



TRIPLE AXIS GYRO SYSTEM

Triple Axis Gyro System for Radio-Controlled Helicopters

TAGS01



Operation Manual

JR PROPO
www.jrpropo.co.jp

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Included Items

Gyro Control Unit TAGS01-A:	1 unit
Gyro Sensor Unit TAGS01-S:	1 unit
Sensor Unit Extension Cable:	1 unit
Lead Harness B:	5 units
Dial Adjusting Screwdriver:	1 unit
Double-sided Tape for Fixing Sensor Unit:	3 pieces
Sensor Angle Changing Housing:	2 sets
Operation Manual (this document):	1 document

Thank you for purchasing this JR product.
To allow safe and correct use of the product, please carefully read this operation manual.

Features

The TAGS01 utilizes an advanced control algorithm with a wide dynamic range. This allows unmatched hovering stability combined with extreme maneuverability during 3D flight.

- The CCPM settings that are set in the transmitter are recognized by the gyro, therefore there is no need to change the CCPM settings in the transmitter when installing the TAGS01 (calibration will be required).
- The basic settings can be intuitively carried out using only the switches and dials, which are incorporated separately for each function in the control unit.
- It is possible to connect the unit to a PC for finely detailed adjustments and access to additional functionality. An additional dedicated interface cable and software will be required.
- This product allows firmware version upgrading.

※ The firmware upgrade is carried out by connecting the control unit to a PC using the dedicated USB interface cable, and then installing the firmware. The latest firmware will be available for download from the JR website.

Safety Notes

Please note issues caused by modification of this product, or the use of non-genuine parts, will be outside the scope of the warranty, and this company will accept no responsibility whatsoever.

[Precautions]

- When switching on power to the main unit, do not move the helicopter until the FBL system has initialized. If the helicopter is moved during this period, the control unit will fail to initialize correctly.
- If this unit is used in an engine powered (nitro) helicopter, please always confirm the unit has initialized before starting the engine.
- When using this triple axis gyro, the servos are working at their greatest performance, so it is normal for servo power consumption to increase. Before each flight, be certain to confirm the remaining battery power.
- With this triple axis gyro, in addition to rudder control, the gyro sensor is also used for swash control. If flight is attempted without correctly setting up the transmitter and gyro, there will be a danger of damage to the helicopter or an accident occurring. Before flight, be sure to confirm the gyro settings including the gyro sensor unit direction, control directions, and limit ranges.
- This product is not an auto-pilot. The function of the flybar in previous helicopter designs is now replaced by this gyro. Because the gyro sensor has a wide dynamic range, outstanding performance can be achieved in acrobatic flight, including 3D flight.
- After re-calibration of the main unit, please again confirm servo movement direction

[Prohibited Items]

- 1) Do not use lead harnesses B or the sensor unit cable if they are in any way damaged.
- 2) Do not subject the device to strong shocks. Further, avoid using sensor units that have been subjected to strong impact.
- 3) Never use the TAGS01 outside its rated voltage (4.8V - 8.5V). This may result in failure of the unit, or other accident.

- 4) Do not get the product wet.
- 5) Do not disassemble or modify the product.

Specifications

Model Name	TAGS01
Supported Control Systems	Mechanical mix swash plate systems and all three servo CCPM swash systems are supported.
Number of Receiver Channels Used	4ch-7ch (Swash 3ch + Rudder 1ch, Gain 0ch - 3ch)
Rated Voltage	4.8V - 8.5V
Dimensions and Weight (Control Unit TAGS01-A)	Width 37.0mm x length 55.0mm x height 11.5mm Weight 22g
Dimensions and Weight (Gyro Sensor TAGS01-S)	Diameter 27.0mm x height 10.3mm Weight 16g
Current Consumption	215mA* (* Maximum, when all LEDs are lit)
Recommended Servos	Refer to the servo recommendations in the next section.

Servo Recommendations

Because this product uses a gyro sensor to implement control of all the swash plate (and rudder) servos, it is recommended to use quality servos that are fast and of high torque.

Recommended Servos: Servos that enable this product to perform at its best potential.

Supported Servos: Servos that are capable of being used with this product. However, maximum performance will not be realized.

Recommended Servos

Class	For Swash Use	For Rudder Use
90 Class or Equivalent	DS8915 ※ 1 DS8355 DS8325 / DS8305 DS8925HV	MPH81G MP80G DS8900G
50 Class or Equivalent	DS8915 ※ 1 DS8355 DS8325 / DS8305 DS8925HV	MPH81G MP80G DS8900G DS8400G
500 Class or Equivalent	MP30S MP30T MP30G DS3500G DS3425HV	MP30G DS3500G

※ 1

In the case of the DS8915 or standard servos (NON-HV servos) use this unit in combination with a 2cell Lipo battery and a regulator (JR REG015 or equivalent) that has an adequate output capacity.

WARNING: Please note that ANALOG servos cannot be used with the TAGS01 3 axis gyro.

Due to the precise and constant control of the TAGS01 3 axis gyro, the servos are working hard all the time. This results in higher receiver battery current consumption than when compared to a traditional single gyro setup. Please be sure to check the remaining battery capacity before each flight.

Supported Servos

Class	For Swash Use	For Rudder Use
90 Class Equivalent	MP70A MP70	
50 Class Equivalent	MP70A MP70	

[Precautions]

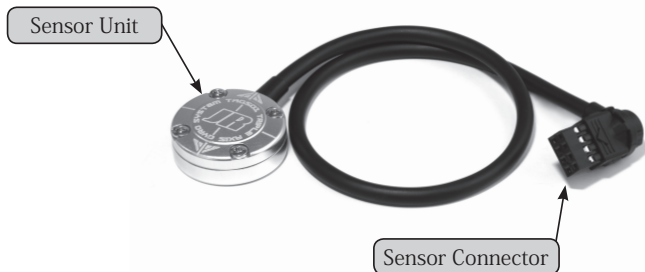
- In using a 2-cell LiPo battery as the power source, ensure your servos support this voltage (HV servos), or use a regulator to supply a voltage compatible with your servos (for example, the JR REG015 or equivalent).
- If using high performance servos, please carefully consider your choice of power supply with regard to capacity and discharge capabilities.
- If the receiver and servos are being powered from a BEC (perhaps in a 500 size helicopter) please take care that the BEC is of sufficient current supply capacity.

Cautions

- Please use servos with high speed and torque to achieve the best performance from this unit.
- If slow servos are used, sometimes the control response will become unstable and the model will be difficult to fly. In this case, please change to servos similar to those recommended above.
- Changes or revisions may be made without prior notice concerning the specifications of this product together with the items described in the operation manual.

The Gyro and Sensor in Detail

Gyro Sensor TAGS01-S



1) Sensor Unit

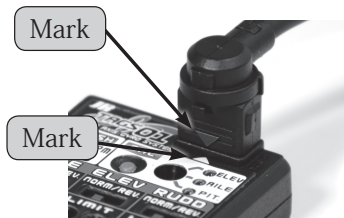
This incorporates the gyro sensor.

2) Sensor Connector

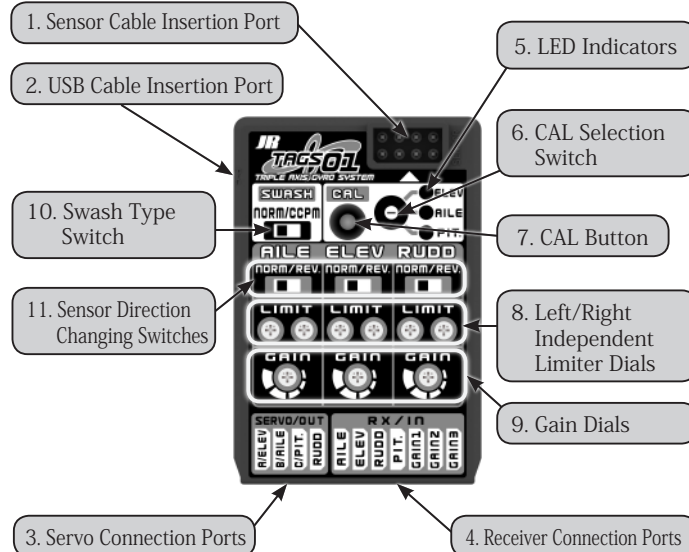
This is the connector for connecting with the main control.

※ If unreasonable force is applied to rotate the connector beyond the stopper, the connector may be damaged.

※ Please observe the connector direction when connecting the connector to the control unit. Make the connection while matching the connector mark with the control unit mark position.



Control Unit TAGS01-A



1) Sensor Cable Insertion Port

The cable from the gyro sensor main unit is inserted here.

2) USB Cable Insertion Port

This is the interface connector for connecting to a PC.

※ For connecting to a PC, the separately available optional TAGS01 dedicated USB interface cable and PC application (GTUNE) will be required (this cable is different from commercially available USB cables).

3) Servo Connection Ports

These are the connection ports for the ELEV servo, AILE servo, PIT. servo and RUDD servo.

4) Receiver Connection Ports

These connect the signals from the receiver.

They are arranged from the left in the order of AILE, ELEV, RUDD and PIT.

Depending on the chosen configuration, between 4 -7 (channel) connection ports will be required.

5) LED Indicators

These display the CCPM swash calibration condition.

Further, during startup and PC connection, each of these 3 LEDs will light or flash according to the operation mode.

6) CAL Selection Switch

During calibration, this is the dial switch for selecting the target control.

7) CAL Button

This is the button for switching between calibration mode and gyro mode. After starting up, operating the CAL button will enable switching to calibration mode.

8) Left/Right Independent Limiter Dials

These dials are for setting the operating ranges of the ELEV, AILE, and RUDD controls. They are operated by turning them using the included screwdriver.

9) Gain Dials

These dials carry out the gain setting for each axis (ELEV, AILE, RUDD).

10) Swash Type Switch

This switch selects the swash system between the Normal (mechanical mix) and CCPM.

11) Sensor Direction Changing Switches

These switch the gyro control direction for each of the ELEV, AILE, and RUDD axes.

About the Connector

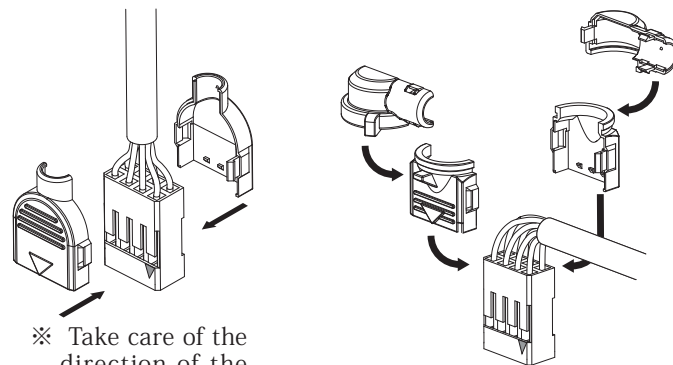
When the sensor unit connector was shipped from the factory, it has L-type connector mounted. However, it is possible to change this to a straight connector.

If using an extension cable (or simply it suites your installation) change the connector configuration before use.

※ Caution

When changing the connector configuration, be absolutely sure not to apply unreasonable force.

Referring to the figure below, ensure the components are assembled correctly.



※ Take care of the direction of the ▼ mark.

※ Take care of the direction of the ▼ mark.

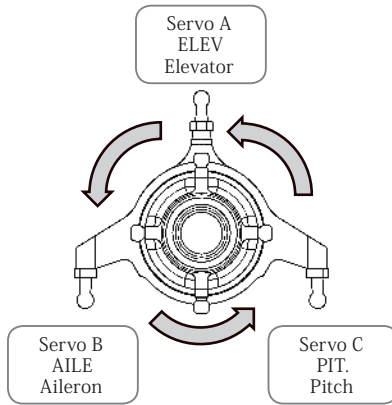
General Considerations

[Caution]

※ If you are installing this unit on an electric helicopter, please unplug the motor power wires from the ESC until you have completed this setup and are ready to fly.

Introduction

- Before connecting the TAGS01, firstly setup the transmitter, receiver and servos in the usual manner and confirm all control functions are working normally (servo directions correct, swash mix directions set correctly, servo arms at neutral, ATV (travel adjust) set to 100% for all swash channels and rudder channel, etc...). Please ensure all transmitter trims are placed (and left) in the neutral position during this step. Note that sub trim can be used as usual to adjust the neutral position of the swash servo arms. Additionally, please inhibit swash mix expo and any transmitter e-ring function. All dual rates should be set to 100%.
- Please note the actual values of the swash mix do not matter



at this point. What does matter is that the swash plate is moving in the correct direction with ELEV, AIL, PIT. Values of (+/-) 60/60/30 are fine. After you complete the setup, you will set the ELEV and AIL swash mix values to set the maximum pitch and roll rates of the helicopter. Often these will be between 50-55%. The PIT swash mix is used to set the total collective pitch throw available. Often values of 30-50% are used here, depending on your rotor head geometry, etc.

- Once set up is complete, and 'real' values are set in the swash mix (for example, ELEV and AIL 50%, PIT 35%) you can use these values during any subsequent re-calibration. All that matters during calibration is the direction of the controls is correct, not the magnitude of the numbers.
- Ensure that the swash plate servos are arranged as shown in the diagram, and adjust so that the swash plate operates normally.
- Please ensure this step is carried out correctly. Refer to the manual for your helicopter and radio for assistance, or get the advice of an experienced pilot.
- Correct setup of the control unit will not be possible until this step is completed.
- After confirming the control settings are correct, please again check that the trims for each channel on the transmitter have been set to zero.

[Caution]

※ If this product is used in a condition where the settings are incorrect, there will be a danger of loss of control leading to an accident. Be sure to setup the product correctly.

Setup Procedures

Flowchart of Settings

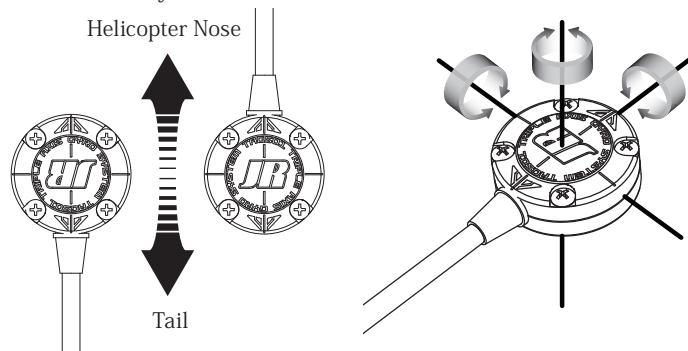
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Regarding the Operation Mode

- There are two modes: Gyro mode for normal use, and the Calibration mode used during setup.
- When the power is switched on, the gyro initializes and automatically enters Gyro (flight) mode.
- When in Gyro mode, Calibration mode can be entered by pressing and holding down the CAL button for approximately 2.5 seconds (or longer).

Mounting in the Helicopter

- 1) With reference to the figure below, mount the sensor unit with the JR logo facing towards or away from the direction of travel. The sensor can be mounted upside down, but not on its side.
 - ※ Mount the sensor in a location where it will experience as little vibration as possible.
 - ※ Be certain to use the included double-sided tape to mount the sensor. If different double sided tape is used, the sensor will be unable to exhibit its full performance. In addition, take great care when mounting the sensor that it is not tilted in any direction.



- 2) Connect the gyro sensor to the control unit.
Take care with the connector direction, and do not use unreasonable force when inserting the connector.
- 3) Set the elevator, aileron, pitch and rudder trims to 0.
In addition, in the situation where a Flight mode is being used, set the trims in each Flight mode to 0.

[Precautions when Mounting the Gyro Sensor]

- Mount the sensor in a location that is not affected by exhaust gas from the engine, or by dust.
- Take care to ensure the sensor is mounted as described above, and that it is correctly lined up with each axis.
- When connecting the sensor to the control unit, confirm the ▼ mark lines up correctly, and insert the connector straight in. If the connector is inserted incorrectly, there is a danger of damaging the connector (refer to "Sensor Connector" on page 6) .

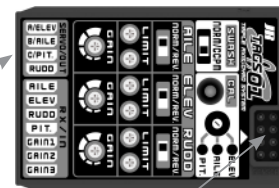
Connecting the Servos and Receiver

- 1) Unplug the swash and rudder servos from the receiver, and plug them into the appropriate ports in the SERVO/OUT area of the control unit.

The ports are arranged in order from the top as described below.

- Elevator
- Aileron
- Pitch
- Rudder

Servo Connection Ports



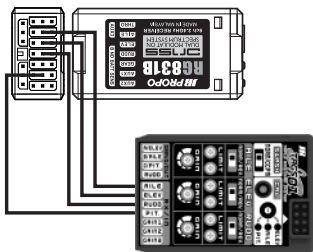
Sensor Cable Insertion Port

Note that the servos connected to the swash plate are arranged counterclockwise in order from the elevator servo followed by the aileron and pitch servos.

For more details, refer to page 10 of this manual.

- 2) Connect the receiver to the control unit.

Make the connection from the receiver to the control unit using the included lead harnesses B while referring to the figure on the right.



- 3) Set the throttle stick to the full slow position, then switch on the transmitter power switch, followed by the receiver power switch.

The control unit LEDs will light, and the swash plate will start moving slowly. Because Calibration is not yet complete, the movement will be random.

- ※ Do not touch the helicopter until the swash plate stops moving. Wait until the movement has stopped, which signifies the end of initialization.

- 4) Select the swash mode.

[NORM] Mechanical Swash (MPM)
[CCPM] 120-140 degree swash



- ※ In the situation where [NORM] is selected, calibration will not be required.

For CCPM swash setup, please continue with the calibration process.

- 5) Press the CAL button (for 2.5 seconds or longer) to switch to the Calibration Mode.

After the 3 LED lamps have flashed, control unit will switch to Calibration mode.



Calibration

Calibration allows the TAGS01 to learn the transmitters programmed CCPM settings and memorize the operating ranges of the sticks. The Calibration process happens individually for each control, in the order of ELEV, AILE, PIT.

In order to avoid the influence of other controls, the swash mixes are briefly zeroed for the controls not being calibrated.

Please also see "About Calibration" on page 37.

Please note: The actual order of calibration (ELEV, AIL, PIT) does not matter, but all three controls must be calibrated during the same session.

Before Carrying Out Calibration

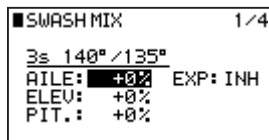
1) As noted on page 10 of this manual, be certain that prior to carrying out calibration, the servos which are connected to the swash plate are in the neutral position. You can confirm that again now by setting the PIT swash mix to 0%. This is another opportunity to confirm the servos are in the exact neutral position (using sub trim), and that the swash plate is level and in the neutral position with the blades at zero degrees pitch (adjusted using the linkages) .

※ Be certain to set the SWASH MIX “EXP” setting to “INH”.

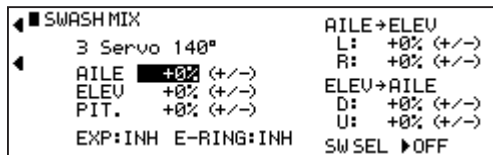
※ Further, if your transmitter supports an electronic cyclic ring function (e-ring) please inhibit this. The TAGS01 includes an e-ring as part of its functionality.

Guide

• XG8 Screen



• 11X Screen



2) About Travel Adjustments

For ch2, ch3, ch6 (AIL, ELE, PIT), set all the values the same so that there is no difference in the up and down directions. 100/100 is a good starting point.

3) Also set the transmitter trims to zero, including any separate trims in each flight mode.

Regarding the sub trims, as long as the numbers set are not extremely large, there will be no problem.

4) **In the case of electrically powered models, disconnect the wiring to the motor to ensure that it does not operate.**

WARNING: Never attempt to fly while in calibration mode.

Start of Calibration

Confirm that the control unit is set to Calibration mode.

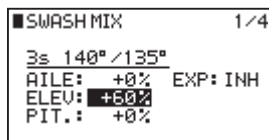
If one of the three LED's is slowly flashing, the TAGS01 is in Calibration mode. Refer to 5), on page 16 for assistance.

Elevator

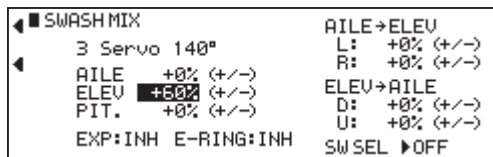
- Using the transmitter SWASH MIX, set all items except ELEV to 0%, and do not move them during the calibration.

Guide

- XG8 Screen



- 11X Screen



- Set the CAL selection switch to ELEV. The **ELEV** LED lamp slowly flashes. If the selection switch is already pointing to **ELEV**, continue to the next step.



- Press the CAL button briefly.

The **ELEV** LED lamp changes to rapid flashing.

- Slowly move the Elevator stick on the transmitter up and down as far as it will go. (Do not move the other sticks.)
When the **ELEV** LED lamp changes to steady (no longer flashing), the elevator calibration is complete.

※ The procedures 2)-4) described above will be the series of actions for each channel.

Aileron

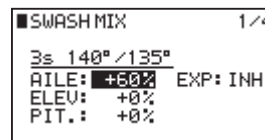
- Using SWASH MIX on the transmitter, return AILE to its original position.

(Take care of the +/- direction.)

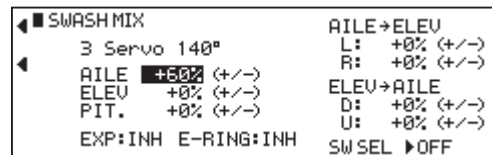
Next, set all items except AILE to 0%, and do not move them during the calibration.

Guide

- XG8 Screen



- 11X Screen



- Set the CAL selection switch to AILE.

The **AILE** LED lamp slowly flashes.

- Press the CAL button briefly.

The **AILE** LED lamp changes to rapid flashing.

- Slowly move the Aileron stick on the transmitter left and right as far as it will go. (Do not move the other sticks.)
When the **AILE** LED lamp changes to steady (no longer flashing), the aileron calibration is complete.

Pitch

1) Using SWASH MIX on the transmitter, return PIT. to its original position.

(Take care of the +/- direction.)

Next, set all items except PIT. to 0%, and do not move them during the calibration.

Guide

- XG8 Screen

```
■ SWASH MIX 1/4
3s 140° / 135°
AILE: +0% EXP: INH
ELEV: +0%
PIT.: -30%
```

- 11X Screen

```
■ SWASH MIX AILE→ELEV
3 Servo 140° L: +0% (+/-)
R: +0% (+/-)
AILE +0% (+/-) ELEV→AILE
ELEV +0% (+/-) D: +0% (+/-)
PIT. -30% (+/-) U: +0% (+/-)
EXP:INH E-RING:INH SWSEL ▶OFF
```

2) Set the CAL selection switch to PIT.

The PIT. LED lamp slowly flashes.

3) Press the CAL button briefly.

The PIT. LED lamp changes to rapid flashing.

4) Slowly move the Pitch stick on the transmitter up and down as far as it will go. (Do not move the other sticks.)

When the PIT. LED lamp changes to steady (no longer flashing), the Pitch calibration is complete.

The above completes the calibration.

Switch off the power to the TAGS01.

After Completing Calibration

- Switch the power off and on then back on.

When the power is switched off and back on, restarting and initialization will be carried out.

※ During initialization, do not move the helicopter and do not touch the transmitter sticks.

※ During initialization, the swash plate will move slowly up and down.

When the swash plate movement stops, the initialization is complete.

- Return the SWASH MIX to its original condition. (Take care of the +/- direction.)

Although the values will be different according to the helicopter servo and rotor head setup, the SWASH MIX will have values similar to those set below. Of course, the +/- may well be different.

Guide

- XG8 Screen

```
■ SWASH MIX 1/4
3s 140° / 135°
AILE: +60% EXP: INH
ELEV: +60%
PIT.: -30%
```

- 11X Screen

```
■ SWASH MIX AILE→ELEV
3 Servo 140° L: +0% (+/-)
R: +0% (+/-)
AILE +60% (+/-) ELEV→AILE
ELEV +60% (+/-) D: +0% (+/-)
PIT. -30% (+/-) U: +0% (+/-)
EXP:INH E-RING:INH SWSEL ▶OFF
```

Operation Confirmation

- ※ **When calibration has been completed, be certain to confirm correct operation.**

If the helicopter is flown with incorrect transmitter, servo or TAGS01 setup, the possibility of crashing is almost 100% - this is clearly a highly dangerous situation.

If the calibration procedure was not carried out accurately, there will be control interaction - for example elevator and pitch may move in response to operation of aileron, and control cannot be carried out normally.

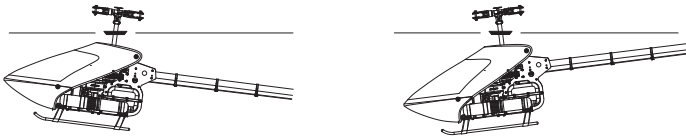
If the main unit is re-calibrated, please again confirm servo movement direction.

Operation Confirmation Method

- 1) Holding the helicopter, tilt it forward and backward and to the left and right.
In response, the swash plate will move so that it remains horizontal.
In the case where the swash plate tilts in the opposite direction, reverse using the sensor direction changing switch.
- ※ The swash plate will slowly follow the angle of the helicopter - the important thing is that it remains horizontal after the initial movement.

When the helicopter is tilted forward or backward

The swash plate maintains horizontality.



When the helicopter is tilted to the left or right

The swash plate maintains horizontality.



- 2) Rudder:

First set the transmitter rudder reverse switch so as the tail servo responds in the correct direction to transmitter stick movement.



Next swing the helicopter in the yaw axis and confirm gyro direction. In the same way as for a normal tail gyro, when the helicopter is rotated in the yaw axis, the gyro should respond with a servo command to oppose the movement. If the gyro responds in the wrong direction, please reverse the sensor for rudder using the direction changing switch on the TAGS01.

- 3) Place the helicopter on a flat surface, and move the throttle/pitch stick up and down.

At this time, confirm that the swash plate remains horizontal, with no movement in the aileron or elevator axes. If the swash plate does not remain horizontal, the calibration has failed, and so please return and check your settings from page 10 on.

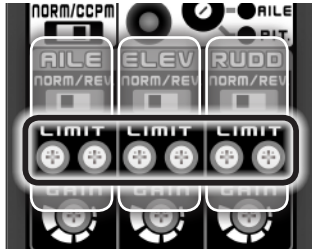
Limiters Setting and Confirmation

The limiters limit the maximum control angles using gyro control.

※ During pitch measurement, do not tilt the helicopter. This is because the gyro will respond to the tilt, and disrupt your measurements.

1) View the main rotor from the side of the helicopter (at 90 degrees to the helicopter nose direction), and mount a pitch gauge.

2) From the condition where the pitch is zero, move the elevator stick to the maximum down position and maximum up position and adjust using the left and right independent limiter dials until the main rotor pitch moves between +12 degrees to -12 degrees.



3) View the main rotor from a position facing towards the helicopter nose.

4) From the condition where the pitch is zero, move the aileron stick to the maximum left position and maximum right position, and adjust using the left and right independent limiter dials until the main rotor pitch moves between +12 degrees to -12 degrees.

5) For the rudder, in the same way as for a normal gyro, move the rudder stick to the maximum positions, and adjust using the left and right independent limiter dials until there is no physical contact or interference.

Please note that with the tail servo in neutral, the tail pitch slider should simply be in the middle of its travel. The actual pitch at this point is unimportant.

[Setting Hints]

As a rough guide, the maximum pitch angle should be set to +/-12 degrees. If +/-12 degrees can not be achieved, set as much pitch as possible with no mechanical binding.

Gain Setting and Confirmation

General Considerations: if the gain is set too low, the gyro effect will become weak, if the gain is raised too high, hunting will occur.

- ※ Carry out adjustments while flying at a dedicated airfield for radio-controlled models to ensure safety.
- ※ If hunting occurs in the elevator or aileron axis, it is easy to lose control of the helicopter, and there will be a danger of an accident occurring.
- ※ Take great care when adjusting the gain dials.

Flight Modes

- This gyro has two gyro sensitivity settings: NORMAL mode and the STUNT mode.

Up till now, we have only been setting NORMAL mode.

Although it will be possible to enjoy maneuvers such as forward flight with the current settings, in the situation where Flight modes are used it is possible, for example, to use the GEAR channel of the receiver to enable gyro sensitivity switching linked with Flight mode selection.

To set STUNT mode, GAIN1 on the control unit should be connected to the GEAR channel of the receiver.

By using the GYRO SENS adjustment on the transmitter, sensitivity switching and adjustment can be carried out remotely.

(Refer to "Detailed Settings: Gyro Sensitivity Switching Modes: 5ch Mode" on page 33)

Settings for Initial Flight

Care is required, since takeoff will be dangerous if the controls are operated too strongly.

- 1) Swash Mixing (The +/- will change depending on the model type.)

AIL • • 50%
ELE • • 50%
PIT. • • 35% (this value is determined by the total collective pitch throw required - see below)
EXP • • INH

2) D/R & EXP

Hovering • • D/R 60% • • • EXP + 20% (Insensitive side)
Stunt • • • • D/R 90% • • • EXP + 20% (Insensitive side)

3) Gyro Gain (In the situation of a transmitter that incorporates a T.LOCK dedicated function)

When using the GYRO SENS function, and T.LOCK is selected. (When using GAIN1)

Hovering • • N (Normal) • • • • 100%
Stunt • • • • T (Tail Lock) • • • 100%
Hold • • • • N (Normal) • • • • 100%

- ※ Each dial should be set to the center position.

By changing the gyro gain up and down, the sensitivity of all 3 axes (AIL, ELE, RUD) will change.

- ※ In the case of transmitters that do not incorporate a gyro sensitivity adjusting function, Travel Adjust should be used.

Other adjustments

- 1) Generally, when using a FBL head, the blades work more efficiently, so you require a smaller collective pitch range than normal. Typically a range of +/- 11 or 12 degrees is ample for most 3D flight.

2) Neutral confirmation

When confirming servo neutral positions, press and hold the CAL button on the control box for several seconds to enter Calibration mode. When in Calibration mode the gyros are inactive, so it is easier to confirm the neutral positions of the servos. To make this easy, set the swash mix to 0% for PIT while setting the servo neutrals. Remember to re-set this to your previous value when finished (be careful of + or - when setting the value). Never attempt to fly in this mode. Always cycle the power to exit this mode and initialize the gyros.

Adjustment Method

- 1) With the helicopter on the ground, slowly increase the main rotor rotation speed.
 - ※ Do not increase the rotation speed suddenly.
As shipped from the factory, the gains have been adjusted to average values.
These are usually a good starting point
 - ※ If the helicopter shows the slightest sign of unstable behavior, immediately reduce the throttle.
- 2) Finally, increase rotation speed until just below the hover.

If the elevator or aileron show signs of hunting (oscillation) during the rotation speed increase, immediately lower the throttle stick, and decrease the gain.

Adjustment:

Completely stop the main rotor rotation, then slightly reduce the corresponding gain (counter clockwise direction) while pressing the main rotor head with your hand.

The adjustment should be a small amount (say 3-5 degrees). Do not adjust by a large amount at once as this may lead to loss of control of the helicopter.



- 3) After confirming that hunting is not occurring, test hover the helicopter.
If the helicopter shows signs of hunting while in the hover, land the helicopter and decrease the gain again.
- 4) If no hunting is seen, the gains should be slowly increased until hunting occurs, then decreased slightly.

Note: If hunting is seen to be in only the elevator axis, decrease just the elevator gain. If hunting is seen only in the aileron axis, decrease only aileron gain. If hunting is in both axes, decrease both gains.

- 5) After setting the gains for hover, some decrease in gain setting may be required during forward flight or 3D flight. If this is the case, either decrease the gain dials as required, or setup remote gain adjustment (page 28) for a separate stunt mode gain. The most common situation is some 'wobble' after releasing a cyclic command - decrease the corresponding gain to eliminate this.

Tail Rotor Gain: The tail rotor gain should be increased until hunting occurs, then decreased to eliminate hunting in the usual manner. A single gain can be used, or multiple remote gains (please see page 28).

About the dials

Because the dial direction is indicated by two points as shown in the figure, these can be used for reference.



The above completes the settings.

Gyro Sensitivity Mode Switching

This product incorporates 4 types of gyro sensitivity switching modes. Select the mode according to your requirements.

※ When gain adjustment is carried out at the transmitter, this will be applied as a plus (or minus) effect to the gain adjustment that was carried out using the control unit.

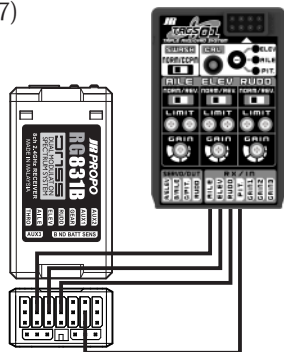
(See "About Flight Modes" on page 37)

4ch Mode

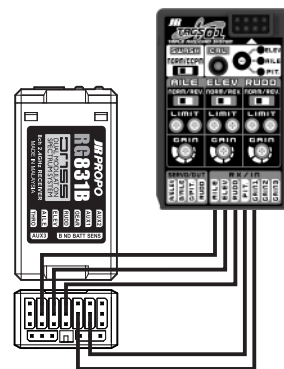
- This mode only uses [NORMAL mode].

The sensitivity adjustment is carried out using the control unit gain dials.

Note that this single gain mode is the simplest and works well in most circumstances. Usually, there is little need for multiple gain controls, which are OPTIONAL.



※ In this situation where operation is carried out only using the gain dials, the lowest limit of gain will be 50% - and the gain cannot be set lower than this. Further, the highest limit will be 150%, and the gain cannot be set higher than this.



5ch Mode (GAIN1 Connection)

- Using the GYRO SENS function on the transmitter, it will be possible to switch between [NORMAL mode] and [STUNT mode].

Note that [NORMAL] and [STUNT] simply refer to two possible gain settings. They could alternatively simply be referred to as gain mode [ONE] and [TWO].

If you choose to run multiple gain settings, the [NORMAL] is usually a hovering gain setting, and [STUNT] is used for forward flight or 3D flying. The [STUNT] gain would normally be set a few percent lower than the [NORMAL] gain setting.

In the situation where T.LOCK has been selected, the setting will be as follows:

N = NORMAL

T = STUNT

Guide

- XG8 Screen

GYRO SENS	1/3
NORM: N	100%
CH: GEAR	ST-1: T 100%
T.LOCK	ST-2: T 100%
TRIM IN	ST-3: T 100%
INH	ST-4: T 100%
HOLD: N	100%

- 11X Screen

GYRO SENS	NORM	GEAR:
LST	AUTO	T.LOCK
		NORM: N 100%
		ST-1: T 100%
		ST-2: T 100%
		ST-3: T 100%
		ST-4: T 100%
DELAY: INH		HOLD: N 100%

Using the control unit, separate gain adjustment is carried out for each control as normal, and then using the transmitter (GEAR channel) the [NORMAL mode] overall gain adjustment and the [STUNT mode] overall gain adjustment can be carried out separately.

※ For both 3D flight and F3C flight, this type of mode selection works well.

For users wishing to carry out swash plate gain adjustment and rudder gain adjustment independently from the transmitter, please refer to the next paragraph and beyond.

6ch Mode (GAIN1/2 Connection)

- Using the GEAR channel and the AUX2 channel, the adjustment for gains is separate for the rudder and swash plate (aileron/elevator).

For each, [NORMAL mode] and [STUNT mode] gain adjustment can be carried out.

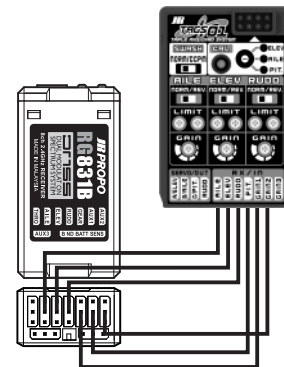
For switching, select TWO GYRO in GYRO SENS on the transmitter to allow adjustment as follows:

- **Rudder axis**
- **Aileron and elevator axis**

Using the control unit, gain adjustment can be carried out independently for each control axis.

On the transmitter, adjustment of the rudder [NORMAL mode]/[STUNT mode] gain and the aileron and elevator [NORMAL mode]/[STUNT mode] gain can be carried out independently.

※ One additional lead harness B will be required.



Channel Connection Gain Control

- ※ GAIN1-GEAR: . . . Rudder gain adjustment
- ※ GAIN2-AUX2: . . . Aileron/elevator gain adjustment

7ch Mode (GAIN1/2/3 Connection)

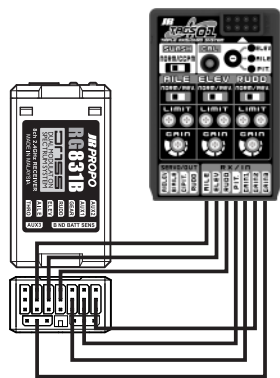
- Using GEAR, AUX2 and AUX3 channels, the gain adjustment is further divided independently into the rudder, aileron, and elevator.

For each, [NORMAL mode]/[STUNT mode] gain adjustment can be carried out.

Using the control unit, gain adjustment can be carried out separately for each control axis.

On the transmitter, each of the rudder, aileron, and elevator [NORMAL mode]/[STUNT mode] gain adjustments can be carried out.

Concerning the gain values, the format will be that the transmitter will increase or decrease the gain of the values set using the dials on the control unit.



※ Two additional lead harnesses B will be required.

Channel Connection Gain Control

- ※ GAIN1-GEAR: . . . Rudder gain adjustment
- ※ GAIN2-AUX2: . . . Aileron gain adjustment
- ※ GAIN3-AUX3: . . . Elevator gain adjustment

Reference Materials (Be Certain to Read These!)

About Flight Modes

In this gyro, two types of gyro sensitivity are set: [NORMAL mode] and [STUNT mode].

Each of these modes are arranged as shown below.

- [NORMAL mode]
These are the settings used when the main rotor rotation speed is low, such as when hovering.
- [STUNT mode]
These are the settings when the main rotor rotation speed is high, such as during forward flight, aerobatics, or 3D flight.

About Calibration

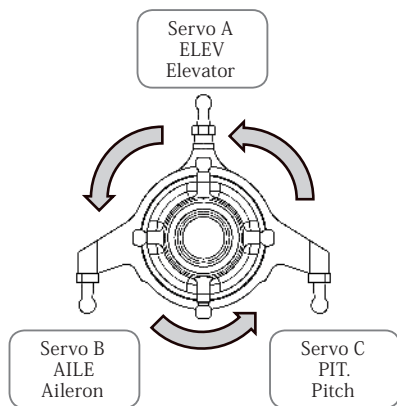
- Calibration must be repeated if the helicopter is modified in any way with regard to the servos or rotor setup.
- If flying is attempted without carrying out calibration, there will be a considerable reduction in function and the danger of an accident occurring due to loss of control. Be certain to carry out calibration.

About Control Surface Settings

- Before mounting this product, ensure that the mechanics and all servos are in good working condition.
- Normally there will be no problem when this product is used with a JR helicopter kit by following the procedures in the manual. However, in the case of other companies' products the servo connection order may be different.

In this case, looking down on the swash plate from directly above, the elevator servo should be taken as the reference and the order of connection should be changed to aileron

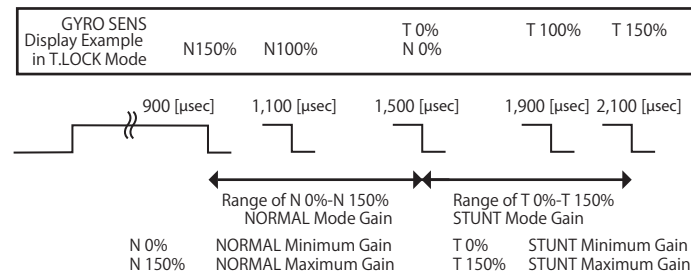
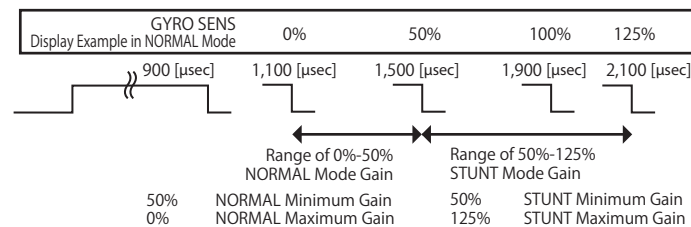
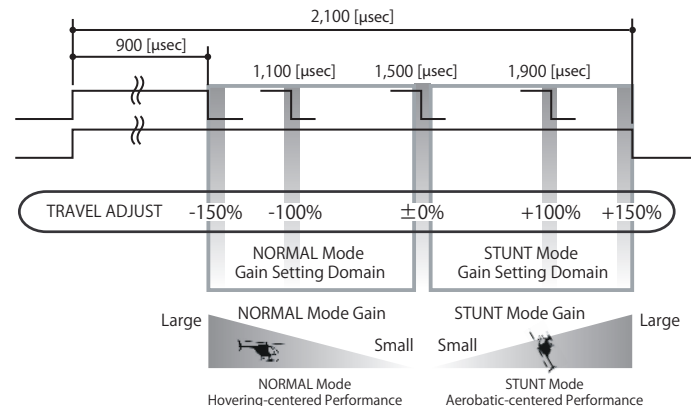
and pitch in counterclockwise rotation. Then set the transmitter so that operation will be normal.



Operation after Completing the Settings (During normal usage)

- 1) Confirm that the throttle is set to the full slow position.
- 2) Switch on the transmitter, then switch on the receiver.
- 3) Do not move the sticks during initialization.
- 4) During initialization, the swash plate will move slowly up and down.
At this time, do not move or shake the helicopter.
- 5) When the swash plate movement stops, and at the same time all the LED lamps switch off, initialization has been completed.
- 6) Before carrying out calibration, be sure that initialization has been completed.

Diagram of Relationship between Gyro Gain and Pulse Width



Repairs and After-Sales Service

For further question or inquiry please contact your local dealer or JR distributor in your country.

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