Flybarless Control Gyro
CGY760R
Gyro Program Box
GPB-1
Software Update Functions Ver 2.0
**Update Functions Ver 2.0**

This software update adds or changes the following functions. In addition to the manual originally supplied with your system, please now refer to the following new instructions: (CGY760R and GPB-1 must be updated separately.)

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GYRO UPDATE (Update mode of CGY760R)
This menu is used to adjust the update mode of the CGY760R. The mode selected will be determined by the model of the CIU selected and personal preference. For example, when using the CIU-3, the user may select either the high speed or the slow speed modes. If using the CIU-2, only the slow speed mode is available.

* The following optional products are required for the update.
  - CIU-2 or CIU-3
  - Cable for CGY760R / GY701 / GY520 or DSC cable for update

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(1) Download CGY760R update file
Download the CGY760R update file from our website or your local distributor's website.

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(2) Preparation for update -1
Connect the CGY760R, GPB-1, CIU-2 or CIU-3 to the PC with reference to the above connection diagram.

NOTE: Updating can NOT be performed when the transmitter and the CGY760R communicate or when “Internal Rx” setting is INH. Turn on the power of the CGY760R with “Internal Rx” being ACT and transmitter power OFF.
### Preparation for update -2
Refer to the "GYRO UPDATE" screen from the GPB-1 menu screen.

### Selection of CIU (Speed)
Use the [↑] or [↓] key to move the cursor to "LOW SPEED (CIU2/3)" or "HIGH SPEED CIU3" and press the [Enter] key. The "Are you sure?" indication will appear on-screen.

### Perform update
Click on the update file downloaded to the PC to update the CGY760R.

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**CAUTION**
Do not turn off the power or remove the battery while updating. CGY760R and GPB-1 may be damaged.

If the update is not performed normally, "FAILED !" will be displayed. If the update has failed, please start the process once again from the beginning. Should it fail once more, it is likely that the update file has been corrupted when downloaded previously. Please download this file and restart the procedure.
When the update has been successfully concluded, "Completed" appears on the screen of GPB-1.

If an error message appears, try redoing the update from the beginning.

If the CGY760R / GPB-1 fails to update or does not start, please have it serviced.
**GPB-1 UPDATE**

The GPB-1 can be updated from PC using CIU-2 or CIU-3.

*The following optional products are required for the update.*
- CIU-2 or CIU-3
- Cable for CGY760R / GY701 / GY520 or DSC cable for update
- Receiver battery

1. Download the CGY760R update file from our website or your local distributor's website.

2. Extract the zip file on your computer.
3. Connect as shown in the figure.
4. Start an executable file by a PC.
   - CIU-3: Updater(Highspeed).exe
   - CIU-2: Updater(Lowspeed).exe

   **PC side**

5. When using the CIU-3, hold down the [Enter] and [Esc/Page] keys of the GPB-1 and turn on the power. Release the [Enter] and the [Esc/Page] keys when the backlight of the screen lights up.

   **GPB-1 side**

   When using the CIU-2, hold down the [↑] and [↓] keys of the GPB-1 and turn on the power. Release the [↑] and [↓] keys when the backlight of the screen lights up.

   **CAUTION**

   Do not turn off the power or remove the battery while updating. GPB-1 may be damaged.

   Wait for about 50 seconds - 5 minutes.

   Don't turn on the power!
6. Turn off the power after the completed message “SUCCESS” appears.
7. Check the GPB-1 program version on the Information screen.
8. Be sure to check each setting and check the operation before using.

### Opening Screen

When GPB-1 starts up with power on, the opening screen is displayed first.

**CAUTION**

Since the data of CGY760R or GPB-1 is rewritten each power up, always check the operation key.

Press and hold the [Enter] key

Read the setting data of the connected CGY760R into GPB-1 and save it.

Gyro Program Box
Gyro Program Box
Futaba Corporation
Futaba Corporation
Correcting...

Press and hold the [Esc/Page] key

Write the current setting data of the GPB-1 to the CGY760R.

WRITE
CGY760R WRITE

Press and hold the [Esc/Page] key

Press and hold the [Esc/Page] key

Parameter setting menu for SBUS servo.

SBUS SERVO

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**Home screen**

**WRITE screen**

**SBUS SERVO screen**
**Functions Ver 2.0**

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### Used by another receiver

**RECEIVER (Receiver system setting)**

On the "RECEIVER" screen, make sure that the CGY760R setting matches the protocol that is selected/utilized in the transmitter. Display the "RECEIVER" screen from the GPB-1 menu screen.

**Note:** To change the "Receiver System" type, first power off the transmitter and receiver, and re-power the CGY760R while the transmitter is still in the OFF position. The only way to change the receiver type is by power cycling the gyro first.

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### ELE2 (S.BUS connection)

When SWASH TYPE setting is "H1 and H3 - XX", CH operation of ELE 2 is possible.

**Setup style “L.SCALE”**

L.SCALE: Initial parameter mode corresponding to a large machine with a total length of 2.5 m or more.

**WARNING**

- If you do not turn off the power after changing "Internal Rx" setting to INH, the internal receiver is in operation. In operation, the receiving system is not in operation. After changing the setting, please power cycle. If the power is not cycled, the receiver will not keep bind and the helicopter will crash.

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### Setup style

3D mode contains a proven set of parameters which are good for not only 3D but also F3C flying. F3C Mode and L.SCALE (Large scale model) Mode are for unique or special tuning types only.

*When the style is changed, setting of AIL/ELE/RUD is re-initialized and defaults are changed.

- Move the cursor to "Setup style" by pressing the [↑] or [↓] key and press the [Enter] key to enter the setting mode. Use the [↑] or [↓] key to set the style. When "EXECUTE: Enter (1 sec)" is displayed, Press the [Enter] key for about 1 second to changes the selected style. The program will also exit the setting mode accordingly.
### Gear Ratio and Pole number

When the Governor function is INH, gear ratio and pole number can be set.

**BASIC MENU screen**

- **FLT.TUNE**
- **FLT. BASIC**
- **Gov. BASIC**

**GOV. BASIC screen**

- **Gov. Rate:** 1/4
- **RPM Rate:** 3000 RPM
- **Pole Num.:** 2 P

**Gear Ratio:**

Input the main rotor gear ratio by pushing the [↑] or [↓] key to select the desired working mode.

**Setting ranges:** 1.00 - 50.00 t  Initial value: 8.00 t

**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:

\[
\text{Gear ratio} = \frac{N_1}{N_2}
\]

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

**Pole Num.: Pole number**

This parameter is used when using a direct phase sensor attachment to a brushless motor lead. Input the motor pole count as specified by the brushless motor manufacturer. When using any revolution sensor other than a direct phase sensor type, set the pole number to 2 p.

**Setting ranges:** 2 - 24 P  Initial value: 2 P

### Gyro base gain setting to RUD. BASIC

**BASIC MENU screen**

- **FLT.TUNE**
- **FLT. BASIC**
- **Gov. BASIC**
- **RUD. BASIC**

**RUD. BASIC screen 1/2**

**RUD. BASIC screen 2/2**

**GYR. Gain: Gyro base gain setting**

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 CGY760R correctly. Use the [↑] or [↓] key to setting the gain.

**Setting ranges:** 0 - 150%  Initial value: 100%

### Writes data saved in GPB-1 to CGY760R

You can copy data when replacing the CGY760R in your machine.

- The data to be written is the "BASIC" menu and "EXPERT" menu.
- With the exception, the setting of ACT / INH of "Internal" on the "RECEIVER" screen of the GPB-1 menu is written.

**WARNING**

After writing, if the setting is "INH", the internal receiver is operating without turning off the power supply once. If the receiver is connected while it is operating, the helicopter crashes with inoperable state.

**CAUTION**

If you press [Ent] start from the opening screen and display the home screen, the setting data of the connected CGY760R will be saved in GPB-1. Please save the setting data to be written again to GPB-1.

- When copying from another CGY760R, connect the copy source CGY760R to the GPB-1 in advance and let the GPB-1 read the setting data.

While data is being written, the Gx LED of the CGY760R high-speed blinking (about 5 sec). It does not high-speed blinking when the data of GPB-1 and CGY760R are the same.
S.BUS SERVO SETTING

An S.BUS servo can memorize the channel and various settings you input. Servo setting can be performed on the GPB-1 screen by wiring the servo as shown in the figure.

*With some S.BUS(2) servos, there are some functions which cannot be used. If a function cannot be used, the display screen will change.

**CAUTION**
- Be sure to connect each servo and set it.
- If multiple servos are connected at the same time, the servo may be damaged.
- Be sure to turn off the power when replacing the servo.
- Servo may be damaged if servo is replaced while power is on.
- Please match the voltage of the battery to be used with the specifications of the servo to be connected.
- Servo will be damaged if voltage higher than specified is applied.

**WARNING**
- Never connect CGY760R and GPB1 when setting S.BUS servo. The helicopter becomes uncontrollable and crashes.
- *Even if the servo is operating on the bench, it could be damaged.*

From the opening screen, hold down the 
[0x0]/+ key to display the SBUS servo screen.

**SBUS / S.BUS2 servo recall, writing, initialization**

1. **RECALL**
   - Load the setting data of S.BUS servo connected to GPB-1. Move the cursor to "RECALL" by pressing the 
   [a] or [w] key. Press the [Enter] key to enter the writing mode. When "EXECUTE: Enter (1 sec)" is displayed, press and hold the [Enter] key for about 1 second. To cancel, select press [Enter] key or [Esc/Page] key to exit the recall mode.
   - *"COMPLETED" is displayed on the screen and the setting data is written to servo. If "FAILED" is displayed on the screen, repeat [WRITE] or turn the power off and confirm the connection, then turn the power on and perform the operation again.*

2. **WRITE**
   - Write the data set with GPB-1 to the connected S.BUS servo. Move the cursor to "WRITE" by pressing the 
   [a] or [w] key. Press the [Enter] key to enter the writing mode. When "EXECUTE: Enter (1 sec)" is displayed, press and hold the [Enter] key for about 1 second. To cancel, select press [Enter] key or [Esc/Page] key to exit the recall mode.

3. **INIT**
   - Write the factory set servo setting data to the connected servo. Move the cursor to "INIT" by pressing the 
   [a] or [w] key. Press the [Enter] key to enter the writing mode. When "EXECUTE: Enter (1 sec)" is displayed, press and hold the [Enter] key for about 1 second. To cancel, select press [Enter] key or [Esc/Page] key to exit the recall mode. The setting of the channel setting and servo type (760 us / 1520 us) is not initialized.
Change servo type

Changing the servo pulse width from 1520 to 760 is possible with the servo type function.

Display of "servo type" when reading

When "RECALL" is executed, the servo type name is displayed on the left side of the screen, and the current 760 or 1520 type is displayed below it. The S.BUS servo not supporting servo type change displays "Unsupported".

Change servo type DG:1520 → DG:760

Change the servo type (760 μs / 1520 μs) to the connected servo. Move the cursor to the type under "SELECT" by pressing the [△] or [▼] key. Press the [Enter] key to enter the changing mode. When "EXECUTE: Enter (1sec)" is displayed, use the [△] or [▼] keys to select the servo type to change, press and hold the [Enter] key for about 1 second. To cancel, select press [Enter] key or [Esc/Page] key to exit the changing mode.

"COMPLETED" is displayed on the screen and the type display on the left side is updated to the changed type. Initialize each parameter.

If "FAILED" is displayed on the screen, please go again or turn the power off and confirm the connection, then turn the power on and perform the operation again.

Notes on servo set to 760μs

To connect the servo set to "DG: 760" or "SWH: 760" to AIL / ELE / PIT / ELE 2, set the servo type to "DG: 760".

To use the servo set to "DG: 760" or "RUD: 760" for RUD, set the servo type to "DG: 760".

Please set the servo type to "DG: 285 Hz" for the AIL / ELE / PIT / ELE 2 servo set to "DG: 1520". For RUD servo, set the servo type to "DG: 1520".

CAUTION

Before connecting the servo and CGY760R with the same setting, if you connect a different setting servo with CGY760R, the servo may be damaged.

Servo type: 760 μs

Servo type: 1520 μs

When the CH setting is DG1 or DG2

If the CH setting is DG1 or DG2, the servo type cannot be changed. Before changing to Servo type, you need to set it to CH 1 to 16 with CH setting and execute "WRITE".

CAUTION

The servo of 760 μs is not connected to ordinary CH, S BUS / S BUS 2 connector such as receiver not compatible.

The servo may be damaged.

Do not set 760 μs servo parameters with transmitter unsupported to 760 μs and PC S-LINK software. Be sure to set parameters with GPB-1.

The servo may be damaged.
Description of function of each parameter

With some S.BUS(2) servos, there are some functions which cannot be used. If a function cannot be used, the display screen will change.

(1) CH
Channel of the S.BUS system assigned to the servo. Always assign a channel before use.
Note: Since servo with servo type set to 760 µs (DG: 760) cannot be used as S.BUS system, CH setting cannot be selected.

(2) Servo Type
This function changes 760 µs type and 1520 µs type. (Only S.BUS servo that can be changed)

(3) NEUTRAL
The neutral position can be changed. When the neutral offset is large value, the servo's range of travel is restricted on one side.
If the servo CH setting is 1 to 16 CH, you can set it while checking the position of neutral, but in the case of DG1 and DG2, you can not check the position of neutral.

(4) DEADBAND
The dead band angle at stopping can be specified.
[Relationship between dead band set value and servo operation]
Small Value Setting → Dead band angle is small and the servo is immediately operated by a small signal change.
Large Value Setting → Dead band angle is large and the servo does not operate at small signal changes.
Note: If the dead band angle is too small, the servo will operate continuously and the current consumption will increase and the life of the servo will be shortened.

(5) SPEED
Speeds can be matched by specifying the operating speed. The speed of multiple servos can be matched without being affected by motor fluctuations. This is effective for load torques below the maximum torque.
However, note that the maximum speed will not exceed what the servo is capable of even if the servo's operating voltage is increased.

(6) TRAVEL (LEFT / RIGHT)
The left and right travels centered about the neutral position can be set independently.

(7) REVERSE
The direction in which the servo rotates can be changed.
Setting: NORM/REV

(8) TYPE
When "Retractable" is selected and the servo has been continuously stopped for 30 seconds, the dead band expands and unnecessary hold current due to external force is eliminated. When a new control signal enters, normal operation is resumed. When using the servo as a landing gear servo, select "Retractable". Also adjust the servo travel to match the landing gear movement range. When the servo type is OLP mode, the torque and time for OLP can be set on S.BUS SERVO screen 4/4. When the load is greater than this setting, torque and continues over this setting time, OLP works.
Setting: NORM/OLP/RETR

(9) SMOOTHER
This function changes smoothness of the servo operation relative to input signal changes. Normally use at Smooth setting. Especially, select the "OFF" mode when quick operation is necessary.
Setting: ON/OFF Initial setting: ON

(10) SOFTSTART
Operation is specified in the direction of the instant the power is turned on. By making this setting, only the first operation when the power is turned on slowly moves the servo to the specified position.

(11) BOOST - ON/OFF
The minimum current applied to the internal motor when starting the servo can be set. Since a small travel does not start the motor, it essentially feels like the dead band was expanded. The motor can be immediately started by adjusting the minimum current which can start the motor.
OFF : It is the boost ON at the time of low-speed operation. (In the case of usual) ON : It is always the boost ON. (When quick operation is hope)

[Relationship between boost set value and servo operation]
Large Value Setting → Motor reacts to a minute current and operation becomes smooth.
Large Value Setting → Initial response improves and output torque increases. However, if the torque is too large, operation will become rough.

(12) DAMPER
The characteristic when the servo is stopped can be set.
When smaller than the standard value, the characteristic becomes an overshoot characteristic. If the value is larger than the standard value, the brake is applied before the stop position.
 Especially, when a large load is applied, overshoot, etc. are suppressed by inertia and hunting may occur, depending on the conditions. If hunting (phenomena which cause the servo to oscillate) occurs even though the Dead Band, Stretch, Boost and other parameters are suitable, adjust this parameter to a value larger than the initial value.
[Relationship between damper set value and servo operation]
Small Value Setting → When you want to overshoot. Set so that hunting does not occur.
Large Value Setting → When you want to operate so that braking is not applied. However, it will feel like the servo response has worsened.
Note: If used in the hunting state, not only will the current consumption increase, but the life of the servo will also be shortened.
(13) STRETCH (Stretcher)
The servo hold characteristic can be set. The torque which attempts to return the servo to the target position when the current servo position has deviated from the target position can be adjusted. This is used when stopping hunting, etc., but the holding characteristic changes as shown below.

| Small Value Setting | Servo holding force becomes weaker. |
| Large Value Setting | Servo holding force becomes stronger. |

(14) BUZZER
When a servo is powered up without a transmitter signal, a buzzer sounds.

When transmitter signal is lost, a buzzer sounds until the servo regains the signal. This is not unusual.
The transmitter has been turned OFF ahead of a servo power supply — The buzzer sound of about 1.25 Hz continues sounding as servo power supply end failure alarm.
Do not insert or remove the servo connector while the receiver power is ON.
A buzzer may sound by incorrect recognition.

Note: Buzzer sound is generated by vibrating the motor of a servo. Since current is consumed and a servo generates heat, please do not operate the number more than needed or do not continue sounding a buzzer for a long time.

(15) Trq
This is the torque for working OLP.

Setting: 10% - 100% Initial setting: 100%
100% is the maximum torque of the servo which you are setting.

(16) TIME
This is the time for working OLP. Set the time when OLP (Over Protection) functions. Displayed only when the type is OLP setting.

Setting: 0.2, 0.5, 1, 2, 3 sec; 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 sec
Initial setting: 5 sec

Note: If the setting of OLP torque and time is decreased, it is easier to work OLP. Then, please be careful not to work OLP at usual operation.

The changeable S. BUS servo of 760 μs and 1520 μs
HPS-H700 / HPS-HC700
(As of November 2018)
When using "Via Trainer" which wirelessly transfers gyro setting data from the transmitter, connect the transmitter and the GPB-1 as shown below.

![Image](image_url)

**CAUTION**

1. Be sure to check the operation for all conditions 1 to 5 before flying.
2. Be sure to connect and disconnect the transmitter and GPB-1 connection cable with the power off.

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**3D VIA TRAINER Screen FUNCTION LIST**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
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</table>
| FL.TUNE  | Cycl. Rt: Cyclic rate setting  
 Cnt. AuthAIL: Control Authority Aileron  
 Cnt. AuthELE: Control Authority Elevator  
 EXP.: Exponential  
 FLT. Styl: Flight style  
 ELE. Comp: Elevator pre compensation |
| SWH. BASIC | SWS. Rate: Rate adjustment  
 PIT. Rate: Rate adjustment  
 SWS. Ring |
| GOV. BASIC | GOV Gain: Governor gain  
 L Lmt. L rmp: Low limit hovering RPM  
 L Lmt. H rmp: Low limit idling RPM |
| FLT. EXPERT | HeadHld A: Head hold aileron  
 StopTune A: Stop tune aileron  
 HeadResp: Head Response  
 HeadHld E: Head hold elevator  
 StopTune E: Stop tune elevator |
| RUD. EXPERT | EXP. AVCS: Rudder exponential AVCS  
 EXP. NORM: Rudder exponential NORMAL |
| CNT. DIn: | Control delay in  
 CNT. DOut: Control delay out |
| ANG: | Pirouette speed  
 Tail Resp: Tail response |