Futaba®

GYRO & GOVERNOR

GY701

Advanced and adaptive operation

GYRO & GOVERNOR

GY701

Advanced and adaptive operation

INSTRUCTION MANUAL

1M23N23906

CE

Gyro : Instructions for gyro function

Governor : Instructions for governor function

Technical updates and additional programming examples can be found at:

www.futabausa.com

PRECAUTIONS

Meaning of Special Markings

Pay special attention to safety where indicated by the following marks:

⚠**DANGER** - Procedures which may lead to dangerous conditions and cause death/serious injury if not carried out properly.

⚠**WARNING** - Procedures which may lead to a dangerous condition or cause death or serious injury to the user if not carried out properly, or procedures where the probability of superficial injury or physical damage is high.

⚠**CAUTION** - Procedures where the possibility of serious injury to the user is small, but there is a danger of injury, or physical damage, if not carried out properly.

⃠ : Prohibited ❗ : Mandatory

⚠WARNING

Failure to follow these safety precautions may result in severe injury to yourself and others.

- Read through the entire manual before operating this product.

BEFORE EACH FLIGHT:

❗ Always check the transmitter and receiver battery voltage to ensure they have enough remaining capacity to complete the flight.

❗ Always exit programming mode before attempting to fly the model.

❗ Only use the GY701 with a 2.4GHz system such as the Futaba FASST system, or a PCM system. Use with a FM system is strongly discouraged since interference can cause serious operational problems.

Gyro operating precautions: Gyro

⃠ ***The GY701 requires 5-10 seconds to initialize when the power is turned on. Do not move the helicopter and do not move the tail rotor stick during this initialization or the gyro may not initialize properly. Once the initialization process is complete, the tail rotor servo will move to the left extent and then to the right extent. This will occur twice. The indicator light will change to solid red for AVCS Mode or solid blue for Normal Mode.***

❗ Verify that the gyro is operating correctly.

❗ Verify that the gyro compensates in the correct direction before flight. If the compensation direction is incorrect the model will pirouette uncontrollably, at a very high rate.

❗ Verify that the gyro is operating in the desired mode.

❗ Verify that the gyro mounting pads are in good condition.

❗ Verify that the gyro wires are not contacting the frame of the helicopter.

❗ The servo type parameter within the GY701 must match the type of servo you are using. Incorrect setting may damage the GY701 or the servo, possibly resulting in a loss of control during flight.

❗ Always ensure that there is some slack in the gyro cables to help maximize performance. Always use the supplied gyro mounting pads to attach the gyro to the helicopter mechanics. Do not use a strap that encompasses the GY701 sensor. This may affect the overall performance of the gyro.

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

⃠ The GY701 sensor uses a high strength aluminum die cast case. Do not allow anything to touch the gyro case as it may cause a short circuit.

❗ If you are switching between Normal Mode and AVCS Mode in flight, please keep in mind that you must have the gyro re-learn the center position after making a trim change within the transmitter. To memorize the new center position simply flip the gain switch on the transmitter three times between Normal Mode and AVCS Mode (Normal→ AVCS→ Normal→ AVCS) within one second. The tail rotor servo will center indicating that the new center position has been memorized.

❗ When operating the gyro in AVCS Mode, all tail rotor compensation and revolution mixing must be disabled and any tail rotor offsets for flight modes must be disabled.

❗ When the GY701 is operated in AVCS mode the tail rotor servo will not center when the stick is released. This is normal operation for AVCS mode. The servo may also move to the extent while the model is being carried out to the flight line. Before take off, you must center the tail rotor servo by moving the tail rotor stick full left, then full right, back to full left and then allow the stick to center within one second. You can also visually center the tail rotor pitch slider by using the tail rotor stick.

⃠ Do not drop the GY701 sensor onto a hard surface or subject the GY701 sensor to a strong shock as this may damage the sensor.

❗ Always use the supplied mounting pads or the Futaba replacement mounting pads available from your local hobby dealer.

Governor operating precautions: Governor

❗ Always set battery fail safe function at the GY701. Since the GY701, when used, controls the throttle, the battery fail safe function that is in a receiver will not be used.

❗ Throttle fail safe function (transmitter setting): Use the fail safe function for the channel that turns the governor on and off to set the fail safe position to the point at which the governor is turned off. With this setting, when the system enters the fail safe state, the governor will be turned off and the receiver throttle signal (fail safe position preset) will be output directly.

❗ When using the condition hold function, transmitter's function), always set the throttle servo maximum operating point to less than the point at which the governor is turned on. Depending on the conditions, this setting will turn on the governor and prevent the engine from exceeding the set speed even when condition hold is set.

❗ At the beginning of flight, keep the governor in the off state by setting the throttle stick to maximum slow side.

❗ When the model is on the ground, lower the pitch to the position at which the model does not try to lift off. Do not take your eyes off the model. When the governor operates and the rotor speed increases the lift also increases causing the model to try lift off , depending on the pitch position.

❗ Check the sensor output not only when installing the sensor but periodically. Since the magnet rotates at high speed, it is subjected to a large centrifugal force. Check the magnet output and mounting state after about every 10 flights.

❗ If the model begins to shake during operation, immediately turn off the governor. The carburetor design, etc. may cause the engine to operate unstable. If this occurs, lower the maximum speed setting to the range over which there is no problem.

WARRANTY & REPAIR SERVICE (IN U.S.A.)

If any difficulties are encountered while setting up or operating your GY701, please consult the instruction manual first. For further assistance you may also refer to your hobby dealer, or contact the Futaba Service Center at the web site, fax or telephone number listed below:

www.futabausa.com
Phone:1-256-461-9399 FAX:1-256-461-1059

If you are unable to resolve the issue, pack the system in its original container with a note enclosed and a thorough, accurate description of the difficulty. Include the following in your note:

- Symptoms (including when the problem occurred)
- System (Transmitter, Receiver, Servos and model numbers)
- Model (Model name)
- Model numbers and quantity
- Your Name, Address and Telephone number

Send the respective items to the authorized Futaba Service Center Address below:

FUTABA Corporation of America

2681 Wall Triana Hwy Huntsville, AL 35824,

U.S.A.

INTRODUCTION

The Futaba© GY701 is combined heading hold AVCS gyro and head speed governor in one box. Its cutting-edge MEMS (Micro Electro Mechanical System) sensor design, ultra high-speed processing speed and advanced PID control algorithm put it a quantum leap ahead of all other heading hold gyros in size, weight and performance. The GY701 has been optimized to work for model helicopter competition.

FEATURES

- Combined Gyro and Governor in one box. Individual either Gyro or Governor working mode are supported.
- The fastest operation scheme is utilized both the Gyro and Governor section.
- Low profile, small size and lighter weight.
- Small size of the combined one box gyro and governor controller, 44 x 29 x 12mm, 13 g
- Using the 128 x 36 dots graphical white color OLED (Organic Light Emitting Display), high brightness and contrast.
- Easy setting divided by Basic and Expert editing menu. The basic setting is for initial setting and Expert setting is for precise setting.
- Firmware can be updated from PC through CIU-2.
- Supporting the S.Bus connection. Only one wire connection to the receiver can operate the GY701.

FEATURES

- Gyro section
  - Advanced and adaptive PID operation is utilized
  - Small and low profile gyro sensor. 2 colors LED are installed on the top surface. Using the Aluminum Alloy metal case. 21 x 21 x 8mm, 14.5 g
  - Wide operation dynamic ranges up to +/- 1,200 deg/sec.
  - 3 kinds of servo type are supported
  - 3D and F3C operation mode is selectable
  - The Feed forward operation is utilized. Pitch signal can be added to the gyro operation. (F/F mixing, only S.BUS connection)
  - New operation algorithm achieves the more consistent pirouette and smooth Yaw control .
- Governor section
  - Advanced and adaptive PID operation is utilized
  - Fastest operation.
  - Wider revolution control ranges, 1000 rpm-3000 rpm
  - Both digital and analog servo can be selected
  - Revolution compensation by Yaw rate is installed
  - Governor or Rev. Limit mode selectable
  - New operation algorism achieves more faster and smooth revolution control .
  - Back plate sensor can be selected by the option (for OS-91, OS-55, OS-50)
- Other function
  - Maximum revolution memorization
  - Engine runtime integration
  - OLED power saving
  - LED on/off selectable

CONTENTS

Your GY701 includes the following components:

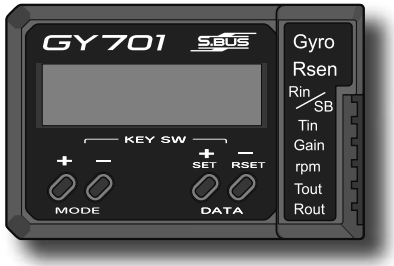
Type of set

- Gyro & Governor set w/BLS251
- Gyro & Governor set
- Governor set
- Gyro set

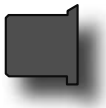
SET CONTENTS				
GY701 Control Amp **Mini Screwdriver* **Dust Covers (x3)*	X	X	X	X
Gyro Sensor **Mounting Pads (x3)*	X	---	X	X
Governor Sensor **Sensor Mounting Hardware* **Magnet (x2)*	---	X	X	X
BLS251 Servo **Servo horn and mounting parts*	---	---	---	X
Extensions (Black/Red)	1	1	2	2

X: supplied ---: not supplied

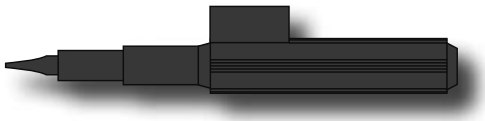
GY701 Control Amp



Dust Cover



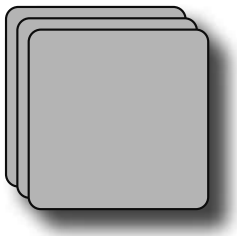
Adjustment Screwdriver



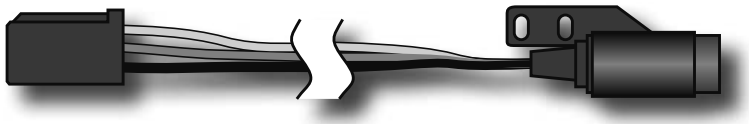
Gyro Sensor

Mounting Pads

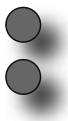
2mm Thick (three)



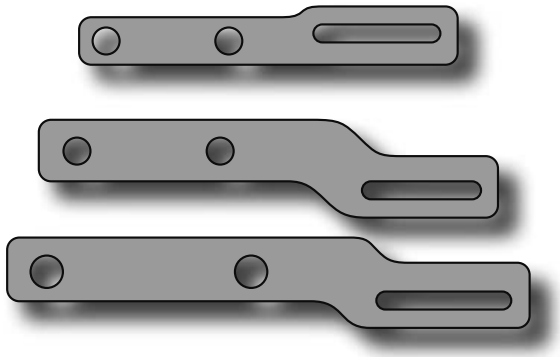
Governor Sensor

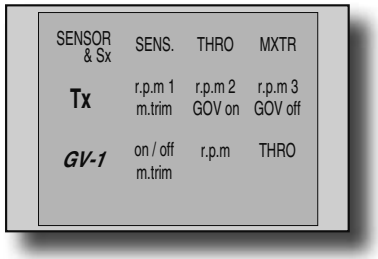


Magnet

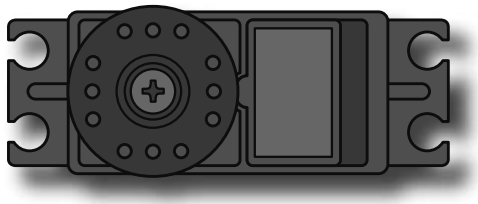


Sensor Mounting Stay



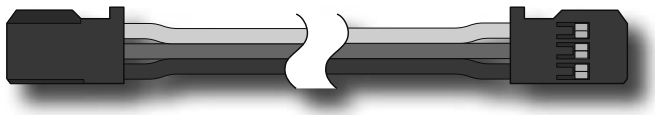


BLS251 Servo

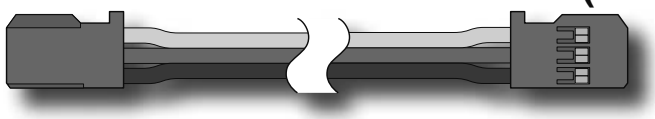


Extensions:

Extension (Black)



Extension (Red)



SPECIFICATIONS

Width (Controller):	1.14in [29mm]
(Gyro sensor):	0.83in [21mm]
(Speed sensor):	0.30in [7.5mm]
Length (Controller):	1.73in [44mm]
(Gyro sensor):	0.83in [21mm]
(Speed sensor):	0.63in [16mm]
Height (Controller):	0.47in [12mm]
(Gyro sensor):	0.31in [8mm]
(Speed sensor):	0.39in [10mm]
Weight (Controller):	0.459oz [13g]
(Gyro sensor):	0.353oz [10g]
(Speed sensor):	0.141oz [4g]
Maximum* Operating Voltage:	3.8V to 8.4V DC
Current Drain:	80mA
Selectable Servo Frame:	70Hz, 280Hz and 570Hz(Gyro only) Rate
Center Pulse Width:	1520µS (70Hz & 280Hz Frame Rate)
Flight Mode:	User selectable F3C or 3D (Gyro)
Control Resolution:	0.1Hz (6rpm) (Engine speed)
Speed stability accuracy:	1%
Speed Control Range:	1,000-3,000rpm (Rotor speed)
Operating Temperature:	14°F to 113°F (-10°C to +45°C)
Control System:	Digital advanced control
Sensor:	Vibrating structure gyro/ Magnetic sensor (Gyro/Governor)
Angular Velocity Range:	±1,200 Degrees Per Second (Gyro)

* The maximum operating voltage listed only applies to the GY701. Always verify that your receiver, servos, tail rotor servo, switch and any other electronic components used in your installation are capable of operating at the voltage you plan to use.

RECOMMENDED SERVOS

.91 Size Helicopters

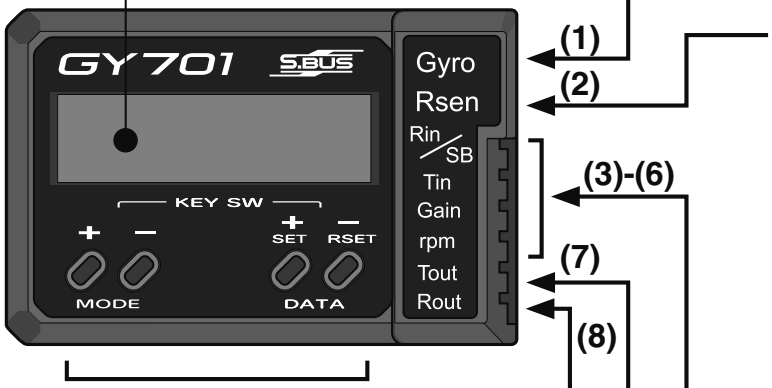
Futaba S9254 Digital Servo Heli: **FUTM0224**
(280Hz/1520µS)
Futaba S9256 Digital Hi Speed: **FUTM0226**
(560Hz/760µS)
Futaba BLS251 Brushless Heli Servo: **FUTM0521**
(560Hz/760µS)

REPLACEMENT & OPTIONAL ITEMS

Futaba PC Interface CIU-2: **FUTM0951**

FSH64 GY520 Extension 200 mm (2): **FUTM4664**
FSH65 GY520 Extension 350 mm (2): **FUTM4665**
FSH66 GY520 Extension 55 mm (2): **FUTM4666**
FSH67 GY520 Extension 80 mm (2): **FUTM4667**
FSH68 GY520 Extension 130 mm (2): **FUTM4668**

FSH69 GY520 Mounting Pad: **FUTM4669**
2x22x22 mm (10)
FSH70 GY520 Mounting Pad: **FUTM4670**
3x22x22 mm (10)
FSH71 GY520 Shield Plate: **FUTM4671**
1x22x22 mm (3)



Edit Keys

- Used when setting data.
- Operated by pushing with the accessory mini screwdriver.

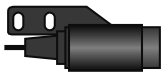
- Connect the GY701 and the receiver with the supplied extensions. [(3) to (6)]

  When using an S.BUS receiver, (4) to (6) are not connected.
- GY701 power requirement: 4.8V (from receiver)

(1) Gyro: Gyro

- Connect the gyro sensor.

*Insert the sensor connector until it is firmly locked.



(2) Rsen: Governor

- Connect the speed sensor.

Receiver

(3) Rin/SB:

- S.BUS receiver: Connect to the S.BUS output of the receiver.
- Other than S.BUS receiver: Connect to the rudder channel output. Gyro

(4) Tin: Governor

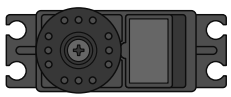
- Connect to the throttle channel output.

(5) Gain: Gyro

- Connect to the gyro gain channel output.

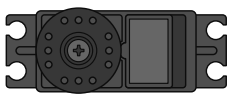
(6) rpm: Governor

- Connect to the governor speed channel output.



(7) Tout: Governor

- Connect the throttle servo.



(8) Rout: Gyro

- Connect the rudder servo.

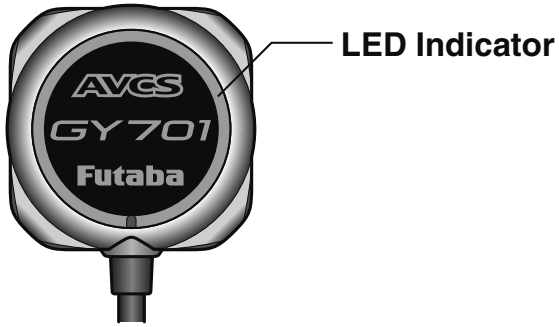
CONNECTING THE GY701 TO YOUR RECEIVER

Connect the supplied extensions to the GY701 connecter. Route the wires through the helicopter mechanics and connect them to the appropriate receiver channels. To determine the appropriate receiver channels please check your transmitter's instruction manual. Using wire mounts, wiring fixtures molded into the helicopter, or hook and loop material, route the extensions to the receiver. Ensure that the extensions leading to the receiver cannot become entangled in rotating components and make sure the extensions are not rubbing against metal or carbon fiber which may damage the wires.

Once the power system is installed into your helicopter please move onto the later section to learn how to program the gyro.

LED INDICATOR DESCRIPTION

Slow Flash: 1/2 Second or longer
Fast Flash: 1/4 Second or shorter



CONDITION	LED INDICATOR	DESCRIPTION
Initialization	*Red Double Flash*	*No Receiver Pulse or Sensor Error*
	Slow Blue Flash	*Warm-Up*
	Fast Blue Flash	*Sensor Initialization*
	Slow Red Flash	*Governor Warning*
Programming	*Blue Single Flash*	*Parameter Programming Mode*
	Slow Blue Flash	*Rudder Limit Setting Mode*
Operating	*Solid Blue*	*Normal Mode, Ready for Flight*
	Solid Red	*AVCS Mode, Ready for Flight*
	Slow Violet Flash	*Offset from the Neutral Position (AVCS)*
	Fast Blue or Red Flash	*Gyro is Rotating*

⚠WARNING

❗ ***Newer high end servos and other radio equipment are capable of placing large demands on the power systems in use today. When using a regulator you must ensure that the regulator is capable of delivering the current demands of the equipment you have selected. In addition to this make sure the wiring and switch you have selected are capable of handling high current draws.***

❗ Even though the GY701 is a high performance gyro and governor it will be necessary to ensure that the helicopter mechanics are also in optimum operating condition. Please use the guidelines below and address all issues before installing and test flying the GY701.

- The GY701 must be used with a rigid tail rotor drive system. Any modern torque tube or belt drive system should be adequate. Do not attempt to fly the GY701 using a wire driven tail rotor system.
- Always ensure the drive gears, torque tube, pulleys, belt, bearings and shafts are in proper working condition. If any of these items are damaged or worn they must be replaced.
- The linkage rod, tail rotor bell crank, pitch slider and tail rotor grips must operate without friction to obtain the best performance from the GY701. If any binding is present it must be fixed before the helicopter can be flown. Binding in the tail rotor control linkage will decrease the performance of the GY701 gyro and this may also shorten the servo lifespan. Please take the time now to ensure the tail rotor system on your helicopter is working correctly, without friction or binding. Gyro

- Vibration will affect the GY701's overall performance. All rotating components on the helicopter should be balanced to minimize vibrations in flight. Ensure that your motor is running smooth and all vibrations have been addressed before installing and test flying the GY701.

The GY701 starts the initializing process when powered up. After it is finished initializing, the GY701 starts initializing and moves to the home screen.

Boot up display

The OLED shows the screen below. The upper line indicates the identification code of the GY701 and the line below indicates the firmware version.

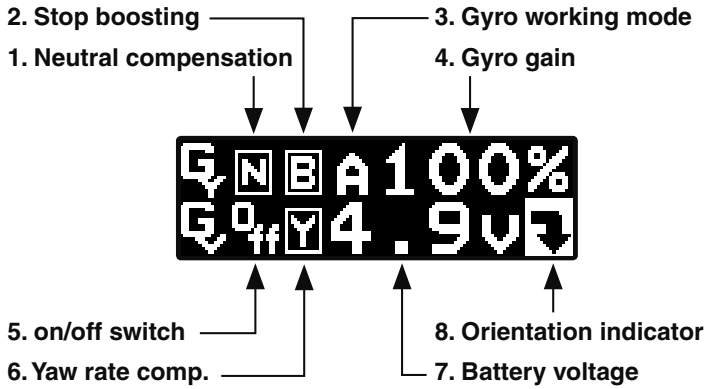
Initializing display

The helicopter images are displayed during initializing. After completing the initialization, the rudder servo moves CW-> CCW as it finishes and moves to home screen. The helicopter must not be moved during the initializing process.

After finishing the initialization sequence, OLED changes the display to Home screen. There are 3 kinds of the Home screen related by the operation mode. The home screen shows the information follows.

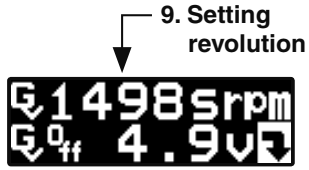
Initial Home screen

•Gyro+Governor mode



•Gyro only mode

•Governor only mode



1. Neutral compensation Gyro

It indicates the function of the neutral compensation when the pirouette stop is active. No display shows when inhibited.

2. Stop boosting Gyro

It indicates the function of the gain boosting when pirouette stop is active. “G” character is displayed when inhibited.

3. Gyro working mode Gyro

This indicates the gyro working mode is either AVCS or Normal mode. The inverse “A“ character is displayed when the rudder neutral is offset.

At the AVCS mode

At the normal mode

Neutral offset at AVCS mode

At the AVCS mode, move the rudder stick more than 2 times left and right full within the period of 1 second and return the stick to neutral position, the rudder servo memorized the neutral position. The OLED shows the "--------" display at this condition.

Reset AVCS

Hold the rudder stick to neutral and move the gyro gain channel, Normal→AVCS→Normal→AVCS in the 1 second period. After doing so, the rudder stick neutral is memorized by the GY701 to match the rudder stick neutral. This operation is useful for rudder neutral re_trimming from normal mode to AVCS mode. After finished the operation, OLED shows "********". The GY701 always renews the rudder neutral position during power up with AVCS mode. The rudder stick must be left in the neutral position during starting up.

Reset rudder neutral

4. Gyro gain Gyro

It indicates the gyro working gain.

5. on/off switch Governor

This shows the switch condition of the governor. The governor is active when ”On” displayed.

6. Yaw rate comp. Governor

This indicates the revolution compensation when the pirouette is active. No display shows when the function is inhibited.

7. Battery voltage

This indicates the battery voltage. The Low battery is displayed at below 3.8 volts.

8. Orientation indicator

This acts as the operation guide. Pushing the key switch below this indicator changes the editing mode.

9. Setting revolution display Governor

This displays the setting revolution of the governor. It shows only in the governor operation mode.

Revolution display Governor

The battery voltage display automatically changes to the engine revolution display once the engine is running, and returns to battery voltage display

when the engine stop. The revolution mode can be selected either during main rotor revolution or engine revolution. The rpm character starts blinking slowly when the governor starts operating and blinking fast when the revolution reaches +/- 2% of the setting revolution. The rpm character changes to inverse character as the revolution increases to within +/- 1% of the setting when the revolution is locked.

For the governor only mode, the revolution is displayed on the top of the display line during engine run.

Sub_Home screen

At the home screen display, the display below the line is scrolled to Battery voltage→Max. revolution→Engine runtime→OLED display mode→LED display mode→Operation mode by pushing the mode + or - key.

---

1. Max. revolution Governor

This memorizes the maximum engine revolution during operation. The display is changed to Max. revolution by pushing the mode + key. The revolution data is stored in the memory. The data is reset by pushing the data + or – key for more than one second.

---

2. Engine runtime Governor

This displays the engine runtime integration. The display is changed to runtime mode by pushing mode + key 2 times from home screen. The display unit will show seconds until 100 hours is reached xxHxxMxx, over 100 hours, minutes as xxxxHxxM. The display is reset by pushing data + or – key for more than 1 second.

---

3. OLED display mode [default: Saver]

This selects the OLED display mode. The Saver mode reduces the brightness and saves the power consumption after no editing has been done for 60 seconds. The brightness is returned by pushing any key. The Light mode always lights to the maximum brightness.

---

4. LED display mode [default: ON]

It selects the display mode of the LED on the gyro sensor. The LED is lit during ON setting, turned off by Off setting for power saving. The mode can be changed by pushing the data + or – key.

5. Operation mode [default: Gyro+Gov]

This sets the operation mode of the GY701. Set to "Governor" when the gyro sensor is not used and set "Gyro" when the governor sensor is not used. Set "Gyro+Gov" when the both gyro and governor sensor are installed. Mode is changed by pushing the data + or – key. The home screen is changed after changing the operation mode. The "SensorER" is displayed when the gyro sensor is not installed and the operation mode is set "Gyro" or "Gyro+Gov" mode. Push any key to escape this display and set the operation mode to "Governor".

When the operation mode is changed, you will need to reboot the GY701. During the operation, you can not change the mode.

WARNING Display

Governor warning display Governor

The warning symbol is displayed when the governor is on during power up. The governor is never activated at this time. The governor will work once the condition is turned off. The governor must be off while starting the engine.

Input error Gyro

This indicates no rudder or throttle signal input. The GY701 does not work in this condition.

Sensor error Gyro

The gyro sensor is not working. The gyro does not work in this condition.

Low battery

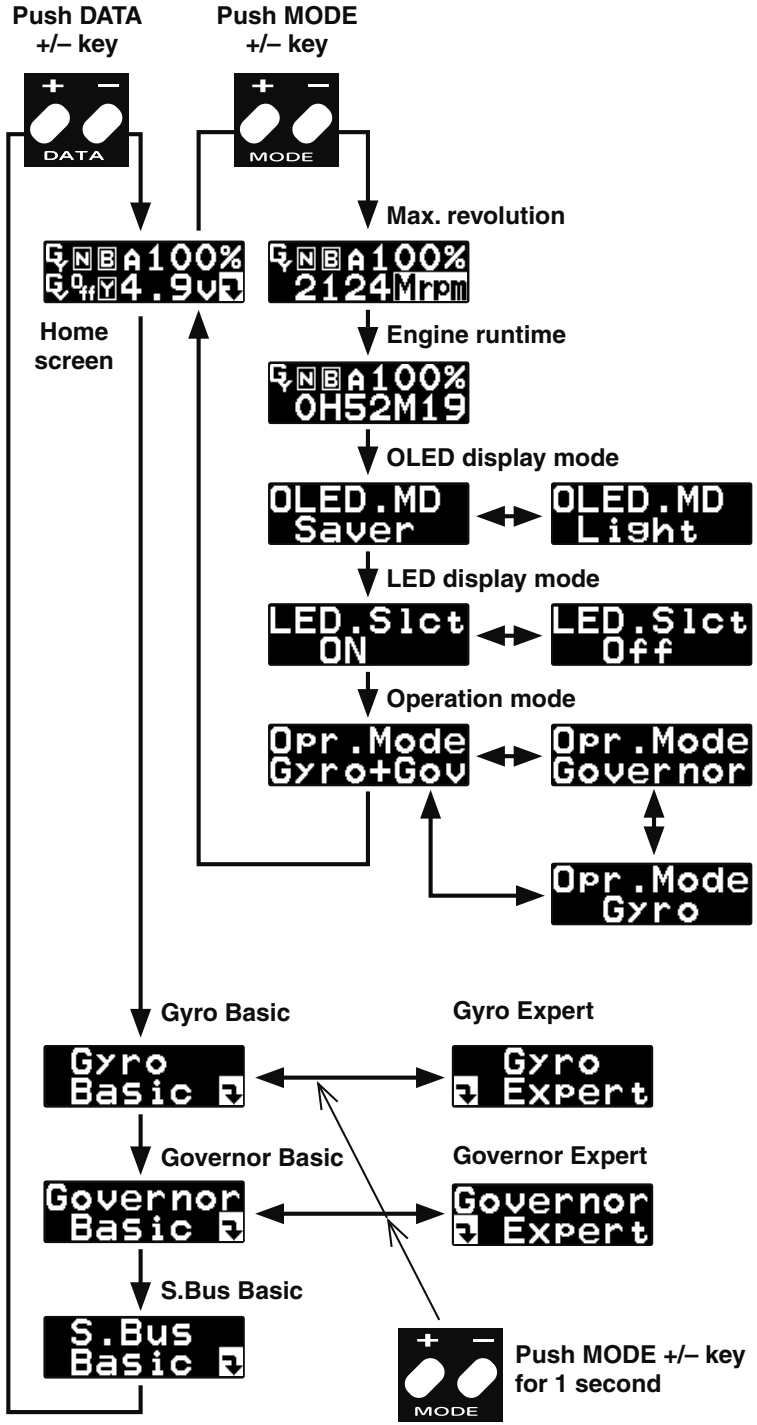
It displays as the battery voltage becomes less than 3.8 v. If low battery is recognized for more than 1 second, the governor goes info low battery condition and the governor operation is stopped. If the B/FS function is activated, the throttle servo is moved to setting position by B/FS function. The B/FS condition is reset for 30 seconds by moving the throttle stick to low full. Throttle servo can be controlled by stick. After 30 seconds have passed, you can go into B/FS condition again. This sequence lasts indefinitely. The helicopter should be landed immediately if B/FS is active.

The edit mode is changed to Gyro basic, Governor basic, or S.Bus basic mode by pushing the data+ or- key. These modes set the basic operation for initial flight. By pushing the mode + or – key for more than 1 second at the gyro or governor screen, the editing mode is changed to the expert mode, more precise setting can be done in this mode. Pushing the mode+ or – key for 1 second again, the editing menu will return to basic menu. The setting of the governor functions are skipped in the gyro only mode and the gyro function are skipped in the governor only mode as well.

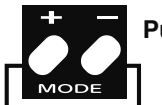
Pushing the mode+ or – key at basic or expert mode, the edit menu will scroll and the parameters can be set in each menu.

At the home screen, the display is changed to Max. revolution→Engine runtime→OLED display mode→LED display mode→Operation mode by pushing the data+ or - key.

The diagram below shows the edit sequence. The instruction describes the Gyro+Governor mode after.



This sets the gyro's fundamental functions. The menu ***(4) Servo limit point setting*** should be set first.



Push MODE +/– key

(1) Start display

The editing menus are scrolled by pushing the mode + or – key.

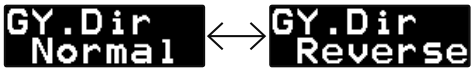
(2) Servo type [default: DG:1520]

Selection of the servo type to be used. The servo type is changed to Digital 1520, Digital 760 or Analog by pushing data+ or – key.

DG 760: BLS251, S9256, S9251
DG 1520: BLS254, BLS257, S9254, S9257

⚠WARNING

❗ This parameter must match the type of servo you are using. Incorrect setting may damage the GY701 or the servo, possibly resulting in a loss of control during flight.



(3) Gyro direction [default: Normal]

Setting the gyro operation direction. Set the direction as the gyro operates the servo to right direction when the helicopter moves to left. The direction is changed by pushing the data+ or – key.

⚠WARNING

❗ Verify that the gyro compensates in the correct direction before flight. If the compensation direction is incorrect the model will pirouette uncontrollably, at a very high rate.

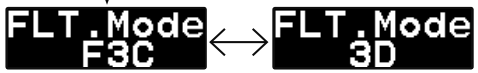
(4) Limit setting [default: 100%, setting range: 50 ~ 150%]

Adjusting the maximum servo throw. Set the amount to limit the rudder throw.

Move the rudder stick right (left) maximum. At this point, increase or decrease the movement by pushing the data+ or – key.

⚠WARNING

❗ When using the GY701 for the first time, or when making changes in the throw of a servo, always perform the limit setting operation.



(5) Flight mode [default: F3C]

Selection of the flight style. F3C mode is more precise rudder control, the 3D mode is more active rudder control, pirouette speed is faster than F3C mode. The mode is changed by pushing the data+ or – key.

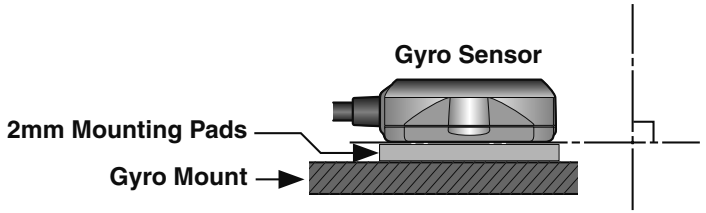
Pirouette rate at AFR100% to full stick:
F3C = 450 deg/sec
3D = 720 deg/sec

GYRO SENSOR INSTALLATION

The gyro sensor should be mounted on a rigid platform, at least 6in [152mm] away from a Nitro Engine. It is not necessary to mount the gyro near the main shaft of the helicopter but it is very important that the mounting area chosen is rigid. Please refer to your helicopter manufacturer's instructions for recommended mounting locations.

Installing the gyro sensor

The GY701 is supplied with three 2mm Mounting Pads. When mounting the gyro in a larger electric or .50 through .91 size nitro helicopter we recommend using a supplied 2mm Mounting Pad.



TROUBLESHOOTING

If you experience erratic gyro operation (drifting, not holding well or inconsistent pirouette rate), please follow the troubleshooting tips listed below.

1. Always verify that your model's tail rotor control and drive system are working correctly.
2. Electromagnetic interference could affect the gyro or tail rotor servo. Mount the gyro in a different location, away from the electronic speed control, servos and drive motor.
3. The trouble may be caused by vibration. Verify that your helicopter's components are balanced. If problems persist, try mounting the gyro in a different location.

TAIL ROTOR SERVO INSTALLATION AND SETUP

Following your transmitter instructions, program your transmitter as follows:

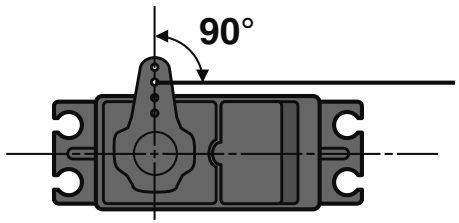
- ❑ Enable the gyro function within the transmitter.
- ❑ Set the gyro mode to AVCS (GY) within the transmitter.
- ❑ Set the remote gyro gain to 70% AVCS in the transmitter for the Normal and Hold flight conditions and use 40% AVCS for all idle up conditions. See "Setting The Gain" section later in this manual for more details.
- ❑ Set the Tail Rotor ATV/EPA to 100% for both left and right.
- ❑ Set D/R to 75% for both left and right. This will reduce the maximum pirouette rate. Make adjustments to these values once the initial test flight has been completed.
- ❑ It is recommended that you run 30% softening expo on the tail rotor channel.

⚠WARNING

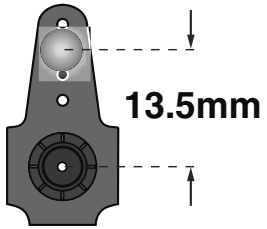
⃠ Do not connect the tail rotor servo to the gyro until the servo type has been selected. Operating the servo using the incorrect setting may damage the GY701 or the servo.

Once these steps are completed, turn the receiver power on and allow the gyro to initialize. Follow the instructions within the "***Gyro Basic Setting***" section of the manual and select the Servo Type that matches the servo you have chosen to use. Power down the receiver for now.

- ❑ Install the tail rotor servo into the mechanics and connect the servo to the gyro. Remove the servo arm screw from the servo. Turn the receiver power on and allow the gyro to initialize. Enter the "***Gyro Basic Setting***" mode and go to parameter (4) "Servo Limit Point Setting". While in the servo limits parameter the servo will remain centered.



- ❑ Place an appropriate servo arm onto the servo and ensure that it is perpendicular to the tail rotor pushrod as shown. Remove the unused sides of the servo arm.
- ❑ Install the control ball supplied with your helicopter onto the servo arm. For larger electric models or nitro powered models we recommend placing the ball 13.5mm from center. Once the control ball has been installed place the arm back onto the servo ensuring that it is perpendicular to the tail rotor pushrod. Install the servo arm screw.



- ❑ Follow the instructions within the "Servo Limit Point Setting" section and set the servo limits for the tail rotor servo. Hold the tail rotor linkage over the linkage ball to avoid damaging the servo. Once the limits are set you can place the linkage onto the linkage ball. When using AVCS mode the optimum setup is to have 0° of pitch with the tail rotor servo centered and use all of the available pitch range in the tail without binding.
- ❑ Turn the receiver power off to exit programming mode and then turn the receiver power back on. Once the gyro has completed initialization move the tail rotor stick to the right on the transmitter and verify that right (clockwise rotation) tail rotor pitch is inputted to the tail rotor blades. If left tail rotor pitch is inputted to the tail rotor blades, then it will be necessary to reverse the tail rotor channel in the transmitter.
- ❑ Pick the helicopter up by the main shaft and rotate the mechanics counter-clockwise (from the top). The gyro should compensate by adding clockwise rotation pitch to the tail rotor blades. If the gyro compensates by adding counter-clockwise rotation pitch to the tail rotor blades then it will be necessary to reverse the "Gyro Direction" setting within the gyro (refer to the "***Gyro Basic Setting***" section earlier in this manual).

If you are going to fly AVCS Heading Hold mode exclusively, then the gyro setup is now complete.

- ❑ Transmitter and Receiver batteries are fully charged.
- ❑ The gyro mounting pads are in good condition.
- ❑ The gyro wiring has some slack in it and all wires are clear of the main frame.
- ❑ Power on the transmitter and receiver. Allow the gyro to initialize.
- ❑ The GY701 servo type parameter matches the servo you are using.
- ❑ The Tail rotor servo arm is perpendicular to the pushrod and the pitch slider is centered.
- ❑ The servo does not bind when full left or full right tail rotor is applied.
- ❑ The gyro is operating in the correct mode (AVCS or Normal).
- ❑ The tail rotor stick operates the tail rotor the correct direction.
- ❑ The gyro compensates the correct direction when the helicopter is rotated.
- ❑ The gain is set correctly and the gyro operates in the correct mode (AVCS or Normal) in every flight condition.

⚠WARNING

❗ Always make small (1%) adjustments to the tail rotor D/R or EPA once the value exceeds 100%. Over 100%, it is possible to exceed the sensor's Angular Velocity Sensing Range (+/- 1,200° per second). The gyro will then no longer control the pirouette rate or consistency. The pirouette rate will be extremely fast.

If you experiment with the ultra-fast pirouette rate, make sure that your flight battery and fuel tank are secure. Also be certain that your model's tail rotor drive train is up to the task.

The Tail Rotor AFR or D/R function within the transmitter is used to adjust the pirouette rate of the helicopter. For example at 100% D/R, with the gyro set to F3C mode, the helicopter will achieve a 450 deg/sec pirouette rate. If you would like the model to pirouette faster, then increase the AFR or D/R. If you would like the model to pirouette slower, then decrease the AFR or D/R.

The gain should be raised until the tail begins to oscillate quickly (also called Tail Wag). Once this point has been achieved, reduce the gain by a couple of percent and test fly the model again. Check and set the gain for each flight mode. Typically the gain will be lower for the Idle up 1 and Idle up 2 flight modes due to the higher head speed being used. The gain for the Hold condition can also be much higher than other flight modes since the head speed is lower and the engine vibration is minimized.

The tail rotor ratio, tail rotor pitch range and tail blade length play a large part in achieving optimum tail rotor performance. The gain value can vary drastically from model to model and the exact value should not play a part in the evaluation of the gyro's performance. How the gyro operates during flight is the only concern of ours.

Most pilots today are using AVCS Mode. If you are just starting out, it is recommended that you use AVCS Mode exclusively from the start. Normal Mode is rarely used today due to the performance benefits of AVCS mode. When using AVCS mode all trimming of the tail is automatically handled by the gyro. If you should decide to use Normal Mode than all trimming and mixing must be setup by you.

If you will be using the Normal Mode (also referred to as Rate Mode) then a few changes to the setup will be necessary. The tail rotor should be set to 10 degrees of tail rotor pitch (to counteract torque) when the tail rotor servo is centered. With clockwise rotating main rotor blades this means 10 degrees of right tail rotor pitch will be necessary to counteract torque. In addition to this it will be necessary to use the tail rotor compensation or revolution mixing functions of your transmitter to help counteract torque. Please see your transmitter instruction manual for more information on how to set this up.

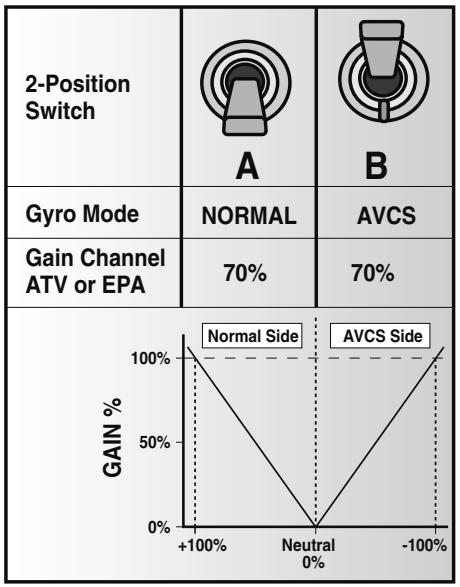
If you decide to switch between Normal Mode and AVCS Mode in flight, you must have the gyro re-learn the center position after making a trim change within the transmitter. To memorize the new center position simply flip the gain switch on the transmitter three times between Normal Mode and AVCS Mode (Normal→AVCS→Normal→AVCS) within one second. The tail rotor servo will center, indicating that the new center position has been memorized.

Most modern computer transmitters will have a gyro function built into them. If this is the case, please refer to your transmitter's instruction manual. Most modern gyro functions will allow you to set the mode of operation and the gains for several flight conditions. The use of these functions is strongly encouraged. Shown below is a recommendation of settings:

Recommended Gyro Function Settings:

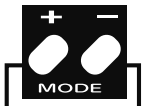
Switch: Condition
Type: GY or AVCS

Gain Values
Normal: 70% A (AVCS)
Idleup 1: 40% A (AVCS)
Idleup 2: 40% A (AVCS)
Hold: 70% A (AVCS)



If your transmitter does not have a Gyro function built in then it will be necessary to use the ATV or EPA function to control the gain. The Gyro Gain channel will generally be assigned to a switch which provides two gain values. Simply set the ATV or EPA for the gyro channel to the desired gain value and set the Gain Switch to the desired mode of operation. Unfortunately since you will only have one gain value available it will be necessary to use the lowest value needed (for example Idleup 2). When using this method of controlling the gain, one direction of the switch will be AVCS mode and the other direction of the switch will be Normal mode. Always ensure the gyro switch is set to the desired mode before flying. Do not accidentally change the gyro switch in flight.

This sets the governor's fundamental functions. The menu ***(9) Servo limit point setting*** must be set first.



Push MODE +/– key

(1) Start display

The editing menus are scrolled by pushing the mode + or – key.

(2) Revolution setting [range: 1000 ~ 3000 rpm]

Setting the main rotor revolution. This is calculated by engine revolution with the gear ratio of the main shaft.

• Using by 3position switch

Make sure the display is changed to 1, 2, 3 by moving the switch. Set the desire RPM at each position by pushing the data + or – key.

• Direct set by transmitter on Gov. mixing

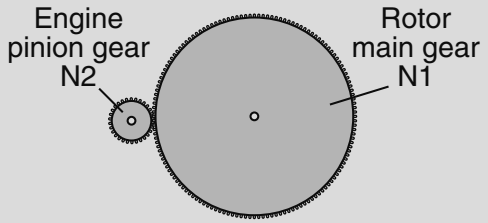
Use default governor mixing as in the T14MZ and T12FG functions, calibration of the 3 point first, then direct RPM setting can be set after that.

(3) Gear ratio [default: 8.00, range: 3 ~ 30]

Input the main rotor gear ratio by pushing the data + or-key.

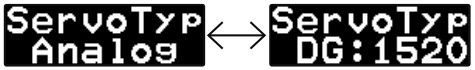
Notes:

- If the gear ratio is not properly set, the set speed and actual engine speed will be different.
- The gear ratio should be given in the helicopter instruction manual. If the helicopter instruction manual does not give the gear ratio, calculate the gear ratio as follows:



Gear ratio = N1/N2

- Carry values less than 1/1000 to the next whole number.

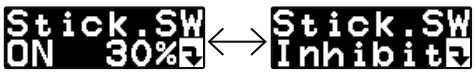


(4) Servo selection [default: Analog]

Select the throttle servo type. Digital servos offer the best response. The type is changed by pushing data + or – key.

⚠WARNING

❗ This parameter must match the type of servo you are using. Incorrect setting may damage the GY701 or the servo, possibly resulting in a loss of control during flight.



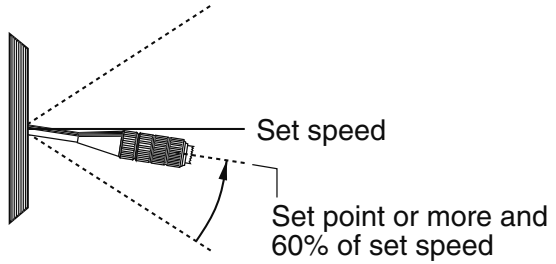
(5) Stick switch [default: 30%]

The governor can be activated by throttle stick position. Move the throttle stick to the on position and push SET key, the on point is memorized. When you push the RSET key, the function is inhibited. When the governor on/off switch is inhibited, the stick switch is automatically turned on.

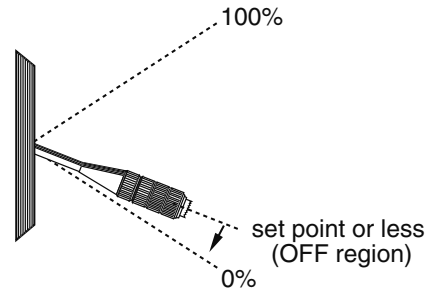
When governor is turned on and off by transmitter throttle stick

The data is set so that the governor can be turned on and off with the transmitter throttle stick. The following describes this operation.

(Governor operating point)



- Throttle stick set to least the set point from slow side and is engine running at 60% or more of set speed→→→ON
- Throttle stick held at the set point or more→→→Remains ON
- Throttle stick lowered past the set point or less than the slow side→→→OFF



(OFF at slow side)

(6) Governor on/off switch [default: Inhibit]

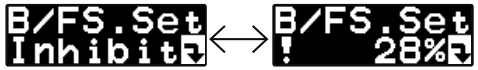
It selects the governor activate switch if additional switch is used. Pushing the SET (Data+) key activates the function. The on/off direction is changed by pushing the SET key again. The function is inhibited by pushing the RSET (Data-) key. This function is only available at S.Bus connection. “Invalid” is displayed at PWM connection.

When governor turned on and off by switch (S.BUS connection only)

Setting the switch to the ON position turns on the governor. The following describes this operation.

Governor can be turned on and off by a switch.

- Switch set to on position and engine running at 60% or more of set speed→→→ON
- Throttle stick set to maximum slow position→→→Remains ON
- Switch set to off position→→→OFF



(7) Battery failsafe setting [default: Inhibit]

The governor goes into the failsafe mode when the battery voltage is below 3.8 v. When activated, the governor is deactivated and the throttle servo is moved to B/FS position. Move the throttle stick to idle position, the B/FS condition is deactivated for 30 seconds, and returned to B/FS after 30 seconds has passed.

Move the throttle stick to B/FS position as desired, push set key to confirm the setting. Pushing RSET will inhibit the function.

(8) Yaw rate compensation [default: CW/TOP]

This works the revolution compensation during pirouette. Set the mode to match the gyro installing direction, either CW/TOP, CW/BOTM, CCW/TOP, CCW/BOTM by pushing the Set key. Pushing the RSET key inhibits the function.

At the governor only mode, this function is inhibited.

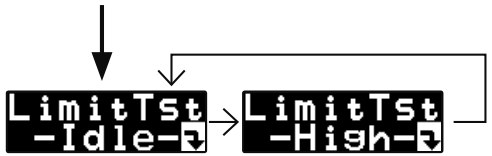
CW: clockwise
CCW: counter clockwise
TOP: normal side
BOTM: reverse side

(9) Servo limit point setting

It sets the throttle servo maximum throw. It is fundamental for governor operation. It must be set prior to other function setting. It must be set when the throttle linkage is changed or trim is changed as well.

For this setting, idling position is set first, then high position guided by the display, push the data + or – key to memorize. "*Finish*" is displayed when the setting is completed, "*Error*" is displayed when the setting position is out of range (too narrow from high to idle below 50 % through).

❗ When using the GY701 for the first time, or when making changes in the throw of a servo, always perform the limit setting operation.



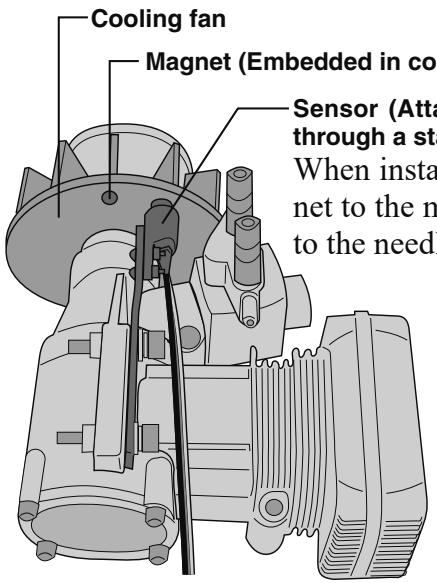
(10) Limit point testing

It tests the limit point if they are correct. Push data + or – key, throttle servo moves to setting point followed to the display.

(11) Revolution sensor testing

It tests the output level of the revolution sensor. Turn the engine by hand, and check the output level. The display indicates the current level on left side numbers, maximum level on right side numbers. The output level needs to be more than 60 % for correct operation.

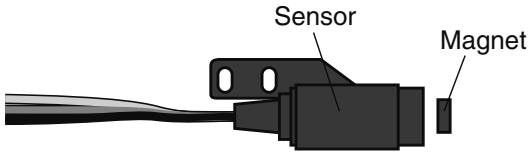
Modify the cooling fan and install the accessory magnet and attach the magnetic sensor to the engine at the position shown below.



When installing the sensor magnet to the muffler side, also refer to the needle side mounting.

Magnet operating side check

❑ Bring the magnet near the end of the sensor and check the operating side.

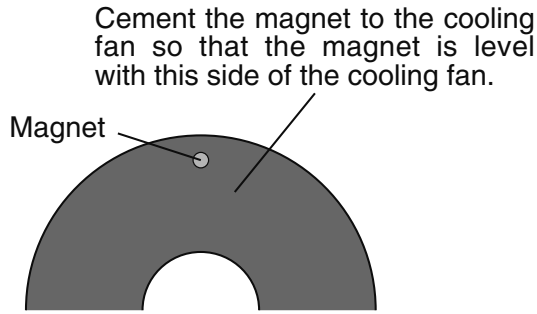


This is the side at which the displayed value increases in the "Revolution sensor testing" menu within the "***Governor Basic Setting***" section earlier in this manual. Install the magnet with this side facing the sensor. Mark this side of the magnet with a felt tip pen.

Cooling fan modification

❑ Drill a hole in the fan at the magnet mounting position. Make the hole about 4.1mm in diameter and 1.5 to 1.7mm deep.

❑ Embed the magnet in this hole in the direction in which an output is obtained. Use epoxy adhesive that cures in 30 minutes or longer. Do not use epoxies that contain metal such as JB Weld.



❑ If the cooling fan is unbalanced and vibrates, etc., balance it by mounting the spare magnet to the opposite side of the cooling fan in the opposite polarity (so that it does not output a signal).

Sensor mounting

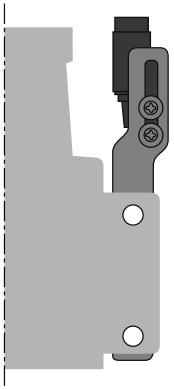
The sensor mounting method depends on the helicopter and engine.

❑ Mount the sensor to the sensor stay. (Temporary assembly)

❑ Drill a hole in the fan cover at the part corresponding to the sensor so that the distance

between the sensor and magnet can be made 1 to 2mm.

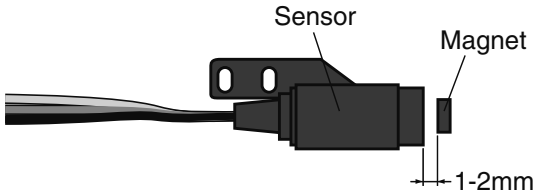
- ❑ Tighten the sensor stay together with the engine mounting flange. (Temporary assembly)
- ❑ Select the mounting method so that the sensor does not touch the frame, or other parts of the helicopter. Temporarily mount the sensor and select the magnet mounting position.

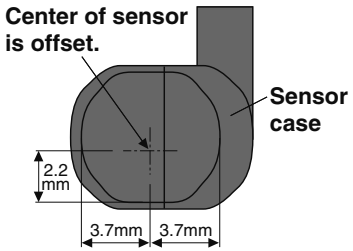


- ❑ Install the sensor to the sensor stay using the accessory screws and washers.
- ❑ Tighten the sensor stay together with the engine using the engine mount screw.

Sensor adjustment

- ❑ Adjust the sensor position to obtain a sensor output of at least 60% in the "Revolution sensor testing" menu within the "***Governor Basic Setting***" section earlier in this manual.





- ❑ The center of the sensor is different from the center of the sensor case so be careful when mounting the sensor.

  If the display is less than 60% when the magnet is directly below the sensor, bring the sensor closer to the magnet so that the 60% or more is displayed. The magnet and sensor gap criteria is approximately 1 to 2mm. If a sensor output is not obtained even when the sensor is brought close to the magnet, the magnet and sensor center positions may have changed.
- ❑ Complete assembly of the sensor by securely tightening the screws that were temporarily tightened.
- ❑ Recheck the sensor output.

Throttle servo linkage precautions

To effectively use the governor, observe the following precautions when connecting the servo linkage.

- ❑ Make the servo operating range as wide as possible. Make the throw of the transmitter EPA (ATV) function and AFR function as close as possible to 100%. The governor will not operate at throws lower than 50%.
- ❑ Fly with the governor turned OFF and adjust the needle so that the engine smoothly reacts to movement of the transmitter stick.
- ❑ If there is a point at which the reaction of the engine is considerably different due to a too rich or too lean mixture, the governor may not operate to its maximum potential.

Fuselage vibration countermeasures

If the helicopter frame is weak, or the engine mount is deformed or not installed properly, the vibrations applied to the engine will increase. Engine vibrations will lead to unstable speed and prevent the governor from maximum performance. Therefore, make sure that the engine is vibration free and that the carburetor is of good liner design because the governor cannot correct engine problems.

Use of a tuned silencer

The use of a tuned pipe type silencer may cause the engine throttle response to be substantially

different from that with a normal muffler. Adjust the needle (and pipe length) so that engine speed changes are proportional to the throttle opening. If the engine speed does not change linearly, the governor will not perform satisfactorily with a muffler or a pipe that does not allow the carburetion to be linear.

Governor operation

The GY701 operates from 1000 to 3000rpm main rotor speed. However, the engine must be running at the set speed. The GY701 turns off the governor when the engine is starting or idling.

* Governor operation: Operation that stabilizes the engine speed at the set speed.

Condition of the governor to be on

For safety purposes, the governor is turned on when the conditions below are satisfied.

- ❑ The on/off switch conditions are set to off during power on.
- ❑ The stick switch is in on position when it is used.
- ❑ The on/off switch is in on position when it is used.
- ❑ Setting speed is not Off.
- ❑ The engine speed exceeds to 60 % of the setting speed.
- ❑ The speed sensor is working properly.

The following operations do not indicate trouble:

When engine speed rises above the set speed:

A near-vertical dive may cause the engine speed to rise above the set speed.

Throttle operation speed and ON/OFF point:

If throttle operation exceeds 60% of the set speed and the rotor speed rises to the set value, the ON/OFF point may seem to differ with the operating speed. Delay operation to smoothen the switching operation causes this and does not mean that the ON/OFF point

has changed.

Deviation from set speed:

The GY701 stabilizes the engine speed to within +1% of the set speed. For example, if the rotor R.P.M. is set to 1500rpm, the Rotor R.P.M. speed will deviate about ±15rpm. However, this poses no problem from the standpoint of practical use.

The GY701 is used by connecting the "rpm" input to the governor speed setting channel of your system. When using an independent governor on/off switch, activate the "(6) Governor on/off switch" funtion within the "***Governor Basic Setting***" section earlier in this manual. (S.BUS connection only)

Direct set by transmitter on Gov. mixing

❑ When governor mixing as in the T14MZ and T12FG is used to switch the RPM of the rotor head speed. The head speed can be switched with each condition or the switch.

*For a description of the governor mixing, refer to your transmitter's manual.

Using by 3position switch

❑ Set the RPM at each switch position in the "(2) Revolution setting" menu within the "***Governor Basic Setting***" section earlier in this manual.

Speed setting precautions

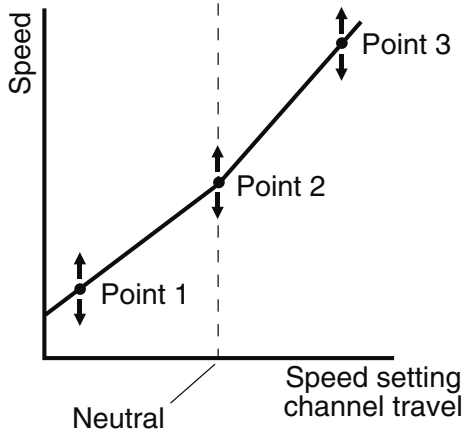
- When the speed setting channel travel (EPA, ATV, AFR) is set to 20% or less, points 1 and 3 cannot be set.
- The engine maximum speed range limits the maximum speed setting.
- Test fly the helicopter with the governor turned off and tach the main rotor R.P.M. while in horizonal flight. This is the maximum R.P.M. that can be achieved with the engine and pitch setup that you are using. Please set the governor maximum speed to approximately 50 R.P.M.'s less than max R.P.M. (Example: If 1800 R.P.M.'s is max then set

governor to 1750)

- The maximum speed can be verified at the MAX. speed display, however this could show some unlocked main rotor condition which is not accurate.

Reference

The transmitter EPA function can also be used to change the point 1 and point 3 speed settings to a certain extent. The amount of this change is proportional to the difference between the point 1 and point 3 set speed and the point 2 set speed. For example, if point 1 is set to 1300rpm and point 2 is set to 1500rpm, and the transmitter EPA is changed from 20 to 100%, the point 1 speed will change from 1460 to 1300rpm. The transmitter EPA function has very little effect on the point 2 speed setting.



The speed changes linearly on a line connecting points 1, 2, and 3.

This sets the function of the channel of the S.Bus connection. It is required with the use of the S.Bus compatible receiver. The wiring from receiver to servos is made simple by using the S.Bus connection, only one main S.Bus wire is connected to receiver and GY701 can complete the operation. In addition, governor on/off switch function, F/F mixing can be available through the S.Bus connection. At the PWM connection, this function is invalid. When not using an S.Bus channel, set "INH" for the channel setting. The S.Bus channels have linear 16ch, digital 2ch, 18ch total, but the controllable channels are limited by the transmitter channels.

Push MODE +/– key

(1) S.Bus connection setting: start display

Mode is changed by pushing mode + or – key.

Setting ranges common: 1 ~ 16ch, DG1, DG2

(2) S.Bus setting: Rudder channel [default: 4ch]

Push data + or – key to match the transmitter rudder channel.

(3) S.Bus setting: Gyro gain [default: 5ch]

Push data + or – key to match the transmitter gyro gain channel.

(4) S.Bus setting: Throttle channel [default: 3ch]

Push data + or – key to match the transmitter throttle channel.

(5) S.Bus setting: RPM channel [default: 7ch]

Push data + or – key to match the transmitter RPM setting channel.

(6) S.Bus setting: GOV. on/off channel [default: 8ch]

Push data + or – key to match the transmitter governor on/off channel.

(7) S.Bus setting: Pitch channel [default: INH]

Push data + or – key to match the transmitter pitch channel.

(8) S.Bus data reset

This resets the S.Bus connection channel to default. The "Exec.??" is displayed by pushing data + or – key for confirmation. Push data+ or – key again, the reset process is done and displayed "-Exec.—" and return to the start display. If you push mode+ or – key during confirmation display, the reset process is aborted.

Invalid display (at PWM)

This sets the detail of the gyro function for the expert modeler. Push the mode + or – key for more than one second on the Gyro Basic menu, to go into the Gyro Expert menu. Push mode + or – key for more than one second again on the Gyro Expert menu to be returned to the Gyro Basic menu.

(1) Start display

Push mode + or – key, the editing menu will scroll. Pushing mode + or – key for more than one second to go, back to the gyro basic menu.

(2) Rudder servo neutral setting

default: 0 uS
ranges: -140 ~ +140 uS

This sets the neutral position of the rudder servo. Pushing data+ or – key, the neutral position of the rudder servo is moved.

(3) Gyro basic gain

default: 100 %
ranges: 50 ~ 120 %

This sets the gyro fundamental gain. By pushing the data+ or – key, the value is changed.

(4) Rudder exponential

default: -60% (F3C-AVCS), -40% (F3C-Normal), -20% (3D-AVCS), -20% (3D-Normal)
ranges: -100% ~ +100%

This sets the feeling of the rudder control. Decreasing the rate to minus, the rudder control is softer, and is quicker when the value is increased to plus side. Pushing the data+ or – key, the value is changed.

(5) Rudder delay mode

default: Function

This selects the rudder delay mode either Function or Constant. The Function mode will have the rudder control feel softer. The Constant mode has the linear and quick motion of the rudder. Select by pilot preference.

(6) Control delay In

default: F3C=12, 3D=15
ranges: 0 ~ 20

This sets the rudder control delay of moving to right or left from neutral side. It adjusts left and right individually. Adding to the value, the control feeling will be mild. Pushing data+ or – key, the value is changed.

(7) Control delay Out

default: F3C=10, 3D=12
ranges: 0 ~ 20

This sets the rudder control delay of moving to neutral from right or left side. It can adjusts left and right individually. Adding to the value, the control feeling will be mild. Pushing data+ or – key, the value is changed.

(8) Stop delay

default: 120%
ranges: 100% ~ 400%

This sets the rudder delay of the tail stop motion. It improves the tail stop bounce to adjust the value. Pushing the data+ or – key, the value is changed.

(9) Gyro working mode

default: CMT

This selects the gyro working mode either CMT, Normal or AVCS. The CMT mode can select the AVCS or Normal mode through gyro gain channel. The Normal mode is always Normal mode, AVCS is always AVCS mode. Pushing the data+ or – key, the mode is changed.

(10) Pirouette speed

default: 450 deg/sec (F3C), 720 deg/sec (3D)
ranges: 100 ~ 999 deg/sec

This adjusts the pirouette speed of the rudder. The default values are set 450 deg/sec on F3C mode and 720 deg/sec on 3D mode when rudder is 100 %. The bottom of the line shows the actual pirouette speed of the rudder. When this value exceeds 1200 deg/sec, the gyro is out of control, the pirouette speed is very quick and this can be a dangerous situation. Pushing the data+ or – key, the value is changed.

(11) Gain change up delay

default: 12
ranges: 1 ~ 50

This sets the delay of the gyro gain from low to high, the value represents from idle up to hovering. Increasing this value may stop tail hunting if it is taking place. Pushing data+ or – key, the value is changed.

(12) Gain change down delay

default: 3
ranges: 1 ~ 50

This sets the delay of the gyro gain from high to low, the value represents from hovering to idle up.

Decreasing this value may stop tail hunting if it is taking place at hovering to idle up. Pushing data+ or – key, the value is changed.

(13) Rudder histeresis

default: 6 uS
ranges: 0 ~ 50 uS

This adjusts the rudder stick null ranges. Pushing data+ or – key, the value is changed.

(14) Gain tracking

default: 0 %
ranges: -20% ~ +20%

This adjusts the gyro holding feeling during left and right pirouette. Pushing data+ or – key, the value is changed.

(15) F/F mixing (S.Bus connection only)

default: off

This selects the F/F (Feed Forward) mixing active. It helps the gyro operation by adding pitch to rudder mixing prior of the gyro operation and improves the gyro performance.

GY701 installs the pitch-> rudder mixing internally. The swash signals are mixed in the swash mode. The correct F/F mixing is achieved by individual pitch signal is input in the GY701.

Separate the pitch signal in the transmitter, and input this signal to the GY701. To do that, make the programmable mixing as pitch-> AUX, and input AUX signal to the GY701.

This function is only available by the S.Bus connection. Invalid is displayed in PWM connection. Pushing data+ or – key, the mode is changed.

(16) F/F mixing rate

default: 0 %
range: -100% ~ +100%

It adjusts the F/F mixing rate. It can adjust low or high pitch rate individually from zero pitch point. Pushing data+ or – key, the value is changed.

(17) F/F mixing acceleration gain

default: 0 %
range: 0 ~ 200 %

It sets the F/F mixing acceleration gain. Pushing data+ or – key, the value is changed.

(18) Pitch zero setting

default: 1520 uS

It sets the pitch zero point of GY701. Move the pitch stick to the zero pitch, push data+ or – key. The zero pitch signal is memorized in the GY701. The display shows ! mark at the setting point.

This setting must be done when F/F mixing is used.

(19) Pitch low setting

default: 1940 uS

This sets the minimum pitch point of GY701. Move the pitch stick to minimum pitch, push data+ or – key. The minimum pitch signal is memorized in the GY701. The display shows ! mark at the setting point. This setting must be done when F/F mixing is used.

(20) Pitch high setting

default: 1100 uS

This sets the maximum pitch point of GY701. Move the pitch stick to maximum pitch, push data+ or – key. The maximum pitch signal is memorized in the GY701. The display shows ! mark at the setting point. This setting must be done when F/F mixing is used.

(21) Sensor mode

default: Middle

It selects the response of the gyro sensor signal. The response is set as Moderate→Middle→Quick, but the stability is vice versa. Select the good match for the individual heli. Pushing data+ or –

key, the mode is changed.

(22) Neutral compensation

default: ON (F3C), Off (3D)

This function works to recall the neutral point of the rudder servo for improving tail stop motion. To use this function effective, hover the helicopter for about one second, and memorize the neutral point. If using a 3D helicopter, the tail movement is often very quick, this function may not work as well. Check the function to see if it works correctly. Pushing data+ or – key, the mode is changed

(23) Yaw smoother

default: ON (F3C), Off (3D)

Selects the rudder control feeling. When On, rudder control becomes more exact. When Off, rudder control response increases. Select the rudder control feeling to your taste.

(24) Stop boosting

default: Off
range: Off ~ 200%

This function works for boosting the gyro gain to improve tail stop motion. Pushing the data+ or – key, the value is changed.

(25) Gyro data reset

It resets the gyro parameter to the default setting. The “Exec.??” is displayed by pushing data + or – key for confirmation. Push data+ or – key again, the reset process is done and displayed “-Exec.—“ and return to the start display. Pushing mode+ or – key during confirmation display, the reset process is aborted.

This sets the details of the governor function for the expert modeler. Push the mode + or – key for more than one second on the Governor Basic menu display, to get into the Governor Expert menu. Push mode + or – key for more than one second again on the Governor Expert menu to be returned to the Governor Basic menu.

(1) Start display

Push mode + or – key, to scroll through the editing menu. Pushing mode + or – key for more than one second, brings you back to governor basic menu.

(2) Governor working mode

default: Governor

This selects the governor working mode as either governor or revolution limit mode. The Governor mode works as the engine revolution is at a constant revolution. The revolution limit (Rev. Lmt) mode only works when the engine revolution exceeds the setting revolution and engine revolution is to be lower. Pushing data+ or – key the mode is changed. When the Rev.Lmt mode is selected, the menu ***(6) Throttle data mode*** should be set to Tx.Curve mode.

(3) Revolution display mode

default: Rotor

This selects the revolution display mode for either the main rotor or engine revolution. Pushing data+ or – key, the mode is changed.

(4) Operation response

default: Middle

This selects the governor operation response. Select the best match for your engine type. Pushing data+ or – key, the mode is changed. Recommended selection are, Middle-> glow engine, Moderate-> gasoline engine, Quick ->Brushless motor-.

(5) Governor gain

default: Moderate=30%,Middle=40%,Quick=60%
ranges: 10~100%

This sets the governor working gain. When the operation response is changed, the governor gain is automatically changed as default. The best gain is the amount right before the revolution wagging takes place. Pushing data+ or – key, the value is changed.

(6) Throttle data mode

default: Optimize

This selects the throttle input operation. Pushing data+ or – key, the mode is changed

Optimize:

GY701 sets the throttle input signal to optimum. No need to consider the throttle curve setting on the transmitter.

Fixed:

The fixed throttle input is utilized related to the revolution. It is recommended for electric motors.

Tx.Curve:

GY701 uses the exact throttle input from the transmitter. The throttle curve setting on the transmitter is required. When the Rev.Lmt mode is selected, this mode should be selected.

(7) Revolution change up delay

default: 8
range: 2 ~ 20

This sets the delay of the revolution from low to high. Pushing data+ or – key, the value is changed.

(8) Revolution down delay

default: 10
range: 2 ~ 20

This sets the delay of the revolution from high to low. Pushing data+ or – key, the value is changed.

(9) Start delay

default: 5
range: 2 ~ 20

This sets the delay during the starting of the governor. Pushing data+ or – key, the value is changed.

(10) Low limit at hovering

default: 25 %
range: 0 ~ 80 %

This sets the throttle low limit during hovering revolution to avoid too lean a carburetor. Pushing data+ or – key, the value is changed.

(11) Low limit at idle up

default: 45 %
ranges: 10 ~ 80 %

This sets the throttle low limit during idle up revolution to avoid too lean a carburetor. Pushing data+ or – key, the value is changed.

(12) Governor data reset

This resets the governor parameter to default setting. The “Exec.??” is displayed by pushing data + or – key for confirmation. Push data+ or – key again, the reset process is done and displayed “-Exec.—“ and return to the start display. Pushing mode+ or – key during confirmation display, the reset process is aborted.

FUTABA CORPORATION oak kandakajicho 8F 3-4
Kandakajicho, Chiyoda-ku, Tokyo 101-0045, Japan
TEL: +81-3-4316-4820, FAX: +81-3-4316-4823

1M23N23906