

2,4Dual FHSS
FREQUENCY HOPPING SPREAD SPECTRUM

PROFESSIONAL RC COMPONENTS

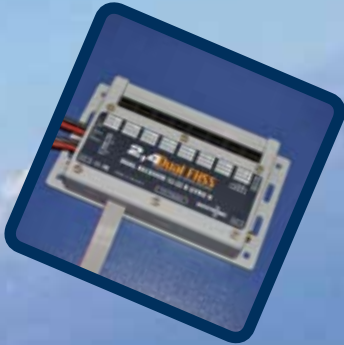


Foto: Flying Bulls

Instruction manual

for weatronic 2.4 Dual FHSS Systems

12 channel TX module

Dual Receiver

micro 8/10/12

12-22 R

12-22 R Gyro II

12-22 R Gyro III

12-22 R Gyro III + GPS

12-30 R Gyro III + GPS

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Regulatory compliance

EMC compliance USA

FCC Radio Frequency Rules and Regulations

This equipment has been tested and found to comply with the limits for a Class A device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can emit radiated radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NO MODIFICATIONS. Modifications to these devices shall not be made without the written consent of weatronic Company. Unauthorized modifications may void the authority granted under Federal Communications Commission Rules permitting the operation of this device.

FCC intentional radiator certification

FCC ID: W3X2754-10 for weatronic Dual Receiver 2.4 Dual FHSS 12-22 R series

FCC ID: W3X2754-20 for weatronic Dual Receiver 2.4 Dual FHSS transmitter module

FCC ID: W3X2754-30 for weatronic Dual Receiver 2.4 Dual FHSS micro series

This equipment contains an intentional radiator approved by the FCC under the FCC ID numbers shown above. These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) These devices may not cause harmful interference, and
- (2) These devices must accept any interference received, including interference that may cause undesired operation.

EMC compliance Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme à la norme RSS Industrie Canada exempt de licence. Son fonctionnement est soumis aux deux conditions suivantes:

- (1) cet appareil ne doit pas provoquer d'interférences et
- (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant causer un mauvais fonctionnement du dispositif.

EMC compliance Europe

This equipment meets the requirements of the RTTE and EMC directives.

CE Conformity

This equipment has been developed and constructed in conformance with the current CE regulations and guidelines:

- 2006/42/EC Machine Directive
- 2006/95/EC Low Voltage Directive
- 2004/108/EC EMC Directive
- 1999/5/EC R&TTE Directive

Safety information

The weatronic 2.4 Dual FHSS Radio Control system is a complex system requiring strict observance of relevant safety rules and guidelines. Before working with the weatronic RC system, ensure that you are familiar with the system and its operating parts, and with the specific safety instructions included in this manual.

This manual describes potential hazards you may encounter during operation of this product, but we cannot predict all possible hazards. Safety messages included in this manual may not represent an exhaustive list, and the guidelines included in this manual should be applied using your judgment and experience.

Prior to using this equipment, read and observe all safety information and instructions included in this manual. If you are unsure about any of the potential hazards discussed, contact your dealer or importer immediately.

Read, understand, and follow all safety information contained in these instructions before using your weatronic 2.4 Dual FHSS Radio Control system. Retain these instructions for future reference.

Intended use

The weatronic 2.4 Dual FHSS Radio Control system consists of modular components. The system is designed for exclusive use of remote controlled airplane models, model ships and cars and other models.

Label locations



FCC-ID location on weatronic 2.4 Dual FHSS 12-22 R series



FCC-ID location on weatronic 2.4 Dual FHSS micro series



FCC-ID location on weatronic 2.4 Dual FHSS transmitter module

www.weatronic.com

1 Introduction

The weatronic 2.4 Dual FHSS series of products have been developed in Germany by a selected team of electronic engineers and IT experts. The result is to have produced a system which is at the cutting edge of today's technology manufactured to exacting standards from the latest components. The very highest quality standards and the best possible level of reliability were the design criteria and every component is subjected to an extensive visual and computer controlled electronic testing to ensure the highest standards possible. All of the research and development work was conducted in Germany and our products are assembled in Germany where the casings are also made, a product which really is 'Made in Germany'.

All components used to construct the weatronic 2.4 Dual FHSS RC-Systems are CE tested and approved and meet not only the current EU (ETSI) requirements but also those of the American Communications Commission (FCC). All of our products have been vigorously flight tested under the most exerting conditions and we have concentrated on developing a system which provides the ultimate in resistance to interference as well as unsurpassed reliability. To make the most of this systems potential and to obtain the best results please take the time to read these instructions thoroughly as only then will you be able to exploit the full potential of our 2.4 Dual FHSS Radio Control System.

The Certificates of Conformity for both the ETSI and the FCC are contained in Annex 3 of this handbook.

2 Contents

A complete 2.4 Dual FHSS radio control system consists of the following items:

- 2.4 Dual FHSS 12 channel transmitter module
- Antenna stalk
- Patch cable
- Adapter Module for the chosen transmitter (with housing if required)
- 2.4 Dual FHSS Micro Receiver with binding jumper or
- 2.4 Dual FHSS 12-22 R, 12-22 R Gyro II, 12-22 R Gyro II, 12-22 R Gyro III + GPS or 12-30 R Gyro III + GPS receiver including electronic switching unit and 2 jumpers

Accessories (not included):

- Micro SD card for the Dual 2.4 Dual FHSS transmitter module
- Micro SD card for the Dual 2.4 Dual FHSS receiver 12-22 R variants
- Coaxial-antenna cable and antennas for external mounting
- USB mini cable to connect the transmitter module with a PC (only required if one of the larger range of receivers is used)
- USB adapter cable to carry out firmware updates to the 2.4 Dual FHSS micro receiver
- 2 Cell High Amp. (C) rated LiPo pack or 3 Cell High Amp. (C) rated Lithium Iron Phosphate pack
- Electronic ON/OFF switch for 2.4 Dual FHSS micro receivers
- Electronic LiPo ON/OFF switch with regulator for 2.4 Dual FHSS micro receivers in two versions

3 Safety Advice

The weatronic 2.4 Dual FHSS radio control systems have been exclusively produced for controlling models, in particular for use with model aircraft or model helicopters and as such they may only be used for that purpose. Children under the age of 14 should only be allowed to operate radio controlled models under the supervision of an adult. Weatronic will accept no liability for the incorrect use of its products.

3.1 At the Flying Field



Only ever operate your models on approved flying sites and always show respect and consideration for other pilots. Stand close to the other pilots so that you can warn them of when you taking off and landing and pay attention to what they tell you as this will reduce the risk of accidents when models are close to the ground. Keep you model within the sector allocated for flying in and never over-fly spectators, other pilots or anyone else who may be in the vicinity.

The weatronic 2.4 Dual FHSS system can safely be operated along-side transmitters using the 35 or 72 MHz bands with no risk of interference. Checking frequencies is not necessary and it is quite safe to have up to 120 weatronic systems operating simultaneously.

3.2 Range Testing



Before you operate a model for the first time it is imperative that you carry out a full range test as described in para. 7.2.6.

3.3 Routine checks

The following routine checks should be carried out before every take-off:

- Check that the correct model slot is selected within your transmitter.
- Make sure that all control surfaces move in the correct direction and that they have full movement in each direction.
- Ensure that all battery packs are sufficiently charged.
- If you wish to save the data from your flight, check that a Micro SD card is inserted (see Para 5. for Data Saving).
- Any switched mixers should be checked to ensure that they work correctly.
- When the system is switched on, both the left green LED on the transmitter module ('STATUS') and the green LED on the receiver must illuminate solidly. The transmitter module's red 'ERROR' LED must not illuminate.
- The meanings of and functions performed by the other LED's are explained in Para. 9.



A model must be secured to a solid object, anchored down or restrained by a helper before the engine is started.



When starting you engine ensure that no-one is within a radius of 3 metres of the propeller and in the case of a turbine make sure that no-one is within 5 meters of the rear of the model.



The throttle stick must always be checked to ensure that it is in the low position before starting. This is particularly important with electric models to prevent the engine and prop. from spinning unexpectedly.

3.4 Installation

The correct installation of the receiver, battery pack, switches, antenna and cables is vital to the safe operation of the receiver system. Please adhere closely to the instructions laid out in para. 10 of this hand book.

4 Understanding your system

The weatronic 2.4 Dual FHSS radio control system is an system exclusively developed by the company weatronic and operates within the 2.4 GHz ISM microwave band. Users of this frequency band who are not required to be licensed are governed by the regulations set by the ETSI (European Telecommunications Standards Institute). The ESTI is a communal body who's aim is to standardise telecommunications regulations Europe wide.

To be allowed to transmit with the maximum output of 100 mW EIRP (effective isotropic radiated power) the ETSI have set a series of regulations governing the use of FHSS (frequency hopping spread spectrum) systems. In line with this weatronic systems use 81 channels spaced at 1 MHz and both transmitter and receiver jump within these channels at 100 times per second following a random pattern which is individual to each transmitter/receiver combination. This sequence is communicated analogically between the transmitter and the receiver and is therefore only known to transmitters and receivers which have been bonded. If interference is experienced on any channel, such channels are excluded from use until they become clear again and this system is called adaptive FHSS. The use of adaptive FHSS ensures that the minimum interference is caused to other users of this band and so making maximum use of the available frequency spectrum.

Furthermore, Dual FHSS also means another two important things:

- The transmitter module is a transceiver, which means that it not only transmits a signal but receives one as well.
- The receiver contains 2 separate and independent receiver circuits and is fitted with a separate antenna for each one.
- Outward signal – the transmitter transmits a signal to the receiver to control the model – return signal – The receiver transmits data back to the transmitter.

The transmitter antenna is a so-called polar (flat) type antenna as used in GPS navigation systems as well as mobile phones. This type of antenna has the great advantage that the signal generated is spherical as opposed to being directional which is the case when using a dipole type antenna. This creates a virtually equal signal regardless of where the transmitter is pointed ensuring a far greater level of reliability over the traditional 'stick' antennas used by many systems.

Polar antennas also generate a far better signal when operating in areas with obstacles such as buildings or trees. Such obstacle deteriorate the performance of traditional stick antennas by masking and absorbing the signal much of which is dependant upon what material the obstacle is made

of as well as where the antenna is pointed. As the signal generated by polar antennas is nearly equal in all directions they are much less susceptible to such losses.

With a weatronic system it is irrelevant how the pilot holds the transmitter or in which direction he points it, which in turn means that regardless of the model's attitude relative to the transmitter, the maximum signal strength will always be reaching the receiver.

The data transmitted is coded so that only the receiver which knows the coding can use the signal to move the servos. There are many million different codes to use so that interference or being 'shot down' as know from the old narrow band technology can be ruled out. It is safe to use up to 120 weatronic systems simultaneously in the same area and the old narrow band (35 or 72 MHz) transmitter will have no effect on a weatronic system what so ever.

The transmitter module is fitted with a micro SD card which stores all data transmitted or received during the flight. Thanks to a small condenser the information will not be lost if the transmitter power fails or if the transmitter malfunctions and the information can be recalled for analysis at a later date. This function effectively gives you a black box in the event of a system failure or crash which will assist you in identifying the cause.

All weatronic Dual 2.4 Dual FHSS systems are designed as powerful transceivers which transmit a variety of useful information back to the transmitter such as the signal strength received by both receiver circuits, the voltage of the receiver batteries, the receiver temperature as well as various telemetry and sensor details. As standard, our 2.4 Dual FHSS micro receivers transmit the following data:

- Signal strength (range warning)
- Receiver battery pack voltage
- Temperature

to the transmitter and if these values fall outside of certain values a warning will given. The red 'ERROR' LED will begin to flash on the transmitter module and if an earphone is fitted an acoustic signal will be heard. By using our GigaControl software a variety of other user defined information can be indicated by the 'ERROR' LED and earphone. Parallel to this the Micro SD card will be storing all of the data received and transmitted and this information can be shown as a 'live stream' on a PC.

Weatronic transmitter modules are available for all of the popular Multiplex, Futaba and JR/Graupner transmitters which are fitted with a plug-in transmitter module. 12 channels can be operated with the current modules and a 16 channel version is being developed.

Modules are currently available for the following transmitters:

- Futaba T12 FG/T14 MZ/FX-30/FX-40
- Futaba FF 7/FF 9/FF 10/WZ-2/FC-18/FC-28
- Multiplex Royal Evo/Royal Pro/Profi MC 3010/3030/4000
- Graupner MC19/MC20/MC 22/MC 22S
- Graupner MX 22/MC 24/JR 9X/JR 10X, JR12X
- Graupner MX 24S

This range is soon to be extended to include the Graupner MC 32 and Multiplex Evo transmitters, both will operate 16 channels.

5 Transmitter module weatronic 2.4 Dual FHSS

5.1 Fitting the transmitter module

A transmitter conversion kit consists of the following items:

- Transmitter module
- Fitting to utilise the original antenna mounting
- Connecting cable with 2 locking plugs
- Adapter module with casing to fit the transmitter

5.1.1 Transmitter module for Futaba FF7/FF9/FF10/WZ-2 transmitters

Remove the original antenna and HF module. Screw the adapter stalk into where the original antenna was fitted (in the case of the WZ-2 the adapter is slid over the collapsed antenna) and plug the weatronic adapter module into where the original HF module was fitted to the rear of the transmitter. Plug one end of the connecting cable into the adapter module and fit the transmitter module to the antenna stalk so that the LEDs are on the upper side (visible when looking at the front of the transmitter). The connecting cable should now be plugged into the transmitter module.

5.1.2 Transmitter module for Futaba FC-18/FC-28 transmitters

Remove the original antenna and HF module. Screw the adapter stalk into where the original antenna was fitted (in the case of the WZ-2 the adapter is slid over the collapsed antenna) and plug the weatronic adapter module into where the original HF module was fitted to the rear of the transmitter. Plug one end of the connecting cable into the adapter module and fit the transmitter module to the antenna stalk so that the LEDs are on the upper side (visible when looking at the front of the transmitter). The connecting cable should now be plugged into the transmitter module.



weatronic transmitter module fitted to a Futaba FC-28 transmitter



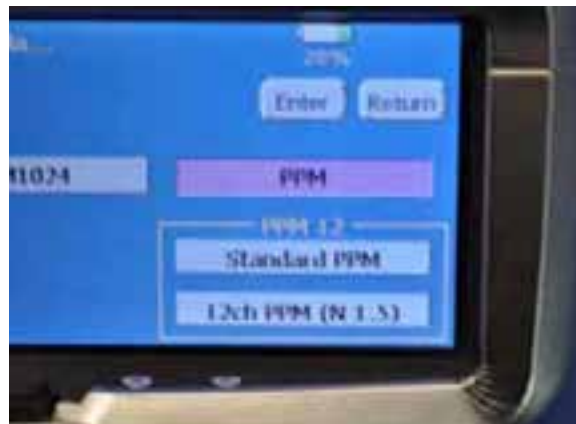
Adapter module for Futaba FC-18 and FC-28 transmitters

5.1.3 Transmitter module for Futaba T12FG, T14MZ, FX-30, FX-40 transmitters

Remove the original HF module and carefully replace it with the weatronic adapter module ensuring that it seats correctly.



weatronic adapter module on Futaba's T14MZ transmitter



Choose this modulation

Connect the adapter module to the transmitter module ensuring that the cable is properly locked home. To release the connecting cable, gently press both sides of the plug.

Settings:

- Set your Futaba transmitter to channel 285 (35.250 MHz).
- Both PPM and PCM 1024 modulation can be used.
- If using PPM 12 modulation, set the middle point to '1.5'.
- Make sure that you do NOT select 'invert'.

These settings are purely to enable the adapter module to communicate with the transmitter module. The actual signal which will be transmitted is dictated by the weatronic system.

Note:

If using the transmitter types T12FG, T14MZ you will require the adapter module with the part number **WZ 6.FU5_35** and for transmitter models FX-30, FX-40 the adapter module with the part number **WZ 6.FU6_35** should be used.

5.1.4 Transmitter module for Futaba T12FG, T14MZ, FX-30, FX-40 transmitters US version (72 MHz)

Follow the instructions in para. 6.1.9. Inform about the frequency to be set under http://www.weatronic.com/en/downloads/cat_view/41-technische-anleitungen.

If using the transmitter types T12FG, T14MZ you will require the adapter module with the part number **WZ 6.FU5_72** and for transmitter models FX-30, FX-40 the adapter module with the part number **WZ 6.FU6_72** should be used.

5.1.5 Transmitter module for Graupner MC 24 transmitters

Remove the original telescopic antenna and open the casing. Remove the original HF module and screw the adapter stalk into the antenna mounting. The weatronic adapter module is now fitted into the HF module mount and the connecting cable plugged into it. Fit the transmitter module to the adapter stalk so that the LEDs are visible when viewed from the front. The plastic visibility window on the casing should now be removed to allow you to route the connecting cable out of the casing, or, alternatively the cable may be fed out via a free external switch hole. Connect the connecting cable to the transmitter module ensuring that both plugs are correctly seated and replace the casing.

5.1.6 Transmitter module for Graupner MX 22/JR 9X/JR10X/MX24S transmitters



Weatronic 2.4 Dual FHSS Transmitter module fitted to a Graupner/JR MX22 transmitter



MX 22 transmitter converted to weatronics Dual 2.4 MHz Dual FHSS

Remove the original antenna and HF module. Screw the adapter stalk into where the original antenna was fitted and plug the weatronic adapter module into where the original HF module was fitted to the rear of the transmitter. Plug one end of the connecting cable into the adapter module and fit the transmitter module to the antenna stalk so that the LEDs are on the upper side (visible when looking at the front of the transmitter). The connecting cable should now be plugged into the transmitter module.



Adapter stalk for the MC 22



For the JR 9X/JR10X/MX24S/JR12X



Weatronic adapter module for JR/Graupner

5.1.7 Transmitter module for Graupner MC19/MC22/MC22S transmitters

Unscrew the original 35 MHz antenna and replace it with the adapter stalk. Remove the back plate and disconnect the blue plug which goes into the original HF module. This plug is now inserted into the weatronic module adapter which is then fixed to the transmitter's main circuit board in the position shown on the picture below using double sided sticky tape. The plastic visibility window on the casing should now be removed to allow you to route the connecting cable out of the casing, or, alternatively the cable may be fed out via a free external switch hole.



Weatronic adapter module fitted to a Graupner MC19S/MC22S transmitter



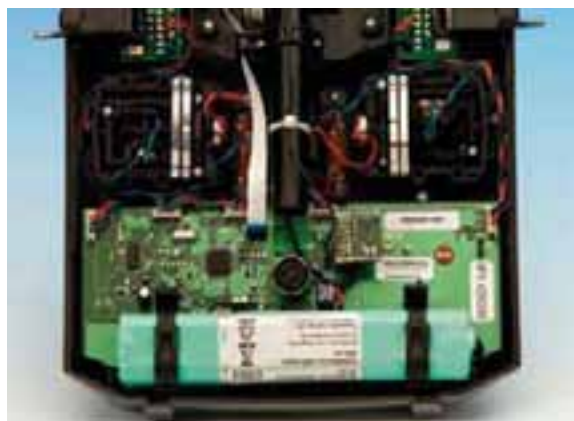
Weatronic transmitter module fitted to a MC 19S transmitter

5.1.8 Transmitter module for Multiplex Evo/Royal Evo Pro 7/9/12 transmitters

Remove the original pole antenna from its housing and open the casing. Plug the special connector cable which is supplied fitted to the adapter stalk into the transmitter module ensuring that it is correctly seated.



The connecting cable for the EVO transmitter is fed down through the antenna tube.



The weatronic adapter module replaces the original Multiplex HF module

Guide the connecting cable down through the antenna tube into the inside of the transmitter and plug it into the free socket on the weatronic adapter module. Remove the original HF module and replace it with the weatronic adapter module. The casing may now be replaced and the adapter stalk pushed into place where it is retained by an 'O' ring. Fit the transmitter module to the stalk ensuring that the LEDs are visible when viewed from the front.

5.1.9 Transmitter module for Multiplex Profi 4000/3030/3010 transmitters

Unscrew the original 35 MHz antenna and replace it by screwing the adapter stalk into its place. Open the casing and remove the original 35 MHz module from its housing. Remove the plastic window from the rear of the transmitter to enable you to feed the connecting cable through.

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Weatronic 2.4 Dual FHSS transmitter module fitted to a Multiplex Profi MC 4000 transmitter



Opened Multiplex Profi MC 4000 transmitter showing the adapter module fitted



Adapter module and connecting cable for Multiplex Profi MC 3030 /4000-Series and EVO Royal/Royal Pro 7/9/12 transmitters



Connecting cable fed out through the visibility window hole on a Multiplex Profi MC 4000 transmitter

Plug the connecting cable into the weatronic transmitter module ensuring that it is correctly seated and fit the transmitter module to the adapter stalk with the LEDs upwards so that they can be viewed from the front. Feed the cable through the hole in the casing which you made by removing the window, or, alternatively the cable may be fed through a vacant external switch hole. The cable should now be plugged into the Weatronic adapter module as shown above ensuring that it is correctly seated which is then plugged into the original HF module housing (shown above). Replace the cover to complete the conversion.

5.2 Transmitter module LEDs and their functions



The transmitter module is fitted with 3 LEDs:

- 1 green LED situated on the left labelled "**STATUS**"
- 1 red LED situated in the middle labelled "**ERROR**"
- 1 yellow LED situated on the right labelled "**TEST**"

On switching on all of the LEDs will illuminate briefly.

- Left LED (green):
LED off -> transmitter switched off
Permanently on -> connection OK, bi-directional mode
Short intermittent flashes -> Uni-directional modus
Fast regular flashes -> Quick binding
Slow regular flashes -> Binding
- Middle LED (red):
LED off -> OK, all values are below the warning levels
Flashing -> Error, warning over the following conditions:
 - The signal quality received by the receiver
 - The receiver battery voltage
 - The receiver temperature
 - The transmitter voltage
 - The transmitter module temperature
 - The signal quality of the return signal
 - The transmitter signal

All warnings will also be accompanied by an acoustic signal if an earphone is connected (see Annex 2).

- Right LED (yellow):
LED off -> Range test not in progress
Flashing -> Range test in progress

For further information regarding the codes indicated by the LEDs please see Annex 2.

6 Fitting the receiver

Weatronic 2.4 Dual FHSS Dual Receivers have been thoroughly tested against and designed to resist vibration and temperature extremes, however our receivers should always be mounted as far away as possible from likely sources of heat or vibration, for example the exhaust systems fitted to internal combustion (i/c) engines.

6.1 Fitting the Dual 2.4 Dual FHSS micro series receivers.

The best method for mounting this type of receiver is to use 2 strips of self adhesive cellular sponge rubber (not foam) attached to a suitable plate which is secured to the model. The strips should be positioned to allow air to circulate under the receiver and under no circumstances should the receiver be wrapped in foam or any other material which may cause a heat build-up.

6.2 Routing the Dual 2.4 Dual FHSS micro series receiver antenna.

Each receiver circuit of a Dual 2.4 Dual FHSS Micro receiver is fitted with a 200 mm long antenna. These antennas should each be routed in a straight line and should be positioned so that they are at an angle of 90 degrees to each other to ensure the best possible reception.



Exception: Fuselages which are constructed from Carbon fibre or those which have a high level of carbon fibre reinforcement should have the antenna routed outside the fuselage. Carbon fibre is a very good insulator against radio waves and mounting the antenna internally would greatly reduce the range of the system. This warning also applies to models with metal or metallic coverings which includes metallic paint.

6.3 Fitting the 2.4 Dual FHSS 12-22 R series receivers.

The perfect method of mounting a Dual 2.4 MHz Dual FHSS 12-22 R receiver is to use our rubber blind nuts which are available from us. These nuts provide the best protection against vibration whilst providing a stable and convenient method of fitting the receiver. To utilise these nuts a plate made from ply, GRP or any other suitable material should be constructed noting that the plate must have holes cut into it in the vicinity of the bottom of the receiver to allow sufficient cooling air to circulate around the receiver's casing. The plate should then be drilled \varnothing 8mm and the rubber mounts inserted, the receiver is then screwed onto the mount using 4 mm bolts.

Receiver mounting dimensions: 130 x 70 mm, \varnothing 8 mm.



\varnothing 8 mm Blind nuts provide optimal vibration protection.

If using a Dual 2.4 Dual FHSS 12-22 R Gyro II receiver, the receiver should be mounted at 90 degrees to the longitudinal axis or the fuselage and horizontal to ensure that both gyros function correctly.

The Dual 2.4 Dual FHSS 12-22 R Gyro III, 2.4 Dual FHSS 12-22 R Gyro III + GPS and 2.4 Dual FHSS 12-30 R Gyro III + GPS receivers are fitted with gyro on all 3 axes which means that they can be mounted along or across the fuselage as long as they are mounted horizontally.

If using a GPS equipped receiver you must ensure that the top of the receiver (the side with a label attached) is upwards to ensure that the receiver receives a good signal from the GPS satellite. Also, the fuselage directly above the receiver should not be constructed from Carbon fibre, metal, metallic covering (chrome effect) or any other material which may shield the receiver and deteriorate the signal. Cables may also shield the receiver and should not be routed above the receiver.

6.4 Routing the Dual 2.4 Dual FHSS 12-22 R series receiver antenna

The receiver is fitted with 2 shielded 200 mm long antennas which are equipped with SMA type screw sockets. The gold coloured locking nuts are 10 mm and should be gently hand tightened using a suitable short spanner. If the model is susceptible to vibration, a drop of 'Pattex' glue may be applied to the threads to act as low tensile thread lock. In effect, only the last un-shielded 29 mms of the antenna receive the signal and they should be located as far apart as possible at an angle of 90 degrees to each other. The antennas must lay straight and we recommend mounting them into plastic tubes (NOT carbon fibre!) for protection.



Original antennas with SMA type connectors



Coax cable extensions for external mounting with SMA type connectors



External stump area for better reception



For fuselages which are constructed from Carbon fibre or those which have a high level of carbon fibre reinforcement we recommend using extensions to mount the antennas outside of the fuselages (these are available in varying lengths). Carbon fibre is a very good insulator against radio waves and mounting the antenna internally would greatly reduce the range of the system. This warning also applies to models with metal or metallic coverings which includes metallic paint.

6.5 Safety notes

6.5.1 Checking the cables and soldered joints

We strongly recommend that you inspect all cables and soldered joints regularly for damage and that any damage is repaired immediately. Cables and soldered joints are particularly susceptible to damage where vibration is present which is often the case with models. All soldered joints should be re-enforced with heat shrink tube of the correct diameter.

6.5.2 Electronic 'noise' suppression – Electric motors

Convention brushed electric motors must have a suitable condenser fitted to suppress any electrical 'noise' that they may generate. Such electric 'noise' is created by the brush to collector contact and may cause severe interference to the receiver if it is not correctly suppressed. In particular, the fuel pump fitted to a model jet's turbine may create a considerable amount of electrical 'noise' and as such you should follow the manufacturers recommendations closely when fitting the pump.

6.5.3 Electronic 'noise' suppression – Electronic ignition systems

Electronic and magnet driven ignition systems also produce high levels of electronic 'noise' which can cause interference or drastically reduce the system's range. Always use a separate battery supply for the ignition to enable you to place the pack as near as possible to the ignition unit and keep the leads as short as possible. Spark plugs, plug caps and HT/LT cables must be screened and the receiver system including all servos and cables should be kept as far as possible away from the ignition system.

6.6 Laying the cables for use on jets

The ECU must not be positioned near to the receiver (minimum distance 10 cms). All cabling for the ECU and its components (battery pack, pump, data BUS, turbine cables etc.) must be kept away from the receiver system cables (receiver battery, servo, switch etc.).

7 Using the system with a Dual 2.4 Dual FHSS micro series receiver

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7.1 General

The Dual 2.4 Dual FHSS micro series receivers are available in 8, 10 and 12 channel versions and can be used as any other 'normal' receiver would be used. In this case the transmitter functions are used to alter the behaviour of the servos (for example, Dual Rate). However, before use all Dual 2.4 dual FHSS micro servos must be bound to the transmitter before use.



For the more demanding or experienced modeller we have developed our programming program, GigaControl. Using this program the receiver can be programmed to perform several useful functions, for example, for setting the receiver outputs to the function which you require, programming servo travel, delayed reaction and sequencing. Unfortunately, the Dual 2.4 Dual FHSS micro series of receivers does not support the multi-servo synchronising feature or the individual servo voltage settings. For more information, please see Para. 9.

7.2 Dual 2.4 Dual FHSS micro 8/10/12 series receivers

7.2.1 Receiver LEDs and their function

The Dual 2.4 Dual FHSS micro receiver is fitted with 2 LEDs

- 1 green LED labelled "**Binding**" – "**On/Off**"
- 1 red LED labelled "**Status**"

On switching on the system, both LEDs will illuminate briefly.

- Green LED:
 - LED off -> Receiver switched off
 - Illuminates solidly -> Connection OK, bi-directional mode
 - Short flashes -> Uni-directional mode
 - Slow regular flashes -> Binding
- Red LED:
 - Flashing -> Failsafe programming active
 - Further codes/flash combinations -> Not yet allocated



Dual Receiver 2.4 Dual FHSS micro 12

7.2.2 Binding a Dual 2.4 Dual FHSS micro series receiver to the transmitter module

You can bind as many receivers as are required to each transmitter module/transmitter as each transmitter module transmits an individual code, of which there are millions, to the receiver which must store the code before it will become 'live'. This makes it impossible for more than one weatronic receiver to react to a weatronic transmitter module at the same time.

Before a weatronic transmitter module and a weatronic Dual 2.4 Dual FHSS series receiver can communicate with each other they must be bonded together (Quick Binding). During this binding process the receiver will receive and store the code transmitted by the transmitter module and the transmitter module will receive and store the receiver's serial number. Once this process is complete, the receiver will only react to signals transmitted by that transmitter module. The process for binding a receiver to a transmitter module is very simple and should be carried out as follows:



During this process, you must ensure that the transmitter module and the receiver are a minimum of half a metre (50 cms) apart.

Two buttons are fitted to the transmitter module, labelled "Button 1" and "Button 2". These buttons become active a few seconds after switching on the transmitter and this will be signalled by all 3 LEDs flashing. Once the transmitter is switched on and the module has conducted its self-test the red LED will flash as the module is not receiving a return signal and the green LED will omit a short double flash indicating that it is not bonded. The transmitter module is now ready for bonding. Begin the bonding process by pressing "Button 2" for at least 5 seconds, at which point the green LED will begin to flash rhythmically.

The Dual 2.4 Dual FHSS micro receiver should now be switched on or power connected. **Once** the receiver is **switched on** the red jumper should be fitted to the pins on the side of the receiver opposite the servo sockets. The jumper can be fitted either to the upper and middle or to the lower and middle pins and binding will begin after approximately 5 seconds.

Once the transmitter module and the receiver are bonded together the green "STATUS" LED will illuminate solidly on both components. The red jumper may now be removed from the receiver.



Weatronic transmitter module showing the earphone socket on the left, the USB cable socket and the SD Micro card slot

7.2.3 Quick Binding

As the serial number of each Dual 2.4 Dual FHSS micro receiver which has been bonded to it is stored within the module's memory, re-bonding (quick Binding) a receiver is extremely quick and easy. Simply switch on the transmitter followed by the receiver and once the self test is complete press "Button 2" once briefly, finished! When the Quick Binding process is complete the green "STATUS" LEDs on both the transmitter module and the receiver will flash at regular intervals (twice per second). / will illuminate solidly.

7.2.4 Failsafe settings for the Dual 2.4 Dual FHSS micro series receiver

The Fail Safe function of a Dual 2.4 Dual FHSS micro receiver is activated and set using the transmitter and all channels can be given a Fail Safe position. To set the Fail Safe positions the red jumper must be fitted to the lower (red, black) pins on the receiver before the receiver is switched on.

This will have put the receiver into Fail Safe setting mode. To set any the value for any function that function must be moved through it's full range (to facilitate this, the Servo Travel value must be set at more than 60% on the transmitter) and then moved to the desired position. If the jumper is then removed before the receiver is switched off, the value will be stored.

Fail Safe will be activated for all functions which have been moved before the jumper is removed and the last position of any sticks, knobs or sliders will be stored by the receiver. Any functions which have not been moved to activate the Fail Safe function will default to the middle (neutral) position. The Fail Safe settings are only saved within the receiver if the jumper is removed before the receiver is switched off, if the receiver is switched off before the jumper is removed the previous settings will be retained.

7.2.5 Range Testing

Before you can conduct a range test the transmitter module must have been bonded to the 2.4 Dual FHSS receiver, see Para. 8.2.2.

- The first Step in conducting a range test is to put the transmitter module into range test mode which will reduce the transmitter's output to 10 mW which is 1/10 of the normal output. To access to this mode switch the transmitter on and wait until the yellow "TEST" LED goes out indicating that the self test is complete "Button 1" (the right hand button) should then be pressed for at least 5 seconds.
- The yellow LED ("TEST") will then begin to flash slowly at regular intervals indicating that the transmitter module is in range test mode. For safety reasons, the transmitter module will only remain in range test mode for 60 seconds, after which time it will revert to normal mode and the output return to full strength.
- Once 1 minute has expired if you have not completed the range test but wish to continue with it, the system must be switched off before switching it back on prior to carrying out the steps detailed above once again. This will put the module back into range test mode for a further 60 seconds.
- Walk away from the model with the transmitter and operate all of the controls for a distance of 80-100 steps. Keep the transmitter pointed at the model and all of the controls must work perfectly.



If the range check fails, do not attempt to operate your model under any circumstances!! If the receiver fails to receive a 'clean' signal, the red "ERROR" LED on the transmitter will flash. If the range check has failed, carefully check the model's installation including all cables, the receiver battery, the receiver switch as well as all plugs and sockets. The transmitter battery should also be checked for sufficient power.



When conducting the range test, the return signal from the receiver will also be tested. This signal is transmitted from the left hand antenna and for this reason if the left antenna is located in a poor position relative to the transmitter, a lack of range may be indicated by the transmitter module. This situation will be amplified if the model is placed on wet grass.

7.2.6 Setting the country code

There are 2 country code settings:

- World: the complete frequency band from 2,401 to 2,4835 GHz will be used
- France: 2,401 – 2,453 GHz will be used

The factory setting is 2,401 to 2,4835 GHz (world).

To change the country code switch on the transmitter and wait until the self test is finished and press both buttons on the transmitter module simultaneously for 5 seconds. The module will now be in change country code mode which will be indicated by all 3 LEDs flashing together.

Slow rhythmical single flashes: World

Slow rhythmical double flashes: France

Pressing both buttons again will change the country code

A further method of changing the country code is outlined in Para 10.2

7.3 Dual 2.4 Dual FHSS micro receiver with Gyro

A 2.4 Dual FHSS Micro Gyro receiver must be configured using the GigaControl software. Please install the Software in accordance with Para 9.4.

8 Power supply for the Dual FHSS micro receiver

The 2.4 Dual FHSS micro receiver operates on a voltage of between 4.00 and 10.0 volts. If you are operating a model which is fitted with 4.8 V servos a 4 cell NiMH battery pack should be used. If using 6.0 V servos you should use a 5 cell pack. In both cases we recommend the use of a weatronic electronic switch.

You can of course choose another make of switch or use a LiPo voltage regulator if desired. The capacity of the packs which you use will depend upon how many servos you operate and what their current draw is.

⚠ The total current draw of all of the servos working under full load must not exceed 6 Amps otherwise the receivers circuit board may be damaged.

9 Using the system with a 2.4 Dual FHSS 12-22 R series receiver

9.1 General

Professionally developed, tried and tested firmware driving high power micro processors make the weatronic 2.4 Dual FHSS 12-22 R series receivers combined with the weatronic transmitter module an incredibly reliable and powerful combination. To get the best performance out of your system you will need a laptop or PC loaded with our GigaControl software which will not only allow you to analyse data gathered during your flights, but will also enable you to make many changes to the internal settings of the hardware. Our software is included with all components which we supply and it can also be downloaded from www.weatronic.com under Downloads. To ensure the best possible results, always install the software from you own disk or download and do not use a version from a third party. Once you have the software installed onto your PC, all you will need is a Mini USB cable and you will be able to perfectly tune your system to your model.



Dual Receiver 2.4 Dual FHSS 12-22 R Gyro II with electronic switch board

9.2 Features

The 2.4 Dual FHSS 12-22 R series receivers are a further development to our well known Dual Receiver 12-20 R 35, 36 and 72 MHz range. Our design target was quite simple, to create an on-board control system that will offer the maximum in reliability using the new 2.4 GHz broad band technology which incorporates a dual power supply circuit capable of handling enough current to be able to supply today's modern digital servos.

The power supply system consists of no less than 8 separate power circuits which can be independently set to a value of 4.8 or 6 Volts and which can deliver a constant 32 Amps. at 6 Volts with a 50 Amp. Burst rating. The voltage regulators are cooled by anodised milled aluminium heat-sinks located on the bottom of the unit.

A further aim was to incorporate a system whereby various data could be stored during the flight to be later recalled for analysis. We have achieved this by incorporating a flash drive using an SD Micro card into the receiver and a similar system in the transmitter module to record the data sent back from the receiver.

2.4 GHz technology allows information regarding the telemetry and system information to be transmitted back to the transmitter and by using our GigaControl Software you can follow the flight on your PC in real time.

We also wanted to use the latest technology to make flying large expensive models not only safer but also to assist the pilot in flying them. This has been achieved with our 2.4 Dual FHSS 12-22 R Gyro II, 2.4 Dual FHSS 12-22 R Gyro III, 2.4 Dual FHSS 12-22 R Gyro III + GPS und 2.4 Dual FHSS 12-30 R Gyro III + GPS receivers by incorporating a 2 or 3 channel state of the art Gyro. These Gyros are extremely temperature stable and can operate in Normal or Heading Hold mode. The rate can be set via the software or from the transmitter and can be assigned to any channel.

The receiver outputs can be freely assigned to any transmitter output and up to 8 servos can be synchronised if they are connected to the same control surface simply by a click of the mouse. The full description of all of the functions which can be set using the GigaControl software are fully described in Para. 10.

9.3 Versions

Dual Receiver 2.4 Dual FHSS 12-22 R

12 channel (extendable to 16), 22 freely programmable outputs, 8 voltage regulators, data record, return channel, external sensor sockets, battery test

Dual Receiver 2.4 Dual FHSS 12-22 R Gyro II

As above, plus a 2 channel Normal/Heading Hold Gyro for use on the X/Y axes

Dual Receiver 2.4 Dual FHSS 12-22 R Gyro III

As above, plus a 3 channel Normal/Heading Hold Gyro for use on the X/Y/Z axes

Dual Receiver 2.4 Dual FHSS 12-22 R Gyro III + GPS

As above, plus a GPS Logger

Dual Receiver 2.4 Dual FHSS 12-30 R Gyro III + GPS

As above, with 30 outputs

9.4 The ON/OFF switching board

The ON/OFF switching board is fitted with 2 LEDs, 1 red (labelled "Battery") and 1 green (labelled "Status") which provide information regarding the condition of the receiver battery. The Dual receiver itself is equipped with 3 LEDs, 2 of which (red for "Battery" and green for "Status") mirror the LEDs on the ON/OFF switching board, and there meaning and an explanation of the flashes which they omit is shown in Annex 3. The 3rd yellow LED indicates that information is been written to the SD Micro card. On the rear side of the switching board are 2 sockets for further LEDs.

9.5 Binding the transmitter to a Dual Receiver

You can bind as many receivers as are required to each transmitter module/transmitter as each transmitter module transmits an individual code, of which there are millions, to the receiver which must store the code before it will become 'live'. This makes it impossible for more than one weatronic receiver to react to a weatronic transmitter module at the same time.

Before a wWeatronic transmitter module and a weatronic Dual 2.4 Dual FHSS series receiver can communicate with each other they must be bonded together (Quick Binding). During this binding process the receiver will receive and store the code transmitted by the transmitter module and the

transmitter module will receive and store the receiver's serial number. Once this process is complete, the receiver will only react to signals transmitted by that transmitter module. The process for binding a receiver to a transmitter module is very simple and should be carried out as follows:



During this process, you must ensure that the transmitter module and the receiver are a minimum of half a metre (50 cms) apart.

Two buttons are fitted to the transmitter module, labelled "**Button 1**" and "**Button 2**". These buttons become active a few seconds after switching on the transmitter and this will be signalled by all 3 LEDs flashing. Once the transmitter is switched on and the module has conducted its self-test the red LED will flash as the module is not receiving a return signal and the green LED will omit a short double flash indicating that it is not bonded. The transmitter module is now ready for bonding. Begin the bonding process by pressing "**Button 2**" for at least 5 seconds, at which point the green LED will begin to flash rhythmically.

Switch the 2.4 Dual FHSS 12-22 R series receiver on by removing the red "**Remove Before Flight**" jumper and then insert the blue "**Binding**" jumper into place in the switching board. Once the transmitter and receiver are bound, the green "**Status**" LED on the both the transmitter module and the receiver will go solid and the blue "**Binding**" jumper can be removed.

9.6 Quick Binding

As the serial number of each 2.4 Dual FHSS receiver which has been bonded to it is stored within the module's memory, re-bonding (quick Binding) a receiver is extremely quick and easy. Simply switch on the transmitter followed by the receiver and once the self test is complete press "**Button 2**" once briefly, finished! When the Quick Binding process is complete the green "**STATUS**" LEDs on both the transmitter module and the switching board will illuminate solidly.

9.7 Range testing

Before you can conduct a range test the transmitter module must have been bonded to the 2.4 Dual FHSS, see Para. 9.5.

- The first step in conducting a range test is to put the transmitter module into range test mode which will reduce the transmitter's output to 10 mW which is 1/10 of the normal output. To access to this mode switch the transmitter on and wait until the yellow "TEST" LED goes out indicating that the self test is complete "Button 1" (the right hand button) should then be pressed for at least 5 seconds.
- The yellow LED ("TEST") will then begin to flash slowly at regular intervals indicating that the transmitter module is in range test mode. For safety reasons, the transmitter module will only remain in range test mode for 60 seconds, after which time it will revert to normal mode and the output return to full strength.
- Once 1 minute has expired if you have not completed the range test but wish to continue with it, the system must be switched off before switching it back on prior to carrying out the steps detailed above once again. This will put the module back into range test mode for a further 60 seconds.
- Walk away from the model with the transmitter and operate all of the controls for a distance of 80-100 steps. Keep the transmitter pointed at the model and all of the controls must work perfectly.



If the range check fails, do not attempt to operate your model under any circumstances!! If the receiver fails to receive a 'clean' signal, the red "ERROR" LED on the transmitter will flash. If the range check has failed, carefully check the model's installation including all cables, the receiver battery, the receiver switch as well as all plugs and sockets. The transmitter battery should also be checked for sufficient power.



When conducting the range test, the return signal from the receiver will also be tested. This signal is transmitted from antenna 1 and for this reason if antenna 1 is located in a poor position relative to the transmitter, a lack of range may be indicated by the transmitter module. This situation will be amplified if the model is placed on wet grass.

10 Power management for the 2.4 Dual FHSS 12-22 R series receivers

10.1 Functions

The weatronic Dual Receivers are fitted with a high current power system for dealing with modern high current draw digital servos and consists of 8 separate circuits, all of which are protected against shorting. Each circuit can draw a maximum of 5 Amps constant which means that you can safely draw up to 40 Amps. in total providing that the receiver is sufficiently cooled and for short (burst) periods even higher currents can be drawn. The GigaControl software can be used to change the output voltage form 4.8 to 6 Volts and the factory settings it 4.8 Volts so please be aware of this when choosing your servos.

The power supply circuit is fed by two battery packs, in normal operation a high current main pack will provide the power and in the event of the failure of the main pack due to a cell being defective, an empty pack, a short circuit, a poor contact within the plug/socket or any other cut the 2nd battery pack will cut-in. If the receiver switches to the back-up (2nd) battery it will be indicated by the red "Battery" LED on the receiver. For this reason it is useful if this LED is visible from outside the aircraft and a second LED can be remotely mounted from the unit.

10.2 Battery test function

On switching on, a battery test will be conducted which consists of the main and secondary battery packs being subjected to a 25 msec. 7 Amp load during which time the packs voltage drop will be measured. If either of the packs drops to below a pre-set value the red "Battery" LED will illuminate and this will prevent you from taking off with batteries which are not sufficiently charged. Depending upon the type of battery packs used, the warning voltage can be set as outlined in Para. 12.2.2

The following battery packs can be used:

- **2 Cell (2C) Lithium Polymer Batteries** nominal voltage 7,4 Volt, minimum current rating 20 C. minimum capacity 2500 mAh
- **3 Cell (3C) Lithium Iron Phosphate Batteries** (A123 Cells), nominal voltage 9,9 Volt
- **6 Cell NimH Batteries**, nominal voltage 7,2 Volt, minimum size SUB C

All weatronic battery packs are of high quality high current draw packs with the lowest internal resistance. They are all fitted with silicon wire and Multiplex high current plugs. You may of course use battery packs from a 3rd party providing that they meet the required specifications and quality.



On no account should AA of Eneloop type cells be used. To be on the safe side we strongly recommend that you use packs which are currently favoured by pilots flying with the current breed of high power brushless systems.

10.3 Selecting a battery with the correct capacity

When choosing batteries for your system, the capacity of the main battery pack is most important factor and if necessary packs should be connected in parallel to achieve sufficient capacity. The nominal voltage should be between 7.2 and 10.0 volts. For the secondary pack 2000 mAh will normally be sufficient as this pack will only be required to power the model for 1 flight + 100% for a safety margin. The red LED will warn you of a problem with the main battery pack (see Annex 2 for blink codes) giving you a chance to solve the problem or to re-charge the pack

We recommend battery packs with the following capacities:

- Acrobatic models with a wingspan of 3 Meters and 9-12 high current digital servos:
Main pack: 4000 - 6000 mAh
Reserve pack: 2000 - 4000 mAh
- Acrobatic models with a wingspan of 2.5 Meters and 7-10 high current digital servos:
Main pack: 3000 - 4000 mAh
Reserve pack: 1500 - 2000 mAh
- Medium sized jets:
Main pack: 3000 - 6000 mAh
Reserve pack: 1500 - 2000 mAh
- Large jets or scale model with many functions and features:
Main pack: 4000 - 8000 mAh
Reserve pack: 2000 - 4000 mAh

10.4 Caring for battery packs

Caring for your battery packs correctly is vitally important! Failure to do so can lead to a failure of the on-board electronics with catastrophic results, which may not only be dangerous but will also be very expensive! Although the chances of suffering a failure of 2 packs is considerable less than when flying with only one pack, you should still take great care over the choice and maintenance of your battery packs. Disregarding pilot error battery failure is one of the main reasons for aircraft crashing. For safety reasons weatronic recommend the use of high quality battery packs which are charged with and maintained by a good quality micro processor driven charger.



Warning: Before charging your battery packs test the charger to see if the voltage begins at 0 V and then rises to the correct voltage or if it give a short 'burst' of high voltage to test the battery first. If your charger gives a high voltage burst to begin, you must disconnect your packs from the Weatronic receiver first as the high voltage 'burst' will damage the receiver.

10.5 Lithium Polymer (LiPo) Batteries

LiPo battery packs have no memory effect and do not suffer from self-discharge (less that 5% per year) and due to this you should store your packs with a 50% charge and they do not need to be discharged before you re-charge them. The perfect method of storing LiPo packs is to have each cell at a voltage of 3.7 – 3.9 V which should equate to 50 – 70% charge and that is the condition in which the manufacturers distribute them. The only time when it is advantageous to discharge your packs is after storing them over winter, during which time the packs should be kept cool (cellar) if possible. You can expect the capacity of your packs to drop by around 20% over a period of 3 years. As individual cell voltages tend to drift, you should always use a Balancer connected between the packs and the charger when charging. The following points should be followed when charging LiPo battery packs to prevent the risk of a fire.



Avoid short-circuits at all costs! Never let the poles of a LiPo cell or pack come into contact with a metal object as the high discharge current will cause the cells to ignite within milliseconds.



Never subject them to a mechanical load and protect them from damage.



Do not damage the soldering tags or attempt to re-solder them.



To ensure 100% safety when charging LiPo packs, they should be removed from the model and placed into a ceramic container or a specially designed LiPo bag or a metal container.



LiPo packs can only be charged using a charger which is designed for that use. LiPos require a different method of charging than other types of cells and the use of an incorrect charger will destroy the cell and could lead to a fire.



Double check that your charger is set to the correct number of cells and that the current and discharge voltage settings correspond to the capacity of the cells which you are using. Refer to the battery manufacturers recommendations as well as your chargers instructions.



After a crash LiPo cells should always be replaced as they may be damaged internally even if they appear to be OK from the outside.



To prevent one of the cells within a pack being over-charged or too deeply discharged it is vital that a balancer is used.

10.6 Lithium Iron Phosphate (LiFe) Batteries

Lithium Iron Phosphate packs have an extremely low internal resistance which mean that they can be subjected to high loads without the voltage dropping. They can also be fast charged and have a long life expectancy. The nominal voltage per cell is 3.3 Volt and due to their chemical composition they can be charged at up to 4 C which means that the pack can be fully charged in 15 – 30 minutes.

10.7 Nickel Metal Hydride (NiMH) Batteries

Nickel Metal Hydride packs do not suffer from memory effect but do have a noticeable self-discharge rate and for this reason packs should be discharged after use to 90% of their nominal voltage and then re-charged shortly before you intend to use them. If the packs have been stored over a longer period of time, it is advantageous to cycle the packs a couple of times using a computer controlled charger to ensure that they are producing their full capacity. Long-term storage (for example, over winter) should be at between +10 and +30°C.

Weatronic recommend replacing NiMH packs every 2 years as after 2 years their reliability may reduce and a new pack will cost a fraction of what a crash would.

11 The GigaControl software

11.1 General

The weatronic GigaControl software offers a multitude of options for programming you system, for example, output channel allocation, delay, sequencing, synchronising groups of servos and many more functions. Another useful feature is the option to store the settings which you have selected on your computer for future use.

11.2 Installing the software

Note: The GigaControl software must be fully installed onto your PC before you connect a 2.4 Dual FHSS receiver to the computer via the USB cable.

- Place the installation CD into the CD/DVD drive of your computer. The CD contains the weatronic software packet, the weatronic GigaControl, the firmware for the transmitter module, firmware for both receiver variants as well as configuration examples.
- The installation program should start automatically. Follow the on-screen instructions.
- If you have switched the auto-start function off on your computer you will have to open 'My Computer' and select your disk drive. Use the Explorer option to open the disk and select GigaSetup.exe from the list. This will start the installation assistant and you should then follow the instructions on your screen to install the GigaControl Software.



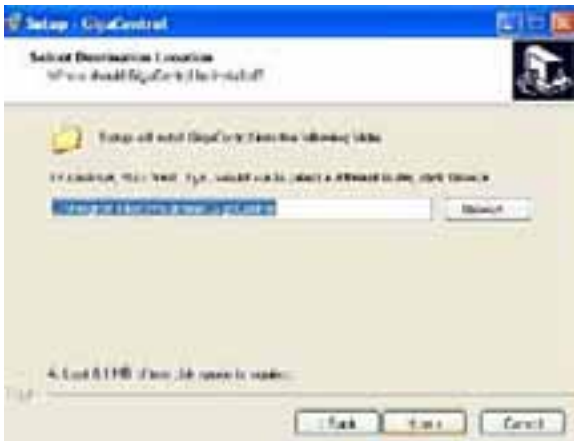
Double clicking the Icon GigaSetup (weatronic program setup) will open the following window:



Select your desired language and click 'OK'. The following window will open:



Click 'Next' to open the next window:



The GigaControl Software will be installed into the directory shown.



Click 'Next'.

Click 'Next' to accept the choice of folder and the following information window will open:

After a few seconds the following window will open:



Click 'Install' and the GigaControl software will begin with the installation. After a few seconds the following window will open:



Wait until the installation is complete at which time the following window will open:



Please click 'Finish' to complete the installation and the software will have been installed onto your computer.

Using Windows Explorer the path C:\Programs\Weatronic\GigaControl will reveal the Icons for the software which has been installed as well as the folder 'Firmware' which contains the latest software versions for the weatronic transmitter module and receivers.



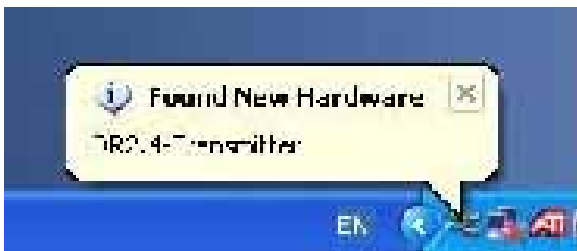
Now you will have to install the USB drivers so that the weatronic hardware will be recognised by your computer.

Installing the USB drivers:

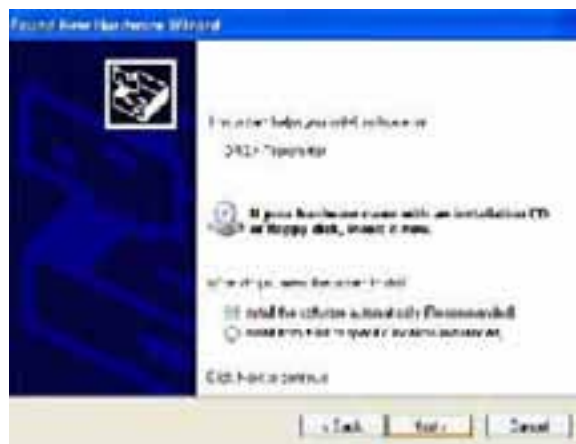
Connect your weatronic transmitter module to your computer by plugging the Mini USB cable into the transmitter module and then into a free USB socket on your computer.



Your computer will recognise the weatronic hardware:



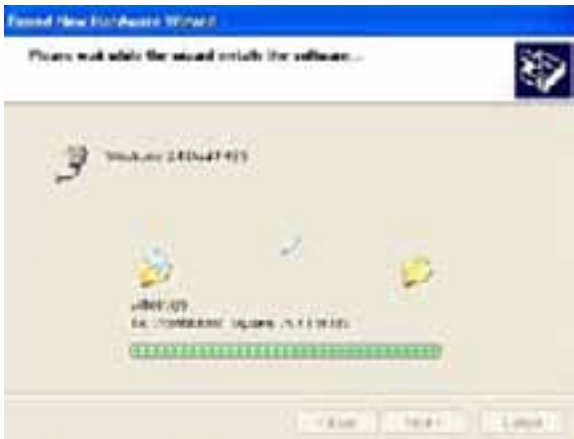
The following screen will then open:



Select the option 'Automatically install software' and allow Windows to install the drivers. If Windows fails to find the drivers, select 'Include this location in the search' and select the path C:\programs\Weatronic\GigaControl.



Choose 'Install'.



The USB drivers for the weatronic transmitter module will now be installed. Wait until the drivers are installed and the following window will open:



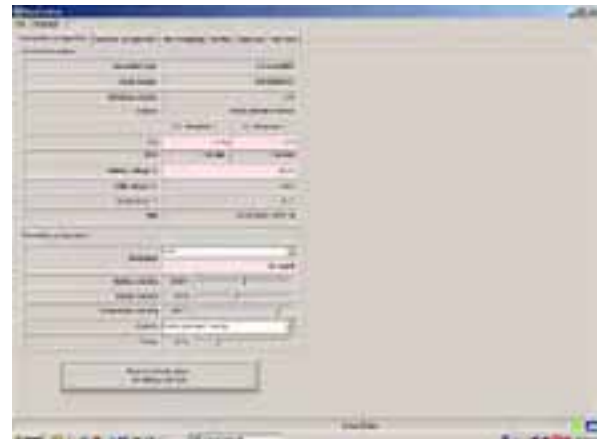
Click 'finished' and Windows will inform you that the hardware was successfully installed:



Your computer can now communicate with the transmitter module. To test this, left mouse click on the weatronic GigaControl icon on your desktop.



The start-up window will now open:

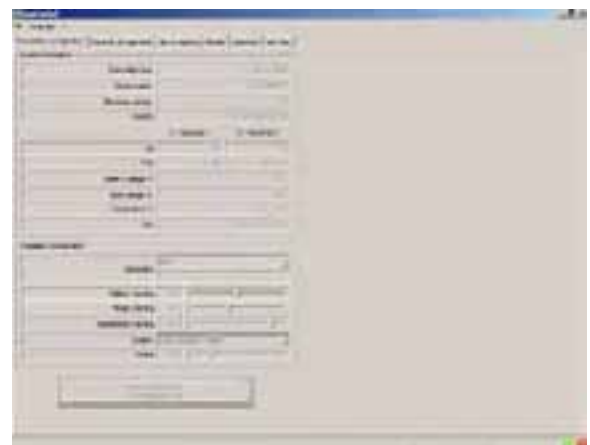


Check that a white arrow on a blue background is displayed in the bottom right hand corner as shown here, this proves that the transmitter module is communicating with the computer.

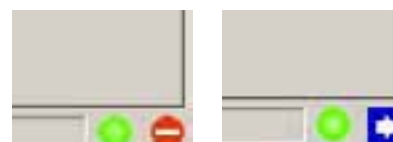
11.3 Configuring 2.4 Dual FHSS RC Systems receivers

Various settings within the GigaControl software can be changed using a simple 'mouse click' and "Arrow up" and "Arrow down" keys.

Start the GigaControl software and the following window will be displayed. This window is the 'Transmitter Configuration' window:



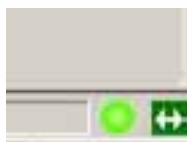
In the lower right hand corner the following symbol will be displayed:



The red 'No-Entry' symbol indicates that nothing is connected to the USB cable. A white arrow on a blue background indicates that a transmitter module is connected to the USB cable but no receiver is in use.



This screen will be displayed after a receiver is connected but before the software is ready. This process can take several seconds and the progress will be indicated by the blue bar and the hour glass.



A white double ended arrow on a green background indicates that a transmitter module is connected to the computer via a USB cable and that the computer is communicating with a receiver.

Plug the red 'Remove Before Flight' jumper into the switching board and connect at least 1 suitable batter pack, remove the red jumper and the receiver is switched on. If using a Dual 2.4 Dual FHSS Micro receiver it is only necessary to connect a battery. The receiver communicates with the computer via the transmitter module which is why the transmitter module must be connected using the Mini USB cable and the receiver switched on to make the link.

The following windows can be opened:

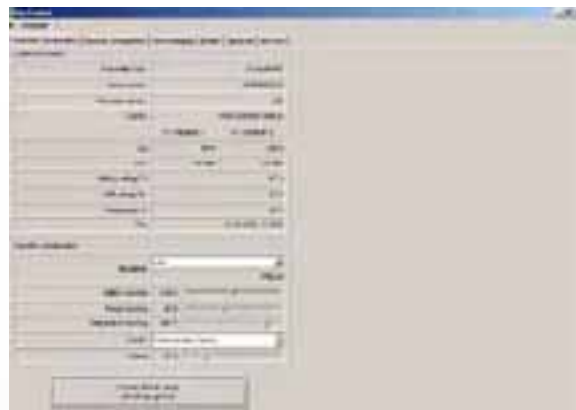
- Transmitter configuration
- Receiver configuration
- Servo mapping
- Monitor
- Spectrum
- NavView

11.3.1 Transmitter configuration

Click on the window "Transmitter configuration" and various information will be displayed regarding the transmitter and weatronic transmitter module which is connected to the computer. If a transmitter in NOT connected, the window will look like this:



Once a transmitter is connected via the USB cable and information is being received by the computer the window will look like this:



The first 4 boxes display system information, the transmitter type, the serial number, the firmware version and the country setting. The next 6 boxes show the actual measured values for the transmitter and display the information as follows:

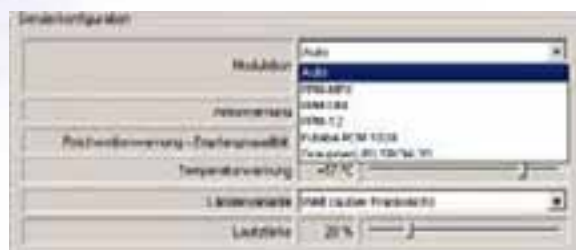
- The signal quality of the return signal for both channels
- The transmitter voltage
- The temperature on the TX module's pcb
- The USB voltage
- The transmitter module main circuit board temperature
- The time and date

The date and time settings are read from a 'real time' clock chip built into the transmitter module and they form the base for data stored on the Micro SD card if fitted. This will enable you to analyse flight data accurately.

The next 6 boxes show the transmitter configuration information and these are the setting which can be altered. The factory setting for modulation is "Auto" which can be changed if your transmitter uses a particular type of modulation, for example:

- JR/Graupner S-PCM,
- Futaba PCM 1024,
- PPM variations,

The correct modulation for your transmitter can be selected by clicking the drop down box next to "Modulation" where one of the following settings can be selected.

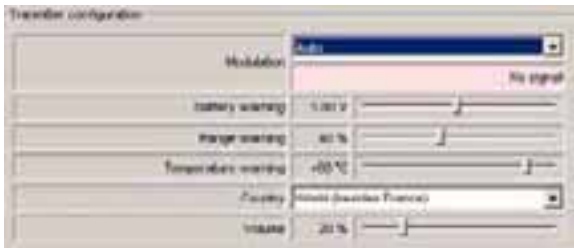


The following 3 options can be used to set the level at which an acoustic signal (if an earphone is fitted) or when the red transmitter module "Error" LED will flash.

The options are:

- Battery warning, this warns of when the transmitter battery voltage is too low and is set in Volts
- Range warning, which warns of when the percentage of good frames drops to below the set level
- Temperature warning, which alerts you when the transmitter module circuit board gets too hot and is set in degrees Celsius

In addition, within the modulation field the signal quality received by the receiver can be seen and the earphone volume can be adjusted.



If the values selected fall outside of the recommended settings, the field will be highlighted in pink.



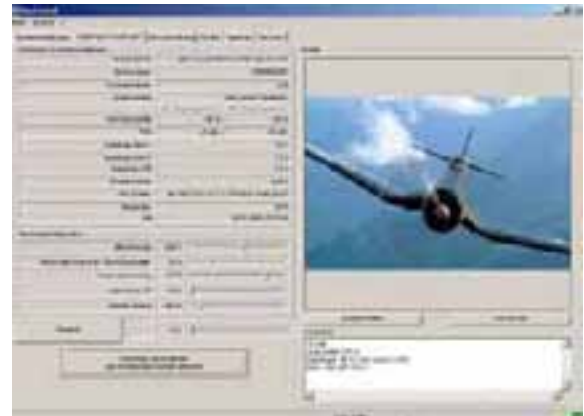
The country setting is used to select either the entire 2.4 GHz frequency band (81 channels) for use world wide, or to select limited band width for use within France. If using a 2.4 Dual FHSS Micro receiver the country setting can be selected without using the GigaControl Software. Please see Para 8.2.7.

The transmitter module can be reset back to the factory settings but it should be noted that this will delete all of the old settings and data, including the details of any receivers bonded to the transmitter module. If the module is reset, all receivers must be bonded to the module again as outlined in Para. 10.5. A warning message will be displayed which must be acknowledged before the reset will take place.



11.3.2 Receiver settings

Click on the window "Receiver settings" and the following window will open. You will now be presented with a variety of information regarding any weatronic Dual receiver which is bound to the transmitter module. This information is sent to the computer via the return signal to the transmitter module.



You can choose a picture which is stored on your computer to identify the receiver by clicking 'Select picture' and choosing a suitable picture from your files. The picture can be deleted by clicking 'Delete picture'. Furthermore, details of the model can be added to the field below the picture ('comment').

The first 4 boxes display system information, the receiver type, the serial number, the Firmware version and the country setting.

The boxes below that show the actual current values of the receiver, namely

- Signal strength received by both of the receiver circuits
- Output signal strength of both of the receiver circuits
- Voltage of both receiver batteries
- USB voltage
- Total current draw
- GPS position
- Receiver circuit board temperature
- Time and date

The area below that shows the values which can be adjusted by the user and are as follows:



The following settings will cause the transmitter "ERROR" LED to flash and an warning tone to be heard (if an earphone is fitted) if the value is exceeded:

- Battery warning, warns of when the receiver battery voltage is too low
- Range warning, warns of when the receiver signal quality is too low
- Temperature warning, warns when the receiver temperature is too high
- Battery test, warns when the voltage drops below the selected value

The value set in the battery test field is also the voltage at which the receiver will switch between the main (primary) receiver battery pack and the secondary (back-up) receiver battery pack. The default setting for this value is 4.8 Volt if a 2.4 Dual FHSS micro series receiver is bonded and 6.0 Volt if a 2.4 Dual FHSS 12-22 R series receiver is bonded.

If using a 2.4 Dual FHSS 12-22 R series receiver with two receiver battery packs, the following settings are recommended:

- Battery warning/switching value when using a 2 cell Lithium Polymer (LiPo) battery pack: 6.0 Volt
- Battery warning/switching value when using a 6 cell Nickel Metal Hydride (NiMH) pack: 5.7 Volt
- Battery warning/switching value when using a 3 cell Lithium Iron Phosphate (A123) battery pack: 8.8 Volt

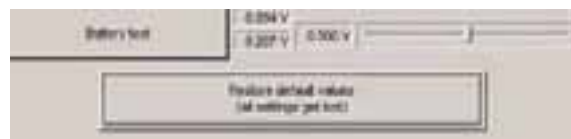
Range warning: The weatronic 2.4 Dual FHSS system has a transfer rate of 100 signal packets (frames) per second. When the percentage of packets sent which cannot be read by the receiver drops below the set value, the system will give a range warning. A value of 40% will ensure that the receiver can still operate accurately but will warn you of an impending problem. 40% is the default setting.

Temperature warning: The internal temperature of the receiver is monitored. The factory setting is 55 degrees Celsius.

Auto power off: This is the setting which dictates how long the receiver will stay switched on before entering sleep mode. This function has been incorporated to protect your receiver battery packs if you forget to switch off your receiver. The switch off point is set in minutes and the range is from 1 to 60 minutes, if you wish to deactivate this function the slider must be moved fully to the left. The factory setting is 15 minutes.

Failsafe timeout: By using the slide control you can set the value at which the Failsafe will activate if no or a corrupt signal is received. The value is in milliseconds and can be set between 100 and 1000 Milliseconds which equals 1 second. The factory setting is 300 Milliseconds.

Battery test: Upon switching on the receiver, it will self-test both of the receiver battery packs as outlined in Para 10.2. The two fields next to the battery test button show the voltage drop measured under load (the upper field shows the value for the main ((primary)) battery pack and the lower field shows the value for the secondary ((back-up)) battery pack). The voltage drop warning value can be set using the slider and the factory setting is 0.500 Volt. The battery test can be manually conducted by pressing the "Battery test" button.



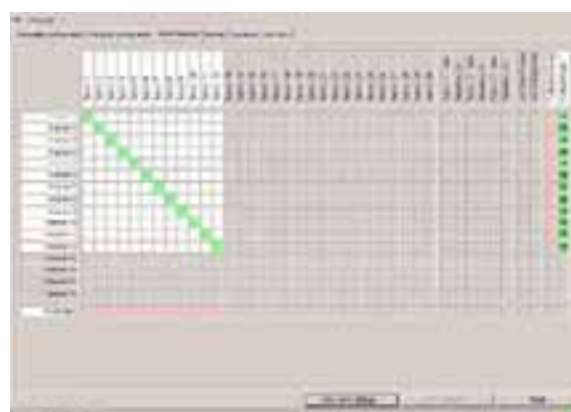
Last but not least the receiver can be returned to the factory setting by using the "Restore default values" button. All values will be returned to the factory settings which will mean that any bonding information will also be lost. This will entail your having to re-bond the receiver to your transmitter module before use and because of this the following warning message will be displayed:



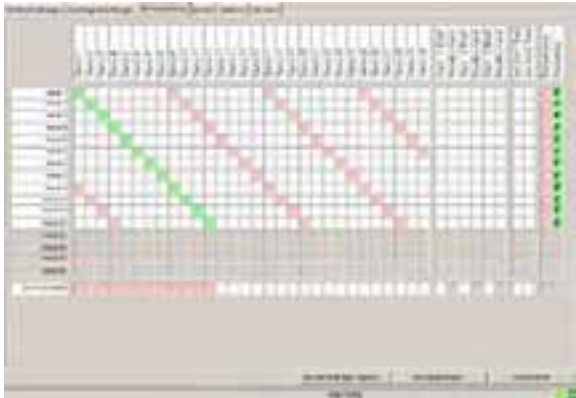
11.3.3 Servo mapping

This window, together with the "Servo Configuration" field (the next option) form the heart of the GigaControl software. Within this window a multitude of parameters can be altered which will improve every model's performance from large scale jets through to gliders.

The left hand side of the matrix lists the transmitter's channels or functions and the software is currently capable of handling 12 channels but this will soon be raised to 16. The top row corresponds to the receiver outputs of which the micro series receivers have 8 to 12 and the 12-22 R series have 22 to 30 outputs.



Standard setting for a 2.4 Dual FHSS micro 12 receiver



Standard setting for a 2.4 Dual FHSS 12-30 R Gyro III + GPS receiver

The pink coloured fields cannot be selected. This is because with the 2.4 Dual FHSS 12-22 R series receivers several servos can be linked to the same function and to optimise the current draw, each servo must be driven from a different circuit.

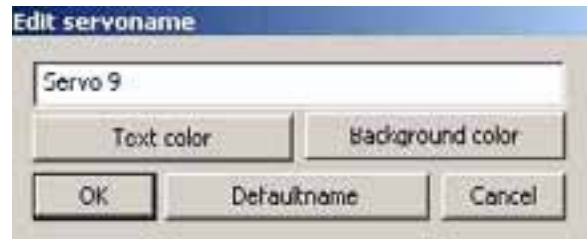
In order for you to be able to easily identify which function is linked to which output we have incorporated the facility to enter a name and to change the background colour of both the input and the output fields. To carry this out, click on the relevant field, for example Channel 1, and the following window will open:



Type in the name of the function, for example Elevator, and then select a colour for both the text and the background as this will assist you identifying the function.



The receiver output fields can be changed in the same way to match the transmitter function driving it

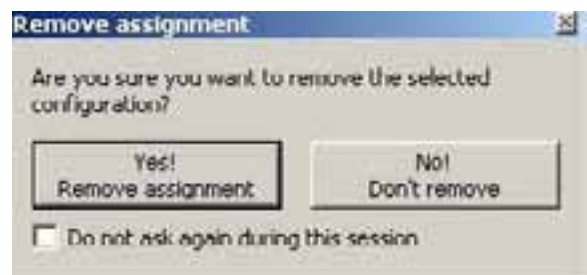


Receiver output field coloured for easier identification

You can link up to a maximum of 8 receiver outputs to each transmitter channel or function which will allow you to drive up to 8 servos or other devices simultaneously, almost as if you had an 8 way 'V' cable connected to the receiver output but with the exception that each servo can be programmed independently. To assign an output to a function, simply click onto the relevant field with the left mouse button which will turn the field green. In this example transmitter channel 4 has been linked to receiver outputs 6 to 13.

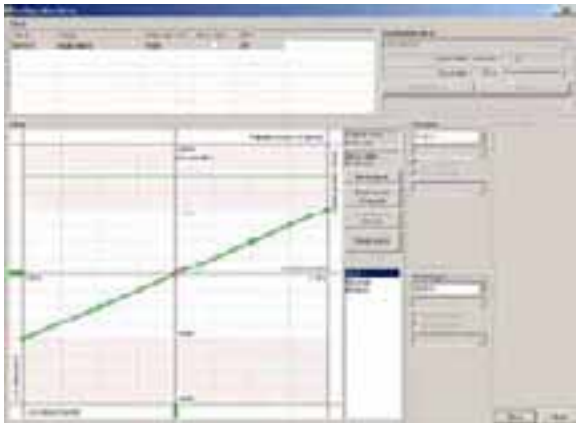


To delete an allocation simply click onto the green field and after acknowledging the following warning message the selection will be cleared.



11.3.4 Configuring the servos

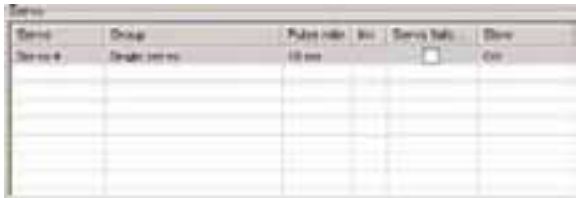
Return to the servo mapping matrix. All transmitter control functions which have been assigned a servo or other devices for example magnetic valves, switches etc. can now be configured. To access these options simply 'right click' on the relevant green field and the following window will open.



This is where all of the settings for each servo output can be adjusted relative to the control input.

Any setting changed must be stored before they become effective. To save your settings, click the 'Store' button which is located in the lower right hand corner. If you do not wish to save the changes, click 'Abort'.

Firstly lets look at the window located in the top left hand corner:



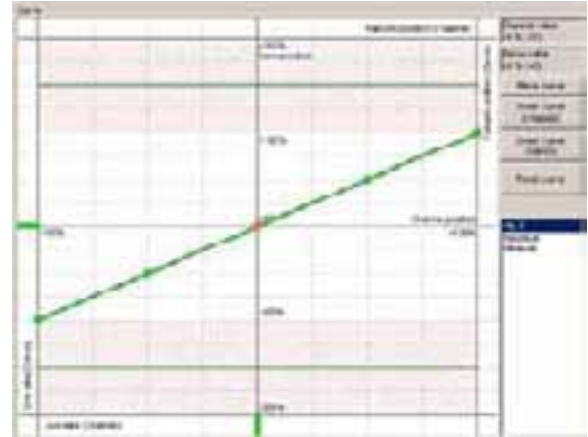
This example is showing a receiver output which has been previously named "AIL 6" (for ailerons on channel 6) as was explained in the last Para. This is the simplest combination where a single servo is linked to a single transmitter function, please refer to Para. 11.4.3.1 to 11.3.4.4.

The upper right hand boxes are where a group of servos mechanically connected to a single control surface can be synchronised. Please refer to Para. 11.3.4.2. for further details.



This is where the parameters for the servos to be synchronised can be entered.

The total throw, direction and fail safe position can be set for each servo in this section of the window.



Finally, the right hand section is where the setting for the integrated Gyro can be set if using a weatronic receiver which incorporates a Gyro. Please see "Handbook Special Gyro" for further details.

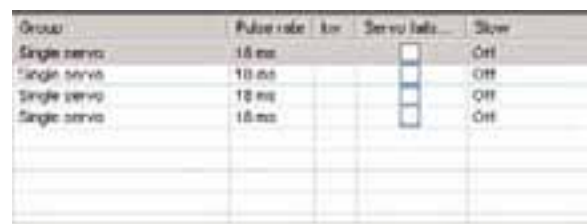
11.3.4.1 Single servo grouping

It is possible to link up to 8 servos to one transmitter function and this can be achieved by simply clicking on the corresponding fields within the servo mapping matrix. The following is an example using channel 3 (ailerons) using a total of 4 servos, 2 for the left aileron and 2 for the right aileron. Each servo can be configured as required, please refer to Para. 11.3.4.5



4 Single servos connected to outputs 5,6,9 and 10 will all be driven by transmitter channel 3.

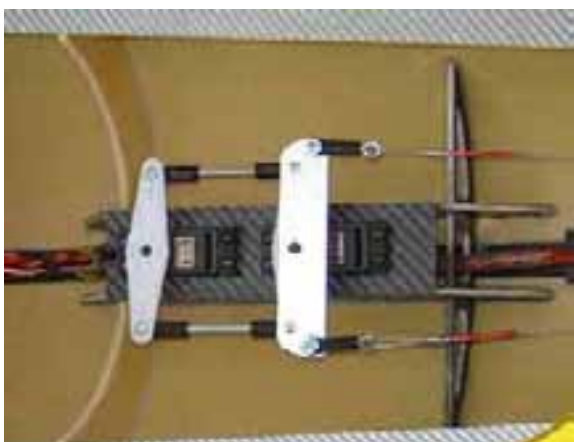
The upper boxes in the servo configuration window will appear so:



11.3.4.2 Synchronising servo groups

In particular large models often suffer from the problem that a single servo does not have sufficient torque to drive the control surfaces and so more than one servo must be connected to the ailerons, elevator, rudder or landing gear. Due the slight difference in reaction times and speeds of servos of the same type, all 2.4 Dual FHSS 12-22 series receivers offer the facility of synchronising servos over their full throw to produce mirrored movements. The servos must be connected rigidly together to ensure that the difference in current drawn is kept to a minimum.

A synchronised group of servos must have a master servo and up to 7 slave servos and it goes without saying that the servos must be of the same make and type.



An example of a sound mechanical linkage of 2 servos driving a Yak's rudder



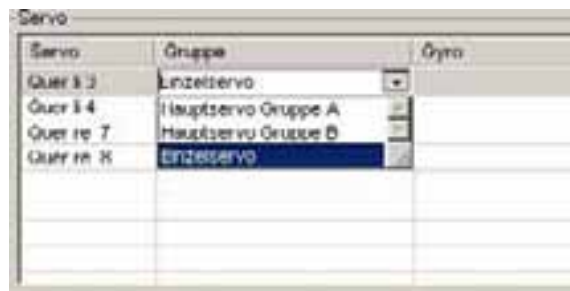
At this point, only the master servo should be connected to the control surface. Do not connect the slave servos yet!

During the automatic synchronisation process the servo will move through all of the points along the servo curve from end to end.



Make sure that the servo is free to move through it's whole range without causing any damage to the servo, push-rods, linkages, horns or hinges. Always set the servo throw using the servo curve and not the transmitter! Please refer to Para. 11.3.4.5.

A group of servos can be synchronised as follow. (The following example is based on the configuration shown above):
Use the mouse to click onto the field 'Single servo', labelled 'Ail left 5' under the heading 'Group'. A drop down window will appear with the options Group A Master, Group B Master and Single servo to choose from.



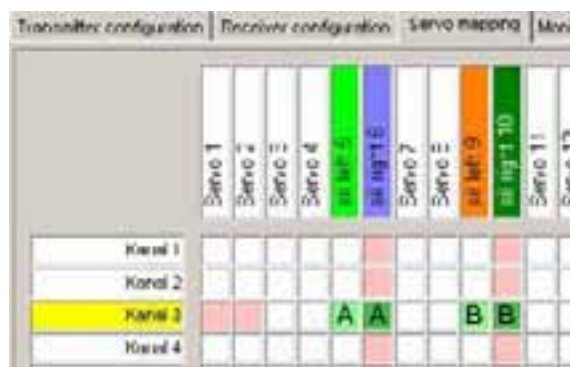
After choosing the following options for the 4 servos

- Ail Le 3 -> Master Servo Group A
- Ail Le 4 -> Slave Servo Group A
- Ail Ri 7 -> Master Servo Group B
- Ail Ri 8 -> Slave Servo Group B

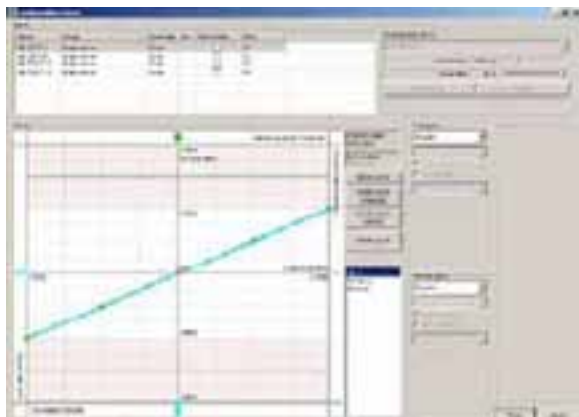
You will see the following in the servo window:

Servo	Group	Pulse rate
ail left 5	Group A Master	18 ms
ail right 6	Group A Slave	18 ms
ail left 9	Group B Master	18 ms
ail right 10	Group B Slave	18 ms

2 groups have now been grouped to function 3. The master servo fields will be coloured light green and brown and the slave servos will be indicated by a light blue and a dark green field.



Function 3 is now driving two groups of two servos. One group of two servos to drive the left aileron and one group of two servos driving the right aileron.



Use the servo curve to set the end points, please refer to Para. 11.3.4.5.

Now the middle point of the slave servos should be set as follows: Click the individual servos in the window shown above and the following will be displayed:



The horizontal line shows the correct relationship between the slave and the master.

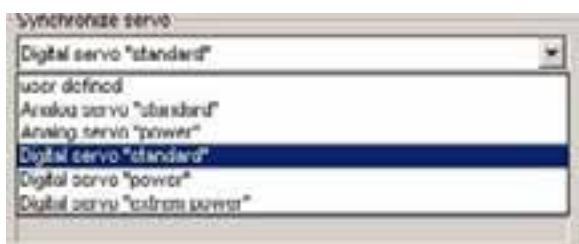
Click on the button "Move curve" and move the red points up or down until the slave servo follows the master servo exactly. The mouse can also be used to move the curve. The same procedure must be followed for all of the slave servos.



The servos can now be connected together mechanically.

A variety of parameters can be set to match your chosen servos and to make synchronising groups easier.

To begin accessing these parameters you have to first click onto the master servo in the upper left field. Directly below the heading 'Synchronise servo' you will see a field with the label 'user defined'. By opening the field the following choices will be displayed:

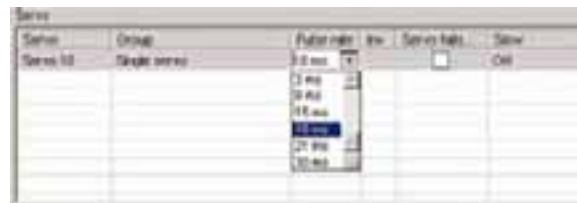


Select the correct type of servo from the list. The field labelled "Current limit" will show a value in mA and the "Travel limit" as a percentage. By clicking the "Synchronise" button the servos in the group will be synchronised and the progress will be indicated by a blue bar. This process can take up to 1 minute.

It is also possible to set the values for "Current limit" and the "Travel limit" manually. To do this, 'User defined' must be selected as the servo type and the Current draw can be set to between 0 and 5000 mAs. The Travel limit range is from 0 to 25%. If a stiff linkage or blow back is experienced these values will prevent damage to the servos and should be adjusted accordingly if the synchronisation process brings disappointing results.

11.3.4.3 Setting the servo input pulse

Weatronic receivers have been designed to work with all makes and type of servos. Many analogue servos which were designed to operate with narrow band PPM or PCM modulation systems often used a slower pulse rate to realise their full potential than modern digital servos. A high speed Tail Rotor servo for example will use a very high pulse rate of 3 msec. For all values except for 3 msec. the servo neutral point will be set at 1.5 msec. and for the 3 msec. setting it will be 0.7 msec. which is needed for a fast tail rotor servo. The weatronic GigaControl gives you the option to choose a value between 3 and 30 msec. and the default setting is 18 msec. On clicking on the drop down box, the following field will be displayed:



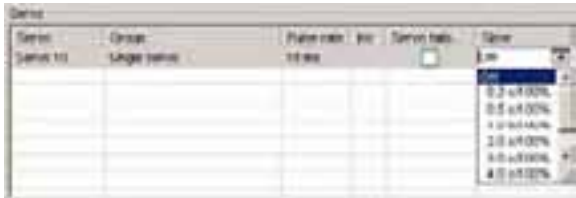
If you are unsure of the correct setting, please refer to the manufacturer's instructions for the correct value. It may be necessary to contact the manufacturer or importer to obtain this information and if the value which you are given is in Hertz (Hz) the table below can be used for converting to msec:

Hertz – Msec. conversion table:

Milliseconds (msec)	Hertz (Hz)
3	333
9	111
15	67
18	56
21	48
30	33

11.3.4.4 Slow function

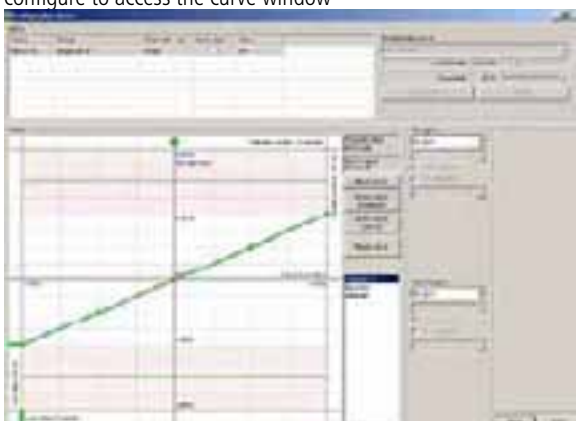
Within the same window the servo speed can be altered. The value which can be set is between 0.5 and 8 seconds for full throw.



This function will be particularly useful when setting up functions like retracting undercarriages, flaps and undercarriage doors.

11.3.4.5 Configuring servo curves

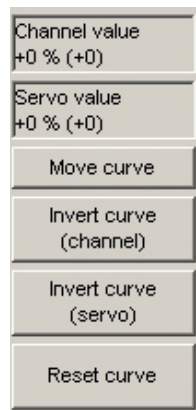
Use the right mouse button to select the output which you wish to configure to access the curve window



The servo curve is represented in the diagram shown in the lower part of the window which is pictured above. Initially the servo curve will be a flat line, shown here as a green line, and if the transmitter function has been highlighted with a colour (see Para 11.2.3) it will be displayed in that colour.

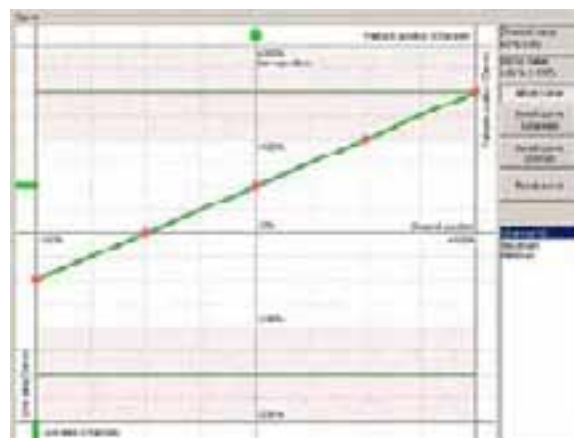
The green bar below the servo curve represents the transmitter function position and will follow the stick, switch or slider as it is moved. The green bar to the left of the servo curve represents the actual servo position as it moves. To ease the identification of which function/servo is being viewed, both of these bars will be in the same colour which was set in the servo mapping screen, if any (if no colour has been set, the bars will default to green).

To the right of the servo curve there are buttons, labelled, for example, "Move curve", and "Invert curve (channel)" etc. which will aid you in adjusting the servo curve.



"Move curve":

Under normal circumstances the servo travel will be lineal with the neutral point in the centre and represented by a flat line as illustrated above. The white area represents 100% of servo throw and the upper and lower red areas are the values which a servo can theoretically set to up to 200%. Once you have activated the "Move curve" button using the mouse the whole curve can be raised or lowered by clicking on one of the red points, holding down the mouse button and moving the curve (line) upwards or downwards. The same effect can be achieved by clicking onto the curve (line) and by using the keyboard's arrow keys to move it . In moving the curve you can adjust the middle (neutral) point for each servo. This option will be partially useful to accurately set-up any function which is driven by two or more separate servos, for example, flaps, airbrakes ailerons or elevators.



Servo neutral (middle) position adjusted by moving the curve.



HOWEVER! Every servo is different in as much as how far it can rotate before it will damage itself. IMPORTANT! Always be careful when adjusting the servo curve, in particular when the values are within the red fields. Connect a servo to the receiver when adjusting the curve and always observe the manufacturers recommendations regarding the maximum permissible throw.

“Invert curve (channel)”:

By clicking on this button the transmitter function will be reversed, i.e. left stick will produce a right stick reaction from the receiver and the function will be reversed.

“Invert curve (servo)”:

By clicking this button the direction of rotation of the servo will be reversed, and each servo can have its direction changed independently. This function is useful when more than one servo is grouped together to ensure that the linkages can be fitted to the correct side of the servo.

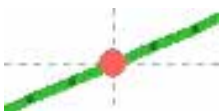
“Reset curve”:

This button will return the curve to the default settings.



The limit lines “Minimum” and “Maximum” are fully explained in the sections “Mixer Special” and “Giro Special”.

The default settings for the servo curves allocates them 5 points which are indicated by the dots



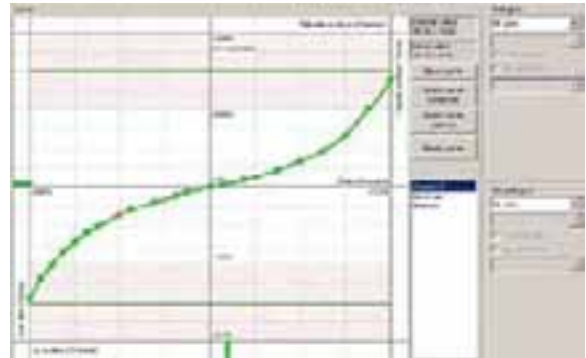
Servo curve adjustment points

The green dots are the points at which the servo curve can be altered by simply clicking onto them (left mouse button) which will cause them to turn red (active) and they can then be moved by dragging them up or down. You can also use the arrow keys to move them. In addition to the 5 fixed points, each servo curve for the Master servo of a group or a single servo can have up to 31 adjustment points added to them.

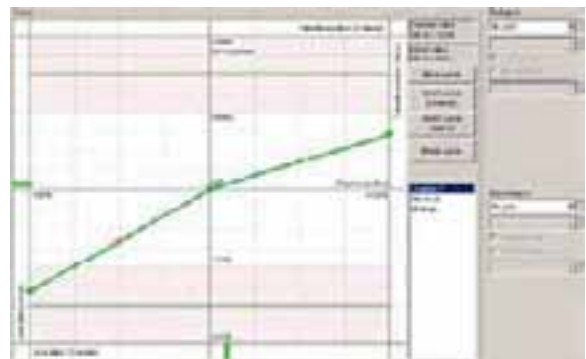
To add an adjustment point, use the right mouse button to click onto one of the smaller dark dots which will ‘activate’ it, it will then become an adjustment point which can be tailored as explained in the paragraph above. If you want to reverse the selection, use the right mouse button once again to click onto the Point and it will

revert to a small dark dot.

Each ‘active’ point can now be moved as required which will allow you to tailor the curve to create, for example, an exponential function to ‘fine tune’ the control response of your model as illustrated below.



Example of a servo curve which will create an exponential movement of the servo



A servo curve which has been tailored to create differential movement which be useful if, for example, you want your ailerons to have more movement up than down to prevent adverse drag.

11.3.4.6 Failsafe settings

Your weatronic R/C system will ignore any Failsafe signals transmitted by your transmitter, this is because we have incorporated our own user-friendly multi-function Failsafe system. Firstly, please refer to Para. 11.3.2 to learn how to set the Failsafe time out value which can be set between 100 milliseconds and 1 second.

In the unlikely event that the receiver loses the transmitter signal, the servos will move to a pre-determined ‘Failsafe’ position or, if no Failsafe position has been set, they will ‘Hold’ where they are.



If no Failsafe position has been set, the system will default to the factory setting. The factory setting is the neutral or middle point for all servos and functions

Weatronic differentiates between ‘Channel Failsafe’ and ‘Servo Failsafe’. The Channel Failsafe function will apply to all servos linked to that function and Servo Failsafe allows you to program individual servos allocated to a channel singularly.

11.3.4.6.1 Channel Failsafe

You can decide whether you want the servos to hold the position where the last known good signal was received ('Hold'), or to move to a pre-determined point, for example, tick over for the engine ('Failsafe'). To choose one of these options the servo mapping window has to be opened. Within this window on the right hand side is a field labelled Failsafe type, in this column are boxes for each channel. Each box should be set to 'F' for 'Failsafe' or 'H' for 'Hold' by clicking it with the left mouse button. If you have selected 'F' for any function click onto that function with the right mouse to open the Configure servo window. A green dot is visible in the upper bar and by clicking onto this dot with the left mouse button and moving it to the left or right the Failsafe position can be set for that channel and the dot will turn to red to indicate that it has been set. The position of the dot will be displayed in the box to the right of the field both as a percentage and in steps (max. +/- 2048).

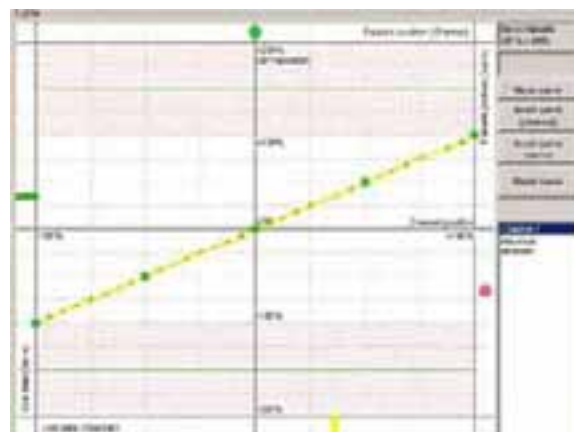


The red dot in the upper field shows a Failsafe position of - 13%.

If 'H' for hold has been selected, the green dot will not appear as the last known good signal position will automatically be held.

11.3.4.6.2 Servo Failsafe

If a group of servos or devices have been allocated to one channel (transmitter function) each individual servo can be independently programmed. In the example below, servos 7, 8 and 9 have been linked to channel (transmitter function) 7. By left mouse clicking the field labelled 'Servo failsafe' a tick will appear in the box and a red dot can be seen in the right hand column (labelled Failsafe position servo). The desired Failsafe position can now be set by left mouse clicking the red button and dragging it up or down. This procedure can be applied to all of the remaining servos



Servo 8 has been set to a Failsafe position of - 65% (the position of the red dot).

11.3.4.7 Copying servo settings

Once you have found the correct setting for one servo, these values can be copied to another servo by using the 'Copy servo settings' function. To access this function click on the button located at the bottom of the 'Servo mapping' window.



In the upper field you can select the servo setting which you want to copy and in the lower field is a list of the servos which the settings can be copied to.

Once you have selected the 'from' and the 'to' servos in the relevant boxes, click 'OK' to copy the settings.

11.3.4.8 Setting the servo voltage

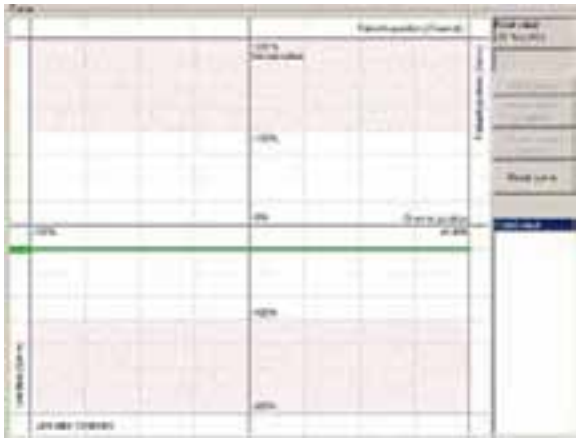
The 2.4 Dual FHSS 12 – 22 R series of receivers are fitted with 8 separate regulated circuits to power the servos and the voltage for each circuit can be set to 4.8 or 6.0 Volts. The voltage for each circuit can be set by accessing the 'Servo voltages' function. To do this click on the button which is located on the bottom right of the 'Servo mapping' window:



In this field the voltage for each servo circuit, and therefore the servos which have been allocated to that circuit, can be set by clicking on the desired value. Select either 4.8 or 6.0 Volts for each circuit and then click 'OK' to store the values.

11.3.4.9 Fixed values

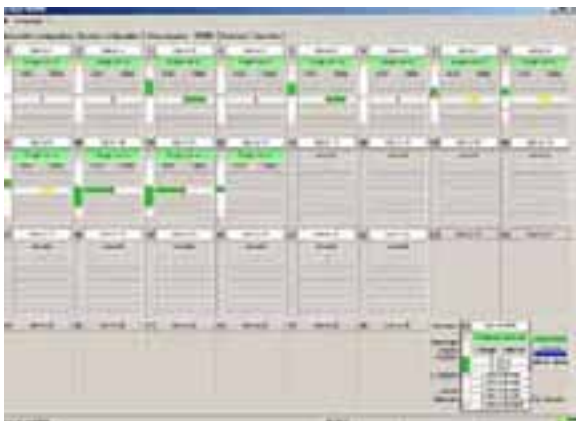
If you require a servo or function to hold a set position and not to move proportionally with the transmitter function (i.e. for Gyro sensitivity) 'Fixed value' must be selected in the 'Servo mapping' window. This option is at the bottom of the window and if it is clicked the field will turn to green. If this green field is then clicked with the right mouse button a window will open which is similar to the 'Configuration servo' window. Please refer to the Gyro handbook for more details.



A servo curve with a fixed value of -26%.

11.4 Monitor

To simplify setting up your model we have incorporated a function called 'Monitor'. If this window is opened you will be able to see a graphic illustration of all of the transmitter functions and servos. All of the relevant information, for example the pulse rate, voltage, Gyro function and Failsafe position will be displayed and by moving your transmitter sticks you will be able to see exactly how each servo will react. Clicking onto the window 'Monitor' will open a matrix with 22 to 30 fields which represent the outputs or your 2.4 Dual FHSS 12 – 22 R series receiver.



Each field shows how a receiver output has been programmed. The

order in which they appear follows the same order as the receiver outputs and in the lower right hand field is an explanation of the information which is displayed.

Servono. → XX	Servo name		
Maximum +100% Position	Single servo/Group		Normal
S Failsafe -100% Minimum	Voltage	Interval	+Norm -Head
	1. Gyro		Ch. failsafe
	2. Gyro		
	1. Mixchannel		
	2. Mixchannel		
3. Mixchannel			
4. Mixchannel			
5. Mixchannel			

Explanation of the information displayed in the 'Monitor' window. The following information is displayed, from top to bottom:

- The servo name
- Single servo or servo group (master A or B, slave A or B)
- Voltage for this servo (4.8 or 6.0 Volts)
- The pulse rate with which this servo is driven
- The nominated gyro channel for this servo (Axis 1)
- The nominated gyro channel for this servo (Axis 2)
- The mixer rate for up to 5 channels

The details regarding the mixing rates and the gyro functions (Normal mode, Heading Hold mode and Combined) can be found in the handbooks 'Handbook Special Gyro' and 'Handbook Special Mixer' respectively.

The green bar which can be seen in left hand column (see illustration below) shows the actual servo position from - 100% to + 100% to the red shaded area. If the transmitter stick or control is moved the green bar will sink or rise to indicate the movement of the servo.

10	Servo 10	11	Servo 11	
	Single servo		Single servo	
	6.0V	18ms	6.0V	18ms

Failsafe marker

Servo 10 has a red bar in the horizontal field which shows the Failsafe position (Channel Failsafe). Servo 11 has a red bar in the vertical field which shows the Failsafe position (Servo Failsafe)

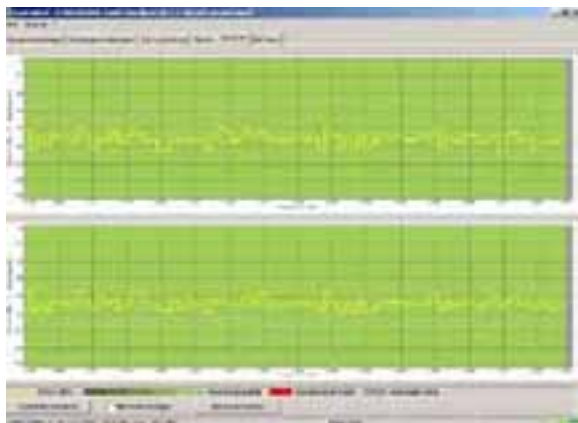


Channel/servo positions.

The horizontal bar (default colour, green) shows the channel position and the vertical bar (green) the servo position. If the background colour has been changed to ease in identifying the channels/servos in the 'Servo mapping' window, these (green) bars will assume that colour.

11.5 Spectrum analyser

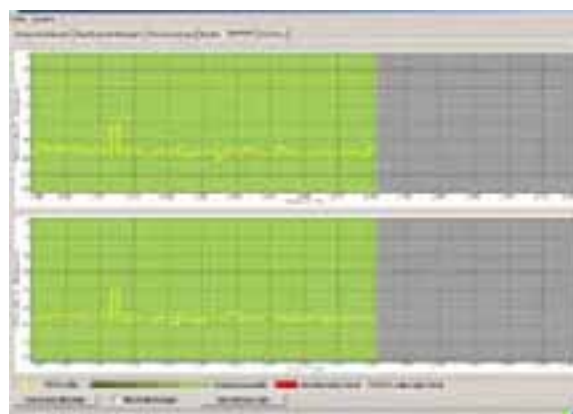
By opening the window labelled spectrum you will have access to another useful tool which we have incorporated into the Giga-Control software, a spectrum analyser. The analyser shows what is currently being received by both of the transmitters patch antennas. If a weatronic receiver is connected and switched on the software will show which channels within the band are being utilised by the Frequency Hopping System. The signal strength (RSSI) will be shown in dBm (Decibel Milliwatts).



This is an example of how the Spectrum analyser will appear if a weatronic R/C system is active using all 81 channels of the 2.4 GHz band.



On this illustration a red bar can be seen on one channel. This is because the Weatronic Adaptive Frequency Hopping System has detected that another system is using this channel and therefore it has temporarily blocked the channel. The dark green bars indicate channels with a poor signal strength.



In this illustration France has been selected in the 'Country setting' and as such only a part of the band is utilised.

If the 'Activate scanmode' button is clicked (located in the bottom left hand corner) the Spectrum Analyser will scan the whole 2.4 GHz band, and will show any other devices currently operating on sections of the band.



Scanmode detecting 3 active WLAN systems.

11.6 Configuring the Store/Charge/Off-Line and On-Line modes

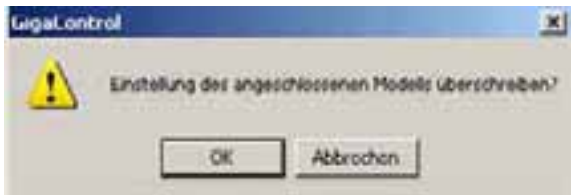
The GigaControl software has the ability to store model configurations on your computer which can then be directly copied into a Weatronic R/C system. There are two methods:

- Offline programming, with this option a weatronic system does not have to be connected to the computer.
- Online programming, when a weatronic system is connected to the computer. Using this option will write the settings directly to the transmitter and receiver.



Under the option 'File', a 'New model file' can be created, a configuration can be loaded from the PC ('File load') or the current setting can be stored ('File save').

If the GigaControl software contains a configuration you will receive a warning asking you if you want to over-write the setting or to abort and retain the current values.



Warning if no weatronic transmitter module is connected. (Off-Line mode)



This warning message will appear if a weatronic R/C system is connected to the computer and switched on.

12 Indemnity Statement/Compensation-Warranty Claims

As the company weatronic GmbH has no influence over the use, installation, maintenance or conditions under which any of its products will operate, we accept no responsibility for any damage caused by it of a physical, financial or theoretical nature. Weatronic GmbH will accept no claim against it which results directly or indirectly from the operation or use of its products.

Your statutory rights apply, any claim made against us will be based solely on the retail price of the product and limited to our (weatronic GmbH) products only.

Appendix 1 - technical specifications

1.1 Transmitter module 2.4 Dual FHSS 12 channels

Transmission: adaptive frequency hopping spread spectrum
 Frequency range: 2,401 – 2,4835 GHz
 Power output: 20 dBm (100 mW)
 Functions (channels): 12
 Frequencies: 81, France: 52
 Intervall: 10 ms
 Modulation: Quadrature Phaseshift keying
 Back channel for telemetry and sensor data
 Real time data via earplug, LED or via PC (GIGAControl)
 Receive sensitivity: -84 dBm
 Temperature range: -10°C to +60 °C
 Voltage: 5 - 10 Volt
 Current consumption: 200 mA
 Range: > 3000 m
 Resolution of channels: 4096 steps
 Data storing: Micro SD card
 Software: GIGAControl
 Firmware update: Micro SD card
 Antennas: 2 patch areals
 Polarisation: circular
 Dimensions : 95 x 65 x 18 mm
 Weight: 60 g

1.2 Dual Receiver 2.4 Dual FHSS micro 8/10/12

Double receiver circuit
 Transmission: adaptive frequency hopping spread spectrum
 Frequency range: 2,401 – 2,4835 GHz
 Power output: 20 dBm (100 mW)
 Functions (channels): 12
 Frequencies: 81, France: 52
 Intervall: 10 ms
 Modulation: Quadrature Phaseshift keying
 Back channel for telemetry and sensor data
 Receive sensitivity: -100 dBm
 Temperature range: -10°C to +60 °C
 Frequency range: 2,401 – 2,4835 GHz
 Power output: 20 dBm (100 mW)
 Functions (channels): 12
 Frequencies: 81, France: 52
 Interval: 10 ms
 Modulation: QPSK*
 Back channel for telemetry and sensor data
 Real time data via earplug, LED or via PC (GIGAControl)
 Receive sensitivity: -84 dBm
 Current consumption: 130 mA
 Resolution of channels: 4096 steps
 Firmware update: USB adapter
 Antennas: 2 $\lambda/4$ wires
 Polarisation: linear
 Antenna length: 200 mm
 Antenna length in operation: 29 mm
 Dimensions: 55 x 33 x 19 mm
 Weight: 30 g

* Quadrature Phaseshift keying

1.3 Dual Receiver 2.4 Dual FHSS 12-22 R

Two separate receivers
 Transmission: adaptive frequency hopping spread spectrum (adaptive FHSS)
 Frequency range: 2,401 - 2,4835 GHz
 Transmitting power: 20 dBm (100 mW)
 Functions (channels): 12
 Frequencies: 81, France: 52
 Intervall: 10 ms
 channels width: \geq 1 MHz
 Modulation: QPSK*
 Reverse channel for telemetry and sensor data
 Free allocation of 22/30 servo exits to 12 (16) channels
 Free programming of servo exits
 Servo failsafe
 Channel failsafe
 Servoline: max. 31 points
 Mixing function - five mixers per servo exit
 Sequencer function
 Slow function
 Automatic Servo synchronisation - max 8 servos per channel
 Temperature range: -10°C to +60 °C
 Operation voltage: 5 - 10 Volt
 Power consumption: 200 mA
 Range: > 3000 m
 Resolution: 4096 steps
 Data storing: Micro SD card
 Operation software: GigaControl
 Servo exits: 22, max. 8 servos per channel
 Electronic switch board , battery testing function
 Data storage: Micro SD card
 Double power supply: two six cells NiMH batteries (min SUB C-Größe) or two two cells Lithium-Polymer batteries or two three cells A123 batteries
 2 $\lambda/4$ radiators
 Polarisation: linear
 Antenna total length: 200 mm, operational length: 29 mm
 Dimensions: 143 x 84 x 26 mm
 Weight: 272 g, switch board with cable 34 g, areals: each 4 g

* Quadrature Phase shift keying

1.4 Dual Receiver 2.4 Dual FHSS 12-22 R Gyro II

[like above plus:](#)
 SMM gyros on X and Y axis, normal mode and heading lock mode adjustable

1.5 Dual Receiver 2.4 Dual FHSS 12-22 R Gyro III

[like above plus:](#)
 SMM gyros on X, Y and Z axis, normal mode and heading lock mode adjustable

1.6 Dual Receiver 2.4 Dual FHSS 12-22 R Gyro III + GPS

[like above plus:](#)
 GPS data logging

1.7 Dual Receiver 2.4 Dual FHSS 12-30 R Gyro III + GPS

[like above plus:](#)
 30 exits for servos/actuators

Appendix 2 - Flash codes Dual Receiver 12-22 R series

2.1 Flash codes Dual Receiver 12-22 R series

Flash codes on switch board:

Status - green LED:

Flash code:	Function:
- Switch on (0,5 s on)	Function test
- Blinking (0,5 s on – 0,5 s off)	Binding
- Double blinking (0,2 s on – 0,1 off – 0,2 s on - 0,5 s off)	Threshold value reception
- 3 times blinking (0,2 s on – 0,1 off – 0,2 s on - 0,1 s off – 0,2 s on - 0,5 s off)	Threshold value temperature
- Fast blinking (0,25 s on – 0,25 s off)	Calibration gyro (max.10 s)
- Steady green with short interruption (0,9 s on - 0,1 s off)	Reception + GPS reception
- Steady green (on)	Data reception

2.2 Flash codes Dual Receiver 12-22 R series

Flash codes on switch board:

Battery – red LED:

Flash code:	Function:
- Switch on (0,5 s on)	Function test
- Hektic blinking (0,2 s on – 0,1 off)	Bad battery
- Double blinking (0,2 s on – 0,1 off – 0,2 s on - 0,5 s off)	Threshold value battery voltage
- Fast blinking (0,25 s on – 0,25 s off)	Backup battery was used
- Blinking (0,5 s on – 0,5 s off)	Normal operation with main battery

2.3 Flash codes Dual Receiver 12-22 R series

Flash codes on case:

Log – yellow LED: (only on case)

Flash code:	Function:
- Blinking (0,5 s on – 0,5 s off)	Logging on SD card
- Fast blinking max 10 s (0,25 s on – 0,25 s off)	Calibration of internal gyros
- Fast blinking (0,25 s on – 0,25 s off)	Mistake – no calibration of gyros

Appendix 3

3.1 Certification 2.4 GHz systems

ZERTIFIKAT • CERTIFICATE • ЗЕРТИФИКАТ • CERTIFICADO • CERTIFICAT

Certificate

This certificate is issued to

Weatronic GmbH


of

Seidenstraße 57
Stuttgart
70174
Germany

to certify that the Equipment known as

Weatronic® Dual Receiver 2.4 Dual FHSS 12-22 R

as described in the Annex to this certificate
conforms to the essential requirements of Directive 1999/5/EC
of the European Parliament and European Council on the basis
of Technical Construction File number 2.4 Dual FHSS 23/02/09
in relation to the essential requirements of
Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed: 
On behalf of BABT

Issue Date: 26 May 2009
Number: NCF1412 Issue: 01

The certificate is issued by BABT and represents a "final NOT" as required under Annex IV of Directive 1999/5/EC
pertaining to the use of the BABT logo. It is subject to the conditions and described above
subject to the obligations including, but not limited to, requirements of applicable EU Directives.
This certificate is not transferable and remains the property of BABT.
The Certificate constitutes page 1 of the combined Certificate and Annex.

British Approvals Board for Telecommunications - (UK) Ltd Group -
Briarley House • Churchfield Road • Welton-on-Thames • Surrey • KT17 5TD • United Kingdom



Certificate

This certificate is issued to

Weatronic GmbH

of

Seidenstraße 57
Stuttgart
70174
Germany

to certify that the equipment known as

Weatronic® Dual Receiver 2.4 Dual FHSS micro

as described in the Annex to this certificate conforms to the essential requirements of Directive 1999/5/EC of the European Parliament and European Council on the basis of Technical Construction File number 2.4 Dual FHSS 23/02/09 in relation to the essential requirements of Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed:

On Behalf of BABT

Issue Date: 28 May 2009

Number: NC/14143 Issue: 01

THIS CERTIFICATE IS ISSUED BY BABT AND REPRESENTS A FULLY QUALIFIED BODY OPERATING UNDER ARTICLE 17 OF DIRECTIVE 1999/5/EC (CONFORMITÉ EUROPEENNE) IN ACCORDANCE WITH THE ESSENTIAL REQUIREMENTS OF THE APPLICABLE EU DIRECTIVES. THIS CERTIFICATE IS THE PROPERTY OF BABT. THIS CERTIFICATE REPLACES THE PAGES 1 OF THE CONFORMITÉ CERTIFICATE AND ANNEX.

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Balfour House • Churchfields Road • Walsley • Doncaster • South Yorkshire • R51 1JY • KT122TD • United Kingdom



ZERTIFIKAT • CERTIFICATE • 認証証書 • CERTIFICADO • СЕРТИФИКАТ • CERTIFICAT



Certificate

This certificate is issued to

Westronic GmbH

of

Seidenstraße 57
Stuttgart
70174
Germany

to certify that the Equipment known as

Westronic® 2.4 Dual FHSS transmitter module 12 channels

as described in the Annex to this certificate conforms to the essential requirements of Directive 1999/5/EC of the European Parliament and European Council on the basis of Technical Construction File number 2.4 Dual FHSS 23/02/09 in relation to the essential requirements of Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed: 
On Behalf of B A B T

Issue Date: 28 May 2009
Number: NC/14144 Issue: 01

This certificate is issued by B A B T and requires a formal Notified Body opinion under Annex IV of Directive 1999/5/EC permitting the use of the B A B T (Notified Body) or the equipment described above subject to the equipment meeting the compliance requirements of all applicable EU Directives. This certificate is not transferable and remains the property of B A B T. The Notified Body certificate uses 1 of the standard Conformity Assessment.

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Double safety has a name!



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