭調高Pitch約＋4~5度 (停懸時主旋翼需為約3200RPM)
			Hovering throttle curve is too high 停懸點油門曲線過高	Decrease throttle curve at hovering point on transmitter (around 65%) 調低停懸點油門曲線 (約65%)
Rudder Response 尾舵反應		Drifting of tail occurs during hovering, or delay of rudder response when centering rudder stick. 停懸時尾翼向某一邊偏移，或撥動方向舵並回復到中立點時，尾翼產生延遲，無法停頓在所控制位置上。	Rudder neutral point improperly set 尾中立點設定不當 Rudder gyro gain too low 尾舵陀螺儀感度偏低	Reset rudder neutral point 重設尾中立點 Increase rudder gyro gain 增加尾舵陀螺儀感度
		Tail oscillates (hunting, or wags) at hover or full throttle 停懸或全油門時尾翼左右來回搖擺。	Rudder gyro gain too high 尾舵陀螺儀感度偏高	Reduce rudder gyro gain 降低尾舵陀螺儀感度
Oscillation during flight 飛行抖動		Helicopter oscillates forward /backward/left/right while performing cyclic maneuvers. 升降舵或副翼打舵動作時，機體前後左右抖動	Swashplate gyro gain is slightly too high. 十字盤陀螺儀感度偏高，產生追蹤現象	Turn the gain dial on MiniGRS counterclockwise, 10 degrees at a time until oscillation is eliminated. 逆時針調整MiniGRS上的感度調整旋鈕，以每次調整約10度的方式，調整至適當位置
		Helicopter front bobbles (nods) during forward flight. 直線飛行時，機頭點頭	Worn servo, or slack in control links 伺服器老化，控制結構有虛位	Replace servo, ball link, or linkage balls. 更換伺服器、連桿頭、球頭
Drifting during flight 飛行飄移		pitching up or aileron drift during forward flight 直線飛行機頭上揚或副翼飄移	Swashplate gyro gain is slightly too low 十字盤陀螺感度偏低	Turn the gain dial on MiniGRS clockwise, 10 degrees at a time until drifting is eliminated. 順時針調整MiniGRS上的感度調整旋鈕，以每次調整約10度的方式，調整至適當位置
Control Response 動作反應		Slow Forward/Aft/Left/Right input response 前後左右飛行動作反應偏慢	Roll rate too low 滾轉速率偏低	Adjust MiniGRS roll rate dial clockwise . 順時針調整MiniGRS滾轉速率旋鈕
		Sensitive Forward/Aft/Left/Right input response 前後左右飛行動作反應偏快	Roll rate too high 滾轉速率偏快	Adjust MiniGRS roll rate dial countercolckwise. 逆時針調整MiniGRS滾轉速率旋鈕

If above solution does not resolve your issues, please check with experienced pilots or contact your Align dealer.
※在做完以上調整後，仍然無法改善情況時，應立即停止飛行並向有經驗的飛手請教或連絡您的經銷商。

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Specifications & Equipment／規格配備:

Length/機身長：	476mm
Height/機身高：	158mm
Width/機身寬：	88mm
Main Blade Length/主旋翼長度：	230mm
Main Rotor Diameter/主旋翼直徑：	525mm
Tail Rotor Diameter/尾旋翼直徑：	143mm
Motor Drive Gear/馬達主齒：	14T
Main Drive Gear/傳動主齒：	115T
Autorotation Tail Drive Gear/尾驅動主齒：	40T
Tail Drive Gear/尾翼傳動齒：	13T
Drive Gear Ratio/齒輪傳動比：	8.21：1：3.08
Weight(without battery)/全配重(不含電池)：	Approx. 418g

88mm

525mm

158mm

476mm