

DOMINATOR TREX 450L INSTRUCTION MANUAL

使用說明書

RH45E21BT
RH45E23XT

ALIGN



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BEASTX™

MICROBEAST PLUS

6-AXIS MEMS SENSOR SYSTEM FOR RC-MODELS




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，甚表謝意。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。

Thank you for buying ALIGN Products. The T-REX 450L Dominator 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 450L Dominator 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.

感謝您選購這拓產品，為了讓您容易方便的使用 T-REX 450L Dominator 直升機，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升機，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 450L Dominator 是由亞利吉研發的新產品，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 450L Dominator 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，而使用錯誤可能導致危險。

IMPORTANT NOTES 重要聲明

R/C helicopters, including the T-REX 450L Dominator 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 450L Dominator 遙控直升機並非玩具，它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，使用之前務必詳讀本說明書，如能熟讀並注意自身安全。注意！任何遙控直升機的使用，製造商和經銷商無法對使用者於操作使用的損耗與或組裝不正確所發生之意外負任何責任。本產品是提供給有操作遙控直升機經驗的人或有相當技術的人員在符合當地合法遙控飛行場飛行，以確保安全無虞下操作使用，產品售出後本公司不負責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，是唯一一對於您自己操作的運後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 450L Dominator requires a certain degree of skill to operate, and is a consumer item. Any damage or dissatisfaction as a result of accidents or modifications are not covered by any warranty and cannot be returned for repair or replacement. Please contact our distributors for free technical consultation and parts at discounted rates when you experience problems during operation or maintenance.

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.

模型商品屬於高操作技術且為高耗性之商品，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裝或不滿意，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，本公司各區分公司或代理經商將提供技術指導、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破壞或傷害，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損耗、意外或傷害，使用者應承擔全部責任。

SAFETY NOTES 安全注意事項

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 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、直升機屬高危險性商品，飛行時務必遠離人群。人為組裝不當或操作損耗、電子控制設備不良，以及操作上的不熟悉，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，並瞭解自負損壞所造成任何意外之責任。
- 每週飛行前須仔細檢查，主翼翼尖固定螺絲、尾翼翼尖固定螺絲，以及機身各部位球頭、螺絲，確實上鎖膠帶才能升空飛行。

**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.

真模型飛行時具有一定的危險性，相對的也潛在著危險性，選擇的場地也相對的需要，請遵守當地法規到合法區域飛行，遠離障礙物及人群，切勿在建築物、高壓電線、樹木等附近飛行，以免對他人、房屋、設施、高壓電線、樹木等造成損傷，並造成自己與他人財產的損失。請勿在下雨、打雷等惡劣天氣下操作，以確保本身及飛機的安全。

**NOTE ON LITHIUM POLYMER BATTERIES 鋰聚合物電池注意事項**

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.

鋰聚合物電池一般用於RC模型用的動力電池，鋰電池比鎳鎘電池和鎳氫電池相對起來更危險的。請嚴格遵守鋰電池說明書之使用注意事項，不但會使用鋰電池，可能造成火災及傷及生命財產安全，切勿大意！

**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.

真模型內部也是由許多精密的電子零件組成，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！

**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，任何的升級改造或維修，請使用原廠產品目錄中的零件，以確保結構的安全。請嚴格於產品說明書內操作，請勿濫用，並勿用於安全、法令外其它非法用途。

**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.)

在飛行前飛行時，需先確認是否有人同頻率的模型正在飛行，因為同頻率的模型可能會導致自己與他人立於不穩的意外危險。並將飛機操控技巧在專業人員再一次的指導，由專業人員親自操作飛行，具有經驗的人工在指導時，才可開始操控飛行，否則將可能造成不可預期的意外發生。(勸導您能跟隨及老手指導進入門必的選擇)

**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，都不能將旋轉中的旋翼對準眼睛，嚴禁用手抓取運行中的真模型，並主旋翼轉動後，或旋翼/尾槳旋轉，務必遠離真模型，站立位置必須距離5公尺以上，不可在視線範圍外進行飛行，降落後也須馬上鬆掉真模型動力系統線。操作真模型時應具備一定的操作技術及能力，避免個人經驗不足造成零件損壞，而引發不可預期的財物及人員損傷，並請留意自身情況，避免疲勞、精神不振或不當操作，都可可能引起不可預期的意外發生。

**ALWAYS BE AWARE OF THE ROTATING BLADES 遠離旋轉中零件**

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.

真模型主旋翼和尾槳旋轉時會以高轉速下運行，在旋轉下的旋翼會造成自己與他人及身體上或環境上的嚴重損傷，請務必遠離旋轉中的主旋翼與尾槳，並保持安全距離及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 纖維或聚乙稀、電子線路為主要材質，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。



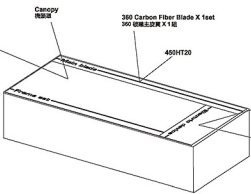

RADIO TRANSMITTER AND ELECTRONIC EQUIPMENT REQUIRED FOR ASSEMBLY 自備遙控及電子設備

 <p>Transmitter (6-channel or more, helicopter system) 遙控器 (六或以上通道直升機式系統)</p>	 <p>Receiver (7-channel or more) 接收器 (七或以上)</p>	 <p>Remote Receiver 衛星天線</p>
 <p>22.2V 6S 1100~1400mAh Li-Po Battery x 1 22.2V 6S 1100~1400mAh Li-Po電池 x 1</p>	 <p>RCC-300 Intelligent Battery Charger RCC-300 智慧型充電器</p>	

ADDITIONAL TOOLS REQUIRED FOR ASSEMBLY 自備工具

 <p>[H45191] Swashplate Leveler 十字盤校正器</p>	 <p>[HET80001] AP800 Digital Pitch Gauge AP800 數位傾角規</p>	 <p>[HETMT901] Multi-function Tester 多功能檢測計</p>					
 <p>Phillips Screw Driver 十字螺絲起子 φ 3.0/φ 1.6mm</p>	 <p>Cutter Knife 刀子</p>	 <p>Hexagon Screw Driver 六角螺絲起子 3mmx2.5mm 2mmx1.5mm</p>	 <p>Needle Nose Pliers 尖嘴鉗</p>	 <p>Oil 潤滑油</p>	 <p>CA Glue 瞬間膠</p>	 <p>Grease 潤滑脂</p>	 <p>Anaerobic Retainer (R48) 厌氧膠 (R48)</p>

PACKAGE ILLUSTRATION 包裝說明













 <p>450HH17 450HB23 450HB21 450HB19 450HT19 450HG1 450HZ25</p> <p>Canopy 機罩</p> <p>360 Carbon Fiber Blade X 1set 360 碳纖維翅翼 X 1 組</p> <p>450HT20</p>	<p>Quick Finder 零件快遞碼</p>  <p>460MX (1600KV) Brushless Motor x 1 460MX (1500KV) 無刷馬達 x 1 RCE-BL45P Brushless ESC x 1 RCE-BL45P 無刷電調器 x 1</p> <p>Optional Equipment 選購品</p> <p>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 Microbeast PLUS Flybarless System x 1 微平姿翼系統 x 1</p>
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There are many versions of T-REX 450L Dominator for your choice. The Super Combo includes additional electronics and other equipment. The Instruction Manual will refer to the T-REX 450L Dominator Super Combo. You may purchase any additional items referenced in the Instruction Manual or any spare parts for other 450L Dominator version by referring to more product information in this manual.

T-REX 450L Dominator 系列產品有多種版本可作為選擇，除標準配備會因您購買的產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 Super Combo 作為參考，您也可依照書面上的產品圖碼來選購其他選購商品。



T-REX 450L DOMINATOR SUPER COMBO STANDARD EQUIPMENT				T-REX 450L DOMINATOR SUPER COMBO 標準配備	[RH45E21BT]
 450HC6	 450HH17	 450HB23	 450HB21	 450HB19	
 450HT19	 450HT20	 450HG1	 450HZ25	 M3 止位螺絲 x 1 Motor Pinion Helical Gear 11T x 1 馬達副齒輪 11T x 1	
 460MX (1800KV) 2222 無刷馬達 x 1	 RCE-BL45P 無刷定速電子速器 x 1	 Microbeast PLUS Flybarless System x 1 無平衡翼系統 x 1	 DS450 數位伺服機 x 3 DS455 Digital Servo x 1 DS455 數位伺服機 x 1	 360 碳纖維主旋翼 X 1	

T-REX 450L DOMINATOR KIT STANDARD EQUIPMENT				T-REX 450L DOMINATOR KIT 標準配備	[RH45E23XT]
 450HC6	 450HH17	 450HB23	 450HB21		
 450HB19	 450HT20	 450HG1	 450HZ25		
 M3 止位螺絲 x 1 Motor Pinion Helical Gear 11T x 1 馬達副齒輪 11T x 1	 460MX (1800KV) 2222 無刷馬達 x 1	 RCE-BL45P 無刷定速電子速器 x 1	 360 碳纖維主旋翼 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.
- 每次飛行前請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。
- 每次飛行前請確定您的發射器與接收器電池的電量是在足夠飛行的狀態。
- 開機前請確認油門桿是否位於最低點，熄火與預熱開關、定速開關(IDLE)是否處於關閉位置。
- 開機時必須遵守電源開機的程序，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。不正確的開機程序可能會造成失控的現象，影響自身與他人的安全，請養成正確的習慣。
- 開機前請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卡阻的情形，使用故障的伺服零件將造成不可預期的危險。
- 飛行前請確認沒有缺少或鬆動的螺絲與螺帽，確認沒有組裝不完整或損壞的零件，仔細檢查主旋翼是否有損壞，特別是接近主旋翼安裝的部位，螺帽或螺絲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，及使用更換零件，請確實嚴格執行以確保安全。
- 檢查所有的連接頭是否有鬆動的情形，過鬆的連接頭應先更新，否則將造成直昇機無法操控的危險。
- 確實電池及電源插頭是否固定牢靠，飛行中的震動或激烈的飛行，可能造成電源插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，以確保相關零件使用之可靠度。



- CA : Apply small amount of CA Glue to fix.
缺膠膠：使用適量瞬間膠固定
- R48 : Apply small amount of Anaerobic Retainer to fix.
缺膠膠：使用適量缺膠膠固定
- 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.
潤滑膏：添加適量潤滑膏

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

各球齒膠製連接頭扣裝時，"A"字標朝外。



Keep plastic parts away from heat.
塑膠件避免靠近熱源。



CA Glue
缺膠膠



Anaerobic Retainer
缺膠膠



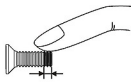
Thread Lock
螺絲膠



Grease
潤滑膏



Oil
潤滑油



- Anaerobic Retainer (R48) is green penetrating threadlocker and is used to fix the metal tube before assembly at temperatures up to +180°C.
- 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.
- 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.

- 缺膠膠 (R48) 為綠色高強度快速固化的缺膠膠，適合於金屬管狀固定用，可耐高溫至 180°C。
- 螺絲膠 (T43) 為藍色低強度螺絲膠，適合小型螺絲；使用於金屬內外型螺絲或螺絲帽，請務必適量使用，必要時請用手去擦多餘膠膠，故拆卸時可於金屬接合部位輕推約 15 秒。
- 潤滑膏 (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(即鎖付零件)屬性需求自行準量並斟酌其用量，以達到最佳組裝狀態，避免因使用不能造成零件損壞或不可預期的意外發生。

450HH17



Thrust Bearing
止推軸承 (φ 4x φ 8x3.3mm) x 2



Washer
墊圈 (φ 5.5x φ 8x5.4mm) x 2



Bearing
軸承 (φ 4x φ 8x3mm) x 4



Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖附於金屬件時使用適量 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屬原裝成品，請確認每顆螺絲是否緊上膠。請注意 T43 不可塗在任何的塑膠材質上。



THRUST BEARING 止推軸承

Metal Main Rotor Holder
金屬主旋翼固定座



"IN" Mark
Faces Inside
"N"字溝朝內

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



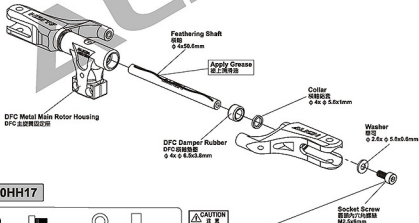
Thin (Larger ID)
(內徑較大)

Thick (Smaller ID)
(內徑較小)



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.

止推軸承及橫軸軸承屬於飛行消耗品，建議每 20 趟定期檢查及更換。若主旋翼轉速飛行時，請縮短定期檢查之週數，以確保飛行安全。



450HH17



Socket Screw
螺絲內六角螺絲 (M2.5x5mm) x 2



Washer
墊圈 (φ 2.6x φ 5.5x0.6mm) x 2



DFC Damper Rubber
DFC 防範橡膠
(φ 4x φ 6.5x3.8mm) x 2



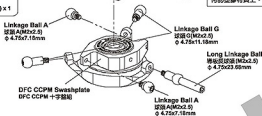
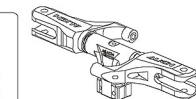
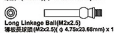
Collar
環形凸環 (φ 4x φ 5.6x1mm) x 2



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

須給螺絲鎖附時請注意鎖附之緊度與使用適量的螺絲膠，建議用配出力扳手或扭力機鎖附螺絲，鎖定扭力值為 5.0kg.cm。

450HH17



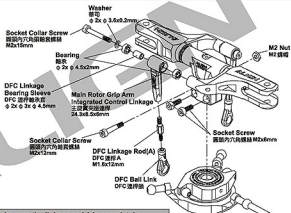
Apply a small amount of T43 thread lock when fixing a metal part.
鎖絲適用於金屬件鎖使用 (T43) (鎖絲組)。

CAUTION
注意

Original manufacturer 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，請確認每顆螺絲均牢固鎖緊，請勿在塑膠件上鎖。請注意 T43 不可用在任何塑膠材質上。

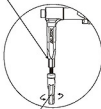
450HH17



Make sure the linkage rod A is completely fastened with main rotor grip arm integrated control link and apply a small amount of T43 thread lock to avoid any vibration and loose fitted during A flight and cause it breaks.

連桿 A 鎖入主旋翼握桿連桿鎖緊頭緊於使用適量 T43 鎖定，避免飛行中的震動及鬆動，嚴重可能導致飛行中斷裂。

450HB19



You may adjust the length of ball link when tracking is off while flight.
若飛行中有變量情形，可適當調整連桿球長度調整。

DFC Main Shaft
DFC 主軸 φ 9x11mm

450HB23



Bearing

轴承 ($\phi 5x \phi 11x5mm$) x 2



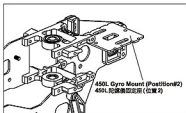
Socket Screw

圓頭內六角螺絲 (M2.5x6mm) x 4



Socket Button Head Screw

半圓頭內六角螺絲 (M2.5x5mm) x 8



450L Gyro Mount (Position#2)
450L 陀螺儀固定座 (位置2)

Bearing
軸承
 $\phi 5x \phi 11x5mm$

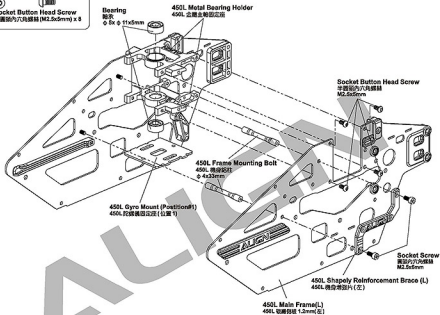
450L Metal Bearing Holder
450L 金屬軸承固定座

Apply a small amount of T43 thread lock when fixing a metal part.
螺絲鎖訂金屬零件時請使用適量 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.

原廠零件包裝包含如果裝載成品，請確認每顆螺絲皆鎖緊並套裝上膠。請注意 T43 不可用在任何的塑膠材質上。



450L Gyro Mount (Position#1)
450L 陀螺儀固定座 (位置1)

450L Frame Mounting Bolt
450L 機身螺絲釘
 $\phi 4x33mm$

Socket Button Head Screw
半圓頭內六角螺絲
M2.5x5mm

Socket Screw
圓頭內六角螺絲
M2.5x5mm

450L Shapely Reinforcement Brace (L)
450L 機身增強片 (左)

450L Main Frame (L)
450L 機身底座 1.3mm (左)

450HB22A



Washer

墊圈 ($\phi 2.6x \phi 5.8x0.6mm$) x 3

450HB23



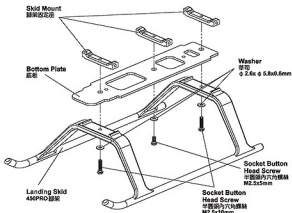
Socket Button Head Screw

半圓頭內六角螺絲 (M2.5x10mm) x 1



Socket Button Head Screw

半圓頭內六角螺絲 (M2.5x10mm) x 2



Skid Mount
腳架固定座

Bottom Plate
底板

Washer
墊圈
 $\phi 2.6x \phi 5.8x0.6mm$

Landing Skid
456PRO 腳架

Socket Button Head Screw
半圓頭內六角螺絲
M2.5x5mm

Socket Button Head Screw
半圓頭內六角螺絲
M2.5x10mm

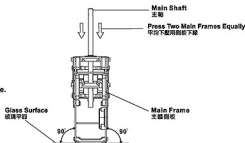


Main frame assembly key point :

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.

機身保板組立重點：

保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是否滑順，主體底板必須與水平桌面(玻璃平面)確實緊貼；請保持主軸滑順與底板平行桌面後慢慢鎖緊螺絲，正確保板的組裝對動力與飛行性能有顯著幫助。



Apply a small amount of T43 thread lock when fixing a metal part.
鎖緊固定於金屬件時請使用適量T43(螺絲膠)。



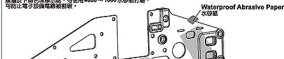
Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.

原廠零件包裝包含產品如果原裝良品，請確認再確認各種螺絲是否鎖緊上膠。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.

建議於下圖色塊標記處，可使用#800~1000水砂紙打磨。

可防止電子設備電線被磨破。



450HB22A



Socket Button Head Self Tapping Screw
半圓頭內六角自攻螺絲
(T2.6x6mm) x 4

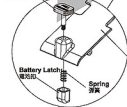
450HB23



Socket Button Head Screw
半圓頭內六角螺絲(M2.5x5mm) x 4

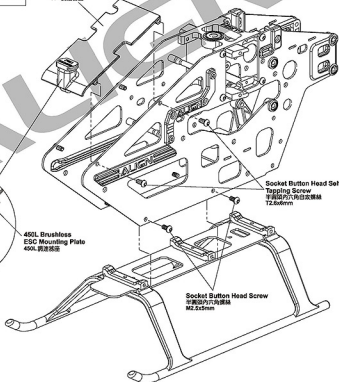
Battery Latch Lever

電池的拉桿



Battery Release Latch
Installation Illustration
電池扣安裝示意圖

450L Brushless ESC Mounting Plate
450L 調速器座



450HZ28A



450HB23



Apply a small amount of T43 thread lock when fixing a metal part.
鎖緊螺絲時的金屬零件請使用適量 T43 (鎖絲膠)。



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

原廠零件包裝包裝如果果是組裝品，請確認每顆螺絲是否鎖緊上膠，請注意 T43 不可塗在任何的塑膠材質上。

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

DS450 Digital Servo
DS450 數位伺服馬達
Optional Equipment
選購品

D4AF Servo Horn
D4AF 伺服臂

M2 Nut
M2 螺帽

Linkage Ball A(M2x3.5)
球頭 A(M2x3.5)
φ 4.7xø8.18mm

12.5mm

Use The Inner Hole
鎖緊於內孔。

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

- DS450 Digital Servo :
1. 1620 μ a standard band / 1520 μ a 寬幅只紙
 2. Stall Torque/ 輸出扭力 : 3.0kg.cm (0.9V)
4.9kg.cm (2.4V)
 3. Motion Speed/ 動作速度 : 0.09sec/90° (0.0V)
0.05sec/90° (2.4V)
 4. Dimension/ 尺寸 : 23 x 12 x 31.3mm
 5. Weight/ 重量 : 17.5g

DS450 Digital Servo
DS450 數位伺服馬達
Optional Equipment
選購品

470 Linkage Ball B(M2x3.5)
470 球頭 B(M2x3.5)
φ 4.7xø11.34mm

D4AF Servo Horn
D4AF 伺服臂

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

M2 Nut
M2 螺帽

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

450HB23



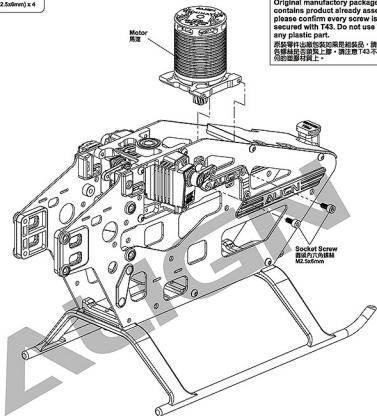
Socket Screw
圓頭內六角螺絲 (M2.5x6mm) x 4

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

原廠零件包裝包裝均為預裝品，請帶再確認每顆螺絲是否鎖死上膠，請注意 T43 不可塗在任何的塑膠材質上。



450HB22A



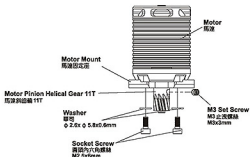
Socket Screw
圓頭內六角螺絲 (M2.5x6mm) x 2

Washer
碟形
(ϕ 2.6x ϕ 5.8x0.6mm) x 2

450HZ28A



M3 Set Screw
M3 止咬螺絲 (M3x2mm) x 1



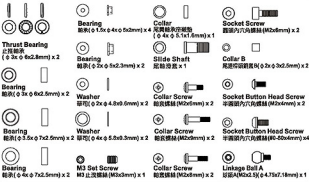
Apply a small amount of T43 thread lock when fixing a metal part.
 螺絲鎖附於金屬件時必須塗薄 T43 (藍線膠)。

450HT19

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.

原廠零件包裝內裝有已裝好產品，請確認每顆螺絲均確實鎖緊，請勿在塑膠零件上塗 T43。



CAUTION
 注意

- The Metal Tail Rotor Holder is assembled at the factory, make sure to apply little thread lock on screws and tighten them back appropriately before starting to fly. Suggest to use torque wrench or torque lock for tightening screws with the torque value 3.0kg.cm.
- Make sure to tighten the screws on each side with equal average strength, equal torque, or there may be imbalance during rotation.

1. 原廠裝出廠產品為預裝好，螺絲必須使用適量螺絲膠重新鎖附，鎖附時注意適量鎖緊即可，建議請配扭力或扭力扳手鎖附，扭力值為 3.0kg.cm。

2. 鎖緊時應控制兩側，上、下螺絲必須平均力量鎖附，不可單邊過緊，否則會造成干涉或滑動不順暢。

CAUTION
 注意

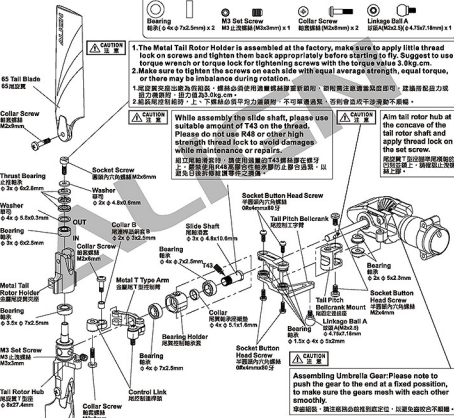
While assembly the slide shaft, please use suitable amount of T43 on the thread. Please do not use R48 or other high strength thread lock to avoid damages while maintenance or repairs.

組立尾軸滑套時，請使用適量的 T43 鎖螺絲在螺絲上。請勿使用 R48 或其他高強度鎖螺絲防止鎖合過緊，以避免日後拆裝螺絲時零件之損傷。

CAUTION
 注意

Aim tail rotor hub at the concave of the tail rotor shaft and apply thread lock on the set screw.

尾座與尾座凹形螺絲座的凹形螺絲上，請鎖緊止流螺絲。



CAUTION
 注意

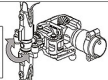
Any slight binding on control link may affect tail action during flight. Please be note while tightening M2x6mm collar screw, please adjust the ball link and make sure it is operating smoothly. Apply suitable amount of T43 on the thread.

尾旋控制桿鎖合干涉，動作不順暢，將影響尾旋控制效果，請注意調整 M2x6mm 船夾螺絲時，須調整至無干涉即可將螺絲鎖緊，並使用適量 T43 鎖螺絲固定。

CAUTION
 注意

After complete the tail rotor assembly, please check if it rotates smoothly.

尾座裝組裝完成後請確認尾旋翼夾座轉動順暢。



Already assembled by factory, please note to check again.
已裝完成，請務必再檢查。

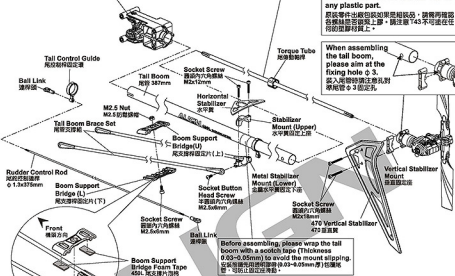
When assembling into the tail boom, please apply some oil on the surface, to make it smooth during the assembling and keep it vertical with the torque tube for smooth rotation.
插入尾筒內時，外表抹些潤滑油，以確保平順裝入尾筒中並與尾筒軸保持垂直，讓尾筒旋轉順暢。

Apply a small amount of T43 thread lock when fixing a metal part.
鎖緊固定金屬零件時請塗抹少量 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.
原廠零件包裝包裝如果是組裝品，請務必確認各螺絲是否鎖緊上膠。請注意 T43 不可塗抹在任何的塑膠材質上。

When assembling the tall boom, please aim at the fixing hole $\phi 3$.
裝入尾筒時請注意孔對準尾筒 $\phi 3$ 固定孔。

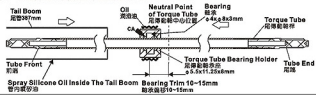


Before assembling, please wrap the tail boom with a scotch tape (Thickness 0.03-0.05mm) to avoid the mount slipping. 安裝前請先用透明膠帶(0.03-0.05mm厚)包纏尾筒，可防止固定座滑動。

TIP TO FIX THE TORQUE TUBE 傳動軸軸承固定位置須

Please apply some CA glue to fix bearing on the torque tube, avoid CA glue from the bearing side or may cause the bearing stick. When assembling into the tail boom, please apply some oil and use the attached torque tube mount holder to press the bearing holder of the torque tube into the tail boom horizontally.

請以少量 CA 膠將軸承固定於尾筒軸管上。避免 CA 膠沾到軸承的側面導致軸承卡死。裝入尾筒內時，尾筒傳動軸軸承座外表抹些潤滑油，利用隨附軸承安裝器將尾筒傳動軸承座平行壓入尾筒中不可歪斜。



CAUTION 注意

The wider side of trapezoid shape imprinted on support bridge need to face forward.
尾支撐桿固定片上，梯形顯示較寬底邊請朝前傾。

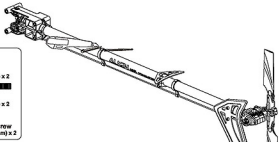
Boom support bridge foam tapes need to be attached to the slots in top and bottom of 450L boom support bridge.
450L 尾支撐桿固定片上下泡棉，需貼貼 450L 尾支撐桿泡棉。

450HT20

- Socket Screw 尾筒內六角螺絲(M2.5x6mm) x 4
- M2.5 Nut M2.5 防鬆螺帽 x 1
- Ball Link 連接球 x 2
- Boom Support Bridge Foam Tape 450L 尾支撐桿固定片泡棉(6x13x1mm) x 4

450HT19

- Socket Screw 尾筒內六角螺絲(M2x12mm) x 2
- Socket Screw 尾筒內六角螺絲(M2x10mm) x 2
- Socket Button Head Screw 半圓頭內六角螺絲(M2.5x6mm) x 2



450HB23

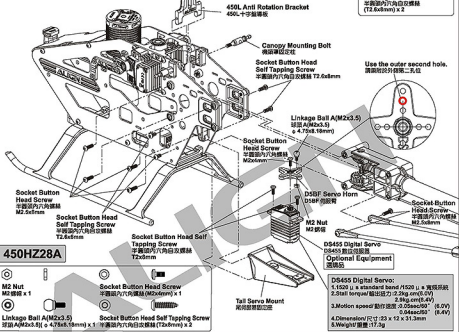


450HT18



Original manufactory packages contains product already assembled, please confirm every screw is firmly secured with T43. Do not use T43 on any plastic part.
原廠零件包裝包裝如果呈組裝品，請再確認每枚螺絲是否鎖緊上膠。請注意 T43 不可用在任何的塑膠材質上。

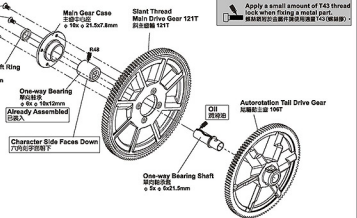
450HB22A



450HZ28A



450HB19



450HH17

Main Blade Fixing Screw 鎖緊內六角鎖緊螺絲



450HZ24

Main Shaft Spacer(0.1) 主軸墊片(0.1)

($\phi 5 \times \phi 9 \times 0.1\text{mm}$)x1

Main Shaft Spacer(0.2) 主軸墊片(0.2)

($\phi 5 \times \phi 9 \times 0.2\text{mm}$)x1

450HB19

Socket Collar Screw 鎖緊內六角鎖緊螺絲

(M2x12mm) x 1

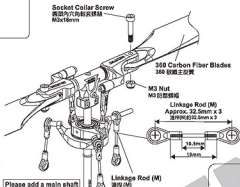
M2 Nut M2 螺帽 x 1

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.

鎖緊主旋翼螺絲時請適當旋緊即可，過緊可能會導致主旋翼夾架受損，飛行意外發生。

Socket Collar Screw 鎖緊內六角鎖緊螺絲

M3x16mm



Please add a main shaft spacer if necessary.
必要時請添加主軸墊片
 $\phi 5 \times \phi 9 \times 0.1\text{mm}$
 $\phi 5 \times \phi 9 \times 0.2\text{mm}$

Apply a small amount of T43 thread lock when fixing a metal part.
鎖緊螺絲固定金屬零件時請使用適量 T43 (鎖固膠)。

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.

原廠零件包裝包裝品是組裝品，請確認每顆螺絲是否確實鎖緊。請注意 T43 不可用在任何的塑膠材質上。

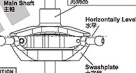
450HZ22

Linkage Rod (M) 連桿(M) $\phi 1.3 \times 16\text{mm} \times 3$



Ball Link 連桿球 x 6

[H45191] Swashplate Leveler 十字架整平器 Optional Equipment 選購品



CAUTION 注意

While using Flybarless system, please use the swashplate lever 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，請務必使用十字架整平器校正十字架，調整伺服連桿長度，確保十字架達到水平狀態，再調整不得體穩定，這樣才能確保飛行性能達到最佳效果。

Slant Thread Main Drive Gear Set 斜主齒輪組



Socket Collar Screw 鎖緊內六角鎖緊螺絲

M2x12mm

M2 Nut M2 螺帽

Set the motor pinion gear to main drive gear mesh to approximately 0.1mm to avoid excess power consumption motor burnt due to overload.
應將齒輪可移動以維持齒輪啮合合適約有 0.1mm 間隙，過緊齒輪會導致成動力損失或過熱高能力的過載，嚴重可導致效率降低。

Please do not over tighten, a over tighten may cause the autorotation tail drive gear deformed.
請以適當扭力鎖緊即可，過緊可能會造成尾旋驅動齒輪變形。

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.

齒輪下緣必須與主齒輪下緣水平切齊，如此才能確保齒輪啮合順暢，避免尾旋主齒輪與斜齒輪主齒輪產生異常干涉磨損。


A MOUNTING ORIENTATION OF MICROBEAST PLUS MICROBEAST PLUS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/beastx/>

Microbeast PLUS provides 8 different direction choices can be installed on any position of helicopter.

Microbeast PLUS 提供8種不同方向選擇，可以安裝在機體的任何一個位置。

THE COLOR OF THE STATUS-LED SHOWS THE CURRENTLY SELECTED ORIENTATION:
 LED指示燈狀態顯示安裝方向：



Status LED Off*
 Status-LED 燈熄滅*



Status LED Flashing Purple
 Status-LED 燈 紫色閃爍



Status LED Purple
 Status-LED 燈紫色



Status LED Flashing Red
 Status-LED 燈 紅色閃爍



Status LED Red
 Status-LED 燈紅色



Status LED Flashing Blue
 Status-LED 燈藍色閃爍



Status LED Blue
 Status-LED 燈藍色



Status LED Flashing Red/Blue
 Status-LED 燈 紅藍色同時閃爍

Front
 機頭方向

◆ Factory Setting

◆ 出廠預設值

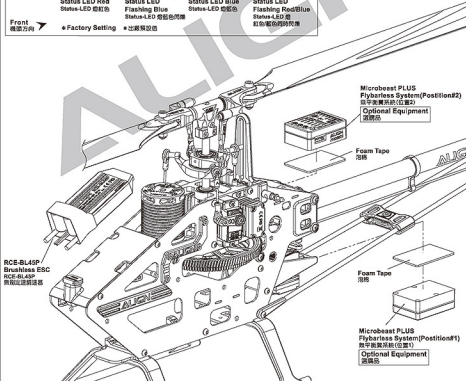


Apply a small amount of T43 thread lock when fixing a metal part.
 鎖緊螺絲釘金屬零件時使用適量T43(鎖絲膠)。



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

原廠零件出廠包裝如果已經裝好，請再確認每個螺絲是否都裝上膠。請注意T43不可塗在任何的塑膠材質上。

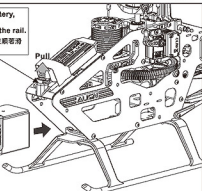
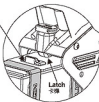


Slide the battery mounting plate along the rail until a "click" is heard to make sure the battery mounting plate is latched.

將電池固定座順著電池滑軌插入至發出“嗒嗒”聲響，使電池固定座完全卡入卡槽。

While drawing out the battery, pull this latch to allow the battery to slide out along the rail.

電池抽出時，請先將拉扣往上拉順著滑軌抽出。



Please attach the hook & loop tape to narrow side of battery.

將術沾膠貼粘在電池的較窄面。

Battery Mount

電池固定座



Hook and Loop Tape

(Hooked)

魔术沾 (勾狀)

Hook and Loop Tape

(Fuzzy)

魔术沾 (毛絨狀)



Battery

電池



Use the included hook & loop strap to fix the battery in place.

Start the strap 1cm below the battery mounting plate, go down along the battery until it wraps around completely. The end of the strap also needs to be 1 cm away from the battery mounting plate.

以附贈的魔术束帶束固定電池，束帶需從電池板下方1公分處，

沿電池由下往上方式纏，最後束帶末頭也須離電池板1公分。

1 cm above

1公分以上

1 cm above

1公分以上



Hook and Loop Strap

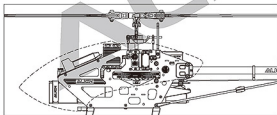
魔术帶



CANOPY ASSEMBLY

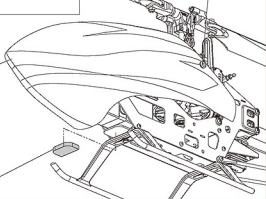
機頭罩安裝

ALIGN



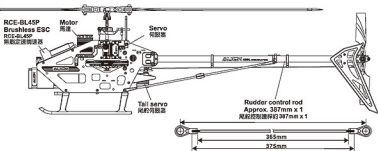
Canopy
機頭罩

Canopy Nut
機頭罩螺絲



Using the included foam tape on battery mount will effectively reduce vibration of canopy.

以隨附泡棉膠固定於電池座，能有效降低機頭罩震動。

Quick Finder
零件快查碼

MICROBEAST PLUS Flybarless System as ALIGN helicopter standard equipment, must and compatible with ALIGN standard equipment including blades, servos, motor, battery and so on, please refer to flight and setup instruction in this manual.

ALIGN 直昇機使用 MICROBEAST PLUS 無平衡翼系統，須搭配 ALIGN 直昇機標準配件(主旋翼、伺服器、馬達)與飛行操作、設定指示。

USER NOTICE 使用注意事項



1. If assembling and operating the helicopter without using ALIGN standard equipment, including electronic equipment & blades...etc, please make sure there is a sufficiently large and stable power supply to your helicopter. If there is any abnormal voltage or insufficient power supply, suggest to upgrade the flybarless system to MICROBEAST PLUS HD (Optional) for better power back up.
 2. Please refer to BEASTX MICROBEAST PLUS/HD website for MICROBEAST PLUS/HD assembly and setup instruction.
 3. Any over use, incorrect setup, misassembly, 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. 安裝、操作您的直昇機時，如非使用 ALIGN 標準配件(含電子配件、主旋翼等)，請務必確定您的供電系統有足夠的供電能力，如發現電壓異常、供電不足，建議您升級使用 MICROBEAST PLUS HD 無平衡翼系統(選配)，以能提供充足、穩定的供電電壓。
 2. MICROBEAST PLUS/HD 使用、設定、組裝，請參照 BEASTX MICROBEAST PLUS/HD 官方說明。
 3. 任何電子配件、零件的過度、錯誤、修改或操作不當所造成的電壓異常、電子零件損壞，即可能造成供電不穩定等問題，每趟飛行前請仔細仔細檢查，防止機件及電子零件故障而引發不可預期的意外。

MANUAL LINK 設定操作連結

MICROBEAST PLUS Flybarless System is the latest version out of the factory, please feel at ease using it. You can also link to BEASTX MICROBEAST PLUS/HD website to get the latest version and the latest news. MICROBEAST PLUS Flybarless System has available some different versions, each version has different programming and function, please make sure your Microbeast version and read its correct manual carefully before assembly or upgrading, especially you are upgrade from version V3.2.X to V4.X.X by yourself, in order to avoid mistake or loss by any misunderstanding, please be sure that you have correct version and follow its setting method accordingly. And please refer to MICROBEAST PLUS V3.2.x and V4.2 instruction manual for operating and setting.

MICROBEAST PLUS 無平衡翼系統，出廠時主程式已是最新版本，您也可以連結至 BEASTX MICROBEAST PLUS/HD 官網查詢，隨時更新最新版本及各項最新訊息。部分版本因升級設定及功能會有所不同，請確定您的版本並詳讀其說明書，尤其您是由 V3.2.x 升級至 V4.x.x，請務必深入了解版本之間的設定功能，以免錯誤而造成損失。操作設定時請同時參閱 V3.2.x 版及 V4.2 版使用說明書。



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/beastx/>



MICROBEAST PLUS

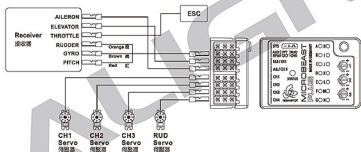
Optional Equipment
選購品

PARTS IDENTIFICATION 各部位名稱

MICROBEAST PLUS FLYBARLESS SYSTEM 無平衡翼系統



MICROBEAST PLUS FLYBARLESS SYSTEM WIRING DIAGRAM 無平衡翼系統接線示意圖



For detail connectivity, please scan QR Code then follow MICROBEAST PLUS manual.

詳細接線方式，請掃描QR Code並結合MICROBEAST PLUS說明書。



MICROBEAST PLUS HD Flybarless System(Optional) MICROBEAST PLUS HD無平衡翼系統(選配)

If assembling and operating the helicopter without using ALIGN standard equipment, including electronic equipment & blades...etc, please make sure there is a sufficiently large and stable power supply to your helicopter. If there is any abnormal voltage or insufficient power supply, suggest to upgrade the flybarless system to MICROBEAST PLUS HD (Optional) for better power back up. Please refer to BEASTX website for MICROBEAST PLUS HD assembly and setup instruction.

安裝、操作您的直升機時，如未使用 ALIGN 標準配件(含電子配件、主旋翼等)，請務必確定您的供電系統有足夠的供電能力，如發現電壓異常、供電不足，建議您升級使用 MICROBEAST PLUS HD 無平衡翼系統(選配)，以確保供電充足、穩定的接收器電源。MICROBEAST PLUS HD 使用、設定、接線，請參照 MICROBEAST PLUS HD 官方說明。

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.

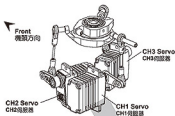
此項設定只須將發射器，接上BEC電源即可進行操作。

注意：為了安全起見，設定前請先不要將無刷電動機與無刷電機三線線接上，以免調整時啟動而發生危險。

SERVO CONFIGURATION 伺服器配置

Following the servo configuration diagram on right, plug the servos to Gyro.

請依右圖顯示的伺服器名稱，將伺服器接到陀螺儀。



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旋轉混控模式，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。發射器設定完成後接上直升機電源，即可進行舵機中立點設置。

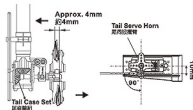
注意：當接上直升機電源時請勿啟動尾舵搖桿或旋轉機體，待3秒陀螺儀開機完成後，尾向舵機需與尾向舵機約成90度，尾旋翼控制組應正確置於尾槳軸約中間位置，即為標準尾舵中立點設定，設定完成後，切換至“鎖定模式”，感度設約70%左右。

TAIL NEUTRAL SETTING 尾中立點設定

After the gyro is enable and under non-head lock mode, correct setting photo. 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，尾向舵機與尾Pitch控制組正確擺置位置。

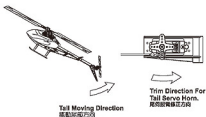
若尾Pitch控制組未置中時請調整尾控制桿的長度來修正。



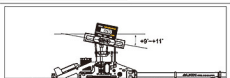
HEAD LOCK DIRECTION SETTING OF GYRO 陀螺儀鎖定向設定

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".

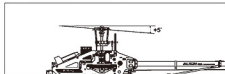
陀螺儀鎖定向正確後，當手搖尾舵反時鐘擺動，尾向舵機臂應反時鐘修正，反時鐘時請切陀螺儀上“鎖定反向”開關修正。



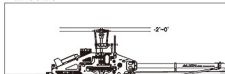
GENERAL FLIGHT 一般飛行模式



Stick Position at High/Throttle 100%/Pitch +9 ~ +11
搖桿高速/油門100%/Pitch +9 ~ +11



Stick Position at Hovering/Throttle 65%~70%/Pitch +5 ~ +6
搖桿停懸/油門65%~70%/Pitch +5 ~ +6

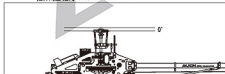


Stick Position at Low/Throttle 0%/Pitch -2'~0'
搖桿低速/油門0%/Pitch -2'~0'

3D FLIGHT 3D特技飛行模式



Stick Position at High/Throttle 100%/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



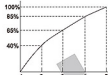
注意

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. 動力與昇力較高轉速的設定方式，優於螺距過大的設定。

GENERAL FLIGHT 一般飛行模式

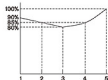
Throttle 油門	Pitch 螺距
5 100% High Speed 100% 高速	+9 ~ +11'
4 85%	
3 65%~70% Hovering 65%~70% 停懸	+5'
2 40%	
1 0% Low Speed 0% 低速	-2'~0'



Throttle Curve (Hovering Flight)
停懸模式油門曲線

IDLE 1: SPORT FLIGHT

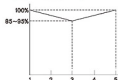
Throttle 油門	Pitch 螺距
5 100%	+11'
4 85%	
3 90%	+5'
2 85%	
1 90%	-5'



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'

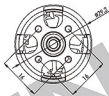
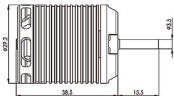


Throttle Curve (3D Flight)
特技飛行模式油門曲線

RCM-BL460MX 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 460MX 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 460MX 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強鐵磁強磁鐵，搭配高品質的雙ZZ超高效率精密軸承設計，電流低、扭力強，將是下一代動力革命中的最具代表性的一顆星。



(Unit: mm)

SPECIFICATION 尺寸規格

KV	KV值	1800KV(RPM/V)	Input Voltage	輸入電壓	6S
Stator Diameter	定子外徑	22 mm	Stator Thickness	定子厚度	22mm
Stator Arms	矽鋼片槽數	9	Magnet Poles	磁鐵極數	6
Max Continuous Current	最大持續電流	30A	Max Instantaneous Current	最大瞬間電流	45A(5sec)
Max Continuous Power	最大持續功率	650W	Max Instantaneous Power	最大瞬間功率	970W(5sec)
Dimension	尺寸	Shaft ϕ 3.5x29.2x54mm	Weight	重量	Approx. 87g

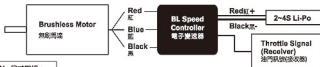
RCE-BL45P BRUSHLESS SPEED CONTROLLER INSTRUCTION MANUAL

無刷馬達器使用說明 ALIGN

PRODUCT FEATURES 產品特色

- 5~8.4V 特設無段可調式BEC輸出，可依伺服器規格與所需的特性自行設定電壓。
- BEC輸入器採用交變式電源設計，適用7.4~22.2V(2S-6S) Li battery, with continuous current rating of 3A, and burst rating of 5A.
- 三段可程式化門速反應速度，使動力的反應更精確。
- 具備啟動及Governor Mode定速功能。
- 體積小，窄型設計，安裝於機身容易。
- 有散熱片設計，可延長電壓壽命。
- 超寬相容性，可對應市面上98%無刷馬達。
- 絕佳起步設計，無論舊車、溫口、內轉、外轉無刷馬達皆能起步順暢。
- 電池電源選擇採用日製Low ESR 低阻抗電解電容，大幅提升馬達之穩定性。
- 進門達200段以上解析度，價格最之門速感。

WIRING ILLUSTRATION 接線示意圖



SPECIFICATION 尺寸規格：

Model 型號	Continuous Current 持續電流	Peak Current 瞬間電流	BEC Output BEC輸出	Dimension 尺寸	Weight 重量
RCE-BL45P	45A	60A	Output voltage: 5-8.4V step-less adjustment Continuous current 3A; Burst current 6A 輸出電壓: 5~8.4V 階梯可調式 承受電流: 持續3A、瞬間6A	58x29.3x21mm	47g

1. Good temperature situation for working at the maximum current
2. Supporting motor types: 2-10 pole in/outrunner brushless motors.
3. Supporting maximum RPM: 2 pole → 190,000 rpm ; 6 pole → 63,000 rpm.
4. Input voltage: 7.4V ~ 22.2V(2-6S Li-Po)

NOTE : 1. When setting to the Quick throttle response speed, the accelerative peak current will increase.

2. To minimize possible radio interference induced by switching power system, BEC should be installed at least 5cm away from the receiver. The use of 2.4G receiver is recommended.

1. 持續最大電流將在機體散熱不良情況下。
2. 支援馬達型號: 二極至十數極之內外轉子無刷馬達。
3. 支援最高轉速: 二極→190,000rpm; 六極→63,000rpm。
4. 輸入電壓: 7.4V-22.2V(2~6S Li-Po)

注意: 1. 設定為高油门反應速度時, 加速瞬間電流會增大情形。

2. 內建 Switching BEC, 安裝時請與接收器保持至少 5cm 以上的距離以避免干擾接收器 (建議使用較穩定的 2.4G 系統接收器)。

FUNCTIONS 產品功能

1. Brake Option - 3 settings that include Brake disabled/Soft brake/Hard brake.
2. Electronic Timing Option - 3 settings that include Low timing/Mid timing/High timing. Generally, 2 pole motors are recommended to use low timing, while 6 or more poles should use Mid timing. High timing gives more power at the expense of efficiency. Always check the current draw after changing the timing in order to prevent overloading of battery.
3. Battery Protection Option- 2 settings that include Li-Ion, Li-poly High/Middle cutoff voltage protection. The default setting is high cutoff voltage protection. CPU will automatically determine cell number of Input Lithium battery (2S-6S). This option will prevent over-discharge of the battery. The following reference is the guideline for setting the Battery Protection option.
- 3-1 Li-Ion/Li-poly High cutoff voltage protection-When the voltage of single cell drops to 3.2V, the first step of battery protection mode will be engaged by the ESC resulting in reduced power. The pilot should reduce the throttle and prepare landing. If the voltage of single cell drops to 3.0V, the second step of battery protection mode will be engaged resulting in power cutoff. (*Note 1) For 22.2V/6cells Lithium battery, the full charge voltage will be approximately 25.2V. According to this Input voltage, CPU will determine that this is a 3cell battery. First step protection: 3.2V x 6cell=19.2V Second step protection: 3.0V x 6cell=18V When the voltage drops to 19.2V, the power will be reduced. When the voltage drops to 18V, the power will be cut off.
- 3-2 Li-Ion/Li-poly Middle cutoff voltage protection- This option is same as instruction 3-1, but when the voltage of single cell drops to 3.0V, the first step of battery protection will be engaged. When the voltage of single cell drops to 2.8V, the second step of battery protection will be engaged. (*Note 1) Note 1: Second step of battery protection only works when Aircraft mode is setting to the option 4-1. Note: this option is only suitable for a fully charged battery pack in good working condition.
4. Aircraft Option: 3 settings that include Normal Airplane / Helicopter 1 / Helicopter 2. Normal Airplane Mode is used for general airplanes and gliders. When flying Helicopters, you can choose Helicopter 1 Mode, or Helicopter 2 Mode. Helicopter 1 Mode provides Soft Start feature. Helicopter 2 Mode provides Soft Start and Governor Mode.
5. Throttle response speed: 3 settings that include standard/ Medium/ Quick throttle response speed. The default setting is "quick speed". Use this option to adjust the setting according to flight character. For example, setting at Medium or Quick speed for 3D and powerful flight to make the power response more quickly, but note the accelerative peak current and power expense will increase.
6. BEC output voltage setting: 5-8.4V step-less adjustment. This option allows custom voltage setting. Default setting is 6.5V; please adjust the voltage according to the specification of the servo (speed and resistance). Prior to entering the setup mode, a voltmeter needs to be connected to the power inlet of the receiver (as illustration) to monitor the selected voltage. The voltage is set by varying the throttle stick position from low (5V) to high (8.4V).

The voltmeter needs to be connected to any un-use inlets "+" and "-" to measure the selected voltage.

將電壓表連接到任一未使用過的空+"或"-端, 以量測所選擇的電壓。



Illustration
(圖1)

NOTE : Certain servos are designed to work with high voltage, while other servos are designed for lower voltage. To avoid damage to servos, please follow the servo's factory specification to determine the proper voltage setting.

注意: 部份伺服器不適合於高的電壓下操作, 請依照廠適用電壓規格設定, 避免造成伺服器損壞。

- Thermal Protection:** When the ESC temperature reaches 80° C for any reason, it will engage the battery protection circuit, reducing power to the ESC. We recommend mounting the ESC in a location with adequate air flow and ventilation.
- Safe Power On Alarm:** When the operator turns on the ESC, it will automatically detect the transmitter signal. The ESC will emit a confirmation tone and enter normal operation mode if the throttle is set to the lowest position. If the throttle position is at full throttle, it will begin to enter Setup Mode. If the throttle is in any other position, the ESC will emit an alarm and not enter into user mode for safety precautions.
- Aircraft Locator:** If the aircraft should land or crash in an unexpected location and become lost, the pilot can enable the Aircraft Locator Option. The aircraft locator option is engaged by turning off the transmitter. When the ESC does not receive a signal from the transmitter for 30 seconds, it will start to send an alarm to the motor. The sound of the alarm will aid the pilot to locate the aircraft. This option will not work with a PCM receiver that has SAVE function enabled, or with low noise resistant PPM receivers.

- 煞車設定:** 三段選擇分為無煞車 / 軟性煞車 / 急煞車
- 進角設定:** 三段選擇分為低進角 / 中進角 / 高進角
設定的機分為二檔以上者按後兩檔，二檔者按前兩檔。一般適用直向角，若若使馬達轉速過高，可將進角設定為中進角，六檔以上無煞車馬達一般適用中進角，若若使馬達轉速過高，可將進角設定為高進角。然而進角之調整要緊注視電壓之變化，避免電池過熱，影響電池及馬達壽命。
- 電池保護電壓設定:** 二段選擇分為 Li-Ion、Li-Po 高截止電壓保護 / 中截止電壓保護
輸出設定為高截止電壓保護: 此功能會自動判定所輸入電池的 cell 數 (2~6S)，並提供使用者對該電池之放電保護，以避免因低電壓過低而造成電池損壞，以下為設定值之列表:
3-1 Li-Ion/Li-Po 高截止電壓保護: 當電壓降至 3.2V 時，電壓會啟動第一階段保護，使動力即軟性中斷，此時使用者應將油门收小，準備降落; 而當電池電壓持續低於 3.0V 時將會啟動第二段保護，完全斷絕動力輸出 (註1: 僅在 4-1 選擇「一般飛機模式」時才會啟動第二段保護)。
例: 以一個使用 22.2V 6cell 電池之系統而前 22.2V 電池池充滿電約 25.2V，此輸入至 ESC CPU 會自動判定為 6cell 電池。
第一階段保護: 3.2Vx6cell=19.2V
第二階段保護: 3.0Vx6cell=18V 當電壓降至 19.2V 時，動力會軟性中斷，當電壓達到 18V 時則完全斷絕動力輸出。
3-2 Li-Ion/Li-Po 中截止電壓保護: 向 3-1 功能說明，但中斷點降低到 3.0V 時，會啟動第一階段保護，單 cell 電壓達到 2.8V 時啟動第二段保護 (註1)。
飛機: 以上功能僅適用於充飽電，且功能正常的電池池。
- 飛機模式設定:** 三段式選擇分為: 一般飛機模式 / 直升機模式 1 / 直升機模式 2
使用於一般飛機或滑翔機時，請設定於一般飛機模式，使用於直升機時可選擇直升機模式 1; 具有緩啟動功能，單自昇機模式 2: 具有緩啟動及 Governor Mode 設定功能。
- 油门反應速度設定:** 三段選擇分為標準 / 中速 / 快速
這項設定值為「快速」油门反應速度，此表提供使用者依所乘的飛行時性來作適當的調整，例如 3D 飛機與劇烈的 3D 昇昇機飛行時可設定為中速或快速，使動力反應更加快速、靈敏，但須注意提高油门反應速度後，加減調整電流與電壓會有增大的情形。
- BEC 輸出電壓設定:** 5~8.4V 無段調整
本功能提供使用者自行設定 BEC 輸出電壓，初始電壓為 6.5V，使用者可依所乘的規格與所需的特性 (速度與扭力) 自行更改設定; 進入此項設定前，請先將電壓表接並到接收器的電源 頭 (如圖 1)，用以監看所選擇的電壓，設定時以油门桿的位置來決定輸出電壓，油门桿最低為 5 伏特，最高為 8.4 伏特，之間的電壓值可移動油门桿的位置任意更改。
- 溫度保護:** 當電壓因不良之空氣污染或過熱輸出導致溫度上升達 80°C 時，電壓會啟動溫度保護，而使動力即軟性中斷，建議將電壓表裝在機體內空氣對流之位置，並須使用電阻表測 輸出電流，以達到電壓之最佳效率。
- 開機防鎖死剎車功能:** 當使用者開啟電壓電源時，系統會自動檢測預設機之設定，如果發射機油门未處於最低點，或未處於最高點準備進入設定模式，馬達將不會轉動，同時會發出警報聲響。
- 尋機功能:** 當飛機降落在與尋機無法以目視定位時，使用者可將發射機關閉，當電壓無法接收來自接收機信號時，電壓會於三十秒後使馬達發出警報聲響，以定位功能，此功能不適用於設定了 SAVE 功能之 PCM 接收機，或難以定位之 PPM 接收機。

SETUP MODE 設定模式

- Setup mode:** Make sure to connect the ESC to the throttle channel of the receiver. Please refer to the user manual of your radio system. The second step is to connect the 3 power-out signal pins to the brushless motor. Before you turn on the transmitter, please adjust the throttle stick to the maximum full throttle position. Proceed to connect the battery to the ESC. You will hear confirmation sounds as soon as you enter the SETUP MODE. Please refer to page 37 for details.
- Throttle stick positions in Setup mode:** Setup mode includes six settings: Brake, Electronic Timing, Battery Protection, Aircraft, Throttle Response Speed and BEC output voltage. Every setting has three options. Simply place the throttle stick in the highest, middle, and lowest positions for each setting. For example, first brake setting (Hard): move the stick to the highest position. Then timing setting (mid): move the throttle stick in the middle position.
- 進入設定模式: 將電壓與接收器之油门 Channel 連接，不同之遙控系統請參閱遙控系統之使用手冊，馬達之三條線亦與電壓連接，將發射器之油门桿推到底點，使之於全油门狀態，先將發射器開電，再將電壓連接至電壓，進入設定模式後，馬達將有設定模式之提示聲響，請參閱第 37 頁程式化設定模式說明。
- 設定模式中各動作: 設定模式共有八項設定，分別為煞車、馬達進角、電池保護、飛機模式、油门反應速度及 BEC 輸出電壓等設定，詳細內容請參閱產品功能之說明。每一項設定中各含三段設定，各項設定以油门桿之最高、中、下位置來決定其設定值。
例如: 煞車設定時，油门桿移至最高點，則設定為急煞車，置入第二段進角設定時，油门桿移至中間，則設定為中進角。

Mode 設定模式	Throttle Position 油门桿位置	Low 低	Middle 中	High 高
Brake 煞車設定		● Brake Disabled(1-1) 急煞車(1-1)	● Soft Brake(1-2) 軟性煞車(1-2)	● Hard Brake(1-3) 急煞車(1-3)
Electronic Timing 馬達進角		● Low-timing(2-1) 低進角(2-1)	● Mid-timing(2-2) 中進角(2-2)	● High-timing(2-3) 高進角(2-3)
Battery Protection 電池保護電壓設定		● High Cutoff Voltage Protection(3-1) 高截止電壓保護(3-1)	● Middle Cutoff Voltage Protection(3-2) 中截止電壓保護(3-2)	—
Aircraft 飛機模式設定		● Normal Airplane/Glider(4-1) 一般飛機/滑翔機(4-1)	● Helicopter 1 (Soft Start)(4-2) 直升機模式 1(軟啟動設定)(4-2)	● Helicopter 2 (Soft Start+ Governor Mode)(4-3) 直升機模式 2(軟啟動+Governor Mode 設定)(4-3)
Throttle Response Speed 油门反應速度設定		● Standard(5-1) 標準(5-1)	● Medium Speed(5-2) 中速(5-2)	● Quick Speed(5-3) 快速(5-3)
BEC Output Voltage BEC 輸出電壓設定		5.0V	● 6.5V	8.4V

Note: ● Default Setting
● 表示初始設定值

Chart A
表 A

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 called out.

在還沒瞭解直升機各動作的操作方式前，應該重複執行，機體進行電腦模擬飛行的練習，一樣要有效、最安全的練習方式，就是透過市面所販售的模擬軟體，以遙控器在電腦上模擬飛行，熟悉各個方向的操控，並不斷的重複，直到手指可熟練的操控各個動作及方向。

1. 將直昇機放在空曠的地方(確實電源為關閉)，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)，並反覆練習油门高低、副翼左/右、升降舵前後及方向的左/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	
		Move Left 左移 Rotate Left 左轉	Move Right 右移 Rotate Right 右轉
		Fly Forward 前進 Forward Rotate 前轉	Fly Backward 後退 Backward Rotate 後轉
			Ascent 上升 Descent 下降
		Turn Right 右轉 Turn Left 左轉	

FLIGHT ADJUSTMENT AND NOTICE 飛行調整與注意



- 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緊?
- 發射器與接收器電池是否足電?



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



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，然後打開發射器將油门搖桿推到最低點。

- Check the movement.
- 動作確認



ON1 Step1
First turn on the transmitter.
先開發射器



Check if the throttle stick is set at the lowest position.

確認油门搖桿是在最低的位置。

- 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。



ON1 Step2
Connect to the helicopter power
接上面昇機電源

OFF1 Step3
Reverse the above orders to turn off.
隨喊電器時請反上述操作動作反執行。

This procedure is best performed on soft surfaces such as grass. The use of rubber skid stopper is recommended on hard surface to prevent vibration feedback from the ground to Gyro, resulting in over-corrections.

將直升機置於柔軟地面上，建議使用起飛腳架裝上避震墊圈。避免升空前腳架與硬性的地面震動太大反映至機身上的陀螺儀，影響無平衡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 lift-off.

若直升機在升空前，十字盤可能因陀螺儀震動的反應，使十字盤有傾斜的情形，此時請勿調整十字盤修正為水平狀態，此現象只會在機身升空後立即解除，可平穩升空；若知要將十字盤修正為水平時，反而會造成感應器過度修正，一體機即會修正方向的危險。

MAIN ROTOR ADJUSTMENTS 主旋翼雙螺平衡調整

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

1. 調整前先在其中一支主旋翼的翼面，貼上有顏色的貼紙或畫上顏色記號，方便雙螺調整辨識。
2. 慢慢的將起飛桿調到離地點並且停止，在飛機離地前，從飛機側面觀察主旋翼轉動。
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“雙螺”的情形時，則必須立即調整軌跡)。

- a. When rotating, the blade with higher path means the pitch is too big. 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

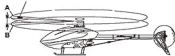
Tracking adjustment is very dangerous, so please keep away from the helicopter at a distance of at least 10m.

調整軌跡非常危險，請於距離飛機最少10公尺的距離。

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角度在停飛時應為大約+5~6°。

Color Mark 有標示記號的主旋翼



FLIGHT ADJUSTMENT AND NOTICE 飛行調整與注意

FORBIDDEN
禁止



⊗ Do not attempt to grab or make 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.

⊗ 嚴禁用手抓或碰運行中的直升機，並禁止將直升機對著眼睛，當主旋翼轉動後，或起飛/試飛時，務必遠離障碍物，站立位置必須距離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.

⊗ 確認離地地面沒有人和障礙物。

⊗ 為了飛行安全，您必須先確認停機時各項操縱動作是否正確。

CAUTION
注意

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

嚴禁無經驗操作飛行經驗者操作飛行。

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。



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桿並將直昇機回到原來位置。



ⓐ 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.

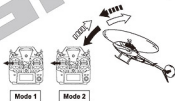
ⓐ 當直昇機機頭偏移時，請降低油門並且降落，然後移動自己的位置到直昇機的正後方 10 公尺再繼續練習。

ⓑ 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. 慢慢升起油門桿。
2. 將直昇機機頭移動左或右，然後慢慢反向移動方向舵桿並將直昇機回到原本位置。



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，在地上畫圓圈並在這個圓圈的範圍內練習飛行，以增加你操縱的準確度。

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



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，站在直昇機側面並繼續練習 STEP1-4。之後，站在直昇機機頭正邊重複步驟練習。



	Problem 狀況	Cause 原因	Solution 對策
Blade Tracking 雙翼平衡	Tracking is Off 雙翼	Pitch linkage rods are not even length PITCH連桿長度調整不平衡	Adjust length of DFC ball link. 調整DFC連桿球桿長度
Hover 停懸	Headspeed too low 主旋翼轉速偏低	Excessive pitch 主旋翼的PITCH偏高	Adjust DFC ball link to reduce pitch by 4 to 5 degrees. 調整DFC連桿球桿使Pitch的+4-5度
		Hovering throttle curve is too low 停懸點油门曲線過低	Increase throttle curve at hovering point on transmitter (around 60%) 調高停懸點油门曲線(約60%)
	Headspeed too high 主旋翼轉速偏高	Not enough pitch 主旋翼的PITCH偏低	Adjust DFC ball link to increase pitch by 4 to 5 degrees. 調整DFC連桿球桿使Pitch的+4-5度
		Hovering throttle curve is too high 停懸點油门曲線過高	Decrease throttle curve at hovering point on transmitter (around 60%) 調低停懸點油门曲線(約60%)
Rudder Response 尾舵反應	Drifting of tail occurs during hovering, or delay of rudder response when centering rudder stick. 停懸時機翼向某一邊偏斜，或停懸時方向舵空回落到中立點時，尾翼產生反應，橫滾停懸在所控制位置上。	Rudder neutral point improperly set 尾舵中立點設定不準	Reset rudder neutral point 重設尾舵中立點
	Tail oscillates (hunting, or wags) at hover or full throttle 停懸或全油门時尾翼左右來回搖擺。	Rudder gyro gain too low 尾舵陀螺儀感度偏低	Increase rudder gyro gain 增加尾舵陀螺儀感度
		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

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諮詢或連絡您的經銷商。

ALIGN

Specifications & Equipment/規格配備:

Length/機身長:705mm

Height/機身高:205mm

Main Blade Length/主旋翼長:360mm

Main Rotor Diameter/主旋翼直徑:804mm

Tail Rotor Diameter/尾旋翼直徑:171mm

Motor Pinion Gear/馬達齒輪:11T

Main Drive Gear/傳動主齒輪:121T

Autorotation Tail Drive Gear/尾槳動主齒:106T

Tail Drive Gear/尾槳傳動齒:25T

Drive Gear Ratio/齒輪傳動比:11:1:4.24

Flying Weight(without battery)/全配重(不含電池): Approx. 730g

