



## OPERATING INSTRUCTIONS

FOR THE T4YF 2.4 GHZ FHSS RADIO CONTROL SYSTEM

T4YF MODE 1 2.4GHZ NO. F4074M1

T4YF MODE 2 2.4GHZ NO. F4074



## Contents

Section	Page
<b>Safety requirements.....</b>	<b>3</b>
<b>1. Set contents.....</b>	<b>3</b>
1.1 Recommended accessories.....	3
<b>2. General description .....</b>	<b>4</b>
2.1 Skysport T4YF transmitter .....	4
2.2 R2004 GF receiver.....	4
<b>3. Specification.....</b>	<b>4</b>
3.1 Skysport T4YF transmitter .....	4
3.2 R2004 GF receiver.....	4
<b>4. Controls .....</b>	<b>5</b>
4.1 Skysport T4YF transmitter .....	5
4.2 R2004 GF receiver.....	5
<b>5. Use with rechargeable batteries.....</b>	<b>6</b>
5.1 Fitting / replacing the transmitter batteries.....	6
5.2 Charging the batteries.....	6
5.3 Transmitter voltage indicator.....	6
5.4 Operating times.....	6
<b>6. Binding the receiver .....</b>	<b>7</b>
6.1 Range-checking .....	7
<b>7. Transmitter adjustment facilities.....</b>	<b>7</b>
7.1 Adjusting the stick length .....	7
7.2 Removing the back panel .....	7
7.3 Changing the throttle ratchet to the right-hand stick.....	8
<b>8. Connecting the servos .....</b>	<b>8</b>
8.1 Elevon mixer .....	8
<b>9. Using the transmitter for the first time .....</b>	<b>9</b>
9.1 Using the sticks.....	9
<b>10. Servo direction (reverse).....</b>	<b>10</b>
<b>11. Trainer mode .....</b>	<b>10</b>
11.1 Pupil mode with other robbe-Futaba transmitters... ..	10
11.2 Use with a flight simulator.....	10
<b>12. The system in use.....</b>	<b>11</b>
12.1 Waterproof receiver installation .....	11
<b>13. Installing the receiving system.....</b>	<b>11</b>
13.1 Receiver.....	11
13.2 Servo installation.....	11
13.3 Servo travels / servo output levers .....	11
13.4 Servo leads .....	12
<b>14. Post Office regulations.....</b>	<b>12</b>
<b>15. Conformity declaration.....</b>	<b>12</b>
<b>16. Guarantee .....</b>	<b>12</b>
<b>17. Liability exclusion.....</b>	<b>12</b>
<b>18. Insurance .....</b>	<b>12</b>
<b>19. General frequency allocation.....</b>	<b>13</b>

<b>20. Recommended accessories.....</b>	<b>14</b>
<b>21. Service Centre addresses .....</b>	<b>15</b>
<b>22. Disposal .....</b>	<b>15</b>

We are delighted that you have purchased a robbe-Futaba radio control system, and hope you have many hours of pleasure and success with your new equipment.

## SAFETY NOTES - PLEASE READ CAREFULLY!

It is essential to read right through these instructions, and the Safety Notes in particular, before using the system for the first time. If you are a beginner to radio-controlled models, we recommend that you ask an experienced modeller for help at this stage.

This radio control system is designed and approved exclusively for use with radio-controlled models. robbe Modell-sport accepts no liability if the equipment is used for any other purpose.

Radio-controlled models are not playthings in the usual sense of the term, and may only be employed and operated by young persons below fourteen years if they are under the supervision of adults.

Building and operating these models calls for technical understanding, manual care and an awareness of safety issues. Errors or neglect when building or flying can result in serious personal injury and / or property damage.

Since the manufacturer and retailer are not in a position to ensure that you build and operate your models competently and correctly, all we can do is expressly draw your attention to these dangers. We deny all liability.

Technical faults of an electrical or mechanical nature may cause the motor to burst into life unexpectedly, resulting in parts coming loose and flying around at high velocity. Turning the receiving system on with the transmitter switched off can also have the same effect.

Such incidents constitute a serious injury hazard. All rotating parts which are powered by a motor or engine represent a constant injury risk.

It is essential to avoid touching such parts. When an electric motor is connected to a flight pack or drive battery, keep well clear of the hazardous area, i.e. the zone around the rotating parts. At the same time ensure that no other objects come into contact with revolving components.

Protect your system from dust, dirt and damp, and do not subject any of the components to excessive heat, cold or vibration. Radio-controlled models should only be operated in a temperature range of -15° C to +55° C.

Use only the recommended battery chargers, and do not charge your batteries for longer than the stated charge time - as advised by the battery manufacturer. Overcharging batteries, or charging them using the incorrect procedure, can result in the cells exploding. Always take great care to maintain correct polarity.

Avoid subjecting the equipment to shock and pressure loads. Check cases and cables regularly for damage. If any part should be damaged in an accident, or get wet, do not use it again - even after it has dried out completely. Either have the affected part checked by a robbe Service Centre, or replace it.

Damp and accidents can cause concealed faults which result in system failure after a short period of operation. Use components and accessories recommended by us exclusively. It is not permissible to carry out modifications of any kind to the system.

#### Routine pre-flight checks

- Before switching the receiver on always ensure that the throttle control on the transmitter is set to the "motor stop" position.
- **Always switch the transmitter on first, followed by the receiver.**
- **Always switch the receiver off first, followed by the transmitter.**
- **Carry out a range-check before the first run or flight of every session.**
- Test all the model's working systems: check in particular that the servos rotate in the correct direction, and that the control systems operate in the proper "sense".
- Are all the mixer functions and switches correctly set?
- Are the batteries adequately charged?
- If you are not sure of any point: do not fly!

#### Operating the model

- Never operate your model in such a way that it endangers people or animals.
- Do not operate your model in the vicinity of canal locks or full-size boat traffic.
- Never operate your model on public streets, motorways, paths, town squares, etc.

Your radio control system must never be used in stormy weather.

# Skysport T4YF 2,4 GHz

## 1. SET CONTENTS

The T4YF system is available on the 2.4 GHz band with the R2004 GF receiver under Order No. F4074 and F4074M1.

- 1 x T4YF transmitter
- 1 x R2004 GF 2.4 GHz receiver
- 1 x Standard switch harness
- 4 x NiMH battery cells, 2500 mAh
- 1 x Plug-type charger



## 1.1 RECOMMENDED ACCESSORIES

- Transmitter bag No. F9906
- T4YF / Spirit Fun transmitter tray No. S2886001
- Receiver battery, 4 NiMH 2000 mAh, flat-pack No. 4551
- Receiver battery charge lead No. F1416
- Trainer lead No. F1591
- Single-point neckstrap No. F1550
- Y-lead No. F1423
- R2004 GF receiver No. F0976

## 2. GENERAL DESCRIPTION

### 2.1 T4YF transmitter

This four-channel hand-held transmitter is equally suitable for use with model aircraft, boats and cars. If you are a beginner to model sport, the system's integral Trainer module provides an easy method of learning the art of model control. The Trainer system is compatible with all transmitters in the robbe-Futaba radio control range which feature a six-pin micro-socket. The T4YF transmitter can therefore be used as a pupil transmitter in conjunction with many high-performance computer systems (please see the notes in Section 11 on page 10).

The bank of hardware change-over switches can be used to reverse any or all of the four channels at the transmitter (servo reverse). This makes it much easier to install the servos in any model. The length of the precision sticks is adjustable by the user.

The transmitter features a charge socket which provides a convenient means of recharging the transmitter battery. The power supply takes the form of four dry cells or four rechargeable NC / NiMH cells.

### 2.2 R2004 GF 2.4 GHz receiver

This small four-channel receiver is a compact unit which is suitable for all kinds of models where space is at a premium. The adoption of 2.4 GHz FHSS technology means: no crystals, no spot frequency selection, and maximum security from same-channel interference. Fast frequency hopping provides the best possible suppression of interference signals.

Frequency Hopping system using thirty channels at 1.5 MHz channel spacing within the range 2404 to 2447.5 MHz. Maximum number of simultaneous users: 28.

Not recommended for large-scale model aircraft and jets.  
Range: approx. 1000 m

# Skysport T4YF 2,4 GHz

## 3. SPECIFICATION

### 3.1 T4YF transmitter

Frequency band:	2404 MHz - 2447.5 MHz
Channel spacing:	1500 kHz
Transmission system:	FHSS
Current drain:	approx. 77 mA
Power supply:	6 V (4 cells)
Dimensions:	180 x 160 x 50 mm
Weight:	approx. 600 g

Not compatible with FASST transmitters.

The transmitter can only be used in conjunction with the receiver stated below.

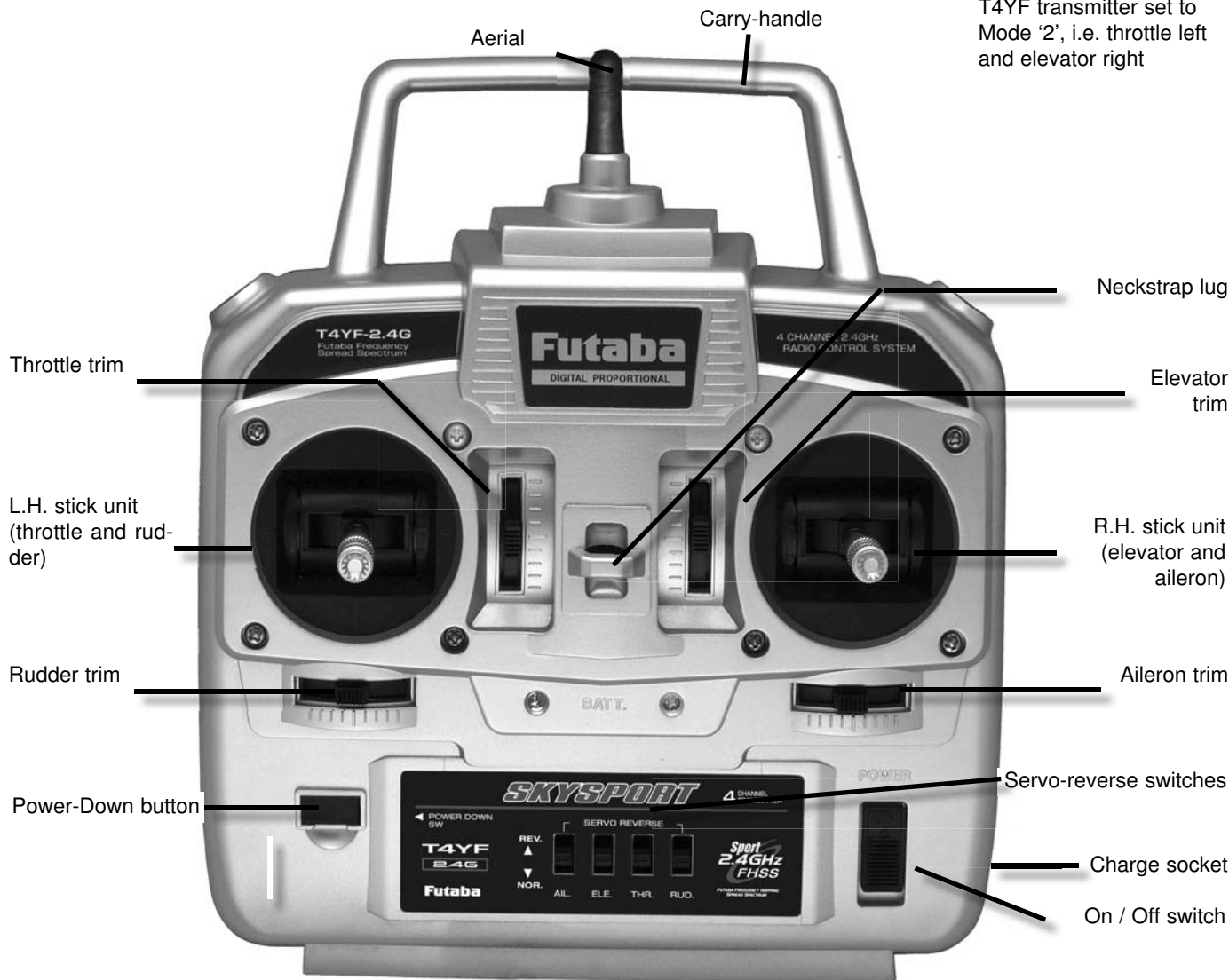
### 3.2 R2004 GF 2.4 GHz receiver

Functions:	4 servos
Reception frequency:	2.404 MHz - 2447.5 MHz
Modulation:	FHSS
Channel spacing:	1500 kHz
Power supply:	4.8 - 6.0 V (4 - 5 NC / NiMH cells)
Current drain:	approx. 40 mA
Weight:	8 g
Dimensions:	39 x 26 x 12.5 mm

# Skysport T4YF 2,4 GHz

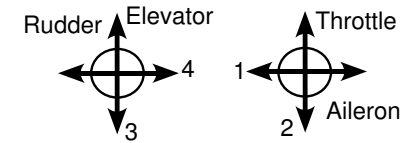
## 4. CONTROLS

### 4.1 T4YF transmitter, mode 2



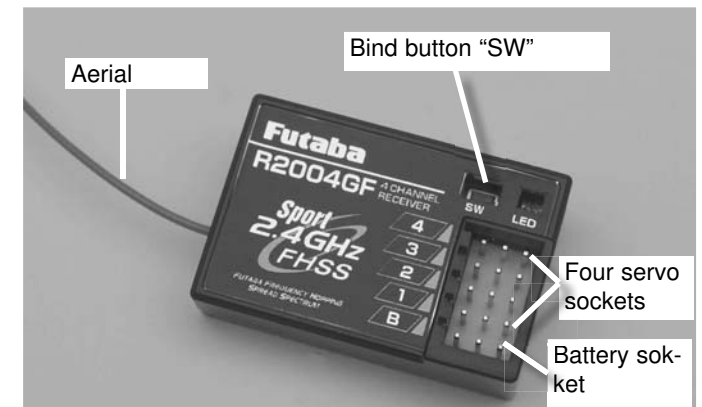
The picture shows the T4YF transmitter set to Mode '2', i.e. throttle left and elevator right

### Stick assignment, mode 1



**MODE 1:**  
Aileron right  
Elevator left  
Throttle right  
Rudder left

### 4.2 Empfänger R2004 GF 2,4 GHz



## 5. USE WITH RECHARGEABLE BATTERIES

### 5.1 FITTING / REPLACING THE TRANSMITTER BATTERIES

The T4YF radio control system is supplied complete with batteries, and you will find a battery compartment in the back of the transmitter. The compartment must be opened in order to fit or replace the batteries. This is accomplished by pushing down lightly at the marked point, and sliding the cover off in the direction of the arrow. Once you have fitted new batteries, the state of charge must be checked before you use the system: switch the transmitter on, and check the state of charge by observing the LED voltage indicator. If the batteries are not fully charged, they must be recharged. If the transmitter is not to be used for a long period, we recommend that you remove the batteries from the transmitter.



### 5.2 CHARGING THE BATTERIES USING THE PLUG-TYPE CHARGER

The charger features two separate outputs, each delivering a charge current of 150 mA, plus an LED charge indicator for each output. The Tx output is for four cells (transmitter), and the Rx output is for four or five NC / NiMH cells (e.g. receiver battery). Each output is fitted with an LED indicator which lights up during the charge process.

Charge currents, charge time A maximum charge current of about 150 mA per output is available for charging the batteries. The charge time varies according to the capacity of the cells to be charged. Charge time (standard) = Battery capacity (mAh) x charge factor 150 mA

**Example: Transmitter battery, 4.8 V / 2500 mAh**

**Charge time:  $\frac{2500 \text{ mAh} \times 1.4}{150 \text{ mA}} = 23 \text{ hours}$**

**This example assumes that the battery is completely flat before charging.**

**\* Charge factor for NiMH cells = 1.4**

If you are using batteries with a capacity lower than 2500 mAh, the charge time will be shorter; if the capacity is higher, the charge time will be longer.

The charge process must be interrupted if:

the NiMH batteries heat up to more than about 45°C.

If charged at a current of 1/10 of their nominal capacity, modern NiMH batteries are not likely to be damaged by overcharging, which means that you can also charge partly discharged batteries for the same period (max. fourteen hours).

#### Connecting and charging the batteries:

- The transmitter must be left switched off for the whole period of the charge process.
- First connect the battery charger to the mains supply (230 V / 50 Hz).
- Connect the receiver battery and / or the robbe-Futaba transmitter to the appropriate charge leads (RX or TX).
- If the battery is connected correctly, the corresponding LED lights up, and the charge process starts.

#### Caution:

**The charger does not switch itself off automatically. Disconnect and remove the battery at the end of the calculated time. When removing the battery, first disconnect it from the charger, and then disconnect the charger from the mains supply.**

After a protracted period of storage (Winter break), the batteries should be cycled (discharged, then charged again) three times before use, as they only regain their full capacity and duration after being conditioned in this way. If you charge the batteries with a charger other than the plug-type unit supplied in the set, you should not exceed a maximum charge current of 1 A. Please note that it is not possible to charge the batteries using a reflex or discharge process when they are fitted in the transmitter. If the plug-type charger is not connected to the main supply, remember to disconnect any batteries connected to the unit!

#### Safety notes:

- Do not submerge the batteries in water or any other liquid.
- Do not short-circuit the batteries or charge them with reversed polarity.
- Do not subject the batteries to physical pressure; do not deform or throw it.
- Do not modify or open the battery cells.
- Rechargeable batteries may only be charged using a charger designed expressly for this purpose. Never connect the battery directly to a mains PSU.
- Keep the batteries well out of the reach of children.
- Avoid the fluid electrolyte contacting your eyes. If this should occur, rinse the affected part immediately with plenty of clean water before seeking medical attention.

- If the fluid electrolyte should contact your clothes or any other object, immediately wash it off using plenty of water.
- Never leave the batteries and charger operating unsupervised.
- Do not operate the charger where inflammable gases might be present.
- Never cover the cooling slots.
- Observe correct battery polarity and the manufacturer's instructions; avoid short-circuits.
- Disconnect the battery if it becomes hot to the touch.
- Always assign the batteries to the correct output according to their cell-count.
- Do not exceed the calculated charge time.
- Never charge batteries on an inflammable surface, and do not leave them on charge without supervision.
- The charger may only be used in dry indoor conditions.
- If the mains supply should fail, or if the mains plug is pulled out, disconnect the batteries from the charger to avoid them discharging each other.
- The charger is only suitable for use with rechargeable cells.
- Never attempt to recharge dry cells - explosion hazard!

### 5.3 TRANSMITTER VOLTAGE INDICATOR

The voltage of the transmitter battery is indicated by the red transmitter voltage LED. If the LED flashes slowly, the battery voltage has fallen to around 4.2 V, and the transmitter battery urgently needs to be recharged. If this should occur when you are operating a model, cease operations immediately in the interests of safety.

### 5.4 OPERATING TIMES

If the transmitter is fitted with high-performance NiMH 2500 AA transmitter cells, No. 8005, its operating time is around twenty hours from a fully charged pack. The same does not apply to the receiver battery, as the operating time for receiver packs varies greatly according to the number of servos connected to the receiver, the stiffness of the mechanical linkages, and the frequency of the control commands. When the servo motor is running, a typical servo draws between 150 and 600 mA, but this is reduced to about 5 - 8 mA with the motor at rest. When the servo reaches the position dictated by the transmitter stick, the servo motor is switched off, and the unit only draws the idle current; this is true whether the servo is at centre, one end-point, or any intermediate position. For this reason it is important to ensure that the mechanical linkages are free-moving, and that no servo is mechanically obstructed at any point in its arc of movement.

## 6. BINDING THE RECEIVER

The transmitter transmits an encrypted code which identifies it unambiguously. The encoding facility renders "channel clashes" impossible.

The transmitter code can be stored in the receiver; once this has been carried out, the receiver only responds to this one transmitter, i.e. the components are "bound" to each other. From this moment on the receiver only accepts the signals of the transmitter with this specific code - regardless of which transmitters log onto the ISM band subsequently.

By its very nature, this fixed assignment between transmitter and receiver offers the best possible pre-conditions for highly effective suppression of interference signals (far better than is possible with conventional RC systems), since a digital filter is employed which is capable of allowing through only those control signals generated by the bound transmitter.

Since the transmitter code is stored in the receiver, the transmitter can be used to operate as many receivers as you like. If you wish to use a receiver which is bound to a different transmitter, a simple button-press erases the receiver's memory, making it possible to store the code for the new transmitter.

- 1 Switch the transmitter on.
- 2 Bring the transmitter and receiver close together (approx. 50 cm).
- 3 Switch the receiver power supply on.
- 4 Locate the "SW" button on the receiver, and hold it pressed in for about two seconds to "bind" the components.



Pressing the "SW" button automatically stores the transmitter's individual code number in the receiver. This binding procedure causes the receiver to respond only to the signals from this specific transmitter, thereby very effectively suppressing interference and the influence of other transmitters. Several receivers can be "bound" to the same module.

If the binding process is to involve a different module, press the SW button again after switching on.

# Skysport T4YF 2,4 GHz

Observe the monitor LED on the receiver!

Function	LED
Transmitter signal NOT received	red: on
Transmitter signal received	green: on
Transmitter signal picked up, but code number incorrect	green: flashes
Irrecoverable error	red and green flash alternately

## 6.1 RANGE-CHECKING (POWER-DOWN MODE)

In this mode the output of the RF section is reduced in order to facilitate range-checking. Locate the push-button at bottom left of the transmitter; Power-Down mode is selected by holding this button pressed in while you switch the transmitter on. The LED now flashes red at a high frequency to indicate that the transmitter is set to low power output.

**First switch the model on without the power system active.**

•Slowly walk away from the model, operating one control surface function slowly but continuously.

•While you are walking away, watch the corresponding control surface on the model, checking for the moment when it falters or stops. It can be helpful to ask a friend to watch the model for you as you walk away, holding the transmitter.

•As the distance increases, occasionally turn the transmitter through 45° in both directions, to simulate different aerial positions relative to the model.

•In Power-Down mode the radio range should be about fifty paces.

•If this initial range-check is successful, repeat the check with the motor running (caution: secure the model).

•The range now obtained should only be slightly shorter (around 20%). If there is a significant reduction, then some part of the power system is causing interference to the receiver. You can usually remedy this by checking all the measures described above.

•Power-Down mode remains active as long as the button is held pressed in.

•If you wish to call up Power-Down mode again, you must switch the transmitter off and then on again. Power-Down mode can then be switched on as described above.

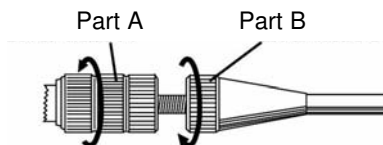
### CAUTION:

Never operate a model with the transmitter set to Power-Down mode (for range-checking).

For safety reasons it is not possible to carry out a second range-check if the transmitter has already been transmitting at full power. If you wish to do this, you must first switch the transmitter off, then on again. This feature is designed deliberately to prevent you switching to range-check mode when you are operating a model.

## 7. TRANSMITTER ADJUSTMENT FACILITIES

### 7.1 Adjusting the stick length



The length of the primary sticks is infinitely variable, and can be adjusted to suit your personal preference.

- Loosen parts A and B
- Screw the stick-top in or out to set the desired length
- Lock part A against part B.

### 7.2 Removing the transmitter back panel

The back panel of the transmitter is secured to the case using four cross-point screws.



Opening the back panel:

- Remove the transmitter batteries.
- Unscrew the four screws in the back panel using a suitable screwdriver.
- Lift off the back panel.

Closing the back panel:

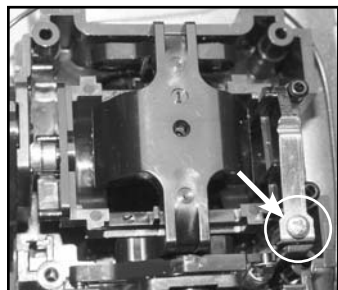
- Carefully replace the back panel on the rear of the transmitter case.
- Fit the four screws and tighten them to secure the back panel.
- Install the batteries, then close the battery compartment.

### 7.3 CHANGING THE THROTTLE RATCHET TO THE RIGHT-HAND STICK

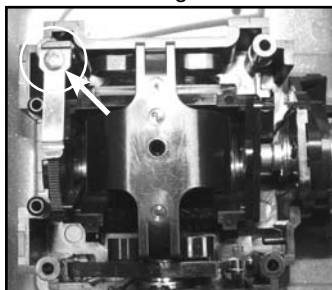
If you change the throttle ratchet function from left to right, the elevon mixer can no longer be used!  
This is the procedure:

(stated right / left directions = as seen from the rear of the transmitter)

1. Remove the transmitter battery
2. Undo the four screws in the back panel using a cross-point screwdriver.
3. Remove the back panel.
4. Undo the throttle ratchet spring on the right-hand stick unit, and remove it.
5. Install the throttle ratchet spring on the left-hand stick unit.
6. Use a pair of tweezers to disconnect the spring on the left-hand vertical centring rocker.
7. Remove the centring lever from the left-hand stick unit. The left-hand vertical stick function is now converted to ratchet function.
8. Install the centring lever in the right-hand stick unit, and connect the spring using tweezers. The right-hand vertical stick function is now converted to self-neutralising action.

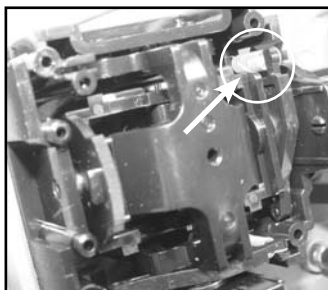


Pos. 4  
Remove throttle spring on right

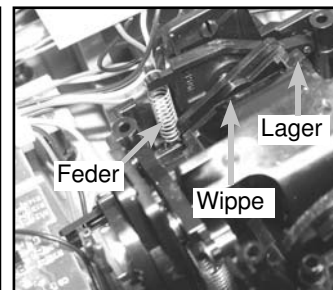


Pos. 5  
Install throttle spring on left

## Skysport T4YF 2,4 GHz



Pos. 6  
Disconnect spring from left-hand vertical centring rocker



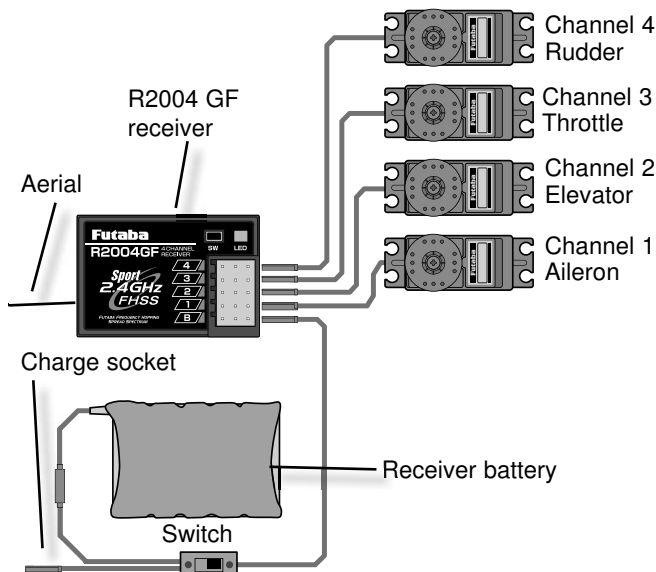
Pos. 8  
Install centring rocker on right-hand stick unit. Connect spring at bottom first, then to rocker

### 8. CONNECTING THE SERVOS

The servo sequence at the receiver is fixed. If you wish to exploit the transmitter's integral elevon facility, you must keep to the stated servo sequence at the receiver output sockets. The sockets and their functions are shown in the illustration below, and stated in the table.

The following diagram shows the servo sequence for a 'fixed-wing' model aircraft.

The battery is connected to the receiver socket marked 'B'.



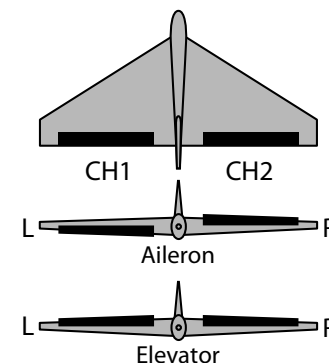
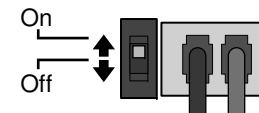
Receiver Output	Function
Channel 1	Aileron, or left elevon if elevon mixer is activated
Channel 2	Elevator, or right elevon if elevon mixer is activated
Channel 3	Throttle
Channel 4	Rudder

### 8.1 ELEVON (DELTA) MIXER

This function is required for model aircraft of the delta or flying-wing configuration. Two servos are used to control superimposed ailerons / elevators, and the mixer controls the servos in accordance with the pilot's commands. If the pilot operates the elevator stick, both servos rotate in the same direction; if he operates the aileron stick, they rotate in opposite directions. The right-hand elevon servo must be connected to receiver output 2 (AIL), and the left-hand elevon to channel 1 (ELE). If either channel needs to be reversed (to suit your particular model), the hardware change-over switches on the front panel should be used.



Elevon Mischer  
ON/ OFF



The mixer can be switched on as described below:

1. Open the transmitter battery compartment and remove the two battery cells on the left.
2. Use a small slot-head screwdriver to move the micro-switch to the desired position (see diagram above).
3. Replace the battery cells and close the transmitter battery compartment again.

**Note:**

**It is essential to check the system before flying the model!**



## 9. USING THE TRANSMITTER FOR THE FIRST TIME

### 9.1 USING THE STICKS

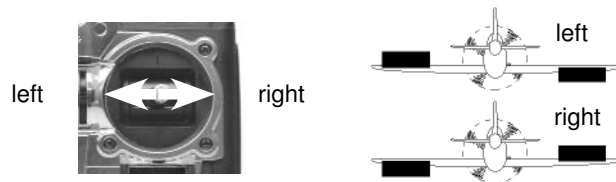
Each of the primary sticks is responsible for two functions.

#### Aileron control (channel 1)

If you move the aileron stick to the right, the control surface on the right-hand wing panel should deflect up, and that on the left-hand wing panel down. Move the same stick to the left, and the left aileron should rise, the right aileron fall. The direction of aileron deflection can be reversed in the software using the “Servo reverse” function (see Section 10).

If you move the aileron stick away from the neutral position (centre) and hold it in that position, a model aircraft rolls around its longitudinal axis in the direction of the stick deflection. The roll rate (speed) varies according to many factors, including the amount by which you deflect the stick.

The diagram below shows the response of the ailerons, looking at the model from the tail.



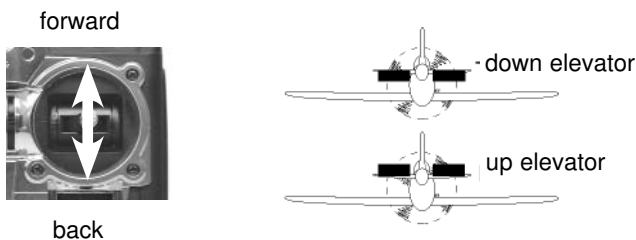
#### Elevator control (channel 2)

Deflecting the elevator causes the model aircraft to rotate around its lateral axis. If you move the elevator stick forward (away from you), the elevator should deflect down; if you pull the elevator stick back (towards you), the elevator should rise. If this is not the case, you can correct it using the servo reverse function.

If you move the elevator stick away from the neutral position (centre) and hold it in that position, a model aircraft flies a loop. The direction (positive or negative) and size of the loop vary according to certain factors, including the direction and amount by which you deflect the stick.

The diagram below shows the response of the elevators, looking at the model from the tail.

## Skysport T4YF 2,4 GHz

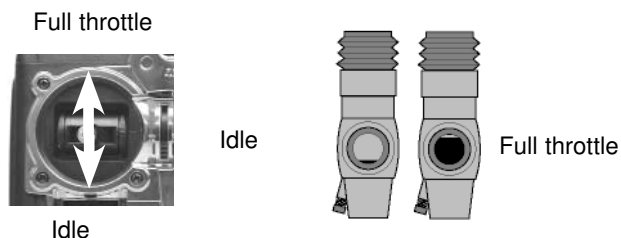


#### Throttle control (channel 3)

If you are flying a model aircraft powered by a glowplug engine, operating the throttle stick causes the carburettor barrel to open and close. Moving the stick in the direction of full-throttle causes the carburettor barrel to open further; moving it towards idle closes the barrel. The direction of throttle control can be reversed in the software using the servo reverse function.

When setting up the throttle linkage it is very important that the servo travel should not be limited by the mechanical system, i.e. the servo must be able to move to its end-points, including trim travel, both at the full-throttle end and at idle. When the system is set up perfectly, the carburettor will be fully open when the stick is moved fully forward, with the trim at centre. However, it is just as important that the engine should run reliably at idle when the stick is moved back to the idle end-point. When set up in this way, the engine can be stopped completely by pulling the trim back to its end-point when the stick is at idle.

The diagram below shows this function



#### Rudder control (channel 4)

If you move the rudder stick to the right, the rudder should also deflect to the right. Move the same stick to the left, and the rudder should move to the left. The direction of rudder deflection can be reversed in the software using the servo reverse function.

When the model is banked over (one wing higher than the other), the rudder also acts in part as an elevator, causing the model to “tuck in” to the turn. This dangerous situation can be corrected by applying slight up-elevator (stick back towards you) at the same time. It is often necessary to apply opposite rudder to return the model to a stable flight attitude.

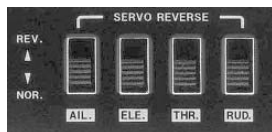
The diagram below shows the response of the rudder, looking at the model from the tail.



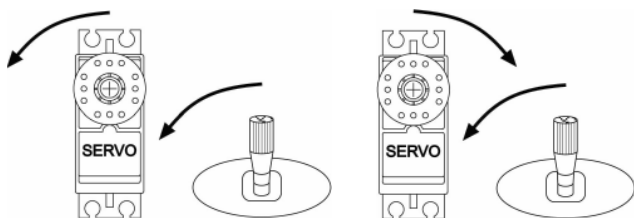
## 10. SERVO DIRECTION (REVERSE)

This function can be used to reverse the direction of rotation of the servo output shaft; it is available for each servo separately. This means that it is not necessary to consider the servos' direction of rotation when installing them in the model. You can simply fit them in the most convenient way, in order to obtain a straight pushrod linkage, for example, and then select the appropriate direction of rotation electronically.

On the lower part of the transmitter's front panel you will find four slide-switches which can be used to reverse the direction of rotation of any or all of the servos. The picture alongside shows all the switches set to the normal direction of servo rotation (NOR). Moving any slide-switch to the opposite end-point (REV) reverses the direction of rotation of the corresponding servo.



Move the switches very carefully, using a small screwdriver.



# Skysport T4YF 2,4 GHz

## 11. TRAINER MODE

Trainer mode is very useful when a beginner to modelling is learning the art of controlling a model by radio. In this mode the teacher, or tutor, has control of the model during the difficult take-off / launch and landing phases, but is able to transfer control to the pupil, or trainee, during the flight, when the model is in a safe position. He does this by operating the Trainer button on his transmitter.

If during the flight the model gets into a dangerous situation or critical attitude, the teacher lets go of the Trainer button or switch, and thereby regains control of the model. This method is ideal for learning the skills of controlling a model, as the pupil can concentrate on just one aspect of flying without having to fear damage to the model, or even its total loss.

The T4YF transmitter is fitted with a Trainer socket as standard; it is located on the back panel.

### Note:

The T4YF is purely a pupil transmitter. It cannot be operated in Trainer mode in conjunction with another T4YF transmitter.

### 11.1 PUPIL MODE WITH OTHER ROBBE-FUTABA TRANSMITTERS

The T4YF transmitter can only be used as a pupil unit in combination with another transmitter from the robbe-Futaba range. The following points have to be taken into consideration:

#### T4YF as pupil transmitter

In its guise as pupil transmitter the T4YF can be very versatile in use; the following special features are available depending on the type of teacher transmitter and the version of the software it contains:

- Teacher transmitter: FF-6, FF-7, F-14, FX-14, FC-16, FX-18, FC-18 Junior, FC-18 V1 & 2, FC-28 V1 & 2, FC-18 V3 and V3 Plus (Version 3.0), FC-28 V3 (Version 3.0).

In this combination the T4YF can only be used as the pupil transmitter if the model does not require any mixer functions other than those provided by the T4YF (i.e. no mixers set up at the teacher transmitter). If the teacher transmitter is a FC-18 or FC-28 it is possible to transfer control of individual channels, whereas the other transmitters transfer all the channels simultaneously.

- Teacher transmitter: FF-8 Super, FF-9, FF-10, FC-18 V3 and V3 Plus (Version 3.1 / 3.2), FC-28 V3 (Version 3.1 / 3.2).

These transmitter types do not require an "intelligent" pupil transmitter with its own mixer functions.

When the pupil has control of the model, the mixer functions set on the teacher transmitter are used.

In this case the T4YF can even be used as the pupil transmitter in order to practise flying a model such as a helicopter. The control functions can be transferred either individually or all together.

If a FC-18, FC-28, T8-FG, T-10CP, T12Z, T-12FG, FX-30, T14MZ or FX-40 transmitter is used, it is even possible to set up combined operation, i.e. both transmitters have simultaneous access to the model.

### 11.2 USE WITH A FLIGHT SIMULATOR

To use the T4YF system to control a flight simulator you need the adapter lead, No. 8239, which is available as an accessory. This converts the Trainer socket to a 3.5 mm barrel socket, which is generally used by flight simulators.

## 12. THE SYSTEM IN USE

Futaba receivers continue to work, with full range, right down to a power supply voltage of 3 V. The advantage of this characteristic is that the receiving system does not usually cease working even if one battery cell fails completely (short-circuit), since robbe-Futaba servos work right down to 3.6 V - albeit slightly more slowly, and with reduced power. This can be very important in Winter when temperatures are low, as brief voltage collapses can have a serious adverse effect on the radio link otherwise.

However, there is also a drawback: under certain circumstances the operator may not even realise that one battery cell has failed. For this reason we strongly recommend that you monitor the receiver battery at regular intervals. We particularly recommend the use of the robbe Battery Monitor 8 LED, No. 8409.

### 12.1 WATERPROOF RECEIVER INSTALLATION

When installing the receiving system in a model car or boat, the receiver should be wrapped in plastic film to prevent water reaching it. However, please note that it is essential to remove the receiver from the film after use, otherwise condensation might form inside it.

## 13. INSTALLING THE RECEIVING SYSTEM

### 13.1 RECEIVER

In the course of the years every RC modeller gathers personal experience, and develops his own preferred methods of installing and using RC components. 2.4 GHz technology has ushered in a new epoch, and has brought enormous advantages with it. Nevertheless, we need to bear in mind certain fundamental changes relating to 2.4 GHz systems, and learn to install and use the RC components differently.

One of the most common mistakes with the new equipment is to continue to wrap the receiver in foam, or place it in a soft foam tube, in order to protect it from the effects of vibration. This is not necessary with 2.4 GHz FHSS receivers, as they do not contain ceramic filters, and are therefore much less vulnerable to vibration than receivers employing earlier technology.

In fact, this "well-intentioned" measure can be counter-productive, as 2.4 GHz receivers are fitted with high-performance ICs which draw fairly high currents, and as a result they can develop significant heat. If the receiver is wrapped in foam, it is difficult for the heat to escape from the receiver.

# Skysport T4YF 2,4 GHz

For this reason we recommend that you simply fix the 2.4 GHz receiver in place using double-sided foam tape or Velcro (hook-and-loop) tape.

### Please note the following points:

- On hot, sunny days do not leave your models in the car, otherwise they and the electronic equipment will heat up excessively.
- Provide adequate ventilation, or - even better - take the model out of the car and place it in the vehicle's shade.
- If your model is fitted with a clear or light-coloured canopy, the sun will shine through and heat up the fuselage and RC components in it. You can avoid this by removing the canopy, thereby ventilating the fuselage; alternatively cover it with a light-coloured cloth.
- Cover dark-coloured models with a cloth, or park them in the shade.
- If your model has a slim or black CFRP / GRP fuselage and contains a receiver, do not leave it in the car or in direct sunshine.
- Do not install the receiver close to the motor, engine or exhaust system, as these parts radiate heat which can cause the receiver's temperature to rise to a dangerous level.
- Silencers installed inside a fuselage generate a lot of heat, which can cause excessive temperatures in the fuselage. The silencer can be separated physically by measures such as a balsa tunnel or compartment, thereby keeping the rest of the fuselage cool.
- It is always best to provide a means for air to circulate through the fuselage.
- If the design does not include such features as standard, cut ventilation slots in the canopy or fuselage.

### General information on 2.4 GHz RC systems

- Large obstacles between the transmitter and receiver may damp or block the signal.
- When close to the ground, the system's transmitted signal is damped (reduced) more severely than in the case of 35 MHz systems. On foggy days and / or when the ground is wet, the effective radio range close to the ground may be reduced.
- If the model is close to the ground and an obstacle (person, vehicle, large object, etc.) comes between the transmitter and receiver, the range may be significantly reduced.
- 2.4 GHz signals are propagated virtually in a straight line, so it is always essential to maintain visual contact with the model.

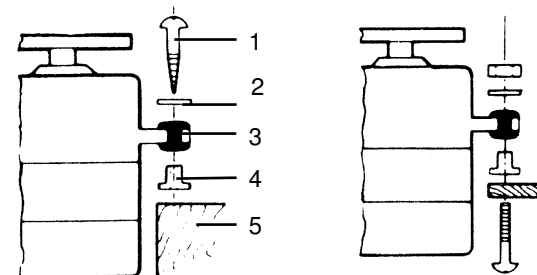
## 13.2 SERVO INSTALLATION

When installing servos, always use the rubber grommets and brass eyelets supplied in the accessory packs. When you fit the servo retaining screws, ensure that they are not tightened beyond the point where the brass eyelets make contact top and bottom; if they are compressed too far, the ability of the rubber grommets to absorb vibration is reduced or lost.

The diagram below shows two typical methods of mounting servos.

Diagram "A" shows a wooden servo plate; diagram "B" shows the use of a plastic or aluminium plate.

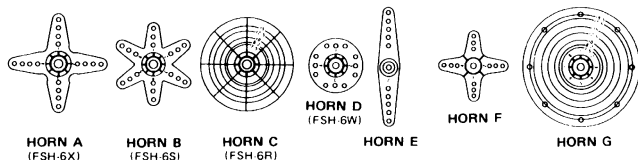
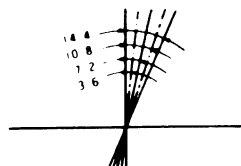
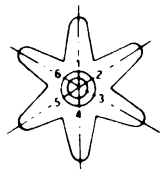
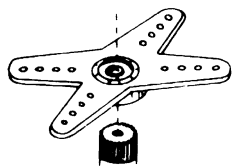
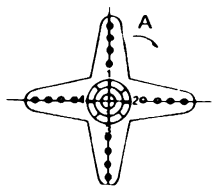
In RC model cars the servos are usually fitted in the openings provided for them in the RC installation plate.



- 1 Woodscrew
- 2 Washer
- 3 Rubber grommet
- 4 Metal eyelet
- 5 Wood

### 13.3 Servo travels / servo output levers

Each servo must be able to move through its full arc of travel without being mechanically obstructed by the control surface or its linkage. This applies in particular to the carburettor linkage. The 'full throttle' and 'idle' settings must be determined by the stick positions; never by the throttle barrel's mechanical end-stop. If you ignore this warning, the servo motor will constantly be under almost full load, and will consume an extremely high current.



#### 13.4 SERVO LEADS

When deploying servo leads ensure that they are not under any mechanical strain, and are not kinked or bent tightly, as this might cause them to fracture over time. Make sure there are no sharp edges which could damage the cable insulation. All electrical connectors must be firmly fitted and secure. When disconnecting them, always pull on the plastic housings - not on the wires. Servo leads should not just be left dangling loosely inside the model; it is far better to attach the leads neatly to, say, the fuselage side or the chassis using adhesive tape or cable ties. It is not permissible to carry out modifications of any kind to the electronic units. Avoid reversed polarity and short-circuits at all times, as the electronic components are not protected against such malpractice.

#### 14. POST OFFICE REGULATIONS

The R&TTE (Radio Equipment & Telecommunications Terminal Equipment) directive is the new European directive applicable to radio systems and telecommunications equipment, and applies to all such equipment which has general conformity approval in the EC.

Part of the R&TTE directive regulates the setting up and operation of radio systems in the European Community.

## Skysport T4YF 2,4 GHz

An important change compared with earlier regulations is the abolition of the requirement for individual user licences.

**CE 0682**

The manufacturer or importer is required to submit the radio system to a conformity assessment procedure before marketing the equipment. The CE symbol is applied to all such equipment, and indicates that it fulfils the currently valid European norms.

Other countries such as Switzerland, Norway, Estonia and Sweden have also accepted this directive. Your radio control system is registered (i.e. approved) in all these countries, and can legally be sold and operated there.

We are obliged to point out that the responsibility for operating a radio system which fulfils the requirements of the directives rests entirely with you, the user.

#### 15. CONFORMITY DECLARATION

robbe Modellsport GmbH & Co. KG hereby declares that this product satisfies the fundamental requirements and other relevant regulations contained in the appropriate CE directives. The original Conformity Declaration can be viewed on the Internet under [www.robbe.com](http://www.robbe.com): click on the logo button marked "Conform" which is included in each device description.

#### 16. GUARANTEE

Naturally our products are guaranteed for a period of 24 months in accordance with statutory regulations. If you have a justified claim under guarantee, please contact your model shop in the first instance, as the retailer is responsible for the guarantee and the honouring of claims. During this period we will correct any operating faults, production defects and material faults which arise, at no charge to you. We will not entertain any claims beyond these terms, e.g. consequent damage.

The unit must be returned to us carriage-paid; it will also be returned to you carriage-paid. We will not accept goods sent to us without pre-paid carriage.

We accept no liability for transit damage and the loss of your shipment; we therefore recommend that you take out suitable insurance to cover these risks.

Send the unit to the Service Centre responsible for the country in which you live.

The following conditions must be fulfilled if we are to process your guarantee claim:

- Send proof of purchase (till receipt) with your shipment.
- The unit must have been operated in accordance with the operating instructions.
- The unit must have been operated with the recommended power sources and genuine robbe accessories.
- The unit must not exhibit damage due to damp, unauthorised intervention, reversed polarity, overload conditions or mechanical damage.
- Please include a concise, accurate description of the fault or defect to help us locate the problem.

#### 17. LIABILITY EXCLUSION

We at robbe Modellsport are unable to ensure that you observe the instructions supplied with this radio control system, and we have no control over the methods you use for installing, operating and maintaining the equipment. For this reason we are obliged to deny all liability for damage, loss or costs which are incurred due to the improper use of our products, or involved in the event in any way.

#### 18. INSURANCE

Most private third-party insurance policies include cover for ground-based models and model gliders (unpowered). Please ensure that you are adequately insured for the type of model you operate.

## 19. GENERAL FREQUENCY ALLOCATION

In the operating frequency range 2400 ... 2483.5 MHz the operation of radio control equipment is approved without requiring registration or fee payment. A general allocation of frequencies for public use has been granted in Germany by the Federal Network Agency.

Vfg 89 / 2003

### Allgemeinzuteilung von Frequenzen im Frequenzbereich 2400,0 – 2483,5 MHz für die Nutzung durch die Allgemeinheit in lokalen Netzwerken; Wireless Local Area Networks (WLAN- Funkanwendungen)

Auf Grund § 47 Abs. 1 und 5 des Telekommunikationsgesetzes ( TKG ) vom 25. Juli 1996 ( BGBl. I S. 1120 ) in Verbindung mit der Frequenzzuteilungsverordnung (FreqZutV) vom 26. April 2001 (BGBl. I S. 829) wird hiermit der Frequenzbereich 2400,0 – 2483,5 MHz zur Nutzung durch die Allgemeinheit für WLAN – Funkanwendungen in lokalen Netzwerken zugeteilt.

Die Nutzung der Frequenzen ist nicht an einen bestimmten technischen Standard gebunden.

Die Amtsblattverfügung Nr. 154/1999 „Allgemeinzuteilung von Frequenzen für die Benutzung durch die Allgemeinheit für Funkanlagen für die breitbandige Datenübertragung im Frequenzbereich 2400 – 2483,5 MHz (RLAN - Funkanlagen)“, veröffentlicht im Amtsblatt der Regulierungsbehörde für Telekommunikation und Post (Reg TP) Nr. 22/99 vom 01.12.99, S. 3765, wird aufgehoben .

### 1. Frequenznutzungsparameter

Frequenzbereich	Kanalbandbreite /Kanalraster	Maximale äquivalente Strahlungsleistung
2400,0 – 2483,5 MHz	Keine Einschränkung	100 mW (EIRP)

Die äquivalente Strahlungsleistung bezieht sich, unabhängig vom Modulations- bzw. Übertragungsverfahren, auf die Summenleistung mit Bezug auf den Frequenzbereich von 2400,0 bis 2483,5 MHz.

### 2. Nutzungsbestimmungen

Maximale spektrale Leistungsdichte bei Frequenzsprung-Spektrumspreizverfahren (FHSS)	Maximale spektrale Leistungsdichte bei Direktsequenz Spektrumspreizverfahren (DSSS) und anderen Zugriffsverfahren
100 mW/100 kHz	10 mW/1 MHz

### 3. Befristung

Diese Allgemeinzuteilung ist bis zum 31.12.2013 befristet.

#### Hinweise:

- Die oben genannten Frequenzbereiche werden auch für andere Funkanwendungen genutzt. Die Reg TP übernimmt keine Gewähr für eine Mindestqualität oder Störungsfreiheit des Funkverkehrs. Ein Schutz vor Beeinträchtigungen durch andere bestimmungsgemäße Frequenznutzungen kann nicht in jedem Fall gewährleistet werden. Insbesondere sind bei gemeinschaftlicher Frequenznutzung gegenseitige Beeinträchtigungen der WLAN - Funkanwendungen nicht auszuschließen und hinzunehmen.

- Geräte, die im Rahmen dieser Frequenznutzung eingesetzt werden, unterliegen den Bestimmungen des "Gesetzes über Funkanlagen und Telekommunikationsendeinrichtungen" (FTEG) und des "Gesetzes über die Elektromagnetische Verträglichkeit von Geräten" (EMVG).
- Diese Frequenzzuteilung berührt nicht rechtliche Verpflichtungen, die sich für die Frequenznutzer aus anderen öffentlich-rechtlichen Vorschriften, auch telekommunikationsrechtlicher Art, oder Verpflichtungen privatrechtlicher Art ergeben. Dies gilt insbesondere für Genehmigungs- oder Erlaubnisvorbehalte (z.B. baurechtlicher oder umweltrechtlicher Art).
- Der Frequenznutzer ist für die Einhaltung der Zuteilungsbestimmungen und für die Folgen von Verstößen, z. B. Abhilfemaßnahmen und Ordnungswidrigkeiten verantwortlich.
- Der Frequenznutzer unterliegt hinsichtlich des Schutzes von Personen in den durch den Betrieb von Funkanlagen entstehenden elektromagnetischen Feldern den jeweils gültigen Vorschriften.
- Beauftragten der Reg TP ist gemäß §§ 7 und 8 EMVG der Zugang zu Grundstücken, Räumlichkeiten und Wohnungen, in denen sich Funkanlagen und Zubehör befinden, zur Prüfung der Anlagen und Einrichtungen zu gestatten bzw. zu ermöglichen.
- Beim Auftreten von Störungen sowie im Rahmen technischer Überprüfungen werden für WLAN - Funkanwendungen im 2,4 GHz - Frequenzbereich die Parameter der europäisch harmonisierten Norm EN 300 328-2 zu Grunde gelegt. Hinweise zu Messvorschriften und Testmethoden, die zur Überprüfung der o. g. Parameter beachtet werden müssen, sind ebenfalls dieser Norm zu entnehmen.

225-13

## 20. RECOMMENDED ACCESSORIES



### Power Peak® A4 EQ-LCD (No. 8560)

Low-cost 230 V / 12 V fast charger housed in a high-quality metal case. For charging 4 ... 8 NC / NiMH cells and 1 ... 4 LiPo cells (3.7 V). With integral equalizer and large LCD screen for displaying current, voltage and capacity.



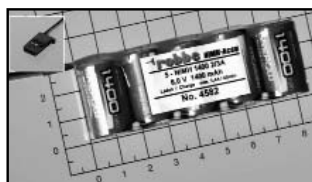
### Power Peak® B6 EQ-BID (No. 8561)

Compact, reasonably priced 230 V / 12 V charge / discharge station with battery management, for 1 ... 14 NC / NiMH cells and 1 ... 6 Lilo, LiPo or LiFe cells, plus 2 ... 12 V lead-acid batteries. With integral equalizer and BID system, housed in a high-quality metal case. Supplied complete with comprehensive accessories and aluminium storage case.



NiMH 2500 mAh transmitter cell  
No. 8005

## Skysport T4YF 2,4 GHz



NiMH receiver battery, 1400  
mAh, flat-pack  
No. 4582



NiMH receiver battery, 2000  
mAh, flat-pack  
No. 4551



Transmitter battery charge  
lead  
No. F1415



Receiver battery charge  
lead  
No. F1416



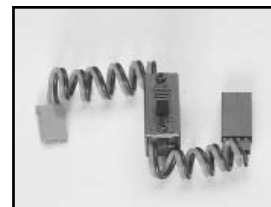
Flight simulator adapter  
No. 8239



Trainer lead  
No. F1591



Y-lead  
No. F1423



Switch harness  
No. F1408

For switching the power  
supply (receiver battery) on  
and off.



Switch harness with  
charge socket  
No. F1407

Required for connecting  
the battery to the recei-  
ver. The battery can be  
recharged via the separate  
charge socket.



Single-point neckstrap  
No. F1550

Soft, variable-length neck-  
strap, with spring-clips and  
swivel.

## 21. SERVICE CENTRE ADDRESSES

Land	Firma	Strasse	Stadt	Telefon	Fax
Andorra	SORTENY	130 LES ESCALDES		0037-6-82 0827	0037-6-82 5476
Dänemark	MAAETOFT DMI		8900 RANDERS	0045-86-43 6100	0045-86-43 7744
Deutschland	robbe-Service	Metzloser Str. 38	D-36355 Grebenhain	0049-6644-87-777	0049-6644-87-779
England	robbe-Schlüter UK	LE10-1UB	Leicestershire	0044-1455-63 7151	0044-1455-63 5151
Frankreich	S.A.V Messe	BP 12	F-57730 Folschviller	0033-387-94 6258	0033-387-94 6258
Griechenland	TAG Models Hellas		143 41 Nea Philadelfia	0030-1-25 84 380	0030-1-25 33 533
Italien	MC-Electronic	Via del Progresso 25	I-36010 Cavazeale (Vi)	00390-0444-94 5992	00390-0444-94 5991
Niederlande/Belgien	Jan van Mouwerik	Slot de Houvelaan 30	NL-3155 Maasland	0031-1059-13 594	0031-1059-13 594
Norwegen	Norwegian Modellers		3101 TØNSBERG	0047-333-78-000	0047-333-78-001
Österreich	Robbe Service	Puchgasse 1	A-1220 Wien	0043-01259-66-52	0043-01258-11-79
Schweden	Minicars Hobby A.B.		75323 Uppsala	0046-18-71 2015	0046-18-10 8545
Schweiz	robbe Futaba Service	Baslerstrasse 67A	CH-4203 Grellingen	0041-61 741 23 22	0041-61 741 23 34
Slowakische Rep.	Fly Fan		91105 Trenčin	0042-1831-74 442 03	0042-1831-74 447 15
Spanien	Modelimport S.A.		28850 Torrejón de Ardoz	0034-91-67 747 20	0034-91-67 798 60
Tschechische Rep.	Ales Marhoun	Horova 9	CZ-33021 Cesk Budejovice	00420-73-66 41 917	00420-38-7251175
Türkey	Formula Modelsports		35060 Pınarbaşı-Izmir	0090-232-47 912 58	0900-232-47 917 14

## 22. DISPOSAL OF OLD EQUIPMENT AND BATTERIES



Electronic equipment must not simply be discarded in the domestic refuse. The transmitter is therefore marked with the symbol reproduced alongside. This symbol attached to an item of electrical or electronic equipment means that you must dispose of it separately from the general household waste when it reaches the end of its useful life. Please take your unwanted radio control system to your local specialist waste collection point or recycling centre. This applies to all countries of the European Union, and to other European countries with a separate waste collection system.



On no account dispose of exhausted batteries in the domestic waste. To protect the environment, take defective and exhausted packs to your local battery collection point after ensuring that they are completely discharged. Collection points include all retail outlets where dry and rechargeable batteries are sold, and also local authority toxic waste collection centres. To avoid short-circuits, apply adhesive tape over any exposed contacts and terminals. The cost of returning and disposing of old batteries is included in their original purchase price. All retail battery outlets have a legal obligation to accept exhausted batteries, whether you purchased them

there or not. Exhausted batteries can be recycled, and the materials re-introduced into the production cycle. Please help to protect the environment.

**robbe Modellsport GmbH & Co.KG**  
**Metzloser Strasse 38**  
**D-36355 Grebenhain OT Metzlos-Gehaag**  
**Telefon +49 (0) 6644 / 87-0**  
**[www.robbe.com](http://www.robbe.com)**  
**[www.robbe.com/rsc](http://www.robbe.com/rsc)**

**robbe Form ACBA 40-35521**

**Errors and technical modifications reserved**  
**Copyright robbe-Modellsport 2010**  
**This document may not be copied or reproduced in**  
**whole or in part without the prior written approval of**  
**robbe Modellsport GmbH & Co. KG**

**CE 0682**