

SKYDROID 云卓

Quanzhou Skydroid Technology Co., Ltd.



*Tablet or mobile device not included

SKYDROID-T12 V1.0

User Manual

WARNING:

Misuse of this product may result in injury, damage or loss of property. Read the manual carefully before using this product. This item is not a toy. This item is intended for use by professional UAV operators and installers only. Do not use this product if you lack the knowledge and expertise to install and maintain UAV radio equipment. DO NOT use unapproved or unofficial components with this system. Operators must strictly follow the operation guides set forth in this manual. Skydroid does not accept any liability for the use or misuse of this product.

A.Description

1. Product features

- ① Dual antenna plus dual RF module with integrated control algorithms ensuring reliable communication via full angle high gain antennas. The T12 uses the Latest in FHSS (Frequency Hopping Spread Spectrum) technology to achieve perfect control and operation.
- ② Integrated digital video transmission able to achieve up to 20km transmission under SD resolution.
- ③ Internal integrated data link able to achieve up to 30km transmission.
- ④ Parameter adjustments via APP with upgraded traditional OSD to touch panel control.
- ⑤ Link by USB cable. Also supports SBus, PPM, PWM and serial port expandability.
- ⑥ Flight parameters can be adjusted via the APP in your Android Device. It can be linked by USB via the OTG function of compatible devices. You can change all features via the APP. Mode, Nor/Rev, Failsafe, output of sbus and ppm, Baudrate,etc. Data is saved on the Android device ready for use anytime.
- ⑦ Based on the "Tower"APP to ensure optimal compatibility with Pixhawk systems. A large map view allows for easy waypoint selection and route planning including one key return to home. The T12 Also supports Tower, QGC, JIYI, TOPXGUN and BOYING APP.
- ⑧ Internal 4000mah Li-ion battery provides over 25hours operation with 20dbm power output.
- ⑨ Highly integrated data link, Video and control 3 in 1. Small in size. Foldable aluminium alloy phone mount. 360 degree rotation or 180 degree support for adjustment.
- ⑩ A Number of optional cameras can be selected for your application, such as mini digital camera, digital camera with LED, 20 times zoom camera, etc.

2. Main application and range of usage

Specially designed for UAV, Helicopter, Fixed Wing, Multi Rotor or Boat operation. In video transmission (optional camera), Data Link and control of UAV.

3. TYPES, SPECIFICATION

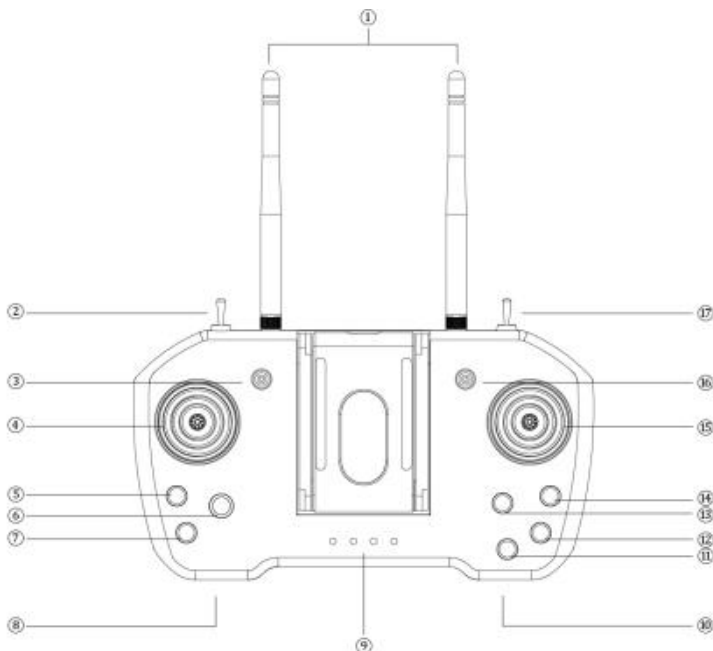
PRODUCT DATA

Controller data			
Model	T12	channels	12
Working voltage	3.7V(1s Li-ion)	Working Current	130mA
Frequency	2.400-2.4833GHz	Modulation	New FHSS
Firmware	APP online	Weight	560g
Dimension	225*123*35mm	Battery Capacitor	4000mA
Duration	25(Hours)	Charge Port	MICRO-USB
Application	Helicopter,Fixed wing,Quadcopter,car,boat		

Receiver data			
Model	R12	channels	12
Working voltage	4.5-5.5V	Working Current	140mA@5V
Dimension	51*41*13(mm)	Weight	14g

4. Order assignment

T12 Controller



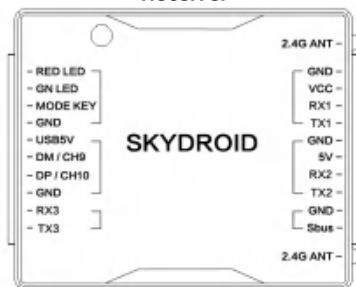
Number Description

Number	Description	Number	Description
1	2.4G 3db antenna	10	USB2/Charge/Data Link
2	Toggle 3 position switch "G"	11	push switch D
3	Toggle 3 position switch "E"	12	push switch C
4	Left stick X1,Y1	13	push switch A
5	Reserved switch(No Function)	14	push switch B
6	Little stick X3,Y3	15	Right stick X2, Y2
7	Power switch	16	Toggle 3 position switch F
8	USB1/Video output	17	Toggle 3 position switch H
9	Power level Lamp①		

① Battery Level LED definition ● ON ○ OFF

Battery Level LED definition				
●	●	●	●	75%–100%
●	●	●	○	50%–75%
●	●	○	○	25%–50%
●	○	○	○	0%–25%

Receiver



Port Description

Part List

Name	Description	Name	Description
RED LED	Red LED	2.4G ANT	Antenna
GN LED	Green LED	GND	Camera port
MODE KEY	Switch	VCC	
GND	Ground	RX1	
USB 5V	USB upgrade port	TX1	
DM/CH9		GND	Data port/Cbus
DP/CH10		5V	
GND		RX2	
RX3	Expansion Port	TX2	Data Port/Sbus
TX3		GND	
		Sbus	
		2.4G ANT	Antenna

Name	Qty	Remarks
T12 Main unit	1 set	
R12 Receiver	1 set	
6p data cable	1 pcs	For data link
Micro USB OTG cable	1 pcs	For video transmission
Type C USB OTG cable	1 pcs	For video transmission
Hexagon key	1 pcs	for phone mount adjustment
Tools	1 set	Change mode
Sticker	2 sheets	Key assignment sticker
stick cap	2 pcs	

Receiver LED status Indication	Receiver Status
Solid Green LED	Connection Normal
Flash slowly Green LED	Disconnected
Flash rapidly Green LED	Binding mode
Solid Red LED	C.Bus mode
Flash slowly Red LED	upgrading
Flash rapidly Red LED	self test failed, re-try or return to factory

5. Environment Condition

PAY ATTENTION

- Environment Temperature: $-10\text{ C} \sim +55\text{ C}$.
 - Storage Temperature: $-25\text{ C} \sim +70\text{ C}$.
 - Relative Humidity: Do not exceed 85%.
 - Atmospheric pressure: 86kPa \sim 106kPa.
- e) Working environment should not contain explosive material or any corrosive or harmful gas that may cause interference in the operation of the product.
- f) Always work under shelter to prevent rain, snow, wind, sand and dust contamination.

6. Working Condition Power supply

Pay attention

T12 series uses a built in Li-ion battery. Charging port is compatible with micro USB 5v chargers (such as cell phone, digital camera USB charger).

In case of smoke, heat or unusual an unusual smell during please stop charging the controller immediately and return to our company for servicing as soon as possible. Do not leave the product unattended while charging. Do not leave the product in a place where children can reach.

DO NOT charge when room temperature over 60 C .

7. Safety

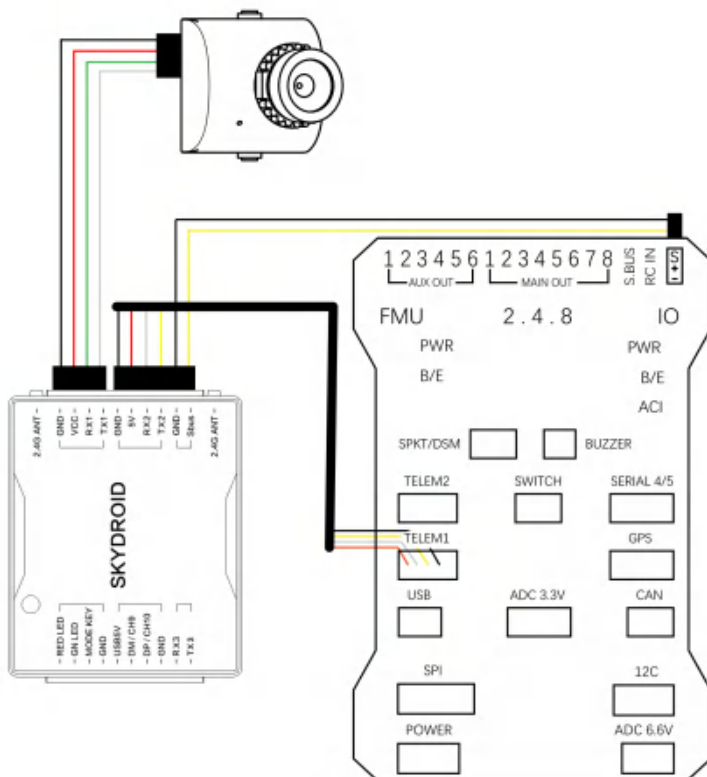
WARNING

Beginners should pay attention for the following! Please read it carefully!

- ⊗ DO NOT fly under the influence of substances, or when tired!
- ⊗ DO NOT fly in strong wind and or rainy conditions!
- ⊗ DO NOT fly close to electric emission towers, communication stations and crowded area!
- ⊗ DO NOT fly nearby airports and other prohibited areas!
- ⊗ DO NOT fly around people or animals, or in any location where possible to damage property
- ⚠ Check equipment before every flight and carry out maintenance and repairs as needed.
- Ⓜ Use certified chargers to charge the batteries.
- Ⓜ DO NOT put unnecessary force on antennas or electronic components to avoid damage.

B.Operation

Please connect Rx as below shown :

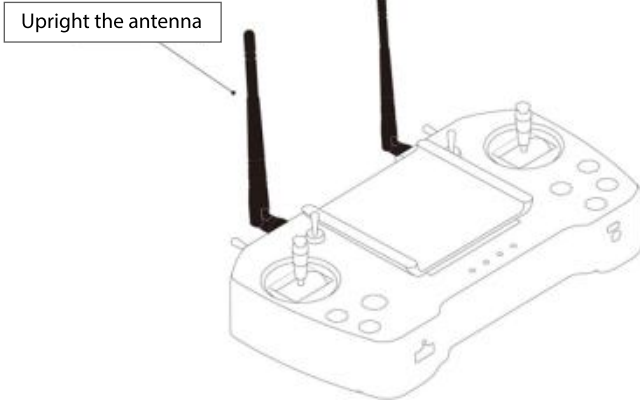


1. Pre-Check and Preparation

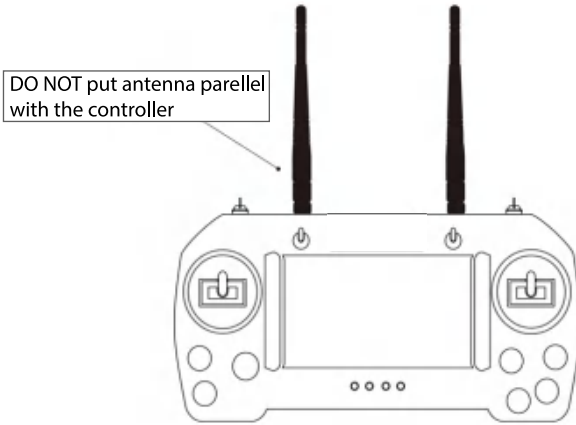
ATTENTION

- ① Check T12 battery level.
- ② Check position of the antenna to get better performance.
- ③ Make sure the firmware is the latest version.
- ④ DO NOT operate under the influence of alcohol or drug.

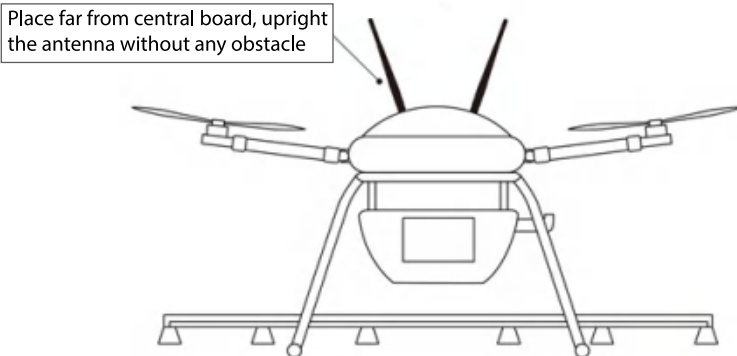
T12 part illustration Correct Position



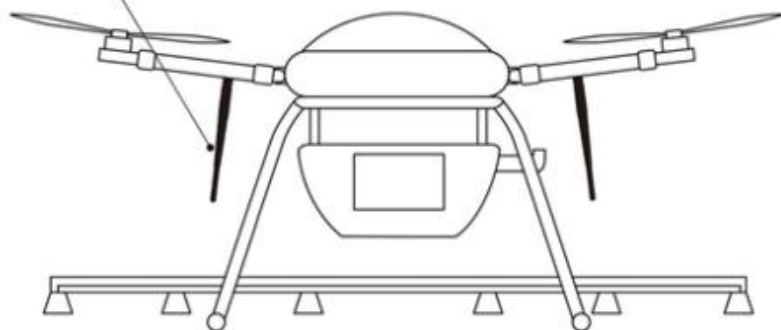
Incorrect operation



UAV Correct antenna position Correct Position

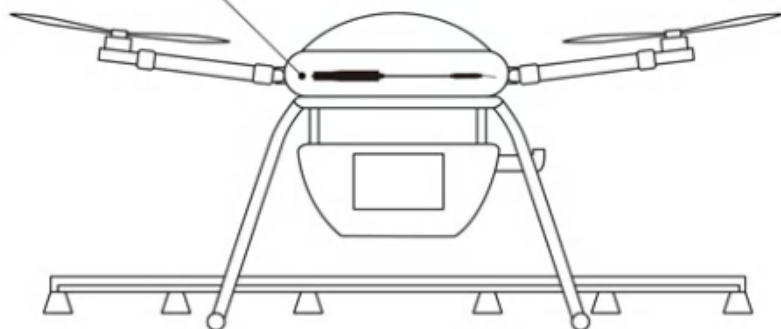


Or put under the drone arm

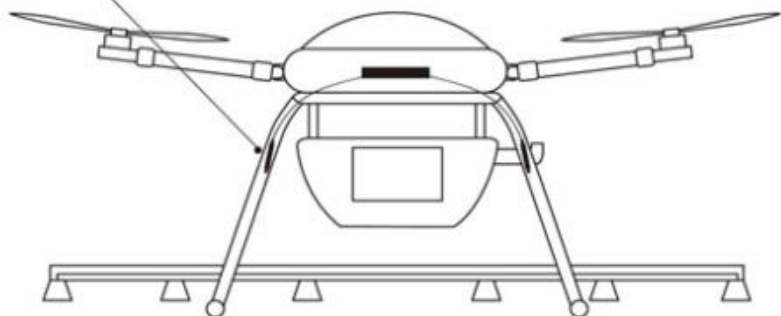


Incorrect operation

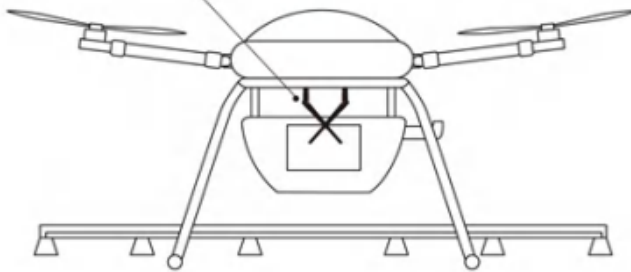
DO NOT put inside of the board



DO NOT place close to Carbon Fiber or Metal part



DO NOT cross the antenna between the central Flight control board and container



2. Operation

Part 1: Connect Device Helper

- 1) Confirm receiver and flight controller are ready, power up to make sure the receiver is running normally.
- 2) Only support Android system.
- 3) Install APP (download from official website www.skydroid.xin: Device Helper).
- 4) Switch on/off the radio (short press and then long press).
- 5) Open Device Helper APP and select Connect USB (Diagram 1), use Micro USB or Type C OTG cable to link up USB1 and cell phone.



(1)

Name	Purpose
Adjust Parameters	Adjust channel Nor/Rev, Channel binding, Failsafe value
Other Options	For selection of sbus,ppm output and baud rate
Hand Settings	Support 4 different types of hand mode
Update Device	For online firmware upgrade

- 6) Adjust parameter: enter controller interface. APP read the current data of controller and receiver.(Diagram 2)



(2)

Example:

Channel 1: X2 has no Rev, Failsafe value is set to be 1500, min travel is 1000, max is 2000.
 Channel 2: Y2 has no Rev, Failsafe value is set to be 1500, min travel is 1000, max is 2000.
 Channel 3: Y1 has no Rev, Failsafe value is 900, min travel is 1000, max is 2000.
 Channel 4: X1 has no Rev, Failsafe value is set to be 1500, min travel is 1000, max is 2000.
and vice versa, view adjustment horizontally is much easier for setting. Just tick related item.

Attention

- ① Please select the value between 900-2100, Failsafe hold select "0".
- ② Please click SAVE at the right upper corner to keep the record. The selected value will be written to the controller and receiver.

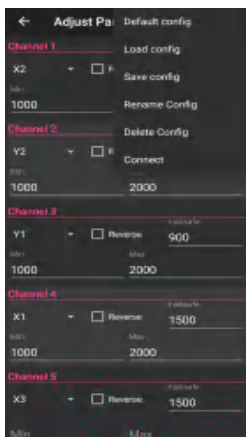
7) Save and download the data (Diagram 3,4,5).

In order to quicker change from model to model, or large scale set up, we can save the data in the APP so that you can find it out easily.

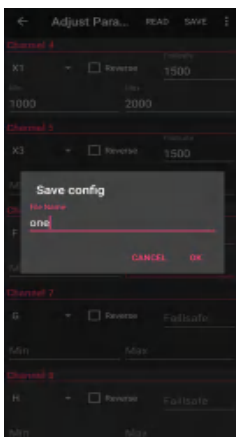
As illustrated: when finished the adjustment, click "⋮" then Save Configuration.

Then rename the model and save it. Same as download the data.

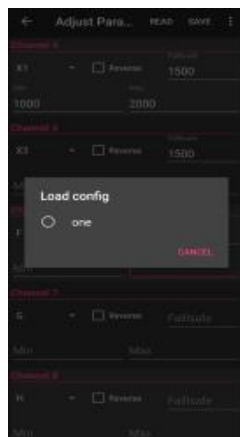
Attention: Adjusted parameter only save in the APP, Click "write" to load data to the controller. Sound "Di" means communication succeeded.



(3)



(4)



(5)

Part 2 : Receiver, Flight controller connection and set up

- 1) Binding: First, short mode key and GND to enter binding mode, Green LED flash quickly then power up the controller. Binding succeed when Green LED turns solid. Second, fast power up the receiver five times, the sixth enter the binding mode, Green LED flash quickly then power up the controller. Green LED turns solid, binding succeeded.
- 2) Data link pin as illustrated, use attached wire or DIY connector to flight control board. Tx pin of receiver to Rx pin of Flight control board.
- 3) Failure LED indication:
 - Receiver self detection failed when Red colour LED flash rapidly, re-try or return to factory for servicing.
 - Red and Green LED flash once alternately, self detection passed.
 - Self detection succeed but Green LED off, Controller is power off or not binding.
 - Fail to power on: check 5 volt output, if no output return to factory for servicing.

Part 3 : T12 Connect to Android phone

- 1) Connection between receiver and camera (example: mini digital camera), Power up the system. Please watch the video of connection in www.skydroid.xin.
- 2) Please go to www.skydroid.xin to download the Skydroid FPV.
- 3) Use USB-OTG cable come with the kit to link up the controller and Android phone.
- 4) Click "Yes" to confirm then image will show on your phone.
- 5) Use of Skydroid FPV please go to the official website.

Part 4: How T12 connect to PC missionplanner, QGC

- 1) Use two USB connectors cable to link between USB1 and USB port in PC. Select the port related to the ground station. Please select Baud Rate 115200 to link with the data port of the flight controller. (QGC, missionplanner need to add SDK of Skydroid to show image, undevelopment).
- 2) Use Micro data cable to connect USB2 and PC, select baud rate 57600 (Only support data, not for video).

Part 5: How T12 to update firmware

1) Android update

Download and install Device Helper before upgrade.

2) Controller upgrade: download Device Helper and use the USB-OTG cable to link with the controller and choose USB as mentioned at part 1.

Open the Device Helper, select Controller Firmware upgrade see any new update. If any, please update.

3) Receiver upgrade: Open the Device Helper, use USB-OTG cable to link up the controller and select connection USB. Power up the controller and receiver (Green LED light solid).

Check if any new update, if any, please update.

Part 6: Q & A

Q: What is the Video/Data distance of T12 in transmission?

A: Under an open area, the max distance of video link is 20km while data link is 30km.

Q: Does T12 support ppm, sbus?

A: Yes! Sbus port is defaulted in the first row. If you need ppm signal which can be switched in Device Helper App.

Q: How to define two antenna on T12?

A: Two antenna are 2.4ghz redundant design. We use diversity technology so both antenna perform data link and transmission.

Q: How to define two antenna on receiver?

A: Two antenna on Receiver are redundant design and telemetry.

Q: How to charge T12?

A: Use micro USB cable come with T12. Please use certified 5v charger. LED status: LED flashing during charging and off when it is full.

Q: Where to watch demonstration video of T12?

A: Please visit <http://www.skydroid.xin> and watch the video.

Q: How to power on/off the T12?

A: Short press and then long press the power switch.

Q: No LED indication on the receiver when plug into the flight control board?

A: T12 is power off; if the case still exist, check battery status(short press power switch to check the battery level), if not binding, then bind it.

Q: How to change Mode?

A: Monitor system linked up with the radio by OTG, then open Device Helper to select mode 1 or mode 2 and saved. No need to set the others.

Q: How to calibrate neutral of the gimbal?

A: Calibration (watch video), please visit www.skydroid.xin.

Q: How many times of command being send out per second?

A: 300 times per second.

Q: Does T12 bind with new receiver?

A: T12 send binding signal with ID to bind a new receiver. Once binded the new one, old receiver need to rebind afterwards.

Q: what is the definition of the sound buzzer?

A: 3 short beep-power on. 4 short beep- binding succeeded, continues short beep-battery low level; slow continues beep-receiver not turn on or disconnected.

C. Maintenance, Servicing

Storage for not using certain period

Put T12 a dry and ventilated area. No direct Sun light to prevent harm to the internal Lipo battery. If store it over three months, it is highly recommended to put room temperature between 22C to 28C. DO NOT put it below 20C or higher than 45C area.

D. Transportation, Storage

WARNING

In order to prevent lost or getting hurt, Please strictly follow the rules of operation:

Keep small parts or wire away from children can reach. DO NOT let children touch the small parts of T12.

ATTENTION

- 1) DO NOT put T12 into water. If it does, please switch off the power and dry it.
- 2) DO NOT crash the T12 or break the battery is prohibited.

E. Scan the QR code to download the APP

If download failed, search www.skydroid.xin



Device Helper



Skydroid FPV



Skydroid Tower

Device Helper—in use of adjustment of radio parameter, firmware upgrade, save models, mode change, etc.

Skydroid FPV—in use of linking Skydroid video, floating window can be top of others App(need to turn on floating window feature in Android system), use for VR, Video capture and Data rate adjustment).

Skydroid Tower— optimised by tower 4.0, can connect to mavlink protocol of APM, PX4 flight controller to realise waypoint data telemetry. Also has video serial port (similar to DJI go).

ATTENTION

You need to wire connect with the Skydroid FPV to open the floating window. Activate QGC and connect with bluetooth to start telemetry. In the future, when QGC join Skydroid SDK then the operation will be as simple as Skydroid Tower. No need to connect bluetooth and no need to multiply another APP on QGC. Very simple. Highly recommend to use Skydroid tower.

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.

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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

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