





RACON

Users Manual

6-CH MULTIFUNCTIONAL TRANSMITTER



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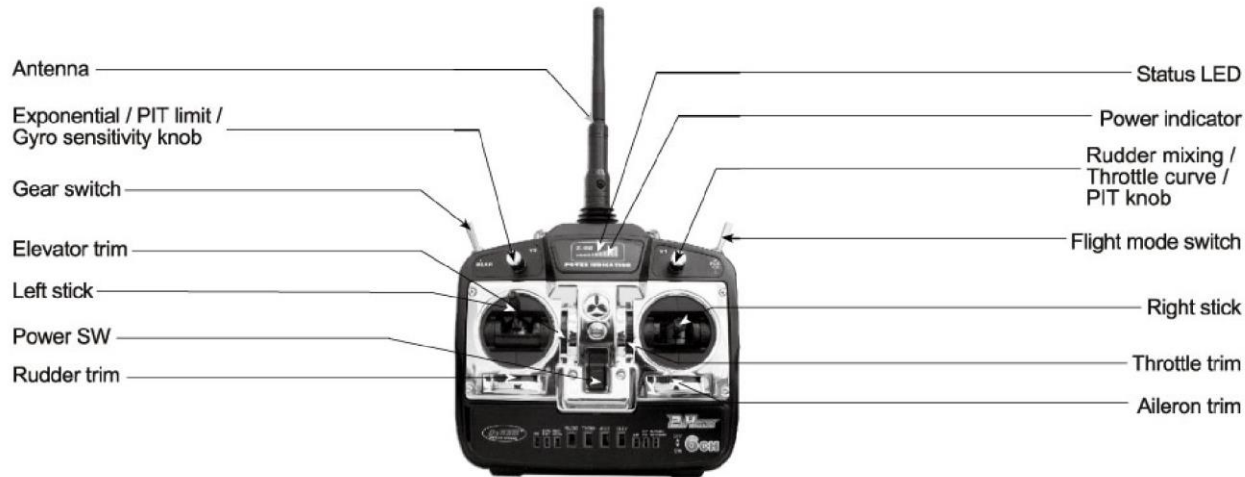
Warning!

**PLEASE ENSURE THAT FLIGHT MODE SWITCH IS ON
CONNECTING BATTERY!**

1.0 Foreword

The RACON is an easy-and-simple-to-operate transmitter with powerful function, which is of throttle curve and PIT adjustment. Its characteristics include subtle trim level, flashing picture, and high sensitive gyro controlled by transmitter. It is suitable for various flight performances.

2.0 Control Identification and Location

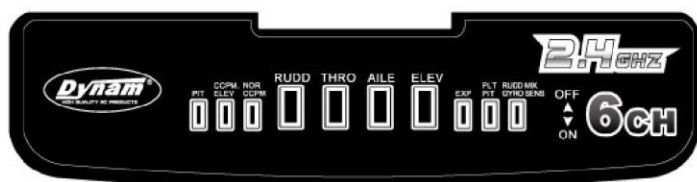


2.4GHZ

3.0 Backboard Identification



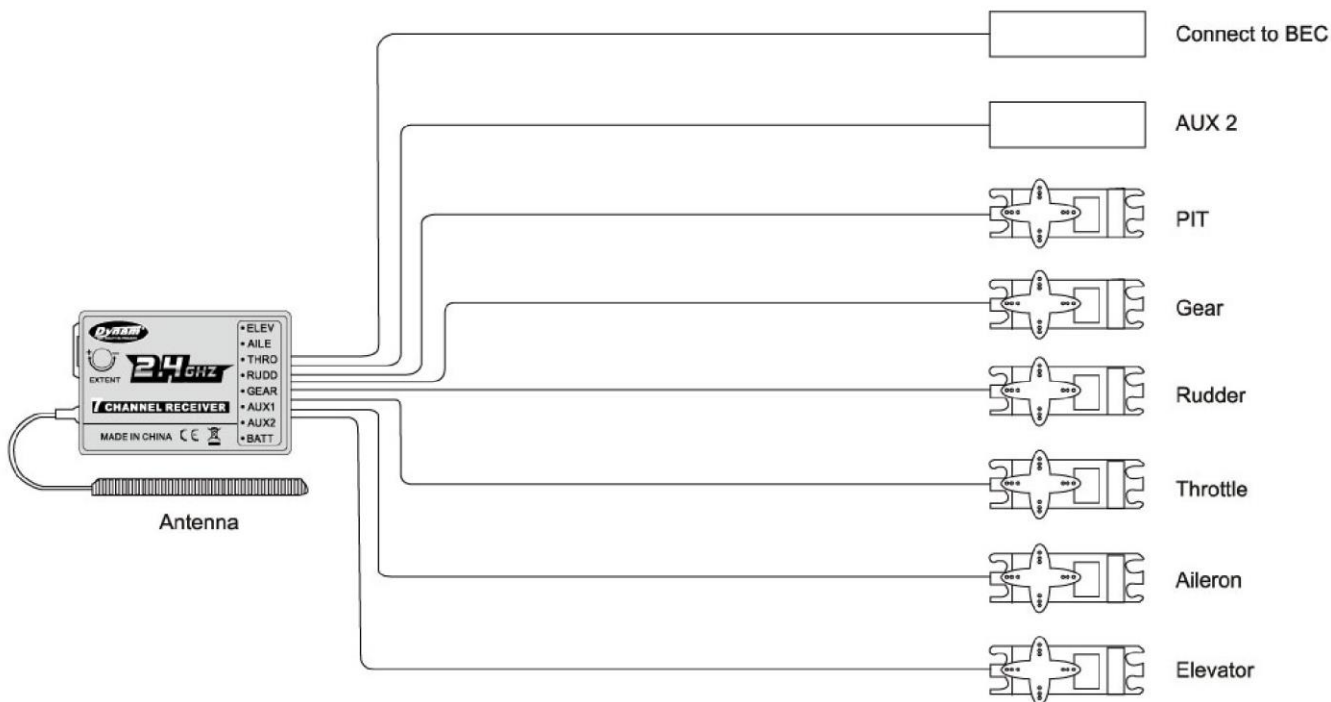
3.1 DIP Switch Allocation



1. PIT
2. CCPM/ELEV
3. NOR CCPM
4. RUDD
5. THRO
6. AILE
7. ELEV
8. EXP
9. PLT PIT
10. RUDD MIX /GYRO SENS

3.2GHZ

4.0 Receiver Connection:



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2.4GHZ

5.0 RACON Control Identification

MODE I

- Left stick / Rudder.** It controls your helicopter forward, backward, left, and right. Push up to fly your helicopter forward, pull down to fly backward, push leftward to fly left, and push rightward to fly right.
- Right stick / Throttle.** It controls your helicopter ascending, descending, left moving and right moving. Push up to ascend your helicopter; pull down to descend, push leftward to move your helicopter left, and push rightward to move right.

MODE II

- Left stick / Throttle.** It controls your helicopter ascending, descending, left, and right. Push up to ascend your helicopter, pull down to descend, push leftward to fly left, and push rightward to fly right.
- Right stick / Rudder.** It controls your helicopter forward, backward, left moving and right moving. Push up to fly your helicopter forward, pull down to fly backward, push leftward to move your helicopter left, and push rightward to move right.

- Throttle trim.** The throttle trim controls your helicopter to ascend and descend. Push up the trim to ascend, and pull down to descend.
- Aileron trim.** The aileron trim controls your helicopter leftward and rightward. Push the trim left and fly left, and push the trim rightward and fly right.
- Elevator trim.** It controls and modifies your helicopter forward and backward. Push up to fly forward, and pull down to fly backward.
- Rudder trim.** The trim controls and modifies your helicopter leftward and rightward. Move the trim left to fly leftward, and move right to fly rightward.
- Gear switch.** Convert the gear switch to fold or release the skid landing system. Switching the switch up is ON, and switching the switch down is OFF.
- Flight mode switch.** Convert the flight mode. Switching up is the normal flight mode, and switching down is the inverted flight mode.
- Exponential / PIT limit / Gyro sensitivity knob.** Under the help of DIP switches, all the functions can be switchable.

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2.4GHZ

10. Rudder mixing / Throttle curve / PIT knob. Under the help of DIP switches, the knob can experience rudder mixing adjustment, throttle curve adjustment, and PIT adjustment.

11. Indicator. Show the battery volume of the transmitter. Green LED on means the electricity is full; Green LED off means the electricity is not enough; Yellow LED off means the electricity is seriously short and the circuit will be automatically protected, and the flight is forbidden.

12. Status LED. LED flashes when turning on the transmitter; Light blue indicates to adjust PIT limit and PIT parameters; Orange indicates to adjust servo exponential and throttle curve; Dark blue indicates to adjust gyro sensitivity and rudder mixing parameters.

6.0 Receiver Channel Assignment

1. **ELEV:** Elevator, connect to elevator servo.
2. **AILE:** Aileron, connect to aileron servo.
3. **THRO:** Throttle, connect to speed controller.
4. **RUDD:** Rudder, connect to rudder servo.
5. **GEAR:** Gear, connect to gear servo.
6. **AUX1:** Pitch / Aux1, connect to pitch servo.
7. **AUX2:** Aux2.

7.0 Transmitter Function

7.1 CCPM / NOR Selection

If your helicopter is using CCPM mode, put the No.8 DIP switch on the reverse side of the transmitter to the OFF position. If your helicopter is using NOR mode, put the No.8 DIP switch to the ON position.

7.2 Reverse Adjustment

Channel No.	Reverse Function	ON Position	OFF Position
1	Elevator	Reverse	NORMAL
2	Aileron	Reverse	NORMAL
3	Throttle	Reverse	NORMAL
4	Rudder	Reverse	NORMAL
5	Gear	Reverse	NORMAL
6	PIT	Reverse	NORMAL
7	Rudder Mixing	Reverse	NORMAL



7.3 PIT Lock and Adjustment

The transmitter provides the PIT and PIT limit adjustment functions and can lock the adjusted parameters as below:

- A. Put the No.10 DIP switch in the ON position and the status LED becomes light blue. Put the No.11 and 12 DIP switches in the OFF position. Circumrotate the V1, V2, which are individually marked on the top left and right knobs, to the 0 position.
- B. Tuning V1 to the "+" end increases the PIT value and tuning V2 to the "-" end decreases the PIT value.
- C. Tuning V2 to the "+" end increases the PIT limit value and tuning V2 to the "-" end decreases the PIT limit value.
- D. After the adjustment is finished, put the No.10 DIP switch to the OFF position and lock the adjusted PIT parameters.

7.4 Gyro Sensitivity and Rudder Mixing Adjustment

- A. Put the No.12 DIP switch on the ON position, and the No.10 & 11 DIP switches on the OFF position. Circumrotate the V1, V2 on the top left and right knobs respectively to the 0 position.
- B. V1 provides the function of rudder mixing adjustment. Adjust the rudder mixing value to 40% when is V1 at 0 position; Tuning V1 to the "+" end increases the rudder mixing value and the maximum value is 80%. Tuning V1 to the "-" end decreases the rudder mixing value and its minimum value is 0%.

C. V2 to the 0 position and the gyro sensitivity is 0. Tuning to the "-" end is the gyro NOR sensitivity, the maximum value is 100% and the gyro is in the NOR mode; tuning to the "+" end is the lock mode, the maximum value is 100%, and the gyro is in the lock mode. The gyro sensitivity in hovering flight is at 70 – 80% and for aerobatic flight is at 60 – 70%. Gyro lock mode in flight is recommended.

7.5 Throttle Curve and Servo Exponential Function

Put the No.11 DIP switch on the ON position and No.10 & 12 on the OFF position. Circumrotate V1 and V2 to the 0 position.

7.5 1 Normal Throttle Curve Adjustment

Switch the 3D inverted flight switch to the normal flight mode. Tune V1 to the "+" end and move the throttle curve upward. the maximum range is 80% upward; tune V1 to the "-" end and move the throttle curve downward and the maximum range is 40% downward. Tune V1 to 0, the curve is linear (Fig. 1).

7.5 2 Inverted Flight Throttle Curve Adjustment

Switch the 3D inverted flight switch to the 3D inverted flight mode. When tune V1 to 0 position, the curve is V-shape and the throttle center is at 60%. Tune V1 to the "+" end, and the curve moves up and its maximum range is 80%; tune V1 to the "-" end, the curve moves down and its minimum range is 40% (Fig. 2).



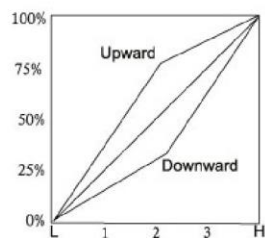


Fig. 1

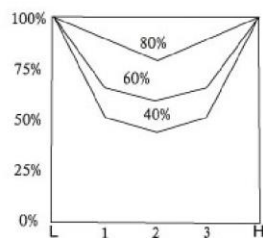


Fig. 2

7.5.3 Servo Exponential Function

When tune V2 to 0 position, the curve is linear (Fig. 3); When tune V2 to the "+" end, the throttle curve will be changed in the form of exponential (Fig. 4). When tune V2 to the "-" end, the throttle curve will be changed in the form of negative exponential (Fig. 5).

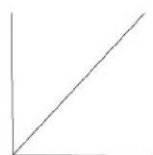


Fig. 3

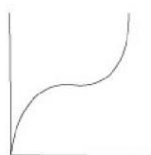


Fig. 4



Fig. 5

7.5.4 3D Inverted Flight

The RACON offers two flight modes: normal and 3D aerobatic. If put the flight mode switch to N position, the flight mode is normal; if put the flight mode switch to 1 position, the flight mode is aerobatic. If the flight mode switch is at 1 position when turning on the transmitter, the LED will flash and there is no signal to be transmitted, and the system will automatically enter the protection status; if the flight mode switch is put to the N position, the protection status will be removed.

8.0 Transmitter Specification

Encoder	----- 6-channel micro computer system
Modulation	----- PCM
Output Power	----- < 750Mw
Current Drain	----- 200mA
Power Source	----- 12x8 NiCad (9.6V 600 mAh) or 1.5Vx8 AA dry batteries
Output Pulse	----- 1050 – 1850 Ms (1450 Neutral)

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2.4GHZ

9.0 Receiver Specification:

Type	----- 6-Channel PCM
Sensitivity	----- 0.5 μ V (minimal)
Selectivity	----- 8KZ/50db
Weight	----- 28g
Dimension	----- 52 \times 38 \times 16mm
Antenna Length	----- 1m
Receiver Battery	----- 4.8V 1100mAh

10.0 Control Stick Adjustment

The length and tension of the control stick are adjustable.

10.1 Control Stick Length Adjustment

To adjust the stick length, use the 1.5mm Allen Wrench to unlock the set screw, and then turn the wrench clockwise or

counterclockwise to adjust the stick length. After the stick length has been adjusted to suit your flying style, tighten the set screw.

10.2 Control Stick Tension Adjustment

Remove the battery pack and 4 back cover screws, and then remove the transmitter back case. Be careful not to damage. Remove the PCB board (don't touch or break the wires), and adjust each screw for the desired tension (Note: clockwise to tighten stick and counterclockwise to loose the stick).

11.0 Neck Strap Usage

There is a Hook on the face of the RACON transmitter. The neck strap can be hooked on the eyelet. The Hook located at the center is helpful to getting the optimal balance of the transmitter.

12.0 Radio Frequency

The RACON adopts a plug-in module system for transmitter frequency changes. There are two options to change the radio frequency:

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2.4GHZ

1. To change the frequency points within the same frequency band such as changing the 2401 into 2403 or 2480.

4. When mounting the receiver antenna, please make sure that the main rotor and tail rotor blades or the propellers cannot entangle it.

5. Transmitter Battery Mounting: Please note the polarities when inserting the plugs.

13.0 Installation Requirement

It is important to correctly mount your radio system in your model. Below are some advices on how to install your "DYNAM" equipment.

1. Installations of rubber grommets and copper sleeve to isolate the vibration are musts. The mounting screws cannot be over-tightened. Otherwise, the rubber grommets will be distorted and decrease the vibration absorption effect.
2. When mounting the servos, please make sure they can freely move over their whole travel ranges and ensure the control linkages don't touch or impede the movement of the servos.
3. Install various switches far away from the engine tuned pipe and far away from the high vibration area, and ensure all the switches move freely over their whole ranges.



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

The specifications of the R/C product may be altered without notice

PPHITEC 2.4GHz Receiver

Instruction

version 1.0

- Risk of explosion exists if battery is replaced by an incorrect type. Dispose of the used battery according to the instructions.

European CE notice to users and product statements:

This product is CE marked according to the provisions of the R&TTE Directive(99/5/EC). Hereby, HITEC RCD Inc, declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. For further information, please contact <http://www.hitecrd.com>

FCC notice to users and product statements:

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received including interference that may cause an undesired operation. **CAUTION:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- FRANCE Frequency Range : 2.4056GHz~ 2.4482GHz

CE0678

2.4GHz Band for use in :
AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,
FI, GB, GR, HU, IE, IT, LT, LU, LV, MT, NL,
PL, PT, RO, SE, SI, SK, FR

Made in the Philippines

Introduction

Thank you for your purchase of the Hitec Adaptive Frequency Hopping Spread Spectrum (AFHSS) 2.4GHz module and receiver system. This manual contains the complete directions on how to use the Optima series of receivers (version 3.00(0)). We encourage you to review the entire manual before using these products.

Service & Support

Hitec Customer Service

Help is available from the Hitec office through phone support and e-mail inquiries.

Our US office is generally open Monday thru Friday, 8:00AM to 4:30PM PST. These hours and days may vary by season. Every attempt is made to answer every incoming service call. Should you reach our voicemail, leave your name and number and a staff member will return your call.

Hitec Website

Make plans to visit the Hitec website, www.hitecrd.com, on a regular basis. Not only is it full of specs and other information about the entire Hitec product line, our website's FAQ pages will eventually hold valuable information and program updates about the Spectra 2.4 module and Optima series of receivers.

The On-Line Community

One of the benefits of the extensive R/C online community is the vast wealth of archived knowledge available. Hitec sponsors forums on most of the popular R/C websites where a Hitec staff member or representative tries to answer all manner of product related questions. Bringing together strangers with common interests is proving to be one of the greatest gifts of the internet. If past history is any guide to the future, we are certain forums will be started about the Hitec 2.4 system and several are certain to stand out as valuable archives of information.

HITEC

Warranty and Non-Warranty Service

All Hitec products carry a two year from date of purchase warranty against manufacturer's defects. Our trained and professional service representatives will determine if the item will be repaired or replaced. To provide all the necessary information we need to administrate your repair, visit our website at www.hitecrd.com and download the repair form, fill it out and send in your item for repair.

Hitec Service

12115 Paine St. Poway CA 92064

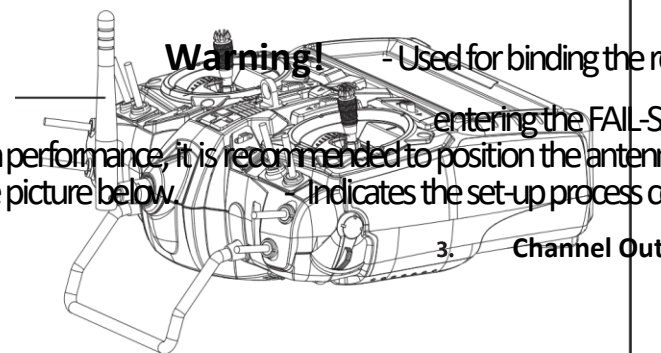
1-858-748-6948

E-mail: service@hitecrd.com

1 . Function Button

Warning!

1. For maximum performance, it is recommended to position the antenna shown in the picture below.



Recommended Position

side end of the Optima receivers.

4. SPC (Supplier)

5. Telemetry

6. BODA (Boosted On)

2. The receiver antenna should not be placed near the engine, metal parts, or a booster makes it a whole lot easier to install the 2.4GHz antenna. Hitec using the 2.4GHz system. This

7 channel systems is better than or equal 3. When using a large number of receivers to our competitor's dual antenna systems. Our Optima 9 receiver the receiver always gets the power it needs in high load conditions. simple, just insert the antenna into the If not, use the system with error to the desired spot you wish to install.

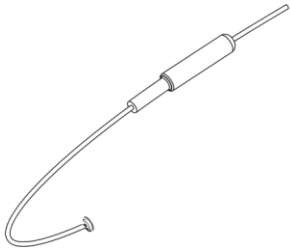
4. There could be a possible time delay in receiving telemetry data from receivers are compatible with transmitters using Hitec's AFHSS 2.4 GHz as Spectra 2.4 module or dedicated built-in module AFHSS 2.4 Hitec tr
5. It is strongly recommended that you use Hitec's genuine Heavy Duty Selectable Receiver Charger Cord (Stock#: 54407S) for all of Optima series of receivers. Other accessories can be set with a FAIL-SAFE point, if power to the receiver

OPTIMA Series Receiver Specifications & Features

Full Range AFHSS 2.4GHz Receivers

Review the Low Battery alarm for

Receiver Model	Size	Weight	Stock Number
MINIMA 6T	1.19 x 0.81 x 0.27in (30.4 x 20.8 x 7.11mm)	0.22oz (6.3g)	26610
MINIMA 6E	1.24 x 0.81 x 0.42in (31.7 x 20.8 x 10.9mm)	0.22oz (6.5g)	26612
OPTIMA 6 LITE	1.76 x 1.11 x 0.29in (44.9 x 18.4 x 7.40mm)	0.33oz (9.4g)	29438
OPTIMA 6	1.81 x 0.82 x 0.47in (46.1 x 21.3 x 12.1mm)	0.52oz (15g)	28410
OPTIMA 7	2.20 x 0.79 x 0.43in (56.9 x 20.8 x 11.6mm)	0.60oz (17g)	28414
OPTIMA 9	1.85 x 1.14 x 0.59in (47.7 x 29.1 x 15.5mm)	0.77oz (22g)	28425



LITE

*These functions/ features are only for the OPTIMA series of receivers.

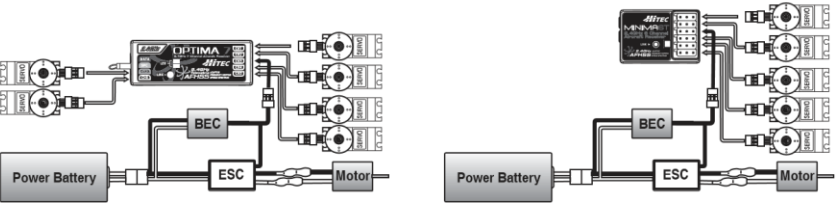
Receiver Connection Diagrams



Note

-To see a receiver connection diagram for the SPC feature, see page 2.

Electric powered aircraft with Electronic Speed Control
Use this method on electric planes using ESCs providing power to the receiver and servo functions.



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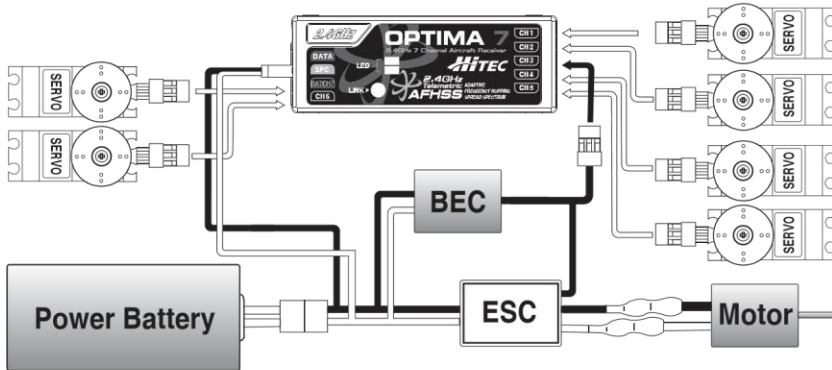
SPC (Supplementary Power Connection) System

Hitec's exclusive optional receiver power system allows you to directly power the receiver from the main motor power battery of an electric powered aircraft. Up to 35 volts can be fed directly into the receiver to power JUST THE RECEIVER FUNCTION. It will not power the servos. Almost all servos will burn up if more than 6 volts are used over a short period of time.



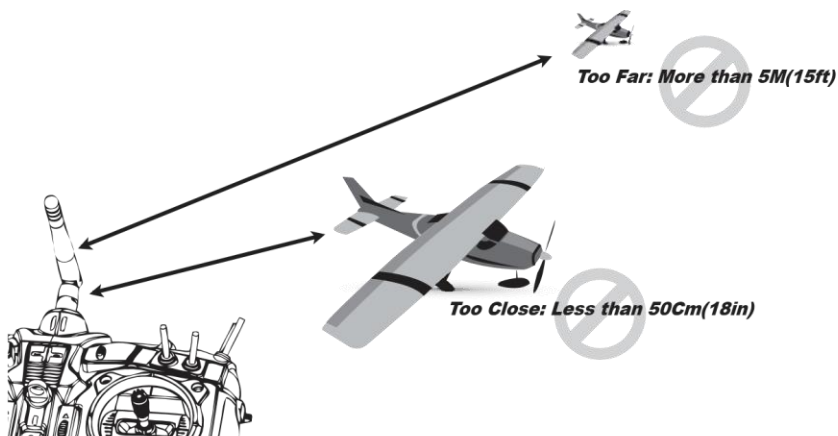
- Some Hitec servos are rated to be used at 7.4 volts. You will still need to supply power for your servos with a four or five-cell NiMH receiver battery or a 2-cell Li-Po and regulator set-up.
- The SPC system was partially created to be integrated into future Hitec telemetry system devices. Check the Hitec website for more information on the availability of telemetry systems in the future.

SPC Connection Diagram



- The SPC function is applicable to the OPTIMA series of receivers only.

Link (ID-Setting)



- Link must be done within 15ft. (5m) of the transmitter and receiver.
- Transmitter and receiver need to be at least 18in. (50cm) from each other to link properly.

Link (ID-Setup or Bind)

Your Hitec AFHSS system uses a communication protocol that links and binds the Hitec 2.4GHz receiver to your transmitter. Once the receiver and module are "bound," no other transmitter can interfere with your receiver during its operation. In the case of multiple model memory transmitters, you can bind as many Hitec 2.4GHz receivers to your transmitter, one per model memory as necessary. Each module and receiver set is paired at the factory for your convenience.

Use one of the following binding methods to bind additional Hitec 2.4GHz receivers to your transmitter.

Non-telemetry RXs (MINIMA & MICRO Series)

Telemetry RXs

- Press and hold the button on the module, and turn on the transmitter.
- Release the link button.
- Check if the BLUE LED is blinking. If the RED LED is blinking, press the link button for 2 sec., so that the LED changes to BLUE.
- Press and hold the link button on the receiver and turn on the power.
- Both RED and BLUE LEDs will blink rapidly to find the transmitter signal. Release the link button when the RED LED on the receiver glows steady.
- When the link is completed, the BLUE LED on the module will blink while the BLUE LED on the receiver glows steady.
- To save the setting, please reboot both the transmitter and receiver.

When they are turned on again, the RED LED on the module(or radio) and the BLUE LED on the receiver will glow steady.

When they are turned on, the module will blink while the receiver glows steady. For the receiver, both BLUE LEDs will glow steady.

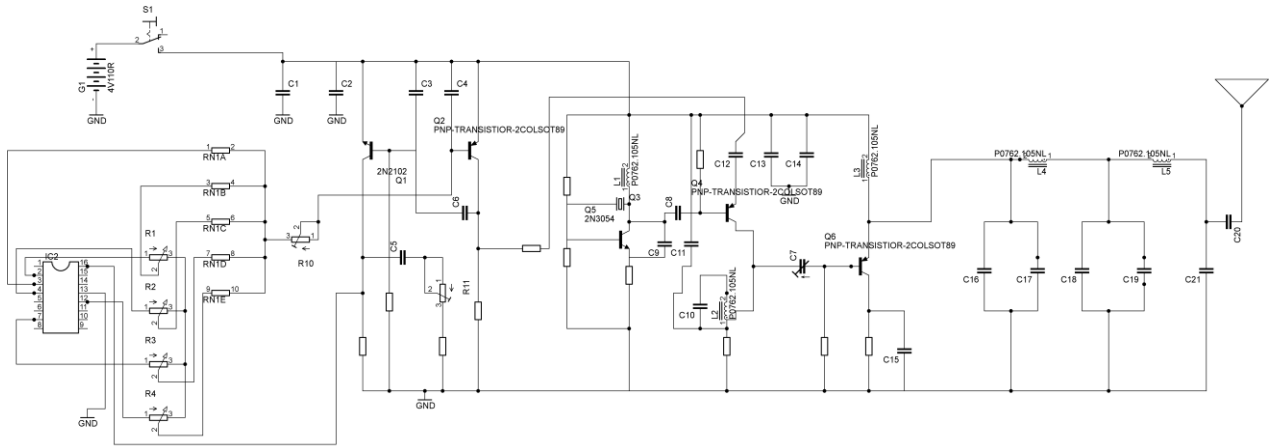
FAIL-SAFE and Hold Mode Setup

If the receiver signal somehow becomes interrupted or interference occurs, the servos will move to the FAIL-SAFE point you previously stored in the FAIL-SAFE set-up. Make sure you set the FAIL-SAFE point properly.

If FAIL-SAFE has not been activated, the signal will switch off after the HOLD period of time, and the servos become "soft" and remain in their last commanded position under no load (full-throttle!), until a valid signal is picked up again.

In the interest of safety, we recommend that the FAIL-SAFE function should always be activated. FAIL-SAFE settings should be selected so as to bring the model to a non-critical situation: electric motor OFF, control surfaces neutral, airbrakes extended, aero-tow release open.

Rangkaian Transmitter (Remote Control)



Rangkaian Receiver

