

GR-12L

Optimized Digital Proportional System

6 Channel HoTT 2.4GHz Receiver

OPERATING INSTRUCTION

Prior to use, please read this manual thoroughly.
Keep this manual in a convenient place for quick
and easy reference.

BEFORE USE

Thank you for purchasing 6CH HoTT 2.4GHz receiver. This system is extremely versatile and may be used by beginners and pros alike. In order for you to make the best use of your system and to fly safely, please read this manual carefully. If you have any difficulties while using your system, please consult the manual, our online Frequently Asked Questions (on the web pages referenced below), your hobby dealer, or the SJ Service Center.

Due to unforeseen changes in production procedures, the information contained in this manual is subject to change without notice.

SUPPORT AND SERVICE

• Customer support

Please feel free to ask any question by e-mail or phone. We've been trying to deal with your question. We are open from nine to six, Monday to Friday in Korea. We may respond to your question by e-mail as soon as possible when we are close.

• Internet sales site

Please feel free to contact "www.openhobby.com" to stay up to date the latest SJ Firmware and the newest product line up

• A/S regulation

Only when the product is faulty after normal operation within the warranty period, we will repair the product for free based on our regulations. The repair will be paid for by the consumer when the damage is due to use in improper ways or beyond the warranty period.

• Warranty regulation

Refer the WARRANTY CARD in a Package

OPENHOBBY A/S CENTER

202 Dong- 201, Chunui Techno-Park II, 18, 198 street, Bucheon-ro, Wonmi-Gu, Bucheon-Shi,
Gyeongki-Do KOREA 420-857

Phone: 82-70-7863-3674 Fax: 82-70-7863-3670

Customer Service E-mail: service@openhobby.com

INTRODUCTION

SJ GR-12L/ GR-12Li/ GR-12Lm HoTT receivers are compatible with SJ T series transmitter and used to airplane, helicopter and glider. HoTT system gives user real-time information on various useful data such as user model's RPM, voltage, temperature, user programmable warning, and so on which are directly obtained from telemetric speed controllers equipped with this HoTT system without having to install separate sensor devices. Of course, all of those telemetric data can be also transmitted from separate sensor devices. The use of up to 75 hopping channels provides advanced reliable operation while keeping from any external interference.

All instructions, warranties and other collateral documents are subject to change at the sole discretion of SJ INCORPORATED. For up-to-date product literature, visit <http://www.openhobby.com> and click on the support tab for this product



WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

FLYING SAFETY

- Do not fly your model near spectators, parking areas or any other area that could result in injury to people or damage of property.
- Ensure that all channels are working in the proper manner.
- Perform a ground range check prior to the initial flight of the day
- Do not fly during adverse weather conditions. Poor visibility can cause disorientation and loss of control of your aircraft. Strong winds can cause similar problems
- **We strongly recommend to set the Failsafe function and also recommend that the preset Failsafe would be idle position**
- You need to set the function of the transmitter after removing a power battery from a model or stopping a engine of a model.
- Ensure that all your batteries have been properly charged prior to flight.

GENERAL INFORMATION

1. Products

- GR-12L : Normal Rx 6ch

2. Features

- The use of up to 75 channels ensures extreme operating reliability and immunity to external interference.
- High bright LED allows to check the operating status
- The optimized sizes and weights
- Receiver input sensitivity and thus the range have been increased further.
- Servo connections in the front panel.
- Failsafe, Hold, OFF, and standard (channel 1 failsafe; all others hold) programmable.

3. The Specification

Parameter	Spec
Channel	6
Frequencies	2.400 - 2.483.5 GHz
Modulation	FHSS spread spectrum
Input Voltage	3.6 ~ 8.4V
Display Indicator	One LED(red)
Upgradable Firmware	Yes(CH5)
SUMD Signal	Yes(CH6)
Fail Safe	Hold/Fail safe
Ch mapping	Yes



When turning on or adjusting the radio control system it is essential to keep transmitter antenna at least 30 cm away from receiver antenna all the time. If transmitter antenna is too close to receiver antenna, receiver will be overloaded and the red status LED on receiver blinks red. Transmitter responds by repeating a single beep every second and the radio control system is entered Fail-Safe mode. If the distance of the antennas between transmitter and receiver would be simply longer than 30cm in this situation, the beep of transmitter is ceased and the red status LED on the receiver turns off

4. LED indicator

You may check the signal reception according to status LED

- LED off : Very good reception
- LED blinking : Poor reception
- LED on : No signal reception

OPERATION

1. Binding

- GR-12L

Turn on receiver's power and press Bind button on receiver for 3 seconds, the red status LED turns off. Follow the procedures of your specific transmitter to bind, the system will connect within a few seconds.

NOTICE: Once transmitter and receiver are connected, the red status LED on the receiver is off, indicating the receiver is bound to the transmitter. If the binding process has failed, repeat the whole procedure.

- Binding a number of receivers in one model

It is possible to bind a number of receivers to a transmitter in one model. Every receiver must be bound to the transmitter individually according to the procedure already described. The last bound receiver is the master receiver when the system is in use. Every telemetry sensors installed in the model must be connected to the master receiver, since the only master receiver transmits the sensor data through the downlink channel. The second and all further receivers are operated as the slave mode which are connected in parallel to the master with the downlink channel switched off. The control signals can be passed to a number of receivers simultaneously and also the different signal can be assigned to each receiver through the channel mapping function of the transmitter or the optional TELEMETRY BOX. The typical example would be the use of two servos for each aileron, etc.

2. Channel Mapping

Access Receive CH mapping on transmitter then you may change to the desired channel

3. Range check

Before every flying session and especially with a new model, it is important to perform a range check. All SJ aircraft transmitters incorporate a range testing system which, when activated, reduces the output power, allowing a range check. Notice that every flying must not be permitted in the range checking mode and the model is restrained on the ground. After binding the receiver to the transmitter, turn on transmitter's power first and then turn on receiver's power. Make sure that the system is operating normally through servo movement.

- Mount the bound receiver in the target place in the model.
- Turn on the RC system so that you could observe the movement of the servos.
- Put the model on a flat surface (pavement, closely mown grass or earth), and ensure that the receiver antenna should be at least 15cm above from the ground.
- Face the model with the transmitter in your normal flying position, the antenna on the transmitter shouldn't be toward the model directly and it keeps stand horizontally during range checking
- Enter range check mode of your specific transmitter and follow the procedures of your specific transmitter to check the range. the transmitter repeat a single beep with a regular rhythm, indicating the Range checking is processed normally.
- Walk over 50 meters away from the model with controlling the transmitter sticks constantly and check whether the model is operating normally. You should have total control of the model with the trainer switch pulled
- If control issues exist within 50 meters, the system should not be used. And contact your local Service Department of SJ INCORPERATED.
- Range-check is automatically terminated in 90 seconds and it is also terminated by turning off the range check function of your specific transmitter. the red status LED on receiver turns off when terminated.
- Have your helper position the model and check effective radio range before every flight while simulate all the servo movements which will take place when the model is in fight. The ground range must always be at least 50m in order to ensure safe and reliable model control.



CAUTION: During normal operations (i. e. when controlling a model) never enter the range check mode !

4. Fail-Safe function

In its default state, the receiver is set to "Hold" mode. If you lose connection, all channels hold last given command and the status LED on the receiver turn solid red. The transmitter also repeats a single warning beep every second. You can use the fail safe option by programming the throttle channel to respond to a fail-safe situation. : the throttle channel of an engine-powered model should be set to idle, the throttle channel of an electric-powered model to "stop", and the throttle channel of a model helicopter to "Hold". When a signal is lost the throttle channel, all channels are driven to the failsafe position so that it could prevent the model crashing and the personal injury or property damage.

5. Range warning

Since the transmitter's output is much higher than that of the receiver, the user tends to be hard to notice the seriousness of the situation and try to keep full control of the model. So when the receiver signal in the down-link channel becomes too weak, the transmitter repeats a single warning beep every second. You should fly back the model towards the safe place until the warning signal ceases. If the beep warning does not cease when you fly back, it is that the transmitter or receiver low voltage warning or temperature warning is activated, you must land the model and cease operations without delay in this situation.

RECEIVER

1. Servo connection

Plug the servos into the row of sockets on the right end of the receiver. The connector has polarity, note the small chamfer on one edge. The socket polarity is also marked on the case, brown wire (-), red (+) and orange (signal). The servo sockets of the receiver are numbered and one of the sockets, from channel 1 to 6, can be used as the battery socket, and also both of the receiver power supply and the servo can be connected to it in parallel with Y-lead. Especially the channel 6 that is used for the sum signal could be programmed by the TELEMETRY BOX.

When using High Power servos, connect the receiver power supply to one of the sockets, from channel 1 to 6, with Y-lead

• Receiver socket

Receiver	Receiver socket
GR-12L	SJ(JR) Type female 3pin

• Receiver channel

	Function	Alternate
CH1	Signal output	
CH2	Signal output	
CH3	Signal output	
CH4	Signal output	
CH5	Signal output	Telemetry, Firmware upgrade
CH6	Signal output	SUMD output

2. Telemetry socket

The channel 5 has "T" mark which means Telemetry interface. Telemetry interface with the optional telemetry sensors, the latest firmware updating with the USB interface and the programming with the SMART BOX could be processed. If the telemetry sensors are connected to the socket of the channel 5, a servo is no longer work in this socket. When using receiver GR-12Li (JST ZHR-3 Conn) or GR-12Lm (SHR-03V-S-B Conn), the adapter cable is also needed.

3. Telemetry setup

When accessing to SETTING & DATA VIEW mode on SJ transmitter or Telemetry box, the telemetry setup menu is appeared

```
RECEIVER 0.01 >
>ALARM VOLT: 3.7V
ALARM TEMP: 65`C
PERIOD: 10ms
SENSOR at CH5: No
SUMD at CH6: No
```

- ALARM VOLT: Low voltage warning

If receiver voltage is out of the preset voltage, transmitter or telemetry box repeats a beep for every second. Setup voltage is 3.5 ~ 5.6V

- ALARM TEMP: Temperature warning

If receiver temperature is out of the preset temperature, transmitter or telemetry box repeats a beep for every second. Setup temperature is 30`C ~ 80`C

- PERIOD: Cycle time

The PPM output cycle of receiver may be changed to 10msec and 20msec. a cycle time of 10 ms can be set in digital servo and 20 ms should absolutely be set in analog servo

- SENSOR at CH5

After selecting "Yes", you may connect Telemetry sensor to CH5 port and when selecting "NO", CH5 output PPM. If you press "^" or "v" button to select a relevant sensor, ASCII screen is appeared.

- SUMD at CH6

When selecting "Yes", receiver channel data is outputted as SUMD format and when selecting "NO", CH6 can output PPM.

4. RX FREE MIXER

When accessing to SETTING & DATA VIEW mode on SJ transmitter or Telemetry box to press ">" button, the RX FREE MIXER menu is appeared

```
RX FREE MIXER <
>MIXER: 1
MASTER CH: 0
SLAVE CH: 0
TRIM: 0%
TRAVEL-: +100%
TRAVEL+: +100%
```



CAUTION: If the mixer menu is already programmed in Wing mixer or Free mixer, you don't need to program RX FREE MIXER

- MIXER

5 Mixers, 1~5, can be programmed simultaneously.

- MASTER CH

MIXER Master CH can be programmed

0 : Mixer OFF

1 ~ 6: Mixer Master channel

- SLAVE CH

MIXER Slave CH can be programmed

0 : Mixer OFF

1 ~ 6: Mixer Slave channel

- Trim

Offset value of mixer can be decided. You may set -30 ~ 0 ~ +30

- TRAVEL –

Output ratio for - input at Master CH is programmed. You may set 100 ~ 0 ~ +100

- TRAVEL+

Output ratio for + input at Master CH is programmed. You may set 100 ~ 0 ~ +100

5. Firmware updates

The latest firmware of receiver can be updated through the telemetry socket on the side of receiver in conjunction with a PC running Windows XP, Vista or 7. You may download the firmware file from the download area in www.openhobby.com. Please refer to Optional products below

Receiver	Optional products for upload	Remarks
GR-12L	S8344 + S8346	Receiver needs independent power

S8344 : PC interface USB V2
(GND)



S8346: HoTT PC INTERFACE GENDER V2 (Signal+ Null + GND)



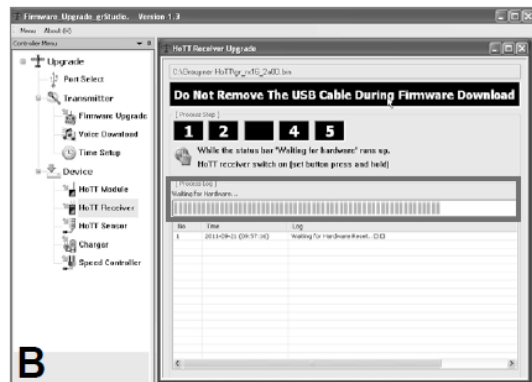
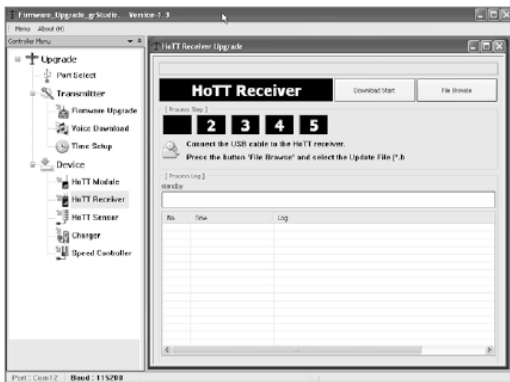
S8347: HoTT Adapter Lead JR/ZH 25AWG 100mm



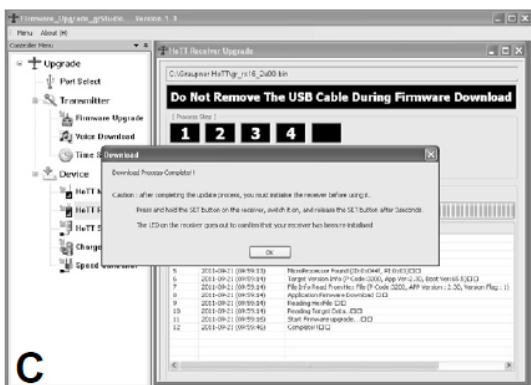
S8348: HoTT Adapter Lead JR/SH 27AWG 50mm



Ensure to connect adapter lead to the receiver correctly



Start the SJ Firmware Update Utility and select the correct COM port, “Silicon Labs CP210x USB to UART Bridge“, at [Port Select]. Choose the “HSTT receiver update“ menu. After clicking the “File Browse” button, find and select the firmware file with extension “bin” from the folder. Now click “Program” button and wait briefly until you see movement in the progress bar. It may take about 5 sec, depending on the computer.



Hold the SET button on the receiver pressed and switch on the receiver. After a few seconds, the message of “Found target device” is appeared and start the firmware update process. You may now release the SETUP button. The progress status of the firmware update is shown in the progress bar. When the update is completed, the popup message of “Download Process Complete” is appeared. Now the firmware update is completed and the receiver is ready to use. During the update process, both of the red and green

LEDs on the receiver go solid and when the update process is completed, the red LED flashes, the green LED goes out.



CAUTION: After completing an update process, you must initialize the device before using it, i.e. reset it to the factory default values.

- Initialization

Press and hold the SET button on the receiver, switch it on, then the red and green LEDs blink. After about 3 seconds, both LEDs turn off. When you release the SET button, your radio control system has been re-initialized. You should notice that the initialization procedure erases all the value you have set so re-programming is needed.

FCC INFORMATION

Graupner GR-12L HoTT #S1012

FCC ID: SNL-16003510

FCC Label Compliance Statement

This device complies with Part 15C of the FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING

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

NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15C of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. RF Exposure Statement. This device has been evaluated to meet the FCC RF exposure requirement when used in combination with the genuine SJ HSTT accessories and operated with a minimum distance of 20 cm between the antenna and your body.

ENVIRONMENTAL PROTECTION NOTES

This product must not be disposed of with other waste. Instead, it is the user's responsibility to their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the produce

