



Black Angel Kit Helicopter

INSTRUCTION MANUAL

Features

- Carbon fiber main blade, tail blade, fly paddle, tail fin for extra weight saving and durability.
- CNC machined high grade aluminum rotor head and tail gear box to ensure sensitive and accurate control.
- +/- 15° patch range for extreme 3D maneuver.
- One way drive gear for auto rotation maneuver.
- Direct to swash CCPM system to ensure quick and slop-free control.
- Direct belt drive tail rotor system to ensure quick response and minimize power lost.
- Adjustable battery mount for quick CG adjustment to suits different flying style.
- 4mm main shaft for extra strength and durability for extreme 3D maneuver.
- Low fraction anti slip 4mm tail drive belt to ensure strength and durability.
- Fiber glass high strength canopy.
- High strength hex screws system to ensure durability and strength.
- All aluminum parts were made by precious CNC machined high grade aluminum.



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MENU

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1. Introduction

Thank you for choosing CopterX Black Angel! You are about to enter the world of high performance electric powered mini helicopter. Black Angel is developed by our professional team with full 3D capability. Please read the following instruction to ensure proper operation of this model. And keep a copy of this manual for future reference.

2. Precaution

CopterX R/C helicopter are NOT A TOY. Improper use of these products may cause serious injury or death. Manufacture and seller assume no liability for the operation or use of this product.

For intermediate and advanced pilot, Black Angel is able to offer performance unheard of by other rivals. For less experience pilot it would be helpful to seek advice from experienced pilot for setup and operation to enjoy the full potential of you new flying machine.

Please check all screw and carbon fiber parts for wear, creaks, or missing before and after each flight. Ensure all screw are tight and apply thread lock when necessary. Replace all worn out or broken parts necessary. Please use genuine CopterX parts to ensure proper operation with you model. Black Angel 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 local distributors for free technical consultation and replacement parts when you experience problems during operation or maintenance.

3. Safety Tips

Only operate Black Angel in open air field away from crowds and keep safe distance with helicopter. Do not operate model under drug influence, poor physical health or extreme weather conditions. Keep safe distance within tall building, power cables and automotive as these situation may effect the range of the transmitter.

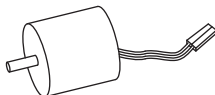
Keep Black Angel away from moisture and other contaminants as there are a lot of electrical component on this copter. These situations may cause malfunctions of the helicopter and possible injury or death.

Black Angel was designed for leisure and 3D flying. Please do not use it for any other purpose which this product is not design for.

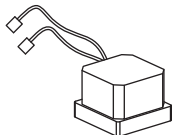
Keep Black Angel away from high temperature and flames to avoid damage to the helicopter and possible fire.

4. Self-preparation (Equipment)

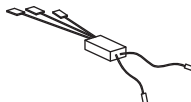
Radio control equipment is necessary to complete the assembly. (Not included in kit)



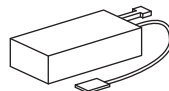
Brushless Motor



Gyro



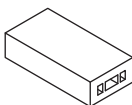
Brushless ESC



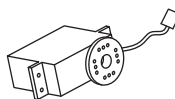
Li-Poly Battery



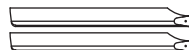
Transmitter
(6ch, helicopter system)



Receiver
(6ch or more)



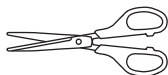
Micro Servo x 3pcs(movements)
Micro Servo x 1pcs(tailrudder)



Blade

5. Self-preparation (Tools)

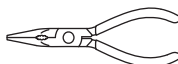
Tools is necessary to complete the assembly. (Not included in kit)



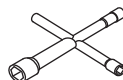
Scissors



Cutter Knife



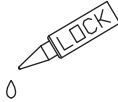
Needle Nose Pliers



Plug Wrench
(4mm 5.5mm)

6. Symbols Guide

When following symbols were shown, please add glue or oil accordingly to ensure proper operation.



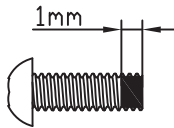
Thread Lock



Oil



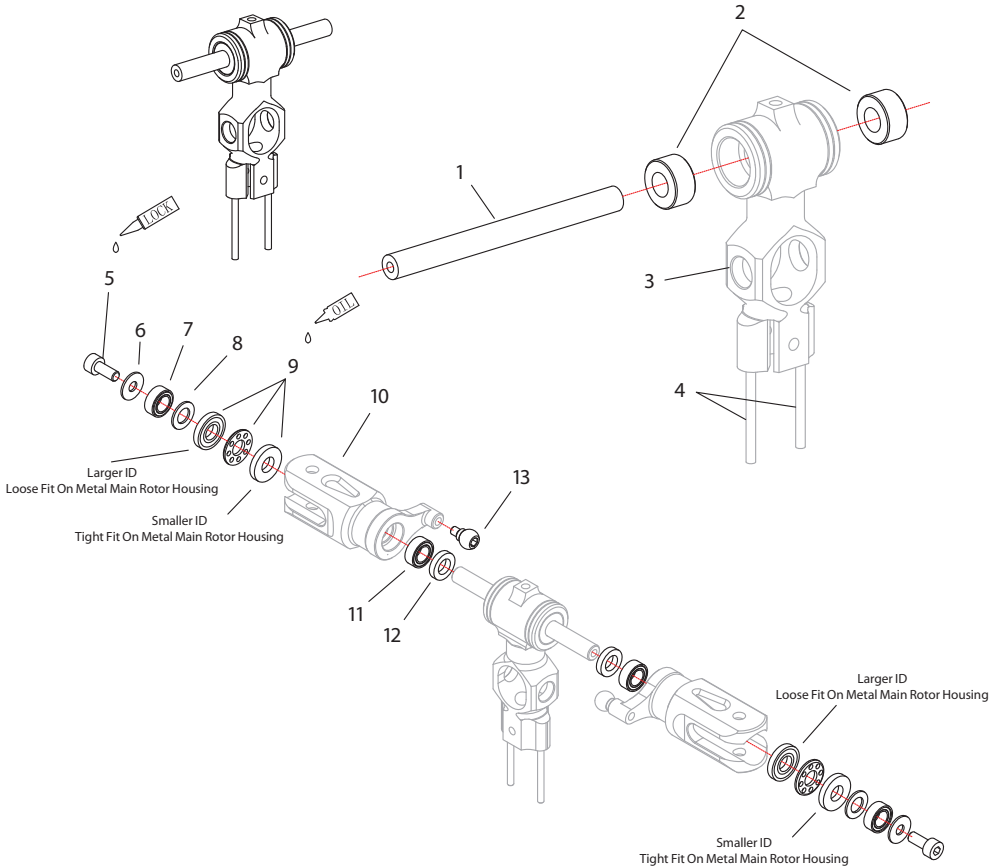
CA Glue



Apply Thread Lock according to the picture above and wipe of excess if necessary.

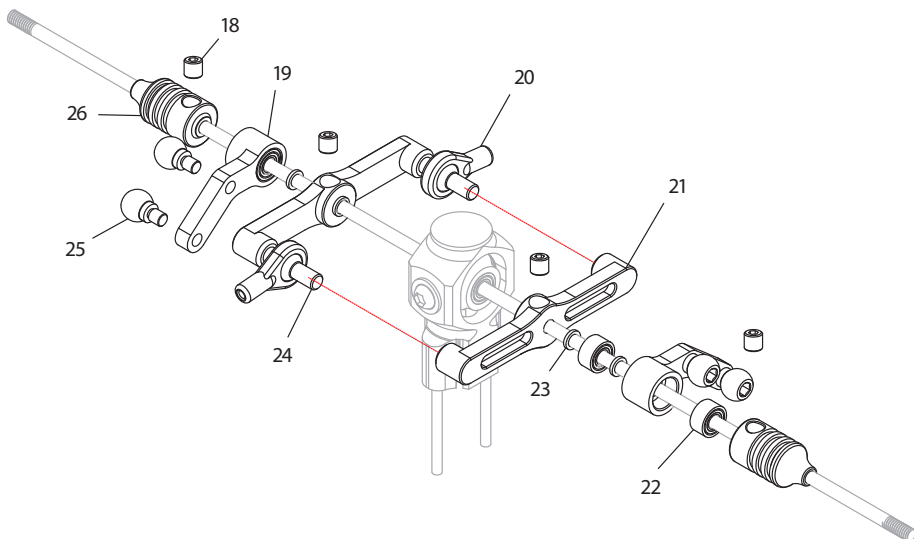
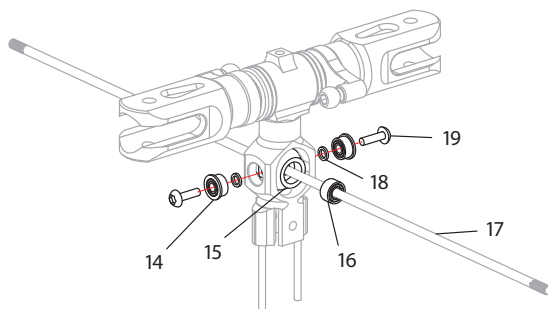
7. Assembly Section

No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
1	121006	Feathering Shaft	Ø 4x45.5	1	2	040200	Dumper Rubber	Ø 8x Ø 4x4	2
3	111002D	Metal Main Rotor Housing		1	4	121004	1.5mm Pin	Ø 1.5x20	2



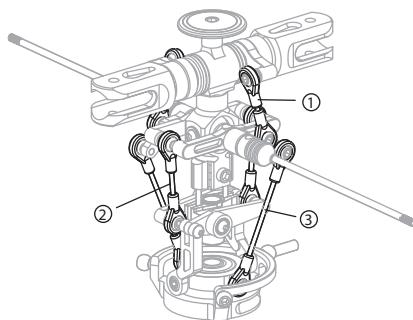
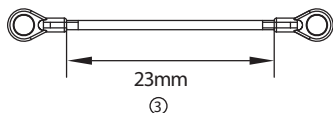
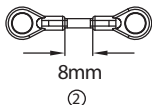
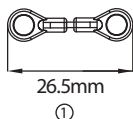
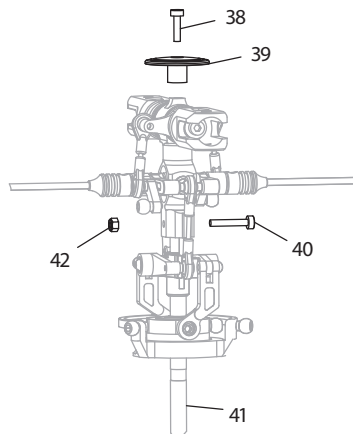
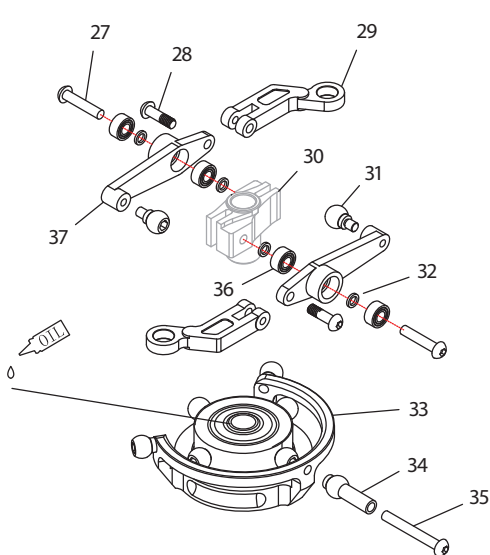
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
5	021070	M2.5x6 Socket Screw	M2.5x6	2	6	030031	M7 Flat Washer	Ø 7x Ø 2.5x0.5	2
7	070071	Ø 7x Ø 4x2.5 Bearing	Ø 7x Ø 4x2.5	2	8	030032	M7 Flat Washer	Ø 7x Ø 4x0.5	2
9	070072	Ø 9x Ø 4x4 Thrust Bearing	Ø 9x Ø 4x4	2	10	111005B	Metal Main Blade Holder		2
11	070079	Ø 9x Ø 4x4 Bearing	Ø 9x Ø 4x4	2	12	111007	M6 Flat Washer	Ø 6x Ø 4x1.5	2
13	161009	Linkage ball		2					

No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
14	070074	Ø 5 Flanged Bearing	Ø 5x Ø 2x2.5	2	15	111011B	Flybar Seesaw		1
16	070073	Ø 5x Ø 2x2.5 Bearing	Ø 5x Ø 2x2.5	2	17	121060	Flybar	Ø 2x209	1
18	030034	Ø 3x Ø 2x0.5 Washer	Ø 3x Ø 2x0.5	2	19	021072	M2x6 Screw	M2x6	2

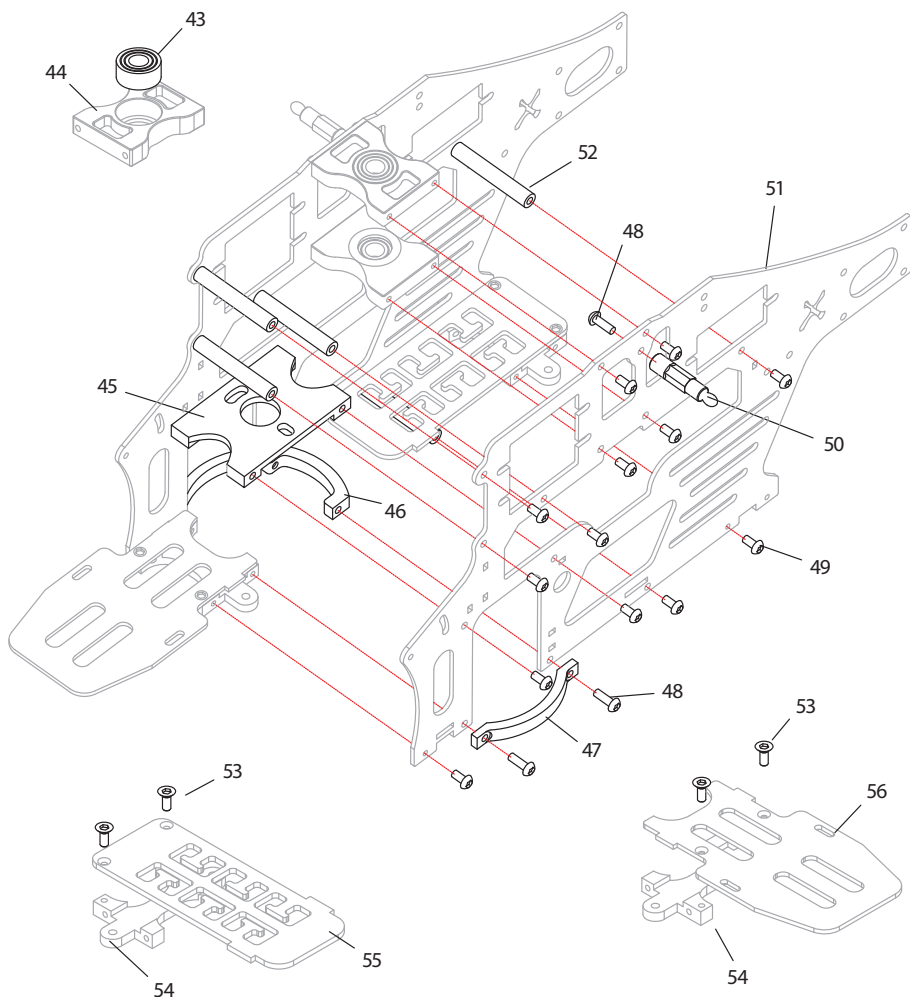


No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
18	021074	M3x3 Set Screw	M3x3	4	19	111008B	SF Mixing Arm		2
20	341078	Ball Link		2	21	111012B	Flybar Control Arm		2
22	070073	Ø 5x Ø 2x2.5 Bearing	Ø 5x Ø 2x2.5	2	23	030034	Ø 3x Ø 2x0.5 Washer	Ø 3x Ø 2x0.5	4
24	111013B	Flybar Control Rod		2	25	161009	Linkage Ball		4
26	111150B	Flybar Weight		2					

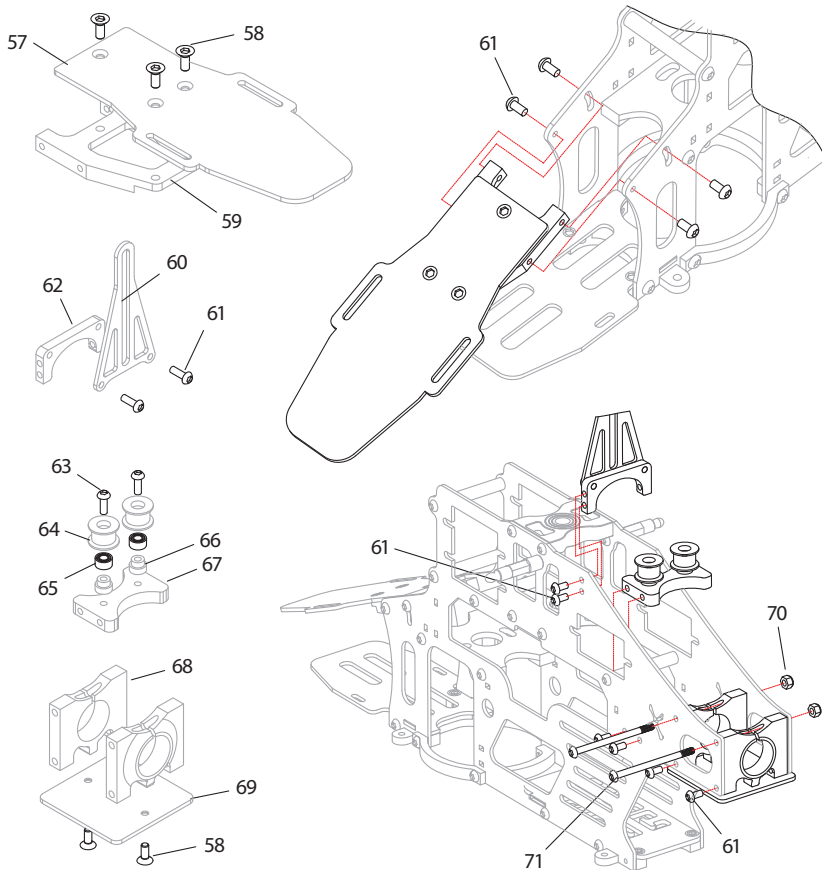
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
27	021074	M2x10 Screw	M2x10	2	28	021090	M2x7 Collar Screw	M2x7	2
29	141017	Radius Arm		2	30	111014B	Washout Base		1
31	161009	Linkage Ball		8	32	030034	Ø 3x Ø 2x0.5 Washer	Ø 3x Ø 2x0.5	4
33	111019B	Swashplate		1	34	161020	Long Linkage Ball		1
35	021075	M2x16 Screw	M2x16	1	36	070073	Ø 5x Ø 2x2.5 Bearing	Ø 5x Ø 2x2.5	4
37	111015	Washout Control Arm		1	38	021084	M2 Socket Head	M2x8	1
39	111001B	Metal Head Stopper		1	40	021080	M2x12 Socket Head	M2x12	1
41	121003	Main Shaft	Ø 5x114	1	42	021077	M2 Nylock Nut		1



No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
43	070075	Ø 11xØ 5x5 Bearing	Ø 11xØ 5x5	2	44	211021B	Main Shaft Bearing Block		2
45	211034B	Motor Mount		1	46	211085B	Frame Mounting Bolt(Motor)		1
47	211083B	Frame Stiffener		2	48	021072	M2x6 Screw	M2x6	6
49	021071	M2x4 Screw	M2x4	26	50	241023B	Canopy Mounting Bolt		2
51	251069B	Main Frames		2	52	211080B	Frame Mounting Bolt		5
53	021078	M2x4 Flat Head Screw	M2x4	4	54	211071B	Bottom Plate Mount		2
55	251037B	Back Bottom Plate		1	56	251036B	Front Bottom Plate		1

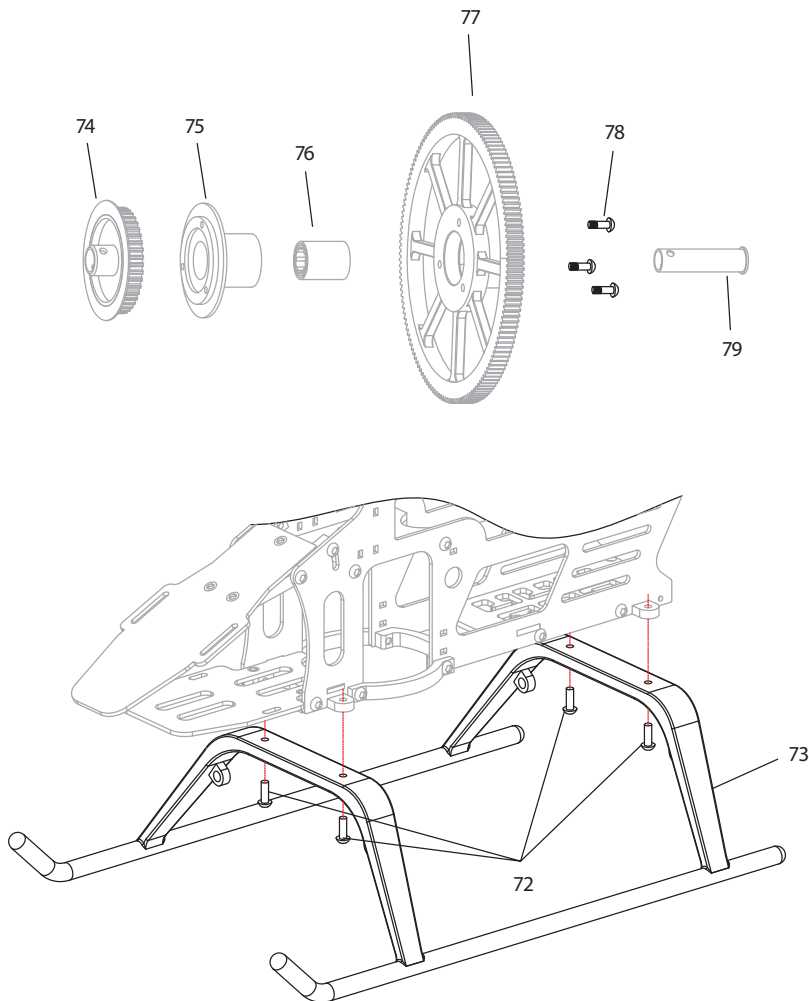


No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
57	251035B	Battery Mounting Plate		1	58	021078	M2x4 Flat Head Screw	M2x4	5
59	211038B	Aluminum Battery Mounting Base		1	60	251025	Anti-Rotation Plate		1
61	021071	M2x4 Screw	M2x4	18	62	211082B	Anti-Rotation Mount		1
63	021074	M2x10 Screw	M2x10	2	64	211029	Pulley Set		2



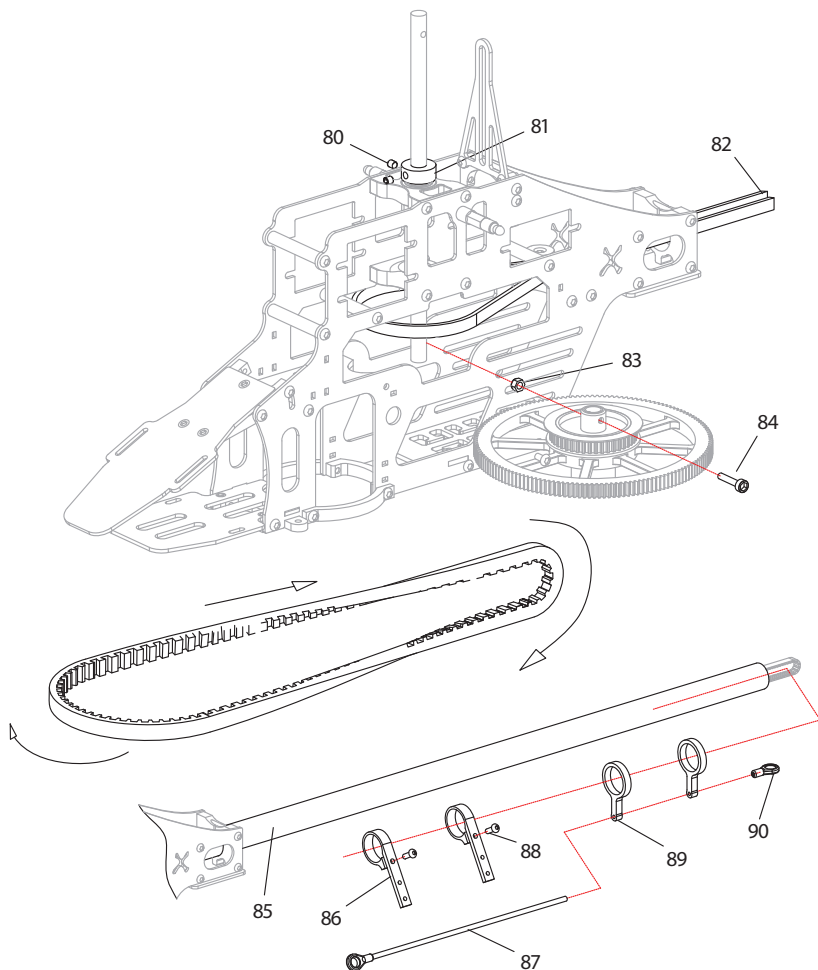
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
65	070073	Ø 5x Ø 2x2.5 Bearing	Ø 5x Ø 2x2.5	2	66	211030	Pulley Collar		2
67	211084B	Pully Mount		1	68	211031B	Tail Boom Mount		2
69	211076B	Rear Gyro Mount		1	70		2mm Nylock Nut		2
71	021081	M2x32 Collar Screw	M2x32	2					

No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
74	211065	Tail Drive Gear		1	75	211063	Main Drive Gear Hub		1
76	070077	One Way Bearing	Ø 10x Ø 6x12	1	77	241033	Main Drive Gear		1
78	021090	M2x7 Collar Screw	M2x7	3	79	221072	One Way Bearing Shaft		1



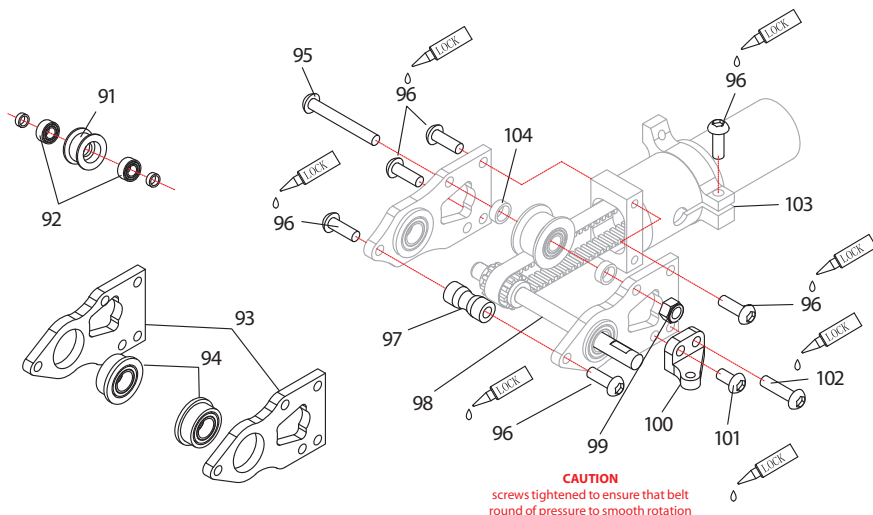
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
72	021072	M2x6 Screw	M2x6	4	73	341061B	Landing Skid		1

No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
80	021074	M3x3 Set Screw	M3x3	2	81	211064	5mm Collar		1
82	040201	Drive Belt		1	83	021077	M2 Nylock Nut	M2	1
84	021840	M2x10 Socket Head	M2x10	1					

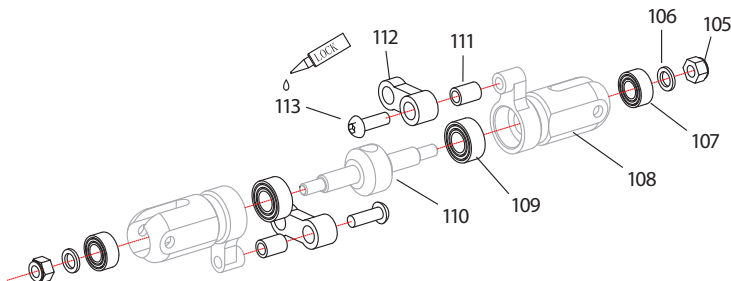


No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
85	311032	Metal Tail Boom	Ø 12x Ø 11x340	1	86	311039	Rudder Servo Mount		2
87	314143	Rudder Control Rod		1	88	021073	M2x8 Screw	M2x8	2
89	341077	Rod Guide		2	90	341078	Ball Link		2

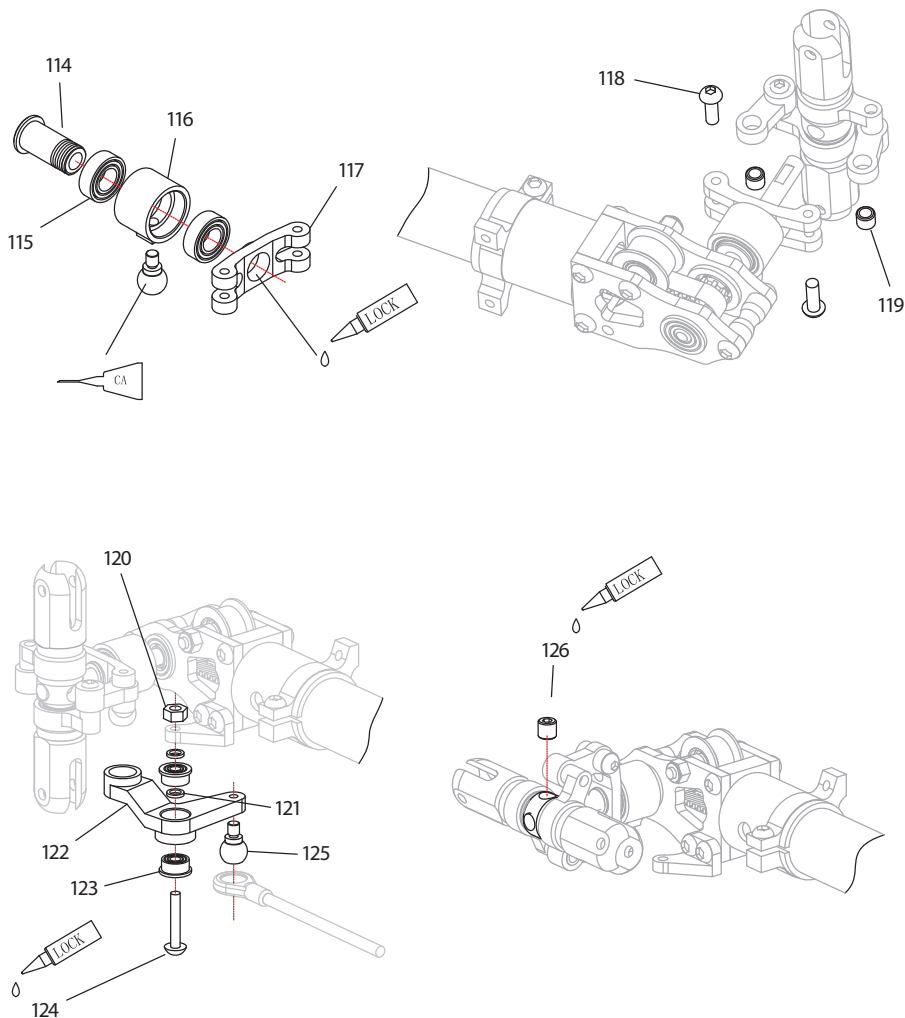
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
91	311046	Idle Pulley		1	92	070073	Ø 5x Ø 2x2.5 Bearing	Ø 5x Ø 2x2.5	2
93	311044B	Metal Tail Case		2	94	070078	Ø 8 Flanged Bearing		2
95	021075	M2x16 Screw	M2x16	1	96	021072	M2x6 Screw	M2x6	6
97	311047B	Aluminum Bolt		1	98	321010	Tail Rotor Shaft		1
99	021077	Nylock Nut	M2	1	100	311048	Control Arm Mount		1
101	021071	M2x4 Screw	M2x4	1	102	021073	M2x8 Screw	M2x8	1
103	311043	Vertical Stabilizer Mount		1	104	311045	Ø 3.5x Ø 2x1.5 Vollar	Ø 3.5x Ø 2x1.5	2



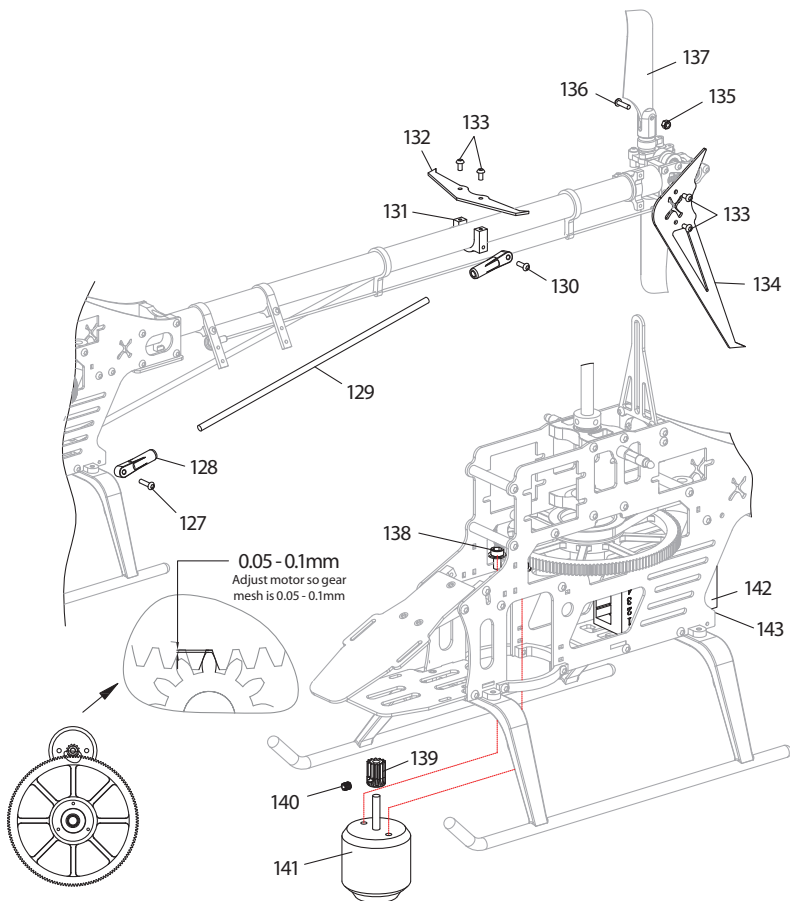
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
105	021077	M2 Nylock Nut	M2	2	106	030037	Ø 5x Ø 2x0.5 Washer	Ø 5x Ø 2x0.5	2
107	070076	Ø 6x Ø 3x2.5 Bearing	Ø 6x Ø 3x2.5	2	108	311056B	Tail Blade Holder		2
109	070080	Ø 7x Ø 3x3 Bearing	Ø 7x Ø 3x3	2	110	311055B	Tail Hub		1
111	331058	Collar		2	112	341057B	Tail Control Link		2
113	021073	M2x8 Screw	M2x8	2					



No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
114	311052B	Slide Shaft		1	115	070081	Ø 8x Ø 5x2.5 Bearing		2
116	341051B	Bearing Holder		1	117	311054B	Rudder Control Arm		1
118	021090	M2x7 Collar Screw	M2x7	2	119	331059	Collar B	M2x6	2
120	021087	M2 Nut		1	121	030034	Ø 3x Ø 2x0.5 Washer		2
122	341049B	Tail Rotor Bell Crank		1	123	070074	Ø5 Flanged Bearing		2
124	021074	M2x10 Screw	M2x10	1	125	161009	Linkage Ball		2
126	021074	M3x3 Set Screw	M3x3	1					

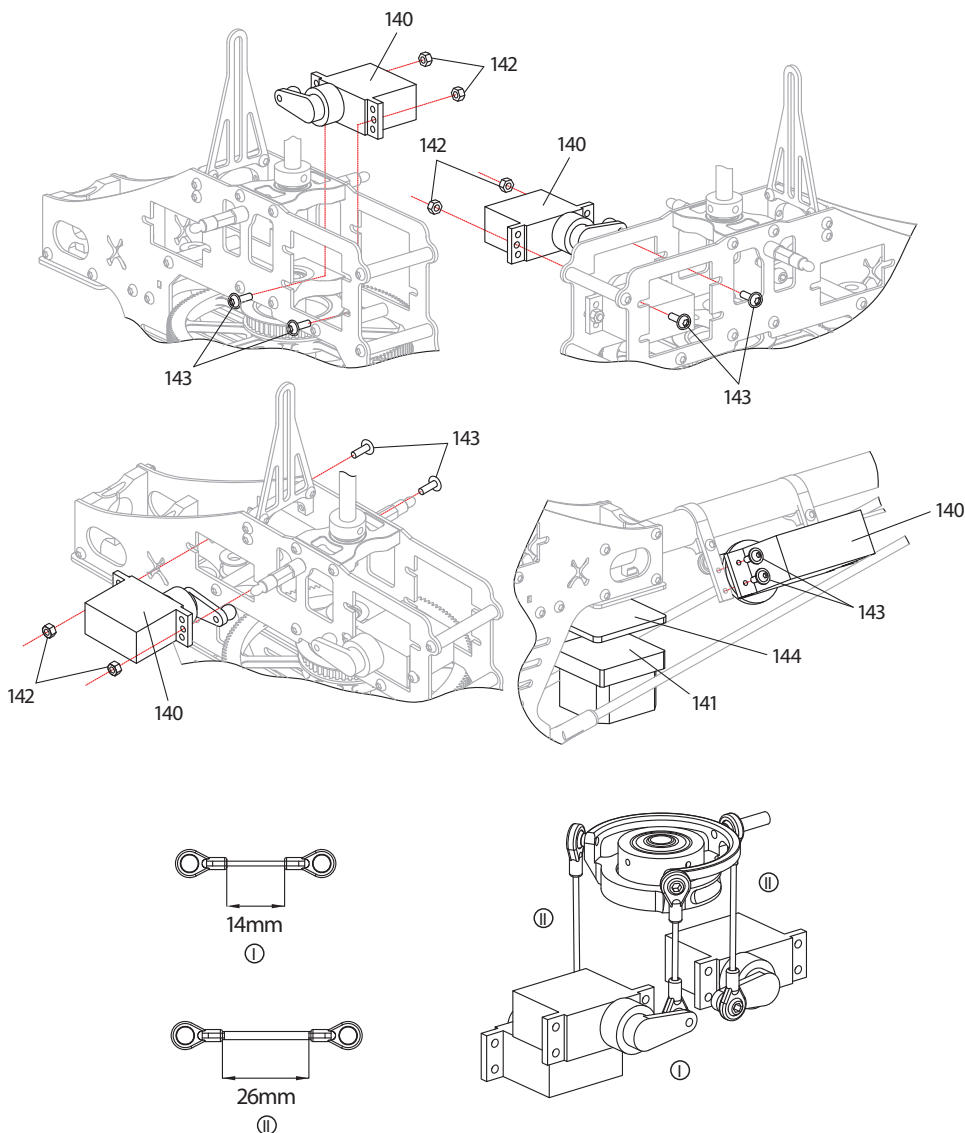


No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
127	021073	M2x8 Screw	M2x8	2	128	341062B	Tail Boom Brace End		4
129	090091	Metal Tail Boom Brace		2	130	021072	M2x6 Screw		2
131	311040	CF Horizontal Stabilizer Mount		1	132	351041	CF Horizontal Stabilizer	M2x6	1
133	021071	M2x4 Screw	M2x4	4	134	351042	CF Vertical Stabilizer		1
135	021087	M2 Nut		2	136	021074	M2x10 Screw		2
137	341079	CF Tail Blade		2					

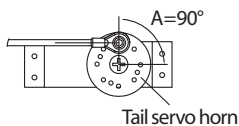
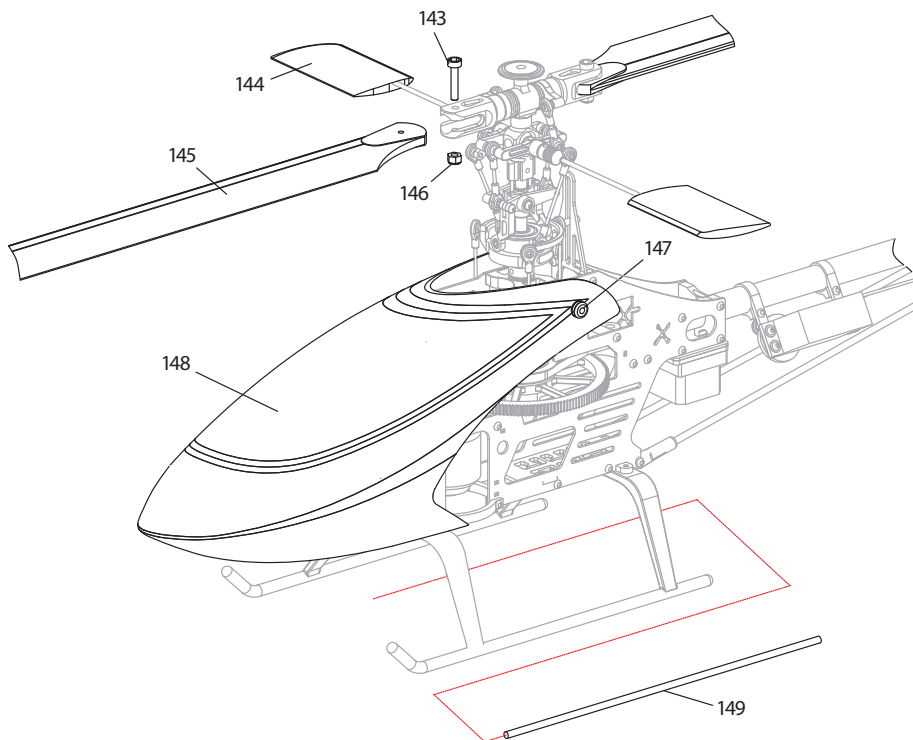


No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
138	021085	M3x6 Socket Head	M3x6	2	139	231074	Motor Pinion Gear		1
140	021088	M3x3 Set Screw	M3x3	1	141		Motor (Not included)		
142		Receiver (Not Included)			143		Double Sided Tape		

No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
140		Servo (Not included)		4	141		Gyro (Not included)		
142		M2 Nut		6	143	021073	M2x8 Screw	M2x8	10
144		Double Side Tape		1					

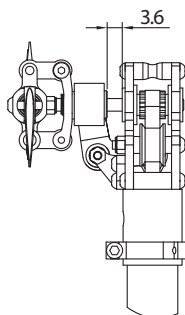


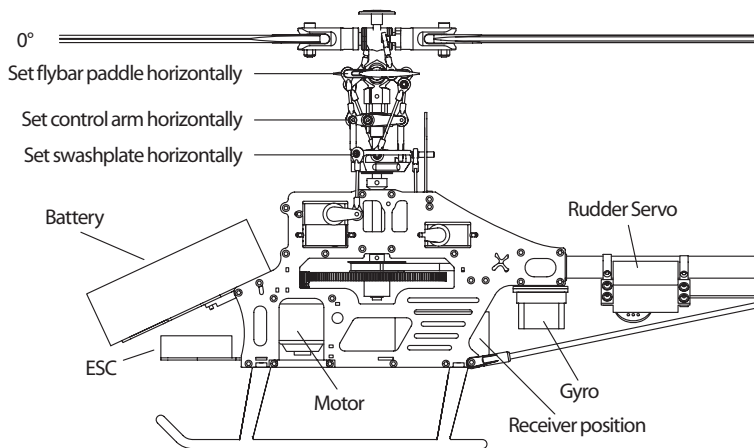
No.	Code No.	Name	Specification	Q'ty	No.	Code No.	Name	Specification	Q'ty
143	021076	M3x16 Socket Head	M3x16	2	144	011080	CF Paddle		3
145		CF Main Rotor Blade		2	146	021086	M3 Nylock Nut	M3	2
147	011082	Canopy Grommet		2	148	011083	Canopy		1
149	041081	Receiver Antenna Tube		1					



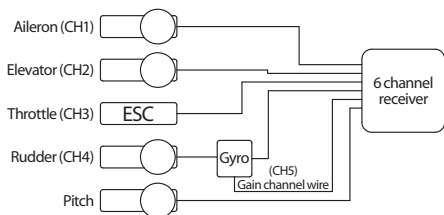
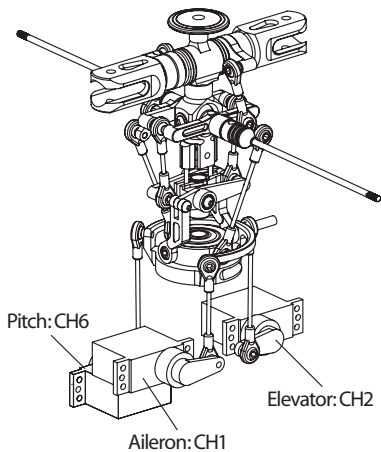
When A be 90°, B will be around 3.6mm

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



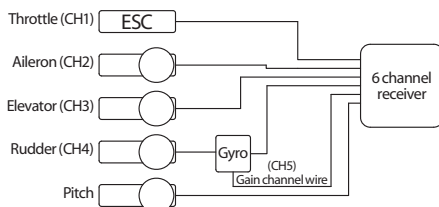
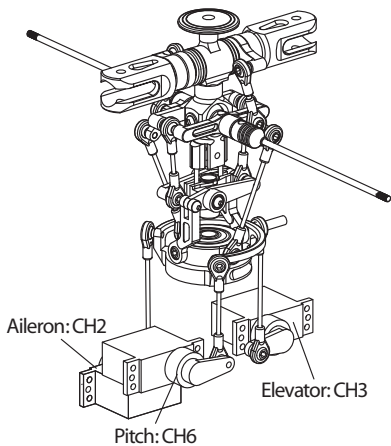


FUTABA / HITEC Transmitter / Servo



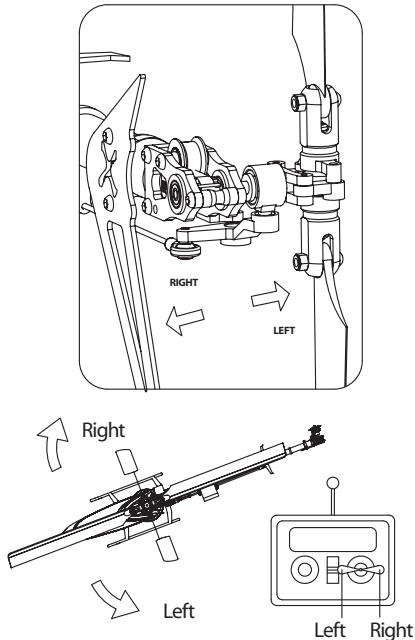
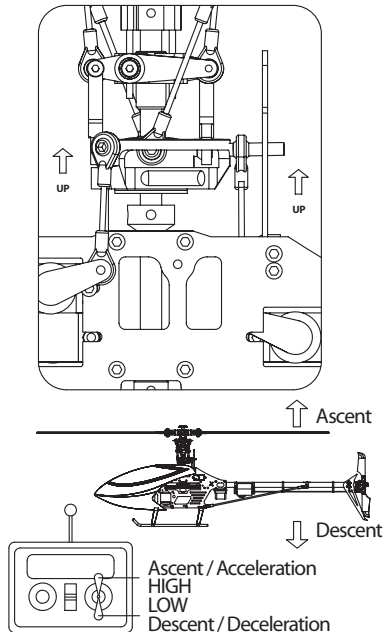
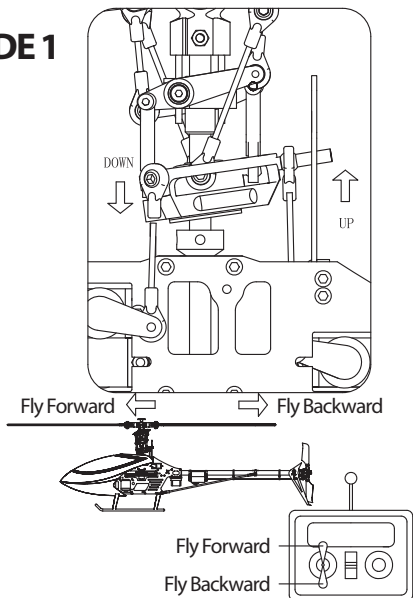
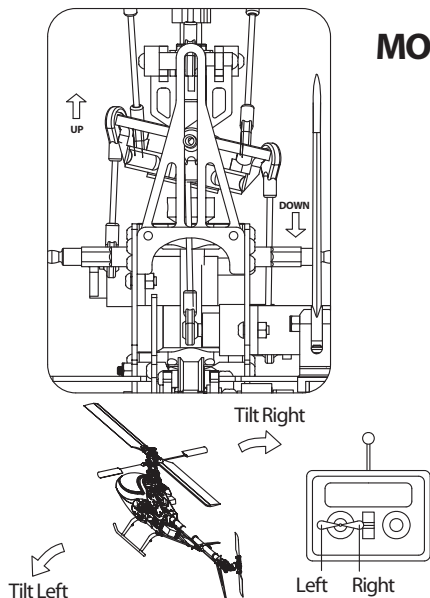
HITEC, FUTABA 6ch receiver wiring

JR Transmitter / Servo

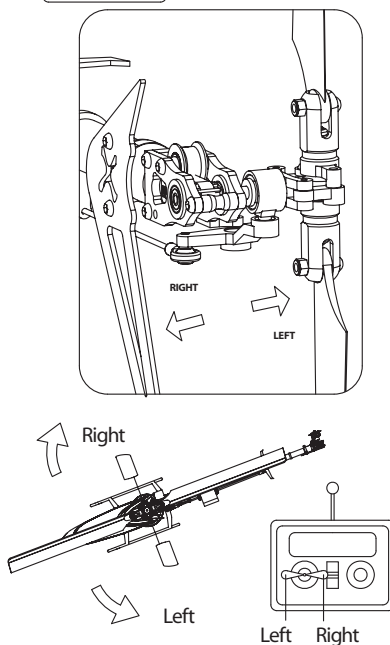
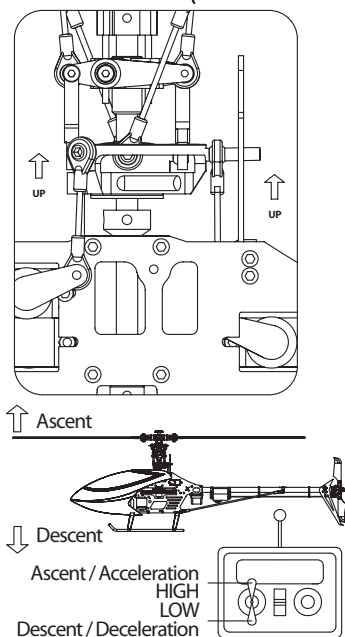
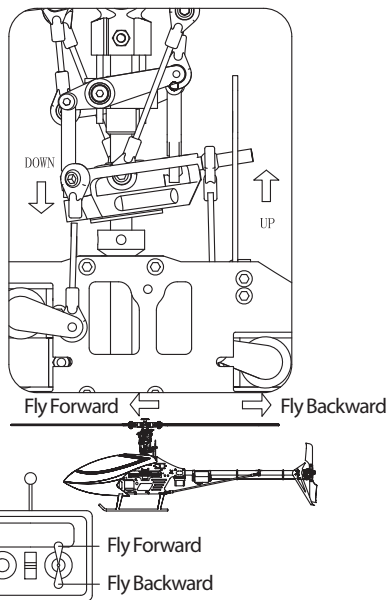
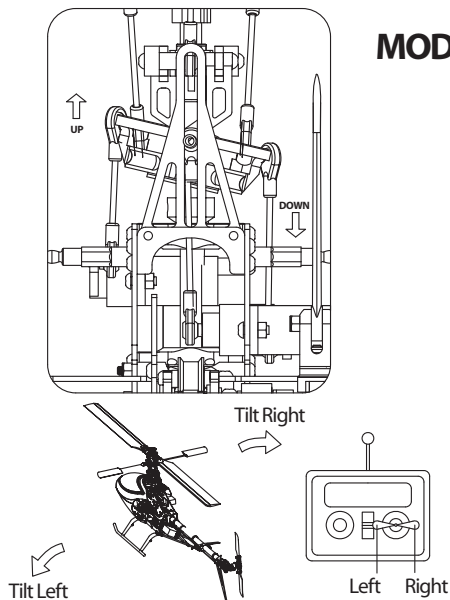


JR 6ch receiver wiring

MODE 1

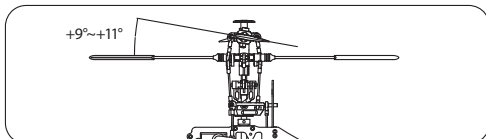


MODE 2

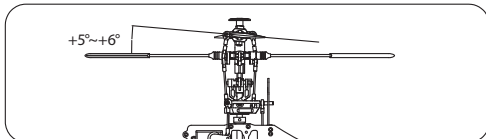


8. Pitch and Throttle Setting

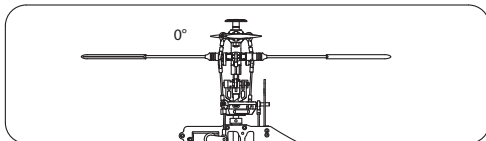
General Flight



Stick position at high / Throttle 100% / Pitch $+9^{\circ}\sim+11^{\circ}$



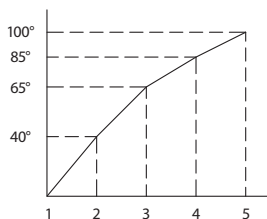
Stick position at Hovering / Throttle 65%~70% / Pitch $+5^{\circ}\sim+6^{\circ}$



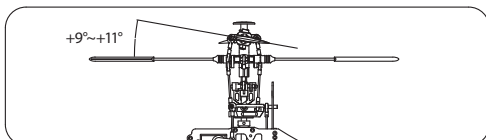
Stick position at low / Throttle 0% / Pitch 0°

GENERAL FLIGHT

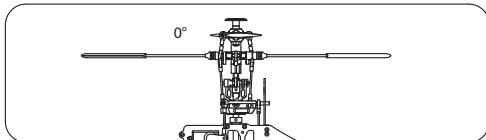
	Throttle	Pitch
5	100% High speed	$+9^{\circ}\sim+11^{\circ}$
4	85%	
3	65%~70% Hovering	$+5^{\circ}\sim+6^{\circ}$
2	40%	
1	0% Low speed	0°



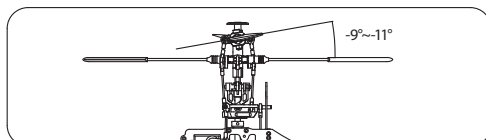
3D Flight



Stick position at high / Throttle 100% / Pitch $+9^{\circ}\sim+11^{\circ}$



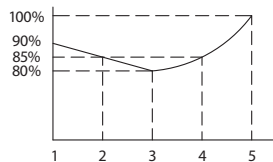
Stick position at middle / Throttle 90% / Pitch 0°



Stick position at low / Throttle 100% / Pitch $-9^{\circ}\sim11^{\circ}$

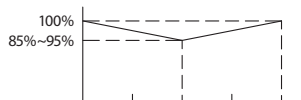
IDLE 1

	Throttle	Pitch
5	100%	$+9^{\circ}\sim+11^{\circ}$
4	85%	
3	80%	$+5^{\circ}\sim+6^{\circ}$
2	85%	
1	90%	-5°



IDLE 2

	Throttle	Pitch
5	100% High	$+9^{\circ}\sim+11^{\circ}$
3	90% Middle	0°
1	100% Low	$-9^{\circ}\sim11^{\circ}$





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