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MADE IN CHINA



RETEVIS

RT97 REPEATER

USER'S MANUAL

To users:

Welcome to choose our company repeater. We will provide you with the reliable , clearly , efficient communication service. In order to let you learn more functions, usage and maintenance method about this repeater, please read this manual carefully before you use the product.

- Please keep the manual , in order to offer reference or use of this product
- In order to safeguard the legitimate rights and interests of you from infringement, please seriously truthfully fill in when buying the company's products(with repair service card), and ask for the purchase vouchers of real and effective.
- This product relates to upgarde or improve, the company reserves without prior notice to change this manual at any time above the rights of software and harware specifications
- All specifications mentioned are only for reference.
- Although all words are carefully check, it is hard to avoid errors, the company reserves the final explanaztion.

Safety Information to Users

For your efficient and safe use of this repeater, please read the following information carefully.

- This repeater input power is DC12V~24V.
- The maintenance of this repeater can be only operated by Professional technician, Self-disassembly is not allowed.
- To avoid EMC interference or EMC compliance problem, please do not install and use this repeater on the places where are sticking the labels “Please Turn Off the Radio” .
- When in the car with airbags, do not install the repeater in the area where the airbags may be functioning.
- When approaching the blasting area and the detonator area, please turn off the repeater first.
- You are forbidden to operate this repeater in flammable and explosive environments.
- Please do not place this repeater at a wet,rainy or overabundance of dust areas.
- Please do not expose this repeater to direct sunlight for a long time or near the heating devices.
- When install the repeater antenna outdoor, the lightning arrester must be install Firstly then connected to the antenna, and the chassis must be reliably grounded to prevent lightning.

Contents

Unpacking and Checking Equipment 01

Supplied Accessories 01

Get Familiar with the Repeater 02

Basic Operation 04

Application Area 04

Features 05

Safety Information To Users 05

Technical Parameters 06

Troubleshooting Guide 08

Unpacking and Checking Equipment

Welcome to use this repeater, before using we suggest you

- Please check the packing box of this product and see if there any sign of damage
- Please open the packing box carefully, we recommand that you identify the items

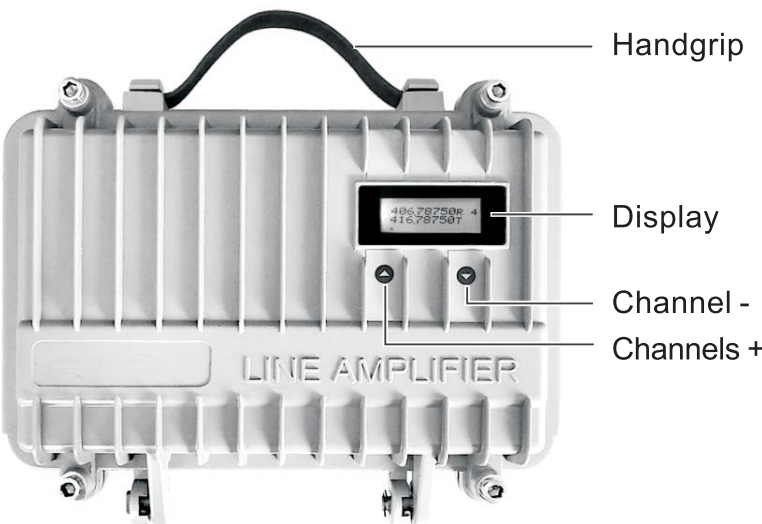
listed in the following packing list. If you find that our product and its accessories in handing are lost or damaged during the shipment, please contact dealers immediately.

Supplied Accessories

Item	Quantity
Repeater	1
Charger	1
Power Supply	1
Car Charger Cable	1
Programming Cable	1
User's Manual	1



Get Familiar with the Repeater



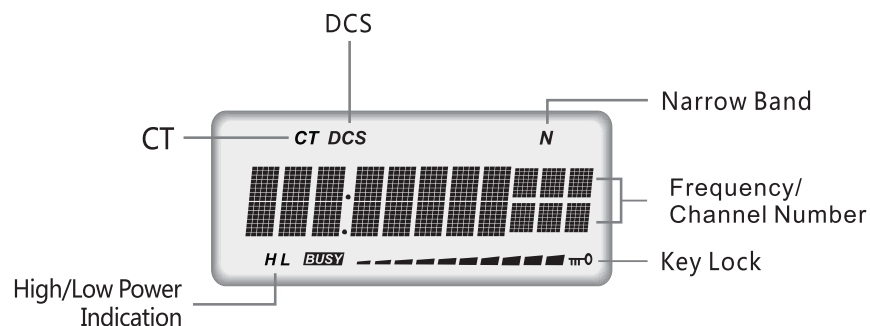
Note:

- Short press ▲ to increase Channel
- Long Press ▲ to indicate the current channel CTCSS/DCS frequency
- Short press ▼ to decrease Channel
- Long Press ▼ to lock/unlock the keypad

LCD Screen

On the screen, you can see different icons which represent the selected functions.

Sometimes you may not remember the settings on handheld transceiver , and at this time,you will find the below chart will be much helpful.



Note: ----- Repeater Indication



Power /
program frequency



ANT

Basic Operation

- Turn on/off the repeater

To turn on the repeater, connect the adapter to the power supply, the screen will display purple; To turn off the repeater, disconnect the adapter from the power supply.

- Select Channel

This repeater can be programmed 16 channels, press + or - to change the channel number.

- Transmit and Receive:

Repeater's TX frequency and RX frequency are different, repeater will TX the signal which they RX in current channel, and repeater will gain the weak signal to high signal, so that enlarge the communication range.

Application Area

- Communication signal coverage of underground parking lots and storeys in property communities.
- Communication signal coverage of the dead zones of hotels, KTV and other entertainment venues.
- Communication signal coverage of the front and rear cars of the moving fleet.
- Communication signal covering of mining, ports, forest and enterprises, etc.

Features

- Small and compact, solid and dust-proof.
- Simple and convenient installation, flexible operation, can be operated as fixed or mobile.
- Multi working power selection, working with the matching power adapter, and also can work under DC12V~24V power or car power.
- The use of antenna can be selected according to actual demand.

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- To avoid EMC interference or EMC compliance problem, please do not install and use this repeater on the places where are sticking the labels “Please Turn Off the Radio” .
- When in the car with airbags, do not install the repeater in the area where the airbags may be functioning.
- When approaching the blasting area and the detonator area, please turn off the repeater first.
- You are forbidden to operate this repeater in flammable and explosive environments.

- Please do not place this repeater at a wet,rainy or overabundance of dust areas.
- Please do not expose this repeater to direct sunlight for a long time or near the heating devices.
- When install the repeater antenna outdoor, the lightning arrester must be install Firstly then connected to the antenna, and the chassis must be reliably grounded to prevent lightning.

Technical Parameters

Specifications

Frequency Range	V/U: 136-174/400-470MHz
	GMRS: 462.5500-462.7250 MHz
Channel Capacity	16CH
Channel Spacing	V/U: ±12.5KHz Narrow/±25kHz Wide
	GMRS:±12.5KHz Narrow/±20KHz Wide
Operating Voltage	DC12V ~24V
Operating Temperature	-30°C~ +60°C
Frequency Stability	±2.5ppm
Antenna Impedance	50Ω
Dimension	200*85*240mm
Weight	2kg

Transmitter

Power Output	5W
Modulation	F3E
Spurious Emission	-60dB or less
Maximum Frequency Deviation	Wide: $\pm 5\text{kHz}$ Narrow: $\pm 2.5\text{kHz}$
Audio Distortion	5% or less
FM Noise	Wide: $\leq 45\text{dB}$ Narrow : $\leq 40\text{dB}$

Receiver

Sensitivity(12dB SINAD)	0.2 μV (Wide) 0.25 μV (Narrow)
Squelch Sensitivity	0.15 μV (Wide) 0.2 μV (Narrow)
Adjacent Channel Selectivity	$\geq 70\text{dB}$ (Wide) / $\geq 65\text{dB}$ (Narrow)
Intermodulation	$\geq 55\text{dB}$
Spurious Rejection	$\geq 55\text{dB}$
Image Rejection	$\geq 55\text{dB}$
FM Ham and Noise	$\leq -45\text{dB}$ (Wide) / $\leq -40\text{dB}$ (Narrow)
Modulation Type	F3E
Operating Bandwidth	$\leq \pm 7\text{KHz}$ / $\leq \pm 5\text{KHz}$
Audio Distortion	$\leq 5\%$

Troubleshooting Guide

Common Problem	Solution
LCD no display Repeater can not be power-on	Checking the power cord and adapter
The repeater can not receive intercom signal	1. The connector of RF cable is loosed 2. Antenna or cable is damaged 3. Talking range is exceed repeater effect range
Front part of the speech is not been relayed	Enter PTT in 0.5s then begin speaking, Delay speech to allow the system delay: System delay owing to: 1. CTCSS/CDCSS decode 2. Requirements for signaling systems
User can not received the signal from Repeater send out	1. The connector of RF cable is loosed 2. Antenna or cable is damaged 3. Talking range is exceed repeater effect range

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Guarantee

Remarks:

1. This guarantee card should be kept by the user, no replacement if lost.
2. Most new products carry a two-year manufacturer's warranty from the date of purchase. Further details, please read at <http://www.retevis.com/after-sale/>
3. The user can get warranty and after-sales service as below:
 - Contact the seller where you buy the product.
 - Products Repaired by Our Local Repair Center
4. For warranty service, you will need to provide a receipt from the actual seller for verification

Exclusions from Warranty Coverage

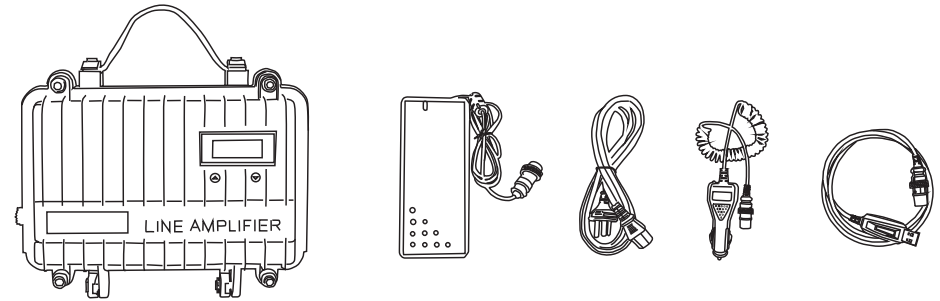
1. To any product damaged by accident.
2. In the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs.
3. If the serial number has been altered, defaced, or removed.

1.Initial installation

1.1 Installation of the repeater

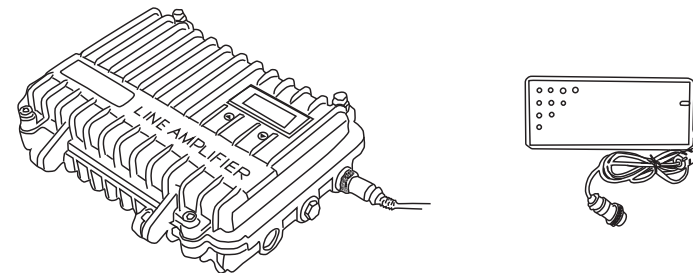
When installing this repeater, please choose a safe, convenient and well-ventilated location that avoids direct sunlight

- (1) Unpack and take out the repeater and accessories.



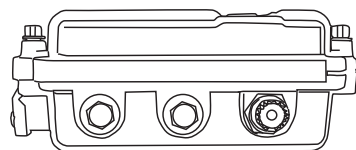
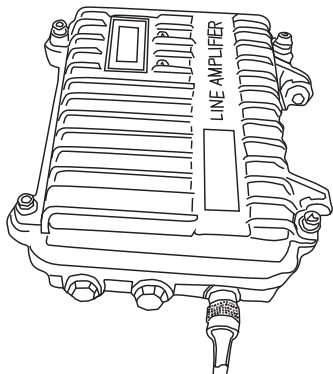
- (2) Power cable connection

Insert the end of the four-hole socket of the power cable in the accessory into the four-pin plug on the side of the relay, and press it tightly. Tighten the screws and connect the other end to the power adapter.



(3) Antenna connection

First, install a highly and precisely tuned antenna. The success of the installation depends on the type of antenna and the correct installation process. If the antenna system is selected and installed carefully, the repeater will achieve perfect operation results.



Guarantee

Model Number:

Serial Number:

Purchasing Date:

Dealer:

Telephone:

User's Name:

Telephone:

Country:

Address:

Post Code:

Email:

Remarks:

- 1.This guarantee card should be kept by the user, no replacement if lost.
- 2.Most new products carry a two-year manufacturer's warranty from the date of purchase. Further details, pls read <http://www.retevis.com/after-sale/>
- 3.The user can get warranty and after-sales service as below:
 - * Contact the seller where you buy.
 - * Products Repaired by Our Local Repair Center
4. For warranty service, you will need to provide a receipt proof of purchase from the actual seller for verification

Exclusions from Warranty Coverage:

1. To any product damaged by accident.
2. In the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs.
3. If the serial number has been altered, defaced, or removed.



ATTENTION!

Before using this radio, read this guide which contains important operating instructions for safe usage and RF energy awareness and control for compliance with applicable standards and regulations.

Local Government Regulations

When the radios are used as a consequence of employment, the Local Government Regulations requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your Retevis radio has a RF Exposure Product Label. Also, your user manual, or separate safety booklet includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

Compliance with RF Exposure Standards (If appropriate, Reference to the actual product's Safety Marking)

Your Retevis radio is designed and tested to comply with a number of national and International standards and guidelines (listed below) for human exposure to radio frequency electromagnetic energy.

FCC ID The FCC ID means: This radio complies with the IEEE (FCC) and ICNIRP exposure limits for "occupational/controlled Use Only" RF exposure environments at operating duty factors of up to 50% talk-50% listen and is approved

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

The radio operates on GMRS frequencies which require an FCC (Federal Communications Commission) license. You must be licensed before operating your radios. Licenses are issued for a ten-year term and can be renewed between 90 days prior to the expiration date and up to the actual expiration date of the license. If you receive a license, any family member, regardless of age, can operate GMRS stations and units within the licensed system.

To obtain a license, you need FCC Form 605 & 159, we suggest visiting the FCC website at <https://www.fcc.gov/wireless/support/fcc-form-605>, which includes necessary instructions. More questions about the license application, please contact the FCC at 1-888-225-5322 or go to the FCC's website: <http://www.fcc.gov>.

operation of the device.

RF Exposure Compliance and Control Guidelines and Operating Instructions

To control your exposure and ensure compliance with the occupational/controlled environment exposure limits, always adhere to the following procedures.

Guidelines:

- User awareness instructions should accompany the device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

Operating Instructions:

- Transmit only when people outside the vehicle are at least the recommended minimum lateral distance away from a properly installed according to installation instructions, externally mounted antenna.
- When operating in front of the face, always place the radio in a Retevis approved accessories for this product. Using approved accessories is important because the use of Non-Retevis approved accessories may result in exposure levels, which exceed the IEEE/ICNIRP occupational/controlled environment RF exposure limits.
- If you are not using a body worn accessory and are not using the radio in the intended use position, in front of the face then ensure the antenna and the radio are kept prescribed enough

distance from the body when transmitting. Keeping the radio at a proper distance is important because RF exposures decrease with increasing distance from the antenna.

Electromagnetic Interference/Compatibility

NOTE: Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed, or otherwise configured for electromagnetic compatibility.

Avoid Choking Hazard



Small Parts. Not for children under 3 years.

Turn off your radio power in the following conditions:

- Turn off your radio in areas that are sensitive to electromagnetic radiation such as: Near electrical blasting caps, in a blasting area, in explosive atmospheres (flammable gas, dust particles, metallic powders, grain powders, etc.).
- Turn off your radio while taking on fuel or while parked at gasoline service stations.



WARNING

To avoid electromagnetic interference and/or compatibility conflicts

- Turn off your radio in any facility where posted notices instruct you to do so, hospitals or health care facilities (Pacemakers, Hearing Aids and Other Medical Devices) may be using equipment that is sensitive to external RF energy.

- Turn off your radio when on board an aircraft. Any use of a radio must be in accordance with applicable regulations per airline crew instructions.

Avoid Burns

Antennas

- Do not use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with the skin when the radio is in use, a minor burn can result.



WARNING

Long transmission

- When the transceiver is used for long transmissions, the radiator and chassis will become hot.

Safety Operation

This radio is designed for and classified as **“Occupational/Controlled Use Only”**, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards; NOT intended for use in a General population/uncontrolled environment.



WARNING

- DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this

- radio, and the antenna gain shall not exceed specified gain by the manufacturer declared.
- DO NOT transmit for more than 50% of total radio use time, more than 50% of the time can cause RF exposure compliance requirements to be exceeded.
 - During operation, the separation distance between user and the antenna shall be at least specified distance, this separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements
 - During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so.

Approved Accessories



WARNING

- This radio meets the RF exposure guidelines when used with the Retevis accessories supplied or designated for the product. Use of other accessories may not ensure compliance with the RF exposure guidelines and may violate regulations.
- For a list of Retevis-approved accessories for your radio model, visit the following website: <http://www.retevis.com>

**This radio is designed for and classified as
“General population/uncontrolled Use”**

- DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio, and the antenna gain shall not exceed 7.2dBi by the manufacturer declared.
- DO NOT transmit for more than 50% of total radio use time, more than 50% of the time can cause RF exposure compliance requirements to be exceeded.
- During operation, the separation distance between user and the antenna shall be at least 36.37cm, this separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements
- During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

For a Class B digital device or peripheral, if applicable.

NOTE: 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.