

# TERA

[www.tera.co](http://www.tera.co)



**User Manual**  
TR-7200 VHF  
TR-7400 UHF

**DMR**  
DIGITAL MOBILE RADIO ASSOCIATION



# TERA DMR Hand Held Digital Transceiver

## Introduction

The TERA DMR Transceiver is a high-performance digital and analog portable unit. Model TR-7200 provides up to 5 watts of power output on the VHF band (136-174 MHz), and Model TR-7400 provides up to 4 watts of power output on the UHF band (400-470 MHz). Operating under the DMR (Digital Mobile Radio) protocol and using TDMA (Time Domain Multiple Access) technology, the TERA DMR handheld provides high spectrum efficiency, along with unparalleled flexibility in configuration for networks using the DMR TDMA protocol.

# TERA

Thank you for purchasing TERA Model TR-7400/TR-7200 DMR radios. These radios are built to commercial DMR standards, which ensure worldwide operation and compatibility.

## **Some key features include:**

- Motorola / Hytera compatibility
- IP67 waterproof
- 1,024 individual channels / 64 Zones
- 800 Talkgroups / frequent individual IDs
- FPP Front Panel Programmable
- MIL-STD810 C / D / E / F / G
- OLED display
- Digital Vocoder AMBE3000+
- Audio output 1.5 watts
- Worldwide Amateur importable receive contact database
- FCC Part 90 certification

To get the most out of your radio, please read this manual before use.

## ◆ Included In Box

Thank you for choosing the TERA DMR radio. Immediately upon receipt of your radio, open the package and inspect the radio for any signs of shipping damage. Please confirm that all the items listed below are in the box.

Should there be shipping damage, or if any items are missing, immediately contact the dealer from whom you purchased the radio to report the issue and get instructions for resolution of the problem.



Radio



Antenna



Battery



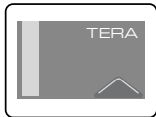
Charger



Belt Clip



Hand Strap



User Manual



Adapter

## ◆ Safety Matters

The following recommendations will help you understand this radio's safety requirements.

1. Only qualified TERA technicians are allowed to service this two-way radio. Do not disassemble the radio by yourself as it will void the warranty.
2. Use only the TERA brand battery pack and desk charger, so as to not damage the transceiver.
3. Do not expose this radio to long periods of direct sunlight, or hot or humid areas.
4. Do not put this radio in dusty or dirty locations.
5. Do not use harsh chemicals, cleaning solvents, or strong detergent to clean this radio.
6. Never transmit on this radio without an antenna.

### Caution

» Safety and operability of this radio can't be guaranteed unless TERA brand accessories or parts are used.

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## ◆ Battery Information

Please use and charge only a TERA approved battery. Attempting to use a different battery type may result in overheating or explosion of the battery, causing damage to the radio and the potential for physical injury.

### **Notes:**

1. Do not short-circuit the battery terminals or dispose the battery in fire. Never attempt to disassemble the battery pack.
2. Charge the battery in 32-105 °F temperature. Otherwise the battery may not fully charge.
3. Turn off the radio before your initial charge. Use of the radio while charging may cause noise or interfere during reception or transmission.
4. Do not pull/plug the adapter and the battery during charging, to avoid interference with the charging procedure.
5. NEVER charge the battery or radio with battery if they are wet. Before charging, you should dry them off with a towel or cloth to avoid danger.

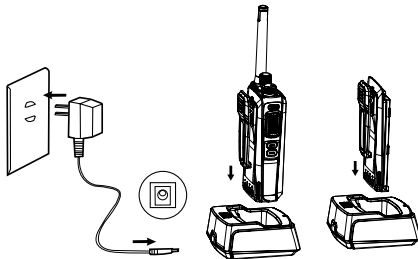


## Warning:

Conductive metals such as jewelry, keys or decorating lace may result in short circuit and generate a large quantity of heat when coming in contact with battery electrodes. Treat any battery carefully especially when placing it into pocket, wallet or other metal container as it can short out.

## Charge Operation

Please charge as follows:



1. Turn off the radio.
2. Plug the AC connector of adapter into an AC output socket

3. Vertically insert the battery or radio equipped with battery into the charger. Make sure the charger and battery are well contacted.
4. After the radio and/or battery are inserted into the charger, the LED glows red and that means the charger is ready for normal charging; if the LED flashes red, it means the remaining battery power is too low and a trickle charge is in process. After the battery power has reached a certain amount during trickle charge, the charger automatically turns to normal (fast) charge mode (solid red colored LED).
5. The battery is fully charged (97%-100%) when LED glows green. The charger stops charging automatically.

#### **Note**

» Trickle charge is not allowed to exceed 30 minutes. If the LED is still flashing in red after 30 minutes, it means that the charger cannot provide power to the battery. Check if the battery or charger is damaged.

#### **Caution when Charging the Battery**

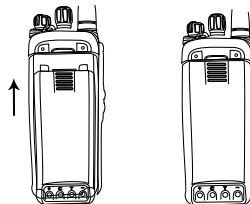
1. The battery is not fully charged from the factory. Please charge the battery before initial use or after long-period of storage.
2. Repeat charging 2 to 3 times will make the battery reach its best capacity. Please replace or charge the battery if battery power is low after repeated charges.

## ◆ Installation of Accessories

### Attaching the Battery

Match the two grooves on the battery with the corresponding grooves on the body of the radio; be sure that the battery is parallel to the radio body and in full contact with the aluminum chassis.

Push the battery upward along the guides until it locks.



Push the battery latch toward the “Lock” mark to lock it.

#### **TIP**

» When storing radio for more than 3 weeks at a time, it is best to remove the TERA battery from radio. This will maintain a full charge in battery so it's ready for use. Batteries will hold a charge 6-12 months when removed from radio.

## ◆ Attaching/Removing the Antenna

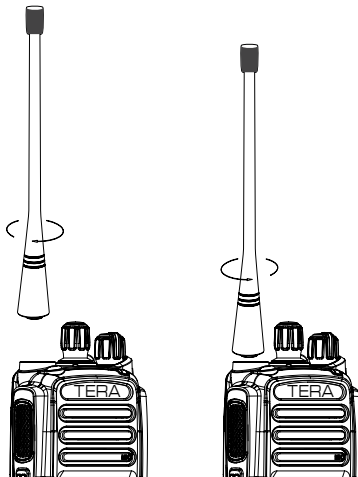
### Attaching the Antenna

Insert the antenna into the connector on the radio while holding the antenna at its base.

Rotate the antenna clockwise to secure it to the radio.

### Removing the Antenna

Rotate the antenna counter-clockwise (turning it at its base) until the antenna is free from the radio.



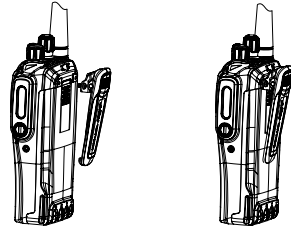
## ◆ Installing the Belt Clip

### Installing Belt Clip

Remove screws from rear of radio and align belt clip over rear holes in case and place belt clip over holes and replace screws.

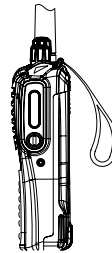
### Notes:

1. If using a belt clip, please mount the belt clip onto the back before installing the battery pack.

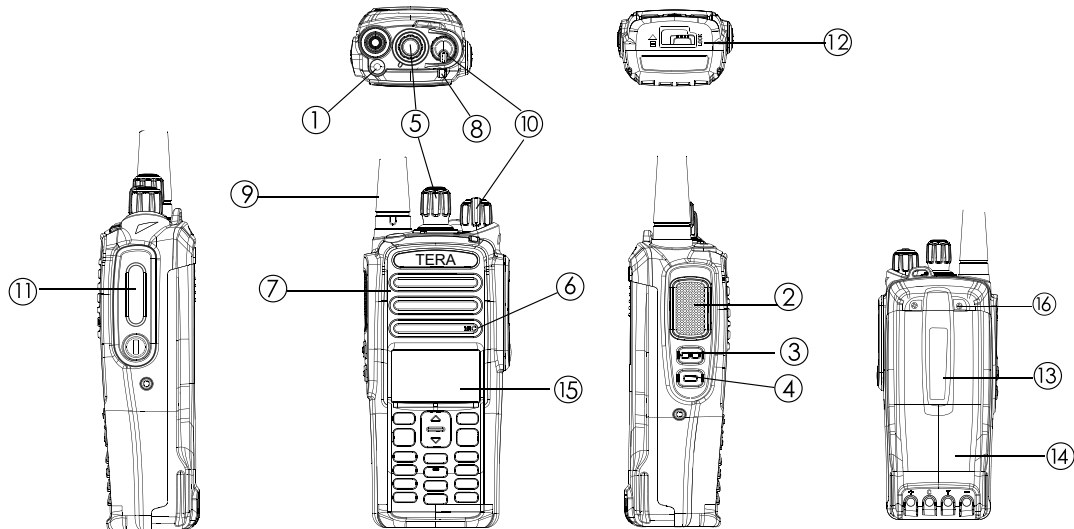


## ◆ Installing the Hand Strap

Thread the strap into the hole at the back of the radio and fasten it.



## ◆Radio Overview



TERA

## ◆ Radio Callouts

No.	Part Name
1	Top Orange Programmable Button
2	Push-To-Talk Button
3	Side Key 2 Programmable Button
4	Side Key 1 Programmable Button
5	Channel Selector Knob
6	Microphone

No.	Part Name
7	Speaker
8	Tricolor LED Indicator
9	Antenna
10	Volume Knob
11	Accessory Jack
12	Battery Latch

No.	Part Name
13	Belt Clip
14	Battery
15	OLED display
16	Belt Clip Screws


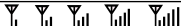










## ◆ LED Indications

The top LED will help you to identify the current radio status.

LED Indication	Status
Flashes Green	Powering On
Constant Red	Transmitting
Constant Green	Receiving
Flashes Orange	Scanning

# ◆ Status Indicators

## Display Icons

Name	Icon	Status
RSSI		No Signal
		More bars indicate a better signal strength
Message Received		New / Unread Message
Scan Status		Scanning in progress
		The scan has paused on a channel (non-priority channel)
		The scan has paused on priority channel 1
		The scan has paused on priority channel 2
Transmit Power Level		Current channel is set to transmit with Low Tx Power
		Current channel is set to transmit with High Tx Power
Battery Status		More bars indicate more battery power left
Tones		Radio Silence Mode is ON
		Radio Silence Mode is OFF



## ◆ Basic Operations

### Turning the Radio ON/OFF

Rotate the radio On-Off/Volume Control knob clockwise to turn ON the radio, and counter-clockwise to turn OFF.

### Volume Adjustment

Rotate the volume control clockwise or counter-clockwise to adjust the desired volume.



## ◆ Selecting a Channel

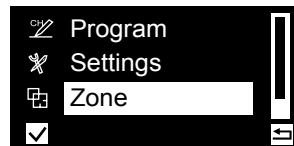
Rotate the "Channel Selector" knob to a desired channel. A channel can either be Analog or Digital. For the analog channels the Push-To-Talk button is always available, and on the Digital Channels parameters can be set up by the users / system operators by channel to allow talk permit. There are three possible settings:

1. Always Allow: The user can transmit all the time.
2. Channel Free: The radio can transmit only if the channel is free.
3. Color Code Free: The radio can transmit only if the channel is free and the color code matches.

## ◆ Selecting a Zone

A Zone is a group of channels grouped together. The TERA DMR radio has 64 Zones. A Zone can have the maximum of 16 analog and/or digital channels.

Accessing a Zone:

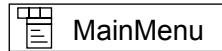


From the Main Menu Screen, scroll up to select Zone, then press OK to enter.  
Use the up/down keys to select your desired Zone.

### Notes

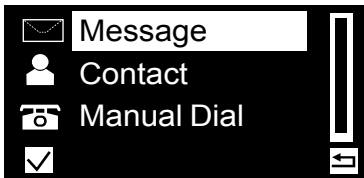
- » The Top and Side buttons can be programmed via software and they have long and short press functions.
- » By default the Top Button is programmed to initiate the Digital Monitor function and the side buttons are programmed with Zone Up and Zone Down.

# ◆ Menu Navigation



Menu display functions can be enabled / disabled in software.

- Message
- Contact
- Manual Dial
- Call Logs
- Scan
- Program
- Settings
- Zone



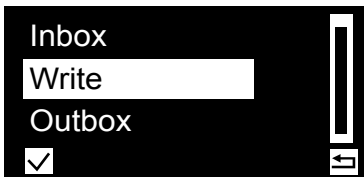
### Message

To access this item, press the Menu key in idle mode and then select "Message," or press the shortcut key to get to message directly.



### Inbox

Each message function can perform any of these operations: Reply/Forward/Edit/Delete.



### Write

Create a text message up to 150 characters and send it to an individual user.



### **Outbox**

The Outbox can save up to 15 sent messages. When the Outbox is full, the oldest entry will be automatically deleted. Each message can have these operations: Resend / Forward / Edit / Delete.



### **Quick Text**

Under this option there are 15 messages that you can pre-define in software.

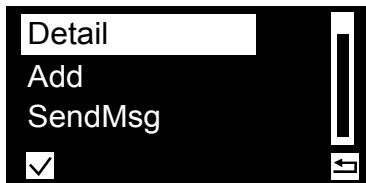
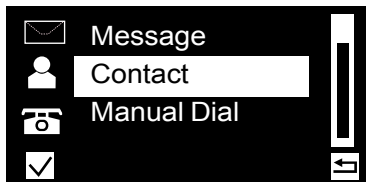


### **Draft Box**

The Draft Box can save up to 15 messages. Users can edit or send the message saved in the Draft Box.

### **Delete**

Can delete messages from Inbox, Outbox, or Draft Box.



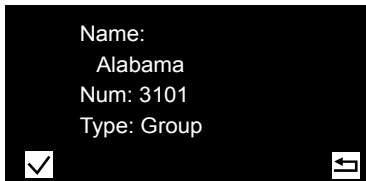
### **Contact / Talkgroup**

By selecting the Contacts menu you will see a list of all the Contacts / Talkgroups (Group ID) that are programmed into the radio. In Field Programming mode you can transmit on these Talkgroups if the repeater is programmed on the correct Frequency, Slot and Color Code.

Please note that due to the limits of the radio you will not hear the responding audio. To receive a specific Talkgroup audio the TERA DMR radio provides for a Field Programmable Receive Group ID function. See Receive Group ID section.

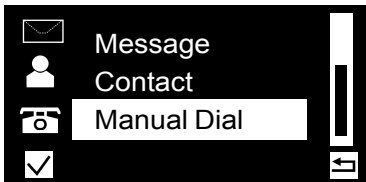
### **Contact details**

After selecting a Contact you can click on a Contact to see the details of the Contact.



Detail information of Talkgroup (Group ID) is available from the keypad.

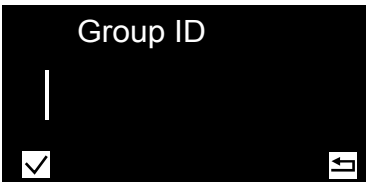
You can also enter and name an Individual Contact from the Keypad.



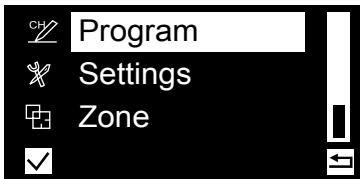
### **Manual Dial a Talkgroup (Group ID)**

To temporarily enter a Talkgroup (Group ID) that is not already programmed select Manual Dial then enter the Group ID number. To manually dial an individual insert a #-key before the ID number.

Note the repeater must be programmed on the correct frequency, Slot and Color Code.



Please note that due to the limits of the radio you will not hear the responding audio. To receive a specific Talkgroup audio the TERA DMR radio provides for a Field Programmable Receive Group ID function.



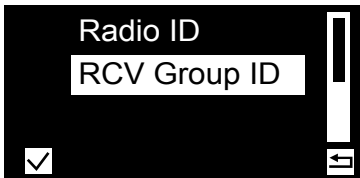
### Receive Group ID

The TERA DMR radio allows one Receive Group to be entered from the Keypad.

From the main Menu scroll up and select Program.

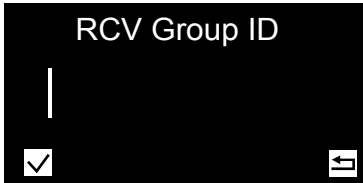


Next select Radio



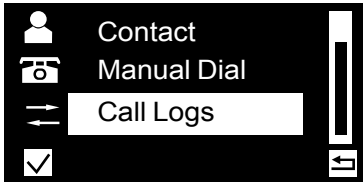
Then select RCV Group ID.





Enter the Talkgroup (Group ID) that you would like to monitor. Make sure to cancel with a 0 after use.

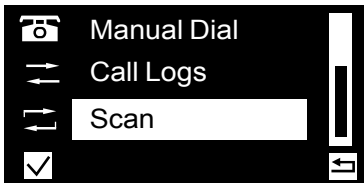
Note the repeater must be programmed on the correct frequency, Slot and Color Code.



### Call Logs

To access this item, press the Menu key in idle mode and then select "Call Logs."

This radio can save up to 20 entries in the Outgoing List, Incoming List and Missed List respectively (only for private call list). When the memory for call logs is full, the oldest entry will be overwritten by latest one automatically. After accessing a list and selecting an entry, you can perform any of these operations: hold down the PTT key to initiate a call, view, send a message or delete it. To delete all entries in Outgoing List, Incoming List and Missed List at a time, select: "Call Logs -> Delete -> Outgoing/Incoming Missed."



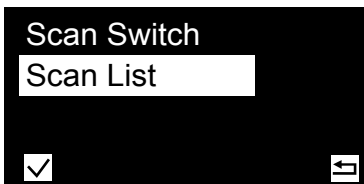
### Scan

To access this item, press the Menu key and then select "Scan."



### Scan Switch

To access this item, press the Menu key and then select "Scan," then click on "Scan Switch."



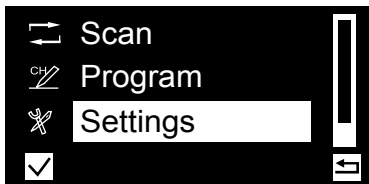
### Scan ON / OFF

The function "Scan" allows you to listen to communication activities on other channels. This option is used to enable or disable the function.

### Scan List

To access this item, press the Menu key and then select "Scan," then click on "Scan List."

Scan List is predefined in software.



Settings menu functions can be enabled / disabled in software.

## Settings

### Radio Info

- Radio ID
- Software Version
- Firmware Version
- Model Number

### Parameter

- TOT Time out timer (1-180 seconds)
- TX Power (High / Low)

### VOX (ON / OFF)

### Tone

- Silence
- Keypad tone
  - Keytone ON/OFF
  - Keytone UP/DOWN

### Low Power Tone

### Msg Tone

### Private Tone

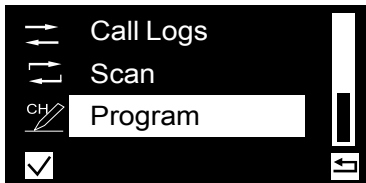
### Grp Call Tone

### Channel Notify

### BasicSettings

### Screen Set

### Keypad LED



## Program

To access this item, press the Menu key and then select Program.

The programming option may be enabled / disabled in the software menu.

Front Panel Programming (FPP) can perform two functions:

### 1. Edit an existing programmed channel.

Select either an analog or digital channel to be edited.

Select PROGRAM

#### Channel - Digital

Frequency

RX Frequency

TX Frequency

Slot

Slot 1

Slot 2

Color Code

0 - 15

#### Channel - Analog

Frequency

RX Frequency

TX Frequency

CTCSS / DCS

## 2. Add a new analog or digital channel from the keypad.

In order to add either a new Analog or Digital channel, the base channel formatting must be predefined, as the attributes are different for digital and analog channels. Zone 64 is predefined with 5 Digital channels (Digital 1-5) and 5 Analog (Analog 1-5). Select any of the predefined Channels.

Select PROGRAM

### Channel - Digital

Frequency

RX Frequency

TX Frequency

Slot

Slot 1

Slot 2

Color Code

0 - 15

For a Talkgroup, go to the Main Menu and select Contacts. Scroll through and select any predefined Talkgroup. Please refer to the Contacts/Talkgroup (Group ID) section about transmitting and receiving of manually entered Talkgroups on page 23.

### Channel - Analog

Frequency

RX Frequency

TX Frequency

CTCSS / DCS

## ◆ Initial Programming

TERA Commercial radios ship from the manufacturer "Keypad" locked per FCC rules. You must first use the programming software to unlock this radio for the first time of use. To unlock the Keypad go to Menu, Basic Settings, and then uncheck  Keypad Lock. Then write the file back to the radio. You will need the programming cable to connect your radio to your computer for programming. Please contact your dealer for a TERA DMR programming cable and software.

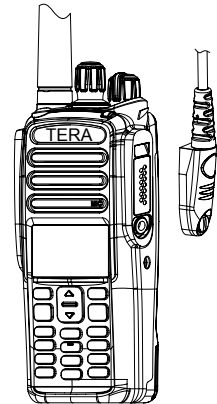
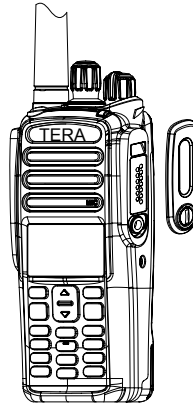
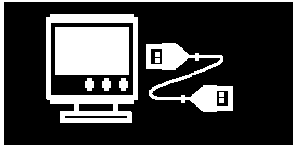
When programming this radio for the first time, it is recommended you first READ the radio with the software and then save this file for future reference as it contains the default programming and settings. In addition, after you READ this radio with software, first make your programming and frequency changes, then send this edited file back to your radio. Please contact the dealer you purchased this radio from or TERA should you have any questions.

## ◆ Attaching the USB Programming Cable

1. Remove the screw on the side accessory jack cover.
2. Slide the tip of the programming cable up into the slide slot.
3. Align and tighten the accessory screw.

### Note

» Side cover must be replaced to maintain IP 67 rating in operation



**Note:** Cable is direct USB. No COM Port drivers required.

## Software Basic Settings

The TERA programming software offers many features for Commercial and Amateur users. In General Settings / Common Settings / Radio Alias / Power-on Screen you can enter your Department Unit Number or Amateur Radio callsign. In the menu settings many features can be enabled / disabled from the display menu.

## DMR Affiliation

If you are a commercial user your Department will program in a “Digital Local Address” in the DMR Services / Local Address, so your radio ID can affiliate within your system.

## Amateur DMR-MARC

For the best Amateur DMR experience obtain a subscriber ID from one of many available Amateur sources. A U.S. Amateur user can obtain an ID from:

<http://www.dmr-marc.net/cgi-bin/trbo-database/register.cgi>

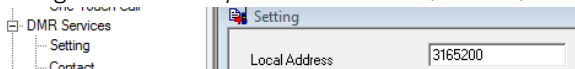
then scroll down to the user registration button.

A blue rectangular button with rounded corners containing the text "User Registration" in white.

Another place to register: <http://register.ham-digital.net/>



Once you obtain your ID go to DMR/Settings tab and add your local address (DMR ID).



For DMR repeaters in your area please see:

<https://www.google.com/maps/d/u/0/viewer?mid=zDtc036qqpWA.kMwk4xZ-Nenc&msa=0>

World DMR repeater network map:

<http://www.dmr-marc.net/repeaters.html>

World DMR repeater network with verified Talkgroups by activity:

<http://dmrx.net/dmrx-map.html>

## ◆ Worldwide Amateur Contact Database

The TERA DMR radios contain a separate database memory for importing and displaying Amateur DMR individual IDs, call sign and user name in comma-delimited format (.csv)

Please reference in the software DMR / Contact Sheet for import and export database operations detailed on page 35.

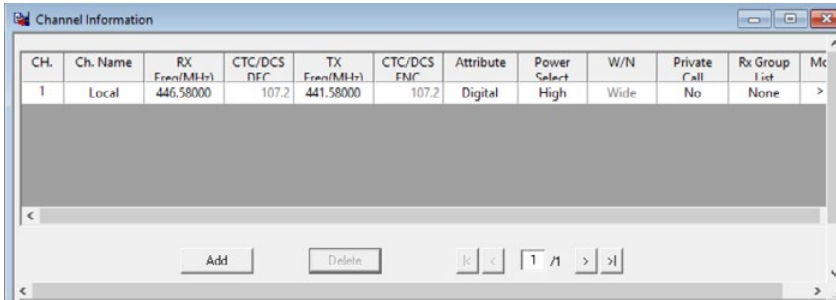


# ◆ Software Overview

The TERA programming software was developed to maximize all the functions of the TERA DMR radio. Programming can be as simple as a few channels or developed to include all 64 Zones of 16 channels totaling 1,024 unique channels.

## Channel Data Entry

TERA software was developed with Amateur users in mind. As an example when programming a Zone of 16 channels for a repeater, enter the first channel data first. Then click "Add" for additional channels up to 15. The main channel data will be duplicated. Then go back and change the predefined Talkgroups and Slots, thereby saving a tremendous amount of programming time.



## Example of the "Add" function in duplicating row data

CH.	Ch. Name	RX Freq(MHz)	CTC/DCS DEC	TX Freq(MHz)	CTC/DCS ENC	Attribute	Power Select	W/N	Private Call	Rx Group List	More
1	Local	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
2	Channel2	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
3	Channel3	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
4	Channel4	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
5	Channel5	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
6	Channel6	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
7	Channel7	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
8	Channel8	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
9	Channel9	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
10	Channel10	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
11	Channel11	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
12	Channel12	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
13	Channel13	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
14	Channel14	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
15	Channel15	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>
16	Channel16	446.58000	107.2	441.58000	107.2	Digital	High	Wide	No	None	>>

Next enter the Talkgroup names for each of the 16 channels. Then go back to the first channel and expand the row by clicking on >> to select a programmed Contact that matches the Channel Name, that was previously entered. If the Contact was not previously defined go to the Contact/Talkgroups section and enter the new Contact information. Then select the appropriated Slot.

## Zone Organization

A key feature is the organization of Zones in the software. Zones can be moved up and down in any order and added or deleted. A unique feature is that channels follow the Zones when the Zones are moved, thereby allowing the channels to be inserted and not having to be in numerical order.

The screenshot displays the Zone Organization software interface, divided into two main sections: 'Zone List' and 'Mixed Use'.

**Zone List:** A table listing zones with columns for 'No.' and 'Zone Alias'. The zones are numbered 5 through 22. Zone 17, 'Mixed Use', is currently selected. Below the table are buttons for 'Up', 'Down', 'Add', and 'Delete'.

No.	Zone Alias
5	Johnstone
6	Sunset
7	PalmSpring
8	SanDimas
9	SanMarcos
10	Palomar
11	SantMonica
12	Woodson
13	Wrightwood
14	Mt Otay
15	Ojai
16	Milpitas
17	Mixed Use
18	Salinas
19	Oakland
20	Clovis
21	Milipitas
22	Castroville

**Mixed Use:** A panel showing channel management. It has two sub-tables: 'Available' and 'Members'. Between them are navigation buttons: '>', '<', and two '?' buttons.

**Available:** A table with columns 'Chan...' and 'Alias'. It lists channels 1 through 17 with their respective aliases.

Chan...	Alias
1	Local
2	SoCal
3	SoCal 1
4	California
5	Cal 1
6	Southwest
7	Southwest1
8	North Am
9	Worldwide
10	W/W Enrg
11	English 1
14	TAC 310
15	Echo Test
16	Audio Test
17	Local

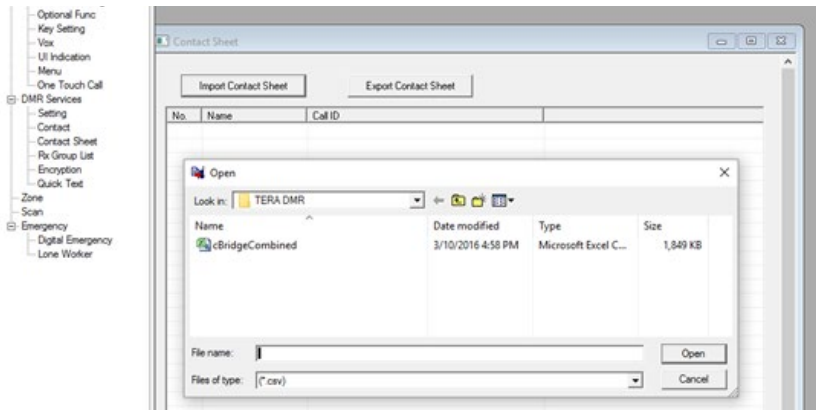
**Members:** A table with columns 'No.', 'Ch.', 'Alias', and 'Alias'. It lists channels 1 through 12 with their respective channel numbers and aliases.

No.	Ch.	Alias	Alias
1	12	DMR+Nation	
2	109	TAC 310	
3	18	PAPA	
4	160	OCRACES	
5	57	441.000	
6	58	446.500	
7	13	Comm 1	
8	206	Shipping	
9	203	Office	
10	204	Direct Wor	
11	205	Simplex Yo	
12	202	Plant	

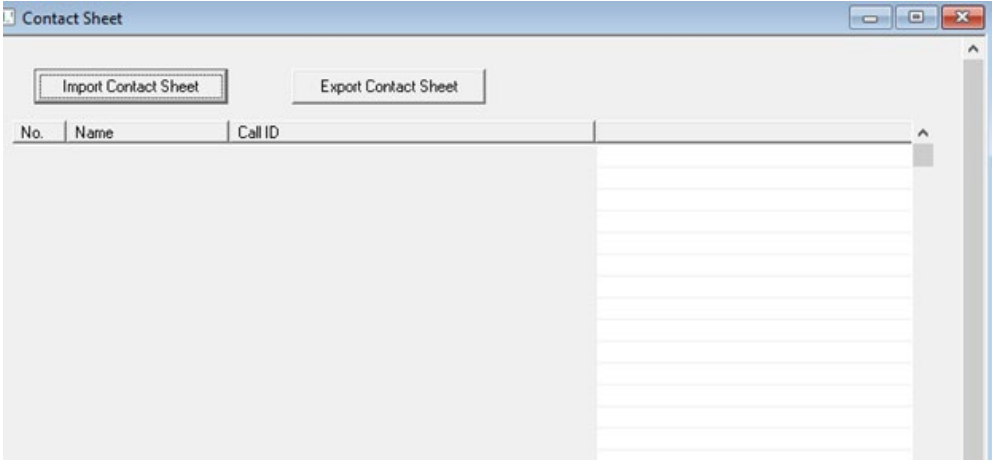
## Contact Sheet Database Import

The latest Contact Database for the TERA DMR radio is located at [www.tera.co/DMR](http://www.tera.co/DMR). This contact database is formatted to directly import into the TERA DMR radio. No contact manager software is needed. Talkgroup and Personal frequent IDs are located in the Talkgroup/Contact database and are not merged into the **Contact Sheet**.

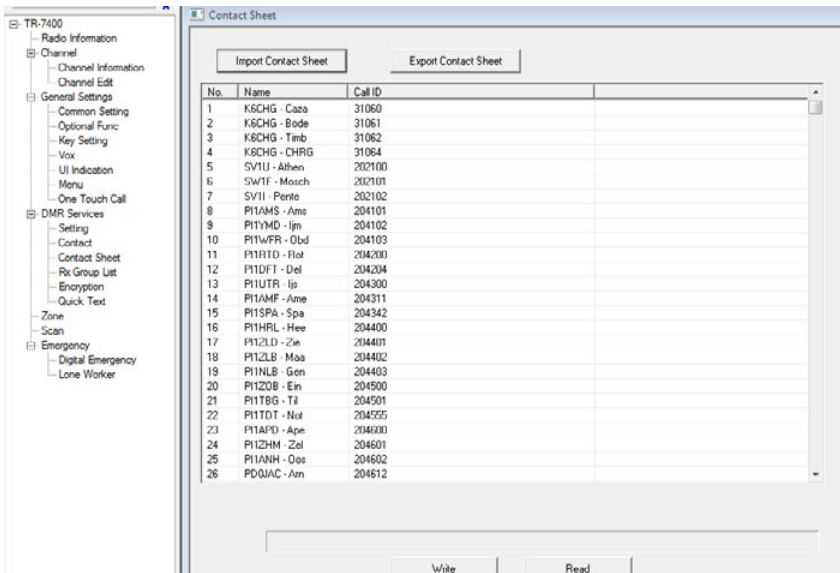
Download the Contact Sheet database to your desktop or a specific folder for importing. In the following example the folder is named TERA DMR. The TERA software will look for the .csv file.



After selecting the file you will see the database starting to load.



Since the Amateur database is ever growing and large, it may take a minute for the database to appear in the display window.

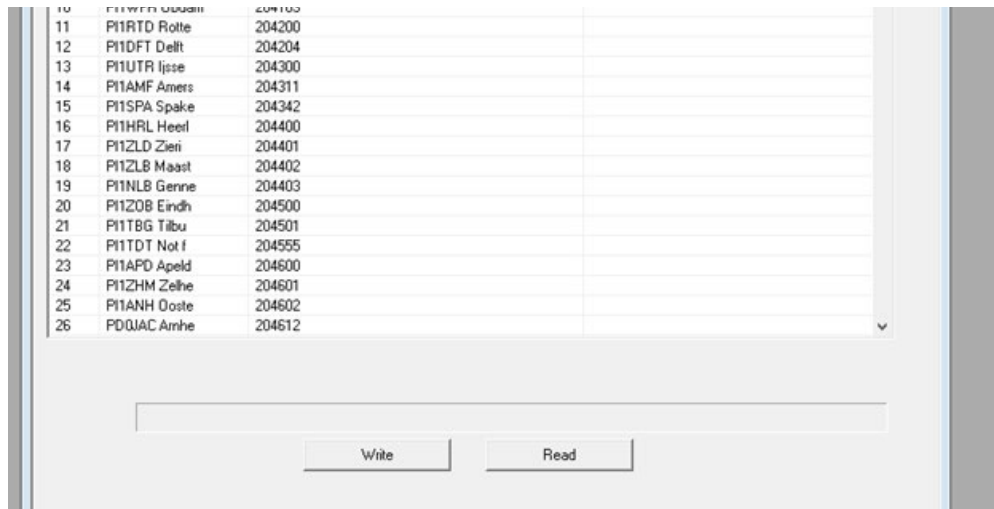


The screenshot shows a software interface with a menu on the left and a 'Contact Sheet' window. The menu includes options like 'Radio Information', 'Channel', 'General Settings', 'DMR Services', and 'Emergency'. The 'Contact Sheet' window has buttons for 'Import Contact Sheet' and 'Export Contact Sheet'. Below these buttons is a table with the following data:

No.	Name	Call ID
1	K8CHG - Casa	31060
2	K8CHG - Bode	31061
3	K8CHG - Timb	31062
4	K8CHG - CHRG	31064
5	SV1UJ - Alben	202100
6	SW1F - Mosch	202101
7	SV1I - Perle	202102
8	P11AMS - Ams	204101
9	P11YMD - Ijm	204102
10	P11wFR - Obd	204103
11	P11R1D - Flot	204200
12	P11DFT - Del	204204
13	P11UTR - Ijs	204300
14	P11AMF - Ame	204311
15	P11SPA - Spa	204342
16	P11HRL - Hee	204400
17	P11ZLD - Zie	204401
18	P11ZLB - Maa	204402
19	P11NLB - Gen	204403
20	P11ZOB - Ein	204500
21	P11TBG - Tã	204501
22	P11TDT - Nol	204555
23	P11AFD - Ape	204600
24	P11ZHM - Zel	204601
25	P11ANH - Oos	204602
26	P0QIAC - Arn	204612

At the bottom of the window, there are buttons for 'Write' and 'Read'.

After the database appears in the Contact Sheet window, select the **Write** button to import the database into the radio.





## ◆ Programmable Buttons

For convenience, you may program the Side Key 1, Side Key 2 and the top Orange Button to one of the functions listed below:

No.	Shortcut Name	Description
1	Disable	Disable a private contact
2	Enable	Enable a private contact
3	Check	Check a private contact
4	Alert	Initiates an alert call
5	Adjust Power Level	Toggles transmit power between high and low
6	Remote Monitor	Monitor a contact
7	Emergency ON	Initiates an emergency call
8	Emergency OFF	Stops the emergency call
9	VOX	Toggles VOX function ON and OFF
10	Messages	Access Messages
11	Contacts	Access Contact List
12	Zone Up / Down / Switch	Change to a desired Zone
13	Keypad Lock	Locks or Unlocks the keypad
14	Man Down	Enables and Disables the Man Down function
15	Squelch OFF	Turns Squelch function OFF
16	Battery Level	Checks Battery Power Level
17	Nuisance Temporary Delete	Nuisance Temporary Delete during scan
18	Digital Monitor	Monitor all digital transmissions per slot

The top and side keys are programmable in software by long and short press.

The screenshot displays the 'Key Setting' configuration window for a TR-7400 device. On the left is a tree view of settings categories: TR-7400, Radio Information, Channel, General Settings, DMR Services, Zone, Scan, and Emergency. The 'Key Setting' option is selected under General Settings. The main window contains the following settings:

- Long Press Duration [s]: 2.0s
- Keypad Input: Enable
- Top Key**
  - Long Key: Digital Monitor
  - Short Key: Digital Monitor
- Side Key 1**
  - Long Key: Nuisance Temporary Delete
  - Short Key: Zone Up
- Side Key 2**
  - Long Key: PowerAdjust
  - Short Key: Zone Down

## ◆ Monitoring Function

The TERA DMR radio has a monitoring function that can be enabled via software on either side or top key button. By default the top key button is programmed to initiate the Digital Monitor. When enabled this function will let you monitor a frequency by Slot and Color Code. All digital transmission can be monitored by slot 1 or 2. To utilize, you must select a programmed channel, that is either in slot 1 or 2.



For example:



The display will show the Call sign and name on the topline and the active Talkgroup (Group ID) on the bottom line.



### Screen Saver

The TERA DMR radio has a built in screen saver that can be enabled in the Optional Functions section in the software.

To enable choose Scroll and the amount of time delay.

Screen saver is enabled by default

## ◆ Optional Accessories

The optional accessories listed below may enhance operation of this radio. The use of only approved TERA quality accessories will ensure optimum communications effectiveness



VHF / UHF Antenna



G-Hook Lapel Mic



Covert Clear Acoustic  
Tube Earphone Mic



Heavy Duty Speaker Mic



USB Programming Cable

# ◆ Care and Maintenance

## Question and Answer

Condition	Analysis	Solution
The equipment can not be powered on.	The battery may be improperly installed.	Remove the battery and attach it again.
	The battery may be fully discharged.	Recharge or replace the battery.
	The battery may suffer from poor contact caused by dirty or damaged battery contacts.	Clean the battery contacts. If the problem can not be solved, contact your dealer or authorized service center for inspection and repair.
During receive operation, incoming voice is weak, intermittent, or not present.	The battery strength may be too low.	Recharge or replace the battery.
	The volume may be set to a low level.	Increase the volume.
	The antenna may be loose, or may be improperly installed.	Power off the radio, and re-install the antenna.
	The speaker may be blocked or damaged.	Clean surface of the speaker. If the problem can not be solved, contact your dealer or authorized service center for inspection and repair.
You can not communicate with other members.	The frequency or signaling may be inconsistent with that of other members.	Set your TX/RX frequency and signaling to the same as that of other members.
	The channel type (digital/analog) may be set inconsistently.	Make sure all members are on the same digital/ analog channel.
	You may be too far away from the group members.	Move closer towards other members.
Irrelevant communications or noises are heard on the channel.	You may be interrupted by radios using the same frequency.	Change the frequency, or adjust the squelch level.
	The radio may not be set with any private tones.	Set tones for all member radios to avoid interference at the same frequency.

## ◆ Terms of Warranty

1. TERA two-way radio body has a 1-year guarantee; accessories (battery, charge adapter, charger and antenna), earphone and speaker-mic have a 6 month warranty.
2. Only the original purchasing sales receipt or valid dealer's invoice will be accepted. The invoice will give clear indication of items purchased and the radio serial-number, and purchasing date.
3. Replacement and repair is available subject to the presentation of original purchasing invoice in case that the radio cannot work normally as the instruction says within 30 days from the purchase date. Note that there must not be visible abrasion on radio body and accessories.
4. Repair of accessories: battery, adapter, charger and antenna is available with the presentation of original purchasing invoice.
5. The cost of materials and labor for repair is covered in warranty.
6. Warranty is void in case that the TERA mark or the serial-number mark is torn off.
7. Warranty is void in cases below:
  - 1) Beyond the warranty period;
  - 2) Defects or damages under abnormal use;
  - 3) Defects or damages because of mis-operation, accident and carelessness;

- 4) Defects or damages because of incorrect testing, operation, repair, installation, reconfiguration or adjustment;
- 5) Defects or damages to antenna because of non-material or non-processing problems;
- 6) Defects or damages because of unauthorized repair and disassembling;
- 7) Product that the serial-number mark is torn off or unable to identify;
- 8) Product with unclear purchasing date on original sales receipt.
- 9) Battery under such conditions:
  - a. Any damages or unsealing to the battery pack;
  - b. Defects or damages to battery because of charging with improper equipment or use beyond regulated maintain condition;
- 10) Abrasion under normal use.

## ◆ Online Service and Support

The TERA website provides additional information about obtaining service or support for the TERA line of two-way radios and accessories. Visit: [www.tera.co](http://www.tera.co)

### **Warning Notes**

Every effort has been made to ensure that the information in this document is complete, accurate, and up to-date. TERA Radio assumes no responsibility for the results of errors beyond its control. The manufacturer of this equipment also cannot guarantee that changes in the equipment made by non-authorized users will not affect the information in it.

### **FCC Licensing Information**

This TERA radio operates on Commercial / Land Mobile frequencies which require a license from the Federal Communications Commission (FCC) for business, personal, education and recreational use. To obtain forms, call the FCC forms hotline at:

1-800-418-3676 or go to <http://www.fcc.gov>.

For questions concerning commercial licensing, contact the FCC at 1-888-CALL-FCC (1-888-225-5322).



## Safety

The TERA DMR handheld transceiver has been carefully designed to provide you with years of safe, reliable operation. As with all electrical equipment, however, there are a few basic precautions you should take to avoid hurting yourself or damaging the radio:

- Read the instructions in this handbook carefully. Be sure to save it for future reference.
- Read and follow all warning and instruction labels on the radio and owner's manual.
- Do not carry the transceiver by the antenna. This may damage the antenna or antenna terminal. Grasp the handheld by its base (not the antenna) when you need to place or remove it.
- Do not keep the radio with the antenna very close to, or touching exposed parts of the body, while transmitting. TERA radios will perform best, if you speak 2-4 inches away from the microphone and the radio is vertical.
- Be sure the "PTT" key is not pressed when you do not need to transmit.
- Do not operate the radio near unshielded electrical blasting caps or in an explosive atmosphere.
- Do not transmit without the antenna fitted on the radio. Though it is provided with a protection, it may damage the TX output final stage.

- Respect the environment conditions. The radio is designed to be used in heavy environments, however avoid exposing it to extremely hot or cold temperature (out of the range between  $-20$  to  $+140^{\circ}\text{F}$ ). Do not expose the transceiver to excessive vibrations as well as dusty or rainy locations.
- Never try to disassemble or service the radio by yourself (aside from the routine maintenance described in this handbook). It may cause damage to the radio transceiver and void your warranty requiring extensive repair work. Always contact your local dealer for assistance.
- Use only authorized accessories. Using non TERA radio brand accessories may seriously damage your handheld transceiver and void your warranty.
- Do not spill liquid of any kind into your radio. If the transceiver gets wet, immediately dry it by a soft and clean cloth.
- Switch the radio off before you clean it. Follow the directions described in the paragraph "Care and maintenance".
- Handle the battery properly. Never place the LI-ion battery in your pocket or purse with loose coins. This could result in short circuiting the battery.
- Be certain that your power source matches the rating listed for the supplied battery charger (AC adapter). If you are not sure, check with your authorized TERA dealer.

- Avoid damaging the power cable of the battery charger. Do not step on or place anything on it as this could result in a damaged charger power cord. This product complies with the requirements of the Council Directives 89/336/EEC and 73/23/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility and low voltage.

## WARNING

Your wireless hand-held portable transceiver contains a low power transmitter. When the Push-to-Talk (PTT) button is pressed it sends out radio frequency (RF) signals. The device is authorized to operate at a duty factor not to exceed 50% TX and 50% RX. In August 1996, the Federal Communications Commission (FCC) adopted RF exposure guidelines with safety levels for hand-held wireless devices. To maintain compliance with the FCC's RF exposure guidelines, this transmitter and its antenna must maintain a separation distance of least 2 inches from your face. Speak in a normal voice, with the antenna pointed up and away from the face at the required separation distance. The belt clip is for storage purposes only. **AVOID TRANSMITTING ON HIGH POWER WHILE RADIO IS ATTACHED TO YOUR BELT.** To transmit, hold the device away from your body and ensure the antenna is at least 2 inches from your body when transmitting.

## General Specification

Frequency Range	VHF: 136-174 MHz (Model TR-7200) UHF: 400-470 MHz (Model TR-7400)
Channel Capacity	1024
Zone Capacity	64 (each with a maximum of 16 channels)
Channel Spacing	12.5 kHz (digital) 25/20/12.5 kHz (analog)
Operating Voltage	7.4 V
Standard Battery	2200 mAh Li-Ion Battery
Optional Battery	2500 mAh Li-Poly Battery
Battery Life	Analog: above 11 h, Digital: above 16 h
Frequency Stability	±1.0 ppm
Antenna Impedance	50 Ω
Dimensions (H x W x D)	126 x 53 x 34 mm
Weight	310 g
OLED Display	1.54"
FCC ID	VHF: 2ACK8TR7200 / UHF: 2ACK8TR7400

## Receiver

Sensitivity (Analog)	0.22 $\mu$ V (12 dB SINAD)/0.3 $\mu$ V (20 dB SINAD)
Sensitivity (Digital)	0.22 $\mu$ V /BER 5%
Selectivity TIA-603 ETSI	60 dB @12.5 kHz/70 dB @20/25 kHz
Intermodulation TIA-603 ETSI	70 dB @12.5/20/25 kHz/65 dB @12.5/20/25 kHz
S/N	40 dB @12.5 kHz/43 dB @20 kHz/45 dB @25 kHz
Rated Audio Power Output	1.5 W
Rated Audio Distortion	<3 %
Audio Response	+1 -3 dB
Conducted Spurious Emission	< -57 dBm

## Transmitter

RF Power Output	VHF: 5 W/1 W ; UHF: 4 W/1 W;
FM Modulation	11 k $\Phi$ F3E@12.5 kHz/14 k $\Phi$ F3E@20 kHz/16 k $\Phi$ F3E@25 kHz
4FSK Digital Modulation	12.5 kHz Data Only: 7k60FXD/12.5 kHz Data & Voice: 7k60FXW
Conducted/Radiated Emission	-36 dBm < 1 GHz/-30 dBm > 1 GHz
Modulation Limit	$\pm$ 2.5 kHz @12.5 kHz/ $\pm$ 4.0 kHz @20 kHz/ $\pm$ 5.0 kHz @25 kHz
FM Noise	40 dB @12.5 kHz/43 dB @20 kHz/45 dB @25 kHz
Adjacent Channel Power	60 dB @12.5 kHz 70 dB @20/25 kHz
Audio Distortion	<3%
Digital Vocoder Type	AMBE3000++
Digital Protocol	ETSI-TS102 361-1.-2.-3

## Environmental Specifications

Operating Temperature	-30 °C ~ +60 °C
Storage Temperature	-40 °C ~ +85 °C
ESD	IEC 61000-4-2 (Level 4) / ±8 kV (Contact) / ±15 kV (Air)
American Military Standard	MIL-STD-810 C/D/E/F/G
Dust & Water Intrusion	IP67 standard
Humidity	Per MIL-STD-810 C/D/E/F/G standard
Shock & Vibration	Per MIL-STD-810 C/D/E/F/G standard

All specifications are tested according to applicable standards, and subject to change without notice due to continuous development.

## Notes

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Radio Model: \_\_\_\_\_

Radio Serial No: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

**Dealer:**







[www.tera.com](http://www.tera.com)

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