1M23Z11902

Futaba

Receiver with built-in airplane gyro

# R3306GY

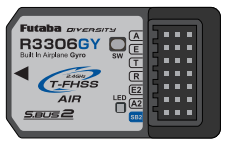
**6-Axis Flight Control**

## Instruction Manual

S.BUS2

For model airplanes

2.4GHz T-FHSS AIR Telemetry System



CE UKCA 合格证 检验员002

## R3306GY Ratings

- Gyro + receiver for model airplanes
- T-FHSS Air-2.4GHz Bidirectional Communication System
- S.BUS2 Port and 6 Channels for Conventional System Receiver
- Dual antenna diversity
- Size: 1.74 x 1.06 x 0.44 in. (44.3 x 27.0 x 11.3 mm)
- Weight: 0.55 oz. (15.5 g)
- Rated voltage: 4.0 V to 8.4 V
- RF power output:20 mW EIRP
- Battery F/S Voltage: It sets up with a transmitter
- Current drain: approx. 63 mA (excluding a servo)
- Operating temperature range: -10ºC to +45ºC

**Applicable systems: Futaba T-FHSS Air-2.4GHz system transmitter**

## Introduction

Thank you for purchasing the R3306GY airplane gyro built-in receiver. This product has the functions of a T-FHSS Air-2.4GHz receiver and a 6-axis gyro for airplanes. Compact and lightweight, the R3306GY is designed to control the ailerons (roll axis), elevators (pitch axis) and rudders (yaw axis). In addition, the R3306GY is equipped with a recovery mode to avoid danger. Features include simple set-up and S.BUS2 connectivity.

## Features

- Combined receiver and airplane gyro.
- Remote gain function.
- 4 flight modes: Recovery mode/Normal/AVCS/Gyro OFF
- Supports 4 ailerons and 2 eleveters.
- Supports a various wing types, includes Flying Wing.
- Supports GP planes and EP planes.

*The R3306GY requires a transmitter with 10 channels or more.

## Set Contents

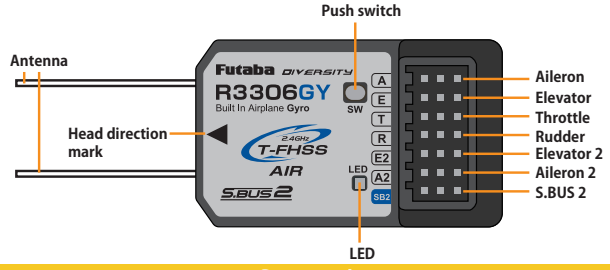
1. R3306GY × 1

2. Double-sided tape × 2

3. Mini screwdriver × 1

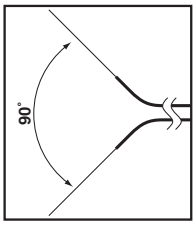
4. Precautions（QR code for the web manual） × 1

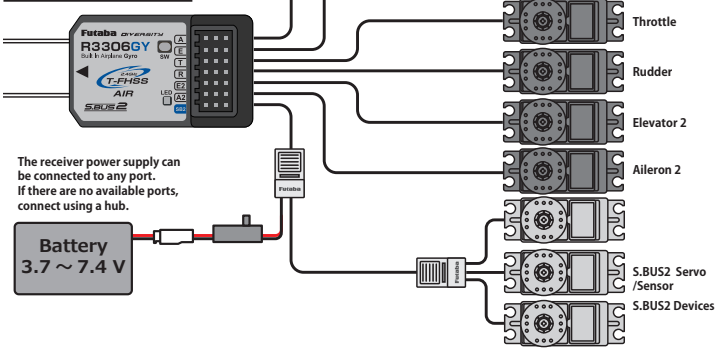
## Each Part




## Connection

(Antenna installation)




## Precautions

### Usage precaution

- Futaba T-FHSS Air system does not work with current Futaba T-FHSS / S-FHSS / FHSS / FASST / FASSTest system.
- The R3306GY receiver can only be used with T-FHSS Air capable transmitters.

### ⚠WARNING

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

**⃠ Do not expose the R3306GY to water.**

**❗Keep away from conductive materials to avoid short circuits.**

### Antenna installation precaution

**⃠ Don't cut or bundle the receiver antenna wire.**

**⃠ Don't bend the coaxial cable. It causes damage.**

**❗The antennas must be mounted in such a way to assure they are strain relieved.**

**❗Keep the antenna as far away from the motor, ESC and other noise sources as you possibly can.**

**❗Be sure that the two antennas are placed at 90 degrees to each other.**

- The R3306GY has two antennas. In order to maximize signal reception and promote safe modeling Futaba has adopted a diversity antenna system. This allows the receiver to obtain RF signals on both antennas and fly problem-free.

### Antenna installation for carbon fuselage

### ⚠WARNING

**❗You must leave 30mm at the tip of the antenna fully exposed. The exposed antenna should be secured so that it cannot move around or back inside of your aircraft.**

### ⚠DANGER

**⃠ Don't connect a connector, as shown right.**

- It will be a short-circuit, if it connected in this way. A short circuit across the battery terminals may cause abnormal heat, fire and burning.


**⃠ Don't connect servo for conventional system to S.BUS2 port.**

- Digital servo for conventional system→ It does not operate.
- Analog servo → It may cause abnormal heat, fire and burning.

### ⚠WARNING

**❗Only S.BUS2 capable devices may be connected the S.BUS2 port. Standard S.BUS servos should not be connected the S.BUS2 port.**

**❗ Check that there is sufficient transmitter battery capacity for flight.**

- Determine the operating time of the receiver, gyro, and servo battery in the adjustment stage and decide the number of flights with a margin to spare.

**❗ Always check the direction of operation of the gyro.**

- Attempting to fly with the operating direction reversed is extremely dangerous. Always check your gyro's direction to ensure safe flights.

**⃠ Do not strike the R3306GY with a hard object. Do not drop it onto a concrete surface or other hard floor.**

- The sensor may become damaged during strong impacts.

**⃠ Do not use the R3306GY for applications other than RC airplanes.**

- This gyro is designed for RC airplanes only. Do not use it for other applications.

**⃠ Do not place R3306GY near heating equipment (engine, motor, ESC, battery, servo, etc.).**

- Always allow the R3306GY to adjust to the surrounding environmental temperature before flight. A large temperature change during use will cause drift and other operational issues.

**❗ The gyro function of the R3306GY stabilizes flight attitude, but it cannot be used with any aircraft. It should only be used with aircraft that are properly manufactured and can fly reliably.**

## Transmitter Function Channel

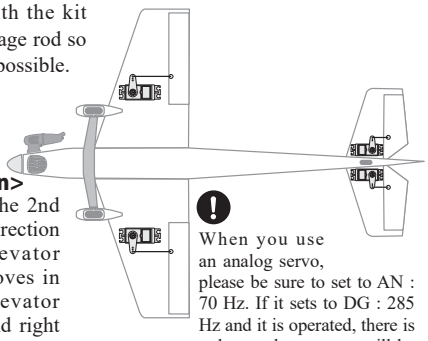
This is the transmitter channel setting. The gain (sensitivity) of each of the three axes can be set independently. Refer to the table below for the settings of each axis.

| | |
|---|---|
| CH1 | Aileron |
| CH2 | Elevator |
| CH3 | Throttle |
| CH4 | Rudder |
| CH5 | Aileron Gain |

| | |
|---|---|
| CH6 | Aileron 2 |
| CH7 | Elevator Gain |
| CH8 | Rudder Gain |
| CH9 | Elevator 2 |
| CH10 | Recovery mode ON/OFF |

## Servo

Link the servo in accordance with the kit instruction manual. Adjust the linkage rod so that the trim amount is as small as possible.



**<2nd servo operating direction>**

During aileron mode operation the 2nd aileron servo moves in the same direction as the aileron servo. In the elevator mode, the 2nd elevator servo moves in the opposite direction of the elevator servo. Mount the servos as left and right objective linkage.

When you use an analog servo, please be sure to set to AN : 70 Hz. If it sets to DG : 285 Hz and it is operated, there is a danger that a servo will be destroyed.

**Digital/Analog servo selection**

Selection of an analog and digital servo is performed in a palameter settings.

**Parameter Settings: 2. Servo type is as follows.**

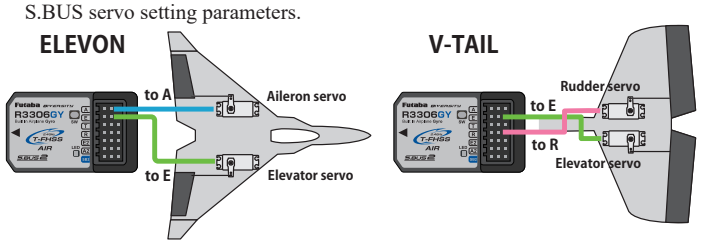
**Digital servo → DG : 285 Hz  Analog servo → AN : 70 Hz**

The stability of digital-servo mode of a flight increases in order to perform a high-speed control action.

## ELEVON/V-TAIL Connection

Set with the wing type of R3306GY. The wing type of the transmitter is not used and is normal.

- Turn off (INH) the elevon / V-tail mixing (Wing type) on the transmitter side.
- Do not use transmitter sub-trim. Adjust using the gyro neutral offset.
- When using the S.BUS servo, you can also use the neutral offset function of the S.BUS servo setting parameters.




## Start up time

When the R3306GY is started, it takes **6 to 7 seconds** to accurately grasp the attitude of the aircraft. During that time, **do not move the aircraft** by fixing it at an inclination of **30 ° or less** horizontally. If it is tilted by 30 ° or more, a startup error will occur and the LED will blink red. In this case, return the aircraft to the horizontal position. R3306GY will restart when it is returned to the horizontal position. Fix the aircraft within 30 ° horizontally even when restarting.

## Servo Operation on the Ground

If the stick is moved when the airplane is on the ground, the servo will move to the limit position. In the AVCS mode, the servo will not return to the neutral position even if the stick is set to the neutral position, but this is normal.

If the stick is moved fully to the left or right three or more times within one second, the servo will temporarily return to the neutral position.

## LED display immediately after startup

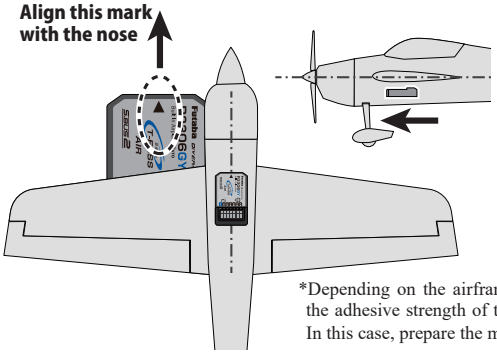
| | State | LED |
|---|---|---|
| 1 | No signal | Red |
| 2 | Waiting for link | Red blinking |
| 3 | Receiving normally | Green |
| 4 | Initializing at startup | Fast blinking Green |
| 5 | After initialization | Green blinking |

## Other LED displays

| | State | LED | Reference |
|---|---|---|---|
| 1 | Recovery mode ON | Slow blinking Green | |
| 2 | Memory error | Red-Green blink | |
| 3 | Startup error | Fast blinking Red | It is tilted by more than 30 degrees. |

## Mounting to the Airplane

Firmly stick the R3306GY to the fuselage with the double sided tape supplied. Install the R3306GYat a level place near the center of gravity where there is little vibration. It can also be installed at the side or rear of the fuselage. In this case, change the mount direction setting.




*Depending on the airframe material such as balsa, etc., the adhesive strength of the double sided tape may drop. In this case, prepare the mounting surface well.

## Link

### Link to the transmitter

1. Bring the transmitter and the receiver close to each other, within 20 inches (half meter).
2. Turn on the transmitter. Place the transmitter into the receiver linking mode.
3. Turn on the receiver.
4. The receiver will wait for the linking process to begin for 3 seconds. Following that it will return to the normal operation mode.
5. The LED will light up green once the link is complete and reception is successful.

(A link waiting state is ended in 3 second.)

- Refer to the transmitters operation manual for complete details on how to place the transmitter into the linking mode.
- If there are many T-FHSS Air systems turned on in close proximity, your receiver might have difficulty establishing a link to your transmitter. This is a rare occurrence. However, should another T-FHSS Air transmitter/receiver be linking at the same time, your receiver could link to the wrong transmitter. This is very dangerous if you do not notice this situation. In order to avoid the problem,we strongly recommend you to double check whether your receiver is really under control by your transmitter.
- If the System Type of the transmitter is changed, the receiver will need to be re-linked to the transmitter.

### ⚠WARNING

⃠ Do not perform the linking procedure while the motor's main wire connected or the engine is operating as it may result in serious injury.

❗ When the linking is complete, please cycle the receiver power and ensure the receiver is properly linked to the transmitter.

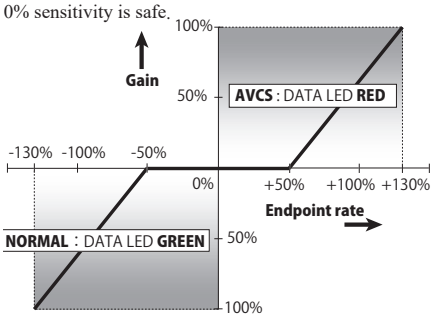
❗ Please power up your system in this order. Transmitter first, followed by the receiver.

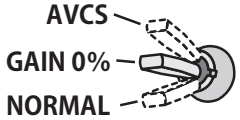
❗ If the R3306GY receiver was previously linked to another transmitter, make sure that transmitter is not operating while linking the receiver to the new transmitter.

## Gyro Sensitivity and AVCS Switching

The gyro has two operation modes: NORMAL mode and AVCS mode.

**In the AVCS mode,** angle control is performed at the same time as NORMAL mode rate (rotating speed) control. **In the AVCS mode,** the neutral keeping force is stronger than the NORMAL mode and the flight attitude of the aircraft is forcefully maintained. During knife-edge flying, idiosyncrasies of the aircraft when climbing will be compensated automatically. On the other hand since the rudder follows when the aircraft stalls, pay special attention to the elevator axis. To be safe, switching to the NORMAL mode when taking off and landing is recommended.When the remote gain function is used normally and AVCS mode switching is performed in accordance with the direction of operation of the transmitter's remote gain channel. At the + rate side, the AVCS mode is selected and at the – rate side, the NORMAL mode is selected. The sensitivity is changed by adjusting the end point rate. If the transmitter has a gyro sensitivity setting mixing function, the sensitivity setting is performed directly. The sensitivity setting criteria by end point is shown in the figure below. The sensitivity becomes zero between end point -50% to +50% and becomes 100% at end point 130%. Refer to the transmitter instruction manual and set the end point. When AVCS is used, setting the 3-positions switch to the sensitivity CH (there are types which cannot be set by transmitter) and setting it as shown above is recommended. In the case of a 2-positions switch, inhibiting the gyro at 0% sensitivity such as NORMAL mode and sensitivity 0% and AVCS mode and 0% sensitivity is safe.




When AVCS is used we recommend that the sensitivity CH be set to the 3-position.

SW **Push 3s**

LED Flashes orange for a moment

Setting mode

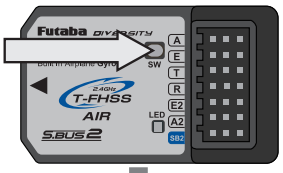
Release SW

| | | LED | |
|---|---|---|---|
| 1.Mount direction (Flat/Side) | Flat (Default) | Green 1 | Default |
| | Side (Mounting on a side panel) | Red 1 | |

Setting change: Short push SW

The setting changes after fast flashing for 1 second.

SW **Push 2s**

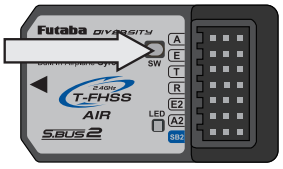


| | | LED | |
|---|---|---|---|
| 2.Mount direction (Normal/Reverse) | Normal | Green 2 | Default |
| | Reverse | Red 2 | |

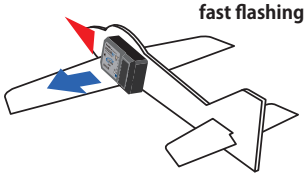
Setting change: Short push SW

The setting changes after fast flashing for 1 second.

SW **Push 2s**



Flat＋Normal

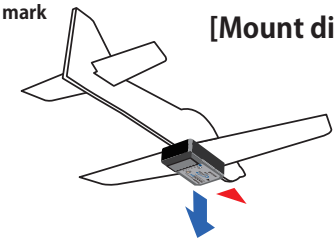


Side＋Normal

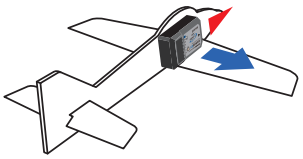
Head direction mark

Label side

[Mount direction]



Flat＋Reverse



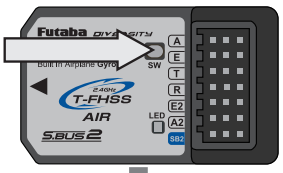
Side＋Reverse

| | | LED | |
|---|---|---|---|
| 3.Servo Type | Digital Servo | Red 3 | Default |
| | Analog Servo | Green 3 | |

Setting change: Short push SW

The setting changes after fast flashing for 1 second.

SW **Push 2s**

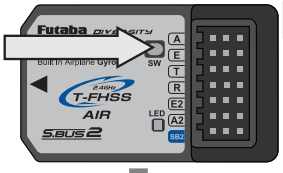


| | | | |
|---|---|---|---|
| 4.Wing Type | Normal | Green 4 | Default |
| | Elevon | Red 4 | |
| | V-tail | Orange 4 | |

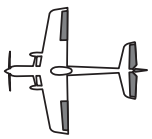
Setting change: Short push SW

The setting changes after fast flashing for 1 second.

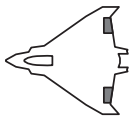
SW **Push 2s**



Normal

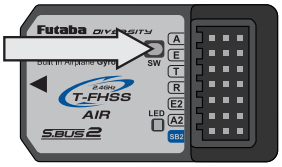


Elevon



V-tail

SW
Push 2s

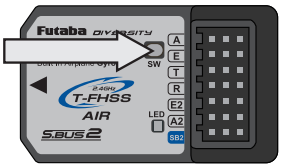



| | | LED | |
|---|---|---|---|
| 5. Gyro Reverse Roll axis AIL | Normal | Green 5 | Default |
| | Reverse | Red 5 | |

Setting change
Short push SW

The setting changes after fast flashing for 1 second.

SW
Push 2s

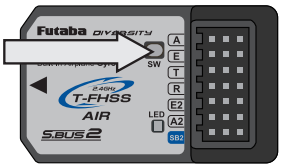



| | | LED | |
|---|---|---|---|
| 6. Gyro Reverse Pitch Axis ELE | Normal | Green 6 | Default |
| | Reverse | Red 6 | |

Setting change
Short push SW

The setting changes after fast flashing for 1 second.

SW
Push 2s

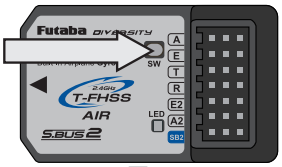



| | | LED | |
|---|---|---|---|
| 7. Gyro Reverse Yaw Axis RUD | Normal | Green 7 | Default |
| | Reverse | Red 7 | |

Setting change
Short push SW

The setting changes after fast flashing for 1 second.

SW
Push 2s




| | | LED | |
|---|---|---|---|
| 8. CH5/9 switching | CH5 | Green 8 | Default |
| | CH9 | Red 8 | |

Setting change
Short push SW

The setting changes after fast flashing for 1 second.

● CH5/9 switching function
The initial setting is to output CH5 (gyro sensitivity CH), and an external gyro can also be connected.

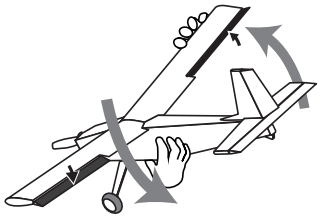
| | | LED |
|---|---|---|
| 9. Reset | Waiting | Green 9 |
| | Reset Wait | Fast flashing |
| | Initialization | Orange 1 |

Power off to escape

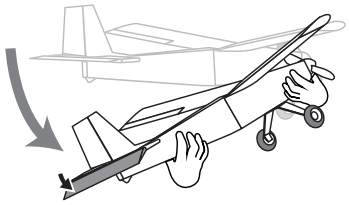
When to reset
Short push SW
Short push Press
Short push 3 times
Short push quickly
when green flashes fast

## Gyro reverse direction check

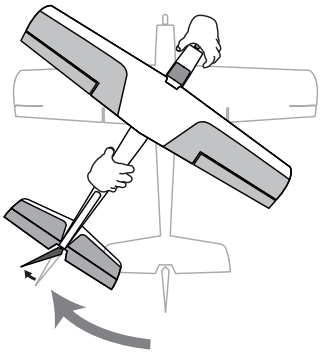
Be sure to check the direction of each servo movement and activate the gyro gain, then check the gyro movement direction as shown below. If the gyro movement direction is reversed, the aircraft will become uncontrollable and will crash.



**Tilt the airplane to the left on the ground and check that the ailerons operate to the right.**



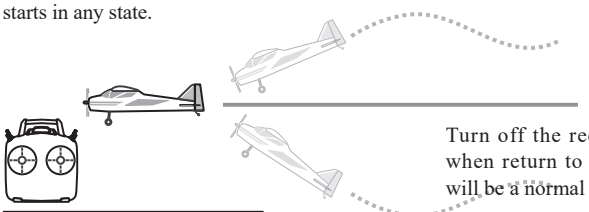
**Raise the airplane with its nose upward and check that the elevator operates down.**



**Turn the airplane to the right on the ground and check that the rudder operates to the left.**

## Recovery Mode（Set with a compatible transmitter or GPB-1）

By turning on the Recovery switch CH of the transmitter, it is possible to automatically return to level flight. It is used in the unlikely event that you lose track of the direction of the aircraft. NORMAL / AVCS / GYRO OFF Recovery mode starts in any state.



Turn off the recovery switch when return to level flight. It will be a normal flight.

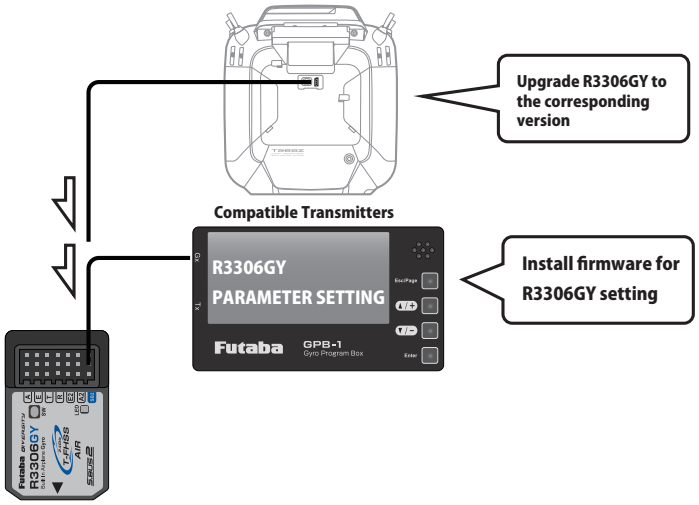
**! Recovery switch CH ON**

Maneuvering is possible even when the recovery switch is ON, but the operation differs as follows.

- When the recovery switch is ON, release the stick to neutral and the aircraft will be in level flight.
- When the recovery switch is ON, the roll and pitch tilt angle is limited to 70 ° when the transmitter travel rate is 100%. Inverted flight is not possible. Decreasing the travel rate of the transmitter will reduce the maximum tilt angle of the aircraft. The maneuvering feels dull and the turning radius increases. If the recovery switch is turned off when turning, the operation will suddenly take effect and the aircraft will tilt and become dangerous. Turn off the recovery switch when the stick is in neutral.
- When the recovery switch is ON, the MODE LED flashes green.
- A momentary type switch is recommended for the recovery mode.

## R3306GY settings from the transmitter or program box

Connect the separately sold compatible transmitters or gyro program box GPB-1 to the SB port of R3306GY, you can set the parameters of R3306GY in the compatible transmitters or GPB-1. However, compatible transmitters or GPB-1 needs to be updated for R3306GY from the Futaba website.  For details, refer to the Futaba website.




The R3306GY will only recognize the connection of a transmitter or GPB-1 immediately after powering on.

Do not connect the transmitter or GBP-1 while the R3306GY is operating, as this may cause a malfunction.

## Air Brake（Set with a compatible transmitter or GPB-1）

This function is the same as the air brake function of the transmitter. Two rates, A1 and A2, can be set.

(The amount of operation is slightly less than that of the air brake function of the transmitter. It can also be used in AVCS mode where the air brake function of the transmitter cannot be used.)

Roll Flat function works even when the air brake is on.

## Camber mixing（Set with a compatible transmitter or GPB-1）

This function is equivalent to the camber mixing function of the transmitter.

It can also be used in AVCS mode where the transmitter's camber mixing function cannot be used.

## Roll Flat（Set with a compatible transmitter or GPB-1）

This function keeps only the roll axis horizontal (roll angle 0°).
When used during landing approach, it keeps the roll axis horizontal, making aileron operation easier and allowing you to concentrate on throttle and elevator operation, making landing easier. It also maintains horizontality during inverted flight. The roll angle at which the roll flat function turns on should be set to 10° to 15° during landing, and 15° to 20° during normal flight, for a smooth flight.
Conditions for the roll flat function to be ON (when all of the following conditions are met)

**1）Roll Flat Switch Channel is set (not INH)**

**2）When the roll flat switch channel is in the - position from neutral when viewed on the transmitter AFR setting screen.**

**3）When the roll flat switch channel operation position is viewed on the AFR setting screen of the transmitter, when the rate value is Wp (%), the roll angle of the aircraft is within Wp/2 (degrees).**

**4）When the aileron stick is in the neutral position.**

**5）When the aircraft pitch angle is ± 60° or less**

**【EX.】When the roll flat switch channel is CH15, if the operating position of CH15 is the AFR rate -50%, the roll angle at which the roll flat function will be turned ON will be within ± 25°**

**When the Roll Flat Switch Channel is set to an AFR rate of -100% or less, the auto recovery mode operates.**

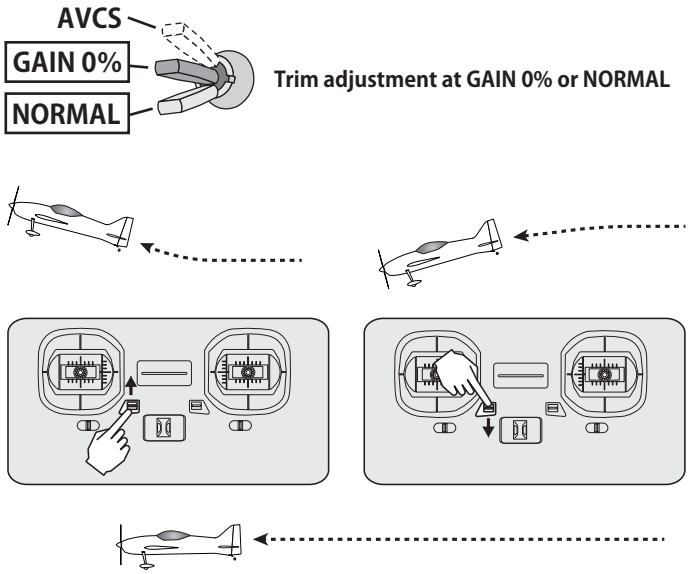
*For detailed settings, refer to the setting manual of compatible transmitter or GPB-1 update manual on the Futaba WEB site.

## Flight Adjustment

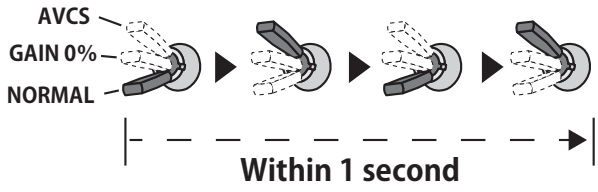
Adjust the transmitter and gyro while repeatedly taking off and landing and with the aircraft on the ground.

### Transmitter adjustments must not be made while flying because it is dangerous.

**1** Fly the plane and adjust the trim with GAIN 0% or NORMAL.




**2** After trimming, switch the gain switch between 0% sensitivity (or NORMAL mode) and the AVCS mode three times at an interval of within one second and then set the gain switch to the AVCS mode position. This memorizes the AVCS mode neutral trim position at the gyro. In the AVCS mode, do not perform trimming during flight.




**3** Adjust the gyro sensitivity so that hunting (deflection of the aircraft in small increments) does not occur in the control axis direction. The gyro sensitivity is different depending on the area of the aircraft rudder, air speed, and gyro used. Initially try changing the sensitivity in 5% steps. If hunting is excessive, the aircraft may be damaged. Hunting tends to stop when the airspeed is lowered.

**⚠WARNING**

**⃠ Do not operate trim in AVCS mode. No mixing is used in AVCS mode.**
- In AVCS mode, all corrections are performed by the gyro. Therefore, turning on trim operation or mixing will result in the same behavior as neutral deviation.

**⃠ Do not set up the transmitter during flight or while the engine or motor is running.**
- Unexpected movements during flight or while the engine or motor is rotating can be extremely dangerous.

## R3306GY Update

R3306GY can be updated from a PC by connecting the separately sold CIU-3 / 2. Please check the Futaba dealer in your country website for the latest firmware and update method.

**https://futabausa.com/**

**Compliance Information Statement (for U.S.A.)**
This device, trade name Futaba Corporation, model number R3306GY, complies with part15 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.
CAUTION: To assure continued FCC compliance
1. Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
2. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
The responsible party of this device compliance is:
FUTABA Corporation of America 2681 Wall Triana Hwy Huntsville, AL 35824, U.S.A.
Phone:1-256-461-9399 FAX:1-256-461-1059 E-mail: service@futabaUSA.com

**Compliance Information Statement (for Canada)**
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
French: Cet appareil radio est conforme au CNR-210 d'Industrie Canada. L'utilisation de ce dispositifest autorisée seulement aux deux conditions suivantes : (1) il ne doit pas produire de brouillage, et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même sice brouillage est susceptible de compromettre le fonctionnement du dispositif. Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

**Declaration of Conformity (for EU)**
Hereby, Futaba Corporation declares that the radio equipment type is R3306GY in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
**https://www.rc.futaba.co.jp/support/manual/**

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取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

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