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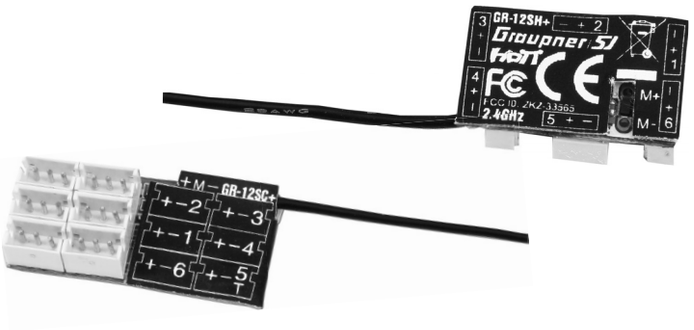
EN V1.0 PN.QH-01

Manual

33565 Receiver GR-12SH+ HoTT
33566 Receiver GR-12SC+ HoTT



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Manual V1.0
Revision: August 2012

Thank you for purchasing the receiver GR-12SH+ or SC+ for the Graupner HoTT 2.4 System. Please read through this entire manual before you attempt the installation and usage of your Graupner HoTT 2.4 System!

These operating instructions are part of this product. They contains important notes to the operation and handling. Please take this into consideration when you pass on the product to third parties. Neglect of the operating instructions and the safety instructions lead to expiring the warranty.
Graupner constantly work on the advancement of all remote control systems; changes of the scope of delivery in form, technology and equipment we must reserve ourselves therefore. Please have understanding for the fact that from data and illustrations of this operating instructions no requirements can be derived. *Please keep these instructions for further reference!*

Intended use
The receiver is specifically designed for slow-fly models whose components are fitted with SH or ZH connectors. The maximum range is around 300 m, which is appropriate to this type of model. The receiver must not be used in any model which requires greater range, or whose servos draw a current which exceeds the maximum permissible for SH connectors (#33565 max. 0.5 A) or ZH connectors (#33566 max. 1 A).
This product works with any Graupner HoTT 2.4 GHz transmitter, but with no others. If you do not own a Graupner HoTT 2.4 system, the receiver will not function. This product is not compatible with any other 2.4 GHz radio control system. It is not suitable for young people under fourteen years. If a young person below that age wishes to use it, he or she must be supervised by an adult.
Before using the receiver for the first time, please read and observe all the warnings and safety notes in these instructions and on the packaging.

WARNINGS

- Do not connect servos to this receiver whose current drain exceeds the maximum permissible for SH connectors (#33565 max. 0.5 A) or ZH connectors (#33566 max. 1 A).
- If channel 1 is used as an electronic speed controller, the continuous current of the motor connected to it must never exceed 2 A, otherwise the receiver could be ruined!
- If several independent models / receivers are operated close together - e.g. for glider towing - the receivers must be kept a minimum of 50 cm apart, otherwise there is a danger of interaction between them. For the same reason the pilots on the ground should stand at least 5 m apart.

1. GENERAL NOTE
When switching on or adjusting the radio control system it is essential to keep the transmitter aerial at least 15 cm away from the receiver aerials at all times. If the transmitter aerial is too close to the receiver aerials, the receiver will be overloaded, causing the red LED starts flashing. The transmitter responds by emitting a beep once every second; the red LED also goes out. The radio control system is now in Fail-Safe mode.
If this should occur, simply increase the distance between the aerials until the audible warning signal ceases, and the red LED on the transmitter lights up again; at the same time the red LED on the receiver should go out.

2. FUNCTIONS

2.1. Binding
When you wish to use the Graupner HoTT 2.4 GHz receiver with a particular transmitter, the first step must always be to “bind” the unit to “its” Graupner HoTT 2.4 GHz RF module (transmitter). This “binding” procedure only needs to be carried out once for each combination of receiver and RF module. The units supplied in the set are already bound to each other at the factory, i.e. the binding procedure described in the following section only needs to be carried out when you wish to use an additional receiver. However, it can also be repeated at any time if required, e.g. after changing transmitters. *Please refer to the „BINDING“ section in your RC system or module instructions for the procedure.*
When binding is required, this is the procedure:
- Switch the transmitter and receiver on.
- Unless the receiver has already been bound to the transmitter, it automatically enters BIND mode when initially switched on. If you have already completed the binding procedure for this combination of transmitter and receiver, the red LED on the receiver goes out, and the model can be operated immediately. If the LED does not go out, please follow this procedure:
- ***Transmitter with HoTT module:*** locate the BIND / RANGE button on the back of the transmitter, and hold it pressed in while you press and hold the SET button on the receiver. Both LEDs on the back of the trans-

OEM Integrator Manual

Federal Communication Commission Interference Statement：
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 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 of the following measures:
1) Reorient or relocate the receiving antenna.
2) Increase the separation between the equipment and receiver.
3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
4) Consult the dealer or an experienced radio/TV technician for help..

FCC Caution:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.

Important Note:
This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. 20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.
This device is going to be operated in 2404~2479GHz frequency range, it is restricted in outdoor environment only.

User Manual of The End Product:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.
The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual.

Label and manual requirements for the End Product:
For an end product using this module,there must be a label containing, at least, the following information.
FCC ID certification number for model : 33566
This device contains FCC ID : ZKZ-33566
The label must be affixed on an exterior surface of the end product such that it will be visible upon inspection in compliance with the modular approval guidelines developed by the FCC.Where the 33566 will be installed in final products larger than 8cm × 10cm following statements has to be placed onto the device .
"Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

Assure Compliance:
The use of the modular transmitter is only approved to be used inside the specified equipment which compliance with all the instruction was subjected. We assure the compliance of the end product when it is assembled inside the specified equipment.

FCC Radiation Exposure Statement:
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Antenna:
This device shall only be used with the tested antenna and separate approval is required for all other operating configurations.

Wir gewähren auf dieses Erzeugnis eine / This product is / Sur ce produit nous accordons une

Garantie von warrantied for garantie de 24 Monaten months mois

Die Fa.Graupner GmbH & Co. KG, Henriettenstrasse 94-96, 73230 Kirchheim/Teck gewährt ab dem Kaufdatum auf dieses Produkt eine Garantie von 24 Monaten. Die Garantie gilt nur für die bereits beim Kauf des Produktes vorhandenen Material- oder Funktionsmängel. Schäden, die auf Abnützung, Überlastung, falsches Zubehör oder unsachgemäße Behandlung zurückzuführen sind, sind von der Garantie ausgeschlossen. Die gesetzlichen Rechte und Gewährleistunsansprüche des Verbrauchers werden durch diese Garantie nicht berührt. Bitte überprüfen Sie vor einer Reklamation oder Rücksendung das Produkt genau auf Mängel, da wir Ihnen bei Mängelfreiheit die entstandenen Unkosten in Rechnung stellen müssen.

Graupner GmbH & Co. KG, Henriettenstrasse 94-96, 73230 Kirchheim/Teck, Germany guarantees this product for a period of 24 months from date of purchase. The guarantee applies only to such material or operational defects witch are present at the time of purchase of the product. Damage due to wear, overloading, incompetent handling or the use of incorrect accessories is not covered by the guarantee. The user´s legal rights and claims under guarantee are not affected by this guarantee. Please check the product carefully for defects before you are make a claim or send the item to us, since we are obliged to make a charge for our cost if the product is found to be free of faults.

La société Graupner GmbH & Co. KG, Henriettenstrasse 94-96, 73230 Kirchheim/Teck, Allemagne, accorde sur ce produit une garantie de 24 mois à partir de la date d´achat. La garantie prend effet uniquement sur les vices de fonctionnement et de matériel du produit acheté. Les dommages dûs à de l´usure, à de la surcharge, à de mauvais accessoires ou à d´une application inadaptée, sont exclus de la garantie. Cette garantie ne remet pas en cause les droits et prétentions légaux du consommateur. Avant toute réclamation et tout retour du produit, veuillez s.v.p. contrôler et noter exactement les défauts ou vices.

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Garantie-Urkunde
Warranty certificate / Certificat de garantie

33565 GR-12SH+
33566 GR-12SC+

Übergabedatum
Date of purchase/delivery
Date de remise

Name des Käufers
Owner´s name
Nom de l`acheteur

Straße, Wohnort
Complete adress
Adresse complète

Firmenstempel und Unterschrift des Einzelhändlers
Stamp and signature of dealer
Cachet et signature du vendeur

mitter now glow constantly, and the red LED on the receiver is on.
or: select the transmitter menu „Basic Settings, Model" and use Use the ▼▲ arrow keys of the left or right touch pad to move to the screen's „RF bind" line". Now start the so-called „receiver binding" process for the receiver to the currently active model memory by briefly pressing the center **SET** button of the right touch pad. At this time the screen's display will begin to indicate the duration of the „bond".

- If the red LED of the receiver expires within about ten seconds, this indicates that the binding process is complete. You can now release both buttons, and your transmitter / receiver combination is ready for use.
- However, if the red LED on the receiver continues to flash for longer than ten seconds, then the binding process has failed. If this should occur, repeat the whole procedure.

2.2. Fail-Safe function

The receiver supports all transmitter-side fail-safe settings. You can exploit the safety potential of the fail-safe option by at least 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". If interference should occur, these settings will help prevent the model flying out of control, possibly causing personal injury or property damage.
Please refer to the appropriate section in your RC system or module instructions for the procedure.

2.3. Range warning

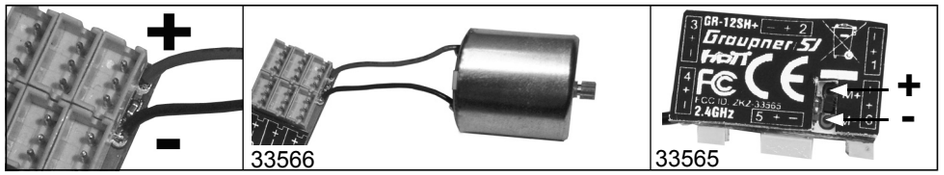
The transmitter always emits an audible range warning in the form of a beep at a rate of about once per second when the receiver signal in the downlink channel becomes too weak. However, since the transmitter operates at much higher power than the receiver, the model can still be controlled safely. In the interests of safety you should nevertheless reduce the distance to the model until the audible signal ceases again. If the audible warning signal continues even when the receiver is (very) close, the transmitter's low-voltage or temperature warning has been triggered! If this should occur, cease operations immediately and recharge the appropriate battery.

3. RECEIVER

3.1 Connections

Connect the servos to the sockets on the top of the receiver. The SH and ZH connector systems are polarised; check for the small lateral lugs. On no account use force to push the connector in; it should engage easily. The sockets are correctly marked: brown wire (-), red wire (+) and orange (signal).

The servo sockets of Graupner HoTT 2.4 GHz receivers are numbered. Note that a brushed electric motor with a maximum continuous current of 2 A can be connected to channel 1 instead of a servo; in this case the wires should be soldered to the solder pads, as shown in the photo. Channel 1 now operates as an electronic speed controller.



Channel 6 can also be programmed for the HoTT sum signal, if you are using a suitable HoTT transmitter or the SMART-BOX (Order No. 33700). This is important for optional devices which require this signal. In the same way channel 5 can also be programmed for voltage measurement (max. 25.2 V DC), e.g. to monitor the receiver battery - see the point entitled 'Voltage measurement'.

3.2 Programming:

The receiver can also be programmed using any suitable HoTT transmitter or the SMART-BOX (Order No. 33700). Five free mixers are available in addition to a number of receiver-specific settings.

3.3 Operation

The receiver set-up menu appears in the "Telemetry" menu under SETUP / DISPLAYS or under SETTING & DATAVIEW if you are using the SMART-BOX. Please read the operating instructions supplied with your transmitter or the Smart-Box to find out how to access this menu.

RECEIVER:

RECEIVER 0.92 < >	
▶ALARM VOLT:	3.8V
ALARM TEMP:	70°C
PERIOD:	20ms
SUMH at CH6:	No
VOLTAGE at CH5:	No
LANGUAGE:	english

Parameter	Description	Setup
RECEIVER 0.92	*0.92* shows the firmware version of the receiver	-
ALARM VOLT.	Alarm threshold of the receiver undervoltage warning	3.0 - 24.0 V factory setting: 3.8 V
ALARM TEMP.	Alarm threshold for excessively high temperature of the receiver	50 - 80° C factory setting: +70° C
PERIOD	Cycle time in ms	10 / 20 ms
SUMH at CH6	Sum signal HoTT at channel 6	Yes / No
VOLTAGE at CH5	Voltage metering at channel 5	-
LANGUAGE	Select menu language	german, english, french, italian and spain

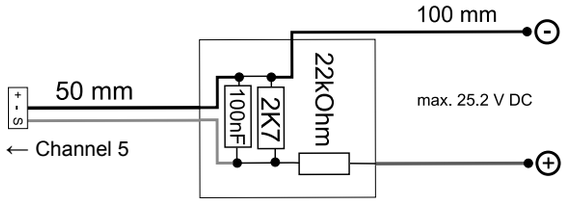
Low voltage warning (ALARM VOLT): if the receiver voltage falls below the selected voltage, the transmitter's RF module generates a low voltage warning in the form of a "general alarm sound": a steady beeping at intervals of about one second or the voice announcement „receiver voltage".

Temperature warning (ALARM TEMP): if the receiver temperature falls below the selected temperature, the transmitter's RF module generates a temperature warning in the form of a "general alarm sound": a steady beeping at intervals of about one second or the voice announcement „receiver temperature".

Cycle time (PERIOD): with the use of only digital servos, a cycle time of 10 ms can be set. In mixed operation or with use of only analog servos, 20 ms should absolutely be set, because the latter can otherwise be „overstrained" and react with „shaking" or „quivering" as a result.

HoTT Sum signal (SUMH): if the digital HoTT sum signal at channel 6 is activated, the sum signal with up to eight channels is generated at this socket instead of a servo signal. This is important for optional devices which require this signal.

Voltage measurement (VOLTAGE at CH5): if voltage measurement at channel 5 is activated, a voltage up to max. 25.5 V DC can be monitored via this input using the circuit described below, instead of a servo. The voltage is then displayed on the screen instead of the receiver voltage. This provides a direct means of monitoring the flight battery without the need for an additional sensor.
Note: Additional sensors can not be connected to the receiver at the moment!



ENVIRONNEMENTAL PROTECTION NOTES

When this product comes to the end of its useful life, you must not dispose of it in the ordinary domestic waste. The correct method of disposal is to take it to your local collection point for recycling electrical and electronic equipment. The symbol shown here, which may be found on the product itself, in the operating instructions or on the packaging, indicates that this is the case.

Individual markings indicate which materials can be recycled and re-used. You can make an important contribution to the protection of our common environment by re-using the product, recycling the basic materials or recycling redundant equipment in other ways.

Remove batteries from your device and dispose of them at your local collection point for batteries.

In case of R/C models, you have to remove electronic parts like servos, receiver, or speed controller from the product in question, and these parts must be disposed of with a corresponding collection point for electrical scrap.

If you don't know the location of your nearest disposal centre, please enquire at your local council office.

Konformitätserklärung gemäß dem Gesetz über Funkanlagen und Telekomunikationsendeinrichtungen (FTEG) und der Richtlinie 1999/5/EG (R&TTE)

Declaration of Conformity in accordance with the Radio and Telecomunikations Terminal Equipment Act (FTEG) and Directive 1999/5/EG (R&TTE)

Graupner GmbH & Co. KG
Henriettenstraße 94-96
D-73230 Kirchheim/Teck

erklärt, dass das Produkt: **GR-12SH+ HoTT - No. 33565**
declares that the product **GR-12SC+ HoTT - No. 33566**

Geräteklasse: **1**
Equipment class

den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entspricht.
complies with the essential requirements of § 3 and the other relevant provisions of the FTEG (Article 3 of the R&TTE Directive).

Angewendete harmonisierte Normen:
Harmonised standards applied

EN 60950-1:2006+A11: 2009+A1:2010+A12: 2011 Gesundheit und Sicherheit gemäß § 3 (1) 1. (Artikel 3 (1)a))
Health and safety requirements pursuant to § 3 (1) 1. (Article 3 (1) a))

EN 301 489-1 V1.9.2
EN 301 489-17 V2.1.1 Schutzanforderungen in Bezug auf elektromagnetische Verträglichkeit § 3 (1) 2, Artikel 3 (1) b))
Protection requirement concernig electromagnetic compatibility § 3 (1) 2, Artikel 3 (1) b))

EN 300 328 V1.7.1 Maßnahmen zur effizienten Nutzung des Frequenzspektrums § 3 (2) (Artikel 3 (2))
Measures for the efficient use of the radio frequency spectrum § 3 (2) (Article 3 (2))

CE

Kirchheim, 07. August 2012

Stefan Graupner, Geschäftsführer
Stefan Graupner, Managing Director

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Tel: 07021/722-0 Fax: 07021/722-188 EMail: info@graupner.de

FREE MIXER:

RX FREE MIXER	<
▶MIXER:	1
MASTER CH:	1
SLAVE CH:	2
TRIM:	+0%
TRAVEL -:	+100%
TRAVEL+:	+100%

Important notice:
If you have already programmed mixer functions in the „Wing mixer“ or „Free mixer“ menu, make absolutely sure that these mixers do not overlap with those in this menu!

Parameter	Description	Setup
MIXER	Mixer selection	1, 2....5
MASTER CH	Signal source or source channel	0,1,2,...6
SLAVE CH	Target channel	0,1,2,...6
TRIM	Trim position in %	-15 - + 15%
TRAVEL-	Admix negative	0 - 150%
TRAVEL+	Admix positive	0 - 150%

MIXER: Up to ?ve mixers can be programmed simultaneously. Switch between Mixer 1, Mixer 2,... and Mixer 5 through „MIXER“.
The following settings in this display always for just the mixer selected in the „MIXER“ line.

MASTER CH („from“): the signal applied at the MASTER CH (signal source or source channel) is mixed to a variable extent to the SLAVE CH (target channel). According to the same principles described in the section „Free mixer“ of the HoTT transmitters.

SLAVE CH („to“): The signal of the MASTER CH (source channel) is mixed proportionally to the SLAVE CH (target channel). The degree of mixture is determined by the percentages entered in the lines „TRAVEL–“ and „TRAVEL +“. Select „00“ if no mixer should be set.

TRAVEL–/+ (proportion of the admix in %): With the settings of these two lines the percentage of the admix is speci?ed in relation to the MASTER signal separately for each direction.

4. FIRMWARE UPDATE GR-12SH+/SC+ RECEIVER

Firmware updates for the receiver can be transferred via the socket „T“ in conjunction with a PC running Windows XP, Vista or 7. For this you also require the USB interface, Order No. 7168.6, and the adapter leads Order No. 7168.S and Order No. 23048 (for 33566), which are available separately.
The program „micro software loader“ and ?les required for this are available from www.graupner.de in the Download area for the corresponding products.

Caution: disconnect all servos from the receiver before carrying out an update, as they could run uncontrollably to one end-point during the procedure, and possibly cause damage to the model.

4.1. Update process

Start the program „micro software loader“ with a double-click on the exe-file. Under „Com Port“ select the correct COM port „Silicon Labs CP210x USB to UART Bridge“, i.e. the one to which the USB lead is connected.

Now click on the “Datei” button and select the the previously loaded firmware file ending in *.bin. If everything is correct, the file will appear in the corresponding window.
The firmware files are encoded in product-specific form, i.e. if you accidentally select a file which does not match the product (e.g. transmitter update file instead of receiver file) you will not be able to start the update procedure.

Press the Button „Start“.

Connect channel 5 of the receiver to the USB update cable and then turn it on. The LED expires and the progress-bar shows you the progress of the firmware update. The update is complete when the bar reaches the right end and the red LED on the receiver starts flashing. Because the receiver settings remain after the update, the receiver can be used immediately.

The latest version of these instructions can be found at www.graupner.de

Specifications GR-12SH/SC+

Connector type	SH / XH
Operating voltage	(2.5) 3.6 ... 8.4 V
Modulation	2.4 GHz FHSS
Frequency	2400...2483.5
Weight	ca. 1.5 g
Range approx.	800 m