

APPENDIX 5
USER'S MANUAL

TWENTY-FOUR (24) PAGE USER'S MANUAL
FOLLOW THIS SHEET

USER'S MANUAL
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APPENDIX 5

75-440

UHF Handheld GMRS Transceiver

User's Manual

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Introduction

Congratulations. 75-440 is an advanced GMRS Professional Radio. Its rugged design allows it to be your reliable partner even during hard working days. Its LCD as well as user friendly controls makes the 75-440 easy to use.

To extend the flexibility of the radio, a VOX "FUNC" has been added which allows switching the transmission just by talking in full hands free condition. (with optional headset)

Transceiver's specifications provided in 75-440 are compliant with EIA/TIA 603 and ETS 300 086, The 74-440 top level design and resistance are compliant with IEC529 level IP54 and MIL STD 810 C,D,E.

Midland Radio is committed to continuous quality improvements, for this reason specifications may vary without prior notice.

Warning notes

Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. Midland 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 people will not affect the applicability of the information in it.

Safety

Your 75-440 handheld transceiver has been carefully designed to give you years of safe, reliable performance. 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 itself.
- **Do not carry the transceiver by the antenna.** This may damage the antenna or antenna terminal. Grasp it by its base (not the tip!) 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. The radio will perform best if the microphone is 5-10 cm away from the mouth 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 -30 to +60°C). Do not expose the transceiver to excessive vibrations as well as dusty or rainy places.
- **Never try to disassemble or service the radio by yourself** (aside from the routine maintenance described in this handbook). It will immediately void the warranty and you may cause damage requiring extensive repair work. Always contact your local dealer for assistance.

- **Use only authorized accessories.** Non original ones could seriously damage your handheld transceiver.
- **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.** Strictly follow the directions described in the paragraph "Care and maintenance".
- **Handle the battery properly.** Strictly follow the directions reported in "Care and maintenance".
- 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 dealer.
- To avoid damaging the power cable of the battery charger, do not put anything on it or place it where it will be walked on.

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.

Conventions and Symbols in this Book

 This symbol marks a 'note'. Notes are hints or tips which offer additional information to help you.

 ***This symbol marks a 'caution'. Cautions are special notices, which you should read and follow carefully to avoid possible damage to your equipment and to avoid potential danger to yourself or other people.***

Key names will be highlighted in **bold**.

Important sentences and words are highlighted in *italic*.

LCD messages, which may appear on the transceiver's display, are highlighted in Courier New

Setup

Unpacking

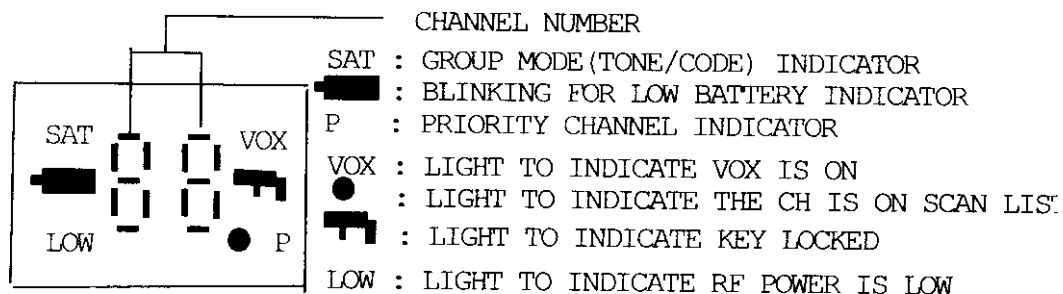
The following items are in the package:

- (a) Transceiver's main body
- (b) Flexible antenna
- (c) Battery pack NiMH 1,200 mA/h
- (d) Belt clip
- (e) Users guide (this book!)

If something is missing please promptly advise your supplier.

Display

This section explains the meaning of the various indications, which may appear, on the LCD of your 75-440 handheld transceiver:



Charging the battery pack

To charge the supplied battery pack you have to setup the charger and connect the radio as follows:

- 1) Connect the jack coming from the AC adapter to the cradle's socket.
- 3) Connect the AC plug of the AC adapter's power cable into a grounded AC power outlet.
- 4) Ensure that the radio is switched off.
- 5) Insert the radio into the cradle with the keypad toward you (the three metallic contacts of the battery pack must touch with the three contacts inside the cradle).
- 6) Wait 8-9 hours and remove the radio after that time.

 *Do not remove the radio before 8 hours, otherwise the battery's duty could be temporarily reduced.*

 **Do not forget to remove the radio after 9 hours.**

 **The battery charger is for indoor use only.**

 **For the next charges, best duty and battery life please see the chapter "Battery Packs".**

Fitting/removing the antenna

To fit the antenna:

- 1) Locate the antenna terminal (thread MX type) on transceiver's top.
- 2) Hold the transceiver with one hand and the base (the thicker part) of the antenna with the other one.
- 3) Attach the included rubber ducky antenna to the antenna terminal by turning it clockwise until it is firmly locked. Do not overtighten it.

To remove the antenna do the same described procedure. At step 3 turn the antenna base counterclockwise.

 **Always have the antenna attached to the radio. You can not communicate without it. Transmitting without the antenna may damage the TX output final stage. For the same reason use only the supplied antenna.**

 *The supplied antenna is broadband type and covers the whole spectrum. No alignment is needed.*

Installing/removing the battery pack

To install the battery pack:

- 1) Hold the transceiver's body with one hand and the battery pack with the other. Put the bottom edge of the battery pack onto the bottom of the transceiver.
- 2) Gently push the battery pack toward the transceiver's body until the battery latches.

To remove the battery pack:

- 1) Press the battery release button located in the top of the battery pack.
- 2) Keep the button pressed and gently pull the battery pack away from the transceivers body.
- 3) Remove the battery pack by separating it from the transceiver's body.

Installing/removing the belt clip

The supplied belt clip allows you to hang the transceiver on your belt or jacket when you are not using the radio and you are in stand-by condition (ready to receive **calls**).

To fit the belt clip onto the transceiver's body:

- 1) Gently slide the clip into the appropriate guides located on the transceiver's battery pack until it firmly locks.

To remove the belt clip:

- 2) Gently move the latch located between the top of the belt clip and the battery pack towards the belt clip
- 3) Slide the belt clip up and off the radio.

Adjusting volume

The **PWR/VOL** knob is used to adjust the RX volume: turn it clockwise to increase or counterclockwise to reduce it.

Channel selection

If your radio has been programmed with more than one channel you can easily change it. As previously explained each channel is identified by 2 numeric digits that were previously defined by your network administrator or dealer.

To select a channel:

- 1) Press the  key to increase the channel number or the  key to decrease it.

Reception

Your radio could be previously programmed to work, channel by channel, in "Open traffic" or "GROUP MODE (CTCSS/DCS)". Please have a look at each description and ask your radio network manager or dealer which mode your radio channels operate.

- **OPEN TRAFFIC:** in this case you will hear all communication which will be transmitted on the selected channel. When the right carrier is received your squelch will un-mute, you will see the status LED glowing green and you will hear the message.
- **GROUP MODE:**
 - **CTCSS/DCS (Continuous Tone Code Squelch System / Digital Coded Squelch):** are systems which use particular TX signaling (a continuous sub audible tone for "CTCSS" or a digital code for "DCS") as an access "key" to work a repeater (encoder) or to unlock the party's signaling sensitive squelch. This last condition allows more radio networks to share the same frequency. In this case you will receive only messages coming from parties sending a proper TX signaling. During "CTCSS/DCS" operation, the radio may be set-up so that the appropriate CTCSS/DCS decoder enables the speaker.
 - **CTCSS/DCS** If more than one station is transmitting at the same time, this will cause interference! Do not transmit if the status LED is glowing. Wait till until the channel is clear before transmitting.
 - **Monitor**

Monitor button can enable or disable "GROUP MODE (CTCSS/DCS)".

- 1) **To enable "GROUP MODE".** Press and release the "MON" button: "SAT" icon is displayed. A Sub Audible Tone mutes your speaker.
- 2) **To Disable "GROUP MODE".** Press the "MON" button: "SAT" icon is **not** displayed. You are now working in "Open Traffic".

 **NOTE:** if "SAT" icon is never displayed, "CTCSS/DCS" tone is not programmed. "GROUP MODE" function is not available.

- 3) Press and Hold "MON" button for three seconds, internal squelch will be disabled and your speaker is un-muted. Press and release the "MON" to restore the squelch to normal operating condition.

Basic Operations

Programming can change standard operation. The included functions of the radio can be modified via an IBM compatible PC. For this reason the way your radio operates may be upgraded and may differ slightly from what is described here.

 **IMPORTANT:** Due to the full programmability of the radio, certain commands could be unavailable. In case of doubts please contact your dealer or radio network administrator for further details.

Switching the radio ON/OFF

To switch the radio on:

- 1) Rotate the "PWR/VOL" knob clockwise until the radio is switched on. The CPU will start an auto test showing in sequence as follows:

- LED will glow GREEN, then RED and turn OFF.
- LCD will display all segments and icons. The letters "PS" (which means "PASS") will be displayed followed by a long beep.
- LCD will display the last operating mode.

 The self-test goes very fast.

- 2) After the auto test has been carried out LCD will show the following data:

- The channel number. (2 numeric characters).

 **NOTE:** About 0.5 second after you select a new channel or change operation mode, the last status is automatically saved. When the Radio is turned on, the most recently used channel is displayed.

 **NOTE:** the following icons will be displayed depending on the operating mode.

- The currently selected TX output power: low (L) or nothing high in the lower left corner of the LCD.
- A small "•" is displayed in the lower right corner of the LCD if the channel is in the SCAN list.
- A "P" is displayed to show that the channel is in the priority Scan list.
- "SAT" in the upper left corner indicates that the channel is a GROUP CHANNEL (for CTCSS or DCS tone).
- "Battery" icon to indicate battery is low. (only if battery is low)
- "VOX" is displayed when "VOX" function is enabled.
- A "Key" icon to indicate that the keypad is locked.

 **NOTE:** When "VOX" is enabled, "PTT" button is not working.

 **NOTE:** When keypad is locked; only "PTT" button is enabled (with exception of VOX enabled).

To switch the radio off, rotate the PWR/VOL knob counterclockwise.

- 2) Select the channel, which is to be added or deleted from the **"Scan"** list.

 *Adding and removing channels from the Scan list is not available during scanning.*

- 3) Press **"CALL"** + **"MON"** button, the **"•"** icon will appear or disappear. (see # 1)

Selecting a Priority Channel

One channel can be assigned as a **"Priority Channel"**. The scanning will look back at the priority channel most frequently.

- 1) To activate (or deactivate) Priority channel, press the **"CALL"** +  key. A **"P"** will be displayed in the lower left corner of the display to confirm your selection.

 **NOTE:** *If the Scan List has no channels, a low tone (error beep) will be heard when the **"CALL"** + **UP(↑)** Key is pressed, no channel will be scrolled in the display. At least two channels must be in the Scan List for the Unit to be put in the SCAN Mode.*

 *When a signal is received on a channel, the radio will stop scanning and the speaker will become un-muted. When the activity on that channel ceases, the unit will automatically resume scanning.*

 *If CTCSS/DCS have been previously programmed, the scanning will stop only if the received carrier has the appropriate signaling.*

 *If **"PTT"** is pressed during scanning, the radio will transmit on the first vacant channel. In case of no activity, the Unit will automatically resume scanning.*

Radio lock

Your 75-440 has been provided with a security function, which protects it against accidental activation of commands. You can lock the radio as follows:

To lock the radio:

- 1) Press the **"FUNC"** key +  key.

To unlock the radio:

- 1) Press the **"FUNC"** key +  key.

 *When the radio is locked only the **"PTT"** button is enabled.*

Transmission

- 1) **Ensure that the channel is not busy** otherwise you will create interference
 - 2) Press the **"PTT"** button, the status LED will glow red.
 - 3) Start talking at a **normal voice level** at approximately 10 cm from the microphone (keep the **"PTT"** key pressed).
 - 4) When you have finished talking, release the **"PTT"** button.
-  **Do not shout!** It will not increase the distance you can transmit, but rather will make you heard distorted.
-  **Do not release the "PTT"** before your message is over or start talking before pressing it, otherwise your message will be "chopped".
-  **A GMRS handheld radio doesn't normally allow you to talk and receive simultaneously, for this reason make your messages short. When you are talking the other parties can not use the channel! Use the common sense.**
-  **Your radio might be programmed with a *timeout timer* which will automatically turn off the transmitter if you talk too long (after a preset time). In this case release the "PTT" and wait for few seconds, the radio TX features will be automatically restored. Ask the network administrator or your dealer for further details.**
-  **The radio might be programmed with a *busy channel lock out* which automatically disables transmit of the radio if your channel is busy.**

Adjusting transmission Power

Your 75-440 can transmit with two power levels according to the distance of your party's station(s). We do recommend, when possible, to use the Low power setting. This will increase the battery life and will reduce the risk of interference with other stations not in your radio network which may be sharing the same channel with you.

- 1) To change the channel's Power Output level from high (2 Watts) to Low (1 Watt), or vice versa, Press and Hold **"FUNC"** key for about 2 seconds. A small **"LOW"** will appear in the lower left corner of the display to indicate **"Low Power"**. High Power has no indicator.
-  **If the battery icon is "blinking" (Low Battery indication), the Unit will automatically switch to Low Power when transmitting in order to help prolong the Battery's operational life. In this case, two short beeps will be heard when you press the "PTT" key before the radio transmits.**

Scanning channels

If you have more than one channel programmed, your 75-440 can scan them. The advanced scan function of the radio allows to optionally look for carrier or carrier with **"CTCSS"** or **"DCS."**

- 1) To **activate scan** press the **"CALL"** button +  key. You will see the channel numbers cycling continuously.
- 2) To **stop scanning** press the **"CALL"** button +  key

Reviewing the Scan-List.

- 1) Scroll the channel list, channels which shows **"•"** icon, are in the **"SCAN"** list.

KEY BEEP

A beep is heard when any key is pressed with the exception of the "PTT" button.

To **enable or disable** Key Beep:

Press the "**FUNC**" key + "**MON**" button.

Advanced Operations

In this section we'll describe some advanced operation which you can do with your handheld transceiver:

Handsfree transmission (VOX)

VOX (Voice Operated Transmit) is an automatic system, which allows you to automatically switch the transmission in hands free mode just by speaking in the built-in microphone of a headset (not provided with the unit). Please ensure that the headset is suitable for your transceiver as reported in the paragraph "Microphone connection".

- 1) **Connect the optional headset** with built-in microphone to the microphone connector located on the transceiver's side. Be sure the headset is equipped for **"VOX"** operation.
- 2) **To activate "VOX"**: Turn the radio off. Press and hold the **"FUNC"** +  keys turn the radio on. **"VOX"** icon will be displayed.
- 3) Ensure that the headset's built-in microphone is located close to the side of your mouth.
- 4) Press the **"FUNC"** key +  key to adjust the **"VOX"** sensitivity in order to ensure a stable transmission when speaking with a normal voice level.

 **"VOX"** icon will flash when **LOW** sensitivity is selected and on steady when **HIGH** sensitivity is selected.

 **We recommend setting the "VOX" for minimum sensitivity. Sensitivity set too high could cause accidental transmissions, especially in hi-noise environments.**

 **"PTT" button is disabled during VOX.**

- 5) **To DEACTIVATE "VOX"**: Turn off the radio. Press and hold the **"FUNC"** +  keys, turn the radio on. The **"VOX"** icon will no longer be displayed. The **"VOX"** is now off.

PAGING CALL

User can alert radios of his fleet by pressing the **"CALL"** button. The other parties will hear a ringer type sound.

*To send an automatic **"CALL"**:*

- 1) Press the **"CALL"** key for about 2-sec. to alert all the radios in your fleet.
- 2) A ringer beep will advise the other parties about the incoming message.
- 3) Press the **"PTT"** and Speak with a normal voice level to send the message.

ROGER BEEP

A roger beep will be heard when **"PTT"** button is released.

*To enable or disable Roger Beep **"FUNC"**:*

Press the **"FUNC"** + **CALL** keys.

- When possible charge battery packs only when they are completely discharged, i.e. when the battery icon has no bars inside.
- Do not remove the battery from the charger before the necessary time to provide a full charge.
- Provide at least two deep charge/discharge cycles per month.
- The best way to avoid memory effect is to use two battery packs and alternate their use with the radio. This will allow you to keep using your transceiver by replacing the battery pack just when it is fully discharged. At the end of your working day you will charge the discharged pack for 8 hours.

Erasing memory effect

Memory effect can be easily erased just by applying 3-4 deeper charge/discharge cycles:

- 1) Use the battery fitted in the radio and wait *till the radio switches off*.
- 7) Wait at least one hour and then try to switch on the radio: you will note that some energy has restored in the battery, because the radio can be switched on.
- 8) Leave the radio in RX until the radio switches off again.
- 9) Repeat steps 2) and 3) three times.
- 10) Fully charge the battery for 9 hours and check the battery duty. If some memory effect still exist go back to step 1.

 *If the battery duty doesn't improve after three of the over stated cycles, it means that your battery pack is faulty or has reached the end of life (please see "Information on rechargeable batteries"). In this case please ask your dealer to provide a new battery pack.*

Warnings for battery and chargers use

Please use these cautions to avoid damaging battery packs or the transceiver:

-  ***Before using the battery charger carefully read any related warning or caution.***
-  ***Do not short battery terminals: this may cause fire, burns or explosions.***
-  ***Never dispose batteries into fire they may explode causing fire, burns or explosions. Strictly follow any disposal regulation of your Country.***
-  ***Use only authorized batteries and chargers. The use of non-authorized accessories may cause burns, fire or explosions causing serious damages to the radio/battery or serious injuries to people.***
-  ***Battery chargers are for indoor use only.***
-  ***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 dealer or with your local power company.***
-  ***To avoid damaging the power cable of the battery charger, do not put anything on it or place it where it will be walked on. Insert the plug in socket provided with earth connection.***
-  ***Avoid strong shocks. Do not use the charger if it received a strong shock, has fallen down or it appears damaged; immediately contact an authorized service station.***
-  ***Never try to disassemble or service the charger by yourself. Always contact your local dealer for assistance.***

Care and Maintenance

Battery Packs

Information on rechargeable batteries

- When the battery pack is new it will not provide 100% of its efficiency. To reach the full battery run time you have to "run-in" the battery with at least 3-4 deep charging/discharging cycles. After that it will reach its maximum capacity. Please see "Proper charging of battery packs" for further details.
- When you properly use the battery pack, you will obtain about 400 charge/discharge cycles (300 with the optional rapid charger). The battery "run time" will progressively reduce after 2/3 of its life (approx.).
- Rechargeable battery packs lose their charge with time if left unused (self-discharge), this is normal. A NiMH (Nickel Metal Hydrate) battery can reduce 10 to 20% of its stored energy in few days.

Proper charging of battery packs

- 1) Ensure that the radio is switched off,
- 5) Insert the radio into the cradle as explained in the paragraph "Charging the battery pack"
- 6) Wait the necessary time to provide a full charge. If the pack isn't completely discharged you will need less than 8 hours.

 ***Do not overcharge the battery: always remember to remove the radio after the necessary time.***

 ***The battery charger is for indoor use only.***

 *When possible, charge the battery only when it is fully discharged or, at least, you have used it for the major part of the day, otherwise the battery's "run time" could be temporarily reduced. Please see the paragraph "Memory effect".*

 *Do not remove the radio before the necessary time, otherwise the battery's "run time" could be temporarily reduced. Please see the paragraph "Memory effect".*

Memory effect

The supplied NiMH (Nickel Metal Hydride) battery pack is made with a more advanced technology than normal NiCd (Nickel Cadmium) battery. For this reason it is virtually free of what is called memory effect", which affects NiCd batteries. Memory effect is a temporary capacity reduction, which reduces the battery duty. Memory effect may occur just if you *regularly* charge the battery when you haven't discharged it at least at 50-70%. Memory effect can be easily avoided by following these simple rules:

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 **To reduce the risk of electric shocks disconnect the plug before providing any cleaning or maintenance. Grasp the plug (not the cable) to remove the plug from the socket. The use of non-suitable extension can cause fire or electric shocks.**

 **Do not expose batteries directly to temperatures below -20°C (-4°F) or greater than 35°C (95°F) during their use and do not charge them outside the range of +5 to +55°C.**

Radio maintenance

Cleaning battery packs

Wipe the battery contacts with a clean and lint free cloth to remove dirt, grease or any other material that may prevent a good electrical contact. If contacts are very dirty you can also wipe them using a *soft pencil rubber* (not hard erasers for ink!). If you feel that battery contacts aren't still working properly, please contact your authorized dealer.

 **Do not use liquid, alcohol or aerosol cleaners.**

Cleaning the radio

- Wipe the radio with a clean and lint free cloth to remove dust. If it is very dirty, you can use a damp (*slightly moistened with water*) cloth.

 **Do not use liquid, alcohol or aerosol cleaners.**

 *If you normally use your radio in dusty or hard environments, we do recommend using the optional carrying case. Please see "Optional accessories".*

Connectors

When the connectors are not being used, they should be fitted with the supplied cover caps.

 **Only suitable accessories must be connected to the related connectors.**

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Quick reference

Operation reference

- 1) **Output Power:** Press the “FUNC” key to set High or Low Power output. “LOW” icon is displayed to show that you set Low Power output. (high output has no indication)
 - 2) **Group Mode:** Press the “MON” button to enable/disable GROUP MODE. SAT icon is displayed.
 - 3) **Squelch:** Press and Hold “MON” button to enable/disable the squelch.
 - 4) **Scan:** Press the “CALL” button + the  key to enter the SCAN.
 - 5) **Scan List:** Press the “CALL” button + “MON” key to change the channel in the scan list. The “•” icon will be displayed if the channel is in the scan list.
 - 6) **Priority:** Press the “CALL” button + the  key to select the priority channel in the scan list. A “P” icon will be displayed.
 - 7) **Lock:** Press the “FUNC” + the  keys to lock/unlock the radio. Only “PTT” button will function when the unit is locked (VOX is disabled).
 - 8) **“VOX”** Press the “FUNC” + the  keys while turning on the radio to enable/disable “VOX”. “VOX” icon will be displayed. (“PTT” button is disabled)
 - 9) When “VOX” function is enabled, Press the “FUNC” + the  key to set HIGH or LOW “VOX” sensitivity. VOX icon blinks to show LOW sensitivity.
 - 10) Press the “CALL” Button for about 2 seconds to send an alert with a ringer type tone to all the users in the fleet. (ringer will also be heard from the speaker when activated)
 - 11) Press the “FUNC” + “CALL” keys to enable / disable roger beep at the end of the transmission.
 - 12) Press “FUNC” + “MON” keys to enable/disable key beep.
-  **Press the “FUNC” + the  key and switch on the unit. UP will be displayed and unit enters the PROGRAMMING MODE. This operation is only allowed to authorized person.**