A560

3D Fixed Wing Vertical Flight with 1 Switch

Instruction Manual

CE FCC RoHS

* Please be kindly noted that this manual will be updated regularly and please visit RadioLink official website to download the latest version.

Disclaimer and Warning

Thank you for purchasing RadioLink 3D fixed wing A560.

To fully enjoy the benefits of this product and ensure safety, please read the manual carefully and set up the device as instructed steps. This product is not a toy and is **NOT** suitable for children under the age of 14. Adults should keep the product out of the reach of children and exercise caution when operating this product in the presence of children.

Inappropriate operation may causes property lose or accidental threats to life. Once the RadioLink product is operated, it means the operator understands this limitation of liability and accepts to take responsibility of the operation.

Make sure to follow the local laws and agree to follow the principles that made by RadioLink.

Fully understand that RadioLink cannot analyze the product damage or accident reason and cannot offer after-sales service if no flight record is provided . To the maximum extent permitted by law, RadioLink won't take any responsibility about the lose caused by indirect/consequent/accidental/special/penal damages including the lose by purchase, operation and failure of operation in any instances. Even RadioLink is informed about the possible lose in advance.

Laws in certain countries may prohibit the exemption from the terms of the guarantee. Therefore consumer rights in different countries may vary.

In compliance with laws and regulations, RadioLink reserves the right to interpret the above terms and conditions. RadioLink reserves the right to update, change or terminate these terms without prior notice.

Warning

① Keep the electric components/battery out of children's reach.
② Make sure the aircraft is distant from crowd and hazardous substances when flight. It's advised to enjoy flights at the site specially for flight.
③ Make sure the power supply and other modules are correctly connected. Otherwise the device may get burnt.
④ Make sure to take off the power and propellers of aircraft when making transmitter channels calibration and firmware upgrade in case of the sudden high speed rotation of motors.
⑤ No foreign matter such as water, oil, sand etc inside the aircraft.
⑥ Make sure the complete device incl. aircraft and transmitter, battery functions well.
⑦ Never self-change the aircraft or related parts. Or it may influence its functionality and possibly cause flight accident.

Must know before flight

Transmitter

- Make sure the transmitter power is fully charged.
- If transmitter is changed, binding process needs to be redone before use. Please refer to the manuals of corresponding products.

- Make sure to power off the aircraft before the transmitter when landing.

Aircraft

Never get close to the high-speed rotation of propellers and motors, which may causes damages. Therefore, please follow the below:

Propellers (Props)

- Make sure to check all props are in good condition before flight. If aged, damaged or deformed, please change to good one then flight.
- Make sure to disconnect the power supply before touching props.
- As props are thin, use tools to (un)install if necessary and be careful to avoid accidental scratch.
- Make sure props are installed well and tight before flight.

Motor

- Make sure motors are installed tightly and rotate smoothly. If fail to rotate, stop operating transmitter immediately and pull the throttle to the bottom position in case of possible damage to motors.
- Never self-change the motor structure.
- When motors stop rotating, never touch it at once, otherwise may get burnt.
- Never cover the air vent on the motor. Make sure no foreign matter inside the motors.
- Make sure motors completely stop before powering off the aircraft and the transmitter.

ESC Make sure there's a tone from ESC when power on the aircraft.

Battery

- Make sure the power connection of transmitter and aircraft is dry.
- Make sure the transmitter and aircraft are fully charged.
- It's advised to stop flight and change battery when there is low voltage warning to avoid over discharge.

SAFETY PRECAUTIONS

Enjoy the flight in an open space, away from crowd and buildings.

Never operate model during adverse weather conditions. Poor visibility can cause disorientation and loss of control of pilots'model.

Never use this product in a crowd and illegal area.

Choose the proper flight modes depending on the space. Vertical mode is all right in small space while level flight needs more space. Be kindly noted that some functions may be limited when indoor.

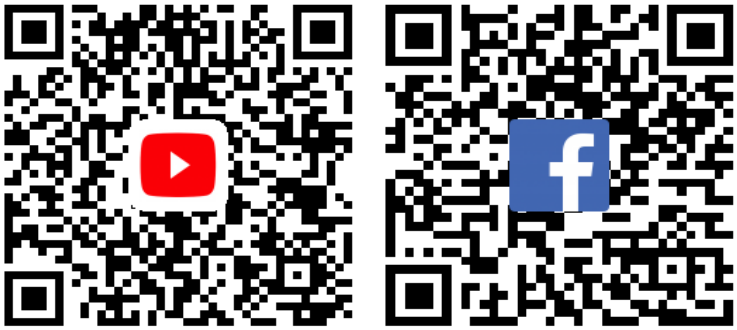
Never operate the device when get drunk or tired. Strictly follow the manual.

Be alert when flight around somewhere close to EMI sources. EMI sources include but not limit to high-voltage wires/station, mobile phone station and television signal tower. When flight around the space mentioned above, the wireless transmission between aircraft and transmitter can be greatly influenced and the aircraft may even fail to take off.

If any problems found during the operation process, either way listed below can be used as online tech support.

1. Send mails to after_service@radiolink.com.cn and we will answer your question at the earliest.
2. PM us on our Facebook page or leave comments on our Youtube page
3. If the product is purchased from the local distributor, you can also ask them for support and repair as prefer.

All manuals and firmwares are available on RadioLink official website www.radiolink.com and more tutorials are uploaded. Or follow our Facebook and Youtube homepage to stay tuned with our latest news.



FCC Statement

This equipment has been tested 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 generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular 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.

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.

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

Packing List

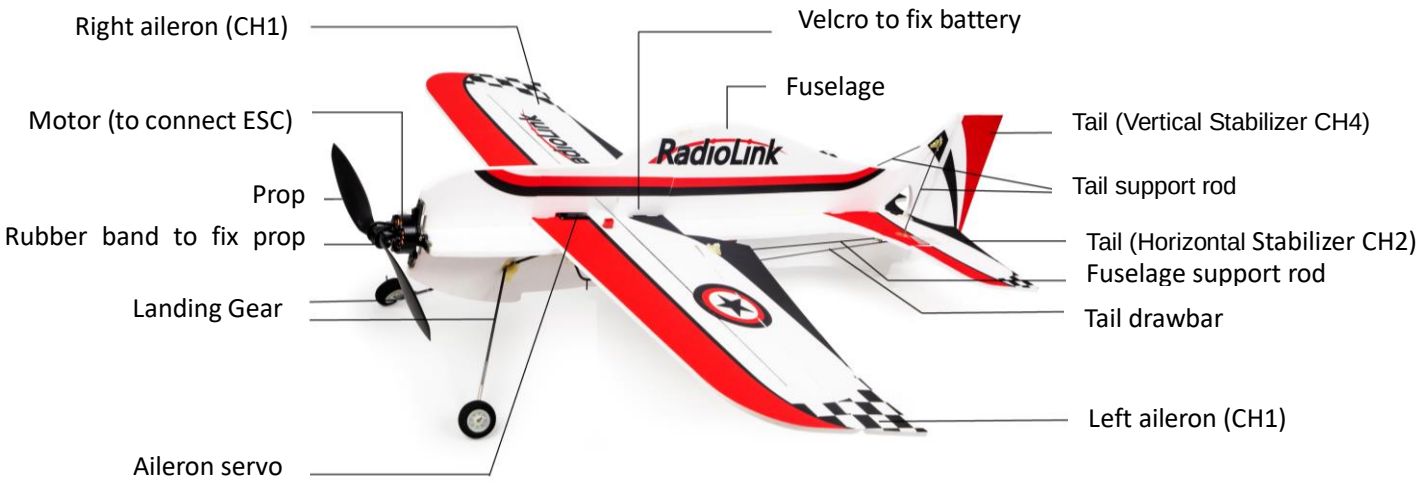
No.	Items	BNP	RTF
1	Fuselage EPP 5mm 560mm	1	1
2	Aerofoil EPP 5mm 560mm	1	1
3	Receiver R8FM	0	1
4	Transmitter RadioLink T8FB	0	1
5	RadioLink Flight controller Byme-A	1	1
6	FULLYMAX 2S 7.4V 350mAh LiPo Battery	1	1
7	Brushless Motor SZ-SPEED 2206F 1450KV	1	1
8	ESC FLYCOLOR 15A BEC	1	1
9	Props GEMFAN 8038 8”dia.3mm	2	2
10	Aileron servo EMAX ES08A with 54mm rudder arm	1	1
11	Tail servo CYS 4.3g	2	2
12	GT POWER A3 Charger for 2S-3S LiPo Battery	0	1

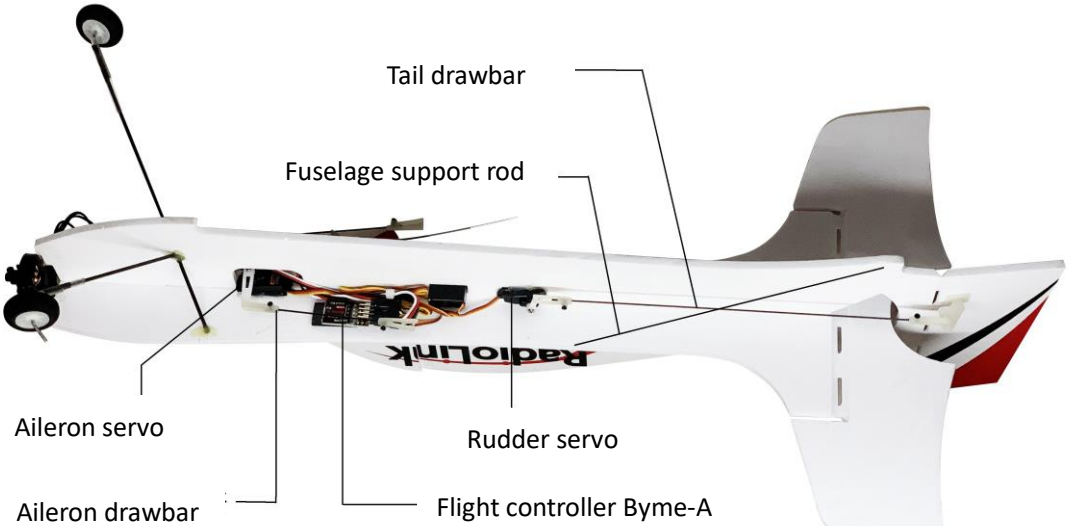
Content

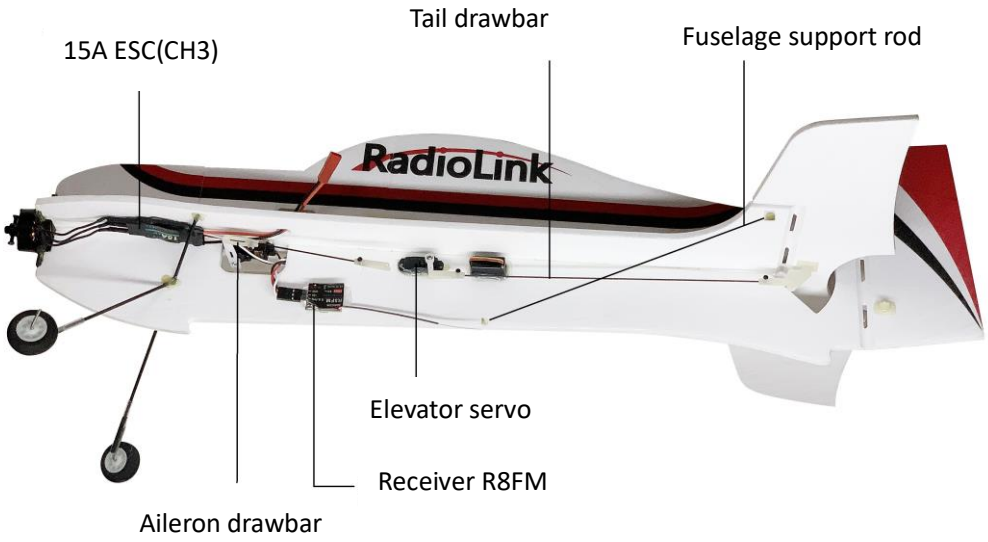
Chapter 1 General Introduction 1
1.1 A560 Units 1
1.2 Motion Principle of Fixed Wing 2
1.2.1 Aileron 2
1.2.2 Elevator servo/Horizontal Tail 2
1.2.3 Rudder servo/Vertical Tail 3
1.3 Transmitter and Receiver 3
1.4 Power System 3
1.4.1 Motors and Propellers 3
1.4.2 ESC 3
1.4.3 Battery 3
1.5 Drive Principle 4
Chapter 2 Parameter Setup 4
2.1 Transmitter 4
2.1.1 Joystick Mode 4
2.1.2 Model Type Setup 5
2.1.3 Phase Setup 5
2.2 Aircraft Installation 6
2.3 Flight Controller Installation 6
2.3.1 Power on and Calibrate the Aircraft 6
2.3.2 Attitude Calibration 6
2.3.3 Servo Phase 7
2.3.3.1 Transmitter Phase 7
2.3.3.2 Flight Controller Phase 9
2.4 Flight Mode Setting 10
2.4.1 Vertical Mode 11
2.4.2 Angle Mode 13
2.4.3 Rate Mode 14
2.4.4 Horizon Mode 14
2.4.5 Manual Mode 14

Chapter 1 General Introduction

1.1 A560 Units

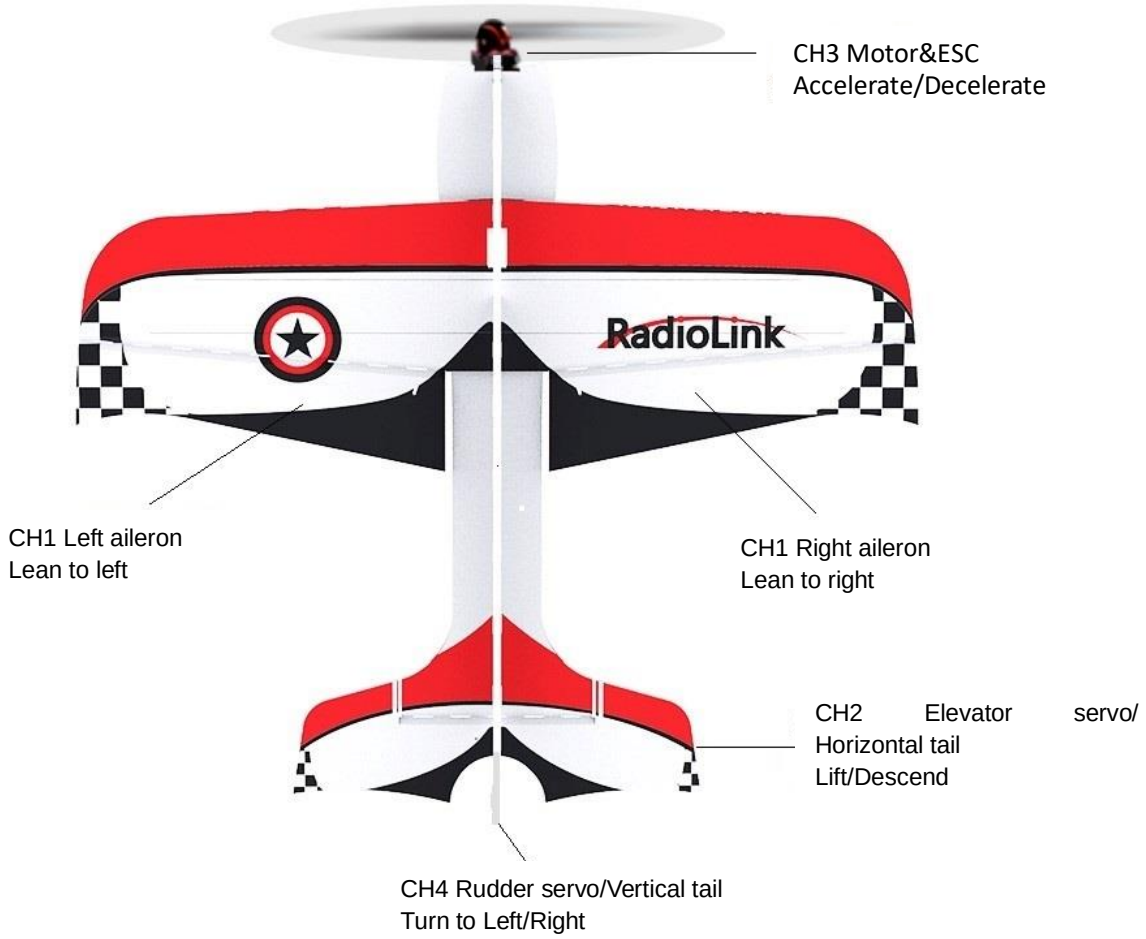






1.2 Motion Principle of Fixed Wing

As below picture shown, besides the propellers, the two ailerons/horizontal tail/vertical tail are also the moving parts of A560.



1.2.1 Aileron

Ailerons are controlled by a servo. When the left aileron moves up and the right down, left aileron gets pushed by airflow downward and the right aileron is pushed by airflow upward, then A560 will lean to left or roll over to left. When the left aileron moves down and the right up, left aileron gets pushed by airflow upward and the right aileron is pushed downward, then A560 will lean to right or roll over to right.

1.2.2 Elevator servo/Horizontal Tail

When the elevator servo moves upward, the horizontal tail gets pushed downward by airflow and the head of A560 will go up. When the elevator servo moves downward, the horizontal tail gets pushed upward by airflow and the head of A560 will go down.

1.2.3 Rudder servo/Vertical Tail

Similar to elevator servo, when rudder servo moves left, the vertical tail gets pushed to right by airflow and the head of A560 will turn left. When rudder servo moves right, the vertical tail gets pushed to left and the head of A560 will turn right.

Note The direction mentioned above is relative to aircraft instead of the ground. That is, if the aircraft is reversed (body upside down), its above is the ground instead of the sky/ceiling.

When there's no flight controller assisting or at MANUAL MODE, if maximize the elevator servo, the aircraft will roll over like roller coaster instead of moving upward. When under the assistance of the flight controller with VERTICAL MODE or STABILIZE MODE, the max pitch angle is limited. The aircraft will keep heading upward instead of rolling over if the elevator servo is maximized.

Besides, the function of all servos are related to the motor/throttle (prop rotation speed). Because if the aircraft moves faster, the airflow applies more force on the servos.

1.3 Transmitter and Receiver

A560 RTF(Ready To Fly) is packed with RadioLink 8-channel transmitter T8FB and mini receiver R8FM, with the stable control distance up to 2000m. （Maximum range tested in unobstructed areas free of interference and may vary depending on local regulations）

If it is the BNP version purchased, transmitter and receiver needs to be installed. A560 is compatible to all transmitters that SBUS/PPM signal supported.

1.4 Power System

The power system of A560 includes motor, ESC, propellers and battery.

1.4.1 Motors and Propellers

Motor installed on A560 is SZ 2206F 1500KV brushless motor. (motor with higher KV value, means higher rotation speed and smaller torsion force, suits smaller propeller)

A560 adopts GEMFAN 8030 props, which is installed by factory default. If new prop needs to be changed, fix the prop and motor with a rubber band.

Note Propeller need to be identified correctly. If forward and reverse mistaken, the aircraft couldn't take off even maximize the throttle. The rotation direction of motor and prop should be same. That is, if the motor rotates clockwise, so is the prop.

1.4.2 ESC

The function of ESC is to change the direct current to alternating one to power supply motor and change its rotation speed basing on the throttle command. Another function of ESC is to lower the model voltage to 5V for receiver as the battery applied for A560 is 7.4V 2S LiPo. Therefore, there are three wires of ESC respectively for battery, motor and receiver. ESC applied in A560 is FLYCOLOR 15A brushless ESC.

1.4.3 Battery

A560 supports 2S-3S LiPo battery. With 660mAh LiPo battery fully charged, pilots can enjoy vertical flight for10min while level flight 20min.

1.5 Drive Principle

Servo outputs signal and voltage by receiver and adjust corresponding angle in real time. Generally, angle that servo can adjust is no more than 90°. A560 uses a EMAX 8G servo as aileron servo and 2 pieces of 4.3G servo for elevator servo and rudder servo respectively.

Chapter 2 Parameter Setup

2.1 Transmitter

2.1.1 Joystick Mode

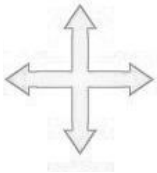
To beginners, it's very important to understand what joysticks connect to different channels and choose the most suitable mode .

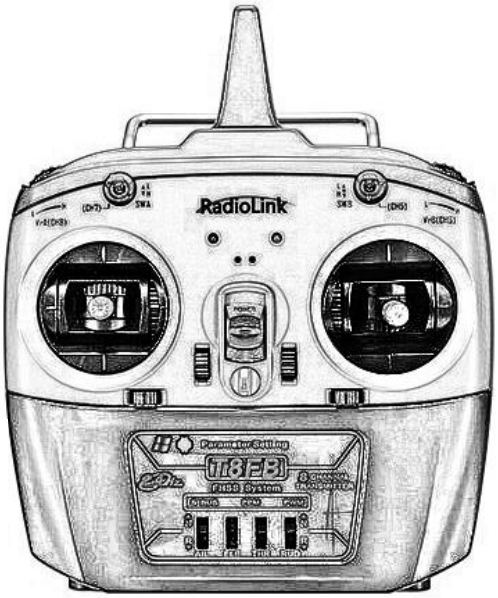
First, throttle is controlled by toggling joystick up(top-max 100%) and down (bottom-min 0%). Below explanation takes MODE 2 with throttle joystick on left as example.

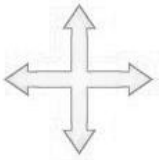
Left Joystick: Toggle up and down to control the motor (up as accelerate while down as decelerate). Toggle left and right to control the rudder (left as anticlockwise while right as clockwise).

Right Joystick: Toggle up and down to control the elevator servo(up as descend while down to lift the fixed wing). Toggle left and right to control the aileron servo(left to make the fixed wing rolling to left while right as rolling to right)

Rudder
Control aircraft to move clockwise /anticlockwise







Aileron
Control aircraft to lean or roll left/right

Throttle
Control aircraft to accelerate/decelerate

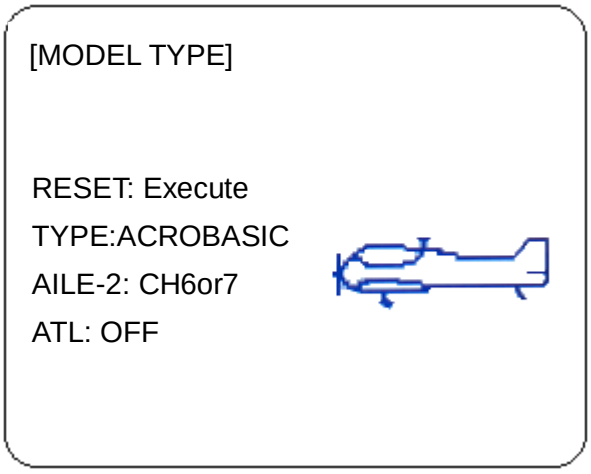
Elevator
Control aircraft to lift/descend

2.1.2 Model Type Setup

Transmitter with A560 by default is RadioLink T8FB. If it is the RTF set purchased or the RadioLink transmitter T8FB used to work with A560 BNF version, there's no need to setup model type. If it is other transmitter to work with A560, model type needs to be set as fixed wing. Take AT9S as example(same as AT10II/AT10/AT9):

Steps:

Power on the transmitter-Long press Mode to enter BASIC MENU-Turn the Dial to highlight MODEL TYPE-Press Push to enter the menu and turn Dial to select ACROBASIC-Long press Push for 1s and a notice "ARE YOU SURE"pops out-Press Push again and a notice"Please wait..." pops out and there will be DEE sound heard, meaning setting complete.

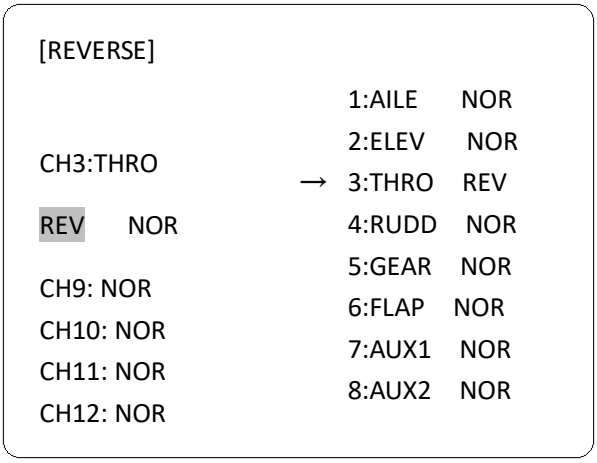


2.1.3 Phase Setup

Transmitter phase relates to attitude calibration and servo phase needs to be calibrated by flight controller(this step can be skipped for A560 RTF version).

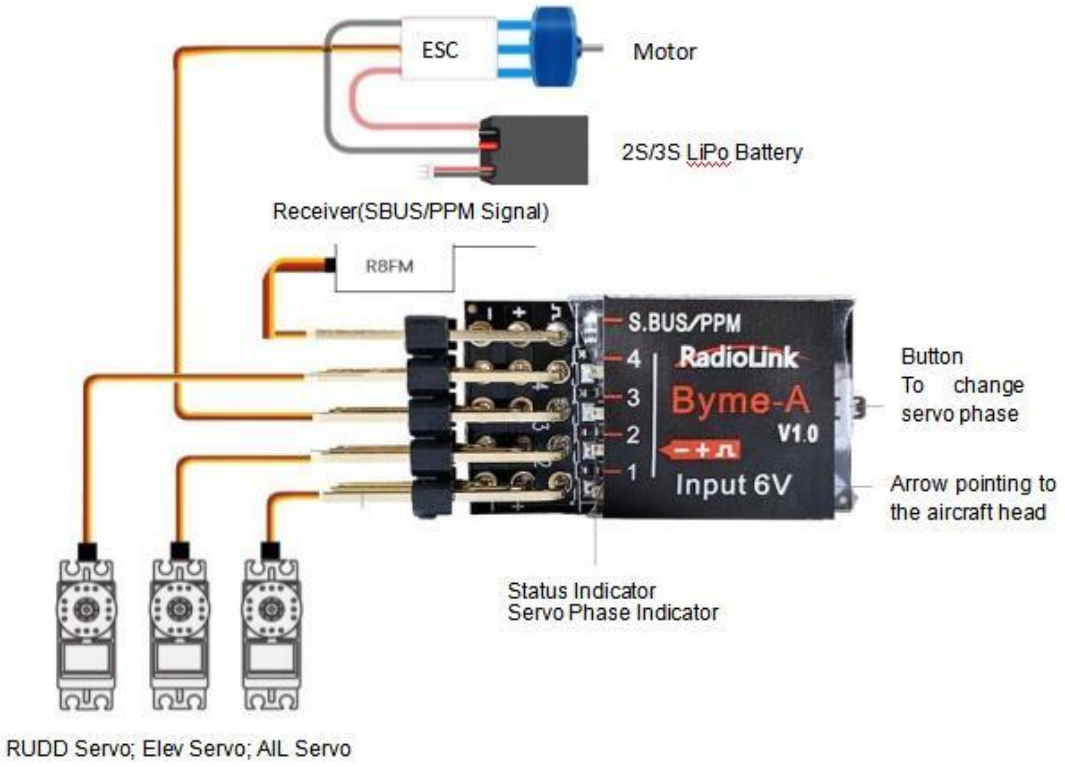
Steps:

Long press Mode to enter BASIC MENU - rotate Dial to highlight REVERSE-Press Push to enter the menu-rotate Dial to highlight 3:THRO -change NOR to REV-press Push to confirm 'ARE YOU SURE?'



2.2 Aircraft Installation

The wing is not assembled by factory default. Therefore, when the box is received and unpacked, please assemble the wing on the fuselage first. Please refer to the video for detailed instructions.
https://youtu.be/WkcsBdWsfMo



Channels on flight controller: Ch1-Aileron, Ch2-Elevator, Ch3-Throttle, Ch4-Rudder, S.BUS/PPM-connect to receiver, SBUS/PPM signal supported.

2.3 Flight Controller Installation

RTF version is with flight controller Byme-A installed by default. If purchase separately, make sure the arrow on Byme-A points to the aircraft head with the 3M paste on the aircraft. It is advised to install the flight controller close to the core and connect the servo wires to the corresponding flight controller pin.

2.3.1 Power on and Calibrate the Aircraft

Each time the flight controller is powered on, the flight controller will calibrate with the green led quickly flashing, which means gyro calibration is under process. Put the aircraft still on the ground until DEE sounds from the motor heard. When the green led is always on means calibration done.

Note It takes approximately 1 minute for flight controller to do self-check after powering on until the DEE tone finishes and green led is always on.

2.3.2 Attitude Calibration

Flight controller Byme-A needs o calibrate the attitudes/level to ensure the balance status.

It is advised to lift up the model head with a certain angle to ensure the calibration accuracy and it will be recorded by flight controller once the attitude calibration is complete with success.

Pull both joysticks to outside corners as below and hold for more than 3 seconds. The green led on flight controller Byme-A flashes once means the calibration completed.

2.3.3 Servo Phase

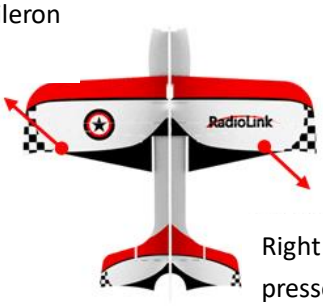
Make sure to switch to MANUAL MODE(eg. T8FB SWA-UP/DWN, SWB-DWN) to check servo phases are correct before each flight. Below Mode 2 is explained as example.

2.3.3.1 Transmitter Phase

（1）Aileron phase

Toggle the aileron joystick to left, left aileron is lifted and right one is pressed; toggle the joystick to right, left aileron is pressed and right one is lifted, meaning the aileron phase is correct.

Left aileron lifted



Right aileron pressed

Right joystick to left

（2）Elevator phase

Toggle the elevator joystick downward, elevator servo(horizontal tail) is lifted; toggle the joystick upward, elevator servo(horizontal tail) is pressed, meaning the elevator phase is correct.

Right joystick downward

Horizontal tail lifted

（3）Rudder Phase

Toggle the rudder joystick to left, rudder servo(vertical tail) turnsto left; toggle the joystick to right, rudder servo(vertical tail) turns to right, meaning the rudder phase is correct.

Left joystick to left

Vertical tail to left

（4）Throttle Phase

Toggle the throttle joystick to the bottom and the motor stays still. Gently push the throttle stick upward, motor moves faster and faster, meaning throttle servo correct.

Note The servo phase of each channel for fixed wing should be always: CH1 AILE-NOR, CH2 ELEV-NOR, CH3 THRO-REV, CH4 RUDD-NOR.

If any of the phases on transmitter is reversed, it needs to be reset in the parameter setup menu,

The standard transmitter of A560 RTF is T8FB. To calibrate the transmitter phase, connect the transmitter to the android mobile/computer and setup the parameters with APP or software. Click https://www.radiolink.com/t8fb_bt_manual to download the detailed manual.

Manuals of other RadioLink transmitter are also available on www.radiolink.com .

2.3.3.2 Flight Controller Phase

After checking transmitter phase , flight controller phase on A560 also needs to be checked as.
Note Transmitter phase should be checked before flight controller one. When checking flight controller phase, flight mode should be set as STABILIZE MODE(eg. T8FB SWA-UP, SWB-UP)..

（1）Aileron Phase on FC

Hold A560 with the aircraft body level. Lean/roll it to left, if left aileron is pressed and right one is lifted; then lean/roll it to right, if left aileron is lifted and right one is pressed, meaning the aileron phase on FC is correct.

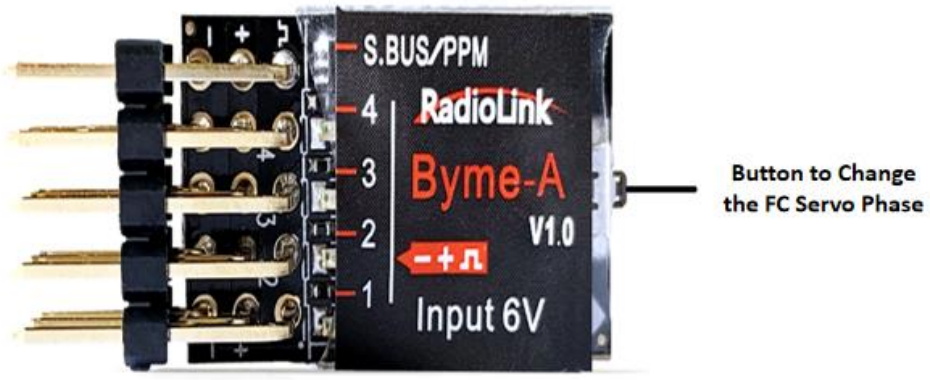
（2）Elevator Phase on FC

Hold A560 with the aircraft body level. Lift up the aircraft head, the elevator servo(horizontal tail) will be lifted. Pitch down the aircraft head, the elevator servo(horizontal tail) will be pressed. Then the elevator phase on FC is correct.

（3）Rudder Phase on FC

Hold A560 with the aircraft body level. Turn it left, the rudder servo(vertical tail) will turn to left. Turn it right, the rudder servo(vertical tail) will turn to right. Then the rudder phase on FC is correct.

If flight controller phase is reversed, press the button at the top of flight controller Byme-A to change servo phase. All flight controller phases can be reset except throttle phase. If throttle resetting is necessary, please enter the transmitter parameter setup menu-servo phase.



No.	Channel	If phase is reversed,	Indicator LED
1	AIL	Short press the button once	Green led to CH1 on/off
2	ELEV	Short press the button twice	Green led to CH2 on/off
3	THRO	N/A	Green led always on
4	RUDDO	Short press the button four times	Green led to CH4 on/off

Note Make sure attitude calibration is done before servo phase calibration. Because flight controller will auto identify NOR/REV and modify gyro direction when doing attitude calibration. Neither the always-on nor off green led means reversed phase. Only toggle the joysticks can check if the corresponding servo phases are reversed.

2.4 Flight Mode Setting

With the three-axis gyroscope and three-axis acceleration sensor and the full attitude algorithm, control algorithm and digital filter, the integrated flight controller Byme-A specially for 3D fixed wing, is different from traditional manual mode. Working with gyro to assist stabilization, Byme-A makes the flight much easier.

There are five flight modes: Vertical Mode, Stabilize Mode, Gyro Mode, Acro Mode, Manual Mode.

No.	Flight Mode	Brief	Switch Position
1	Angle Mode	FC assists to balance aircraft. When joystick back to center, aircraft will back to level. There's max roll angle and pitch angle.	SWA-UP, SWB-UP
2	Rate Mode	FC assists to balance aircraft. When joystick back to center, aircraft will NOT back to level.	SWA-UP, SWB-MID
3	Manual Mode	No FC or gyro assist to balance. The most advanced level for professionals.	SWA-UP, SWB-DWN
			SWA-DWN, SWB-DWN
4	Horizon Mode	Combination of Angle Mode and Rate Mode. When joystick is back to center, aircraft will back to level. There's NO max roll angle or pitch angle. Rolling over is possible.	SWA-DWN, SWB-MID
5	Vertical Mode	Stabilization achieved by FC . One switch to flight vertically.	SWA-DWN, SWB-UP

Flight modes are set by CH5(3-way switch SWB) and CH7(2-way switch SWA) as below.

SWA-UP

Angle Mode

Horizon Mode

Manual Mode

SWA-DWN

Vertical Mode

Rate Mode

Manual Mode

Flight mode setup of other transmitter from RadioLink is the same. Channel 5 and channel 7 are for flight mode setup by default. First select the model type of fixed wing in the setting menu, then set a three-way switch(Ch5) and a two-way switch(Ch7) in the auxiliary channel menu. Five flight modes can be switched with this combination.

2.4.1 Vertical Mode

Vertical Flight Mode can be changed with one switch and control as multicopter, pilots can make the fixed wing automatically fly with the vertical posture. Tutorial video can be checked via https://youtu.be/N2Gm4OUhu-c

At this mode, A560 will keep vertical attitude automatically. The attitude algorithm of flight controller will convert the joystick output to the horizontal coordinates and control with full posture.

Below is the picture illustration with Mode 2 as example:

When the aircraft is vertical, toggle the aileron joystick(Ch1) to control the aircraft moving left or right.

If the joystick on right is toggled to left, A560 flights to left horizontally.

If the joystick on right is toggled to right, A560 flights to right horizontally.

When the aircraft is vertical, toggle the elevator joystick(Ch2) to control the aircraft moving forward or backward.

Note If keep toggling this joystick upward, the aircraft will flight forward with a certain angle.

If the joystick on right is toggled upward, A560 flights forward.

If the joystick on right is toggled downward, A560 flights backward.

When the aircraft is vertical, toggle the rudder joystick(Ch4) to control the aircraft moving (anti)clockwise.

If the joystick on left is toggled to left, A560 flights anticlockwise.

If the joystick on left is toggled to right, A560 flights clockwise.

If toggle the throttle joystick(Ch3) upward, A560 rises vertically; toggle the throttle joystick downward, A560 descends vertically.

2.4.2 Angle Mode

Different form manually control, Angle Mode with flight controller balancing, is suitable for beginners to practice level flight.

The model attitude (inclination angles) is controlled by joysticks. When the joystick is back to central point, A560 will level. The max inclination angle is 70° for rolling while that for pitching is 45°.

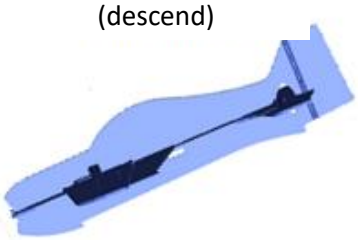
A560 leans to left
(move to left)

Rolling to left

A560l head lifts
(ascend)

Pitching downward

A560 head pressed
(descend)



Pitching upward

A560 turns left

Rudder to Left

A560 turns right

Rudder to right

If the throttle (joystick on left)is toggled upward, A560 accelerate. If toggled downward, A560 decelerate.

2.4.3 Rate Mode

At this more advanced mode, the integrated three-axis gyro assists to increase the stability. But A560 won't level even the joystick is back to central point. The joystick control the rotation(angle speed) of the aircraft. That is, when rolling, pitching or rudder joystick is toggled, A560 will rotate with the corresponding speed.

2.4.4 Horizon Mode

Combination of Angle Mode and Rate Mode makes it easy to realize various free styles such as rolling, rapid pitching, backward, side flight and spiral descending.
A560 will level when the joystick is back to central point. If the joystick is toggled with small range, A560 will move to the corresponding directions.
When toggle joysticks with large range, aircraft will rotate to the corresponding directions.

2.4.5 Manual Mode

No assistance from flight controller algorithm or gyro, all flight movements are realized manually, which requires the most advanced skills.

It's strongly advised for beginners to choose Vertical Mode or Stabilize Mode to practice. Or if in small space, Vertical Mode can be set to take off and landing then switch to level flight(Stabilize Mode/Gyro Mode/Acro Mode/Manual Mode) when reach a certain height. If switch to other flight modes from Vertical Mode, remember to pull the elevator joystick to ensure rising of A560. Otherwise the aircraft will crash.
When at Vertical Mode, the joystick operation is same as that of multicopters.
When at Stabilize Mode/Gyro Mode/Acro Mode/Manual Mode, the joystick operation is standard one of fixed wing. Beginners have better to practice with simulators and get familiar to the operations of aileron/elevator/throttle/rudder joysticks in advance.

Thank you again for choosing RadioLink product.