

## **User Handbook**



Nine Eagle NE R/C 218A (Kestrel 500) Helicopter www.nineeagle.com

# Nine Eagle NE R/C 218A (Kestrel 500) Helicopter User Handbook

Safer steadier, more stable and easier to fly
Nearest concept, design, and structure
One of the stablest single blade helicopters in the world

Congratulations on becoming a Nine Eagle Helicopter pilot!

To ensure safe use, please read this manual thoroughly before flying the helicopter. This instruction manual should help you to learn how to fly.

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## Warning!!

#### READ BEFORE FLYING

The Nine Eagle NE R/C 218A (Kestrel 500) is not a toy. Children under 14 years old are strictly forbidden from flying this helicopter.

You must fly this helicopter safely and if you are an inexperienced pilot we suggest that you seek advice from an experienced pilot. A good place to start might be your local Model Flying Club. The manufacturer and dealers are not liable any use of the helicopter.

When flying or preparing the helicopter for flight you should strictly adhere to the instructions. Ensure that yours and other people's hands, face are kept away from the rotating parts.

Always use the helicopter indoors or in outdoors areas that are free of wind. Never fly close to or fly above others.

Always unplug the helicopter battery before turning off the transmitter when the helicopter is stopped.

Eagle Explorer NE R/C 106A uses lithium polymer battery. Always adhere to operating instructions for the lithium polymer battery to avoid accidents such as combustion or explosion.

Always use a genuine Nine Eagles charger and power adaptor designed for this helicopter.

Always unplug the charger and adapter from the electrical outlet after completion of each charge.

Never overcharge the battery, use or leave it in the sun or near fire. Ensure the battery is kept dry.

Never store or transport the battery with metal objects.

Never disassemble the battery.

Never using your wet hands contact the charger

When you fly the helicopter, keep distance from other electrical equipment, magnetic objects, wireless devices. etc, avoid to interfere with each other to cause accidents.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been test and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in aparticular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- @ Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- © Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- © Consult the dealer or an experienced radio/TV technician for help.

## I Introduction

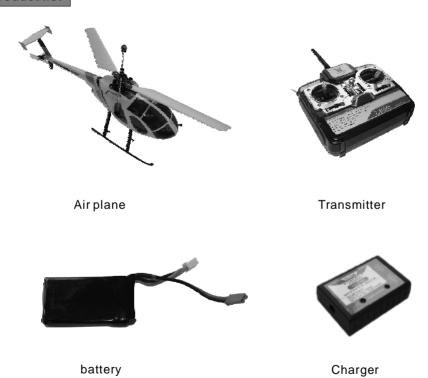
#### 1.Characteristics

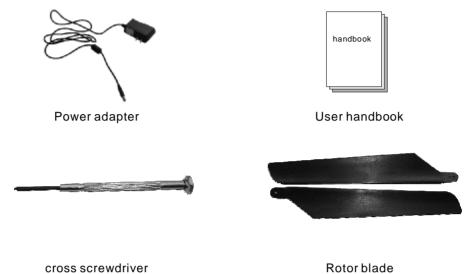
Your Nine Eagle NE R/C 218A (Kestrel 500) is a single-blade remote control helicopter. It emulate the MD500, designed by the professional engineer it has beautiful outline. With the nearest concept, design, and structure, this kind of helicopter is one of the stablest single blade helicopters in the world.

With the most advanced 2.4Ghz remote control technology, it can fly with other helicopters at the same time.

These instructions should help you to become familiar with Nine Eagle NE R/C 218A (Kestrel 500) Helicopter and you will enjoy flying in a very short time. If you have the experience of flying a double-blade-one-axis helicopter, it is very easy for you to control this one. This is the most ideal type for your future play.

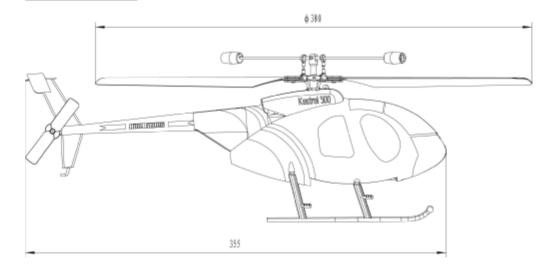
#### 2.Product list





Rotor blade

#### 3. Specification



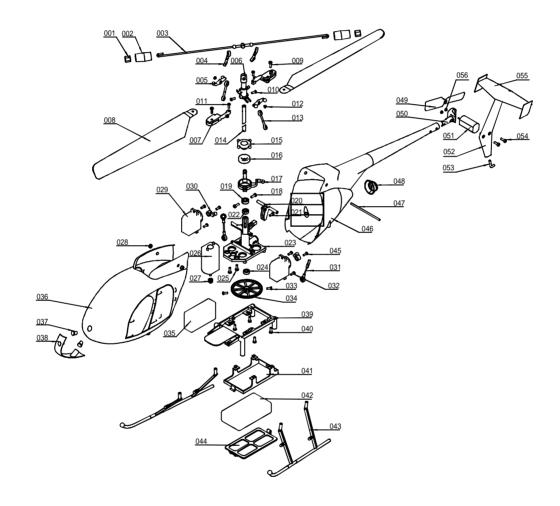
Flying Weight: 185g Overall Length: 355mm Blades Diameter: 380mm Power System: 180 motor, N30

Transmitter: 2.4Ghz, 4 channels

Mix controller: 4 in 1 controller (W/gyro, mixer, ESC, receiver) Servo: 5g, 1.3KG/CM, 0.12S/60

Battery: 7.4v 600MAH

10C Li-polymer battery



#### 5. Spare parts

001	Weight block	2
002	Hammer balance	2
003	Flybar set	1
004	Upper ball linkage rod	2
005	Mixed-rocker	2
006	Upper T shape holder	1
007	rotor blades grip set	2
008	Main rotor blades grip	2
009	Screw PM2X6	2
010	Screw PA1.7X4	2
011	Screw PA1.7X4	2
012	Screw PWA1.7X4	2
013	Middle ball linkage rod	2
014	Spindle	1
015	Upper swashplate	1
016	Bearing137zz	1
017	Under swashplate	1
018	Screw PM2X3	2
019	Positioning Laps	1
020	Stent	1
021	Screw PA1.7X4	1
022	Upper bearing MR74zz	1
023	Main frame	1
024	Under bearing MR74zz	1
025	Screw PM2X3	2
026	Motor	1
027	Gear	1
028	Rubber fixed circle	2

029	Servo	2
030	Rocker	2
031	Under ball linkage rod	4
032	Screw PA1.7X4	2
033	Screw CB1.7X2.5	1
034	Under gear	1
035	Receiver	1
036	Cabin	1
037	LED light	2
038	Fixed pieces of LED lights	1
039	Landing skid	1
040	Screw PA1.7X4	4
041	Battery frame	1
042	Battery	1
043	Landing skid	2
044	Battery cover board	1
045	Screw PA1.7X4	2
046	Chasiss	1
047	Sting	1
048	Fumarole	1
049	Tail frame	1
050	Motor fame	1
051	Motor	1
052	Vertical tail	1
053	Tail	1
054	Screw PWA1.7X6	2
055	Hirao	1
056	Screw PM1.7X4	2

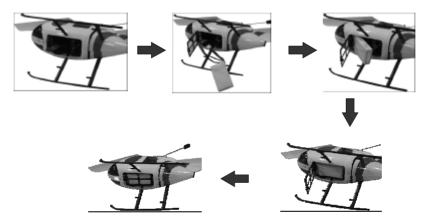
#### Guarantee

We guarantee the Speed/Night Eagle to be free of manufacturing faults and material defects. This product has been checked, undergone a test flight and adjusted individually before leaving the manufacturer.

Please contact your local hobby shop for replacement parts and technical support. To help identify broken or damaged parts we have included a detailed parts list and assembly diagram within this user handbook

### II Battery Mounting, Charging and Maintenance

- 1) The transmitter is mounted with 4 "AA" alkaline batteries.
- 2) The helicopter uses a 2 cell 7.4v 600mah 10c Li-polymer battery.
- 3) Charging: Connect the Li-polymer battery, adaptor and charger with a power outlet. The red light indicates power on. The green light indicates charging. When the green light is off, the battery is fully charged, and should be removed from the charger at this point.
- 4) When charging, please keep the battery away from sources of heat. Do not cover the charger or battery. Always keep them ventilated.
- 5) Always unplug the charger and power adaptor from the electrical outlet after completion of each charging.
- 6) Put the charged battery into the battery frame. Switch on the transmitter before connecting the battery for the helicopter to ensure that the helicopter controlled by the transmitter once power is flowing.



- 7) Please stop flying when you feel the battery is running low.
- 8) Always unplug the helicopter battery immediately and then turn off the transmitter when you are finished flying.
- 9) If you do not use the helicopter in a long time, please keep 50% power of the Lipolymer battery, and take out the battery of the transmitter.

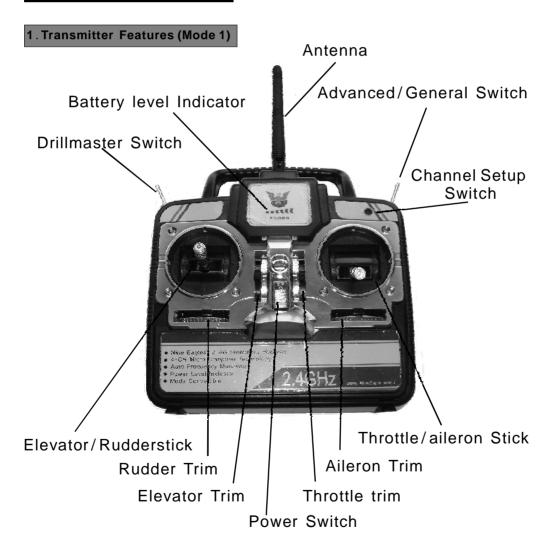
### IIII Introduction of the 2.4Ghz Remote Control

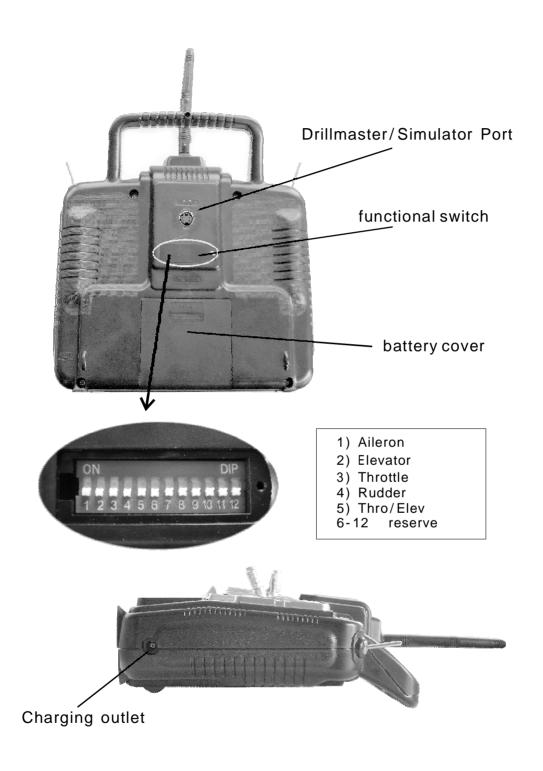
2.4Ghz remote control system using advanced spread spectrum technology and advanced digital coding technology to ensure that the limited-rate bandwidth can be fully utilized. In theory, 30 people can fly their helicopters in same place at the same time with no interference.

Using highly-integrated frequency synthesizer technology and the microprocessor, it can automatically planning and setting the working frequency. So there is no concept of the crystal frequency settings. Intelligent use of the new digital technology, it has the characteristic of fast response, high accuracy and the rudder does nit shake. As high-frequency, it has short-wavelength, so with very short antenna.

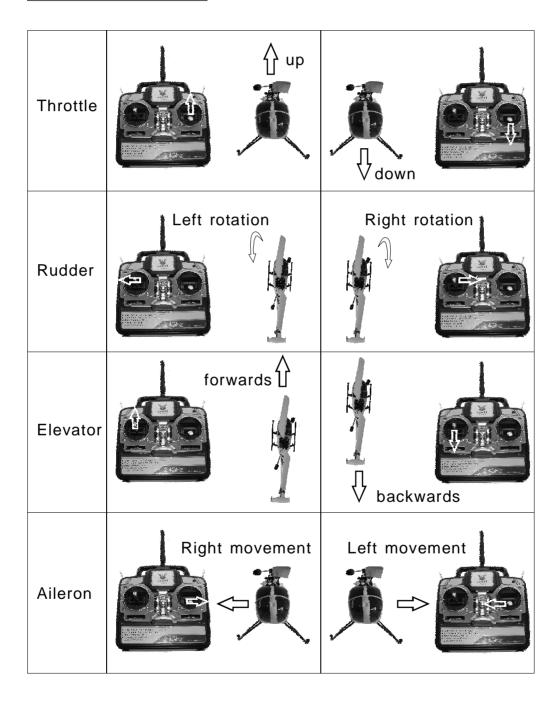
As a microwave, 2.4Ghz has the function of screen spread. In brief, it spread in straight line. When you use 2.4Ghz remote control system, you should avoided the insight objects, which allows you remote control model always in your sight distance

## IV Flying Guide

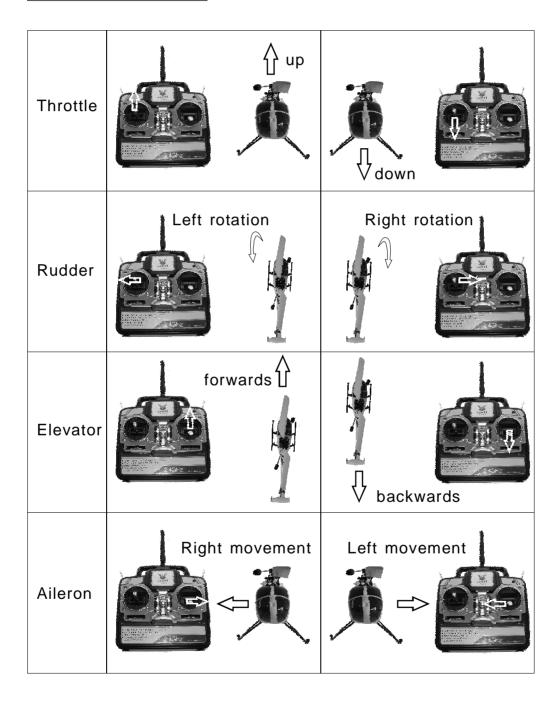




#### 2. Operation skills (Mode 1)



#### Operation skills (Mode 2)



## Maiden Flight Checklist

#### PRE-FLIGHT

IT IS IMPORTANT TO PEFROM THIS PRE-FLIGHT SAFETY CHECK BEFORE EVERY FLIGHT.

1. Assembling the Transmitter

Install eight (8) AA batteries into the removable battery tray at the back of the transmitter (see instructions above). Facing the radio, twist the antenna into the socket on the top of the radio clockwise to ensure it is tight. A loose antenna could cause intermittent control.

2. Check for Loose Items

It is important to check the helicopter for loose screws and nuts before flight, in case they have loosened in shipping. Check:

- Blade grip screws
- Rotation holder and collar screws
- Servo push rod screws
- Motor screws
- Main rotor gear set screws
- Ensure all components such as the receiver, servos and motors are secured to the airframe
- Check that servo wires are not touching the gears
- Check the main shaft from the flybar down to the swash plate
- Check the flybar weights to ensure they are secure.



#### 3. Check for Cracked or Damaged Parts

Any part that is cracked or damaged on the helicopter can cause unpredictable flight performance.

#### Basic Radio Introduction

The Speed/Night Eagle transmitter offers optimal functionality and control. It is mportant to have a basic understanding of the layout of the transmitter before flying. The transmitter may come in Mode 1 or Mode 2 configurations.

Mode 1 Transmitter. In Mode 1, the right control stick controls the Throttle and Aileron.

The left control stick controls the Elevator and Rudder. The relevant trim levers are beside

each control stick.

Mode 2 Transmitter. In Mode 2, the left control stick controls the Throttle and Aileron.

The right control stick controls the Elevator and Rudder. The relevant trim levers are beside each control stick.

#### **Control Stick Functions**

#### Mode 1

Move the RIGHT control stick to the right and the Swashplate will tilt to the back. Move it to the left and the Swashplate will tilt forward. (observe from behind the helicopter)

Pull the LEFT control stick back towards you and the Swashplate will tilt left. Push it forward and it will tilt right. (Elevator Control)

#### Mode 2

Move the LEFT control stick to the right and the Swashplate will tilt to the back. Move it to the left and the Swashplate will tilt forward. (observe from behind the helicopter)

Pull the RIGHT control stick back towards you and the Swashplate will tilt left. Push it forward and it will tilt right. (Elevator Control)

#### Basic Fine Tuning

the trim levers.

This information will be relevant after your first test flight. It is provided at this stage to give you a basic understanding of the trim lever functions. There are four trim levers used to fine tune the four functions of the main control sticks. To adjust these position yourself about 1.5 to 2.0 metres (6-7 feet) behind the helicopter. Bring the helicopter to a hover position about 1.0 metre (4 feet) from the ground and observe the movement of the helicopter as follows:

- 1. If the tail begins to rotate to the left, slide the rudder trim lever to the left.
- 2. If the helicopter begins to move forward, slide the elevator trim lever back.
- 3. If the helicopter begins to move left, slide the aileron trim lever to the right.
- If the helicopter begins to move ascend, slide the throttle trim back.
   If movements are in the opposite directions take the reverse actions on

#### Turning on the Helicopter

ATTENTION: Before connecting the battery to the helicopter, you must confirm the following settings. Make sure the Speed/Night Eagle is turned off during this process.

- 1. The crystals on the transmitter and receiver must match each other.
- 2. The throttle stick is pulled fully back in the off position, otherwise serious damage to the Speed/Night Eagle and personal injury may occur.
- 3. The transmitter antenna is screwed in and extended, batteries are fully charged and the transmitter has been turned on.
- 4. On the transmitter pull the throttle stick back to the end stop position and the throttle trim lever to the centre position then turn the transmitter on.
- 5. Place the helicopter on a flat surface. Plug the battery into the helicopter and the light inside the helicopter should turn on. If it does not turn on, check that the transmitter is correctly turned on.
- Make sure all trims are centred.
- 7. Make sure the Swashplate is parallel to the ground. If not, see the flight adjustments section. You will use the trim levers to fine tune the helicopter once you have completed a test flight.

## Flight Preparation

#### Flight Area

Find an area which is suitable for flying. Choose a big room without any obstacles. If flying outdoors, make sure you have an open free of trees, wires and other obstacles.

#### 2. Preflight Operation



Charge the battery



Start the transmitter





Connect the helicopter battery

When binding is complete, The green light on indicates ready to fly

#### 3. For the code:

- a) to hold down the transmitter code switch, turn on the power switch and then release the code, then the transmitter light flashing rapidly.
- b) Turn on the power of the receiver, the light flashing rapidly.
- c) Receiver and transmitter communicate automatically . When the flashing lights of the receiver and transmitter stop shinning simultaneously, it can be worked.

Tips: After completion of the code, it is unnecessary to adjust it again in the future.

#### 4. Blade Adjustment

Both blades should trace the same path and appear to overlap. If not, it is referred to as 'Double Blades'. This will not only cause vibration, affecting stability, but may also reduce pneumatic efficiency. If Double Blades arises in the upper blade, adjust the control link on the stabilizer set. Adjust the higher blade to a lower angle. If Double Blades arises in the lower blade, adjust the blade by adjusting the higher blade to a lower angle, and the lower blade to a higher angle.



#### 5. The Center of Gravity

The center of gravity shall be in the main bearing. Shift the battery back or forward to adjust the center of gravity.

## Flight Training Course

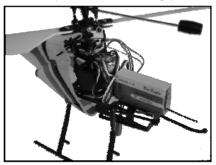
#### 1. Trim Adjustment

Turn on the transmitter and plug in the helicopter battery. Position yourself 1.5 to 2 meters behind the helicopter. Push up the throttle/aileron stick and increase the blades rotating speed, until the helicopter takes off. Observe the helicopter carefully. If the tail turns left or the helicopter tends to move forward, backward, left or, right, please trim it using the trim adjusters on the transmitter. If the tail begins to rotate to the left, slide the rudder trim lever to the left.

If the helicopter begins to move forward, slide the elevator trim lever back. If the helicopter begins to move left, slide the aileron trim lever to the right. Otherwise, slide the trim lever to the opposite direction.

Sometimes, sliding the trim lever does not solve the problem. Take the following methods:

Take off the landing skid, cap as the following pictures:



### **Transmitter Trim Adjustments (Fine Tuning)**

#### Mode 1 Transmitter

If the main rotor blades start rotating and if the right control stick has not been pushed forward slowly adjust the trim lever until they stop rotating.

Make sure the swashplate is horizontal to the ground. If the Swashplate is not parallel from front to back, adjust the transmitter tri until it is parallel to the ground. If the Swashplate if not horizontal from side to side adjust the rim until it is level to the ground. Test the flight controls to make sure they are operating properly and the Swashplate moves in a direction you want to fly. Push the right control stick slightly forward to start the blade rotation. Keep your fingers, eyes and other objects clear of the rotating parts. Slowly push the right control stick forward to increase rotor speed.

The Speed/Night Eagle may not take off vertically, it may go forward or backwards, left or right. Continue to push the right control stick forward and bring the helicopter to a hovering height at about waist height. While hovering use trim levers to fine tune the Speed/Night Eagle while hovering. You may also find the helicopters nose may swing to

the left or right side when you increase throttle. In this case you need to adjust the trim. Now you have finished all the settings and adjustments. Pull the throttle stick back to the stop position, turn off the Speed/Night Eagle by disconnecting the battery, then turnoff the transmitter power. Never turn off the transmitter before disconnecting the battery as the helicopter may become uncontrollable.

#### Mode 2 Transmitter

If the main rotor blades start rotating and if the left control stick has not been pushed forward slowly adjust the trim lever until they stop rotating.

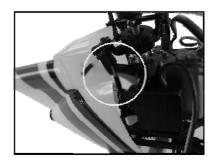
Make sure the swashplate is horizontal to the ground. If the Swashplate is not parallel from front to back, adjust the transmitter tri until it is parallel to the ground. If the Swashplate if not horizontal from side to side adjust the rim until it is level to the ground. Test the flight controls to make sure they are operating properly and the Swashplate moves in a direction you want to fly.

Push the left control stick slightly forward to start the blade rotation. Keep your fingers, eyes and other objects clear of the rotating parts.

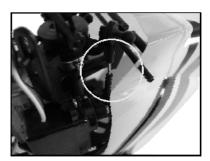
Slowly push the left control stick forward to increase rotor speed. The Speed/Night Eagle may not take off vertically, it may go forward or backwards, left or right. Continue to push the left control stick forward and bring the helicopter to a hovering height at about waist height. While hovering use trim levers to fine tune the Speed/Night Eagle while hovering. You may also find the helicopters nose may swing to the left or right side when you increase throttle. In this case you need to adjust the trim.

Now you have finished all the settings and adjustments. Pull the throttle stick back to the stop position, turn off the Speed/Night Eagle by disconnecting the battery, then turnoff the transmitter power. Never turn off the transmitter before disconnecting the battery as the helicopter may become uncontrollable.

(1) If the elevator trim slides to the end of back, yet the helicopter still moves forward, then you should change the length of the control link slight shoter.



(2) If the aileron trim slides to the end of left, Yet the helicopter still moves right, then you should adjust the length of control link to slightly longer. Vice verse.



#### 2.sensitivity Adjustment

When you feel the tail of the helicopter does not work well, increase sensitivity. On the contrary, reduce.



#### 3.Adjustment of the main rotor blades and the tail

When the helicopter flying to one rotation ,you can resolve this problem by the mixed function.



#### 4. Flying Principles

When you take off, push the throttle stick quickly. After the helicopter takes off, push it slowly. Always direct the tail at you until you are familiar with this and then continue the.

In case of any accident, quickly push down the throttle stick to the end.

For the beginners, it is better to repeat the flying several times. Control the helicopter at a height of 0.5 to 1 meter above the ground. This will help you to learn quickly and safely.

#### 5.Practice

Frog jump(control the power immediately after taking off),

- -> Extend the time of the frog jump
- ->Hover around the tail
- -> Learn the right/left, forward/backward flying
- ->360 degree rotation circle flying
- ->Box pattern practice
- I) With the tail towards you, fly the Speed/Night Eagle in a box pattern. Slide the helicopter sideways, forwards and backwards instead of turning the helicopter.
  - 2) Repeat the box pattern facing the side of the helicopter.
  - 3) Repeat the box pattern with the front of the helicopter facing you.

- -> "8" shape flying
- ->Flight route flying

#### 6. Take off from the Ground

The helicopter can take off after trimming. Push the throttle stick up, the rotating speed will increase. Push the throttle stick up quickly before the helicopter takes off the ground. When the helicopter takes off, slow down the speed and keep the helicopter about 0.5 meters high above ground. Observe how the helicopter is moving and trim it until it is at its best.

- 7. The beginner should concentrate their effects on vertical control and the direction control. First, you should control the throttle stick. After the helicopter takes off, slowly push the stick up or down. And control the sticks to keep the tail facing you.
- **8.** Do not fly the lower 0.3 meters high above the ground, because the airflow under the rotating blades would cause the ground effect and affect normal flying and operation.
- **9.** After you have learned how to take off and hover the helicopter, it is better to learn other movements in safe condition.

### Flight Manoeuvres

#### Inner and Outer Ball Linkages

One feature that makes the Nine Eagles Helicopters so great for beginners is the special inner and outer ball linkage on the swashplate. When you received the helicopter the setting is on the Outer Ball of the Swashplate for beginners. After you have mastered the flight manoeuvres below, you can adjust to the Inner Ball of the Swashplate for more advanced flying and even more fun.

#### The Principles of Flying

The Nine Eagles Helicopters are counter rotating helicopters. Unlike a conventional helicopter that uses a single main rotor to generate lift and a tail rotor to change heading and cancel the unwanted torque generated by the main rotor, a counter rotating helicopter generates lift using two counter rotating blades. Changes in direction are controlled by varying the RPM of each rotor. Because the torque generated by the two rotors counter each other out, there is no need for a tail rotor to control heading and maintain stability. While counter rotating helicopters by design have more complex drive systems, they are more stable, easier to control and more efficient as 100% of the rotors energy is used to produce lift. The features of a counter rotating helicopter make the Helicopters a perfect, stable training helicopter.

#### Flying Environments

What you need now is a spacious room without any obstacles. Make sure that the air is calm. Drafts caused by open windows/doors, airconditioners or fans should be avoided. We recommend a flat, smooth floor on which the Speed/Night Eagle can slide, soft carpet is not a good choice for flying, because it could hook the skid of the helicopter and cause damage.

ATTENTION: Errors and carelessness in assembling and flying the Speed/Night Eagle may result in serious personal injury and damage to property. Never touch the spinning rotor blades or any other exposed moving parts.

#### Operation Procedures

- 1. Place the Speed/Night Eagle in the middle of the room, you should always sand approximately 2m (6ft) from the helicopter and behind the tail. Make sure the helicopter and transmitter have been set up and adjusted in accordance with this handbook. Switch the Transmitter on, connect the battery, and check once more that the servos are operating correctly before proceeding.
- 2. Now you are ready to start learning to fly. The control diagrams on the next few pages will help you trim and fly the helicopter.
- 3. Initially you do not need to worry about how to operate your Speed/Night Eagle skilfully. Through practice, you will become more confident operating the controls and adjusting the throttle. When your fingers respond to the movements of the helicopter spontaneously, you are ready for more advanced flying. Please note the direction described here are if you are facing the tail of the helicopter.
- 4. Push the throttle up gradually until the Speed/Night Eagle starts to become light and then carefully move the throttle stick further until it lifts off. Observing the helicopter's response, correct any movement if necessary. Don't fly too high, keep its height above the floor at about 1m (3ft). If there is any instability, shaking, or if the helicopter is out of control, please land at once. The only thing hat helps at this stage is topractice and then practice some more.
- 5. Try to control the Speed/Night Eagle using the smallest possible corrective commands. The sooner you notice a movement and respond to it, the smaller the corrective measures are required, and the smaller the flying deviation. Be patient as it does take time to learn all the required skills to control the helicopter. Al successful pilots have mastered the skill of flying through lots of practice.
- 6. Once your flying time increases and you are capable of controlling your Speed/Night Eagle in the air, you can slowly increase its height off the ground. The helicopter will become more stable as it is flown a little higher, this is because it leaves its own down thrust turbulence. If you fly the helicopter in a small room you may find after a short time that it flies unevenly and unpredictably. This is because the helicopter quickly moves the air in the room and creates a turbulent environment, if this occurs, land and take a break for a minute, the air will calm down quickly. When you are able to control the Speed/Night Eagle smoothly at 3m high and can vary the altitude, you are now ready for advanced flying.

7. You might like to try flying the Speed/Night Eagle outdoors or setup a flying course to test your skill (set up your flying course with soft materials such as cushions so that you do not damage the helicopter if you lose control). You can also practice with the nose of the helicopter facing you, just remember that your left and right will now be reversed! Try these three flying box patternsto practice your advanced flying skills.

## What to do after a crash

Lift Nose and Throttle Down

Pull Both Control Sticks Backwards





While the Speed/Night Eagle is easy to fly, crashing is part of the learning experience. If you can't avoid a crash, remember two important things:

ONE - Throttle down to the off position before you crash to avoid damaging the motors.

TWO - Try to hit boom first to avoid damaging the receiver. After a crash there are several important steps to take before flying your Speed/Night Eagle again.

#### Check for damage

Before your next flight always take time to inspect the helicopter for damage. Refer to the Pre-Flight check in this handbook. If there are any broken parts replace them immediately! Parts are available form your Nine Eagles supplier or from <a href="https://www.nineeagle.com/shop.lf">www.nineeagle.com/shop.lf</a> there is no damage follow these pre-flight tips before your next flight:

- 1. Check the CG. They battery pack may have shifted during the crash. Follow the instructions earlier in this handbook to reset the CG.
- 2. Straighten the rotor blades. If the rotor blades moved in the crash and are not straight, your Speed/Night Eagle will fly very erratically.
- 3. Check the Radio System. Make sure the servos move correctly and the helicopter is receiving signals correctly.





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