

## **THANK YOU!**

Thank you for your purchase of HYT TR-800 Repeater. This easy-to-use repeater will deliver you instant and reliable communications at peak efficiency. Please read this manual carefully before use. The information presented herein will help you to derive maximum performance from your repeater.

### MODELS COVERED IN THIS MANUAL

TR-800 VHF Repeater

TR-800 UHF Repeater

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## Safety and General Information

The following general safety precautions as would normally apply, should be observed during all phases of operation, service and repair of this equipment.

- ◇ This equipment should be serviced by qualified technicians only.
- ◇ Do not modify the radio for any reason.
- ◇ To avoid electromagnetic interference and/or compatibility conflicts, do not operate your radio when you are near 380V AC mains or above.
- ◇ For vehicles with an air bag, do not place a repeater in the area over an air bag or in the air bag deployment area. Air bags inflate with great force. If a repeater is placed in the air bag deployment area and the air bag inflates, the radio may be propelled with great force and cause serious injury to occupants of the vehicle.
- ◇ Turn off your repeater prior to entering any area with a potentially explosive atmosphere.
- ◇ To avoid possible interference with blasting operations, turn off your radio when you are near electrical blasting caps, in a blasting area, or in areas posted: "Turn off two-way radio." Obey all signs and instructions.
- ◇ Do not charge your back-up battery in a potentially explosive atmosphere
- ◇ Do not expose the repeater to direct sunlight over a long time, nor place it close to heating source.
- ◇ Do not place the repeater in excessively dusty, humid areas, nor on unstable surfaces
- ◇ Connect to the lightning arrester prior to the antenna which is installed outside the building, and the chassis or equipment housing must be connected to an absolute earth ground, to minimize any possible shock hazard from lightning strike.
- ◇ Please make sure no stress on the antenna joint during transportation or installation.

### **Caution:**

This equipment generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the owner's manuals, can cause interference to radio communications.

## Product Inspection

Before unpacking the TR-800 repeater, please inspect the packaging for signs of damage and report any damage to your dealer.

Upon unpacking of the TR-800 repeater, please ensure that all items shipped were received, report any missing or damaged items to your dealer.

Please power on the repeater to check whether the fan works normally. Any damage of the fan during packaging or shipping will impact performance of the repeater.

<b>Item</b>	<b>Qty. (PCS)</b>
AC Power Cable	1
DC Power Cable	1
Spare ATO Fuse	1
Duplexer Bracket	1
Screws	8
Hex Nuts	4
RF Jumper Cable	1
Owner's Manual	1

## **Performance**

The TR-800 is not a high performance repeater, unable to work with 100% continuous duty cycle, but able to withstand constant use. Equipped with switching power and repeater controller, the desktop repeater TR-800, is designed for indoor or fixed vehicle application where protection from the elements (rain, humidity, etc) can be provided.

The fan is continuously variable, which minimizes noise in office or duty room environments while providing maximum cooling at elevated ambient temperatures or during heavy transmit duty cycles. It may have a surprisingly lower power slump when keyed for long periods in an office or shop environment.

## **Accessories**

Your repeater comes with accessories including duplexer, microphone and antenna.

### **Duplexer**

The duplexer allows the TR-800 receiver and transmitter to operate simultaneously in the same frequency band with a single antenna and feed line. Without the duplexer installed in the TR-800, it would be necessary to use two antennas spaced apart, with one connected to the receive radio and the other to the transmit radio. The positioning can vary from different models approved by HYT.

### **Microphone**

The TR-800 can be used as base station in some occasion, where the microphone is required for dispatch application. There are two options available: palm microphone for mobile dispatch and desktop one for fixed application.

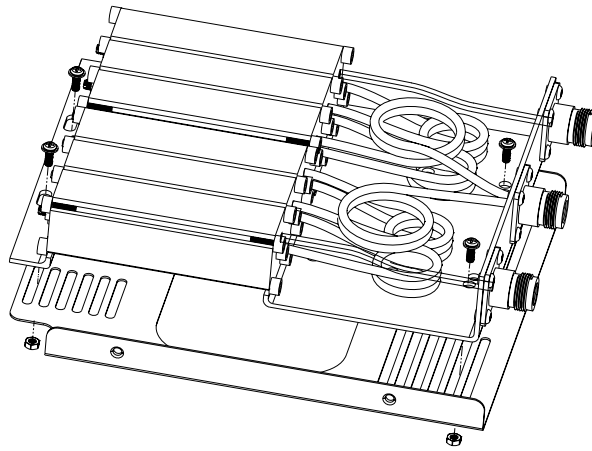
### **Antenna**

When using two separate antennas, make sure enough physical spacing between transmit and receive antennas to yield at least 70dB isolation based on transmit and receive frequency separation. Generally, vertical spacing provides better isolation yet shorter physical spacing than horizontal spacing. HYT omni-directional antenna and mobile antenna are available.

## **Installing Accessories**

### **Installing Duplexer Option**

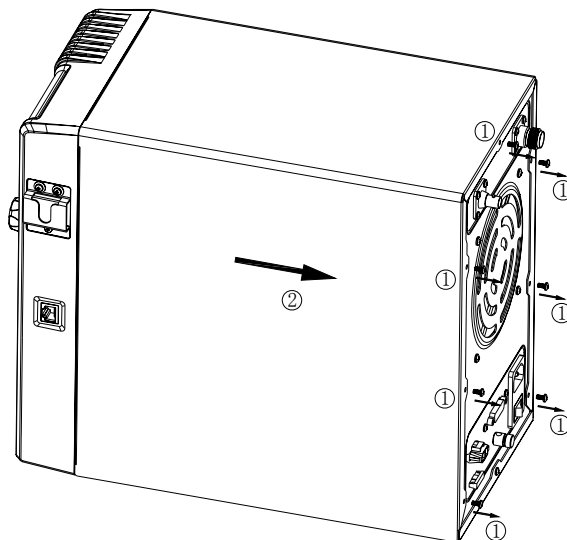
Secure the duplexer on the bracket using four pan-head screws and four hex nuts, the duplexer mounting position may vary from different repeater models, shown as Figure 1.



**Figure 1**

### **Installing Duplexer Bracket**

1. Remove the seven screws ① that locking the top cover of repeater, shown as Figure 2.
2. Remove the top cover ②, shown as Figure 2.
3. Place the duplexer on the housing ③, make sure its four screw holes match those on the housing, shown as Figure 3.
4. Secure the duplexer using four screws ④, shown as Figure 3.



**Figure 2**

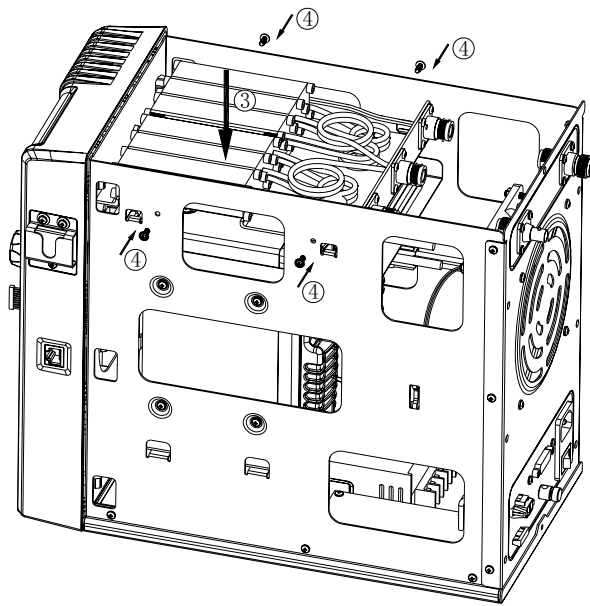


Figure 3

### Installing RF Jumper Cable

When using duplexer, RF cable is required to connect the antenna connector on duplexer ① with the antenna adaptor (N type) on the back of TR-800 ②, shown as Figure 4, this antenna connector is used for both transmitting and receiving.

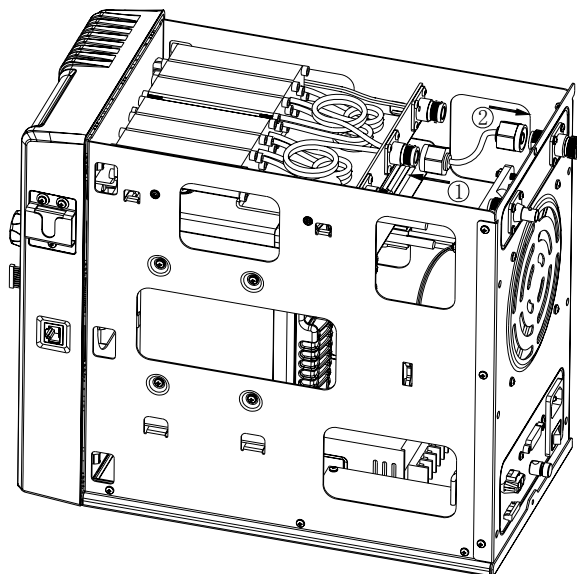


Figure 4

### Attaching Microphone Option

Plug the microphone into the RJ45 connector ① located on the side of front panel. Hang up the microphone on the hook ② located on the side of repeater when the microphone is not in use, shown as Figure 5.

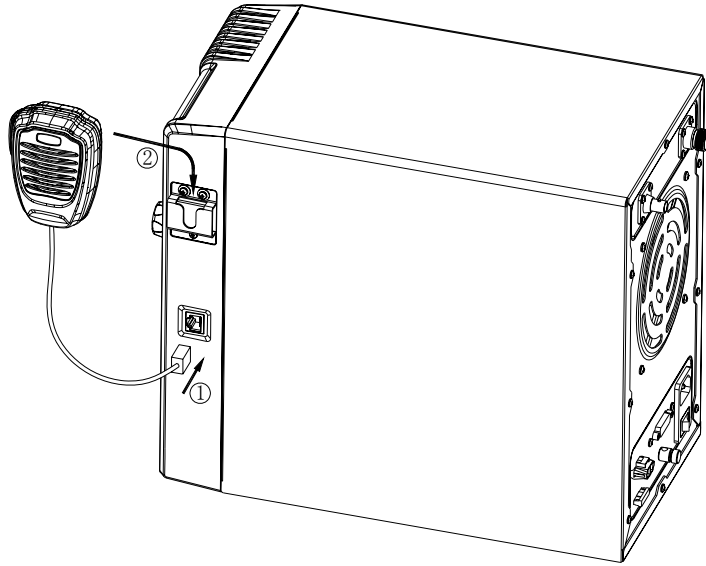
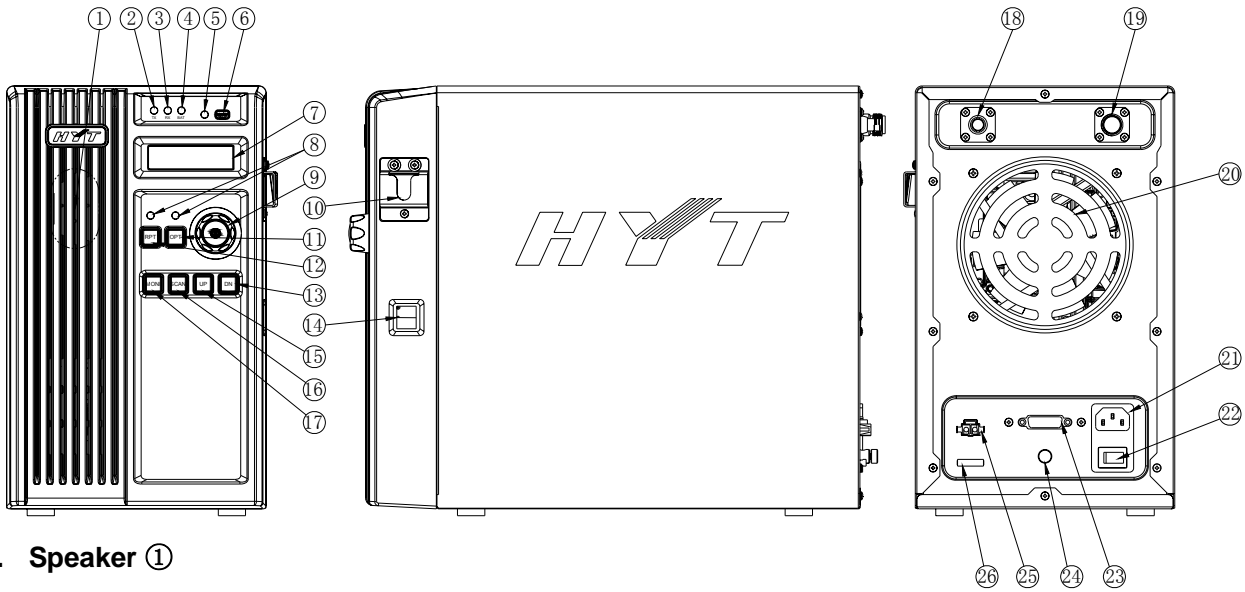


Figure 5



## Repeater Overview



### 1. Speaker ①

### 2. LED Indicators

Red LED ② lights while the main radio is transmitting, and flashes while receiving.

Green LED ③ lights while the slave radio is transmitting, and flashes while receiving.

Dark red LED ④ lights while DC power supplies and the AC power fails.

Orange LED ⑤ lights while the repeater in setup state and goes out while in knockdown state.

Blue LED ⑧ lights while the RPT/OPT is active, and goes out while inactive.

### 3. Repeater Setup/Knockdown ⑥

The setup button is a momentary contact switch that enables or disables the main radio of TR-800.

### 4. LCD Display ⑦

Display current channel number, frequency, power level, receive status, etc.

### 5. Power Switch/Volume Control Knob ⑨

The power switch is located in the center of the knob, short press of which turns repeater on, and long press for 1 second turns repeater off. Rotate the volume control knob clockwise to adjust the volume for a comfortable listening level.

### 6. Microphone Hook ⑩

### 7. RPT Button, OPT Button

Press the RPT button ⑫ to enable uni-directional function, and press the OPT button ⑪ to enable bi-directional one.

### 8. Scan Button, Monitor Button

Press the Scan button ⑬ to initiate radio scan, which is active only when in uni-directional mode

(i.e., RPT is active while OPT is inactive).

Short press the Monitor button ⑰ to display channel frequency by turns of slave radio Rx frequency, slave radio Tx frequency, main radio Rx frequency, main radio Tx frequency; long press it to monitor the activities on the current channel. The main radio processes monitoring while OPT is active, the slave radio processes monitoring while OPT is inactive.

#### 9. “Up” Button ⑮, “Down” Button ⑬

Press the “Up” or “Down” button to select a desired channel.

#### 10. RJ45 Connector ⑭

Plug the desktop microphone or palm microphone into this port to input audio, or plug the programming cable into this port to program both radios.

#### 11. Antenna Connector

The N connector ⑲ is for connecting with the main radio’s antenna, while the BNC connector ⑱ is for the slave radio’s antenna.

When using duplexer, choose the correct adaptor on the back of TR-800 according to your antenna connector type.

#### 12. Fan ⑳

The fan is temperature-controlled with continuously variable speed as temperature changes.

#### 13. AC Power Inlet ㉑ (with Switch ㉒)

#### 14. Accessory Connector ㉓ (DB15/F)

Used for external control equipment or link equipment.

#### 15. Grounding Lug ㉔

For lightning protection, this terminal must be connected to an absolute earth ground via a thick copper wire, or use lightning arrester if necessary.

#### 16. DC Power Inlet ㉕

The power supply would auto-revert to backup battery once the AC mains fails. This DC port also provides floating charge function with approximate 400mA current.

#### 17. DC Fuse ㉖

The 15A/32Vdc fuse protects against battery polarity reversal.

## Functions and Operations

### Basic Operations

Short press the power switch to turn on the repeater; rotate the volume control knob clockwise to adjust the volume for a comfortable listening level. Press the “Up” or “Down” button to select a desired channel, then the radio operates as you set. Rotate the volume control knob fully counter-clockwise to minimize the volume, when no need to monitor activities on the channel.

To achieve the basic repeater functions, the radio must be in repeater setup, and operates in the uni-directional or bi-directional repeater mode.

### Repeater Setup/Knockdown

Press the SETUP button located on the front panel to toggle between repeater setup and knockdown, with LED indications. While in setup state, both radios turn on at power-up; in knockdown state, only receive radio turns on at power up. There are three repeater types: base station, uni-directional and bi-directional in the repeater setup state. The repeater is initialized to base station mode when it toggles from setup to knockdown state. But in the knockdown state, the repeater works only similar to a mobile radio.

### Operation Modes Toggle

The repeater can operate in modes including base station, uni-directional and bi-directional repeater mode. The logic control of operation mode can be achieved via the RPT and OPT buttons, with LED indications, shown as the following table:

	Uni-directional (Forward)	Uni-directional (Reverse)	Bi-directional	Base station
RPT LED	√	×	√	×
OPT LED	×	√	√	×

“√” indicates LED lights, while “×” indicates LED goes out.

Note: The repeater function is inactive while the repeater operated as base station, with slave radio as receiver, and main radio as transmitter. The front panel microphone PTT is disabled while

repeater operates in bi-directional repeater mode.

### **Repeater Hang Time**

After receiving stops upon signal off, the transmitter remains transmitting for a programmed time period, which reduces delay on conversation due to the setup of repeater link. The repeater Hang Time is active when in forward directional repeater only.

### **Frequency Display**

Short press the Monitor button displays the frequency in the turn of: slave radio Rx frequency, slave radio Tx frequency, main radio Rx frequency, main radio Tx frequency.

### **Monitor**

If the Monitor function is set by your dealer, long press (over 1.2s) the programmed Monitor key while in receive mode, to hear activities on the current channel. The monitor function is inactive while in the bi-directional repeater mode. Two operation modes listed below are provided for you to choose via the programming software.

#### **A. Carrier Squelch-Momentary**

Hold down the Monitor key over 1.2s to open CTCSS/CDCSS signalling squelch. Release to close the signalling squelch.

#### **B. Squelch Off-Momentary**

Hold down the Monitor key over 1.2s to open carrier squelch; release to close the carrier squelch.

### **Scan**

The Scan function is active while in the forward directional repeater mode only. Press the Scan button to initiate radio scan (if scan parameter is applicable). The Scan Interval Time and Dropout Delay Time are configurable via the programming software.

### **CTCSS/CDCSS**

Set up talkgroups/users with unique CTCSS/CDCSS to prevent unwanted conversations on the same frequency. If CTCSS/CDCSS is set on the current channel, causes a CTCSS/CDCSS match to be required on an incoming call. If not set, the radio unmutes to all calls within the communication range on the current channel. Your dealer may preset CTCSS/CDCSS on certain channels.

Note: This feature does not mean that your conversation will not be heard by others.

**Time-out Timer (TOT)**

The feature allows for more efficient use of channels by limiting the maximum time of each transmission. It protects the radio from damage caused by long time transmission.

Once a continuous transmission exceeds the preset time (15~1200s programmable), the transmission is automatically terminated

**LED Indicators**

LEDs indicate real-time radio status shown as the following table:

LED	Description	Indicates:
Tx	Red	<ol style="list-style-type: none"> <li>1. Lights while the main radio is transmitting.</li> <li>2. Flashes while the main radio is receiving.</li> <li>3. Flashes while the main radio is monitoring channel activities.</li> <li>4. Flashes while programming the main radio.</li> </ol>
Rx	Green	<ol style="list-style-type: none"> <li>1. Lights while the slave radio is transmitting.</li> <li>2. Flashes while the slave radio is receiving.</li> <li>3. Flashes while the slave radio is monitoring channel activities.</li> <li>4. Flashes while programming the slave radio.</li> </ol>
RPT	Blue, ultra bright	<ol style="list-style-type: none"> <li>1. Lights while the RPT is active.</li> <li>2. Goes out while the RPT is inactive.</li> </ol>
OPT	Blue, ultra bright	<ol style="list-style-type: none"> <li>1. Lights while the OPT is active.</li> <li>2. Goes out while the OPT is inactive.</li> </ol>
SETUP	Orange	<ol style="list-style-type: none"> <li>1. Lights while in the Setup state.</li> <li>2. Goes out while in the Knockdown state.</li> </ol>
BAT	Dark red	<ol style="list-style-type: none"> <li>1. Lights while the backup battery supplies power.</li> <li>2. Goes out while the AC power supplies power.</li> </ol>

## Troubleshooting





Symptom	Problem	Solution
1. Cannot power on the repeater	<ul style="list-style-type: none"> <li>a. AC power is not switched ON or the AC power cable is not properly connected;</li> <li>b. Both radios are power off;</li> <li>c. The AC fuse is blown.</li> <li>d. The DC fuse is blown during DC power supplies.</li> </ul>	<ul style="list-style-type: none"> <li>a. Switch on the AC power and confirm the AC power cable is correctly plugged into the socket.</li> <li>b. Long press the front panel power switch for 1 second, to turn on both radios.</li> <li>c. Check the AC fuse, replace the fuse if it is blown.</li> <li>d. Check the DC fuse, replace the fuse if it is blown.</li> </ul>
2. Cannot talk to or hear group members, or repeater cannot talk to portables.	<ul style="list-style-type: none"> <li>a. Radios do not have the correct frequency, or CTCSS/CDCSS settings;</li> <li>b. The repeater is in the repeater knockdown state (the main radio is off);</li> <li>c. Other strong signals may interfere with your transmission.</li> <li>d. Group member is out of range of the repeater.</li> </ul>	<ul style="list-style-type: none"> <li>a. Confirm radios have the correct channel, and CTCSS/CDCSS settings, reset the frequency if necessary.</li> <li>b. Enable repeater setup to turn on the main radio through the SETUP button.</li> <li>c. Find out the interference source, or apply another legal frequency if you are not able to eliminate or stand away from such source.</li> <li>d. Make sure the group member is within the range of the repeater.</li> </ul>
3. Limited talk range, poor audio quality	<ul style="list-style-type: none"> <li>a. Broken cable may result in signal energy leakage.</li> <li>b. Loose or faulty antenna connector.</li> <li>c. The cable is damaged.</li> <li>d. The duplexer is not properly tuned (if applicable)</li> </ul>	<ul style="list-style-type: none"> <li>a. Check the cable, or replace it if necessary.</li> <li>b. Check and secure the connecting, replace the connector if necessary.</li> <li>c. Replace the cable.</li> <li>d. Contact your dealer or the manufacturer to re-tune the duplexer.</li> </ul>

## Care and Cleaning



- ◇ Do not invert or lean the repeater.
- ◇ Clean the repeater with a lint-free cloth to remove dirt or grease, to avoid poor contact due to excessive dust.
- ◇ Clean the repeater using a cloth moistened with clean water and a mild dishwashing liquid.
- ◇ Avoid subjecting the repeater to corrosives, solvents or spirits.

## Optional Accessories





### Duplexer

			
DT01 (137~172MHz)	DT02 (220~240 MHz)	DT03 (336~370 MHz)	DT04 (380~470 MHz)

### Microphone

	
Palm Microphone SM07R2	Desktop Microphone SM10R1

### Antenna

			
Omni directional VHF Bandwidth 8MHz UHF Bandwidth 14MHz	Omni directional VHF Bandwidth 8MHz UHF Bandwidth 14MHz	Mobile Antenna VHF Bandwidth 4MHz UHF Bandwidth 15MHz	Mobile Antenna VHF Bandwidth 4MHz UHF Bandwidth 15MHz



HYT endeavors to achieve the accuracy and completeness of this manual, but no warranty of accuracy or reliability is given. All the above specifications and design are subject to change without notice due to continuous development.

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