

KENWOOD

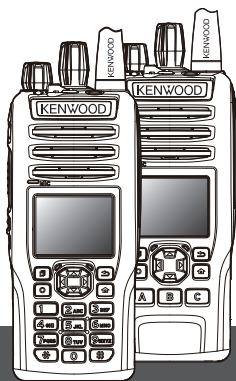
NEXEDGE

NX-5200

NX-5300

NX-5400

USER GUIDE



JVCKENWOOD Corporation

B5A-****-00 (K)

VHF DIGITAL TRANSCEIVER/
UHF DIGITAL TRANSCEIVER
700/800MHz DIGITAL TRANSCEIVER

NX-5200/ NX-5300 NX-5400

USER GUIDE

JVCKENWOOD Corporation

ENGLISH

NXDN™

NXDN™ is a protocol name for a new digital communications system using 4-level FSK technology which has been co-developed by JVC KENWOOD and Icom.

This device made under license under one or more of the following US Patents: 5,502,767.

The AMBE+2™ voice coding Technology embodied in this product is protected by intellectual property rights including patent rights, copyrights and trade secrets of Digital Voice Systems, Inc. This voice coding Technology is licensed solely for use within this Communications Equipment. The user of this Technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the Object Code, or in any other way convert the Object Code into a human-readable form. U.S. Patent Nos. #5,826,222, #5,754,974, #5,701,390, #5,715,365, #5,649,050, #5,630,011 and #5,581,656

Firmware Copyrights

The title to and ownership of copyrights for firmware embedded in KENWOOD product memories are reserved for JVC KENWOOD Corporation.

Terminal Descriptions

Universal connector

It is possible to use a resin-based cover for the Universal connector.

No.	Name	Description	Specification	I/O
1	SSW	Ext/Int Speaker Switch Input	Hi: INT, Low: EXT	I
2	SP+	BTL Output + for External Speaker	Standard load 8 Ω	O
3	SP-	BTL Output - for External Speaker	Standard load 8 Ω	O
4	MSW	Ext/Int MIC Switch Input	Hi: INT, Low: EXT	I
5	EMC	External MIC Input	Impedance: 1.8 k Ω	I
6	ME	External MIC GND	-	-
7	PTT	External PTT Input	Low: PTT ON	I
8	PF	Programable Function Key Input	Input voltage: 0 V - 3.3 V	I
9	OPT	Aux I/O Port (for EXT Option)	I: 0 V - 3.3 V O: Standard load 25 k Ω	I/O
10	E	GND	GND	-
11	5V	5V	5V power supply output Max output current: 140 mA	O
12	TXD	Serial Data Output	Baud rate: 115200 bps max	O
13	RXD	Serial Data Input	Baud rate: 115200 bps max	I
14	EMC	External MIC input	Impedance: 1.8 k Ω	I

Antenna Terminal

50 Ω impedance

THANK YOU

We are grateful you have chosen **KENWOOD** for your land mobile radio applications.

This Users Guide covers only the basic operations of your portable radio. Ask your dealer for information on any customized features they may have added to your radio. For using details instruction manual, refer to the following URL.

http://manual2.jvckenwood.com/en_contents/search/

NOTICES TO THE USER

- ◆ Government law prohibits the operation of unlicensed radio transmitters within the territories under government control.
- ◆ Illegal operation is punishable by fine and/or imprisonment.
- ◆ Refer service to qualified technicians only.

SAFETY: It is important that the operator is aware of and understands hazards common to the operation of any transceiver.

One or more of the following statements may be applicable:

FCC WARNING

This equipment generates or uses radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

INFORMATION TO THE DIGITAL DEVICE USER REQUIRED BY THE FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can generate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and 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 to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer for technical assistance.



The RBRC Recycle seal found on **KENWOOD** nickel metal hydride (Ni-MH) battery packs indicates **KENWOOD's** voluntary participation in an industry program to collect and recycle Ni-MH batteries after their operating life has expired. The RBRC program is an alternative to disposing Ni-MH batteries with your regular refuse or in municipal waste streams, which is illegal in some areas.

For information on Ni-MH battery recycling in your area, call (toll free) 1-800-8-BATTERY (1-800-822-8837).

KENWOOD's involvement in this program is part of our commitment to preserve our environment and conserve our natural resources.



The RBRC Recycle seal found on **KENWOOD** lithium-ion (Li-ion) battery packs indicates **KENWOOD's** voluntary participation in an industry program to collect and recycle Li-ion batteries after their operating life has expired. The RBRC program is an alternative to disposing Li-ion batteries with your regular refuse or in municipal waste streams, which is illegal in some areas.

For information on Li-ion battery recycling in your area, call (toll free) 1-800-8-BATTERY (1-800-822-8837).

KENWOOD's involvement in this program is part of our commitment to preserve our environment and conserve our natural resources.

PRECAUTIONS

- Do not charge the transceiver and battery pack when they are wet.
- Ensure that there are no metallic items located between the transceiver and the battery pack.
- Do not use options not specified by **KENWOOD**.
- If the die-cast chassis or other transceiver part is damaged, do not touch the damaged parts.
- If a headset or headphone is connected to the transceiver, reduce the transceiver volume. Pay attention to the volume level when turning the squelch off.
- Do not place the microphone cable around your neck while near machinery that may catch the cable.
- Do not place the transceiver on unstable surfaces.
- Ensure that the end of the antenna does not touch your eyes.
- When the transceiver is used for transmission for many hours, the radiator and chassis will become hot. Do not touch these locations when replacing the battery pack.
- Do not immerse the transceiver in water.
- When water gets into the microphone opening or the speaker grill, the voice level may become incoherent or distorted. Lightly shake the transceiver to remove the water from the speaker and/or microphone before operating the transceiver.
- Always switch the transceiver power off before installing optional accessories.

**WARNING****Turn the transceiver power off in the following locations:**

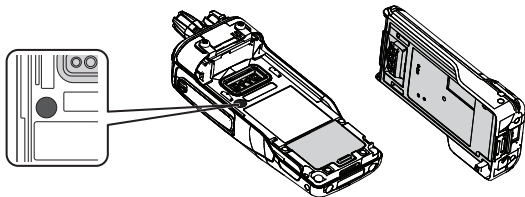
- Near explosives or blasting sites.
- In aircrafts. (Any use of the transceiver must follow the instructions and regulations provided by the airline crew.)
- Where restrictions or warnings are posted regarding the use of radio devices, including but not limited to medical facilities.
- Near persons wearing pacemakers.

Turn the transceiver power off in the following locations, unless the model is specifically qualified for such use (Intrinsically Safe such as approved by Factory Mutual, CSA):

- In explosive atmospheres (flammable gas, dust particles, metallic powders, grain powders, etc.).
- While taking on fuel or while parked at gasoline service stations.

**WARNING**

- Do not remove the black sheet from the reverse side of the transceiver (refer to the illustration below). Removal of this sheet decreases the waterproof efficiency of the transceiver and may cause malfunctions if water seeps into the transceiver.
- The orange seal on the reverse side of the transceiver is important with respect to the waterproof efficiency of the transceiver. Do not place stickers or other materials on or around the seal shown in the figure, or on the reverse side of the battery pack. Doing so will impair the waterproof efficiency of the transceiver and may cause it to break down. Additionally, in order to prevent damage to the seal, do not allow it to come in contact with foreign materials.



**CAUTION**

- Do not disassemble or modify the transceiver for any reason.
- Do not place the transceiver on or near airbag equipment while the vehicle is running. When the airbag inflates, the transceiver may be ejected and strike the driver or passengers.
- Do not transmit while touching the antenna terminal or if any metallic parts are exposed from the antenna covering. Transmitting at such a time may result in a high-frequency burn.
- If an abnormal odor or smoke is detected coming from the transceiver, switch the transceiver power off immediately, remove the battery pack from the transceiver, and contact your **KENWOOD** dealer.
- Use of the transceiver while you are driving may be against traffic laws. Please check and observe the vehicle regulations in your area.
- Do not expose the transceiver to extremely hot or cold conditions.
- Do not carry the battery pack (or battery case) with metal objects, as they may short the battery terminals.
- Danger of explosion if the battery is incorrectly replaced; replace only with the same type.
- When attaching a commercial strap to the transceiver, ensure that the strap is durable. In addition, do not swing the transceiver around by the strap; you may inadvertently strike and injure another person with the transceiver.
- If a commercially available neck strap is used, take care not to let the strap get caught on nearby machine.
- When operating the transceiver in areas where the air is dry, it is easy to build up an electric charge (static electricity). When using an earphone accessory in such conditions, it is possible for the transceiver to send an electric shock through the earphone and to your ear. We recommend you use only a speaker/microphone in these conditions, to avoid electric shocks.

Information concerning the battery pack:

The battery pack includes flammable objects such as organic solvent. Mishandling may cause the battery to rupture producing flames or extreme heat, deteriorate, or cause other forms of damage to the battery. Please observe the following prohibitive matters.



DANGER

- **Do not disassemble or reconstruct battery!**

The battery pack has a safety function and protection circuit to avoid danger. If they suffer serious damage, the battery may generate heat or smoke, rupture, or burst into flame.

- **Do not short-circuit the battery!**

Do not join the + and – terminals using any form of metal (such as a paper clip or wire). Do not carry or store the battery pack in containers holding metal objects (such as wires, chain-necklace or hairpins). If the battery pack is short-circuited, excessive current will flow and the battery may generate heat or smoke, rupture, or burst into flame. It will also cause metal objects to heat up.

- **Do not incinerate or apply heat to the battery!**

If the insulator is melted, the gas release vent or safety function is damaged, or the electrolyte is ignited, the battery may generate heat or smoke, rupture, or burst into flame.

- **Do not leave the battery near fires, stoves, or other heat generators (areas reaching over 80°C/ 176°F)!**

If the polymer separator is melted due to high temperature, an internal short-circuit may occur in the individual cells and the battery may generate heat or smoke, rupture, or burst into flame.

- **Avoid immersing the battery in water or getting it wet by other means!**

If the battery becomes wet, wipe it off with a dry towel before use. If the battery's protection circuit is damaged, the battery may charge at extreme current (or voltage) and an abnormal chemical reaction may occur. The battery may generate heat or smoke, rupture, or burst into flame.

**DANGER**

- **Do not charge the battery near fires or under direct sunlight!**

If the battery's protection circuit is damaged, the battery may charge at extreme current (or voltage) and an abnormal chemical reaction may occur. The battery may generate heat or smoke, rupture, or burst into flame.

- **Use only the specified charger and observe charging requirements!**

If the battery is charged in unspecified conditions (under high temperature over the regulated value, excessive high voltage or current over regulated value, or with a remodelled charger), it may overcharge or an abnormal chemical reaction may occur. The battery may generate heat or smoke, rupture, or burst into flame.

- **Do not pierce the battery with any object, strike it with an instrument, or step on it!**

This may break or deform the battery, causing a short-circuit. The battery may generate heat or smoke, rupture, or burst into flame.

- **Do not jar or throw the battery!**

An impact may cause the battery to leak, generate heat or smoke, rupture, and/or burst into flame. If the battery's protection circuit is damaged, the battery may charge at an abnormal current (or voltage), and an abnormal chemical reaction may occur.

- **Do not use the battery pack if it is damaged in any way!**

The battery may generate heat or smoke, rupture, or burst into flame.

- **Do not solder directly onto the battery!**

If the insulator is melted or the gas release vent or safety function is damaged, the battery may generate heat or smoke, rupture, or burst into flame.

- **Do not reverse the battery polarity (and terminals)!**

When charging a reversed battery, an abnormal chemical reaction may occur. In some cases, an unexpected large amount of current may flow upon discharging. The battery may generate heat or smoke, rupture, or burst into flame.

- Use of any option on the transceiver not specified by KENWOOD, may reduce or void the water resistant and dust resistant performance.
- Read the transceiver's instruction manual for other precautions on usage.

**DANGER**

- **Do not reverse-charge or reverse-connect the battery!**

The battery pack has positive and negative poles. If the battery pack does not smoothly connect with a charger or operating equipment, do not force it; check the polarity of the battery. If the battery pack is reverse-connected to the charger, it will be reverse-charged and an abnormal chemical reaction may occur. The battery may generate heat or smoke, rupture, or burst into flame.

- **Do not touch a ruptured and leaking battery!**

If the electrolyte liquid from the battery gets into your eyes, wash your eyes out with fresh water as soon as possible, without rubbing your eyes. Go to the hospital immediately. If left untreated, it may cause eye-problems.

**WARNING**

- **Do not charge the battery for longer than the specified time!**

If the battery pack has not finished charging even after the regulated time has passed, stop it. The battery may generate heat or smoke, rupture, or burst into flame.

- **Do not place the battery pack into a microwave or high pressure container!**

The battery may generate heat or smoke, rupture, or burst into flame.

- **Keep ruptured and leaking battery packs away from fire!**

If the battery pack is leaking (or the battery emits a bad odor), immediately remove it from flammable areas. Electrolyte leaking from battery can easily catch on fire and may cause the battery to generate smoke or burst into flame.

- **Do not use an abnormal battery!**

If the battery pack emits a bad odor, appears to have color changes, is deformed, or seems abnormal for any other reason, remove it from the charger or operating equipment and do not use it. The battery may generate heat or smoke, rupture, or burst into flame.

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UNPACKING AND CHECKING EQUIPMENT

Note:

- ◆ The following unpacking instructions are for use by your KENWOOD dealer, an authorized KENWOOD service facility, or the factory.

Carefully unpack the transceiver. We recommend that you identify the items listed in the following table before discarding the packing material. If any items are missing or have been damaged during shipment, file a claim with the carrier immediately.

SUPPLIED ACCESSORIES

Belt clip	1
• Screws for belt clip (M3 x 8 mm)	2
Universal connector cap	1
• Dressing screw	1
• Packing (preassembled)	1
Users Guide	1

INSTALLING/ REMOVING THE (OPTIONAL) BATTERY PACK

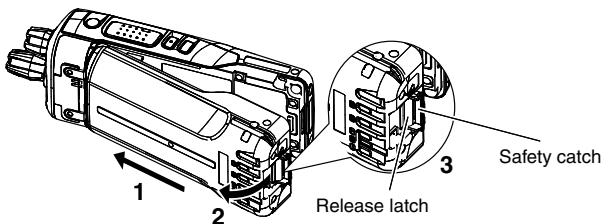
Installing/ Removing the Battery Pack



CAUTION

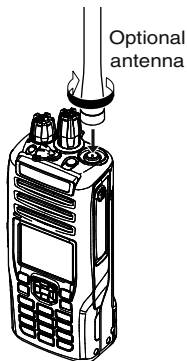
- ◆ Do not short the battery terminals or dispose of the battery by fire.
- ◆ Never attempt to remove the casing from the battery pack.
- ◆ Install the battery pack after cleaning the battery pack contacts and the transceiver terminals.
- ◆ Before charging a battery pack that is attached to the transceiver, ensure that the safety catch is firmly closed.

- 1 Match the guides of the battery pack with the corresponding grooves on the upper rear of the transceiver, then firmly press the battery pack to lock it in place.
- 2 Lock the safety catch to prevent accidentally pressing the release latch and removing the battery pack.
- 3 To remove the battery pack, lift the safety catch, press the release latch, then pull the battery pack away from the transceiver.



INSTALLING THE (OPTIONAL) ANTENNA

Screw the antenna into the connector on the top of the transceiver by holding the antenna at its base and turning it clockwise until secure.

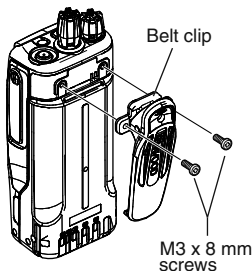


INSTALLING THE BELT CLIP

If necessary, attach the belt clip using the two supplied M3 x 8 mm binding screws.

Note:

◆ If the belt clip is not installed, its mounting location may get hot during continuous transmission or when left sitting in a hot environment.

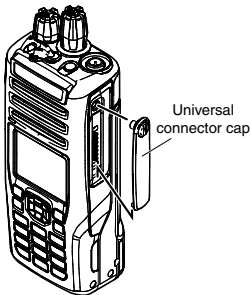


CAUTION

Do not use glue which is designed to prevent screw loosening when installing the belt clip, as it may cause damage to the transceiver. Acrylic ester, which is contained in these glues, may crack the transceiver's back panel.

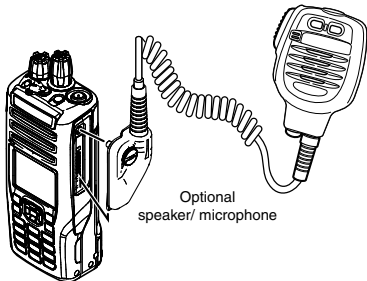
INSTALLING THE CAP OVER THE UNIVERSAL CONNECTOR

- 1 If you are not using an optional speaker/ microphone or headset, install the cap over the universal connector.
- 2 Secure the cap in place using the dressing screw.



INSTALLING THE (OPTIONAL) SPEAKER/ MICROPHONE OR HEADSET

- 1 Insert the guide of the speaker/ microphone or headset connector into the groove of the universal connector.
- 2 Secure the connector in place using the attached screw.

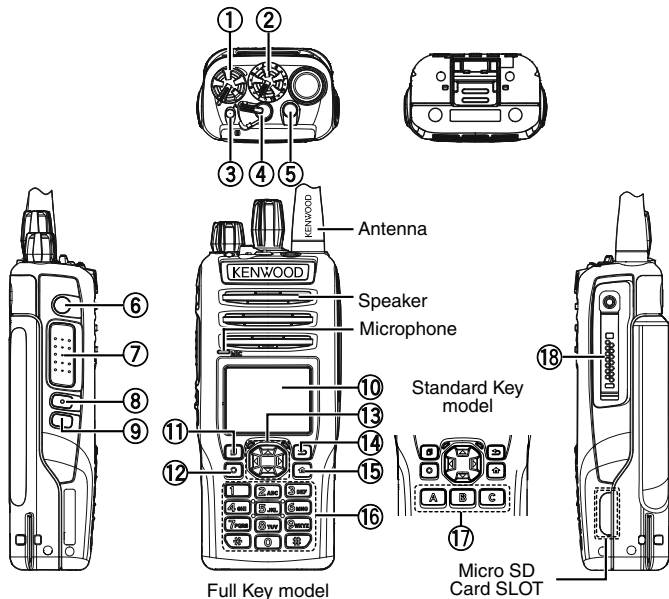


Note:

- ◆ When not using an optional speaker/ microphone or headset, install the cap over the universal connector.
-

GETTING ACQUAINTED

KEYS AND CONTROLS



① Power switch/ Volume control

Turn clockwise to switch the transceiver ON. Rotate to adjust the volume. Turn counterclockwise fully to switch the transceiver OFF.

② Selector knob

Rotate this control to activate its programmable function. The default setting is Channel Select.

- ③ **Transmit/ Receive/ Battery low indicator**
Lights red while transmitting, green while receiving (on Conventional channels only), and orange when receiving an encoded call (i.e. 2-tone, DTMF signaling, etc.). Flashes red when the battery power is low while transmitting. Replace or recharge the battery pack when the battery power is low.
-

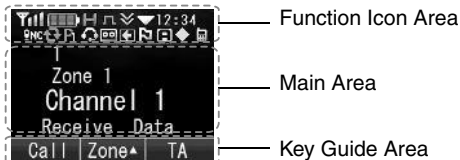
Note: This indicator can be disabled by your dealer.

- ④ **Lever switch**
Switch the toggle position to activate its programmable function. The **O** position turns the function ON. The **●** position turns the function OFF.
- ⑤ **Auxiliary (orange) key**
Press to activate its programmable function.
- ⑥ **Side 1 key**
Press to activate its programmable function.
- ⑦ **PTT (Push-To-Talk) switch**
Press and hold this switch, then speak into the microphone to call a station.
- ⑧ **Side 2 key**
Press to activate its programmable function. Acts as an Up key for certain transceiver settings.
- ⑨ **Side 3 key**
Press to activate its programmable function. Acts as a Down key for certain transceiver settings.
- ⑩ **LCD Display**
Refer to the display on page 8.
- ⑪ **Menu key**
Press to activate its programmable function. The default key setting is **[Menu]**.
- ⑫ **Function key**
Press to activate its programmable function. The default key setting is **[Function]**.

- ⑬ **Left/ Right/ Up/ Down key**
Press to activate its programmable function.
- ⑭ **Back key**
Press to activate its programmable function. The default key setting is [**Back**].
- ⑮ **Home key**
Press to activate its programmable function. The default key setting is [**Home**].
- ⑯ **Keypad (Full key model only)**
Press the keys on the keypad to send DTMF tones. The keypad keys can also be programmed with secondary functions if a programmable function keys is programmed as Function.
- ⑰ **A/ B/ C key (Standard key model only)**
Press to activate its programmable function. The programmed name appears on the bottom of the display.
- ⑱ **Universal connector**
Connect the (optional) speaker/ microphone here. Otherwise, keep the supplied cap in place.

DISPLAY





















Basic Frame















Display Area	Description
Function Icon Area	Display the various function Icons ,signal strength indicator and battery power indicator.
Main Area	Display the information of the transceiver such as Channel number and Zone number.
Key Guide Area	Display the key functions (key guide).

Function Icon

Icon	Description
	Signal strength/ out of range indicator.
	Battery power indicator.
	The channel is using high transmit power.
	The channel is using medium transmit power.
	The channel is using low transmit power.
	The channel is using auto transmit power.
	Digital mode
	Analog mode
	Appears when the Bluetooth function is activated.

Icon	Description
	Appears when the GPS function is activated.
	Appears when the current zone is added to the scanning sequence. is activated.
	Appears when you are using Scan mode.
	Appears when the Priority scan is in progress.
	Appears when the current channel is programmed as a Priority channel.
	Appears when the current CH/GID1 is added to the scanning sequence.
	Appears when the Scrambler/ Encryption (AES) function is activated.
	Appears when the Encryption (DES) function is activated.
	Appears when the Talk Around is activated.
	Appears when the Monitor or Squelch Off function is activated.
	Appears when the External Speaker is activated.
	Appears when the External Speaker (both) is activated.
	Appears when the Noise Cancel is activated.
	Appears when there is a message stored in the transceiver memory.
	Appears when recognize the MicroSD / SD card.
	Appears when the VOX is activated.
	Appears when the Vibrator function is activated.
	Appears when the Site Lock function is activated.
	Appears when the Broadcast Call function is activated.
	Appears when the Surveillance function is activated.

Icon	Description
	Appears when the Call Diversion function is activated.
	Selected group is programmed as telephone IDs or RIC (Repeater Interconnect).
	Appears when you have entered a Tactical Group zone.
	Appears when the AUX A is activated.
	Appears when the Lone Worker function is activated.
	Appears when the Activity Detection function is activated.
	Appears when the OVCM function is activated.
	Appears when the Comander function is activated.
	Appears when the Operator Selectable Tone function is activated.
	Appears when the Auto Recording is activated.
	Appears when the Auto Reply Message is activated.
	Appears when the Key Lock function is activated.

KENWOOD

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RADIO FREQUENCY ENERGY SAFETY INFORMATION

This **KENWOOD** transceiver has been tested and complies with the standards listed below, in regards to Radio Frequency (RF) energy and electromagnetic energy (EME) generated by the transceiver.

- FCC RF exposure limits for *Occupational Use Only*. RF Exposure limits adopted by the FCC are generally based on recommendations from the National Council on Radiation Protection and Measurements, & the American National Standards Institute.
- FCC OET Bulletin 65 Edition 97-01 Supplement C
- American National Standards Institute (C95.1 – 1992)
- American National Standards Institute (C95.3 – 1992)

WARNING

This **KENWOOD** transceiver generates RF EME while transmitting. RF EME (Radio Frequency Electric & Magnetic Energy) has the potential to cause slight thermal, or heating effects to any part of your body less than the recommended distance from this radio transmitter's antenna. RF energy exposure is determined primarily by the distance to and the power of the transmitting device. In general, RF exposure is minimized when the lowest possible power is used or transmission time is kept to the minimum required for consistent communications, and the greatest distance possible from the antenna to the body is maintained. The transceiver has been designed for and is classified for *Occupational Use Only*. Occupational/ controlled exposure limits are applicable to situations in which persons are exposed to RF energy as a consequence of their employment, and such persons have been made aware of the potential for exposure and can exercise control over their exposure. This means you can use the transceiver only if you are aware of the potential hazards of operating a transceiver and are familiar in ways to minimize these hazards. This transceiver is not intended for use by the general public in uncontrolled environments. Uncontrolled environment exposure limits are applicable to situations in which the general public may be exposed to RF energy, or in which the persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

The following list provides you with the information required to ensure that you are aware of RF exposure and of how to operate this transceiver so that the FCC RF exposure limitations are not exceeded.

- While transmitting (holding the **PTT** switch or speaking with **VOX** enabled), always keep the antenna and the radio at least 3 cm (1 3/16 inches) from your body or face, as well as from any bystanders. A LED on the top of the radio shows red when the transmitter is operating in both **PTT** and **VOX** modes.
- Do not transmit for more than 50% of the total transceiver use time; transmitting over 50% of the total use time may exceed the limits in accordance to the FCC RF exposure requirements. Nominal transceiver operation is 5% transmission time, 5% reception time, and 90% stand-by time.
- Use only the specified antenna for this transceiver; this may be either the antenna provided with the transceiver or another antenna authorized by **KENWOOD**.

Use only **KENWOOD** authorized accessories (antennas, battery packs, belt clips, Speaker/ Mics or headsets etc.): When worn on the body, always place the radio in a **KENWOOD** recommended clip or carrying case meant for this product. The use of other than recommended or approved body- worn accessories may result in RF exposure levels which exceed the FCC's occupational/ controlled environment RF exposure limits.

CAUTION

To ensure that your exposure to RF EME is within the FCC limits for occupational use, you must observe and adhere to the above points.

Electromagnetic Interference Compatibility

Electronic devices are susceptible to electromagnetic interference (EMI) if they are not adequately shielded or designed for electromagnetic compatibility. Because this transceiver generates RF energy, it can cause interference to such equipment.

- Turn OFF your transceiver where signs are posted to do so. Hospitals and health care facilities use equipment that is sensitive to electromagnetic radiation.
- Turn OFF your transceiver while on board an aircraft when so instructed. Use of the transceiver must be in accordance with airline regulations and/or crew instructions.

B59-2687-00