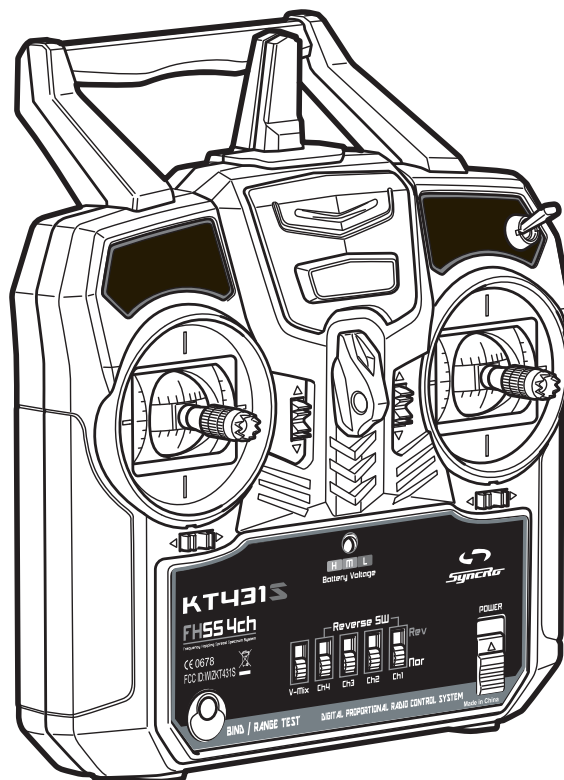




KT431S

Digital proportional radio control system

INSTRUCTION MANUAL



FHSS 4ch
Frequency Hopping Spread Spectrum System

[Http : // www.kyosho.com](http://www.kyosho.com)

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Digital proportional radio control system **KT431S**

1. Introduction

Thank you for choosing the kyosho KT631ST 6 channels 2.4GHz **FHSS** computerized digital proportional RC airplane and helicopter system. If it's your first use of a computerized radio system, this user manual will bring you easily to a new world of fun and sophistication. In all cases, please read carefully and completely this user manual as it contains all information to keep you safe.


2. Services


If you encounter any problem during use, please refer to this manual. If the problem still persists, please contact your local dealer or visit to our service and support website:


<http://www.kyosho.com>

3.Special symbols

Please pay attention to the following symbols when they appear in the manual and read carefully.

 **Danger:** Not following these instructions may expose the user to serious injuries or death.


 **Warning:** Not following these instructions may expose the user to serious injuries.


 **Attention:** Not following these instructions may expose the user to minor injuries and even to serious injuries.


 **Prohibited**


 **Mandatory**

4.Safety guide


 Don't fly at night or in bad weather like rain or thunderstorm as this can cause erratic operation or loss of control.


 Make sure moving direction of all motors be same with the operating direction. If not, please adjust direction first.


 The shutdown sequence must be to first disconnect the receiver battery then to switch off the transmitter, if the transmitter is switched off while the receiver is still powered, it may lead to uncontrolled movement or engine start and may cause an accident.


 In particular, the 2.4G RC system will affect the plane or the car nearby after you turn on the transmitter.


Digital proportional radio control system **KT431S**


 Do not operate outdoors on rainy days, run through puddles of water or use when visibility is limited. Should any type of moisture (water or snow) enter any component of the system, erratic operation and loss of control may occur.

 Do not operate in the following places:
Near other sites where other radio control activity may occur,
Near people or roads,
On any pond when passenger boats are present,
Near high tension power lines or communication broadcasting antennas,
Interference could cause loss of control,
Improper installation of your Radio Control System in your model could result in serious injury.

 Do not operate this R/C system when you are tired, not feeling well or under the influence of alcohol or drugs. Your judgment is impaired and could result in a dangerous situation that may cause serious injury to yourself as well as others.

 Do not touch the engine, motor, speed control or any part of the model that will generate heat while the model is operating or immediately after its use. These parts may be very hot and can cause serious burns.

 Please have an overall check about the model before any operation.
Any problem in radio control system or improper installation may cause out of control.
Simple distance test methods:
One hold the model, and the other one carry the transmitter to a proper place to check the servo system condition.
Please stop operation if any exceptional case occurs.
Please check the model memory to make sure the matching is right.

 Turn on the power, please check if the throttle neutral position is in its lowest position while turning on the transmitter every time. When making adjustments to the model, do so with the engine not running or the motor disconnected, you may unexpectedly lose control and create a dangerous situation.

5.2.4GHz System

AFHDS2A stands for "Automatic Frequency Hopping Digital System 2A". This highly sophisticated radio transmission system will guarantee you a long range, jamming free and long battery life experience. This is the result of years of research and testing and makes Kyosho one of the world leader in the market.

RF specifications:

RF range: 2.4055-2.475GHz
Channel bandwidth: 500KHz
Number of channels: 140
RF power: less than 20dBm
RF mode: AFHDS 2A(Automatic Frequency Hopping Digital System 2A)
Modulation type: GFSK
Antenna length: 26mm*2(dual antenna)
RX sensitivity: -105dBm

Danger:

Misuse of this radio system can lead to serious injuries or death. Please read completely this manual and only operate your radio system according to it.

The 2.4GHz radio band has a completely different behavior than previously used lower frequency bands. Keep always your model in sight as a large object can block the RF signal and lead to loss of control and danger. The 2.4GHz RF signal propagates in straight lines and cannot get around objects on its path. Never grip the transmitter antenna when operating a model as it degrades significantly the RF signal quality and strength and may cause loss of control and danger

Danger:

Always turn on the transmitter first then the receiver. When turning off the system, always turn off the receiver first then the transmitter. This is to avoid having the receiver on itself as it may pick a wrong signal and lead to erratic servo movements. This is particularly important for electric powered models as it may unexpectedly turn on the motor and lead to injuries or death.
A separation distance of at least 20 cm from all persons is required during operation.

6. System Characteristic



This radio system works in the frequency range of 2.4055 to 2.475GHz. This band has been divided into 140 independent channels. Each radio system uses 16 different channels and 140 different types of hopping algorithm. By using various switch-on times, hopping scheme and channel frequencies, the system can guarantee a jamming free radio transmission.



This radio system uses a high gain and high quality multi directional antenna. It covers the whole frequency band. Associated with a high sensitivity receiver, this radio system guarantees a jamming free long range radio transmission.



Each transmitter has a unique ID. When binding with a receiver, the receiver saves that unique ID and can accept only data from that unique transmitter. This avoids picking another transmitter signal and dramatically increases interference immunity and safety.



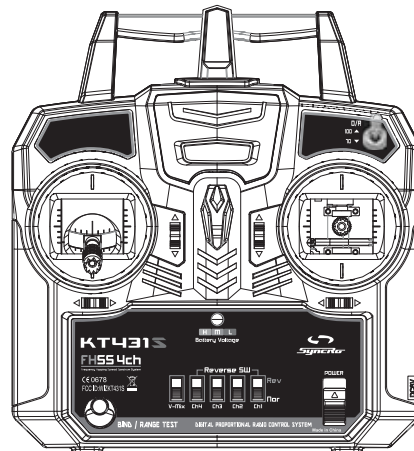
This radio system uses low power electronic components and a very sensitive receiver chip. The RF modulation uses intermittent signal transmission thus reducing even more power consumption. Comparatively, this radio system uses only a tenth of the power of a standard FM system.

7. Transmitter specifications

MODELS: KT431S

Transmitter specifications:

Number of channels: 4
 Model type: fixed-wing/glider/sailboat
 Channel resolution: 1024 steps
 Power supply: 6V (1.5V AA x4)
 Low voltage warning: red LED flashing and alarm less than 4.2V
 Antenna length: 26mm
 Color: Black
 Size: 174*89*190mm
 Weight: 322g
 Certification: CE, FCC

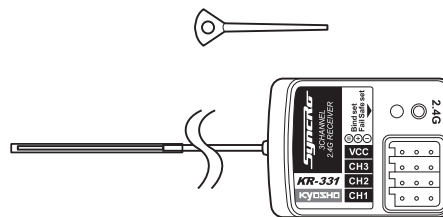


8. Receiver specifications

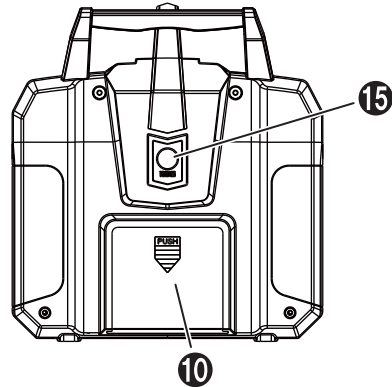
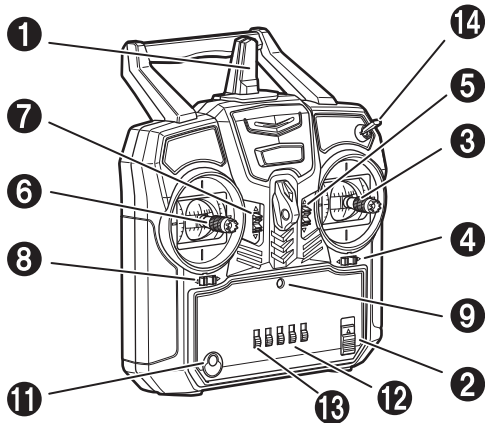
MODEL: KR-331

SPECIFICATIONS :

Number of channels: 3
 Model type: car / boat / sailboat
 RF receiver sensitivity: -105dBm;
 Modulation : GFSK
 2.4G system: AFHDS 2A
 Bind button: yes
 Binding stick: yes
 Power port: yes(VCC)
 Power: 4.0-6.5V
 Weight: 8g
 Antenna length: 26mm
 Size: 34*26*12.5mm
 Color: black
 Certification: CE, FCC.

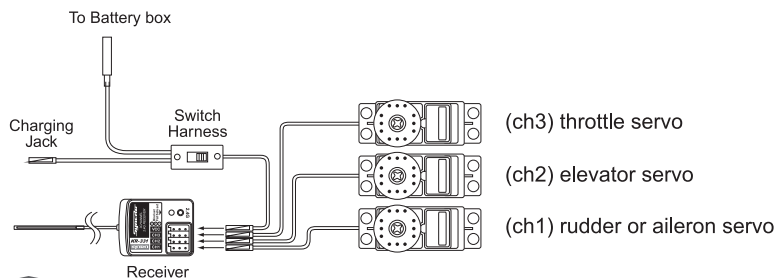


9. Transmitter functions



- | | |
|--|---|
| <p>1 Transmitter Antenna</p> <p>2 Power Switch</p> <p>3 Right Stick
Mode1: Ch1(Left/Right)/Ch3(Up/Down)
Mode2: Ch1(Left/Right)/Ch2(Up/Down)</p> <p>4 Right Stick Trim Switch(Left/Right)
For adjusting the neutral position.</p> <p>5 Right Stick Trim Switch(Up/Down)
For adjusting the neutral position.</p> <p>6 Left Stick
Mode1: Ch2(Up/Down)/Ch4(Left/Right)
Mode2: Ch3(Up/Down)/Ch4(Left/Right)</p> <p>7 Left Stick Trim Switch(Up/Down)
For adjusting the neutral position.</p> | <p>8 Left Stick Trim Switch(Left/Right)
For adjusting the neutral position.</p> <p>9 Battery Level Indicator</p> <p>10 Battery Cover</p> <p>11 Binding Button</p> <p>12 Reverse Switch
For change the servo direction.</p> <p>13 V-Mix Switch
Switch the mixing of rudder and elevator for V-tail airplane.</p> <p>14 D/R Switch
Switch the angle settings of the ch1,2&4(up for 100%,down for 70%)</p> <p>15 Simulator port
Output for simulator</p> |
|--|---|

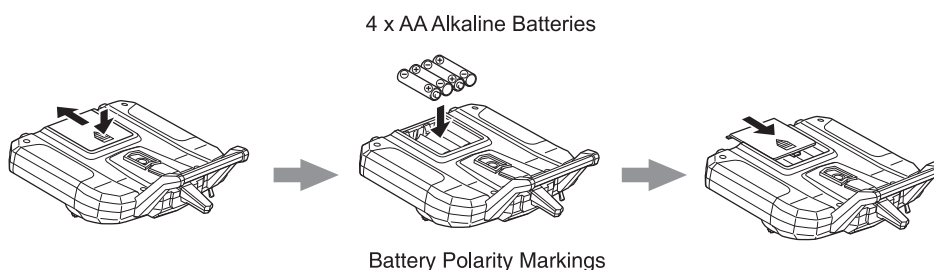
10. Receiver and servo connections



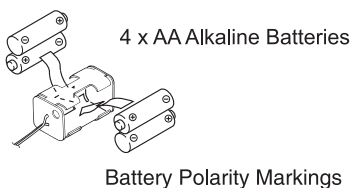
11. Before Operating

11-01. Loading battery

Transmitter



Receiver



11-02. Binding

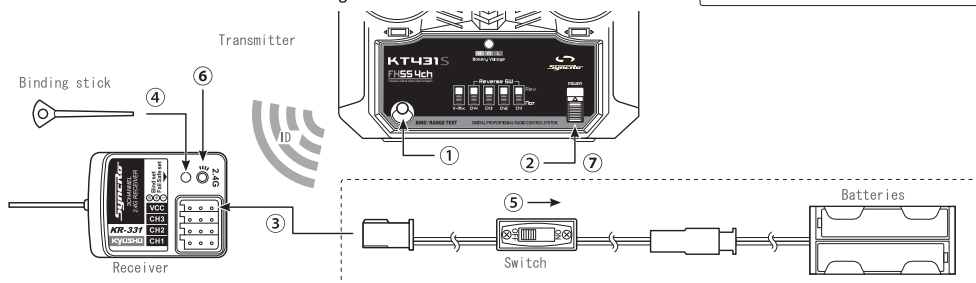
The supplied transmitter and receiver are already bound at production time so you don't need to do it. If you are using another transmitter or receiver, you have to first bind them before use as described below:

Make sure that the transmitter and the receiver is within 1 meter range.

1. Push and hold the BIND switch on the transmitter.
2. Turn on the transmitter switch. LED will start to flash rapidly.
3. Connect the switch connector to VCC slot on the receiver.
4. Use binding stick to press and hold bind set button on the receiver.
5. Turn on the switch of receiver.
6. LED will start to flash rapidly. When the flashing LED turns to fixed light, the binding procedure is complete. The LED on the receiver will flash slowly if the binding procedure is not successful.
7. Turn off the transmitter and turn on again.

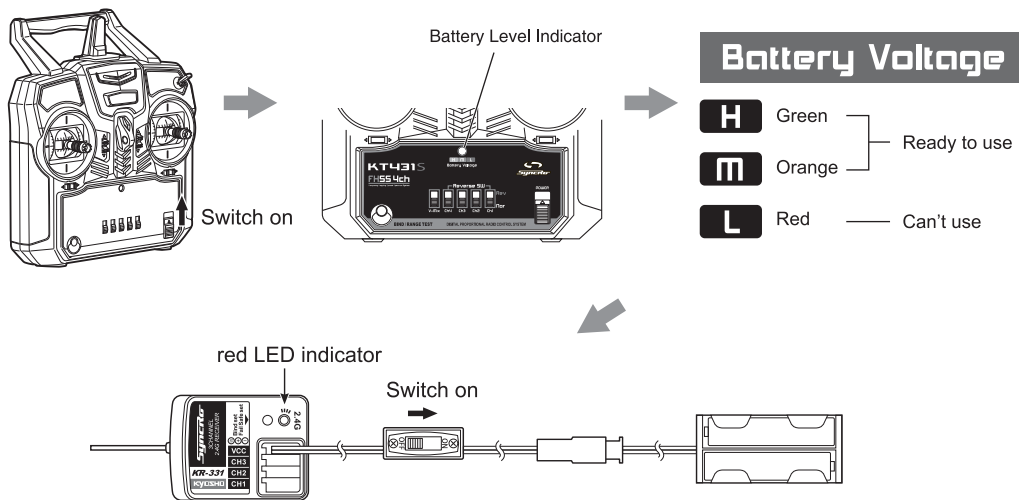
Binding

Binding is a procedure to have the Receiver unit memorize the ID of the transmitter, allowing the transmitter to control or send signals to the receiver. Once the transmitter and receiver have gone through the binding procedure, it will not require the binding procedure again unless the receiver goes through the binding procedure with another transmitter or binding has been cancelled. Binding procedures are done in factory. In case they are not, please go through the binding procedures.



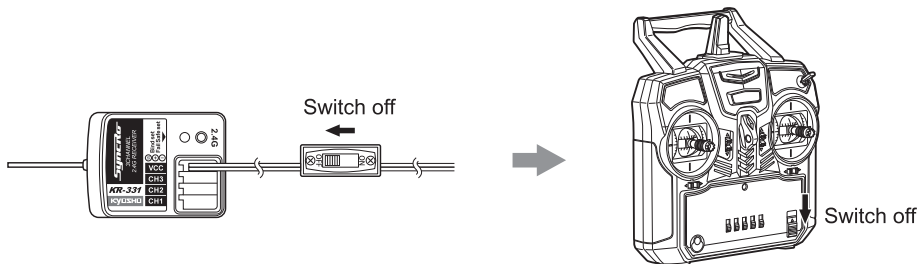
11-03. Power on

1. Switch on the transmitter
2. transmitter LED is solid indicating
3. Connect the receiver battery
4. The receiver red LED indicator is solid indicating the presence of a correct signal
5. Use the radio system








11-04. Shut down

1. Switch off the receiver
2. Switch off the transmitter



12. Packaging content

NO:	Model	Q'ty	Remarks
1	4 channel 2.4G transmitter 	1	
2	3 channel 2.4G receiver 	1	
3	User manual 	1	CD
4	Simulator cable 	1	Optional
5	Servo 	2	Optional

13. FCC Statement

FCC Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example use only shielded interface cables when connecting to computer or peripheral devices).

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.