

Futaba®

Flybarless Control Gyro

CGY750



INSTRUCTION MANUAL

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Gyro : Instructions for gyro functions

Governor : Instructions for governor function

Technical updates and additional programming examples can be found at:

www.futaba-rc.com/faq

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

PRECAUTIONS

⚠ 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 CGY750 with a 2.4GHz system such as the Futaba FASST™ system, or a PCM system. Use with an FM system is strongly discouraged since interference can cause serious operational problems.

Gyro operating precautions: Gyro

⊘ ***The CGY750 requires 5-10 seconds to initialize when the power is turned on. Do not move the helicopter and do not move the tail rotor, aileron and elevator sticks during this initialization or the gyro may not initialize properly. Once the initialization process has been completed the swash servos and tail servo will move several times indicating that the CGY750 is now ready for flight.***

❗ Verify that the gyros are operating and compensating in the correct direction before each flight. If the compensation direction is incorrect on any axis the model will become uncontrollable after take off.

❗ 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 parameters within the CGY750 must match the type of servo you are using. Incorrect setting may damage the CGY750 or the servos, 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 CGY750 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 gyro sensor and control box have a electroconductive coating. Do not allow any power leads or other wiring to come into contact with these items.
- ❗ 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 servo will center indicating that the new center position has been memorized.
- ❗ When operating the gyro in AVCS Mode, all compensation and revolution mixing must be dis-

PRECAUTIONS

abled and any tail rotor or swash offsets for flight modes must be disabled.

❗ When the CGY750 is operated in AVCS mode the tail rotor or swash servos will not center when tail rotor, aileron or rudder stick is released. This is normal operation for AVCS mode. The servos may also move to the extent while the model is being carried out to the flight line. Before take off, you must visually center the tail rotor pitch slider and level the swash plate by using the transmitter control sticks. You can also center the servos 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; similarly for aileron and elevator servos.

⊘ Do not drop the CGY750 sensor onto a hard surface or subject the CGY750 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**

❗ When the throttle servo is connected to the CGY750 the battery failsafe function within the CGY750 must be setup and enabled.

❗ 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 on the

transmitter, always set the throttle servo maximum operating point to less than the point at which the governor is activated. If this is not done the governor may activate while in condition hold.

❗ While preparing for flight or starting the engine always ensure the throttle remains below the governor activation point and do not select any flight modes that may activate the governor.

❗ If you prefer to activate the governor while the model is still on the ground always ensure that you have at least -5 degrees of pitch in the model before activating the governor. This is necessary to prevent an unexpected lift off as the governor activates and the head speed increases to the desired RPM.

❗ Periodically check the RPM sensor output to ensure proper governor operation. Due to the high level of vibration and centrifugal forces the magnet may come loose or the sensor alignment may change. Verify that the magnet and sensor are properly mounted every 10th flight.

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

If any difficulties are encountered while setting up or operating your CGY750, 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.futaba-rc.com or www.hobbyservices.com

Fax (217)-398-7721, Tel (217) 398-0007

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 Service Center
3002 N Apollo Drive Suite 1
Champaign, IL 61822**

The Futaba[®] CGY750 is a combined 3-axis 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 CGY750 has been optimized to work for flybarless helicopters.

FEATURES

- Combined 3-Axis Gyro and Governor in one box.
- High speed operation and extremely low latencies result in greater stability.
- Low profile, small size and light weight.
- Small size of the gyro and governor controller, 44 x 29 x 12mm, 13 g
- Utilizes a 128 x 36 dots graphical white color OLED (Organic Light Emitting Display), high brightness and contrast even in direct sunlight.
- Settings divided into Basic and Expert menus. The basic setting is for initial setting and Expert setting is for more advanced settings.
- Firmware can be updated from a Windows based personal computer when used with the optional CIU-2 interface.
- S.Bus compatible. Only one connection is necessary between the S.Bus receiver and CGY750 control box for operation.

FEATURES

• Gyro section

- Advanced and adaptive PID control loop is utilized
- Small and low profile 3-axis gyro sensor. 21 x 21 x 8.5mm, 8g

Rudder (yaw) section:

- Capable of sensing angular velocity up to +/- 1,200 deg/sec.
- Compatible with 1520 μ S Analog (70Hz), 1520 μ S Digital (280Hz), and 760 μ S Digital (560Hz) tail rotor servos.
- 3D and Sports flight mode
- Feed Forward Option allows the CGY750 to consider other control functions during operation. This results in more accurate corrections and precise operation.
- Cutting edge control algorithm provides a consistent pirouette rate, precise operation, and smooth yaw control in any flight condition.

Aileron, Elevator (roll, pitch) section:

- Developed specifically for flybarless helicopters.
- Included preset parameters for helicopter types (450-550, 600-700, and 750+) along with control feel preset parameters makes initial setup as easy as pressing a button.
- Supports H3-120, H3-140, H3-90, H4-00, and H4-45 swashplate types.

• Governor section

- Advanced and adaptive PID control loop is utilized
- High speed operation and extremely low latencies provide a more consistent and accurate operation.
- Capable of governing head speeds from 1000 RPM through 3000 RPM
- Compatible with 1520 μ S Analog (70Hz) and 1520 μ S Digital (280Hz) throttle servo types.
- Feed Forward Option allows the CGY750 to consider other control functions during operation. This results in precise governing of the head speed.

FEATURES

- Governor or Revolution Limiter mode selectable
 - Supports gear ratios from 1.00 through 30.00.
 - Cutting edge control algorithm provides more consistent RPM governing.
 - Revolution sensor is compatible with the GV-1. The CGY750 also supports a optional back plate revolution sensor.
- **Other function**
- Maximum RPM memory.
 - Cumulative engine operation timer.
 - Power saving OLED.

CONTENTS

Your CGY750 includes the following components:

Type of set

- Gyro & Governor set w/R6203SB
- Gyro & Governor set
- Gyro set w/R6203SB
- Gyro set

SET CONTENTS				
CGY750 Control Amp				
*Mini Screwdriver	X	X	X	X
*Dust Covers (x3)				
Gyro Sensor				
*Mounting Pads (x3)	X	X	X	X
Governor Sensor				
*Sensor Mounting Hardware	---	---	X	X
*Magnet (x2)				
R6203SB Receiver				
	---	X	---	X
Extension Cord				
	X	X	X	X

X: supplied ---: not supplied

CGY750 Control Box



Dust Cover



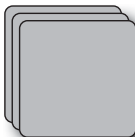
Adjustment Screwdriver



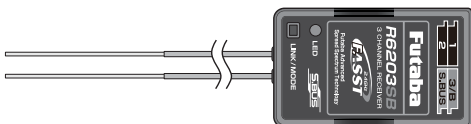
Gyro Sensor



Mounting Pads



R6203SB Receiver



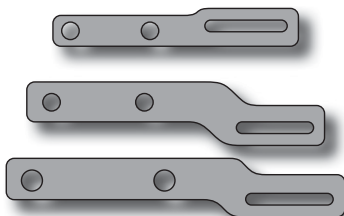
Revolution Sensor



Magnets (2)



Sensor Mounting Bracket



Extension Cord:



SPECIFICATIONS

- Width (Controller):** 1.14in [29mm]
(Gyro sensor): 0.83in [21mm]
(Revolution sensor): 0.30in [7.5mm]
- Length (Controller):** 1.73in [44mm]
(Gyro sensor): 0.83in [21mm]
(Revolution sensor): 0.63in [16mm]
- Height (Controller):** 0.47in [12mm]
(Gyro sensor): 0.33in [8.5mm]
(Revolution sensor): 0.39in [10mm]
- Weight (Controller):** 0.459oz [13g]
(Gyro sensor): 0.282oz [8g]
(Revolution sensor): 0.141oz [4g]
- Operating Voltage:** 3.8V to 8.4V DC*
- Current Drain:** 70mA
- Selectable Servo Frame:** 70Hz, 280Hz and 560Hz
(Rudder Gyro only) Rate
- Center Pulse Width:** 1520 μ S (70Hz & 280Hz)
760 μ s (560Hz)
- Presets:** 3D, Sports, 450-550,
600-700 and 750+
- Governor Resolution:** 0.1Hz (6rpm)
(Engine RPM)
- RPM Accuracy:** 1%
- Head Speed Range:** 1,000-3,000rpm
- Operating Temperature:** 14°F to 113°F
(-10°C to +45°C)
- Control System:** Digital advanced control
- Sensor:** Micro Electromechanical
Systems (MEMS) Gyro
Hall effect sensor
- Angular Velocity Range:** \pm 1,200 Degrees Per
Second (Gyro)

* The operating voltage shown only applies to the CGY750. 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 (Rudder Servo)

Futaba S9254 Digital Servo Heli: **FUTM0224**
(280Hz/1520 μ S)

Futaba BLS254 Brushless Heli Servo: **FUTM0524**
(280Hz/1520 μ S)

Futaba S9257 EP Heli Digital Servo: **FUTM0667**
(280Hz/1520 μ S)

Futaba BLS257 EP Brushless Heli Servo: **FUTM0527**
(280Hz/1520 μ S)

Futaba S9256 Digital Hi Speed: **FUTM0226**
(560Hz/760 μ S)

Futaba BLS251 Brushless Heli Servo: **FUTM0521**
(560Hz/760 μ S)

REPLACEMENT & OPTIONAL ITEMS

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

Extension 200 mm:

Extension 350 mm:

Extension 55 mm:

Extension 80 mm:

Extension 130 mm:

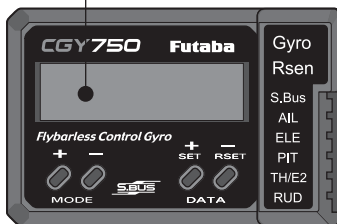
Mounting Pad:

1x22x22 mm (10)

CONNECTING THE CGY750

OLED Display

- Displays menus, parameters and status information.



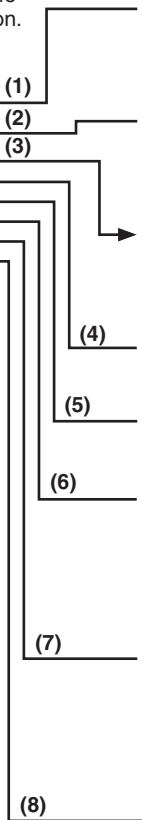
Edit Keys

- Used when setting data.
- Use the included plastic adjustment screwdriver to press the buttons.

* This diagram shows the various connections between the CGY750 and receiver, servo, or sensors.

* If the governor and limiter functions are disabled when using the [Gyro+THR] mode then the throttle signal is sent directly to the TH/E2 connection on the CGY750. In this case you may connect the throttle servo to the appropriate channel on the receiver or to the CGY TH/E2 connector.

* When the swash mode is set to H4-xx mode, the TH terminal is changed to 2nd elevator output. In this case, the governor function is inhibited.



CONNECTING THE CGY750



(1) Gyro Sensor:

- Connect the gyro sensor.

*Insert the sensor connector until it is firmly locked.



(2) Rsen (Revolution sensor):

- Connect the speed sensor.



(3) S.Bus:

- Connect to the S.BUS output of the receiver with the supplied extension.



(4) AIL Output:

- Connect the aileron servo.



(5) ELE Output:

- Connect the elevator servo.



(6) PIT Output:

- Connect the pitch servo.

(7) TH Output:

- Connect the throttle servo.
- Connect the ESC w/BEC and set the operation mode to Gyro+THR mode.



(7) E2 2nd ELE Output:

- Connect the second elevator servo.
(Swash mode: H4-00 or H4-45)



(8) RUD Output:

- Connect the rudder servo.

CONNECTING THE CGY750

Connection to the receiver, servos and sensors

The CGY750 requires an S.Bus receiver (such as the R6108SB, R6208SB or the R6203SB) or the optional PWM Receiver to S.Bus adapter available separately.

Using the supplied extension connect the S.Bus receiver port (or from the S.Bus PWM adapter) to the CGY750 S.Bus port. Install your receiver battery, regulator, switch and any other necessary electronics now. Connect the power lead of your switch / regulator to the battery connector on the receiver.

Plug the cyclic servos (AIL-[Aileron], ELE-[Elevator], PIT [Pitch], RUD [Tail Rotor] and if using the H4xx swash plate type TH/E2-[Elevator 2]) into the appropriate port on the CGY750.

Determine the best location to place the receiver and CGY750 control box. Mount the receiver and the CGY750 control box to the helicopter mechanics using vibration adsorbing self adhesive foam pads. The CGY750 gyro sensor will be installed in a later step.

Using wire mounts, wiring fixtures molded into the helicopter, or hook and loop material, route the servo leads and extensions. Make sure the wires are not rubbing against metal or carbon fiber which may damage the wires.

S.Bus channel setting

Since the S.Bus protocol uses a single wire to transmit all channel information to the CGY750 it is necessary to assign each channel number (1

through 16) a function (such as aileron, pitch, collective, gain, ail gain, ele gain, rpm, gv on/off) within the CGY750 control box. The default CGY750 S.Bus channel assignments should work properly with all Futaba transmitters, if you experience any problems please refer to the S.Bus section of the manual to set/verify each channel number for each function.

- ❑ If your transmitter does not offer enough channels to operate all of the functions it is possible to operate the CGY750 without the GV On/Off, Ail Gain and Ele Gain channels connected. When any these functions are not used it is necessary to set the channel number to [INH] within the CGY750 S.Bus menu to disable the function and use the setting value inside the GY750 menu instead.

When the GV On/Off channel is not used, the governor on/off control is handled by the [Stick Switch] function.

When the remote Ail or Ele Gain channels are not used the operating mode (NOR/AVCS) and gain value can be set in the appropriate AIL / ELE Basic menu option by using the Data +/- keys when the function is displayed.

Using the CGY750 with a electric helicopter

⚠ DANGER

ⓘ It is necessary to remove the pinion gear from the electric motor or disconnect the motor from the ESC before powering the model

CONNECTING THE CGY750

up for setup or bench testing. Electric motors are extremely powerful and the capable of delivering the power instantly causing injury to yourself, others, or the surroundings.

If the CGY750 is being installed into an electric helicopter you may want to consider connecting the ESC to the [TH/E2] (throttle / elevator 2) output of the CGY750. Before doing this you must remove the pinion gear from the electric motor or disconnect the motor from the ESC before powering the model up the first time. Once the model has been powered up navigate to the gyro mode function and set it to [GYRO+THR]. This sets the CGY750 to act as a gyro and throttle output. The CGY750 will simply pass the throttle signal from the receiver through to the TH/E2 port on the CGY750.

Once your ESC is connected to the CGY750 you must complete all necessary transmitter setup (ATV / EPA / REV / ETC) per your ESC instructions and it is recommended to test the ESC setup with the pinion gear removed from the motor to ensure everything has been setup properly.

⚠ 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.*

- The servo current draw can be up to 50% higher on a flybarless helicopter. Always ensure your receiver battery is fully charged before each flight.

❗ *Even though the CGY750 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 flying the CGY750.*

- The CGY750 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 CGY750 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 CGY750. Binding in the tail rotor control linkage will de-

crease the performance of the CGY750 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.

- Vibration will affect the CGY750'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 CGY750.

Gyro sensor replacement:

- Each CGY750 gyro control box is calibrated specifically for the gyro sensor included. Do not attempt to use another CGY750 sensor with the control box as performance will suffer due to being out of calibration. The calibration process must be completed by an authorized service center.

If your sensor needs replacement, please send the complete unit to your region's support center for repair.

Verify that all of the connections are correct between the CGY750, receiver and power supply. If your helicopter is using an electric motor for propulsion remove the pinion gear now for safety.

If this is the first time the helicopter has been powered up remove the servo arms and linkages to prevent damaging the servos. Power up the transmitter and allow it to initialize. Turn the receiver on or connect the flight battery and allow the helicopter to remain still while the CGY750 initializes.

The display will first show the ID number of your CGY750 and the Firmware Version.

ID:65535
Ver:1.01

After the CGY750 has powered up the screen will change to show an animation of a helicopter performing a stationary flip. This indicates that the initialization process is taking place and the helicopter must remain perfectly still so the controller can determine the gyro center position for each axis.

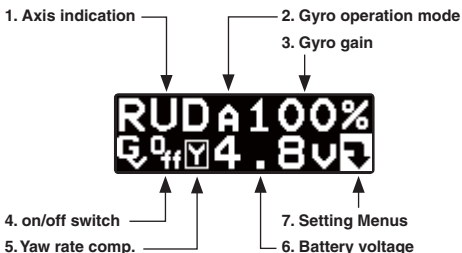


HOME SCREEN

Once the initialization process has been completed the Home Screen will be displayed and the cyclic + tail rotor servos will move several times in quick succession.

If the CGY750 is set to the [Gyro+THR] mode or if the H4-xx swash plate type has been selected then the governor will be disabled and the screen will look like (d) below instead. The display will cycle through and show the current AIL, ELE and RUD gains.

Initial Home screen



(b) Aileron gain display

AILA 65%
G⁰ffY 4.8V

(c) Elevator gain display

ELEA 70%
G⁰ffY 4.8V

(d) Gyro only mode

RUDA 100%
4.8V

1. Axis indicator Gyro

This will cycle every two seconds and show the axis (AIL, ELE or RUD) and the current gain value.

2. Gyro operation mode Gyro

This indicates either [A] for AVCS or [N] for Normal operating modes. If the [A] is shown in inverted colors then the rudder neutral is offset and re-learning the center position should be completed immediately.

▼
RUD A 100%
G 0 f Y 4.8 v R

RUD AVCS Mode
at 100% gain

▼
RUD N 100%
G 0 f Y 4.8 v R

RUD NOR Mode
at 100% gain

▼
RUD A 100%
G 0 f Y 4.8 v R

Neutral offset at
AVCS mode

When using the AVCS operating mode the servos will not re-center when the control stick is released. If you need to center the servo (during setup or before takeoff) you can move the appropriate control stick to its full extent (left & right or up & down) twice and allow the control stick to return to center within a one second period of time then servo for that axis will return to its center position.

For example if you move the tail rotor stick full left, full right, full left, full right and allow it to come back to center within one second then the display will change to show [-----] and the tail rotor servo will center.

G 0 f Y 4.9 v R

Return servo to
center position

When using the AVCS operating mode and if trim changes have been made on any axis then the neutral position must be read and memorized by the CGY750. To do this simply change the operating mode twice within one second (for example Normal → AVCS → Normal → AVCS) and the display will change to [*****] to indicate that the current stick position has been memorized as the new neutral position.

G 0 f Y 4.9 v R

Read and memorize
the current neutral
position.

HOME SCREEN

3. Gyro gain Gyro

This indicates the current gyro gain for the axis noted in the Axis Indicator position.

4. Operating condition Governor

This indicates whether the governor is operating [ON] or [OFF].



RUD A 100%
Gyro gain 4.8

5. Yaw rate comp. Governor

This indicates that the Governor yaw feed forward function is enabled.

6. Battery voltage

This indicates the battery voltage. The display will change to show [LOW BAT] once the voltage has fallen below the Battery fail safe voltage setting (BFS).

7. Setting Menus

Pushing this button will exit the normal operating mode and enter the settings menu mode.

RPM display Governor



RUD A 100%
RPM 1512

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

the engine has stopped running. The RPM display can be either the head speed or the engine speed depending on the setting in the revolution display mode setting found in the governor expert menu.

Home screen options

When the home screen is shown the mode [+] and [-] keys can be used to cycle the bottom line through the following items; Battery voltage, Max RPM, Engine runtime, OLED display options, Operating Mode, Roll rate maximum display, and Elevator rate maximum display.

1. Maximum RPM Governor



AILA 65%
2063 Mrpm

From the home screen press the mode [+] button once to show maximum recorded RPM [Mrpm]. The [Mrpm] value is maintained until you clear it by pressing the data [+] or [-] key for at least one second. This function allows you to check for over speeding during flight.

2. Engine runtime Governor



RUDA 100%
0H15M27

From the home screen press the mode [+] key twice to show the engine runtime display. The time shown is how long the engine has been running. This is a cumulative timer and the value is maintained in memory. To reset the timer simply press the data [+]

HOME SCREEN

or [-] key for more than one second and the timer will reset back to 0.

3. OLED display options [default: Saver]

OLED.MD
Saver

OLED.MD
Light

When the [Saver] option is selected the display will dim after 60 seconds of inactivity. Once a button is pressed on the CGY750 controller box the OLED will switch back to full brightness. The [Saver] option helps to conserve power and extend the life of the display. When the [Light] option is selected the display will remain at full brightness at all times.

4. Operation mode [default: Gyro+Gov]

Opr.Mode
Gyro+Gov

Opr.Mode
Gyro+THR

Opr.Mode
Gyro+H4

This selects the operating mode of the CGY750.

⚠ WARNING

❗ If the operating mode has been changed then the CGY750 must be reset by powering down and then powering back up.

[Gyro+Gov] Both the gyros and the governor are operational.

[Gyro+THR] The gyro is operational and the governor is disabled. The throttle channel from the receiver is passed through to the [TH/E2] port on the CGY750.

[Gyro+H4] Must be selected when a [H4 xx] swash plate type is selected. This disables the governor

and throttle servo output and the [TH/E2] port on the CGY750 is now the second “Elevator” [E2] servo output.

1. Roll rate maximum display Gyro



Roll Max
306Md/S

Displays the maximum roll rate recorded during flight. This value is reset back to 0 when the CGY750 is powered up.

1. Elevator rate maximum display Gyro



Elev Max
234Md/S

Displays the maximum elevator rate recorded during flight. This value is reset back to 0 when the CGY750 is powered up.

WARNING Display

Governor warning display Governor



RUDA 1
4

The warning symbol is displayed when the governor is activated during power up. Immediately switch to a condition that has the governor disabled and the symbol will disappear. When this

WARNING DISPLAY

warning symbol is shown the governor will be disabled until the condition has been turned off. The engine must be started with the governor turned off.

Sensor error Gyro

SensorER

⚠WARNING

❗ *The helicopter must remain perfectly still during the initialization process or a [Sensor-ER] sensor calibration error may occur.*

If an error was detected during initialization, power the CGY750 down and let it rest for 60 seconds. Verify that the gyro sensor lead is properly connected to the CGY750. Power the CGY750 up again and allow the helicopter to remain still until the initialization has been completed.

If this problem persists please contact your regions technical support center (the contact information can be found in the beginning of this manual).

Low battery

Low Batt

⚠WARNING

❗ *The [Low Batt] warning is displayed if the*

receiver battery voltage falls below the [BAT/FS] voltage set within the CGY750 → Governor → Expert menu. If this condition lasts for more than one second then the Battery Fail Safe function activates and the throttle servo is brought back to idle. This is done to warn you that the battery capacity is dangerously low and you must land immediately.

At this point the throttle can be reactivated by bringing the transmitter control stick all the way back to idle and then the throttle control will continue to operate. After 30 seconds the Battery Fail Safe function will activate again requiring you to repeat this process if necessary.

Memory writing indicator



⚠ WARNING

⊘ Do not power off the CGY750 when the Memory writing symbol is displayed.

When a setting is changed within the CGY750 the new value must be written to memory and the “Memory writing indicator” is displayed during this process. This may take up to two seconds and the power must not be switched off during this process.

If the power is switched off during the writing process then all of the settings may be lost.

⚠WARNING

❗ Always exit the Setting Menu and return to the home screen before flying your model. The gyro operation is disabled within several of the settings menus to help with setup tasks.

❗ Always check the operation of the CGY750, verify that the controls are operating the correct direction and ensure the gyros are correcting in the proper direction for all axis before attempting to fly the model.

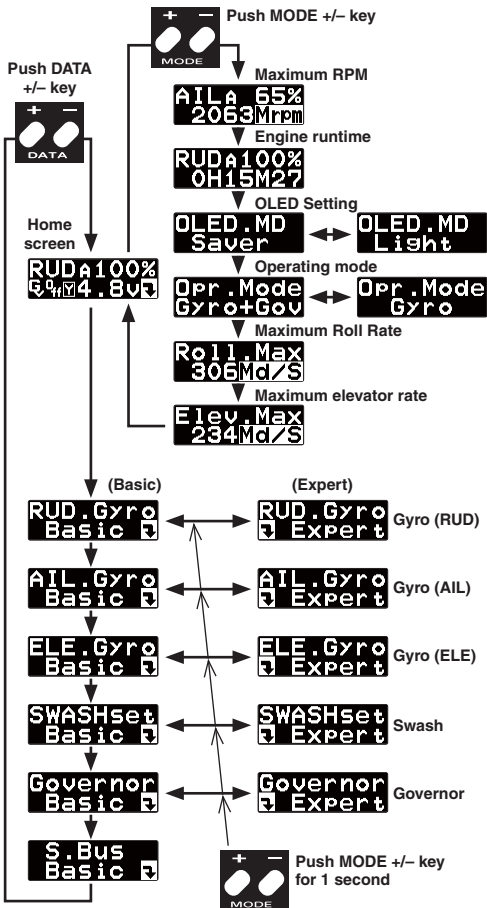
The data [+] and [-] keys are used to navigate through the Setting Menus; [RUD.Gyro], [AIL.Gyro], [ELE.Gyro], [SWASHset], [Governor]* and [S.Bus] Basic menus. Once the desired menu is shown press and release the mode [+] or [-] key to show the next or setting items respectively.

The expert menus are entered or exited by pressing and holding the mode [+] or [-] key for one second. To exit the current menu simply go back to the Basic Settings Menu for the function (for example, [AIL.Gyro - Basic]) and press and release the mode [+] or [-] key until the home screen is shown.

Please see the Setting Menus diagram for a complete listing of the Home Screen, Basic and Expert menus.

* The [Governor] setting menu is not displayed if the Operating Mode has been set to [Gyro+Thr] or if the swash plate type has been set to the H4 xx type.

SETTING MENUS



RUDDER GYRO BASIC SETTING

The [RUD.Gyro].Basic menu contains all of the functions necessary to setup the CGY750 tail gyro for operation.

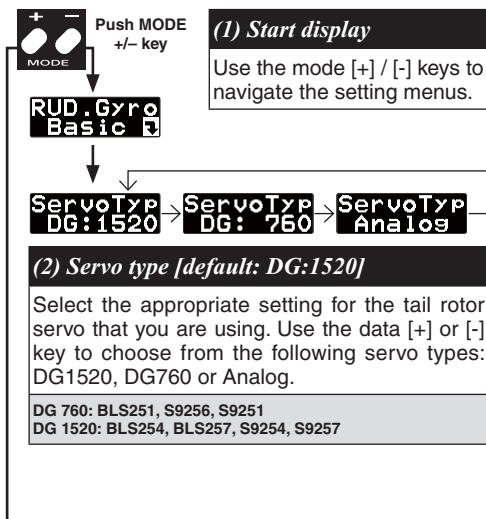
Please follow these steps for initial setup:

- Read the “SWASH SERVO INSTALLATION AND SETUP” section later in this manual to install and set up the servos.
- Remove all of the servo arms (cyclic servos and tail rotor servo) and linkages from the servo to prevent any possible damage. All analog servos must also be disconnected until the servo type has been set up within the CGY750. Power the system up and allow the CGY750 to initialize.
- Navigate to the [RUD.Gyro].Basic menu
- Read and follow step (2) [RUD.Gyro].Basic → ServoTyp
- Temporarily place the servo arm onto the servo and hold the linkage over the control ball. Follow step (3) [RUD.Gyro].Basic → GY.Dir
- While lightly holding the tail rotor linkage onto the servo arm, move the transmitter’s tail rotor stick to the right and ensure that the tail rotor pitch slider moves the proper direction. If necessary use your transmitter’s reverse function on the tail rotor channel.
- When the CGY750 is in the Servo limit function the servo will always remain centered and the gyro sensor no longer operates. Install the servo arm, ensuring that the control ball linkage is perfectly perpendicular to the

RUDDER GYRO BASIC SETTING

tail rotor push rod. Follow step (4) [RUD. Gyro] → Sv.Limit to set the endpoint travel for each direction, ensuring no binding is present.

- ❑ Install the servo arm screw and place the linkage onto the control ball on the servo arm.
- ❑ Before proceeding verify that all of your settings are correct and check for binding throughout the entire range of servo movement.



⚠ WARNING

❗ Read your servo instruction sheet to determine the proper servo settings. The servo type parameter within the CGY750 must match the type of servo you are using. Incorrect setting may damage the CGY750 or the servo. Incorrect setting may also result in a loss of control during flight.



GY.Dir
Normal ↔ **GY.Dir**
Reverse

(3) Gyro direction [default: Normal]

This parameter controls which direction the CGH750 (yaw axis) will compensate when the helicopter rotates. Hold the tail rotor linkage over the linkage ball on the servo, pick the helicopter up by the main shaft and rotate the mechanics counter-clockwise. The CGY750 should compensate by adding clockwise rotation pitch to the tail rotor blades. If the CGY750 compensates by adding counter-clockwise rotation pitch to the tail rotor blades, then it will be necessary to reverse the Compensation Direction setting by pressing the [+] or [-] data key.

⚠ WARNING

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



Sv.Limit
Ⓜ: 100 %

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

When the CGY750 is in the Sv.Limit parameter the gyro will no longer operate and the tail servo will always center when the tail rotor stick is released.

Always exit setup functions before attempting to fly the model. Before each flight always ensure that the gyros are operating and compensating in the correct direction.

The Servo Limit parameter within the CGY750 is used to set the mechanical limits for the tail rotor servo. To obtain the best performance it is recommended to set the limit in the CGY750 to 100% for both directions and then adjust the servo arm length to set the mechanical endpoints. After that has been completed use the servo limit parameter to make small adjustments that could not be made mechanically. Values between 90% and 110% are considered optimal.

Navigate to the [RUD.Gyro].Basic→Sv.Limit menu and slowly move the rudder stick to the left or to the right maximum extent and use the data [+] or [-] key to increase or decrease the maximum throw respectively. Ensure that the pitch slider does not reach the maximum extent and cause binding.

⚠WARNING

❗ When using the CGY750 for the first time, or when making mechanical changes involving throw, you must check and set the servo limits again to prevent binding.



(5) Flight mode [default: 3D]

Selects the flight mode. Always try the “Sports” flight mode first and if you determine that the feel is not aggressive enough or if the pirouette rate is not fast enough then try the “3D” flight mode. The “Sports” Flight Mode will satisfy most pilots.

The flight mode is changed by pushing the data [+] or [-] key.

Pirouette Rate:

Sports = 540 degrees per second

3D = 720 degrees per second

AILERON GYRO BASIC SETTING

The [AIL.Gyro] → Basic menu contains all of the functions necessary to set up the CGY750 roll axis for operation.



(1) Start display

Use the mode [+] / [-] keys to navigate the setting menus.

AIL.Gyro
Basic

AIL.Dir
Normal

AIL.Dir
Reverse

(2) Gyro direction [default: Normal]

This parameter controls which direction the CGY750 (roll axis) will compensate when the helicopter rolls. Pick the helicopter up and roll the helicopter to the right. The CGY750 should compensate by adding left cyclic to the swash plate. If the CGY750 compensates in the wrong direction, then it will be necessary to reverse the Compensation Direction setting by pressing the [+] or [-] data key once.

⚠ WARNING

❗ Verify that the CGY750 compensates in the correct direction before flight. If the compensation direction is incorrect the model will roll uncontrollably, at a very high rate.

AILERON GYRO BASIC SETTING

↓
AGn: 100%
Gm: A 65%

(3) Gyro gain [default:100%, ranges:0~120%]

The top line shows the Aileron Gyro Base Gain and the bottom line shows the actual working gain as set within the transmitter. If the Aileron Gain Channel is set to [INH] within the CGY750 [S.Bus]->Basic setting menu, then the remote transmitter gain adjustment is not available and the actual working gain is set by using data [+] or [-] keys within this parameter.

↓

Wrk.Mode → **Wrk.Mode** → **Wrk.Mode**
CMT **Normal** **AVCS**

(4) Gyro working mode [default: CMT]

The available choices are CMT, Normal or AVCS. The CMT mode will allow you to select either AVCS or Normal mode by using the Aileron Gain Channel. The Normal mode will always operate in Normal Rate Mode, and AVCS will always operate in AVCS Mode. Use the data [+] or [-] key to select the desired working mode.

ELEVATOR GYRO BASIC SETTING

The [ELE.Gyro] → Basic menu contains all of the functions necessary to set up the CGY750 pitch axis for operation.



ELE.Gyro
Basic

(1) Start display

Use the mode [+] / [-] keys to navigate the setting menus.

ELE.Dir
Normal

ELE.Dir
Reverse

(2) Gyro direction [default: Normal]

This parameter controls which direction the CGY750 (pitch axis) will compensate when the helicopter pitches forward or backward. Pick the helicopter up and rotate the nose of the helicopter downward. The CGY750 should compensate by adding aft cyclic to the swash plate. If the CGY750 compensates in the wrong direction, then it will be necessary to reverse the Elevator Compensation Direction setting by pressing the [+] or [-] data key once.

⚠ WARNING

❗ Verify that the CGY750 compensates in the correct direction before flight. If the compensation direction is incorrect the model will flip uncontrollably, at a very high rate.

ELEVATOR GYRO BASIC SETTING

EGn: 100%
Gm: A 70%

(3) Gyro gain [default:100%, ranges:0~120%]

The top line shows the Elevator Gyro Base Gain and the bottom line shows the actual working gain as set within the transmitter. If the elevator Gain Channel is set to [INH] within the CGY750 [S.Bus]->Basic setting menu, then the remote transmitter gain adjustment is not available and the actual working gain is set by using data [+] or [-] keys within this setting menu.



(4) Gyro working mode [default: CMT]

Selects the gyro working mode. The available options are CMT, Normal or AVCS. The CMT mode will allow you to select either AVCS or Normal mode by using the gyro gain channel. The Normal mode will always operate in Normal Rate Mode, and AVCS will always operate in AVCS Mode. Use the data [+] or [-] key to select the desired working mode.

The [SWASHset] → Basic menu contains all of the functions necessary to set up the swash plate servos and to set up all swash plate mixing functions.



SWASHset
Basic

SWASHTyp
H3-120

SWASHTyp
H3-140

SWASHTyp
H3-90

SWASHTyp
H3-140?

(Confirmation screen)

SWASHTyp
H4-00

SWASHTyp
Normal

SWASHTyp
H4-45

(1) Start display

Use the mode [+] / [-] keys to navigate the setting menus.

(2) Swash type [default: H3-120]

The available options are [H3-120], [H3-140], [H3-90], [H4-00], [H4-45] and [Standard]. Pushing the Data [+] key once will show the next swash plate type and a “?” is shown requesting confirmation of the change. If the Data [+] (Set) key is pressed again within one second, the new swash plate type is selected and the “?” confirmation will disappear. If no confirmation is made within one second, the display will revert back to the prior swash plate type and no change will be made.

⚠ WARNING

❗ All of the swash plate parameters are reset when the swash plate type is changed. Please proceed through the entire setup process before attempting to fly the model.



(3) Servo type [default: Analog]

Select the appropriate setting for the cyclic servos. Use the data [+] or [-] key to choose from the following servo types: DG1520 or Analog.

⚠ WARNING

❗ Read your servo instruction sheet to determine the proper servo settings. The servo type parameter within the CGY750 must match the type of servo you are using. Incorrect setting may damage the CGY750 or the servo. Incorrect setting may also result in a loss of control during flight.



(4) Helicopter Presets [default: 600-700]

Please select the most appropriate setting for your model. The available presets are 450-550, 600-700 and 750 or larger.


The size profiles change many of the options within the CGY750 to tailor the gyro towards a certain helicopter size and the way that it reacts in flight. When using this option the CGY750 will be adjusted to provide a consistent feel for various helicopter sizes.

* Please refer to the back of this manual for a complete listing of the helicopter profiles and the flight mode presets.


FLT .Mode
-3-**(5) Flight mode presets [default: 3]**

The flight mode presets are used to control the overall feel and aggressiveness of the CGY750 in flight. The adjustment range is 1 through 5. Flight mode 1 is the least aggressive and is intended for beginners, sport, scale and even some F3C pilots. Flight mode 3 is considered average and is good for intermediate and 3D pilots who are not very aggressive. Flight mode 5 is intended for advanced pilots who like an aggressive feel. This is a personal preference option and it is recommended to test fly using flight mode 2 initially.

Available Flight Mode Presets:

- 1 - Least aggressive, good for beginners through F3C pilots
 - 2 - Average sport and 3D flight
 - 3 - Intermediate, sport and 3D flight
 - 4 - Fairly aggressive
 - 5 - Extremely aggressive
- 

AIL.Rev ↔ **AIL.Rev**
Normal ↔ **Reverse**

(6) Aileron servo reverse [default: Normal]

This setting is used to set the operational direction for the Aileron CCPM servo. The easiest way to set up the CGY750 is to observe which direction each servo needs to move when the collective stick is moved towards positive collective pitch. If the servo is moving the wrong direction then press the data [+] or [-] key to reverse that specific servo within the GY750. Once the collective is operating in the correct direction, check the cyclic controls. If the cyclic controls operate in the wrong direction, reverse the Swash AFR for that function within the CGY750.



ELE.Rev ↔ **ELE.Rev**
Normal ↔ **Reverse**

(7) Elevator servo reverse [default: Normal]

This setting is used to set the operational direction for the Elevator CCPM servo. The easiest way to set up the CGY750 is to observe which direction each servo needs to move when the collective stick is moved towards positive collective pitch. If the servo is moving the wrong direction, then press the data [+] or [-] key to reverse that specific servo within the GY750. Once the collective is operating in the correct direction check the cyclic controls. If the cyclic controls operate in the wrong direction, reverse the Swash AFR for that function within the CGY750.



PIT.Rev ↔ **PIT.Rev**
Normal **Reverse**

(8) Pitch servo reverse [default: Normal]

This setting is used to set the operational direction for the Pitch CCPM servo. The easiest way to set up the CGY750 is to observe which direction each servo needs to move when the collective stick is moved towards positive collective pitch. If the servo is moving the wrong direction, then press the data [+] or [-] key to reverse that specific servo within the GY750. Once the collective is operating in the correct direction check the cyclic controls. If the cyclic controls operate in the wrong direction, reverse the Swash AFR for that function within the CGY750.



ELE2.Rev ↔ **ELE2.Rev**
Normal **Reverse**

(9) 2nd Elevator reverse [default: Normal]

This setting is used to set the operational direction for the 2nd Elevator CCPM servo (only used for the H4-xx Swash plate types). The easiest way to set up the CGY750 is to observe which direction each servo needs to move when the collective stick is moved towards positive collective pitch. If the servo is moving the wrong direction, then press the data [+] or [-] key to reverse that specific servo within the GY750. Once the collective is operating in the correct direction, check the cyclic controls. If the cyclic controls operate in the wrong direction, reverse the Swash AFR for that function within the CGY750.

* This function is only used with the H4 swash plate types. Otherwise the function is disabled.

SWASH BASIC SETTING

↓
AIL.Ntr
+0 uS

↓
ELE.Ntr
+0 uS

↓
PIT.Ntr
+0 uS

↓
ELE2Ntr
+0 uS

(10) Servo neutral adjustment [default: 0µS]

Individual neutral adjustment for each of the swash plate servos. All servo arms should be perfectly perpendicular to the control linkage with the collective stick positioned at 0 degrees collective (usually centered). The ELE2 neutral adjustment only works if the H4-xx swash plate type has been selected.

To use this function select the servo you would like to adjust and press the data [+] or [-] key to position the servo as desired.

↓
AIL.Rate
+60 %

↓
ELE.Rate
+60 %

↓
PIT.Rate
+60 %

(11) Swash AFR (rate adjustment) [default: 50%]

The Swash AFR settings are used to adjust the direction and amount of throw allowed for each function. Think of this as the maximum travel endpoint for each function, except you want to set this to the maximum amount of cyclic/collective pitch you would like available to the CGY750. Use the Data [+] or [-] key to make an adjustment.

If any of the functions operate the incorrect di-

rection, then reverse the sign of the value. For example +60 would have to become -60. All of the servo, neutral and reversing adjustments should be made within the CGY750 and the transmitter functions should be left at the default values.

The [AIL.Rate] and [ELE.Rate] functions are dependent on servo arm length and head geometry, so it will be necessary to use a pitch gauge to make adjustments. For the cyclic controls it is recommended to start with 8 degrees of pitch change in any one direction. Adjustments to this value can be made after the 1st test flight once you determine the cyclic rates and the overall gyro behavior.

The [PIT.Rate] is the amount of collective pitch travel allowed and this value will be similar to what you normally fly other helicopters with. A good starting range for Sport, 3D and F3c is +/-10 to +/-12 degrees. Beginners may want to change the negative collective pitch to -3 degrees instead of -10.



SWS.Ring
100 %

(12) Swash ring [default: 100%]

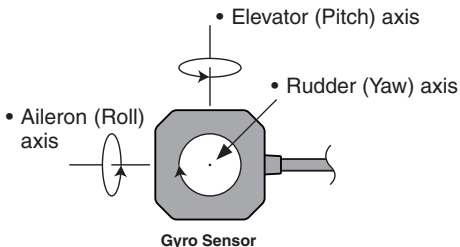
This function is used to prevent binding of the swash plate servos when the transmitter control stick is moved toward a corner (for example, full right and full aft cyclic). The default setting is 100%. This is considered normal for most helicopters. In some cases you may have to decrease the value to prevent binding. Press the Data [+] or [-] key to adjust the value.

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.

Test fit the gyro sensor, ensuring that the sensor is in perfect alignment with the helicopter on the roll and pitch axis. The cable from the gyro sensor must exit toward the front or the rear of the helicopter since this is the pitch axis. Any misalignment will cause a loss of performance so it is very important to ensure that everything is aligned properly.

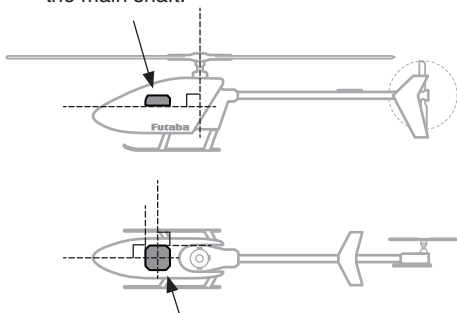
Once you are certain everything is properly aligned and that the sensor lead can be routed to the gyro, go ahead and mount the gyro sensor to the helicopter using one of the supplied gyro pads. Route the gyro sensor lead to the CGY750 control box and plug the lead into the gyro sensor port. Verify that the connector is firmly locked in place.



GYRO SENSOR INSTALLATION

Important: The CGY750 gyro sensor must be mounted so that the roll and pitch sensing axis are in alignment with the helicopter. Any misalignments over 1/2 of a degree will cause a loss in performance. Please take extra care in this step to ensure the optimum flight performance.

- The bottom of the CGY750 Gyro Sensor must be perpendicular to the main shaft.



- The roll axis must be parallel to the tail boom and the pitch axis must be perpendicular to the side frame.

TROUBLESHOOTING

If any issues are noted during flight (such as drifting, inconsistent hold or inconsistent control rates) then please review the following troubleshooting recommendations.

1. Always verify that the tail rotor and swash plate mechanisms operate, and that the drive system

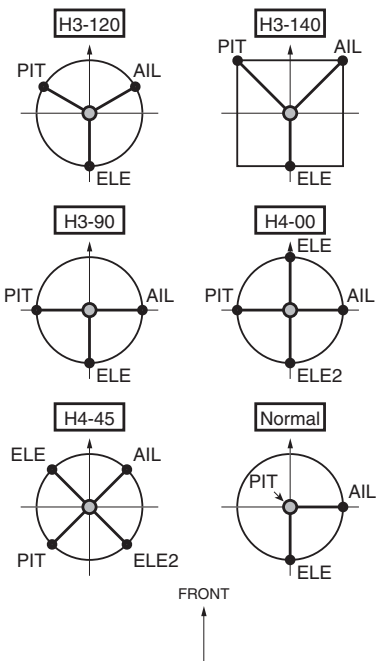
is in proper working order.

2. Electromagnetic interference could be causing the problem. If you feel everything is set up correctly and that the helicopter is vibration free, then consider moving the gyro sensor to a new location away from servos, ESC and drive motors.
3. Vibrations will decrease the performance of all gyro systems. Even though the CGY750 gyro sensor is the most vibration resistant gyro sensor available, eliminating vibrations will always improve performance. Throughout extensive testing it has been found that the CGY750 gyro sensor performs best when the sensor is mounted rigidly to the airframe. This is mainly due to the sensing of all 3 axis. It is highly recommended to avoid using soft foam pads as this may allow the gyro to bounce around on the roll and pitch axis, causing instabilities and possible loss of control during flight.

All components of the helicopter must be balanced and operate in a smooth manner. The newer gyro sensors are so sensitive (and extremely accurate) that even something as simple as a bad ball bearing can cause enough vibration to cause the sensor to read incorrectly. Main and tail rotor blades must also be perfectly balanced. Ensure that your engine is running smoothly and properly tuned. If you feel that all of the criteria has been met, then it is recommended to relocate the gyro sensor to a different position on the helicopter and test fly again to look for improvements.

SWASH SERVO INSTALLATION AND SETUP

The CGY750 supports 6 different swash plate types as shown below.



Swash Servo installation

- Determine which of the swash plate types shown match your helicopter and install the swash plate servos per the diagram and per your helicopter's instruction manual.
- Your transmitter should be reset to the default settings and the swash plate type selected

SWASH SERVO INSTALLATION AND SETUP

with the transmitter should be set to Normal (H-1) or single servo mode. All CCPM mixing is set up and handled with the CGY750 and the transmitter functions should not be used. The expo function and dual rates can be used with the transmitter but everything related to the CCPM mixing should be set up and handled by the CGY750. Set your transmitter AFR, ATV and D/R (Swash functions) to 100% initially for setup and all subtrims should be set to 0.

- ❑ Power up your transmitter and helicopter. Allow the CGY750 to initialize. Use the CGY750 [SWASHset] → Type function to select the swash plate type that matches your helicopter.
- ❑ Navigate to the Servo Type parameter on the CGY750 and select the servo type that matches your servo manufacturer's recommendations. If there is any doubt, select the analog servo type to prevent damaging the servos and check with your servo's manufacturer to determine the proper type.
- ❑ Navigate to the [SWASHset].AilNTR setting at this time. This will disable the gyros and cause the cyclic servos to remain in the center position. If you are using an electric motor then it will be necessary to remove the pinion gear now or disconnect the motor from the ESC. Once you are certain that the drive motor cannot apply power to the main rotor blades, temporarily install servo arms onto the servos. Slowly move the collective stick towards positive collective and

SWASH SERVO INSTALLATION AND SETUP

verify that each servo is moving the proper direction to increase collective pitch. If any servo is moving the wrong direction, use the [SWASHset] Reverse function to change the direction.

Once the servos are operating in the correct direction for the collective control (positive and negative), the next step is to slowly move the collective stick to the center position (verify within your transmitter's Servo Display function if possible). This will be considered the 0 collective position for setup. Temporarily install the servo arms onto the cyclic servos and ensure that the servos are perfectly level. Small adjustments can be made using the [SWASHset].Basic → AIL/ELE/COL.Ntr adjustment for each servo if necessary. Mount the linkage ball onto the servo arm per your helicopter's instruction manual and install the servo retention screw onto each servo.

- Move the forward / aft cyclic stick forward and verify that the swash plate tilts forward. If the swash plate tilts the wrong direction, then it will be necessary to reverse the sign of the [SWASHset].ELE.Rate parameter (for example +50 would become -50). Move the left / right cyclic stick to the right and verify that the swash plate tilts to the right. If the swash plate tilts left, then reverse the sign of the [SWASHset].AIL.Rate parameter.

As a final check, verify that the swash plate moves in the proper direction per your stick movements for the roll, pitch and collective

SWASH SERVO INSTALLATION AND SETUP

functions.

- Navigate to the [SWASHset] → Basic → AIL.Rate parameter. This will disable the gyros and cause the servos to remain centered during set up. Using a pitch gauge, ensure that the swash plate is perfectly level and that the main rotor blades are at 0 degrees pitch when the collective stick is centered. Make any mechanical adjustments as needed to achieve 0 degrees of pitch on both main rotor blades.

Rotate the main rotor blade with the pitch gauge so that it is aligned with the tail boom. Apply full right cyclic on the transmitter and measure how much pitch is on the blade. Initially it is best to start with 8 degrees of cyclic. Adjust the value of the [SWASHset] → Basic → Ail.Rate parameter until 8 degrees of cyclic is achieved.

Rotate the main rotor blade so that it is perpendicular to the tail boom and apply full aft cyclic. Adjust the [SWASHset] → Basic → Ele.Rate parameter until 8 degrees of cyclic is achieved.

If the values for the cyclic do not match up, do not be concerned. This is perfectly normal and generally the Aileron rate will be lower than the Elevator rate.

Using the pitch gauge, adjust the collective range per your preference or per your helicopter's instruction manual.

All of the AFR, ATV and D/Rs for the cyclic and collective functions within the radio

SWASH SERVO INSTALLATION AND SETUP

should be set to 100%. At this point the basic setup is complete, but it is necessary to set up the gyros and compensation directions before attempting to fly the model.

- ❑ Check the cyclic and collective movements for interactions and if any are noted please refer to the Swash Plate Adjustment procedure listed within the back of this manual. When using modern digital servos and with a proper setup this shouldn't be necessary. Sometimes mechanical design flaws or mistakes within the setup will cause interactions and it is best to remove these before flight.

Finishing the setup:

Using the T8FG, T12FG, T12Z and 14MZ Remote Gain Functions (roll, pitch and yaw)

1. Some Futaba transmitters contain auxiliary gain functions for aileron, elevator and yaw. Please refer to your transmitter's instruction manual. Assign the GYR, GYR(AIL) and GYR(ELE) channels within the transmitter. Within the CGY750 [S.Bus] → Basic menu, assign the [AGN], [EGN] and [RGN] to the appropriate channels.
2. The gyro function within your transmitter should list all three gain channels. Adjustments can be made from within this function. The gyro function can usually be assigned to various switches or conditions to offer greater adjustability. Please refer to your transmitter's instruction manual for further details.
3. Initially the AIL and ELE gains should be set to 50 and the operating mode should be set to [NOR]. Once the trim process has been completed, the flight mode should be changed over to [AVCS].

⚠ WARNING

❗ Verify that the gyro compensates in the correct direction for all three axis before flight. If the compensation direction is incorrect, the model will roll, flip, or pirouette uncontrollably at a very high rate.

Setting the CGY750 gains by using endpoints or manual adjustments

1. If your transmitter does not support the remote gain adjustment it is still possible to use two spare channels on the transmitter to make the adjustments. Assign two unused channels (verify that these channels are not assigned or operated by a switch or dial) within the transmitter. Set the [SBus.Basic] → AGN and [SBus.Basic] → EGN channels to the appropriate channel. Use the end point adjustment within your transmitter for these channels to make the gain adjustments and the reverse function within the transmitter to set the mode [AVCS/NOR]. Conditions with the transmitter may also be used to achieve different gains based upon flight modes. Please refer to your transmitter's instruction manual for further details.
2. Initially the AIL and ELE gains should be set to 50 and the operating mode should be set to [NOR]. Once the trim process has been completed, the flight mode should be changed over to [AVCS].

⚠ WARNING


! Verify that the gyro compensates in the correct direction for all three axis before flight. If the compensation direction is incorrect, the model will roll, flip, or pirouette uncontrollably at a very high rate.

AILERON/ELEVATOR GYRO SETUP

Manual gain adjustment

1. If your setup does not leave any channels free or if your transmitter does not support auxiliary gain adjustment, then it is possible to adjust the gain manually within the CGY750. Set both the [SBus].Basic → AGN and [SBus].Basic → EGN to [INH]. The gain adjustments are now made by entering the [AIL/ELE].Basic → Gain and pressing the data [+] or [-] keys.
2. The gain adjustments are made by entering the [AIL / ELE].Basic->Gain and pressing the data [+] or [-] keys.
3. Initially the AIL and ELE gains should be set to 50 and the operating mode should be set to [NOR]. Once the trim process has been completed, the flight mode should be changed over to [AVCS].

WARNING

 Verify that the gyro compensates in the correct direction for all three axis before flight. If the compensation direction is incorrect, the model will roll, flip, or pirouette uncontrollably at a very high rate.

TAIL ROTOR SERVO INSTALLATION AND SETUP

Following your transmitter instructions, program your transmitter as follows:

- Enable the rudder gyro function within the transmitter.
- Set the gyro mode to AVCS (GY) within the transmitter.
- Set the remote gyro gain to 80% AVCS in the transmitter for the Normal and Hold flight conditions and use 50% 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.

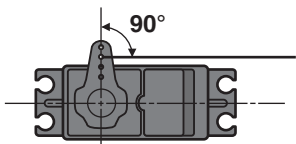
⚠WARNING

⊘ 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 CGY750 or the servo.

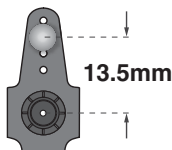
Once these steps are completed, turn the receiver power on and allow the gyro to initialize. Follow the instructions within the “*Rudder Gyro Basic Setting*” section of the manual and select the Servo Type that matches the servo you have chosen to use. Power down the receiver for now.

TAIL ROTOR SERVO INSTALLATION AND SETUP

- ❑ 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 “*Rudder 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.



TAIL ROTOR SERVO INSTALLATION AND SETUP

- ❑ Follow the instructions within the “[RUD. Gyro].Basic → SV.Limit” 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 rudder gyro setup is now complete.

BEFORE FLIGHT CHECKLIST

- Always verify that the transmitter and Receiver batteries are fully charged.
- Check the gyro mounting tape and ensure that it is in good condition. Make sure the gyro is firmly mounted to the helicopter.
- Verify that 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.
- Check and verify that the servo type parameter is set correctly for the tail rotor and cyclic servos.
- Verify that all of the servo arm screws are installed.
- Ensure that the cyclic and tail rotor servos do not bind when moved to the full extent of the throw.
- Verify that the gyro is operating in the correct mode [AVCS or Normal] and that the gains are properly set.
- Test all controls and verify that they move in the correct direction.
- Verify that the gyro compensates in the correct direction for all three axis before flight. If the compensation direction is incorrect the model will roll, flip, or pirouette uncontrollably, at a very high rate.

ADJUSTMENTS DURING THE TEST FLIGHT

⚠ WARNING

❗ Always level the swash plate using the cyclic stick before applying throttle and spooling the main rotor blades up. During takeoff small corrections may be necessary. If you make large corrections while the helicopter is on the ground, it may tip over since the helicopter is firmly on the ground and the gyros are overcompensating due to the lack of movement.

❗ Some helicopters may have a tendency to resonate/shake during spool up. Always leave the helicopter on the ground until this resonance or shaking goes away. If this issue continues, it is recommended to try some rubber skid stops or take off from a softer surface such as grass. Vibrations contribute to this ground resonance. Verify that everything on your model is balanced correctly.

*When the CGY750 is used with a ESC or BEC and a power switch is not used there is a possibility that the intermittent connection as you connect the flight battery may cause the CGY750 initialization to fail. Always ensure that the gyro has initialize properly by verifying that the gyros are compensating as the helicopter is moved. It is recommended to use a power switch on the power supply line to avoid this possibility.

Trim flight:

A trim flight should be performed on a new setup or when making setup changes to the mechanical adjustments on the helicopter.

1. Verify that the AIL and ELE gyros are set to

ADJUSTMENTS DURING THE TEST FLIGHT

50% gain and the Normal operating mode. Take the model off into a hover and use the transmitter trim tabs to trim the model during flight.

2. Once the model is trimmed out, land the model and shut the engine off. Move the gyro gain switch from Normal to AVCS mode 3 times in a second. Make sure the neutral positions for both aileron and elevator are memorized.

*If your gyro gain switch is on the flight mode switch, perform the trim flight and land the model. Shut the engine off and change the CGY750 operating mode to AVCS. Now turn the CGY750 off and back on. The neutral positions for both aileron and elevator will be memorized.

*Manual Gain Adjustment: Perform the trim flight and land the model. Shut the engine off. Change the CGY750 operating mode to AVCS. Now turn the CGY750 off and back on. The neutral positions for both aileron and elevator will be memorized.

3. After the trim flight, change the gyro operating mode to AVCS and test fly the model again. Increase the gain on the aileron and elevator gyro until you notice a oscillation, then decrease the gain slightly.

*In case of lack of the channel for gyro gain setting on the transmitter, adjust the gyro gain on the CGY750.

Rudder gyro adjustments:

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 Sports mode, the helicopter will

ADJUSTMENTS DURING THE TEST FLIGHT

achieve a 450 deg/sec pirouette rate with the stick at its extent. 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. The gain for the Hold condition can also be 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.

RECOMMENDED GYRO GAIN SETTINGS

Recommended gain settings:

Size	Recommended Gyro Gain	
	AIL/ELE Gyro	RUD Gyro
450-550	30-50%	30-50%
600-700	70-90%	60-90%
750-more	80-100%	80-100%

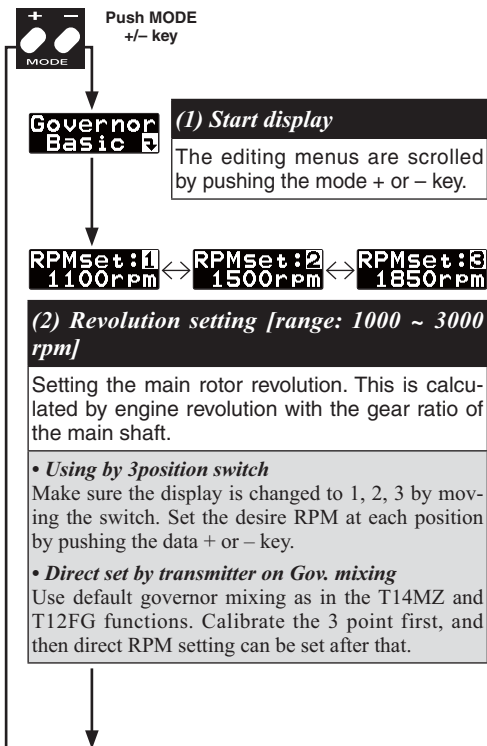
Most pilots today are using AVCS Mode. If you are just starting out, it is recommended that you use AVCS Mode exclusively from the start. Normal Mode is rarely used today due to the performance benefits of AVCS mode. When using AVCS mode all trimming of the tail is automatically handled by the gyro. If you should decide to use Normal Mode then 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 servo will center, indicating that the new center position has been memorized.

GOVERNOR BASIC SETTING

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



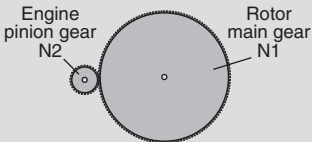
Gear.Rt
7.92 t

(3) Gear ratio [default: 8.00, range: 1 ~ 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:



$$\text{Gear ratio} = N1/N2$$

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

ServoTyp Analog ↔ ServoTyp DG:1520

(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 CGY750 or the servo, possibly resulting in a loss of control during flight.



Stick.SW ON 30% ↔ Stick.SW Inhibit

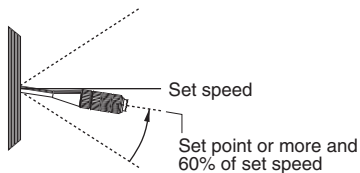
(5) Stick switch [default: 30%]

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.

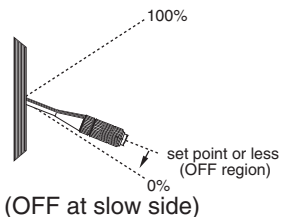
When governor is turned on and off by transmitter throttle stick

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 held at the set point or more → → → Remains ON
- Throttle stick lowered past the set point or less than the slow side → → → OFF



GOVERNOR BASIC SETTING

On/OffSW Inhibit ↔ On/OffSW ON ↔ On/OffSW Off

(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.

When governor turned on and off by switch

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



B/FS.Set
Inhibit ↔ B/FS.Set
! 28%

(7) Battery failsafe setting [default: Inhibit]

The governor goes into the failsafe mode when the battery voltage is below BFS.Volt. 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 have 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



GOVERNOR BASIC SETTING

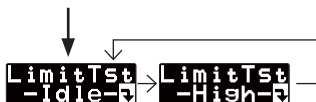


(9) Servo limit point setting

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 CGY750 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.

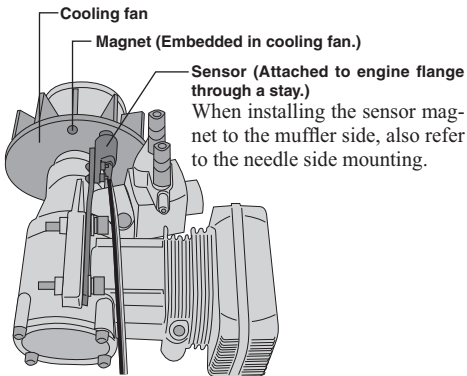
Rev. Sens
1% 62%M

(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.

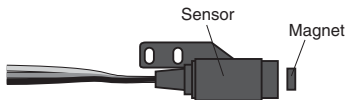
MOUNTING THE MAGNET AND SENSOR

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



Magnet operating side check

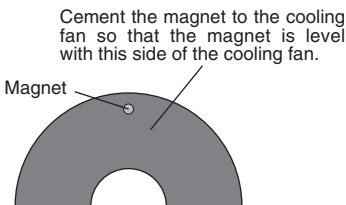
- Bring the magnet near the end of the sensor and check the operating side.



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

MOUNTING THE MAGNET AND SENSOR

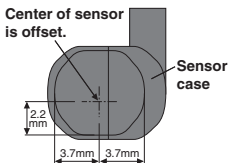
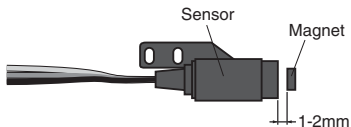
between the sensor and magnet can be made 1 to 2mm.

- ❑ 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.



MOUNTING THE MAGNET AND SENSOR

- 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.

FUSELAGE SETTING PRECAUTIONS

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%.
- ❑ 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

FUSELAGE SETTING PRECAUTIONS

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 CGY750 operates from 1000 to 3000rpm main rotor speed. However, the engine must be running at the set speed. The CGY750 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 CGY750 stabilizes the engine speed to within $\pm 1\%$ 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 ± 15 rpm. However, this poses no problem from the standpoint of practical use.

GOVERNOR SPEED SETTING

The CGY750 is used by setting the channel in the “(10) Revolution channel” menu within the “*S.BUS Basic Setting*” to the governor speed setting channel of your system. When using an independent governor on/off switch, activate the “(6) Governor on/off switch” function within the “*Governor Basic Setting*” section earlier in this manual.

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 horizontal 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

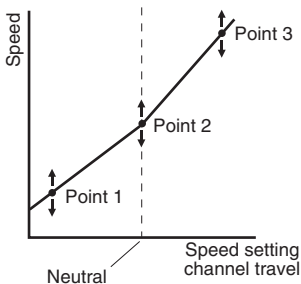
GOVERNOR SPEED SETTING

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.

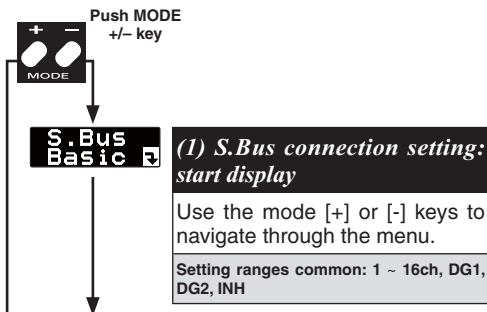
S.BUS BASIC SETTING

Since S.Bus sends all 18 channels (may be limited by your transmitter) over a single wire, it is necessary to assign a CGY750 function (such as AIL, ELE or COL) to each channel. The channel assignments are performed within the [S.BUS]. Basic menu.

If a function is not going to be used, then it must be set to [INH]. For example, if the AGN and EGN remote gain functions are not going to be used, then set them to [INH] and the CGY750 will then allow you to make gain adjustments within the respective menu.

⚠ WARNING

❗ Always verify that the S.Bus function assignments match your transmitter function assignments. If any changes are made within the transmitter function assignments, then it will also be necessary to make the changes within the S.Bus function assignments as well.



S.BUS BASIC SETTING

S.BusCN7
AIL: 1ch

(2) S.Bus setting: Aileron channel [default: 1ch]

Using the data [+] or [-] keys to set the correct channel number.

S.BusCN8
ELE: 2ch

(3) S.Bus setting: Elevator channel [default: 2ch]

Using the data [+] or [-] keys to set the correct channel number.

S.BusCN3
THR: 3ch

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

Using the data [+] or [-] keys to set the correct channel number.

S.BusCN1
RUD: 4ch

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

Using the data [+] or [-] keys to set the correct channel number.

S.BusCN6
PIT: 6ch

(6) S.Bus setting: Pitch channel [default: 6ch]

Using the data [+] or [-] keys to set the correct channel number.

S.BusCN9
AGn: 9ch

(7) S.Bus setting: AIL gain channel [default: 9ch]

Using the data [+] or [-] keys to set the correct channel number.

S.BUS BASIC SETTING

**S.BusCN1
EGn: 10ch**

(8) S.Bus setting: ELE gain channel [default: 10ch]

Using the data [+] or [-] keys to set the correct channel number.

**S.BusCN2
RGn: 5ch**

(9) S.Bus setting: RUD gain channel [default: 5ch]

Using the data [+] or [-] keys to set the correct channel number.

**S.BusCN4
RPM: 7ch**

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

Using the data [+] or [-] keys to set the correct channel number.

**S.BusCN5
GVs: 8ch**

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

Using the data [+] or [-] keys to set the correct channel number.

***RESET*
S.Bus [F]**

***RESET*
Exec.??[F]**

***RESET*
-Exec.--**

(12) S.Bus data reset

This resets the S.Bus channel assignments back to the defaults. Press the data [+] key and [Exec ??] will be displayed as a confirmation. Press data [+] to confirm the reset back to the default settings.

RUDDER GYRO EXPERT SETTING

The expert menu contains settings for pilots looking to achieve the absolute best performance from there gyro. To enter the expert menu navigate to the Basic menu, press and hold the mode [+] key for one second and the menu will change from the Basic to Expert. To exit the expert menu press and hold the mode [+] key for one second and the basic menu will be displayed.

(1) Start display

A black LCD display with white text. The top line shows "Gyro" and the bottom line shows "Expert". A small square icon with a right-pointing arrow is located to the left of the text.

Use the mode [+] or mode [-] keys to navigate the menu.

(2) Rudder servo neutral setting

A black LCD display with white text. The top line shows "RUD.Ntr" and the bottom line shows "+0 uS".

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

This parameter is used to set the neutral position of the rudder servo. Press the data [+] or [-] key to make adjustments.

(3) Gyro basic gain

A black LCD display with white text. The top line shows "GY.Gain" and the bottom line shows "A: 100 %".

default: 100 %
ranges: 50 ~ 120 %

This parameter sets the base gain of the gyro. This can be used to adjust the gain % if your actual transmitter gain does not match the gain on the CGY750 correctly.

(4) Rudder exponential

EXP.AVC
-40 %

EXP.NOR
-10 %

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

This parameter sets the feel of the tail rotor control around center. Decreasing the number will result in a softer feel and increasing the number will result in a more aggressive feel. Adjust to suit your preference. The RUD EXP functions within your transmitter can also be used to make this adjustment.

(5) Rudder delay mode

Dly.Mode
Function

Dly.Mode
Constant

default: Function

Select [Function] for a softer control feel and [Constant] for a linear and aggressive feel.

(6) Control delay In

CNT.DIIn
A: 20 n

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

This parameter sets the delay as you move the stick from neutral toward left or right. Larger values will result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(7) Control delay Out

CNT.Dout
A: 20

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

This parameter sets the delay when the stick is returned back to the neutral position. Larger values result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(8) Stop delay

Stop.Dly
120 %

default: 120%
ranges: 100% ~ 400%

This parameter is used to adjust the aggressiveness of the stop. Larger values will delay the tail stops resulting in less bounce. Use the data [+] or [-] key to adjust the value.

(9) Gyro working mode

Wrk.Mode
CMT

Wrk.Mode
Normal

Wrk.Mode
AVCS

default: CMT

This parameter sets the gyro operating mode. The choices are CMT, Normal and AVCS. The CMT function is used when you need to switch between the Normal and AVCS modes based on the gain value. Use the data [+] or [-] key to select the operating mode.

(10) *Pirouette speed*

ANG: 450d
AM +0d

default: 450 deg/sec (Sports), 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. Use the data [+] or [-] key to adjust the value.

(11) *Gain change up delay*

CG.D1Inc
12 Fr

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. Use the data [+] or [-] key to adjust the value.

(12) *Gain change down delay*

G.D1yDec
3 Fr

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. Use the data [+] or [-] key to adjust the value.

(13) Rudder hysteresis

RUD.His
6.0 uS

default: 7 uS
ranges: 0 ~ 50 uS

This adjusts the rudder stick null ranges. Use the data [+] or [-] key to adjust the value.

(14) Gain tracking

G.Track
+0 %

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

This adjusts the gyro holding feeling during left and right pirouette. Use the data [+] or [-] key to adjust the value.

(15) F/F mixing

F/F.Mix
Off

F/F.Mix
Active

F/F.Mix
Invalid

default: off

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

F/F mixing is handled within the CGY750. Do not attempt to use revolution or acceleration mixing within your transmitter as this will actually adjust the input signal to the gyro.

(16) F/F mixing rate

F/F .Rate
[L]: +0 %

default: 0 %

range: -100% ~ +100%

This parameter adjusts the F/F mixing rate. The [L] low and [H] high rates are adjustable individually. Larger values will add more mixing as the collective is moved away from center towards + or - pitch.

(17) F/F mixing acceleration gain

ACC .Gain
0

default: 0 %

range: 0 ~ 200 %

If the collective stick is moved quickly, then the acceleration gain is used to increase the F/F mixing rate to help compensate for this sudden change. Use the data [+] and [-] key to make adjustments. Use the data [+] or [-] key to adjust the value.

(18) Sensor mode

Sen .Mode
Moderate

Sen .Mode
Quick

Sen .Mode
Middle

default: Moderate

This parameter selects the response of the gyro sensor signal. The response is set as Moderate→Middle→Quick, but the stability is vice versa. Most helicopter will perform the best when using the Moderate setting. Smaller helicopter may perform better on the Quick or Middle setting. Use the data [+] or [-] key to adjust the

value.

(19) *Neutral compensation*

Ntr.Obstr
Off

Ntr.Obstr
ON

default: ON

This function works to recall the neutral point of the rudder servo for improving tail stop motion. To use this function effectively, hover the helicopter for about one second, and memorize the neutral point. If using a 3D helicopter, this function may not work as well due to the quick and aggressive movements. Check the function to see if it works correctly. Use the data [+] or [-] key to enable and disable this option.

(20) *Yaw smoother*

Yaw.Smth
Off

Yaw.Smth
ON

default: ON

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. Use the data [+] or [-] key to enable or disable this function.

(21) *Stop boosting*

StpBoost
Off

StpBoost
150 %

default: Off

range: Off ~ 200%

This function works for boosting the gyro gain to improve tail stop motion. Use the data [+] or [-]

key to adjust the value.

(22) Gyro data reset

RESET
Gyro **↵**

RESET
Exec.?? **↵**

RESET
-Exec.--

This resets all of the rudder gyro parameters back to the default values. Press the data [+] key once and [Exec ??] is shown as a confirmation. Press the data [+] key again to confirm the operation and all of the gyro parameters will be reset.

AILERON GYRO EXPERT SETTING

The expert menu contains settings for pilots looking to achieve the absolute best performance from their gyro. To enter the expert menu navigate to the Basic menu, press and hold the mode [+] key for one second and the menu will change from the Basic to Expert. To exit the expert menu press and hold the mode [+] key for one second and the basic menu will be displayed.

(1) Start display

AIL.Gyro
↓ Expert

Use the mode [+] or [-] keys to navigate through the menus.

(2) Exponential

EXP.AVC **EXP.NOR**
-40 % **-10 %**

default: -40% (FLT.Mode-3, 600-700)

ranges: -10% ~ +100%

This parameter sets the feel of the AIL cyclic control around center. Decreasing the number will result in a softer feel and increasing the number will result in a more aggressive feel. Adjust to suit your preference. The AIL EXP functions within your transmitter can also be used to make this adjustment.

(3) Control delay in

AIL.DIIn
A: 2 n

AILERON GYRO EXPERT SETTING

default: 7 (FLT.Mode-3, 600-700)

ranges: 0 ~ 20

This parameter sets the delay as you move the stick from neutral toward left or right. Larger values will result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(4) Control delay out

AIL.Dout
A: 2 n

default: 7 (FLT.Mode-3, 600-700)

ranges: 0 ~ 20

This parameter sets the delay when the stick is returned back to the neutral position. Larger values result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(5) Stop delay

Stop.Dly
120 %

default: 120%

ranges: 100% ~ 400%

This parameter is used to adjust the aggressiveness of the stops. Larger values will delay the stop resulting in less bounce. Use the data [+] or [-] key to adjust the value.

(6) AVCS damping

AVCS.Dmp
98 %

default: 98% (FLT.Mode-3, 600-700)

ranges: 0 ~ 150%

This parameter sets the AVCS damping factor. Increasing the value, the holding power is increased,

but the control feeling may be influenced.

(7) Control feeling

Cnt. feel
5 n

default: 5n

ranges: 1 ~ 10n

This parameter sets the control feeling of the aileron control. Increasing the value, the control feeling will be consistent. Decreasing the value, the control feeling will be dynamic.

(8) Rate Constant

Rate.Cst
50 %

default: 50% (FLT.Mode-3, 600-700)

ranges: 0 ~ 150%

This parameter selects the consistency of the roll rate. Adjust the roll rate between stationary or straight flight differences.

(9) Roll rate setting

ANG. Rate
100 %

default: 100%

ranges: 50 ~ 150%

This parameter adjusts the roll speed by the aileron control. Set the values to match the roll rate of the helicopter.

(10) D gain setting

D. Gain
200 %

AILERON GYRO EXPERT SETTING

default: 200% (HeliSize=600-700)

ranges: 0 ~ 250%

This parameter adjusts the D gain (differential gain) of the aileron gyro. It changes the characteristics of the control feeling and stop motion. Select the preferred value.

(11) Sensor mode

Sen.Mode
Moderate

Sen.Mode
Quick

Sen.Mode
Middle

default: Middle

This selects the response of the gyro sensor signal. The response is ordered by Moderate→Middle→Quick, but the stability is vice versa. Select the good matching for the heli. Pushing data+ or - key, the mode is changed.

(12) Data reset

RESET
AIL.Gyr 

RESET
Exec.?? 

RESET
-Exec.--

This resets all of the aileron gyro parameters back to the default values. Press the data [+] key once and [Exec ??] is shown as a confirmation. Press the data [+] key again to confirm the operation and all of the gyro parameters will be reset.

ELEVATOR GYRO EXPERT SETTING

The expert menu contains settings for pilots looking to achieve the absolute best performance from their gyro. To enter the expert menu navigate to the Basic menu, press and hold the mode [+] key for one second and the menu will change from the Basic to Expert. To exit the expert menu press and hold the mode [+] key for one second and the basic menu will be displayed.

(1) Start display



ELE.Gyro
↓ Expert

Use the mode [+] or mode [-] keys to navigate the menu.

(2) Exponential



EXP.AVC EXP.NOR
-40 % -10 %

default: -40% (FLT.Mode-3, 600-700)

ranges: -100% ~ +100%

This parameter sets the feel of the ELE cyclic control around center. Decreasing the number will result in a softer feel and increasing the number will result in a more aggressive feel. Adjust to suit your preference. The ELE EXP functions within your transmitter can also be used to make this adjustment.

(3) Control delay in



ELE.D1In
A: 2 n

default: 10 (FLT.Mode-3, 600-700)

ranges: 0 ~ 20

ELEVATOR GYRO EXPERT SETTING

This parameter sets the delay as you move the stick from neutral toward forward and aft cyclic. Larger values will result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(4) Control delay out

ELE.Dout
A: 2 n

default: 10 (FLT.Mode-3, 600-700)
ranges: 0 ~ 20

This parameter sets the delay when the stick is returned back to the neutral position. Larger values result in a smoother feel. Use the data [+] or [-] key to adjust the value.

(5) Stop delay

Stop.Dly
120 %

default: 120%
ranges: 100% ~ 400%

This parameter is used to adjust the aggressiveness of the stop. Larger values will delay the stop resulting in less bounce. Use the data [+] or [-] key to adjust the value.

(6) AVCS damping

AVCS.Dmp
98 %

default: 98 % (FLT.Mode-3, 600-700)
ranges: 0 ~ 150 %

This sets the AVCS damping factor. Increasing the value, the holding power is increased, but the control feeling may be influenced.

(7) Control feeling

Cnt. feel
5 n

default: 5 n
ranges: 1 ~ 10n

This parameter sets the control feeling of the elevator control. Increasing the value, the control feeling will be consistent. Decreasing the value, the control feeling will be dynamic.

(8) Rate Constant

Rate.Cst
50 %

default: 50 % (FLT.Mode-3, 600-700)
ranges: 0 150%

This parameter selects the consistency of the elevator rate. Adjust the elevator rate between stationary or straight flight differences.

(9) Roll rate setting

ANG.Rate
100 %

default: 100 %
ranges: 50 ~ 150 %

This parameter adjusts the pitch speed by the elevator control. Set the values to match the roll rate of the helicopter.

(10) D gain setting

D.Gain
200 %

default: 200% (HeliSize=600-700)
ranges: 0~250%

This parameter adjusts the D gain (differential

ELEVATOR GYRO EXPERT SETTING

gain) of the elevator gyro. It changes the characteristics of the control feeling and stop motion. Select the preferred value.

(11) Sensor mode

Sen.Mode
Moderate

Sen.Mode
Quick

Sen.Mode
Middle

default: Middle

This selects the response of the gyro sensor signal. The response is ordered by Moderate→Middle→Quick, but the stability is vice versa. Select the good matching for the heli. Pushing data+ or - key, the mode is changed.

(12) Data reset

RESET
ELE.Gyr

RESET
Exec.??

RESET
-Exec.--

This resets all of the rudder gyro parameters back to the default values. Press the data [+] key once and [Exec ??] is shown as a confirmation. Press the data [+] key again to confirm the operation and all of the gyro parameters will be reset.

The expert menu contains settings for pilots looking to achieve the absolute best performance from their gyro. To enter the expert menu navigate to the Basic menu, press and hold the mode [+] key for one second and the menu will change from the Basic to Expert. To exit the expert menu press and hold the mode [+] key for one second and the basic menu will be displayed.

(1) Start display

The image shows a digital display with the text "SWASHset" on the top line and "Expert" on the bottom line. A small square icon with a downward-pointing arrow is positioned to the left of the word "Expert".

Use the data [+] and [-] keys to navigate through the menu.

(2) PIT→AIL mixing rate

The image shows a digital display with "PIT→AIL" on the top line and "A: 100%" on the bottom line. A small square icon with an upward-pointing arrow is positioned to the left of the text "A: 100%".

default: 100%

ranges: 30~150%

This adjusts the pitch to aileron mixing rate. The pitch up and down rates can both be adjusted individually.

(3) PIT→ELE mixing rate

The image shows a digital display with "PIT→ELE" on the top line and "A: 100%" on the bottom line. A small square icon with an upward-pointing arrow is positioned to the left of the text "A: 100%".

default: 100%

ranges: 30~150%

This adjusts the pitch to elevator mixing rate. The pitch up and down rates can both be adjusted individually.

(4) *PIT*→*ELE2* mixing rate

PIT→ELE2
A: 100 %

default; 100%
ranges: 30~150%

This adjusts the pitch to 2nd elevator mixing rate. The pitch up and down rates can both be adjusted individually. It is only available at H4 swash mode.

(5) *AIL*→*PIT* mixing rate

AIL→PIT
B: 100 %

default; 100%
ranges: 30~150%

This adjusts the aileron to pitch mixing rate. The rate can be adjusted for left and right directions individually.

(6) *AIL*→*ELE* mixing rate

AIL→ELE
B: 100 %

default; 100%
ranges: 30~150%

This adjusts the aileron to elevator mixing rate. The rate can be adjusted for left and right directions individually. It is only available for H4-45 swash mode.

(7) *AIL*→*ELE2* mixing rate

AIL→ELE2
B: 100 %

default; 100%
ranges: 30~150%

This adjusts the aileron to 2nd elevator mixing rate. The rate can be adjusted for left and right directions individually. It is only available for H4-45 swash mode.

(8) *ELE*→*PIT* mixing rate

ELE→PIT
B: 50 %

default; 50%(H3-120), 100%(except H3-120)
ranges: 30~150%

This adjusts the elevator to pitch mixing rate. The rate can be adjusted for up and down directions individually.

(9) *ELE*→*AIL* mixing rate

ELE→AIL
B: 50 %

default; 50%(H3-120), 100%(except H3-120)
ranges: 30~150%

This adjusts the elevator to aileron mixing rate. The rate can be adjusted for up and down directions individually.

(10) *ELE*→*ELE2* mixing rate

ELE→ELE2
B: 100 %

default; 100%
ranges: 30~150%

This adjusts the elevator to 2nd elevator mixing rate. The rate can be adjusted for up and down directions individually. It is only available for H4 swash mode.

(11) Linkage compensation aileron

SWcp.AIL
[E]: 0 %

default; 0%
ranges: 0~100%

This adjusts the linkage compensation of the aileron control influenced to pitch and elevator direction. There are 4 point settings, left and right on pitch high and low.

(12) Compensation direction of the aileron

CpA.Dir
Plus

CpA.Dir
Minus

default; plus

This selects the direction of the aileron compensation. The direction is changed by pushing the Data + or - key. Set the direction of interaction to be smaller.

(13) Linkage compensation elevator

SWcp.ELE
[E]: 0 %

default; 0%
ranges: 0~100%

This adjusts the linkage compensation of the elevator control influenced to pitch and aileron direction. There are 4 point settings, up and down on pitch high and low.

(14) Compensation direction of the elevator

CpE.Dir
Plus

CpE.Dir
Minus

default; plus

This selects the direction of the elevator compensation. The direction is changed by pushing the Data + or – key. Set the direction of interaction to be smaller.

(15) Speed compensation

SpeedCmp
0 %

default; 50%(H3-120), 0%(except H3-120)
ranges: 0~100%

This parameter adjusts the speed of the pitch and aileron servos at the elevator operation. Adjustments to their interaction should be minimal.

(16) Swash rotation

SWASHRot
+0 deg

default; 0 deg
ranges: -90~+90 deg

This parameter is used to adjust the control phasing. Use the data [+] or [-] keys to make adjustments.

(17) Pitch zero setting

Pit.Zero
!1520 uS

default: 1520 uS

This parameter sets the pitch zero point of CGY750. Move the pitch stick to the zero pitch. Push data+ or – key. The zero pitch signal is memorized to CGY750. The display shows “!” marked at the setting point.

(18) Pitch low setting

Pit.Low
!1939 uS

default: 1940 uS

This parameter sets the minimum pitch point of CGY750. Move the pitch stick to minimum pitch. Push data+ or – key. The minimum pitch signal is memorized to CGY750. The display shows “!” marked at the setting point.

(19) Pitch high setting

Pit.High
!1226 uS

default: 1100 uS

This parameter sets the maximum pitch point of CGY750. Move the pitch stick to maximum pitch. Push data+ or – key. The maximum pitch signal is memorized to CGY750. The display shows “!” marked at the setting point.

(20) Data reset

RESET
SWASHse

RESET
Exec.??

RESET
-Exec.--

This resets all of the Swash plate parameters back to the default values. Press the data [+] key once and [Exec ??] is shown as a confirmation. Press the data [+] key again to confirm the operation and all of the gyro parameters will be reset.

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

```
Governor  
Expert
```

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

```
Wrk.Mode  Wrk.Mode  
Governor  Rev.Lmt
```

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

Rv.Disp
Rotor

Rv.Disp
Engine

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

Response
Moderate

Response
Middle

Response
Quick

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

Gv.Gain
40 %

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

THR.Mode
Optimize

THR.Mode
Fixed

THR.Mode
Tx.Curve

default: Optimize

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

Optimize:

CGY750 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:

CGY750 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

Rv.UpDly
10 Frm

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

Rv.DnDly
10 Frm

default: 10

range: 2 ~ 20

GOVERNOR EXPERT SETTING

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

(9) Start delay

StartDly
1 St

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

LLmt_Hov
20 %

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

LLmt Idup
40 %

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) Battery F/S voltage setting

BFS.Volt
3.8 v

default: 3.8 v

ranges: 3.5 ~ 7.5 v

This sets the battery fail safe and low battery alarm voltage. Set the proper voltage by the battery type. The battery characteristics are different by different manufacture. Please make sure the battery capacity is remained for 1 flight time (5-10 minutes) after starting the battery alarm. The value is changed by pushing DATA+ or - key. Suggested setting voltages are as follows.

- 4 cells NiCd or NiMH (Normal: 4.8v) = 3.8 v
- 2 cells LiFe (Normal: 6.6 v) = 6.0 ~ 6.2 v
- 2 cells LiPo (Normal: 7.4 v) = 7.2 ~ 7.4 v

(13) Governor data reset

RESET
Gov. 

RESET
Exec.?? 

RESET
-Exec.-

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

SWASH SETTING PARAMETER TABLE

The table shows the preset parameters by each heli size and flight mode combination. Refer to the instructions within the “*Swash Basic Setting*” section of the manual.

450-550

[Aileron gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	96%	97%	98%	98%	100%
Cnt.DlyIn	15	12	7	4	2
Cnt.Dlyout	15	12	7	4	2
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	20%	20%	20%	10%	0%
D.Gain	100%	100%	100%	100%	100%
ANG. Base	360d/s	420d/s	420d/s	480d/s	480d/s

[Elevator gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	97%	98%	98%	99%	100%
Cnt.DlyIn	15	12	10	8	5
Cnt.Dlyout	15	12	10	8	5
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	20%	20%	20%	10%	0%
D.Gain	100%	100%	100%	100%	100%
ANG. Base	240d/s	300d/s	300d/s	360d/s	360d/s

SWASH SETTING PARAMETER TABLE

600-700

[Aileron gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	96%	97%	98%	98%	100%
Cnt.DlyIn	15	12	7	4	2
Cnt.Dlyout	15	12	7	4	2
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	30%	40%	50%	40%	30%
D.Gain	200%	200%	200%	200%	200%
ANG. Base	240d/s	270d/s	300d/s	300d/s	300d/s

[Elevator gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	97%	98%	98%	99%	100%
Cnt.DlyIn	15	12	10	8	5
Cnt.Dlyout	15	12	10	8	5
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	30%	40%	50%	40%	30%
D.Gain	200%	200%	200%	200%	200%
ANG. Base	180d/s	210d/s	240d/s	270d/s	270d/s

SWASH SETTING PARAMETER TABLE

750-More

[Aileron gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	96%	97%	98%	98%	100%
Cnt.DlyIn	15	12	10	8	5
Cnt.Dlyout	15	12	10	8	5
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	30%	40%	80%	70%	60%
D.Gain	200%	200%	200%	200%	200%
ANG. Base	210d/s	240d/s	270d/s	270d/s	270d/s

[Elevator gyro]

	Flight Mode				
	1	2	3	4	5
AVCS.Dmp	97%	98%	98%	99%	100%
Cnt.DlyIn	15	12	10	8	5
Cnt.Dlyout	15	12	10	8	5
EXP.	-60%	-50%	-40%	-30%	-20%
Rate.Cst	30%	40%	60%	70%	60%
D.Gain	200%	200%	200%	200%	200%
ANG. Base	150d/s	180d/s	210d/s	240d/s	240d/s

This explains how to set the linkage compensation example for the H3-120 swash mode.

* The aileron, elevator and pitch movement should be set to maximum through by the transmitter in advance.

Pitch calibration (This should be set prior to the compensation process)

- This reads the pitch operation ranges to the CGY750. Move the pitch stick to center position (Pitch zero point). Open the Pit.Zero on the SWASHset Expert menu, and push the set button. The pitch zero point is memorized to the CGY750.
- Move the pitch stick to minimum position. Open the Pit.Low menu, and push the set button. The minimum pitch position is memorized.
- Move the pitch stick to maximum position. Open the Pit.High menu, and push the set button. The maximum pitch position is memorized.

Pitch movement calibration

- Make sure the swash plate is flat when the pitch stick is center position at first. Adjust the length of the linkage rods so that the swash plate is to be flat.

Move the pitch stick to maximum position and make sure if the swash plate is flat by adjusting the PIT→AIL, PIT→ELE mixing rate on the SWASHset Expert menu. Move the pitch stick to minimum position. Make the same adjustment as maximum stick position.

LINKAGE COMPENSATION

Aileron movement calibration

- ❑ Move the pitch stick to center position. Move the aileron stick right and left. Make sure if the interaction to pitch or elevator direction.

Adjust the AIL→PIT mixing rate on the WASHset Expert menu to be minimized the interaction. It should be adjusted both left and right direction.

- ❑ Move the pitch stick to maximum position. Open the SWcp.AIL on the SWASHset Expert menu. Move the aileron stick left and right. Adjust the SWcp.AIL rate on the SWASHset Expert menu to be minimized the interaction to the elevator or pitch direction.

In case of the interaction is increased when increase the SWcp.AIL rate, it may be opposite the compensation direction, open the CpA.Dir menu and set the direction to minus.

- ❑ Both left and right aileron should be adjusted. Move the pitch stick to minimum position. Adjust SWcp.AIL rate same way as pitch maximum position.

Elevator movement calibration

- ❑ Move the pitch stick to center position. Move the elevator stick up and down. Make sure that the interaction is to the pitch or aileron direction.

Adjust the ELE→PIT, ELE→AIL mixing rate on the WASHset Expert menu to be minimized the interaction.

It should be adjusted both up and down direc-

tion.

- ❑ Move the pitch stick to maximum position. Open the SWcp.ELE on the SWASHset Expert menu. Move the elevator stick up and down. Adjust the SWcp.ELE rate on the SWASHset Expert menu to be minimized the interaction to the aileron or pitch direction.

In case of the interaction is increased when increase the SWcp.ELE rate, it may be opposite the compensation direction, open the CpE.Dir menu and set the direction to minus.

- ❑ Both up and down elevator should be adjusted. Move the pitch stick to minimum position. Adjust SWcp.ELE rate same way as pitch maximum position.
- ❑ Open the SpeedCmp on the SWASHset Expert menu. Move the elevator stick up and down quickly. Adjust the SpeedCmp rate to be minimized the interaction to the pitch direction.

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Flybarless Control Gyro

CGY750