

English



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## 1 Introduction

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Thank you for choosing one of our products. Besides being characterised by a compact design, a housing in aluminum die-cast and a high resistance to all types of aggressions, Alan HP450 rugged is an industrial and portable PMR446 device particularly suited for very noisy environments and able to guarantee maximum robustness. Alan HP450 can be used in the hardest working conditions because it is compliant with the severe requirements of standards **MIL 810 C, D, E, F, and has an IP67 class, which means that it is waterproof down to a maximum depth of 1 meter of water.** The device offers also truly innovative features like the scrambler for confidential communications and **e-VOX** that be used also without external microphones, **unlike traditional handsfree systems.**

Alan HP450 is supplied in the spacious semirigid EVA box that is large enough to hold the wide range of accessories supplied with the device: battery, holster in rigid polycarbonate with swiveling clip (360°) and a two-position fast charger.

- **312 channels** - These channels can be used to store several combinations of radio/tone frequencies
- **Class IP67 for maximum robustness and reliability** - The housing safely protects the device from dust and from water infiltration up to a maximum depth of one meter
- **MIL STD 810 C, D, E, F** - The compliance with these severe US military standards is itself a guarantee of maximum reliability
- **Large display** - 11 icons and 2+2 digits
- **Out of range function** - Warns the user when the device is out of range
- **E-VOX** - Enables to communicate handsfree without audio accessories or having to press buttons

- **Built-in inversion scrambler** - Protects communications
- **High capacity lithium battery** (optional for some models) - This compact battery has an autonomy of 26 hours
  - ▣ *The manufacturer may change these features without warning as a result of improvements applied to the products.*
  - ▣ *The actual features available depend on the programmed settings. For more information, contact an authorised distributor or the radio link provider.*
  - ▣ *Depending on the version, HP450 may be fitted with a 2,200 mAh lithium battery or a 1,100 mAh Ni-MH battery.*
  - ☞ ***The resistance to immersion is guaranteed only if the battery and protective cover of the connectors have been correctly installed. In the event of accidental contact with water, the device must be immediately dried.***

## 2 Safety information

### 2.1 Symbols used

#### Warnings

 Practical recommendations that help to improve performance.

### 2.2 Warnings

Carefully read all the instructions contained in the manual and on the labels applied to the device. The manufacturer has taken all possible measures to ensure that all the information contained in this manual is complete, accurate and current. However, CTE International shall not be responsible for damages for which it is not directly responsible. Modifications performed by unauthorized personnel may affect the validity of the information contained in this manual.

- This transceiver is compliant with Directive 99/05/EC. Before using the device, always refer to the restrictions on the use enclosed to this manual.
- Always use the professional transceiver selected in compliance with the regulations in force in the country of residence and refrain from using it when its use is forbidden or if it is likely to cause interference or serious hazards.

#### Attention

The portable HP450 extra transceiver has been specifically designed to guarantee a long-term safe and reliable operation. For optimum and safe performance, always observe the basic precautions applicable to all electric equipment:



#### Do not handle the transceiver by its aerial.

The use of a faulty aerial could seriously damage the transmission power stages.



#### Do not keep the aerial of the radio too close to your body during transmission.

**Users with cardiac stimulators, acoustic implants or medical devices should always consult their doctor or the manufacturer of these devices to make sure that they are adequately protected against RF energy.**



Do not use the radio close to unshielded primers in explosive atmospheres.



-20°C/+55°C

The radio is designed to be used in extreme conditions. However, it is always advisable to avoid exposing it to very high or low temperatures (temperatures below -20°C or above +55°C).



Do not expose the transceiver to excessive vibrations, dust or rain.



**Do not attempt to disassemble or repair the radio or battery** (except for performing the routine maintenance operations described in this manual).



Use original accessories only in order not to damage the radio.



Do not use the radio next to water sources and not spill liquids on the radio.

If the transceiver gets wet, dry it immediately with a soft and clean cloth.



Always switch the radio off before cleaning it.



Verify that the supply source is compatible with the battery-charger supplied (AC adapter).



Do not place any objects on the power cable of the battery-charger in order not to damage it.

## 2.3 Technical support

Write the serial number of your transceiver in this space. This number is printed on the nameplate inside the battery compartment of the transceiver and must be provided for technical support and/or in the event of loss and/or theft of the unit.

HP450 transceiver - Serial number \_\_\_\_\_

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## 3 Controls and functions

### 3.1 Description



#### 3.1.a Front and left sides

- 1 **Aerial** – Fixed
- 2 **On/volume knob**
- 3 **Status LED** – Red when the HP450 radio is in transmission mode, green when it is in reception mode

- 4 **LCD display** – (P 3.2).
- 5 ▲ key
- 6 ▼ key
- 7 **Built-in microphone**
- 8 **Built-in speaker**
- 9 **MENU Key**
- 10 **SCAN/LOCK key**– Hold this key down to lock the keyboard (P 5.14).
- 11 **HI/LO key**– Enables to select a high or low transmission power (not active on standard models - P 5.11).
- 12 **E (emergency) key** – Enables to call the preset emergency channel (P 5.13).
- 13 **PTT (Push To Talk) key** – Hold this button down to set the transceiver in transmission mode.
- 14 **MON key** – Hold this key down to enable the monitoring function (P 5.10); press it twice quickly to adjust the squelch (P 5.13).
- 15 **CALL key** – Press it briefly to start the preset audio call (tone).

### 3.1.b Rear and right sides

- 16 **Battery pack** – Powers the portable transceiver.
- 17 **Battery pack lock** – Enables to remove the battery pack from the radio (P 4.3.a).
- 18 **Clip fixing grooves** – Enable to fix the optional clip directly onto the battery pack and hang the radio to your belt without holster.
- 19 **Battery recharge contacts** – Enable to connect the battery-charger to the desktop quick charger (P 4.4).
- 20 **Fixing screw** - Fixes in place the protective cover of the







microphone connectors.

- 21 **Protective cover of the microphone connectors.**
- 22 **SPK connector** (under the cover) - 3.5 mm jack connector for external speaker. Together with the **MIC** connector it can be used to connect optional microphones.
- 23 **MIC connector** (under the cover) - 2.5 mm jack connector for external microphone. Together with the **SPK** connector, it can be used to connect optional microphones. This connector can also be used for the Cloning feature (P 6.7), which requires however the connection of the special optional cable.



### 3.2 Displayed symbols

The transceiver has an LCD display that continuously displays information on the operating status of the radio.

Symbol	Meaning	Description
	<b>Battery charge</b>	Indicates the charge level of the battery.
	<b>Strength of the received and transmitted signals</b>	According to the number of bars displayed: <ul style="list-style-type: none"> <li>• Reception mode - Indicates the level of the received signals</li> <li>• Transmission mode- Indicates the level of the output power.</li> </ul>
	<b>Radio/multifunctional channel</b>	In standby these large digits indicate the currently selected radio channel. During the programming of features, they are used to display different parameters or values (for example <b>bP</b> = Beep that confirms that a key has been pressed).
	<b>Multifunctional indicator</b>	During programming, it is used to display different values and parameters. For example <b>oN</b> stands for ON (enabled feature) and <b>oF</b> stands for OFF (disabled feature).
<b>LO</b>	<b>Low TX power</b>	Indicates that a low transmission power has been selected.
	<b>Keyboard lock</b>	Indicates that the keyboard has been locked.
<b>CTC</b>	<b>CTCSS</b>	Indicates that the currently used channel has been programmed with a CTCSS tone.
<b>DCS</b>	<b>DCS</b>	Indicates that the currently used channel has been programmed with a DCS code.
<b>SCAN</b>	<b>Channel scan</b>	Indicates that the SCAN (automatic signal scan) is in progress on the preset channels.
<b>P</b>	<b>Priority channel</b>	Indicates that the currently selected channel has been programmed as a priority channel during the scan.
<b>DW</b>	<b>Dual Watch</b>	Indicates that the Dual Watch (fast search of signals on two channels) is in progress.
	<b>Roger bip</b>	Indicates that the Roger bip function has been enabled.
<b>VOX</b>	<b>e-VOX</b>	Indicates that the e-vox (enhanced Voice Operated eXchange – handsfree transmission) has been enabled.



## 4 Setup

### 4.1 Items supplied with the radio

Before using the transceiver, always make sure that the semi-rigid EVA box contains the following items:

- The transceiver with the rubber (fixed) aerial and the rechargeable battery pack
- The holster in rigid polycarbonate with rotating clip to fix the radio to the belt. **To properly fix the radio into the holster, push the holster till you hear 2 clic.**
- The desktop battery-charger (that includes the charging seat, the AC adapter and AC cable)
- The operating manual (this manual)

If any of the above-described parts are missing or damaged, immediately contact the retailer.

 *To operate the radio, use the Ni-MH or Li-Ion battery pack.*

### 4.2 Fixing/removing the optional belt clip



To remove the clip from the battery pack, unhook the battery pack from the radio, then pull the release lever, situated on the upper part of the clip, outwards, then remove it pulling it upwards.

To reinsert the clip, insert the guides into the grooves on the rear of the battery pack, then slide the clip downwards until it snaps in place.



### 4.3 Removing/installing the battery pack

Depending on the model, the transceiver can be fitted with the following battery packs:

- BP4511 - NiMH battery pack, 1,100 mAh, for standard applications
  - BP4522 - Li-Ion battery pack, 2,200 mAh.
-  **If you are planning not to use the transceiver for a long period of time, remove the battery pack.**
-  **Be careful not to soil/damage the contacts of the battery compartment of the radio and battery pack.**

#### 4.3.a Removing/installing battery pack

To insert the battery pack:

- 1) Insert the battery pack as shown in the figure.
- 2) Push the battery pack down towards the transceiver until it clicks in place.



To remove the battery pack:

- 1) Press and hold down the battery release button.
- 2) Remove the battery pack from the upper side of the transceiver.

#### 4.4 Recharging the battery pack

The fast desktop battery-charger enables to recharge the battery pack without removing it from the radio or to recharge the battery pack separately.

- 📌 *At the end of the recharge operation, it is possible to leave the radio/battery pack in the charger, because the latter has a special protection that prevents the battery pack from being damaged by overvoltages.*
- 📌 *Battery packs tend to loose their charge if they are not used (automatic discharge). This condition is perfectly normal. All models of battery packs tend to loose 10 - 20% of their power after a few days.*
- 📌 *If the battery pack is new, it is necessary to fully recharge it before using it. Then, it is sufficient to follow the recommendations given in paragraph 4.4.a.*
- 📌 *Always use the battery-charger with the above-described models of battery packs. Do not attempt to use the battery-charger to recharge other types of batteries (and specifically alkaline batteries), as this operation could cause explosions and personal injuries.*
- 📌 *Always keep the battery-charger compartments clean.*

##### 4.4.a Recharging the battery pack

New batteries are not charged.

The battery provides maximum efficiency after 3-4 full charge/recharge cycles.

- 1) Connect the connector of the transformer to that of the base.
- 2) Connect the plug of the power cable of the adapter to a grounded

AC power socket.

- 3) Verify that the radio has been s
- 4) Insert the radio into the compartment of the battery-charger, with the keyboard facing upwards. The recharge starts and the orange indicator **UNIT** lights.
- 5) Once the recharge is completed (see following table), **UNIT** turns to green.



#### INDICATIVE TIME REQUIRED TO FULLY RECHARGE THE BATTERY

Type of battery pack	Recharge time (hours)
BP4511 (NiMH, 1,100 mAh)	<3h
BP4522 (Li-Ion, 2,200 mAh)	

##### 4.4.b External battery pack

Insert only the battery pack into the compartment on the rear of the battery-charger. **BATT** switches on. Once the recharge has completed (see the table on the previous page), **BATT** turns green.

## 4.5 Correct use of the battery packs/Hall effect

### 4.5.a BP4511 battery pack (NiMH, 1,100 mAh)

BP4511 is based on the NiMH technology, which means that it does not affected by the so-called "Memory effect".

### 4.5.b BP4522 battery pack (Li-Ion, 2,200 mAh)

The BP4522 battery pack uses the Li-Ion technology.

## 5 Basic features

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### 5.1 Switching the device on and off

Turn the **On/Volume** knob clockwise until it clicks: the LCD displays switches on and the device issues a confirmation beep.

- ▮ *The backlighting of the LCD display switches off automatically after five seconds for energy saving purposes, while the display remains on.*

To switch the transceiver off, turn the **On/Volume** counterclockwise.


### 5.2 Backlighting

When you switch the device on or press one of the **HI/LO**, **SCAN/LOCK**, **MENU** or **MON** keys, the device automatically enables the backlighting for approximately five seconds to allow you to read the displayed messages if the lighting is not adequate. To keep the backlighting on for 5 seconds more, press another key.

- ▮ *The backlighting of the display consumes battery energy and should therefore be used sparingly.*

### 5.3 Checking the level of charge the batteries

When the transceiver is in standby mode, the battery charge indicator continuously displays the residual charge of the battery.

- ▮ *Icon  indicates that the charge is insufficient and that the device will soon switch off.*
- ▮ *The consumption of the battery charge is affected by the volume level set.*

#### 5.4 Adjusting the squelch (suppressing background noise)

The radio is fitted with a device called squelch that attenuates the background noise when no signals are present. The enabling threshold can be adjusted according to your specific needs.

- 1) Briefly press **MON** twice. **Sq** displays, while the right section displays a number from **1** to **8**, depending on the squelch level you have set.
- 2) Press **▼** several times to set the enabling threshold on **1** (minimum value). You will hear a slight background noise.
- 3) If the radio is not receiving signals, press **▲** several times to gradually increase the squelch value and stop as soon as you detect the minimum value that guarantees a stable noise suppression.
- 4) Press **PTT** (or wait five seconds). The device returns to the standby mode and stores the settings you have selected.
  - 📖 *Make sure you do not set an excessively high squelch level because in this case you may not be able to receive weaker signals. On the other hand an excessively low squelch value could enable the squelch even when no signals are present.*
  - 📖 *This adjustment must be carried out within five seconds, otherwise the device returns to standby mode and stores the currently set value.*
  - 👉 *Squelch must always be adjusted when no signals are present.*

#### 5.5 Selecting the operating channel

- 1) Press **MENU** once. The display flashes.
- 2) Press **▲** or **▼** to select the desired channel. To quickly scroll the

channels hold down **▲** or **▼**.

- 3) Press **PTT** (or wait five seconds) to store the setting.
  - 📖 *It is obvious that other parties shall also have to select the same channel, otherwise communications will not be possible.*
  - 📖 *This adjustment must be carried out within five seconds, otherwise the radio returns to the standby mode storing the currently set channel.*

##### 5.5.a How to select the channel

The HP450 radio has been programmed as follows:

- Channels from **1** to **8** are programmed with the 8 radio frequencies of the PMR446 band
- Channels from **9** onwards are programmed with the same repeated radio frequencies (for example channel **9** has the same frequency of channel 1, channel **10** has the same frequency of channel 2, etc.), but also include CTCSS tones or DCS codes. If you select these channels, **CTC** or **DCS** displays.

👉 *the DCS codes can be enabled only via software.*

👉 *If you need to communicate with transceivers of different brands, it is generally preferable to use one of the first eight channels to ensure maximum compatibility. It is obviously necessary to select the less used channel of your area. If the parties you are communicating with use a HP450 device (or a device with CTCSS tones), you may choose any channel. If all the eight PMR446 frequencies are occupied in your area, you can select a channel from 9 to 16 (the less busy one) to allow the CTCSS tone or DCS code to enable you to listen to communications of the members of your group only.*


- For more information on CTCSS tones and DCS codes, see [5.8](#) and [5.9](#).

## 5.6 Receiving and transmitting

During reception and transmission try and keep the aerial as vertical as possible so that the signal can be transmitted without hindrances. This precaution optimises the radio signal.


- The reception/transmission mode described below is the so-called "open traffic mode", which is simplest one. It is however possible also to set other modes as described in [paragraph 5.8](#).

### 5.6.a Reception

As soon as the signal has been received, the squelch disables automatically, the status LED turns green and icon  displays showing the intensity of the received signal.

- If the signal is received fragmented because of weak signals, try using the monitoring feature.

### 5.6.b Transmission

- Verify that other parties are not connected to the selected channel (status LED off).
- Hold **PTT** down: the status LED turns permanently red to indicate that the transmission is in progress, while indicator  indicates the transmission power.
- Wait a few seconds, then talk normally at about five centimetres from the transceiver transmitter. Your message will be simultaneously heard by all the parties listening to the same channel.
- To end the communication, press **PTT**: the status LED switches off to indicate that the device has returned to the reception mode

and icon  disappears.

- Only one user at a time can talk during radio communications. Therefore, it is important not to transmit when you are receiving a communication and use the transmission mode sparingly to allow other users to use the feature.
- Transmission consumes a significant amount of energy and should therefore be used sparingly to prolong the battery life. Alternatively, it is also possible to select a low transmission power.
- If you are unable to contact a station that you have no problems in receiving, the station may be using CTCSS tones or DCS codes ([5.8](#)).

## 5.7 busy channel lockout

When **BCLO** has been enabled and the channel is busy, the selection of **PTT** or **CALL** will have no effect and the radio will issue an error beep. As soon as the channel is free, **PTT** and **CALL** shall automatically resume ordinary operation.

### 5.7.a Transmission timer

The HP450 radio can be programmed with a transmission timer that temporarily blocks transmission if the radio has been used beyond the maximum time permitted.

The radio is forced in reception mode if it continues transmitting after the preset timer threshold has been reached. To restart the transmission, it is sufficient to release key **PTT**.

## 5.8 Operating modes (open or restricted traffic)

HP450 can be used in two modes:

Mode name:	Default setting	Comments
<b>Open traffic</b> (without CTCSS/ DCS)	From channel 1 to 8	Guarantees maximum compatibility with the devices of other manufacturers. However, if the channel you are using is used also by other parties, you will also receive their communications. The open traffic mode is not particularly suitable for professional applications as operations could be disturbed by other communications.
<b>Restricted traffic</b> (with CTCSS/ DCS)	From channel 9 onwards (with several CTCSS tones or DCS codes)	CTCSS and DCS tones are similar to access codes and enable the radio to communicate only with the parties that use the same frequency or have set the same code.

- ▮ For information on how to change the CTCSS tone or DCS code of a channel programmed in restricted traffic mode, see [▫ 5.9](#).
- ▮ The restricted traffic mode enables several radios to use the same radio frequency. However, if several parties (for example a user of group A and a user of group B) simultaneously use the same channel for transmission purposes, interference may occur. For this reason, it is advisable not to transmit if the radio signals that the channel is busy although there are no communications.

- ▮ The restricted traffic mode does not guarantee the privacy of communications. In this mode it is in fact possible to listen also to parties that use CTCSS tones/DCS codes, although it is not possible to call them because they would not be able to receive the call. To communicate in confidential mode, enable the scrambler [▫ 6.5](#).
- ▮ If you need to use the HP450 radio next to electric equipment that generates impulses that frequently enable the squelch of the radio (that is the radio cannot be permanently silenced when there are signals and noise can be occasionally perceived), it is generally preferable to use the restricted traffic mode.

## 5.9 Programming the CTCSS/DCS codes

It is possible to change the CTCSS tones or DCS codes that have been preset for the channels from 9 onwards.

### 5.9.a Selecting the CTCSS tones

- 1) Select the operating channel.
  - 2) Press **MENU** twice. **CTC** displays on the left along with the flashing value that has been set on the right: **oF** (disabled) or a number ranging from **1** to **38** (CTCSS tone), depending on the channel in use.
  - 3) Press **▲** or **▼** to highlight the desired setting.
  - 4) Press **PTT** to store the tone (or wait five seconds).
- ▮ The setting of a CTCSS tone disables all DCS codes, because these functions cannot be used simultaneously.

### 5.9.b Selecting the DCS codes

- 1) Select the operating channel.
- 2) Press **MENU** three times. **DCS** displays on the left along with the flashing value that has been set on the right: **oF** (disabled) or a number ranging from **1** to **83**, depending on the DCS code used.
- 3) Press **▲** or **▼** to select the desired setting.
- 4) Press **PTT** or wait five seconds to store the DCS codes.

📌 *The setting of a DCS code disables the CTCSS tones because these functions cannot be used simultaneously.*

### 5.9.c LED operation with CTCSS/DCS

When you use the restricted traffic mode, the status LED provides slightly different indications as compared to those of the open traffic mode:

- **Off**: indicates that no signal is being received (as in the open traffic mode)
- **Green**: indicates that a signal with a correct CTCSS/DCS tone is being received (it is enabled together with the radio volume)
- **Orange**: indicates the receipt of a signal without a CTCSS/DCS tone or with a different CTCSS/DCS tone (the volume will not be enabled)
- **Red**: indicates that the transmission is in progress (as in the open traffic mode)

### 5.10 Monitoring function - Monitor/squelch

This feature can be used to monitor the selected channel before transmitting and receiving low intensity signals. Press **MON** to disable the mode (CTCSS).

To disable the **squelch (noise reduction)**, hold **MON** down for

approximately 3 seconds. In this mode, you can hear all the noise present in the environment.


📌 *The disabling of the squelch increases the consumption of the battery power.*


### 5.11 Selecting the transmission power

The **HI/LO** button is disabled in the standard models such as HP450.

The transmission power is displayed with the icon  at the top left of the screen.

### 5.12 Locking the keyboard

Hold down **SCAN/LOCK** for approximately three seconds to highlight symbol  (in the lower left section of the screen). All the functions of the radio are temporarily disabled, except transmission (**PTT**), calls (**CALL**) and the features for the adjustment of the squelch/monitor.

To release the keyboard, repeat the operation described. Symbol  disappears from the display.

📌 *If the radio is in Scan or Dual Watch mode and you press **SCAN/LOCK**, these features are disabled without the keyboard being locked. To perform the latter operation, it is therefore necessary to press the key once more.*

### 5.13 Emergency mode

The **E** button is disabled in the standard models such as HP450.

In Emergency mode, the only channel displayed is the emergency one and the power output is high level.

## 5.14 Scan function

### 5.14.a Channel scanning


HP450 can automatically search signals on all the available channels by "scanning" them, that is rapidly selecting them in sequence.


To start the scan briefly press **SCAN/LOCK**. **SCAN** displays.

During the scan you can also:

- Reply to a call by pressing **PTT**.

To disable the scan, press once more **SCAN/LOCK**. **SCAN** disappears from the display and the transceiver returns to the standby mode on the channel that had been selected before starting the scan.

 If a *priority channel* has been programmed and you select it, **P** displays in the lower left section of the screen.

 **The channels to scan must be previously enabled through the programming software.**

### 5.14.b Dual Watch (dual listening mode)

This function enables you to scan two selected channels only.

- 1) Select the desired operating channel.
- 2) Press **MENU** five times. **DW** (Dual Watch) flashes on the display along with **oF** (Dual Watch disabled).
- 3) Press **▲** or **▼** to select the second channel.
- 4) Press **PTT** (or wait five seconds) to enable the Dual Watch feature.

**DW** displays in Dual Watch mode.

To disable the Dual Watch feature, briefly press **SCAN/LOCK**.

## 6 Functions of MENU key

- 1) Press **MENU** several times to highlight the desired function.
- 2) Press **▲** or **▼** to set the selectable value for the displayed feature.

The following table lists the features that can be set (the number of times key **MENU** has to be pressed is indicated in the columns on the left):

MENU	Feature	Display	Disabled
1	Selection of the operating channel	(channel)	NO
2	Selection of the CTCSS tones	<b>CTC</b>	NO
3	Selection of the DCS codes	<b>DCS</b>	NO
4	Mode	<b>VOX</b>	YES
5	Dual Watch	<b>DW</b>	YES
6	Roger bip		NO
7	Keyboard tones	<b>bP</b>	NO
8	Selection of the call tone	<b>CA</b>	NO
9	Scrambler	<b>SC</b>	NO
10	Out of range indicator	<b>oU</b>	YES
11	Cloning (copying data between radios)	<b>CL</b>	NO

### 6.1 E-VOX

e-VOX (enhanced Voice Operated eXchange) enables to start a transmission without pressing any keys, but by simply talking. The sensitivity of e-VOX can be adjusted according to needs; for example depending on whether you use the transceiver only or the optional microphone or on whether you use the radio in a very noisy or noise-



less environment.

- 1) Press **MENU** several times until **VOX** flashes on the display (normally 4 times). The right section of the displays shows the current VOX setting (for example **oF** if the feature is disabled).
- 2) Press **▲** or **▼** to highlight the number related to the desired setting as shown in the following table:

No.	Sensitivity	Comments
<b>oF</b>	-	VOX disabled. transmission can be started only by pressing <b>PTT</b>
<b>1</b>	Minimum	In this case you can talk even in a very low voice and at a greater distance from the radio. However, if the environment is too noisy, transmission may be accidentally started by any noise.
<b>2</b>	Medium	Intermediate setting
<b>3</b>	Maximum	In this case you will have to talk in a loud voice and close to the radio, but it is also possible to use the radio in very noisy environments.

- 3) Press **PTT** to confirm.


### 6.1.a Connecting the optional microphones



To connect the optional microphones:

- 1) Verify that the radio has been **switched off**.
- 2) Loosen the screw [20] that fixes in place the protective cover [21] of the microphone connectors.
- 3) Remove the protective cover of the microphone connectors by pushing the section labelled **PUSH** upwards.
- 4) Insert the jack of the microphone into the **SPK** and **MIC** slots of the radio.

## 6.2 Roger bip


“Roger bip” is a short audio tone that the radio issues when you release **PTT** at the end of the transmission. To enable/disable roger bip:

- 1) Press **MENU** six times to highlight .
- 2) Press **▲** or **▼** to enable or disable it.
- 3) Press **PTT** to confirm.

 *If the Roger bip feature has been enabled and the radio is in standby mode,  displays.*

## 6.3 Keyboard tones

- 1) Press **MENU** seven times to highlight **bP** (bip).
- 2) Press **▲** or **▼** to enable or disable the keyboard tones.
- 3) Press **PTT** to confirm.

 *When you press one of the keys to disable the keyboard tones (**oF**) in step 2, the radio will not issue a beep to confirm the disabling. The re-enabling of the tones (**on**) is instead signaled with a beep.*

## 6.4 Selecting the call tone

Briefly press **CALL** to start an audio call. To select one of the five available tones:

- 1) Press **MENU** eight times. **CA** (CALL) displays on the left along with the currently set value: **oF** (disabled) or **1, 2, 3, 4** or **5**, according to the tone in use.
- 2) Press **▲** or **▼** to select the desired setting. You can listen to the tone you are setting through the speaker.

3) Press **PTT** to exit.

- ☞ If you select **oF** (Disabled), the call function shall be disabled. Thus, the selection of **CALL** shall produce no effect.

## 6.5 Scrambler

The scrambler is designed to protect communications.

This feature prevents parties from other networks from hearing and understanding voice communications.

*To enable/disable the scrambler:*

- 1) Press **MENU** nine times. **SC** (Scrambler)
- 2) Press **▲** or **▼** to enable/disable the scrambler.
- 3) Press **PTT**.

If the scrambler is enabled, the status LED flashes in green (two repeated flashes in green).

- ☞ *When the scrambler is enabled, it is not possible to clearly receive communications. Therefore, before enabling it, it is necessary to make sure that all the radios you wish to communicate with have enabled this feature, otherwise you will not be able to communicate with them.*

- ☞ *The scrambler of the transceiver does not fully guarantee the safety of communications.*

## 6.6 Out of range indicator

If this feature is enabled, the HP450 will issue a double beep when the radio is out of range.

The radio with which you are communicating must also enable this feature.

*To enable/disable the out of range indicator:*

- 1) Ask the other radio to enable the feature.
- 2) Press **MENU** ten times. **oU** (Out of range) is displayed.
- 3) Press **▲** or **▼** to enable or disable this feature.
- 4) Press **PTT** (or wait five seconds).

## 6.7 Cloning (copying data between radios)

The Cloning feature enables to copy all the settings (for example channels, CTCSS/DCS, call tones, enabled/disabled features) onto another HP450 radio:

### 6.7.a Connection

- 1) Connect the two ends of the optional cloning cable to the **MIC** connectors of both radios.

### 6.7.b Enabling the Cloning feature

On the radio you wish to program (that receives the data):

- 1) Press **MENU** 11 times. **CL** (cloning)
- 2) Press **▼**. **CL** displays followed by **re** (receipt).
- 3) Press once more **▼**. The status LED lights in green to indicate that the radio is ready to receive the data.

On the programmed radio (that has already been programmed):

- 1) Press **MENU** 11 times. **CL** (cloning)
- 2) Press **▲**. **CL** displays followed by **tr** (transmission).
- 3) Press once more **▲**. The status LED flashes in red and the data transfer is started.
- 4) At the end of the transfer operation, **P** displays on the radio that has received the data.
- 5) Press **MENU** on both radios to exit.


## 7 Care and maintenance

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### 7.1 Cleaning the radio

Delicately clean the radio with a soft, clean and lint-free cloth. If the radio is very dirty, dampen a cloth in a solution containing water and detergent.

 **Do not use detergents, alcohol or abrasive substances.**

 **Do not remove the protection of the side connectors and the battery pack during cleaning. Do not wet connectors or electric contacts.**


### 7.2 Recharge contacts of the batteries

If the operations described above do not allow you to thoroughly clean the recharge contacts of the battery pack [19], you can delicately rub them with a clean eraser.

### 7.3 Connectors

When unused, connectors should be protected with the appropriate cover.

 **Do not connect the connectors to parts that have not been supplied or recommended by CTE International as this could damage the radio.**

 **The resistance to immersion can be guaranteed only if the protection of the connectors is firmly installed on the radio. In the event of accidental immersion in water, immediately dry the device.**

### 7.4 Battery-charger

Always handle the radio in compliance with the above-described precautions. Always keep seats and contacts clean.

 **Before performing cleaning operations, disconnect the battery-charger from the mains.**

### 7.5 Troubleshooting

HP450 has been designed to guarantee years of trouble-free operation. However, if a failure occurs, please read the content of this chapter before contacting the local service center.

### 7.5.a Table of solutions

Problem	Possible cause	Solution
<b>The radio doesn't switch on</b>	The battery pack is discharged and/or has not been installed correctly.	Verify that the battery pack is charged and that it has been correctly installed.
<b>The radio switches off shortly after it has been switched on</b>	Discharged battery pack.	Recharge the battery pack.
<b>The battery pack does not recharge</b>	The battery-charger has not been connected or installed correctly.	Inspect the connections of the battery-charger and the installation of the batteries.
<b>The radio switches on but is unable to receive signals</b>	The site of installation is too shielded.	Move to an another area.
	The volume is too low	Adjust the volume.
	Incorrect CTCSS or DCS	Check that the CTCSS tone or DCS code corresponds to the one set by the parties you are communicating with.
<b>Noise is always present in reception mode</b>	The monitoring function is enabled.	Disable the monitoring function.
<b>It is not possible to communicate with other parties</b>	An incorrect radio channel has been selected.	Select the same radio channel used by the parties you are communicating with.
	The radio is installed in a shielded area or is too far from the party you are communicating with	Move to another area.
	Incorrect CTCSS or DCS	Check that the CTCSS tone or DCS code corresponds to the one set by the parties you are communicating with.
<b>Reception is fragmented and/or disturbed</b>	The signal is very weak.	Try temporarily disabling the squelch by means of the Monitoring feature.
	The transmission distance is excessive and/or there are obstacles in the transmission path	Move closer to the party you are communicating with or to another area.
	Other parties are using the same channel	Check the traffic on the radio channel by means of the Monitoring feature and select another channel if required.
	The radio has been installed too close to equipment that causes interference (televisions, computers, etc.)	Increase the distance between the radio and this equipment.
<b>Received communications are not clear</b>	The scrambler has been configured on a different setting as compared to that of the parties you are communicating with (all the parties should either enable or disable the scrambler).	Select the same scrambler setting of the parties you are communicating with.

<b>Transmission is not always possible</b>	The channel is used by an excessive number of parties or the transmission has been barred due to a busy channel.	Select another channel. Ask the radio link provider to disable the block due to busy channel.
	The transmission timer has enabled	Reduce transmission time. Ask the radio link provider to set the transmission timer to a higher value.
<b>VOX causes the radio to accidentally enable transmission</b>	The sensitivity and/or environmental noise is too high.	Reduce the VOX sensitivity.
<b>The VOX feature requires speaking in a loud voice</b>	The sensitivity is too low.	If the environmental noise is not high, increase the sensitivity or use an optional microphone.
<b>The autonomy of the battery pack is limited</b>	Commission time is too high.	Try reducing the transmission time and/or using a low power.
	For NiMH battery packs only: memory effect on the battery pack	Eliminate the memory effect.
<b>Some functions are not available</b>	The radio may have been programmed so that these functions are disabled.	Contact the radio link provider or your authorised supplier.
<b>Logic related faults (unreadable displayed symbols, functions blocked, etc.)</b>	Incorrect setting caused by a problem with the power supply.	Perform a Soft Reset procedure.

## 7.6 Correcting logic faults (Soft Reset)

Some faults are caused by temporary problems originating from external factors; for example the presence of disturbances in the power supply during the recharge of the batteries may alter the settings of the radio. In this case try switching the radio off and on and verify that the transceiver is working correctly after it has been reset.

## 8 Technical specifications

GENERAL SPECIFICATIONS		
Channels	312	99 are pre-programmed to assure complete compatibility with HP446 extra
Frequency generation	-	PLL synthesizer
Frequency range	MHz	From 446.00625 to 446.09375 MHz
Aerial		"Rubber ducky" in rubber
Rated power supply	Vdc	From 4.5 to 7.2 Vdc (Li-Ion or NiMH battery pack)
Operating temperature	°C	From -25° to +55°
Size (H x L x D with aerial)	mm	113 × 54 × 35
Weight (without batteries)	g	180
TRANSMITTER		
Output power (ERP)	W	0,5
Type of circuit	-	FM
Suppression of spurious signals	-	Compliant with R&TTE standards
RECEIVER		
Sensitivity at 12dB SINAD	µV	Above 0.25
Audio output power (10% THD)	W	1
Spurious signals rejection	dB	70
Medium frequencies	MHz	First 45.1
	KHz	Second 455
CONNECTIONS		
Connection for external microphone and recharge	-	2.5 mm stereo jack
Connector for external speaker	-	3.5 mm mono jack

Specifications are subject to change without notice.

## 9 Tables of codes

### 9.1 Correspondence of the HP450 reference number to be selected - Frequency of CTCSS tones

Number displayed	Tone frequency Hz	Number displayed	Tone frequency Hz	Number displayed	Tone frequency Hz
1	67	14	107.2	27	167.9
2	71.9	15	110.9	28	173.8
3	74.4	16	114.8	29	179.9
4	77	17	118.8	30	186.2
5	79.7	18	123	31	192.8
6	82.5	19	127.3	32	203.5
7	85.4	20	131.8	33	210.7
8	88.5	21	136.5	34	218.1
9	91.5	22	141.3	35	225.7
10	94.8	23	146.2	36	233.6
11	97.4	24	151.4	37	241.8
12	100	25	156.7	38	250.3
13	103.5	26	162.2		

### 9.2 Correspondence of the HP450 reference number to be selected - DCS codes

No.	DCS code	No.	DCS code	No.	DCS code
1	23	31	223	61	503
2	25	32	226	62	506
3	26	33	243	63	516
4	31	34	244	64	532
5	32	35	245	65	546
6	43	36	251	66	565
7	47	37	261	67	606
8	51	38	263	68	612
9	54	39	265	69	624
10	65	40	271	70	627
11	71	41	306	71	631
12	72	42	311	72	632
13	73	43	315	73	654
14	74	44	331	74	662
15	114	45	343	75	664
16	115	46	346	76	703
17	116	47	351	77	712
18	125	48	364	78	723
19	131	49	365	79	731
20	132	50	371	80	732
21	134	51	411	81	734
22	143	52	412	82	743
23	152	53	413	83	754
24	155	54	423		
25	156	55	431		
26	162	56	432		
27	165	57	445		
28	172	58	464		
29	174	59	465		
30	205	60	466		

