



QUICK REFERENCE GUIDE

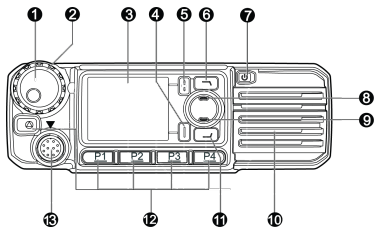
MD78X DIGITAL MOBILE RADIO



Product Overview

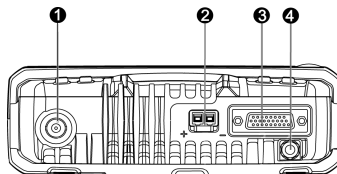
Product Layout

Front Panel



No.	Part Name	No.	Part Name
1	Volume Control & Channel/Group Selector Knob	8	Up Key
2	LED Indicator	9	Down Key
3	LCD Display	10	Speaker
4	OK/Menu Key	11	P5/Answer Key
5	Back/Subgroup Key	12	Programmable Keys
6	P6/End Key	13	Aviation Connector
7	On-Off Key	/	/

Rear Panel

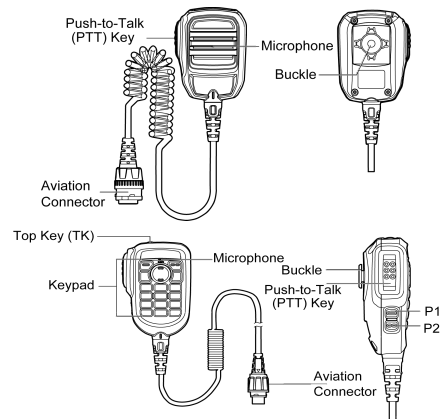


No.	Part Name	No.	Part Name
1	RF Antenna Connector	3	Accessory Connector
2	Power Inlet	4	GPS Antenna Connector

Note

The GPS antenna connector is used only by radios with the GPS feature.

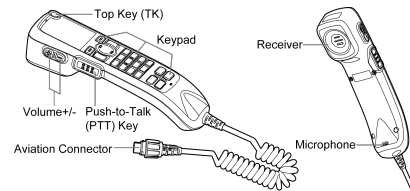
Palm Microphone



Note

The palm microphone without keypad is available for the digital radio and the one with keypad is for the trunking radio.

Handset



Note

The handset is available only for the duplex radio.

Programmable Keys

You can request your dealer to program the following keys as shortcuts to assignable radio features:

- Mobile radio: **P1** key, **P2** key, **P3** key, **P4** key, **TK**, **P5/Answer** key, **P6/End** key, **Up** key, and **Down** key.
- Palm microphone with keypad: **TK**, **P1** key, and **P2** key.
- Handset: Same as the mobile radio.

Installation

Instructions

Before installing the radio in a vehicle, read the following instructions carefully:

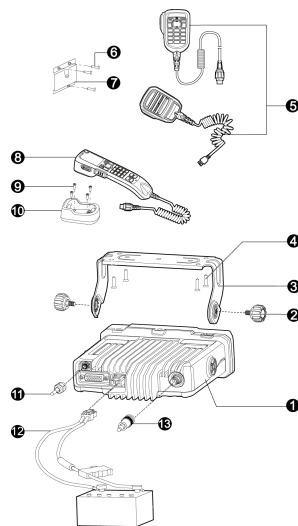
- The radio must work with a 13.6V \pm 15% negative ground electrical system only. Ensure to check the polarity and voltage of the vehicle power supply.
- Check how long the screws will extend from the bottom surface of the radio. Drill the mounting hole cautiously to avoid damage to the vehicle wiring and other parts.
- Connect the antenna and power cord to the radio before you install the radio in the bracket. Use the antenna and power cord authorized by the Company only.
- Install the radio with the mounting bracket supplied by the Company to avoid radio looseness in case of accidents. The loose radio may cause bodily injury.

- Install the radio in a location where you can reach the front panel conveniently.
- Keep sufficient clearance at the back of the radio for wiring.
- Be sure to use the fuse with the same specification for the DC power cord upon replacement.
- Ensure that the antenna of the radio must be no less than 10 meters away from that of other RF devices.
- As the manufacturer declare, the installation of EUT is for built-in, only front enclosure can be touched, others parts can't be touched.

Tools

- Electric drill
- Cross head screwdriver
- T20 torx screwdriver

Parts



NO.	Part Name	NO.	Part Name
1	Mobile Radio	8	Handset
2	Locking Knob	9	Screw (4 mm x 16 mm)
3	Mounting Bracket	10	Handset Hanger
4	Screw (4.8 mm x 20 mm)	11	GPS Antenna
5	Palm Microphone	12	Power Cord (with

NO.	Part Name	NO.	Part Name
			fuse)
6	Screw (4 mm x 16 mm)	13	RF Antenna
7	Microphone Hanger	/	/

Note

- The RF antenna should be purchased separately.
- The GPS antenna is available only for radios with the GPS feature.
- The palm microphone without keypad (with ⑥ and ⑦) is available for the digital radio and the one with keypad (with ⑥ and ⑦) is for the trunking radio. The handset (with ⑨ and ⑩) is for the duplex radio.

Procedure

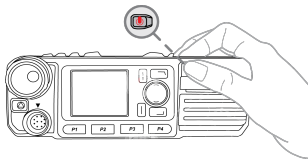
1. Select a location, drill holes based on the shape of the mounting bracket, and then use the screws (4.8 mm x 20 mm) to secure the bracket.
2. Connect the RF antenna, GPS antenna, and power cord to the radio.
3. Slide the radio into the mounted bracket and secure it using the locking knobs.
4. Install the microphone hanger in a location where you can reach it easily, and use the screws (4 mm x 16 mm) to secure it.
5. Align the triangle index on the palm microphone or the handset with the installation index, plug the connector into the radio, and rotate the connector clockwise to secure it.
6. Place the palm microphone or the handset on the hanger when you do not use it.

Basic Operations

Turning the Radio On or Off

To turn the radio on, long press the **On-Off** key.

To turn the radio off, press the **On-Off** key.



Adjusting the Volume

1. Press the **Volume Control** knob to switch to volume control mode.



2. Rotate the **Volume Control** knob to adjust the volume.



Using the Keypad

You can use the keypad on the palm microphone or the handset to edit user aliases or IDs and text messages.

- To switch the input method between alphabetic mode and numeric mode, press **[ABC]**.
- To enter special characters, press **[*]** in alphabetic mode or **[#]** in numeric mode.
- To enter a space, press **[Space]** in alphabetic mode.

Switching the Operation Mode

The radio can operate in conventional or trunking mode. In conventional mode, you can receive and transmit voice and data after selecting the required channel. In trunking mode, you can receive and transmit voice and data after the radio registers with the base station (BS) successfully.

- To manually switch the operation mode, go to **Mode>Manual Switch**, or press the preprogrammed **Operation Mode Switch** key.
- To allow the radio to automatically switch to conventional mode when the signal drops below the preset level in trunking mode, go to **Mode>Auto Switch**, or press the preprogrammed **Mode Automatic Switch** key.

Conventional Mode

In conventional mode, the radio receives and transmits data and voice on the selected channel.

Selecting Zones and Channels

A channel is used to receive and transmit data and voice. A zone is a group of channels within the same operational area. The radio supports up to 64 zones, each of which contains up to 256 channels.

To receive and transmit data and voice, do as follows:

- Select a zone in either of the following ways:
 - On the Zone menu, press the **Up** or **Down** key to select a zone, and then press the **OK/Menu** key.
 - Press the preprogrammed **Zone Up** or **Zone Down** key.
- Select a channel in one of the following ways:
 - Rotate the **Channel Selector** knob.
 - Press the preprogrammed **Channel Up** or **Channel Down** key.
 - Press the preprogrammed **Preset Channel** key.



Note

If the Voice Notify feature is enabled by your dealer, the radio announces the channel number upon channel switching.

Trunking Mode

In trunking mode, the radio communicates with each other through base stations after successful registration. The radio can communicate with a group of radios or a single radio.

Selecting Subgroups

A subgroup is a group of group or private contacts. To select a subgroup, do either of the following:

- Press the **Back/Subgroup** key and then press the **Up** or **Down** key.
- Press the preprogrammed **Subgroup Up** or **Subgroup Down** key.

Selecting Group or Private Contacts

- Rotate the **Group Selector** knob.

- Press the **Back/Subgroup** key and then press the **Up** or **Down** key to select from the member list.
- Press the preprogrammed **Group/Private Up** or **Group/Private Down** key.

Status Indications

Checking LCD Icons

The following tables list icons that may appear on the radio's liquid-crystal display (LCD).

Operation Mode

Icon	Radio Status
DM	Direct mode: The radio transmits and receives directly.
RM	Repeater mode: The radio transmits and receives through a repeater.
TM-DW	Trunking Mode - Digital Wide: The radio operates under multiple interconnected BSS.
TM-DL	Trunking Mode - Digital Local: The radio operates under a single BS.
DM-R	Direct mode: The single frequency repeat (SFR) feature is enabled on the current channel.
	The Mode Automatic Switch feature is enabled.

Basic Status

Icon	Radio Status
	The Dual-Tone Multi-Frequency (DTMF) keypad is enabled.

Icon	Radio Status
	There is no signal in DM, RM, or TM-DW mode.
	The number of bars indicates the signal strength in DM, RM, or TM-DW mode.
	There is no signal in TM-DL mode.
	The number of bars indicates the signal strength in TM-DL mode.
	The radio operates in high power mode.
	The radio operates in low power mode.
	An accessory is connected.
	The Global Positioning System (GPS) feature is enabled, and the radio receives GPS data.
	The GPS feature is enabled, but the radio receives no GPS data.
	The radio is in emergency mode.
	The radio is roaming.
	The radio is detecting sites for roaming.
	The Scrambler or Encrypt feature is enabled.
	The Over The Air Encrypt feature is enabled.
	The radio is scanning or hunting.
	The radio stays on a non-priority channel.

Icon	Radio Status
	The radio stays on priority channel 1.
	The radio stays on priority channel 2.
	The non-dedicated control channel feature is enabled
	The Voice Operated Transmit (VOX) feature is enabled.
	The Monitor feature is enabled.
	The speaker is turned on.
	The radio operates in silent mode.
	The Loudness and Quality Optimizer (LQO) feature is enabled.
	The SFR feature is enabled.

Short Data Service

Icon	Radio Status
	There is/are unread short message(s).
	The Inbox is full.
	There is/are unread work order(s).
	The work order list is full.

Call Service

Icon	Radio Status
	There is/are alert call(s).

Icon	Radio Status
	The Call Divert feature is enabled.
	A full-duplex call is in progress.
	A private call is in progress or a private contact is on the contact list.
	A group call is in progress or a group contact is on the contact list.
	An all call is in progress or an all call contact is on the contact list.
	An include call is in progress.

Checking LED Indications

To determine the radio status, check the LED indicator on the radio according to the following table:

LED Indicator	Radio Status
Flashes green	Being turned on.
Flashes green slowly	Standby in trunking mode.
Glow green	Receiving.
Glow red	Transmitting.
Flashes red	Establishing a call in trunking mode. This indication is applicable only to the calling radio.
Flashes orange slowly	Scanning, hunting, or roaming.
Flashes orange	<ul style="list-style-type: none"> Conventional mode: Operating in

LED Indicator	Radio Status
rapidly	emergency mode. <ul style="list-style-type: none"> Trunking mode: Establishing a Full Off Air Call Set-Up (FOACSU) call. This indication is applicable only to the called radio.
Glow orange	Call hang time: No voice is being transmitted or received on the channel during a call. Within such a period, you can press and hold the PTT key and speak.

Call Services

When you are speaking during a call, keep the microphone about 2.5 to 5 cm away from your mouth. This ensures optimal voice quality on the receiving radio.

Note

- Unless otherwise specified, the **PTT** key mentioned in this manual indicates that on the palm microphone or the handset.
- The radio cannot make any call if it fails to register with the BS or you select an empty group.


Digital Calls


You can initiate or receive the following types of digital calls:






- Group call: A call from an individual user in a group to all the other members.

- Private call: A call from an individual user to another individual user.

Initiating Group Calls

The following table describes how to initiate a group call in conventional mode and trunking mode. When you initiate a group call, the radio displays .



Mode	Manner	Operation
Conventional	Preset Contact	<ol style="list-style-type: none"> 1. Rotate the Channel Selector knob to select the channel associated with the required group contact. 2. Press and hold the PTT key.
	Contact List/Favorite Contact	<ol style="list-style-type: none"> 1. Go to Contact > Contact List/Favorite Contact. 2. Select the required group contact. 3. Press and hold the PTT key.
	Manual Dial	<ol style="list-style-type: none"> 1. Go to Contact > Manual Dial. 2. Press  on the palm microphone or the handset to switch the input mode to Group ID. 3. Enter the required group ID.

Mode	Manner	Operation
Trunking	Preset Contact	<ol style="list-style-type: none"> 1. Rotate the Group Selector knob to select the required group contact. 2. Press and hold the PTT key.
	Group Contact	<ol style="list-style-type: none"> 1. Go to Subgroup > Members. 2. Select the required group contact. 3. Press  on the radio, or press  or press and hold the PTT key on the palm microphone or the handset.
	Manual Dial	<ol style="list-style-type: none"> 1. Go to Settings > Radio Set > Keypad Mode, and then select Enable. 2. From the home screen, enter the group number. 3. Press  on the radio, or press  or  or press and hold the PTT key on the palm microphone or the handset.

Note

For dialing rules, contact your dealer.

Receiving Group Calls

When you receive a group call in conventional mode, the radio displays . The call is established automatically. In trunking mode, the radio displays  after the call is established successfully.

Ending Group Calls

In conventional mode and trunking mode, a group call automatically ends when the call hang time expires.

In trunking mode, a group call also ends in any of the following cases:

- The calling party ends the call.
- The call duration preset by your dealer expires.
- A preemptive or emergency call interrupts the call.
- The calling party switches to an empty group.
- The base station signal is lost.


Initiating Private Calls


You can initiate simplex or duplex calls, which can be set by going to **Settings>Radio Set>Call Setup Mode** or pressing the preprogrammed **Call Setup Mode** key.







- Duplex call: both parties can speak at the same time.
- Simplex call: Only one party can speak at one time.

Note

The duplex call is only available for duplex radios.

The following table describes how to initiate a private call in conventional mode and trunking mode. When you initiate a private call, the radio displays .

Mode	Manner	Operation
Conventional	Preset Contact	<ol style="list-style-type: none"> 1. Rotate the Channel Selector knob to select the channel associated with the required private contact. 2. Press and hold the PTT key.
	Contact List/Favorite Contact	<ol style="list-style-type: none"> 1. Go to Contact > Contact List/Favorite Contact. 2. Select the required private contact. 3. Press and hold the PTT key.
	Manual Dial	<ol style="list-style-type: none"> 1. Go to Contact > Manual Dial. 2. Press  on the palm microphone or the handset to switch the input mode to Private ID. 3. Enter the required private ID. 4. Press and hold the PTT key.
Trunking	Preset Contact	<ol style="list-style-type: none"> 1. Rotate the Group


Mode	Manner	Operation
Conventional		<ol style="list-style-type: none"> 1. Selector knob to select the required private contact. 2. Press and hold the PTT key.
	Favorite Contact/Private Contact	<ol style="list-style-type: none"> 1. Go to Contact > Favorite Contact/Private Contact. 2. Select the required private contact. 3. Press  on the radio, or press  or  press and hold the PTT key on the palm microphone or the handset.
	Manual Dial	<ol style="list-style-type: none"> 1. Go to Settings > Radio Set > Keypad Mode, and then select Enable. 2. From the home screen, enter the private call number. 3. Press  on the radio, or press  or  or press and hold the PTT key on the palm microphone or the handset.

 **Note**

For dialing rules, contact your dealer.

Receiving Private Calls

Conventional Mode





When you receive a private call, the radio displays . The call is established automatically.

Trunking Mode

You can listen to a call in different ways varying with the setup mode of the call:

- FOACSU

When receiving a FOACSU private call, the radio rings and vibrates, and displays .

To answer the call, press  on the radio, or press  or press and hold the **PTT** key on the palm microphone or the handset within the preset time period. After the call is established successfully, the radio emits a tone and displays . If you don't answer this call, the radio displays .

- Off Air Call Set-Up (OACSU)

When receiving an OACSU private call, you can listen to it without any operation.

Ending Private Calls

In conventional mode and trunking mode, a private call automatically ends when the call hang time expires.

In trunking mode, a private call also ends in any of the following cases:

- The calling or called party ends the call.
- The call duration preset by your dealer expires.
- A preemptive or emergency call interrupts the call.

- The calling or called party switches to an empty group.
- The base station signal is lost.

Analog Calls

You can initiate or receive a call on an analog channel with or without signaling.

Call Without Signaling

On an analog channel without signaling, you can initiate a call to all the other users on the channel. Do as follows:

1. Select the required channel.
2. Press and hold the **PTT** key, and speak into the microphone.

Call With Signaling

On an analog channel with signaling, you can initiate a call to a specific contact on the channel. Do as follows:

1. Rotate the **Channel Selector** knob to select the required channel.
2. Press the **OK/Menu** key, and go to **Contact > Contact List**.
3. Select the required channel.
4. Press the **PTT** key or the preprogrammed **One Touch Call/Menu** key to send the code.

The call is established when the target radio receives and decodes the matched signaling.

Emergency Call

In case of emergency, you can initiate an emergency call to ask for help from other personnel or the control centre.

This feature needs to be configured and enabled by your dealer. For details, refer to the Emergency feature described in the relevant user manual.

Message Services

The Message feature allows you to send and receive the following types of messages in trunking mode or on a digital channel in conventional mode:

- Text messages: messages created using the keypad.
- Quick text messages: frequently used messages predefined by your dealer but editable.
- Status messages (trunking only): frequently used messages predefined by your dealer and not editable.

Viewing Messages

To view a message upon receiving, directly press the **OK/Menu** key.

To view a message from the Inbox or a sent message, go to **Message > Inbox/Outbox**, and then select the required message.

Sending Messages

Sending Text Messages

1. Go to **Message > New Msg**, and then type the text.
2. Press the **OK/Menu** key, and then select **Send**.
3. Select or enter the required contact, and then press the **OK/Menu** key.

Note

Instead of directly sending the new message, you can also select **Save** in conventional mode or select **Save to Drafts** or **Save to QuickText** in trunking mode to save the new message, and send it later.

Sending Quick Text Messages

1. Go to **Message > Quick Text**, and then select the required quick text message.
2. Select **Send**, and then select or enter the required contact.
3. Press the **OK/Menu** key.

Sending Status Messages

1. Go to **Message > Status Msg**, and then select the required status message.
2. Press the **OK/Menu** key, and then select or enter the required contact.
3. Press the **OK/Menu** key.

Note

You can also send status messages by manual dialing. For details, contact your dealer.

Deleting Messages

Deleting Text Messages

To delete a message from the Inbox, OutBox, or Drafts, do as follows:

1. Go to **Message > InBox/OutBox/Drafts**.
2. Select the required message, and then press the **OK/Menu** key.
3. Select **Delete**, and then press the **OK/Menu** key.

Deleting Quick Text Messages

In trunking mode, you can go to **Message > Quick Text** to select and delete a quick text.

For details on more features and operations, please visit our website at <http://www.hytera.com>, or scan the QR code to download the relevant user manual.



Operational Instructions and Training Guidelines

To ensure optimal performance and compliance with the occupational/controlled environment RF energy exposure limits in the above standards and guidelines, users should transmit not more than 50% of the time and always adhere to the following procedures:

- Antenna gain must not exceed 3 dBi.
- The antenna must be installed complying with the requirements of manufacturer or supplier, and it must be at least 20 cm away from human body.

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 FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Verification of harmful interference by this equipment to radio or television

reception can be determined by turning it off and then 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 different circuit to that of the receiver's outlet.
- Consult the dealer or an experienced radio/TV technician for help.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Note: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ISED Statement

This device complies with Innovation, Science and Economic Development Canada Compliance license-exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

ISED Radiation Exposure Statement:

This device must be restricted to work related operations in an Occupational/Controlled RF exposure Environment.

This equipment should be installed and operated with minimum distance **20cm** between the antenna & your body.

ISED exposition aux radiations:

Ce dispositif doit être limité aux opérations liées au travail dans un environnement d'exposition RF professionnel/contrôlé.

Cet équipement doit être installé et utilisé avec un minimum de **20cm** de distance entre la antenne et votre corps.



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