



EK1H-E013
 EK1H-E014
 EK1H-E015

www.twf-sz.com

BELT-CP INSTRUCTION MANUAL

Specification

Length: 650mm
 Height: 230mm
 Main blade diameter: 680mm
 Tail blade diameter: 130mm
 Motor gear: 10T
 Main driver gear: 140T
 Tail driven gear: 110T
 Driver gear rate: 10:140/110:22
 weight: About 670g(Including 1500mAh, 11.1V Lithium Battery)

Recommended Power and Radio Equipment

Lithium Battery: 1500mAh, 11.1V Lithium Battery
 Super motor: 450
 ESC: 25A
 Gyro: 1Pcs
 Servo: 8g*4Pcs
 Transmitter: 6channel or more(Helicopter system)
 receiver: 6channel or more

规格配备:

机身长: 650mm
 机身高: 230mm
 主翼直径: 680mm
 尾翼直径: 130mm
 马达齿轮: 10T
 主齿传动轮: 140T
 尾驱动主齿: 110T
 齿轮传动比: 10:140/110:22
 整机重: 约670g(含1500mAh, 11.1V锂电)

自备动力及电力设备规格:

锂电池: 1500mAh, 11.1V锂电池
 无刷马达: 450
 调速器: 25A
 陀螺仪: 1Pcs
 伺服器: 8g*4Pcs
 发射机: 6通道或6通道以上(直升机系统)
 接收机: 6通道或6通道以上

目录	Catalogue
----	-----------

简介	
Brief introduction	2
注意事项	
Warning	2-3
飞行前的检查和调整	
Pre-flight inspection and adjustment	4
电池的充电	
Charging the battery pack	5
直升机双桨的调整	
Blade tracking adjustment	6
单功能控制系统的调整	
Adjustment of the single function helicopter control system	7
可变螺距控制系统是怎样运作的	
The following pictures will show you How Does CCPM work	8
组装程序	
Assembly process	9
稳定翼组装步骤	
Assembly process of paddles	10-11
动力系统组装步骤	
Assembly process of power system	12
机架组装步骤	
Assembly process of main frame set	13
尾旋翼组装步骤	
Assembly process of tail rotor blades	14
尾管组装步骤	
Assembly process of tail boom set	15
装配完成图	
Picture of fulfilled assembly	16
分解图	
Explosion picture	17
配件料表	
Explosion view	18
配件图	
Spare parts picture	19-22
一般保养方法	
Regular maintenance	23-24

◆ 简介

Brief introduction

感谢您选择ESKY产品，为了您更加了解使用这款直升机，请您仔细阅读本产品所配备的说明书后再进行组装以及操作这台直升机，并请您妥善的保存好说明书，以便以后对直升机的调整或是维修做参考。这款直升机是由ESKY自行研发的新产品，无论您是初学者还是飞行爱好者都将是您的最佳选择。

Thank you for choosing TWF products. Please read the manual carefully before assembling and operating the helicopter so as to know more about it. Be sure to keep the manual properly for future reference of adjustment or amendment. This helicopter is a new product developed by ESKY. It would be your best choice, no matter you are a beginner or a hell fun.

◆ 注意事项

Warning

摇控模型不是玩具，会对人身造成伤害，在操作之前请仔细阅读该手册，在操作中不要接近人群，防止伤害他人，注意自身安全。电池充电远离易燃物品。禁止14岁以下儿童操作。造成事故本公司不负任何责任。

ESKY RC model helicopter is not toy and is not suitable for modeler 14 years. Carefully read the instruction before any use, if you are a beginner, its advisable to be assisted by an experienced helicopter pilot. ESKY HOBBY internation alreserves the righth to modifythe model without prior notice.



警告
Warning

该符号表示你和他人需特别小心的地方，以免造成伤害！

The sign indicate things you and other people should pay attention to, in order to avoid injury.



禁止
Prohibition

该符号表示为避免造成伤害的意外事故不允许的行为！

The sign indicate the unallowed actions that may cause incident or damage.



1. R/C 模型直升机并不是玩具，操作失误会造成人身伤害和损坏。
2. 如果您是新手，我们建议您找一位专业的或者操作熟练的模型爱好者指导您操作飞行。
3. 在您操控模型之前您需要学习如何操控和检查所有控制系统是否正常，然后再开始操控。

- 1.R/C models are not toys! Incorrect operation may cause serious injury or damage.
- 2.If you are a novice pilot we strongly suggest that you should find an experienced pilot in R/C model to assist you.
- 3.It is absolutely necessary to read the readiness of the helicopter before every flight, it is mandatory to check all control systems and mechanical linkages for proper operation before every flight. Safety first!





直升机飞行速度极快，相对潜在一定的危险性，所以场地的选择也十分重要。

Since the helicopter flies very fast, it may cause danger, so the choice of the flight field is of great importance.



飞行时须选择四周没有人，无高压电线，少树木等的环境，避免操控不当造成自己与他人的安全及财产损失。

Choose the place without people surrounded, high voltage cables or few trees when flying, so as to ensure the safety of yourself and others.



请勿在下雨，打雷等恶劣的气候下操作，以确保自身的安全。

Do not fly in bad weather such as rainy or thurdering to assure the safety of yourself.



初学者建议在空旷场地飞行，并可适当搭配练习架练习飞行，这样能够很大程度的保护飞机，降低飞行失误所造成的损坏。

It is suggested to fly at an open field for beginners, can fly with the training set to practice yourself, in that case the helicopter can be protected and damage caused by the improper operation can be reduced.



在飞行场地或其附近飞行之前，需确认是否有相同频率的飞行器正在进行飞行，否则将导致干扰。

Before flying, check to make sure that no one else is operating on the same frequency, otherwise may cause interference.



初学者飞行操控技巧在初期有一定的难度，要尽量避免独自操控飞行，最好请有经验的飞行员在旁指导。

It is difficult for beginners to fly skillfully at the first time, avoid operating lonely, you'd better fly under the guidance of the experienced pilot.



当直升机主旋翼与尾旋翼运转时，切勿触摸并且使直升机远离其他物件，以避免造成危险和损害。

Don't touch the helicopter when the main blade and tail blade were running, keep it away from other things to avoid danger and damage.



一般，由于遥控飞机是以PVC或聚乙烯为主要材料，所以尽量远离热源，避免因高温而变形甚至发生熔毁的可能。

Generally, R/C models are mainly made up of PVC or polythene, put it away from the heat source, to keep it from distortion and melting caused by high temperature.



飞行前的检查和调整 Pre-flight inspection and adjustment



在打开发射机之前，您要确认油门操纵杆是否在最低点，油门微调是否在最低，然后检查倒置开关是否有打回，确认后再打开发射机的电源。

Be sure the throttle stick and the throttle trimmer are at the lowest position before turning on the transmitter.



注意所有模型产品的遥控系统的开启都是先打开发射机再接通模型的电源，如果操做反了，可能会有危险。

Always turn on the transmitter first, and then power on the helicopter, If this is not, dangers and injuries may happen.



当您打开发射机电源在接通模型直升机的电源时，模型直升机的电子系统都需要进行自检，这种自检的过程需要您等待几秒，直到自检完成，指示灯显示可工作的状态，您才能操纵直升机。

Never move the helicopter during the process of calibration. During the Calibration, the light display blinking or steady red, when the light turns steady green, the helicopter is finished calibration and is ready for flight.



在自检过程中不要用手或其它方式让模型有任何移动。

After turning on the transmitter and helicopter, the helicopter electronic system calibrates itself.



禁止在飞行时，用手去触摸。

It is prohibited to touch the model when flying.



禁止在人多场所飞行，以免失控至伤。

It is prohibited to fly at crowded place, otherwise may cause injury or out of control.



禁止在下雨天飞行。

It is prohibited to fly at rainy days.



电池的充电 Charging the battery pack

充电是飞行的一个重要程序, 首先建议在初始测试飞行时, 完全用尽电池, 然后再遵循以下的充电指示。
注意:

充电过程中想知道电池是否充满, 可以用以下三种方法来判断。

1. 测电压:
是用电压表来测电池电压, 这是最标准的方法!
2. 温度:
在充电时, 不时查看电池的温度, 发现电池开始升温时, 就表示电已即将充满, 需立刻断开充电器。
3. 用公式形式算出充电时间
充电时间 = 电池容量 / 充电电流

警告: 充电时间最长不能超过120分钟。

Charging battery should be part of your procedure for flight. It is recommended that you completely discharge the battery during the initial test flight before following the charging guidelines outlined below.

Note:

Do not leave the charger and battery unattended during the charging. Also please keep away from the combustibles. During the charging process, you can determine whether the battery is fully Charged as follows:

1. Voltage measurement:

Use a voltage indicator. This is the best way.

2. Temperature:

When charging, examine the temperature of the battery all the time. When the temperature of the battery is rising, it shows that the charging is close to finish. Please turn off the charger.

3. Calculation of the charging time:

charging time = capacity of the battery / charging current

Warning: The time for battery charging can not exceed 120 minutes.

锂聚合物电池 About Lithium polymer battery

用锂聚合物电池来飞行您的直升飞机是您最好的选择。锂聚合物电池能提高您的飞行性能和时间, 锂聚合物电池比镍氢电池更持久。总而言之, 使用锂聚合物电池, 您的直升机将能达到更好的特技飞行效果。

请注意锂聚合物电池充电器表面贴纸上的描述。

1. 当指示灯为红色闪烁时, 显示充电器已接通电源。
2. 显示红灯时, 表示充电已完成。
3. 当指示灯呈现出红色和绿色时, 表明正在充电, 但指示灯出现红绿灯闪烁时, 表示充电有误。
4. 为了您更安全快捷的充电, 请使用ESKY 原厂的充电器!
5. 锂聚合物电池在充电的时候应有人看护。
6. 充电时锂电池应单独放在阴凉通风的地方, 避免日源, 远离易燃易爆物品。
7. 充电时, 电池应该从整机上取出, 不能放在整机上充电。

Using Esky's Li-Po battery to fly your helicopter is your best choice. The Li-Po battery will improve flight performance and flight time, which is longer than Ni-Mh battery. With Li-po battery, your helicopter will do the best aerobatic performance. will do the best aerobatic performance. Please notice the label on the battery.

1. The red light flashing indicate power on.
2. steady red, it has been charged completely
3. when it is displays red and green, it is charging. if red and green flash, it indicate charged error
4. in order to charge safely and fast, please use only Esky's chargers.
5. Please look after the battery when you change the Li-polymer batteries.
6. To avoid shining, Please put the Li-Polymer batteries in the cool and ventilating place separately when charging, And far from the flammable and explosible things.
7. The battery must be took out of the helicopter when charging, and should not be charged with the helicopter.

锂聚合物电池的充电方式(图示)
Illustration of Li-po battery charging



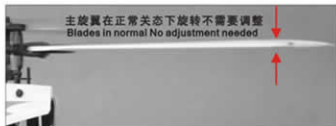
直升机双桨的调整 Blade tracking adjustment

直升机的双桨现象是一个普遍存在的现象, 要想使您的直升机飞行稳定, 首先要懂得如何处理双桨的问题, 直升机的双桨现象是因为同一个平面旋转的不同主旋翼的攻角大小不一样导致不同的主旋翼不能在同一平面旋转, 这种现象会引起机体振动, 升力减少。

Flying helicopters, it is very necessary to track the main blade properly. We should adjust blades tracking as they are required so as to achieve a stable flight. If the angle of attack of the two rotor blades are not the same, the blades do not track in the same line, with a consequent vibration and decrease in lift.

木制主旋翼变形的影响很小, 往往是因为翼形的误差, 控制机构的间隙, 结构塑料件的变形误差而导致双桨现象, 如图所示

The influence of blade distortion with wood main rotor is small, the main reason that the wood main rotor blades are out of track are structure clearance, tolerance of the main rotor blades shape and the distorted plastic component, showing as below:



采用木制主旋翼的直升飞机都有攻角调整连杆, 您只需扭转球座来改变攻角连杆的长度, 就可轻而易举的完成双桨的调整, 当然在调整时最好采用正负攻角配合调整。

The helicopter with wood main rotor blade all have pitch control links. You only need to turn the control link to achieve the blade tracking adjustment. Certainly, the best way is adjusting both pitch control link at the same time.



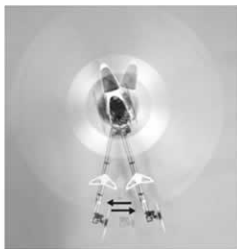
当您调整一支主旋翼还不能改变双桨现象时您可以调整另一支主旋翼来配合调整, 这样反复的调整直到您的直升机的主旋翼在同一平面旋转, 您会发现您的直升机很稳定。

If you made small adjustment on one rotor blade, the main rotor blades are still out of track, if so, you need to adjust another blade, and repeat the process to check the blade tracking and make adjustment until both blades run in track. With proper adjustment, the helicopter will fly stably and smoothly.

单功能控制系统的调整 Adjustment of the single function helicopter control system

因单功能控制系统主要应用于尾传动直升机。而尾传动直升机的主旋和尾旋的转速比是机械式固定的，所以对陀螺仪感度的调整。在直升机飞行时，主旋翼的转速与尾旋翼的转速是固定比例。如果发现尾部不受控制，一直左右小幅度颤抖，且不受发射机控制时，那是因为尾部被锁的太紧，须调小陀螺仪感度。（如图1，图2）

The single function helicopter control system mainly applies to helicopters with tail rotor drive system. Because the rotation of the main rotor blades and the tail rotor blades are automatically fixed, this helicopter just needs the adjustment of Gain Trim. During the flight, the tail rotor blades rotate in a fixed proportion to the main rotor blades, if the tail is out of control, wobbling slightly from left to right, which indicates that the tail is locked too tight, please adjust the Gain Trimmer to decrease (-) the gyro gain (fig.1 and fig.2).



(图 1)



(图 2)

如果发现尾部一直在左右大幅度摇摆不定，且不受发射机控制时，这时要将陀螺仪上的感度调大，调到适当位置即可（如图3，图4）

If the tail moves a large angle to the left or right, wobbling considerably from left to right, please adjust the Gain Trimmer to increase (+) the gyro gain (fig.3 and fig.4).

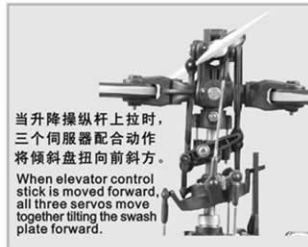
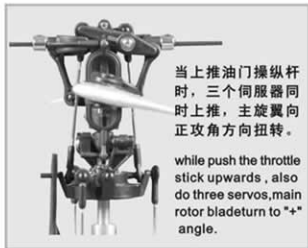


(图 3)



(图 4)

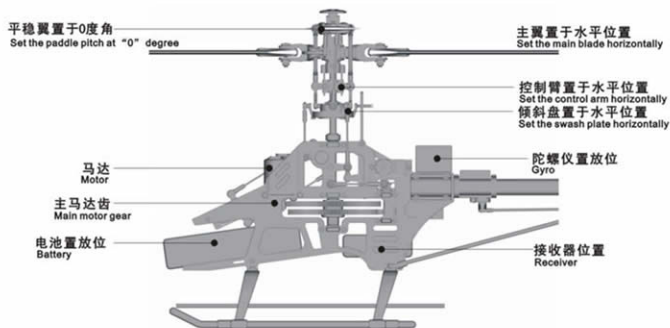
可变螺距是怎样运作的 The following pictures will show you How Does CCPM Work



组装程序 Assembly process

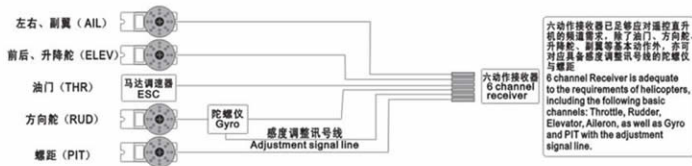
各部件与设备装配图示

Assembly diagram of each spare part and equipment:



接收器、伺服器连接频道说明

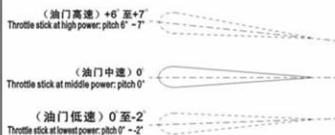
Connection diagram of receiver and servo:



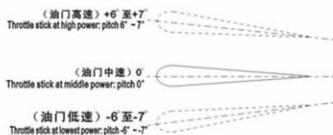
PITCH设定建议说明 飞行前主旋翼设定

Final pre-flight adjustment

Normal 一般飞行模式



IDLE 特技飞行模式



稳定翼组装步骤 Assembly process of paddles

零件用量表 (Dosage form of spare parts)

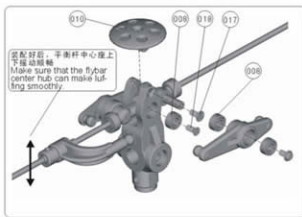
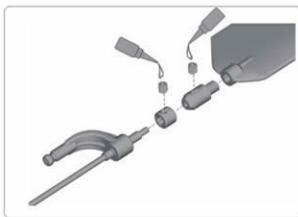
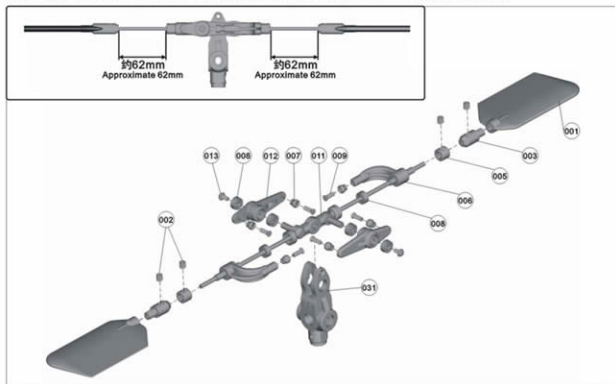
序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification
002	I	MXH3003	4	M3*3	009	H	MKP2006	6	M2*6	006	H	平衡翼控制臂 Paddle control arm	2	
013	H	TWP1704	2	T1.7*4	001	F	平衡翼 Paddle	2		031	H	平衡翼控制臂 Center hub set	1	
008	H	滑珠轴承 Bearing	8	Φ3*Φ6*L2.5	003	H	平衡翼固定轴 Paddle fixed shaft	2		010	H	控制头盖 Cap of hub set	1	
012	H	贝尔控制臂 Bell	2		005	H	平衡翼固定环 Paddle collar	2	Φ3*Φ7*5	018	H	MKP1703	2	T1.7*3
007	H	铝球 Aluminum ball	6	Φ4*3	004	H	平衡翼杆 Flybar	1	Φ1.8*220	017	H	TKP1704(大头) Large end screw	2	T1.7*4
011	H	平衡杆中心座 Flybar center holder	1											

组装程序按照编码组装, 组装时需注意的重点:

- 平衡杆装配时注意两端必须对等长, 平衡翼控制臂锁定的角度、两端必须平行, 两件平衡翼锁定的位置必须一致, 平衡翼的角度可以使用两支攻角量规, 各固定住一个平衡翼来做调整, 螺丝锁固金属件请使用螺丝胶防松, 注意螺丝须确实锁紧, 但是也不能因此发生过度锁紧, 需致使发生滑牙或断裂现象。
- 各控制臂锁固请注意, 锁紧后请保持旋转滑顺, 并尽量降低前后间隙之锁固要领。

Assemble the components according to the code, pay attention to the following focal point:

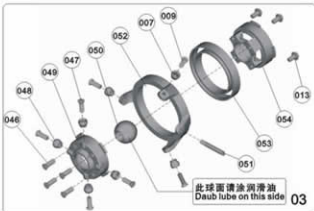
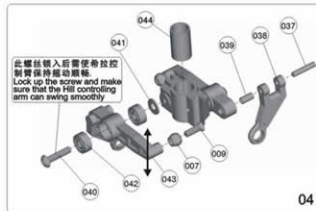
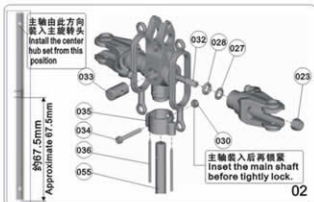
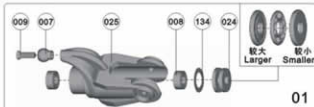
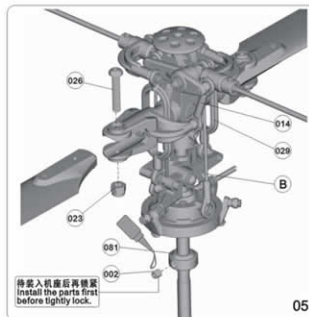
- Please note that the length of the two side of the flybar should be equivalent, the locking angle of the paddle and the two sides should be parallel, and you can use an angle gauge to adjust the angle of the paddle, take some screw glue to prevent loosen while locking up the metalwork.
 - Please make sure that the screws are locked in but not too tighten.
2. Please note that each controlling arm can run smoothly after locking up and try to reduce the fore and after space.



稳定翼组装步骤 Assembly process of paddles

零件用量表 (Dosage form of spare parts)

序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification
009	H	MKP2006	7	M2*6	035	H	中心座 Center hub set	1		049	G	倾斜内盘上盖 Cover of swash plate (inner)	1	
007	H	铝球 Aluminum ball	7	Φ4*3	036	H	相位螺栓 Plastic bolt	2	Φ1.2*19	047	G	MKP2007	4	M2*7
025	H	主翼夹头 Main blade clamp	2		055	B	主轴 Main shaft	1	Φ5*122	050	G	万向球 universal ball	1	SR5*8
008	H	滚珠轴承 Bearing	4	Φ3*Φ6*2.5	037	G	剪型臂固定销 Forciform arm fixed pin	2	Φ1.5*8	052	G	倾斜外盘 swash plate (outer)	1	
134	H	垫片 Washer	2	Φ5*Φ8*0.2	038	G	剪型臂 Forciform arm	2		051	G	倾斜盘固定销 swash plate fixed pin	1	Φ2*Φ14
024	H	止推轴承 Shower-stopping bearing	2	F3-8M	039	G	剪型臂衬套 Forciform arm bush	2	Φ1.5*Φ2.5*4	053	G	滚珠轴承 Bearing	1	Φ20*Φ27*4
032	H	主翼固定轴 Main blade fixed shaft	1	Φ3*46	043	G	前拉控制臂 Rotor head control arm	2		054	G	倾斜外盘下盖 Cover of swash plate (inner)	1	
030	D	普通螺母 Common nuts	1	M2	042	G	滚珠轴承 Bearing	4	Φ2*Φ5*2.5	013	G	TWP1704	3	T1.7*4
028	H	O型圈 "O" ring	2	Φ2*Φ6*2	044	G	铜套 Copper sheath	1	Φ5*Φ6*10	026	H	MPH3016	2	M3*16
027	H	垫片 Washer	2	Φ3.1*Φ5.5*0.5	041	G	垫片 Washer	2	Φ2*Φ4*0.3	081	H	定位环 Collar	1	
023	H	定位螺母 Locknut	4	M3	040	G	MPP2010	2	M2*10	002	H	MXH3003	1	M3*3
033	H	主翼转头固定套 Fix pulg of center hub set	1	Φ5.8*11	046	G	TKP1704(小头) Large end screw	4	T1.7*4	014	G	双孔连杆 Ring-link linkage	2	
034	D	MHH2014	1	M2*14	048	G	铝球 Aluminum ball	4	Φ4*4	029	G	双孔拉杆 Ring-link push-rod	2	





EK1H-E013
EK1H-E014
EK1H-E015

www.twf-sz.com

BELT-CP INSTRUCTION MANUAL

Specification

Length: 650mm
Height: 230mm
Main blade diameter: 680mm
Tail blade diameter: 130mm
Motor gear: 10T
Main driver gear: 140T
Tail driven gear: 110T
Driver gear rate: 10:140/110:22
weight: About 670g(Including 1500mAh, 11.1V Lithium Battery)

Recommended Power and Radio Equipment

Lithium Battery: 1500mAh, 11.1V Lithium Battery
Super motor: 450
ESC: 25A
Gyro: 1Pcs
Servo: 8g*4Pcs
Transmitter: 6channel or more(Helicopter system)
receiver: 6channel or more

规格配备:

机身长: 650mm
机身高: 230mm
主翼直径: 680mm
尾翼直径: 130mm
马达齿轮: 10T
主齿传动轮: 140T
尾驱动主齿: 110T
齿轮传动比: 10:140/110:22
整机重: 约670g(含1500mAh, 11.1V锂电)

自备动力及电力设备规格:

锂电池: 1500mAh, 11.1V锂电池
无刷马达: 450
调速器: 25A
陀螺仪: 1Pcs
伺服器: 8g*4Pcs
发射机: 6通道或6通道以上(直升机系统)
接收机: 6通道或6通道以上

目录	Catalogue
----	-----------

简介	
Brief introduction	2
注意事项	
Warning	2-3
飞行前的检查和调整	
Pre-flight inspection and adjustment	4
电池的充电	
Charging the battery pack	5
直升机双桨的调整	
Blade tracking adjustment	6
单功能控制系统的调整	
Adjustment of the single function helicopter control system	7
可变螺距控制系统是怎样运作的	
The following pictures will show you How Does CCPM work	8
组装程序	
Assembly process	9
稳定翼组装步骤	
Assembly process of paddles	10-11
动力系统组装步骤	
Assembly process of power system	12
机架组装步骤	
Assembly process of main frame set	13
尾旋翼组装步骤	
Assembly process of tail rotor blades	14
尾管组装步骤	
Assembly process of tail boom set	15
装配完成图	
Picture of fulfilled assembly	16
分解图	
Explosion picture	17
配件料表	
Explosion view	18
配件图	
Spare parts picture	19-22
一般保养方法	
Regular maintenance	23-24

◆ 简介

Brief introduction

感谢您选择ESKY产品，为了您更加了解使用这款直升机，请您仔细阅读本产品所配备的说明书后再进行组装以及操作这台直升机，并请您妥善的保存好说明书，以便以后对直升机的调整或是维修做参考。这款直升机是由ESKY自行研发的新产品，无论您是初学者还是飞行爱好者都将是您的最佳选择。

Thank you for choosing TWF products. Please read the manual carefully before assembling and operating the helicopter so as to know more about it. Be sure to keep the manual properly for future reference of adjustment or amendment. This helicopter is a new product developed by ESKY. It would be your best choice, no matter you are a beginner or a hell fun.

◆ 注意事项

Warning

摇控模型不是玩具，会对人身造成伤害，在操作之前请仔细阅读该手册，在操作中不要接近人群，防止伤害他人，注意自身安全。电池充电远离易燃物品。禁止14岁以下儿童操作。造成事故本公司不负任何责任。

ESKY RC model helicopter is not toy and is not suitable for modeler 14 years. Carefully read the instruction before any use, if you are a beginner, its advisable to be assisted by an experienced helicopter pilot. ESKY HOBBY internation alreserves the righth to modifythe model without prior notice.



警告 Warning

该符号表示你和他人需特别小心的地方，以免造成伤害！

The sign indicate things you and other people should pay attention to, in order to avoid injury.



禁止 Prohibition

该符号表示为避免造成伤害的意外事故不允许的行为！

The sign indicate the unallowed actions that may cause incident or damage.



1. R/C 模型直升机并不是玩具，操作失误会造成人身伤害和损坏。
2. 如果您是新手，我们建议您找一位专业的或者操作熟练的模型爱好者指导您操作飞行。
3. 在您操控模型之前您需要学习如何操控和检查所有控制系统是否正常，然后再开始操控。

- 1.R/C models are not toys! Incorrect operation may cause serious injury or damage.
- 2.If you are a novice pilot we strongly suggest that you should find an experienced pilot in R/C model to assist you.
- 3.It is absolutely necessary to read the readiness of the helicopter before every flight, it is mandatory to check all control systems and mechanical linkages for proper operation before every flight. Safety first!





直升机飞行速度极快，相对潜在一定的危险性，所以场地的选择也十分重要。

Since the helicopter flies very fast, it may cause danger, so the choice of the flight field is of great importance.



飞行时须选择四周没有人，无高压电线，少树木等的环境，避免操控不当造成自己与他人的安全及财产损失。

Choose the place without people surrounded, high voltage cables or few trees when flying, so as to ensure the safety of yourself and others.



请勿在下雨，打雷等恶劣的气候下操作，以确保自身的安全。

Do not fly in bad weather such as rainy or thurdering to assure the safety of yourself.



初学者建议在空旷场地飞行，并可适当搭配练习架练习飞行，这样能够很大程度的保护飞机，降低飞行失误所造成的损坏。

It is suggested to fly at an open field for beginners, can fly with the training set to practice yourself, in that case the helicopter can be protected and damage caused by the improper operation can be reduced.



在飞行场地或其附近飞行之前，需确认是否有相同频率的飞行器正在进行飞行，否则将导致干扰。

Before flying, check to make sure that no one else is operating on the same frequency, otherwise may cause interference.



初学者飞行操控技巧在初期有一定的难度，要尽量避免独自操控飞行，最好请有经验的飞行员在旁指导。

It is difficult for beginners to fly skillfully at the first time, avoid operating lonely, you'd better fly under the guidance of the experienced pilot.



当直升机主旋翼与尾旋翼运转时，切勿触摸并且使直升机远离其他物件，以避免造成危险和损害。

Don't touch the helicopter when the main blade and tail blade were running, keep it away from other things to avoid danger and damage.



一般，由于遥控飞机是以PVC或聚乙烯为主要材料，所以尽量远离热源，避免因高温而变形甚至发生熔毁的可能。

Generally, R/C models are mainly made up of PVC or polythene, put it away from the heat source, to keep it from distortion and melting caused by high temperature.



飞行前的检查和调整 Pre-flight inspection and adjustment



在打开发射机之前，您要确认油门操纵杆是否在最低点，油门微调是否在最低，然后检查倒置开关是否有打回，确认后再打开发射机的电源。

Be sure the throttle stick and the throttle trimmer are at the lowest position before turning on the transmitter.



注意所有模型产品的遥控系统的开启都是先打开发射机再接通模型的电源，如果操做反了，可能会有危险。

Always turn on the transmitter first, and then power on the helicopter, If this is not, dangers and injuries may happen.



当您打开发射机电源在接通模型直升机的电源时，模型直升机的电子系统都需要进行自检，这种自检的过程需要您等待几秒，直到自检完成，指示灯显示可工作的状态，您才能操纵直升机。

Never move the helicopter during the process of calibration. During the Calibration, the light display blinking or steady red, when the light turns steady green, the helicopter is finished calibration and is ready for flight.



在自检过程中不要用手或其它方式让模型有任何移动。

After turning on the transmitter and helicopter, the helicopter electronic system calibrates itself.



禁止在飞行时，用手去触摸。

It is prohibited to touch the model when flying.



禁止在人多场所飞行，以免失控至伤。

It is prohibited to fly at crowded place, otherwise may cause injury or out of control.



禁止在下雨天飞行。

It is prohibited to fly at rainy days.



电池的充电 Charging the battery pack

充电是飞行的一个重要程序, 首先建议在初始测试飞行时, 完全用尽电池, 然后再遵循以下的充电指示。
注意:

充电过程中想知道电池是否充满, 可以用以下三种方法来判断。

1. 测电压:
是用电压表来测电池电压, 这是最标准的方法!
2. 温度:
在充电时, 不时查看电池的温度, 发现电池开始升温时, 就表示电已即将充满, 需立刻断开充电器。
3. 用公式形式算出充电时间
充电时间 = 电池容量 / 充电电流

警告: 充电时间最长不能超过120分钟。

Charging battery should be part of your procedure for flight. It is recommended that you completely discharge the battery during the initial test flight before following the charging guidelines outlined below.

Note:

Do not leave the charger and battery unattended during the charging. Also please keep away from the combustibles. During the charging process, you can determine whether the battery is fully Charged as follows:

1.Voltage measurement:

Use a voltage indicator. This is the best way.

2.Temperature:

When charging, examine the temperature of the battery all the time. When the temperature of the battery is rising, it shows that the charging is close to finish. Please turn off the charger.

3.Calculation of the charging time:

charging time = capacity of the battery / charging current

Warning: The time for battery charging can not exceed 120 minutes.

锂聚合物电池 About Lithium polymer battery

用锂聚合物电池来飞行您的直升飞机是您最好的选择。锂聚合物电池能提高您的飞行性能和时间, 锂聚合物电池比镍氢电池更持久。总而言之, 使用锂聚合物电池, 您的直升机将能达到更好的特技飞行效果。

请注意锂聚合物电池充电器表面贴纸上的描述。

1. 当指示灯为红色闪烁时, 显示充电器已接通电源。
2. 显示红灯时, 表示充电已完成。
3. 当指示灯呈现出红色和绿色时, 表明正在充电, 但指示灯出现红绿灯闪烁时, 表示充电有误。
4. 为了您更安全快捷的充电, 请使用ESKY 原厂的充电器!
5. 锂聚合物电池在充电的时候应有人看护。
6. 充电时锂电池应单独放在阴凉通风的地方, 避免日源, 远离易燃易爆物品。
7. 充电时, 电池应该从整机上取出, 不能放在整机上充电。

Using Esky's Li-Po battery to fly your helicopter is your best choice. The Li-Po battery will improve flight performance and flight time, which is longer than Ni-Mh battery. With Li-po battery, your helicopter will do the best aerobatic performance. will do the best aerobatic performance. Please notice the label on the battery.

- 1.The red light flashing indicate power on.
- 2.steady red, it has been charged completely
- 3.when it is displays red and green, it is charging. if red and green flash, it indicate charged error
- 4.in order to charge safely and fast, please use only Esky's chargers.
- 5.Please look after the battery when you change the Li-polymer batteries.
- 6.To avoid shining, Please put the Li-Polymer batteries in the cool and ventilating place separately when charging, And far from the flammable and explosible things.
- 7.The battery must be took out of the helicopter when charging, and should not be charged with the helicopter.

锂聚合物电池的充电方式(图示)
Illustration of Li-po battery charging



直升机双桨的调整 Blade tracking adjustment

直升机的双桨现象是一个普遍存在的现象，要想使您的直升机飞行稳定，首先要懂得如何处理双桨的问题，直升机的双桨现象是因为同一个平面旋转的不同主旋翼的攻角大小不一样导致不同的主旋翼不能在同一平面旋转，这种现象会引起机体振动，升力减少。

Flying helicopters, it is very necessary to track the main blade properly. We should adjust blades tracking as they are required so as to achieve a stable flight. If the angle of attack of the two rotor blades are not the same, the blades do not track in the same line, with a consequent vibration and decrease in lift.

木制主旋翼变形的影响很小，往往是因为翼形的误差，控制机构的间隙，结构塑料件的变形误差而导致双桨现象，如图所示

The influence of blade distortion with wood main rotor is small, the main reason that the wood main rotor blades are out of track are structure clearance, tolerance of the main rotor blades shape and the distorted plastic component, showing as below:



采用木制主旋翼的直升飞机都有攻角调整连杆，您只需扭转球座来改变攻角连杆的长度，就可轻而易举的完成双桨的调整，当然在调整时最好采用正负攻角配合调整。

The helicopter with wood main rotor blade all have pitch control links. You only need to turn the control link to achieve the blade tracking adjustment. Certainly, the best way is adjusting both pitch control link at the same time.



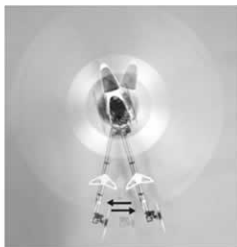
当您调整一支主旋翼还不能改变双桨现象时您可以调整另一支主旋翼来配合调整，这样反复的调整直到您的直升机的主旋翼在同一平面旋转，您会发现您的直升机很稳定。

If you made small adjustment on one rotor blade, the main rotor blades are still out of track, if so, you need to adjust another blade, and repeat the process to check the blade tracking and make adjustment until both blades run in track. With proper adjustment, the helicopter will fly stably and smoothly.

单功能控制系统的调整 Adjustment of the single function helicopter control system

因单功能控制系统主要应用于尾传动直升机。而尾传动直升机的主旋和尾旋的转速比是机械式固定的，所以对陀螺仪感度的调整。在直升机飞行时，主旋翼的转速与尾旋翼的转速是固定比例。如果发现尾部不受控制，一直左右小幅度颤抖，且不受发射机控制时，那是因为尾部被锁的太紧，须调小陀螺仪感度。（如图1，图2）

The single function helicopter control system mainly applies to helicopters with tail rotor drive system. Because the rotation of the main rotor blades and the tail rotor blades are automatically fixed, this helicopter just needs the adjustment of Gain Trim. During the flight, the tail rotor blades rotate in a fixed proportion to the main rotor blades, if the tail is out of control, wobbling slightly from left to right, which indicates that the tail is locked too tight, please adjust the Gain Trimmer to decrease (-) the gyro gain (fig.1 and fig.2).



(图 1)



(图 2)

如果发现尾部一直在左右大幅度摇摆不定，且不受发射机控制时，这时要将陀螺仪上的感度调大，调到适当位置即可（如图3，图4）

If the tail moves a large angle to the left or right, wobbling considerably from left to right, please adjust the Gain Trimmer to increase (+) the gyro gain (fig.3 and fig.4).

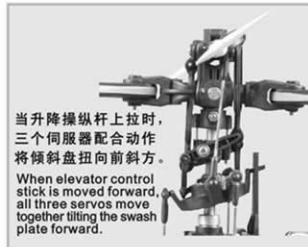
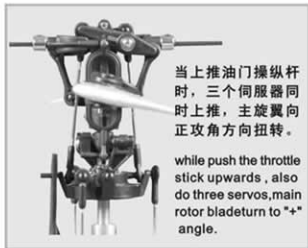


(图 3)



(图 4)

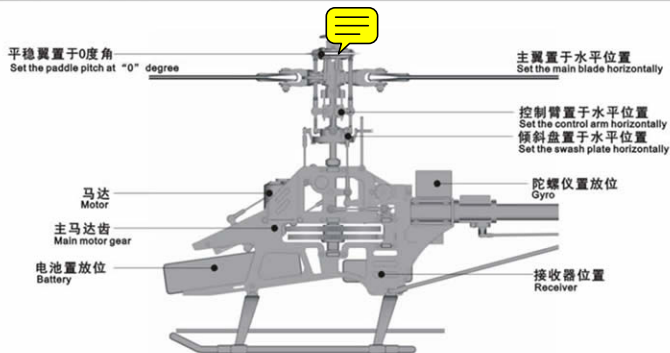
可变螺距是怎样运作的 The following pictures will show you How Does CCPM Work



组装程序 Assembly process

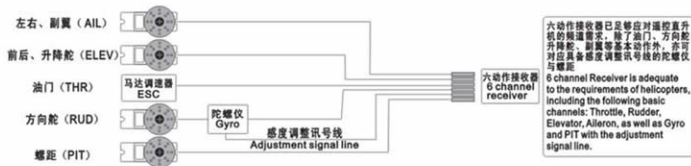
各部件与设备装配图示

Assembly diagram of each spare part and equipment:



接收器、伺服器连接频道说明

Connection diagram of receiver and servo:



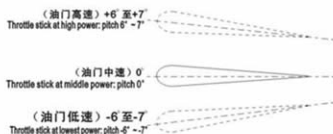
PITCH设定建议说明 飞行前主旋翼设定

Final pre-flight adjustment

Normal 一般飞行模式



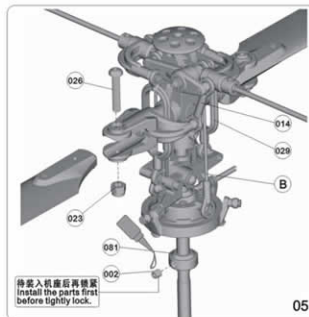
IDLE 特技飞行模式



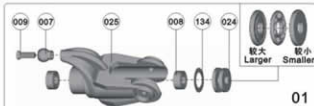
稳定翼组装步骤 Assembly process of paddles

零件用量表 (Dosage form of spare parts)

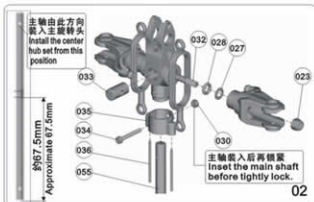
序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification	序号 No	包装 Package	品名 Name	数量 Quantity	规格 Specification
009	H	MKP2006	7	M2*6	035	H	中心座 Center hub set	1		049	G	倾斜内盘上盖 Cover of swash plate (inner)	1	
007	H	铝球 Aluminum ball	7	Φ4*3	036	H	相位螺栓 Plastic bolt	2	Φ1.2*19	047	G	MKP2007	4	M2*7
025	H	主翼夹头 Main blade clamp	2		055	B	主轴 Main shaft	1	Φ5*122	050	G	万向球 universal ball	1	SR5*8
008	H	滚珠轴承 Bearing	4	Φ3*Φ6*2.5	037	G	剪型臂固定销 Forkiform arm fixed pin	2	Φ1.5*8	052	G	倾斜外盘 swash plate (outer)	1	
134	H	垫片 Washer	2	Φ5*Φ8*0.2	038	G	剪型臂 Forkiform arm	2		051	G	倾斜盘固定销 swash plate fixed pin	1	Φ2*Φ14
024	H	止推轴承 Shower-stopping bearing	2	F3-8M	039	G	剪型臂衬套 Forkiform arm bush	2	Φ1.5*Φ2.5*4	053	G	滚珠轴承 Bearing	1	Φ20*Φ27*4
032	H	主翼固定轴 Main blade fixed shaft	1	Φ3*46	043	G	前拉控制臂 Rotor head control arm	2		054	G	倾斜外盘下盖 Cover of swash plate (inner)	1	
030	D	普通螺母 Common nuts	1	M2	042	G	滚珠轴承 Bearing	4	Φ2*Φ5*2.5	013	G	TWP1704	3	T1.7*4
028	H	O 型圈 "O" ring	2	Φ2*Φ6*2	044	G	铜套 Copper sheath	1	Φ5*Φ6*10	026	H	MPH3016	2	M3*16
027	H	垫片 Washer	2	Φ3.1*Φ5.5*0.5	041	G	垫片 Washer	2	Φ2*Φ4*0.3	081	H	定位环 Collar	1	
023	H	定位螺母 Locknut	4	M3	040	G	MPP2010	2	M2*10	002	H	MXH3003	1	M3*3
033	H	主翼转头固定套 Fix pulg of center hub set	1	Φ5.8*11	046	G	TKP1704(小头) Large end screw	4	T1.7*4	014	G	双孔连杆 Ring-link linkage	2	
034	D	MHH2014	1	M2*14	048	G	铝球 Aluminum ball	4	Φ4*4	029	G	双孔拉杆 Ring-link push-rod	2	



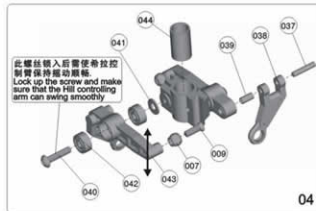
05



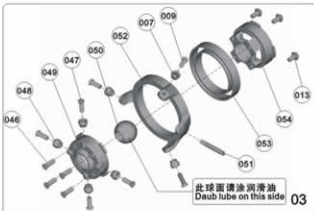
01



02



04



03

REGULAR MAINTENANCE:

Regular inspection: Regular maintenance is required to keep the Belt-CP electronic helicopter in optimal and safe flying condition. The model requires precise configuration of the components and setting to be kept by the owner. Maintain regular maintenance on the model to avoid accidents or loss, and the optimum performance.

MAIN ROTOR CHECKLIST:

1. Main rotor Housing: when the main rotor housing is worn or faulty, there will be obvious vibration and poor flight control. Check the main rotor, main shaft and feathering shaft for wear or deformity. Replace parts as necessary to eliminate imbalance.
2. O-Rings: The O-Rings will lose their elasticity over time. This will cause excess play on rotor and cause instability. Replace as needed.
3. Main Rotor Holder: when the heli will not fly or reacts sluggishly, even after checking for proper setting of pitch and throttle, check the following items: Plastic parts, Bearings, Ball bearings, Rotor blades. Check for excess play or gaps between the surfaces, missing or broken parts, or binding or restricted movement, it is important to check for main rotor balance before each flight. Operating the model when out of balance will cause excessive wear and premature failure of parts, possibly resulting in a dangerous situation.
The Control Arm should be checked regularly for checked, Worn, bent or binding control arms and pushrods. Smooth movement of control arms and linkages is required for stable, vibration free flight.
The Swashplate should be checked for excess slop in the main ball where the main shaft rides on, and slop or looseness between the plastic and metal surfaces. Swashplate wear will result in poor stability and lack of control during flight. Replace as necessary.

FUSELAGE/CHASSIS:

1. Main shaft bearing: Normal replacement interval for proper operation is 100 flights. If flying 3D or extreme aerobatics often, inspect the bearing frequently and shorten the interval as necessary.
2. One way bearing: one way bearings have longer lifetimes. Failure is not common to keep the one-way bearing in good operation, remove it and lubricate after every 50 flights. If the main drive gear is loose, you should replace the one way bearing.
3. Tail drive belt: TWF uses only the top quality stretch-proof belts. It is however impossible to prevent the belt from stretching or wearing out. Check the belt tension regularly, and check for the wear on the teeth. Replace the necessary.

LINKAGE RODS & CONNECTING PARTS.

During assembly, take special care to keep the connecting parts in smooth operation, and avoid excess play or binding. Failure to do so will result in poor stability. The linkage rods and ends will break and wear due to normal usage, crashing and poor maintenance and environment. Check for wear and proper operation regularly, replace as needed.

TAIL ROTOR SYSTEM:

1. Tail rotor control set: check the tail rotor bearing regularly. If there is excess play or gaps replace immediately. Avoid any binding or improper contact on the tail components and bearings as this will cause excess wear and heat potentially melting or deforming the tail system.
2. Tail unit assembly: avoid flying in tall grass or weeds. If grass and weed becomes lodged in the tail rotor unit, it will interfere with the operation, as cause the helicopter to lose control. Always check for foreign objects in the tail and clean them off immediately. Avoid using lubricants on the exposed surfaces of the model as it will attract and collect dirt and debris, and cause failure.
3. Tail rotor housing: Disassemble tail rotor housing for cleaning and maintenance after every 50 flights. If the tail does not operate smoothly or shows any signs of stress or wear, please replace immediately.
4. Tail rotor: check the tail rotor blades regularly for damage, especially if the helicopter ever strikes the ground while flying, or after the hard landings. Damaged Tail Rotor blades can induce vibration.

Attentions:

The loosening screw may lead to some unexpected accidents. Make sure check the screws regularly.



公司名称:深圳市天外飞模型贸易有限公司
公司地址:深圳市罗湖区笋岗东路3002号万通大厦
电话:0755-82124391 <http://www.twf-sz.com>
传真:0755-82124390 E-mail:twf@twf-sz.com
销售中心:深圳市罗湖区莲园路艺展中心B座418

Company name:Shenzhen TWF Hobby Co.,Ltd
Address:Wantong Building,NO.3002,Sungang Rd East,Luohu,Shenzhen
Tel:0755-82124391 <http://www.twf-sz.com>
Fax:0755-82124390 E-mail:twf@twf-sz.com
Distribution center:NO.418,b building,Light Industrial Products City,Liyuan Rd,Luohu,Shenzhen