KENWOOD

INSTRUCTION MANUAL

144/440 MHz FM DUAL BANDER

TM-V71A

144/430 MHz FM DUAL BANDER

TM-V71A/ TM-V71E

Information on Disposal of Old Electrical and Electronic Equipment (applicable for EU countries that have adopted separate waste collection systems)

Products with the symbol (crossed-out wheeled bin) cannot be disposed as household waste.
Old electrical and electronic equipment should be recycled at a facility capable of handling these items and their waste byproducts. Contact your local authority for details in locating a recycle facility nearest to you. Proper recycling and waste disposal will help conserve resources whilst preventing detrimental effects on our health and the environment.

Kenwood Corporation

THANK YOU

We are grateful you decided to purchase this **Kenwood** FM transceiver. **Kenwood** always provides Amateur Radio products which surprise and excite serious hobbyists. This transceiver is no exception. **Kenwood** believes that this product will satisfy your requirements for both voice and data communications.

FEATURES

This transceiver has the following main features:

- Enhanced Programmable Memory (PM) channels store virtually entire current operating environments for your quick recall.
- Contains a total of 1000 Memory channels to program frequencies and other various data. Allows each Memory channel to be named using up to 8 alphanumeric characters.
- Continuous Tone Coded Squelch System (CTCSS) or Digital Code Squelch (DCS) rejects unwanted calls from other stations.

WRITING CONVENTIONS FOLLOWED IN THIS MANUAL

The writing conventions described below have been followed to simplify instructions and avoid unnecessary repetition.

Instruction	Action
Press [KEY].	Momentarily press KEY.
Press [KEY] (1s).	Press and hold KEY for 1 second or longer.
Press [KEY1], [KEY2].	Press KEY1 momentarily, release KEY1, then press KEY2.
Press [F], [KEY].	Press the F key to enter Function mode, then press KEY to access its secondary function.
Press [KEY] + Power ON.	With the transceiver power OFF, press and hold KEY while turning the transceiver power ON.

NOTICES TO THE USER

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.

WHEN CONDENSATION OCCURS INSIDE THE TRANSCEIVER

Condensation may occur inside the transceiver in such a case where the room is warmed using a heater on cold days or where the transceiver is quickly moved from a cold room to a warm room. When condensation occurs, the microcomputer and/or the transmit/receive circuits may become unstable, resulting in transceiver malfunction. If this happens, turn OFF the transceiver and just wait for a while. When the condensation droplets disappear, the transceiver will function normally.

⚠ WARNING

◆ EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, etc.)

Turn OFF your transceiver while taking on fuel or while parked in gasoline service stations. Do not carry spare fuel containers in the trunk of your vehicle if your transceiver is mounted in the trunk area.

◆ INJURY FROM RADIO FREQUENCY TRANSMISSIONS

Do not operate your transceiver when somebody is either standing near to or touching the antenna, to avoid the possibility of radio frequency burns or related physical injury.

◆ DYNAMITE BLASTING CAPS

Operating the transceiver within 150 m (500 feet) of dynamite blasting caps may cause them to explode. Turn OFF your transceiver when in an area where blasting is in progress, or where "TURN OFF TWO-WAY RADIO" signs have been posted. If you are transporting blasting caps in your vehicle, make sure they are carried in a closed metal box with a padded interior. Do not transmit while the caps are being placed into or removed from the container.

PRECAUTIONS

Observe the following precautions to prevent fire, personal injury, and transceiver damage.

- When operating mobile, do not attempt to configure the transceiver while driving; it is too dangerous.
- Do not transmit with high output power for extended periods. The transceiver may overheat.
- Do not disassemble or modify the transceiver for any reason, unless instructed by this manual or by **Kenwood** documentation.
- Do not expose the transceiver to long periods of direct sunlight, nor place it near heating appliances.
- Do not place the transceiver in excessively dusty, humid, or wet areas, nor on unstable surfaces.
- If an abnormal odor or smoke is detected coming from the transceiver, switch the transceiver power off immediately, and contact a **Kenwood** service station or your dealer.
- Use of the transceiver while you are driving may be against traffic laws. Please check and observe the vehicle regulations in your area.
- Be aware of local laws pertaining to the use of headphones/headsets while driving on public roads. If in doubt, do not wear a headset while mobiling.
- Do not use options not specified by **Kenwood**.

⚠ CAUTION
- ◆ The transceiver is designed for a 13.8 V DC (±15%) power source! Never use a 24 V battery to power the transceiver. Check the battery polarity and voltage of the vehicle before installing the transceiver.
- ◆ Use only the supplied DC power cable or a Kenwood optional DC power cable.
- ◆ Do not insert metal objects into the cooling fan.

⚠ WARNING
- ◆ Do not cut and/or remove the fuse holder on the DC power cable. Improper connections and/or current surges may cause smoke or fire.
- ◆ For passenger safety, install the transceiver securely using the supplied mounting bracket and screw set so the transceiver will not break loose in the event of a collision.

CONTENTS

SUPPLIED ACCESSORIES

Note: A market area code (K, E, or M4) can be found on the label attached to the package box.

Item		Part Number	Quantity
Microphone		T91-0657-XX	1
DC power cable (with 20 A fuses)	K, M4 types	E30-7628-XX	1
	E type	E30-3452-XX	1
Mounting bracket		J29-0628-XX	1
Screw set		N99-0331-XX	1
Fuse (15 A)	K, M4 types	F51-0079-XX	1
	E type	F52-0024-XX	1
Warranty Card	K, E types only	— —	1
Instruction manual		B62-1926-XX	1

MOBILE INSTALLATION

Select a safe, convenient location inside your vehicle that will minimize danger to your passengers and yourself while the vehicle is in motion. Consider installing the transceiver under the dash in front of the passenger seat so that knees or legs will not strike the radio during sudden braking of your vehicle. Try to a pick well-ventilated location that is shielded from direct sunlight.

Note: You may experience interference on your GPS receiver when using in or around 438.8 MHz (A band) and/or 443.8 MHz (B band). To eliminate the interference, ensure that the transceiver is installed at a location separate from your GPS receiver.

1 Install the mounting bracket in the vehicle using the supplied self-tapping screws and flat washers (4 of each are supplied).

- The bracket can be mounted with the bracket opening facing down, for underdash mounting, or facing up.
- The bracket must be installed so that the 3 screw slots on the edge of each bracket side are facing the back.

Self-tapping screw (5 x 16 mm)
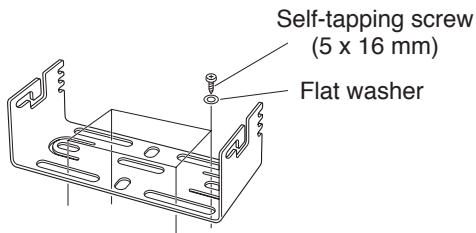
Flat washer

2 Position the transceiver, then insert and tighten the supplied hexagon SEMS screws and flat washers (4 of each are supplied, 2 for each side of the bracket).

- Ensure that all hardware is tightened, to prevent vehicle vibration from loosening the bracket or transceiver.

SEMS screw
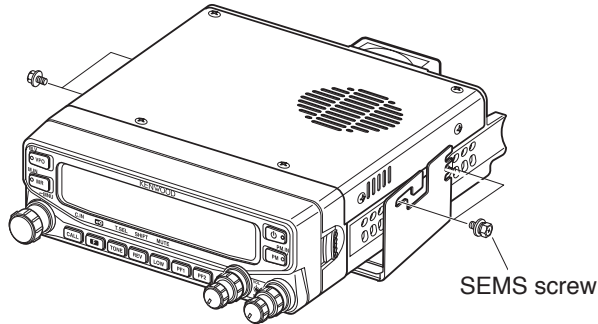
- Set an appropriate angle for the main unit, using the 3 screw slots on the rear edge of each bracket side.
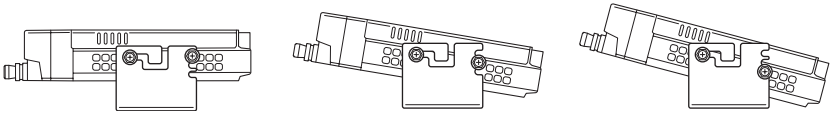
POWER CABLE CONNECTION

■ Mobile Operation

Be sure to use a 12 V vehicle battery that has sufficient current capacity. If the current to the transceiver is insufficient, the display may darken during transmission or the transmit output power may drop excessively. Never connect the transceiver to a 24 V battery

Note: If you use the transceiver for a long period when the vehicle battery is not fully charged or when the engine is OFF, the battery may become discharged and will not have sufficient reserves to start the vehicle. Avoid using the transceiver under these conditions.

1 Route the DC power cable supplied with the transceiver directly to the vehicle's battery terminals using the shortest path from the transceiver.

- When using a noise filter, it should be installed with an insulator to prevent it from touching metal on the vehicle.
- We do not recommend using a cigarette lighter socket as some cigarette lighter sockets introduce an unacceptable voltage drop.
- If the power cable must be routed through a hole in the vehicle chassis or body, for example in the firewall at the front of the passenger compartment, use a rubber grommet to protect the cable from abrasion. Dismantle the fuse holder to pass the cable through the firewall.
- The entire length of the cable must be dressed so it is isolated from heat, moisture, and the engine secondary (high voltage) ignition system/ cables.

2 After the cable is in place, wind heat-resistant tape around the fuse holder to protect it from moisture. Tie down the full run of cable.

3 To prevent the risk of short circuits, disconnect other wiring from the negative (–) battery terminal before connecting the transceiver.

4 Confirm the correct polarity of the connections, then attach the power cable to the battery terminals; red connects to the positive (+) terminal and black connects to the negative (–) terminal.

- Use the full length of the cable without cutting off excess, even if the cable is longer than required. In particular, never remove the fuse holders from the cable.

5 Reconnect any wiring removed from the negative terminal.

6 Connect the DC power cable to the transceiver.

- Press the connectors firmly together until the locking tab clicks.

Engine compartment ← → Passenger compartment

Fuse holder (E type)

Black (—) cable

Fuse holder (K, M4 types)

Red (+) cable

Rubber grommet

Fuse holder (K, M4 types)

Fuse holder (E type)

12 V vehicle battery

DC power cable
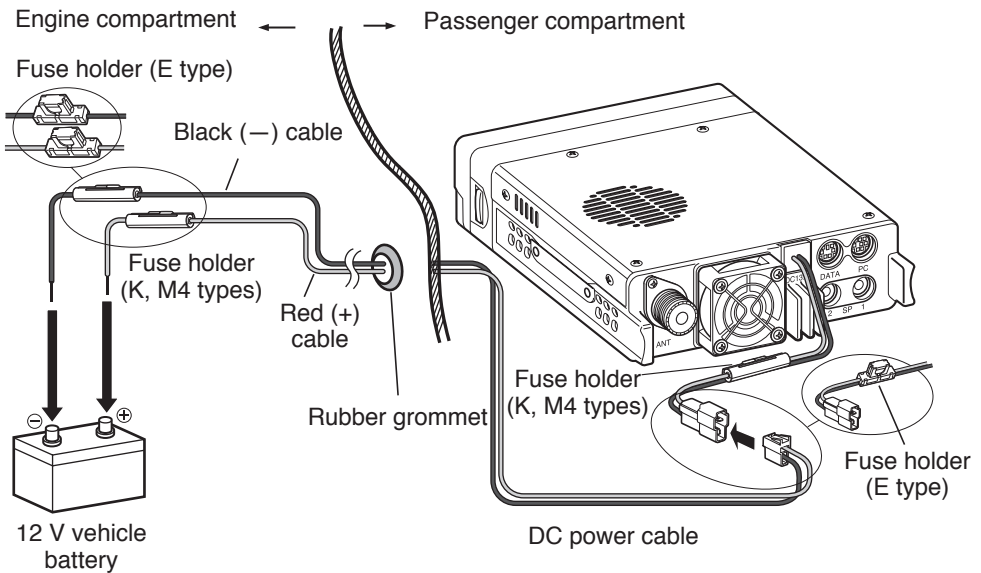
■ Fixed Station Operation

In order to use this transceiver for fixed station operation, you will need a separate 13.8 V DC power supply that must be purchased separately. The recommended current capacity of the power supply is 12 A.

Note: Do not plug the DC power supply into an AC outlet until you make all connections.

1 Ensure that the transceiver and DC power supply are both OFF.

2 Connect the DC power cable to the regulated DC power supply and ensure that the polarities are correct (Red: positive, Black: negative).

- Use the supplied DC power cable to connect the transceiver to a regulated power supply. Do not directly connect the transceiver to an AC outlet.
- Do not substitute the cable with smaller gauge wires.

3 Connect the DC power cable to the transceiver.

- Press the connectors firmly together until the locking tab clicks.

Note: For your transceiver to fully exhibit its performance capabilities, we recommend using an optional PS-33 (20.5 A, 25% duty cycle) power supply.

Fuse holder (E type)

Black (—) cable

Fuse holder (K, M4 types)

Red (+) cable

Fuse holder (K, M4 types)

Fuse holder (E type)

DC power cable

Regulated DC power supply
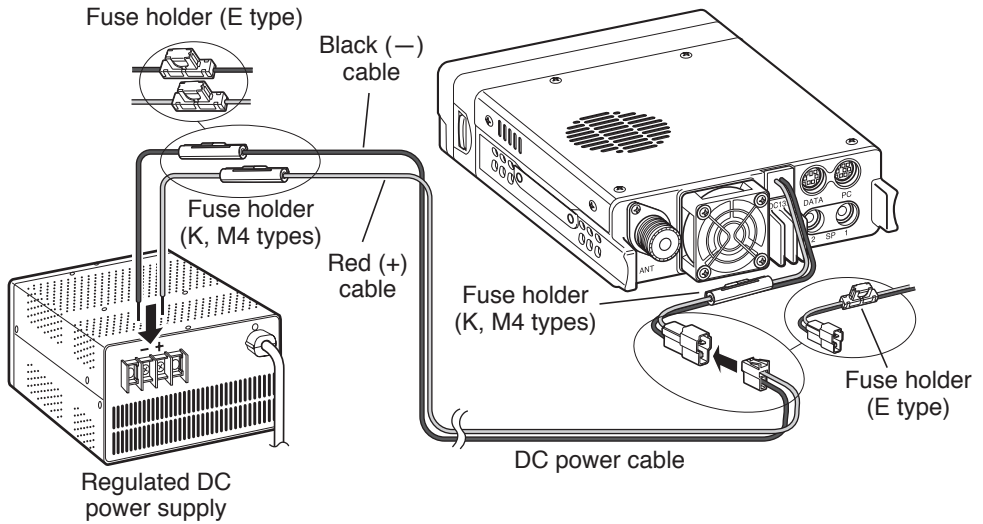
■ Replacing Fuses

If the fuse blows, determine the cause, then correct the problem. After the problem is resolved, replace the fuse. If newly installed fuses continue to blow, disconnect the power cable and contact your authorized **Kenwood** dealer or an authorized **Kenwood** service center for assistance.

Fuse Location	Fuse Current Rating
Transceiver (located on the DC connector)	15 A
Supplied DC power cable	20A

⚠ CAUTION

Only use fuses of the specified type and rating; otherwise the transceiver could be damaged.

Fuse holder (E type)

Fuse

Fuse holder
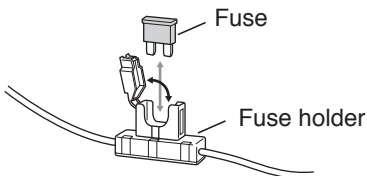
Fuse holder (K, M4 types)

Fuse holder

Fuse
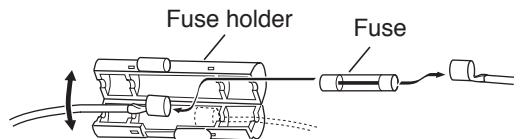
ANTENNA CONNECTION

Before operating, you must first install an efficient, well-tuned antenna. The success of your installation will depend largely on the type of antenna and its correct installation. The transceiver can give excellent results if the antenna system and its installation are given careful attention.

Use a low-loss coaxial feed line that also has a characteristic impedance of 50 Ω, to match the transceiver input impedance. Coupling the antenna to the transceiver via feed lines having an impedance other than 50 Ω reduces the efficiency of the antenna system and can cause interference to nearby broadcast television receivers, radio receivers, and other electronic equipment.

⚠️ CAUTION

◆ Transmitting without first connecting an antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.

◆ All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock, and/or transceiver damage.

Antenna terminal

Feed line connector

To antenna
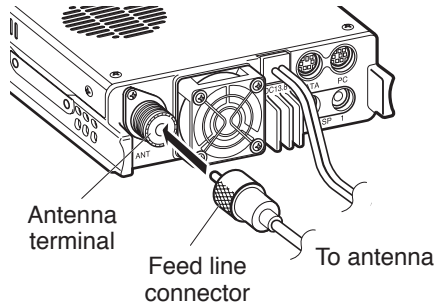
FRONT PANEL ORIENTATION

This transceiver allows you to change the orientation of the front panel. Depending on where/how you installed the transceiver you may wish to flip the front panel upside-down for easier operation.

1 On the right side of the front panel, pull the panel release latch forward.
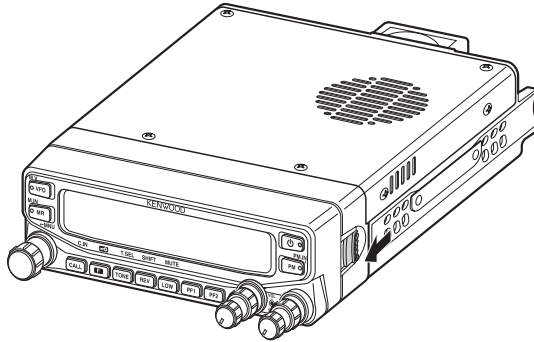
2 Slide the front panel to the left, then pull it away from the main body of the transceiver.
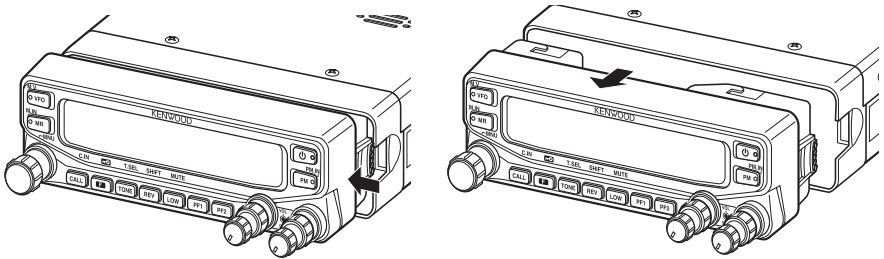
3 Flip the front panel upside-down, then reattach it to the main body of the transceiver.

ACCESSORY CONNECTIONS

■ External Speakers

If you plan to use external speakers, choose speakers with an impedance of 8 Ω. The external speaker jacks accept a 3.5 mm (1/8") mono (2-conductor) plug. We recommend using SP-50B speakers.

There are 2 speaker jacks on the rear of the transceiver: SP 1 and SP 2. Refer to page 71 to determine how the speakers will be used.

SP 1 jack

External speakers (SP-50B)

SP 2 jack

■ Microphone

To communicate using voice, connect the supplied microphone to the MIC jack on the left side of the transceiver. Press firmly on the plug until the locking tab clicks.

MIC jack

Microphone connector

FRONT PANEL

① **VFO**
   Press **[VFO]** to enter VFO mode {page 17}, then rotate the **Tuning** control to select an operating frequency. Press **[VFO] (1s)** to start VFO scan {page 43}. Press **[F], [VFO]** to copy the current Memory channel or Call channel to the VFO (memory shift) {page 36}.

② **MR**
   Press **[MR]** to enter Memory Channel mode {page 18}, then rotate the **Tuning** control to select a Memory channel. Press **[MR] (1s)** to start Memory scan {page 44}. Select a Memory channel, then press **[F], [MR]** to store the current operating frequency in the Memory channel {page 33}.

③ **Tuning Control**
   Rotate to select an operating frequency or Memory channel, change the scan direction, select a tone frequency, etc. Press **[F]**, then press the **Tuning** control to enter Menu mode {page 20}. Press **[MHz] (1s)** to start MHz scan {page 48} or Group scan {page 45}.

④ **CALL**
   Press **[CALL]** to select the Call channel. Press **[CALL] (1s)** to start Call scan {page 48}. Press **[F], [CALL]** to store the current operating frequency to the Call channel {page 33}.

⑤ **F**
   Press **[F]** to enter Function mode. Press **[F] (1s)** to turn the transceiver key lock function ON or OFF {page 63}.

⑥ **TONE**
   Press **[TONE]** to turn the Tone function ON. Continually press **[TONE]** to toggle the functions as follows: Tone ON >> CTCSS ON >> DCS ON >> OFF. While Tone, CTCSS, or DCS is ON, press **[F], [TONE]** to enter CTCSS or DCS setup mode.

⑦ **REV**
Press **[REV]** to turn the Reverse function ON or OFF {page 30}. Press **[REV] (1s)** to turn the Automatic Simplex Checker ON {page 30}. Press **[F], [REV]** to enter Offset Direction selection mode. Each time you press **[F], [REV]**, the offset direction toggles as follows:
plus (+) direction –> minus (–) direction –> –7.6 MHz (E type only) –> OFF.

⑧ **LOW**
Press **[LOW]** to toggle the transmit output power as follows: High Power (K, E types only) –> Middle Power –> Low Power {page 70}. Press **[F], [LOW]** to turn the Mute function ON or OFF {page 69},

⑨ **PF1**
Press **[PF1]** to activate its programmable function {page 66}. The default function is "Frequency Band Select".

⑩ **PF2**
Press **[PF2]** to activate its programmable function {page 66}. The default function is "Operation Band Select".

⑪ **BAND SEL (VOL) Control**
Rotate the **[BAND SEL]** control to adjust the speaker volume {page 14}. Press the left **[BAND SEL]** to select the A band. Press the right **[BAND SEL]** to select the B band. Press **[BAND SEL] (1s)** to toggle between single and dual-band mode.

⑫ **SQL Control**
Rotate the **[SQL]** control to adjust the squelch level. Clockwise opens the squelch and counterclockwise tightens the squelch {page 68}.

⑬ **PM**
Press **[PM]** to enters the PM (Programmable Memory) channel selection mode {page 40}. Press **[F], [PM]** to enter PM Channel registration mode {page 40}.

⑭ ⏻
Press ⏻ to turn the transceiver power ON and OFF.

DISPLAY

< A Band >   < B Band >

Indicator	Description
PTT	Appears when there is a transmission band available. Blinks when the cross-band repeater is ON (K type only).
CTRL	Appears when there is an operation band available. Blinks when the wireless remote control is ON (K type only).
T	Appears when the Tone function is ON.
CT	Appears when the CTCSS function is ON.
DCS	Appears when the DCS function is ON.
+	Appears when the Shift function is set to plus.
−	Appears when the Shift function is set to minus.
R	Appears when the Reverse function is ON.
R	Appears when the ASC function is ON. Blinks when the ASC function is performing an OK check.
AM	Appears while in AM mode.
N	Appears while in Narrow FM mode.
▲	Appears when the selected channel is registered while in Memory Input mode.
888	Displays the Memory channel and Menu number.
★	Appears when the Memory Channel Lockout function is ON.
H	Appears while using High output power. Blinks when the temperature protection circuit turns on.
M	Appears while using Middle output power. Blinks when the temperature protection circuit turns on.
L	Appears while using Low output power.
𝟪𝟪𝟪𝟪𝟪𝟪	Displays the operating frequency, Memory channel name, and Menu.
BUSY	Appears when receiving a busy signal.
▂▃▄▅▆▇9▇▆▅	Performs as an S meter when receiving a signal and displays the selected power level while transmitting.
ON AIR	Appears while transmitting.

| Indicator	Description
D	Appears while using the data band.
96	Appears when the data terminal is set as 9600 (bps).
25	Appears when the frequency is set to ***,***,250 Hz.
5	Appears when the frequency is set to ***,***,500 Hz.
75	Appears when the frequency is set to ***,***,750 Hz.
33	Appears when the frequency is set to ***,***,333 Hz.
67	Appears when the frequency is set to ***,***,666 Hz.
🅵	Appears when the F key is pressed.
MUTE	Appears when mute has been turned ON.
📼	Appears while making a recording.
🔁	Appears when using an EchoLink Memory channel.
🔑	Appears when the Key Lock function is ON.
OFF	Appears when making a PM call.
ESC	Appears while in Menu mode and when the Tone/CTCSS/DCS code is selected.
PM1◀	Blinks when recalling a PM channel and while writing to memory. Only the "1" will blink while recording or in playback mode.
BACK	Appears while accessing the Menu.
PM2◀	Blinks when recalling a PM channel and while writing to memory. Only the "2" will blink while recording or in playback mode.
←	Appears when entering characters in Menu mode or entering a code.
PM3◀	Blinks when recalling a PM channel and while writing to memory. Only the "3" will blink while recording or in playback mode
→	Appears when entering characters in Menu mode or entering a code.
PM4◀	Blinks when recalling a PM channel and while writing to memory. Only the "4" will blink while recording or in playback mode.
CLR	Appears when entering characters in Menu mode or entering a code.
PM5◀	Blinks when recalling a PM channel and while writing to memory.
WX	Appears when Weather Alert is ON. Blinks when receiving a signal (K type only).

REAR PANEL
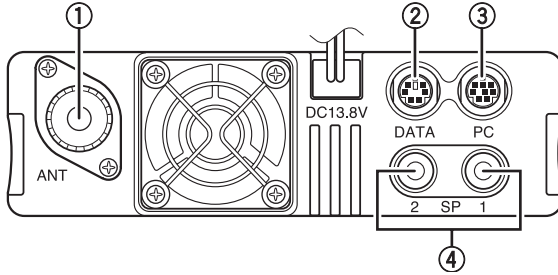
① **ANT**
Connect an M-type (TM-V71A) or N-type (TM-V71E) external antenna to this terminal {page 5}. When making test transmissions, connect a dummy load in place of the antenna. The antenna system or load should have an impedance of 50 Ω.

② **DATA**
Connect a TNC unit to this terminal, via a 6-pin mini DIN connector.

③ **PC**
Connect a personal computer to this terminal, via an 8-pin mini DIN connector.

④ **SP (SP 1/ SP 2)**
If desired, connect 1 or 2 external speakers for clearer audio. These jacks accept 3.5 mm (1/8") diameter, 2-conductor plugs {page 7}. Refer to page 71 to determine how the speakers will be used.

SUB-PANEL
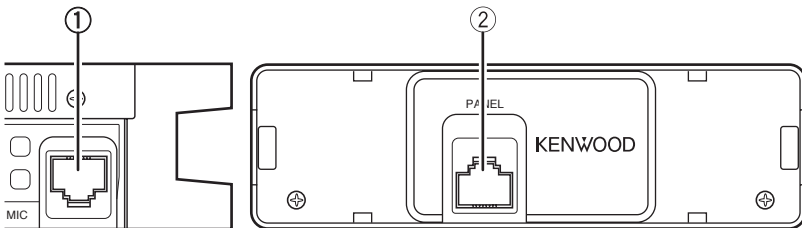
① **MIC**
Connect the supplied microphone to this jack {page 7}.

② **Panel Terminal**
When using an optional panel kit, attach the panel to this terminal using the cable that comes with the panel kit.

MICROPHONE (MC-59)
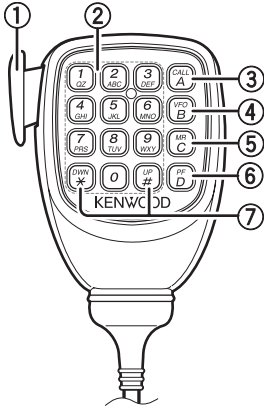
Microphone Jack
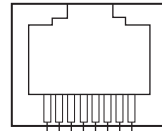
- ❽ Keypad serial data
- ❼ No Connection
- ❻ MIC, 600 Ω impedance
- ❺ GND (MIC)
- ❹ PTT
- ❸ GND
- ❷ DC 8 V, 100 mA max
- ❶ No Connection

① **PTT switch**
Press and hold, then speak into the microphone to transmit.

② **DTMF keypad**
Press these keys to make DTMF calls, enter frequencies, or enter characters.

③ **CALL/ A**
Functions the same as the transceiver front panel **[CALL]** key. This is also the PF4 key and can be reprogrammed with a programmable function {page 66}.

④ **VFO/ B**
Functions the same as the transceiver front panel **[VFO]** key. This is also the PF3 key and can be reprogrammed with a programmable function {page 66}.

⑤ **MR/ C**
Functions the same as the transceiver front panel **[MR]** key. This is also the PF2 key and can be reprogrammed with a programmable function {page 66}.

⑥ **PF/ D**
Press to toggle between bands A and B. This is also the PF1 key and can be reprogrammed with a programmable function {page 66}.

⑦ **UP/ DWN**
Functions the same as the transceiver **Tuning** control.

SWITCHING THE POWER ON/ OFF

Press the ⏻ switch to switch the transceiver ON.

- The power on message momentarily appears on the display.
- If the transceiver password protection has been activated {page 74}, you must first enter your password before you can operate the transceiver.
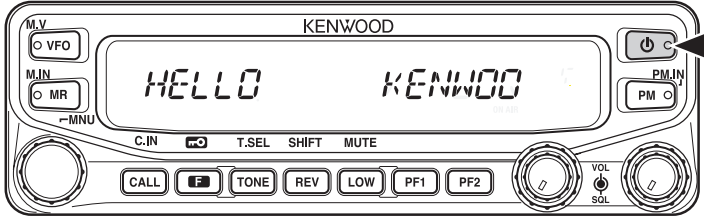
Press the ⏻ switch again to switch the transceiver OFF.

ADJUSTING THE VOLUME

Rotate the **[BAND SEL] (VOL)** control of your selected band clockwise to increase the volume and counterclockwise to decrease the volume.

Note: Some functions of this transceiver, such as the beep and voice announcements, have their own volume settings. Adjust those settings to your desired values.
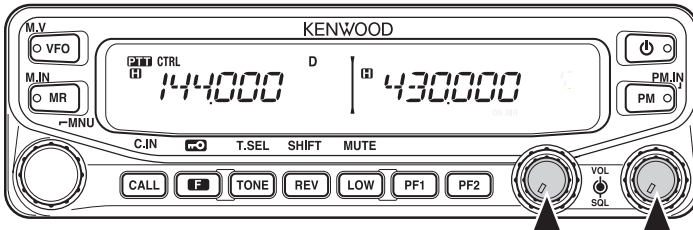
ADJUSTING THE SQUELCH

Squelch is used to mute the speaker when no signals are present. With the squelch level set correctly, you will hear sound only while actually receiving a signal. The higher the squelch level selected, the stronger the signals must be in order to hear them.

Rotate the **[SQL]** control of your selected band, when no signals are present, and select the squelch level at which the background noise is just eliminated.
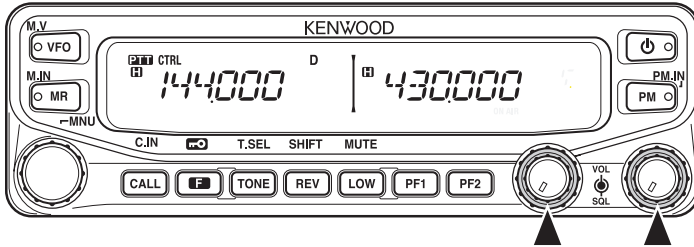
SELECTING A BAND

Press the left **[BAND SEL]** control to select band A and the right **[BAND SEL]** control to select band B.

- The CTRL icon appears at the top of the band on which you are operating and the PTT icon appears at the top of the band on which you are currently set to transmit.

Band A (left **[BAND SEL]** control):
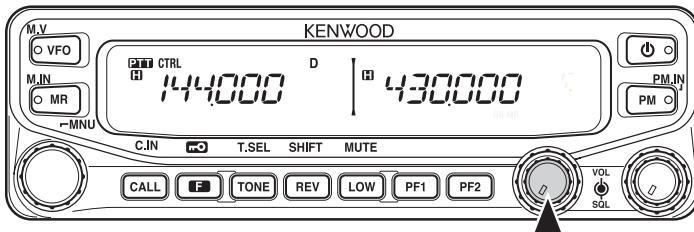
Band B (right **[BAND SEL]** control):
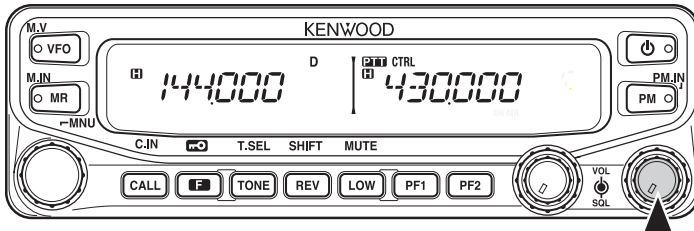
Pressing **[PF2]** allows you to switch the operating band between bands A and B, while maintaining the original band as the transmit band.

Band A is the transmit band and band B is the operating band:
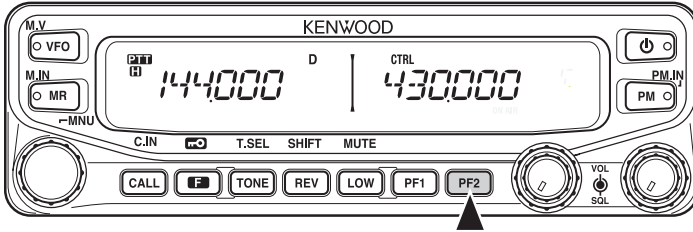
Band A is both the transmit and operating band:
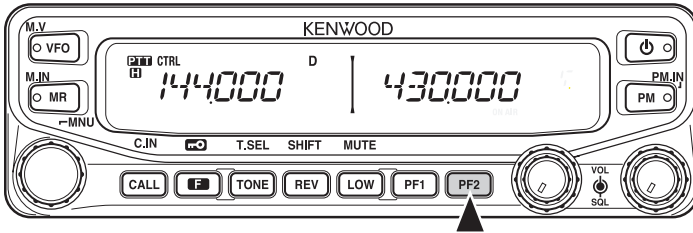
SELECTING DUAL BAND MODE/ SINGLE BAND MODE

You can switch the transceiver between dual band operation and single band operation by pressing **[BAND SEL] (1s)** of your selected band.

Dual band mode:
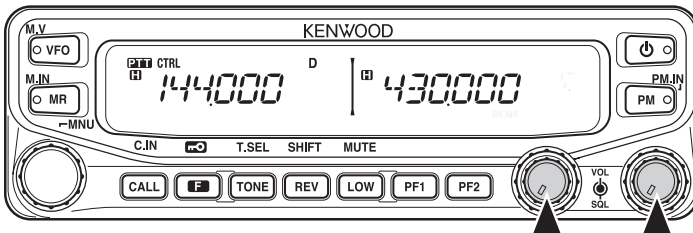
Single band mode (band A only):
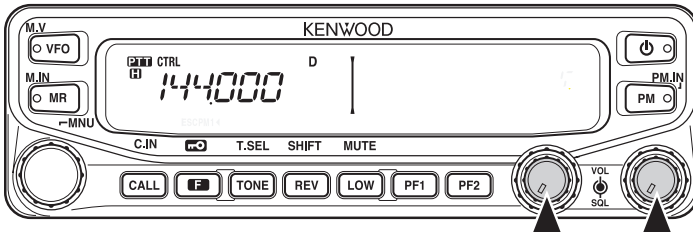
(In Single band mode, you can turn the center partion bar display off {page 72}.)

SELECTING A FREQUENCY BAND

You can change the default frequency bands for bands A and B.

1   Select band A or B by pressing the **[BAND SEL]** control or **[PF2]**.

2   Press **[F], [BAND SEL]** of your selected band.

- Each time you press **[F], [BAND SEL]**, you cycle to the next frequency band.
- The default setting of the **[PF1]** key also allows you to cycle to the next frequency band.
- When masking a band {page 71}, you are restricted to using only the selectable band.
- When receiving 2 signals on the same band, the image interference, senstivity, etc., performance will decrease.
- Band A: 118 >> 144 (default) >> 220 >> 300 >> 430/440 (MHz).
- Band B: 144 >> 220 >> 430/440 (default) >> 12000 (MHz).

Note:
◆   M4 type models do not have the following frequency bands available: 118, 220, 300, or 12000 (MHz).
◆   E and M4 type models use the 430 MHz band and K type models use the 440 MHz band.
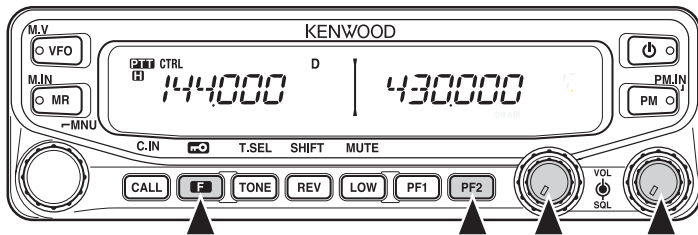
SELECTING AN OPERATING MODE

There are 3 operating modes available to choose from: VFO mode, Memory Channel mode, and Call Channel mode.

■ VFO Mode

VFO mode allows you to manually change the operating frequency.

1   Press **[VFO]** to enter VFO mode.
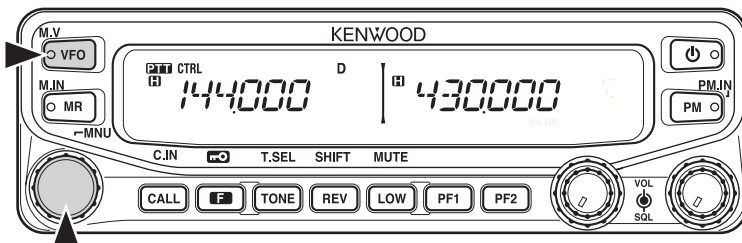
2 Rotate the **Tuning** control to select your desired operating frequency.

- You can also adjust the frequency by using the microphone **[UP]/[DWN]** keys.
- The default step frequency for the **Tuning** control varies according to the type and operating band:

Type	144 MHz	430/440 MHz
K	5 kHz	25 kHz
E	12.5 kHz	25 kHz
M4	10 kHz	10 kHz

- To adjust the frequency by a larger amount, you can press the **Tuning** control to enter MHz mode. While in MHz mode, rotate the **Tuning** control to adjust the frequency in steps of 1 MHz. Press the **Tuning** control again to exit MHz mode and adjust the frequency using the normal step frequency.

■ Memory Channel Mode

Memory Channel mode allows you to quickly select a frequently used frequency and related data which you have saved in the transceiver memory.

1 Press **[MR]** to enter Memory Channel mode.
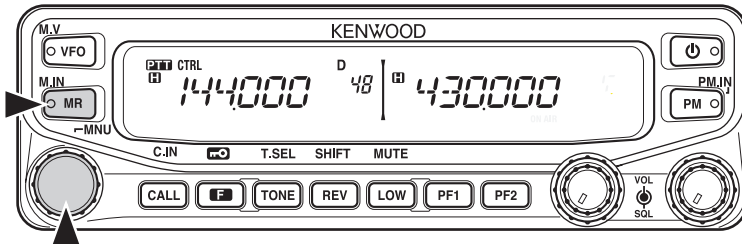
2 Rotate the **Tuning** control to select your desired Memory channel.

■ Call Channel Mode

Call Channel mode allows you to quickly select a preset channel to allow immediate calls on that frequency. The Call channel can be conveniently used as an emergency channel within your group.

1 Select your desired band (A or B).
- The Call channel has a dedicated frequency for both bands A and B. The default frequency for band A is 144 MHz. The default frequency for band B is 430/440 MHz.

2 Press **[CALL]** to enter Call Channel mode.
- The C icon appears on the display.
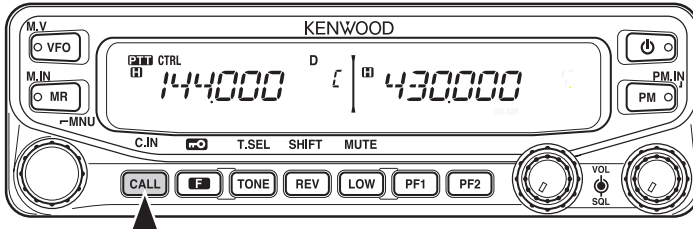
3 Press **[CALL]** again to return to your previous operating frequency.

TRANSMITTING

1 Select your desired band and frequency/channel.

2 Press and hold the microphone **[PTT]** switch and speak into the microphone to transmit.
- The ON AIR icon and the RF power meter appear on the display for the selected transmit band. The RF power meter shows the relative transmit output power.
- The H/ M/ L icon(s) appear on the display, depending on what output power you have selected {page 70}.
- Speak into the microphone in your normal voice, while keeping the microphone approximately 5 cm from your mouth. Speaking too close to the microphone or too loudly may increase distortion and reduce intelligibility of your signal at the receiving station.
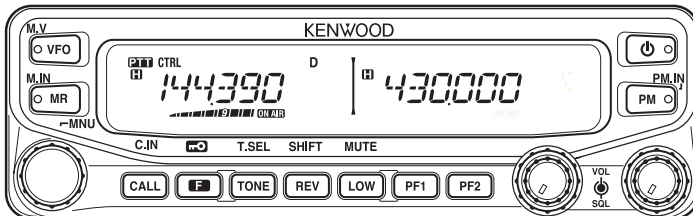
3 When you finish speaking, release the **[PTT]** switch.

Many functions on this transceiver are selected or configured through the Menu instead of physical controls. Once you become familiar with the Menu system, you will appreciate the versatility it offers.

MENU ACCESS

1 Press **[F], Tuning** control to access the Menu.
- The Menu name and number appears on the display.

$$BEEP \qquad 000 \qquad ON$$

ESC

2 Rotate the **Tuning** control to select your desired Menu.

3 Press the **Tuning** control to set up the current Menu.

$$BP.VOL \qquad 001 \qquad 5$$

ESC   BACK
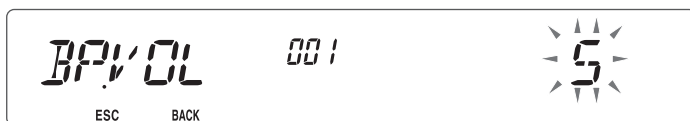
4 Rotate the **Tuning** control to select your desired value for the selected Menu.

5 Press the **Tuning** control to set the selected value.

6 Repeat steps 2 to 5 to set up additional Menus.
- Press **[CALL] (ESC)** at any time to exit Menu mode.
- Press **[F] (BACK)** at any time to cancel the Menu setup and return to the Menu selection.

MENU CONFIGURATION

Menu No.	Display	Description	Setting Values	Default Setting	Ref. Page
000	BEEP	Beep sound	OFF/ ON	ON	64
001	BP.VOL	Beep volume level	1 ~ 7	5	64
002	EXT.SP	External speaker output mode	MODE 1/ MODE 2	MODE 1	71
003 [1]	ANN	Voice announcement mode	OFF/ AUTO/ MANUAL	AUTO	75
004 [1]	ANN.LNG	Voice announcement language	ENG/ JPN	ENG	77
005 [1]	ANN.VOL	Voice announcement volume	1 ~ 7	5	77

Menu No.	Display	Description	Setting Values	Default Setting	Ref. Page
006 [1]	ANN.SPD	Voice announcement speed	0 ~ 4	1	77
007 [1]	PLAY.BK	Recording playback repeat	OFF/ ON	OFF	80
008 [1]	P.BK.INT	Playback repeat interval time	0 ~ 60 (seconds)	10	80
009 [1]	CON.REC	Conversation recording	OFF/ ON	OFF	79
100	PRG.VFO	Programmable VFO setup	Varies with the selected frequency band	–	64
101	STEP	Step frequency	Varies with the selected frequency band	–	65
102	MODLAT	Modulation/demodulation mode	Varies with the selected frequency band	–	69
103	VHF.AIP	VHF band AIP	OFF/ ON	OFF	68
104	UHF.AIP	UHF band AIP	OFF/ ON	OFF	68
105	S.SQL	S-meter squelch	OFF/ ON	OFF	68
106	S.SQ.HNG	S-meter squelch hangup time	OFF/ 125/ 250/ 500 (ms)	OFF	68
107	MUT.HNG	Mute hangup time setup	OFF/ 125/ 250/ 500/ 750/ 1000 (ms)	OFF	70
108	B.SHIFT	Beat shift	OFF/ ON	OFF	69
109	TOT	Time-out timer	3/ 5/ 10 (minutes)	10	70
110 [2]	WX.ALT	Weather alert	OFF/ ON	OFF	73
200 [3]	M.NAME	Memory name setup	Up to 6 characters	–	35
201	RECALL	Memory channel recall method	ALL/ CURRENT	ALL	34
202 [3]	L.OUT	Memory channel lockout	OFF/ ON	OFF	44
203	GR.LINK	Memory group link registration	Up to 10 digits (0 ~ 9)	–	45
204	ELK.MEM	EchoLink memory setting	Up to 8 characters for EchoLink memory	–	59
205	ELK.SPD	EchoLink memory transmission speed	FAST/ SLOW	FAST	60
300	DT.HOLD	DTMF transmission hold	OFF/ ON	OFF	55

Menu No.	Display	Description	Setting Values	Default Setting	Ref. Page
301	DT.MEM	DTMF memory	Up to 8 characters for DTMF memory name Up to 16 characters for DTMF code	–	56
302	DT.SPD	DTMF memory transmission speed	FAST/ SLOW	FAST	57
303	DT.PAUS	DTMF pause code time	100/ 250/ 500/ 750/ 1000/ 1500/ 2000 (ms)	500	58
304	DT.LOCK	DTMF key lock	OFF/ ON	OFF	58
400	OFFSET	Offset frequency	See reference page	–	27
401 [4]	ARO	Auto Repeater Offset	OFF/ ON	ON	29
402	1750.HD	Transmission hold when transmitting a 1750 Hz tone	OFF/ ON	OFF	30
403 [2]	RPT.MOD	Repeater mode	CROSS/ A-TX/ B-TX	CROSS	81
404 [2]	RPT.HLD	Repeater transmission hold	ON/ OFF	OFF	82
405 [2]	RPT.ID	Repeater ID registration	Up to 6 characters	–	82
406 [2]	ID.TX	Repeater ID transmission	OFF/ MORSE/ VOICE	OFF	82
500	P.ON.MSG	Power on message setup	Up to 6 characters	HELLO	62
501	BRIGHT	Display brightness	OFF/ 1 ~ 8	8	62
502	AUTO.BR	Display auto brightness	OFF/ ON	OFF	62
503	COLOR	Backlight color	AMBER/ GREEN	AMBER	63
507	PF1	PF1 key programmable function value	See reference page	FR.BAND	66
508	PF2	PF2 key programmable function value	See reference page	CTRL	66
509	MIC.PF1	Microphone PF1 key programmable function value	See reference page	A/B	66
510	MIC.PF2	Microphone PF2 key programmable function value	See reference page	MR	66

Menu No.	Display	Description	Setting Values	Default Setting	Ref. Page
511	MIC.PF3	Microphone PF3 key programmable function value	See reference page	VFO	66
512	MIC.PF4	Microphone PF4 key programmable function value	See reference page	CALL (K/ M4 types) 1750 (E types)	66
513	MIC.LCK	Microphone key lock	OFF/ ON	OFF	63
514	SC.RESM	Scan resume method	TO/ CO/ SEEK	TO	43
516	APO	Auto Power Off time	OFF/ 30/ 60/ 90/ 120/ 180 (minutes)	180	67
517	DAT.BND	Data Band mode	A/ B/ ATX.BRX/ ARX.BTX	A	83
518	DAT.SPD	Data communications speed	1200/ 9600 (bps)	1200	83
519	PC .SPD	PC terminal baud rate speed	9600/ 19200/ 38400/ 57600 (bps)	9600	84
520	SQC.SRC	SQC output type	OFF/ BUSY/ SQL/ TX/ BUSY.TX/ SQL.TX	BUSY.TX	84
521	AUTO.PM	Automatic PM entry	OFF/ ON	ON	41
522 [2]	REM.ID	Personal Identificaton Number	000 ~ 999	000	85
523 [2]	ANS.BK	Answer back	OFF/ ON	ON	85
527	DP.BAR	Display partition bar	OFF/ ON	ON	72
998	PROTEC	Password protection	OFF/ ON	OFF	74
999	RESET	Reset	VFO/ PART/ PM/ FULL	VFO	88

[1] Menu numbers 03 ~ 09 are available only when the optional VGS-1 unit is installed in the transceiver.

[2] Menu numbers 110, 403 ~ 406, 522, and 523 are available only for K type models.

[3] Menu numbers 200 and 202 are available only if a Memory Channel has been stored in the transceiver.

[4] Menu number 401 is available only for K and E type models.

CHARACTER ENTRY

Certain menus require you to enter characters, such as the power on message and memory names. When character entry is required, a cursor will appear on the display.

1 Press the **Tuning** control.
- The cursor will blink.

```
MNAME        200    ░░
     ESC   BACK   ←   →   CLR
```
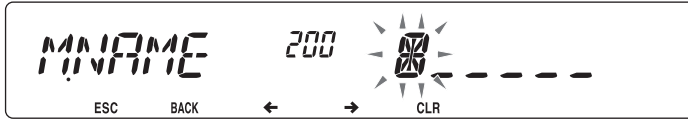
2 Rotate the **Tuning** control to select your desired character.
- You can enter characters as described below:
    - Power on message, memory name, DTMF memory name, and repeater ID (K type only): 0 ~ 9, A ~ Z, -, /, @, and space
    - EchoLink memory: 0 ~ 9, A ~ Z, and space
    - DTMF memory: 0 ~ 9, A ~ F, and space
    - Memory group link and wireless remote ID (K type only): 0 ~ 9

3 Press the **Tuning** control to set the selected character.
- The cursor will move to the next digit.

```
MNAME        200    U0
     ESC   BACK   ←   →   CLR
```
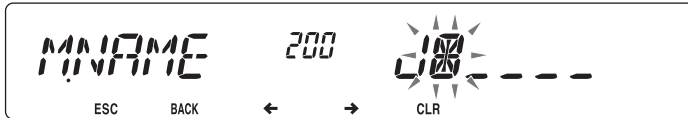
- You can move the cursor to the left or right by pressing **[REV] (←)** or **[LOW] (→)**.
- You can delete the selected character by pressing **[PF1] (CLR)**.

4 Repeat steps 2 and 3 to enter the remaining characters.
- Press **[CALL] (ESC)** at any time to exit Menu mode.
- Press **[TONE] (BACK)** at any time to cancel the Menu setup and return to the Menu selection.

■ Microphone Keypad Character Entry

The microphone keys can also be used to enter characters. Refer to the table below for characters corresponding to microphone keys.

Key	Character Display (with each press of the key)			
1	Q	Z	1	
2	A	B	C	2
3	D	E	F	3
4	G	H	I	4
5	J	K	L	5
6	M	N	O	6
7	P	R	S	7
8	T	U	V	8
9	W	X	Y	9
0	(space)	0		
✳	Not used			
#	–	/	@	

The microphone **[A]** ~ **[D]** keys have special functions assigned to them:

[A]: Functions the same as **[PF1] (CLR)**

[B]: Functions the same as **[REV]** (←)

[C]: Functions the same as **[LOW]** (→)

[D]: Functions the same as the **Tuning** control

Repeaters are often installed and maintained by radio clubs, sometimes with the cooperation of local businesses involved in the communications industry.

Compared to simplex communication, you can usually transmit over much greater distances by using a repeater. Repeaters are typically located on mountain tops or other elevated locations. They generally operate at higher ERP (Effective Radiated Power) than a typical station. This combination of elevation and high ERP allows communications over considerable distances.

TX: 144.725 MHz
TX tone: 88.5 Hz
RX: 145.325 MHz
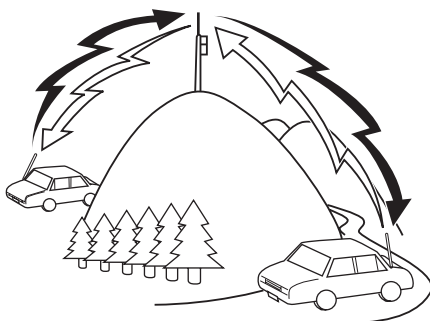
TX: 144.725 MHz
TX tone: 88.5 Hz
RX: 145.325 MHz

REPEATER ACCESS

Most repeaters use a receive and transmit frequency pair with a standard or non-standard offset (odd-split). In addition, some repeaters must receive a tone from the transceiver in order to gain access to the repeater. For details, consult your local repeater reference.

■ Selecting an Offset Direction

The offset direction allows your transmit frequency to be higher (+) or lower (–) than the receive frequency.

1 Select your desired band (A or B).

2 Press **[F], [REV] (1s)** to select an offset direction.

- Each time you press **[F], [REV] (1s)**, the offset direction changes as follows:
  Simplex operation >> + >> – >> Simplex operation
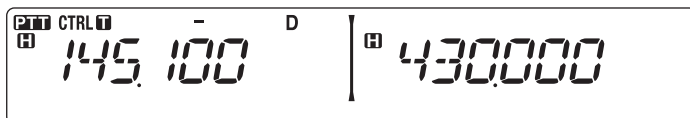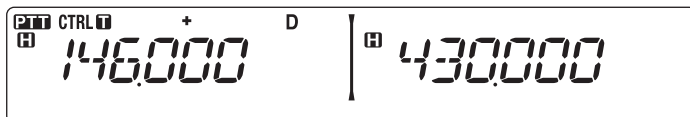
- If you are using an E-market transceiver, when operating on the 430 MHz band, the offset direction changes as follows:

  Simplex operation >> + >> – >> = (–7.6 MHz) >> Simplex operation

If the offset transmit frequency falls outside the allowable range, transmitting is inhibited. Use one of the following methods to bring the transmit frequency within the band limits:

- Move the receive frequency further inside the band.
- Change the offset direction.

Note: While using an odd-split memory channel or transmitting, you cannot change the offset direction.

■ Selecting an Offset Frequency

The offset frequency is the value which the transmit frequency will be offset from the receive frequency. The default offset frequency on the 144 MHz band is 600 kHz for all market versions. The default on the 430/440 MHz band is 5 MHz.

1 Select your desired band (A or B).

2 Enter Menu mode and access Menu 400 (OFFSET) {page 20}.

```
OFFSET   400      0600
         ESC   BACK
```

3 Set the appropriate offset frequency value.

- The selectable range is from 00.00 MHz to 29.95 MHz, in steps of 50 kHz.

Note: After changing the offset frequency, the new offset frequency will also be used by Automatic Repeater Offset {page 29}.

■ Activating the Tone Function

To turn the Tone function on:

1 Select your desired band (A or B).

2 Press **[TONE]** to turn the Tone function ON.

- Each time you press **[TONE]**, the selection changes as follows:

  None >> T (Tone) >> CT (CTCSS) >> DCS (DCS) >> None

```
PTT CTRL         –        D
H                             H
   145.100           430.000
```
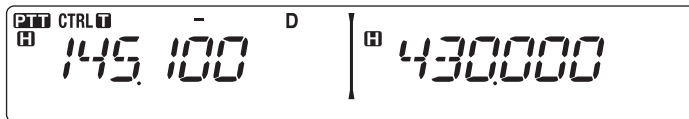
Note: When accessing a repeater that requires a 1750 Hz tone, you do not need to activate the Tone function. Simply press the key assigned to the 1750 Hz tone {page 66} to transmit the tone.

■ Selecting a Tone Frequency

To select the tone frequency required to access your desired repeater:

1 Turn the Tone function ON.

2 Press **[F], [TONE]**.

- The current tone frequency appears on the display. The default frequency is 88.5 Hz.

3 Rotate the **Tuning** control to select your desired frequency.

- To exit the tone frequency selection, press **[F] (ESC)**.

4 Press any key other than the **Tuning** control and **[F] (ESC)** to set the selected frequency.

Note: If you have set up a Memory channel with a tone setting, simply recall the Memory channel instead of setting up the tone frequency every time.

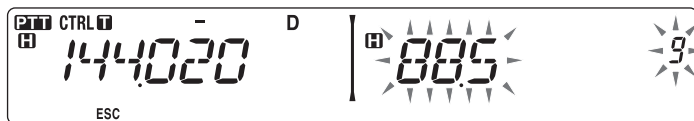| No.	Frequency (Hz)	No.	Frequency (Hz)	No.	Frequency (Hz)	No.	Frequency (Hz)
01	67.0	12	97.4	23	141.3	34	206.5
02	69.3	13	100.0	24	146.2	35	210.7
03	71.9	14	103.5	25	151.4	36	218.1
04	74.4	15	107.2	26	156.7	37	225.7
05	77.0	16	110.9	27	162.2	38	229.1
06	79.7	17	114.8	28	167.9	39	233.6
07	82.5	18	118.8	29	173.8	40	241.8
08	85.4	19	123.0	30	179.9	41	250.3
09	88.5	20	127.3	31	186.2	42	254.1
10	91.5	21	131.8	32	192.8		
11	94.8	22	136.5	33	203.5		

■ Automatic Repeater Offset (K and E Types Only)

This function automatically selects an offset direction and activates the Tone function, according to the frequency that you have selected. To obtain an up-to-date band plan for repeater offset direction, contact your national Amateur Radio association.

1 Enter Menu mode and access Menu 401 (ARO) {page 20}.

2 Set the ARO to ON.

```
ARO          401              ON
      ESC    BACK
```
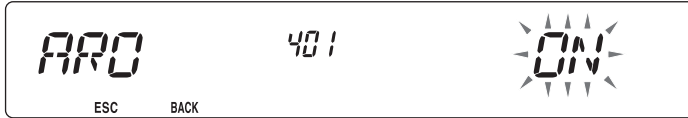
3 Press **[BAND SEL A]** to select the A band.

4 Press **[VFO]** to select VFO mode.

5 Rotate the **Tuning** control to select your desired frequency.

```
PTT CTRL T        −      D
H  145.100         H 430.000
```

6 Press **[PTT]** to start a call.

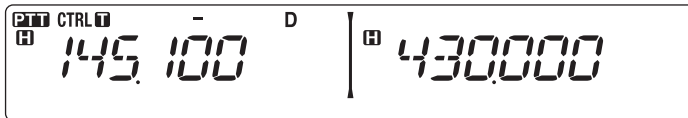   • You will be transmitting on an offset frequency value determined from your offset setting value {page 27} and an offset direction depending on your selected frequency. Refer to the settings below for offset directions:

   K Market:
   Under 145.100 MHz: No offset (Simplex operation)
   145.100 ~ 145.499 MHz: Minus (–) offset
   145.500 ~ 145.599 MHz: No offset (Simplex operation)
   146.000 ~ 146.399 MHz: Plus (+) offset
   146.400 ~ 146.599 MHz: No offset (Simplex operation)
   146.600 ~ 146.999 MHz: Minus (–) offset
   147.000 ~ 147.399 MHz: Plus (+) offset
   147.400 ~ 147.599 MHz: No offset (Simplex operation)
   147.600 ~ 147.999 MHz: Minus (–) offset
   148.000 MHz and higher: No offset (Simplex operation)

   E Market:
   Under 145.000 MHz: No offset (Simplex operation)
   145.600 ~ 145.799 MHz: Minus (–) offset
   145.800 MHz and higher: No offset (Simplex operation)

TRANSMITTING A 1750 Hz TONE

Most repeaters in Europe require that a transceiver transmit a 1750 Hz tone. By turning the 1750 Hz tone menu item ON, the transceiver will automatically transmit the 1750 Hz tone for 2 seconds whenever you transmit.

1 Enter Menu mode and access Menu 402 (1750HD) {page 20}.

```
1750HD   402        OFF
     ESC   BACK
```

2 Set the tone to ON or OFF.
  - When set to ON, the 1750 Hz tone will transmit. When set to OFF, the tone will not be transmitted.

REVERSE FUNCTION

After setting a separate receive and transmit frequency, you can exchange these frequencies using the Reverse function. This allows you to manually check the strength of signals you receive directly from other stations, while using a repeater. If the station's signal is strong, move to a simplex frequency to continue the contact and free up the repeater.

Press **[REV]** to turn the Reverse function ON or OFF.
  - When the Reverse function is ON, the R icon will appear on the display.

```
PTT CTRL       - R    D
       145.100          430.000
```
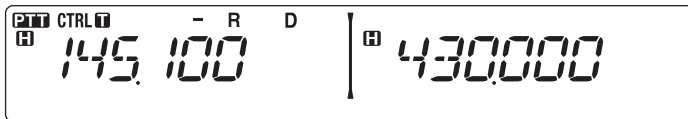
Note:
  ◆ If the transmit frequency is outside the allowable transmit frequency range when using Reverse, pressing **[PTT]** will cause an error tone to sound and transmission will be inhibited.
  ◆ If the receive frequency is outside the receive frequency range when using Reverse, an error tone will sound and Reverse will not operate.
  ◆ The ARO (Automatic Repeater Offset) will not function when Reverse is ON.
  ◆ You cannot switch Reverse ON or OFF while transmitting.

AUTOMATIC SIMPLEX CHECKER (ASC)

While using a repeater, ASC periodically monitors the strength of signals you receive directly from the other stations. If the station's signal is strong enough to allow direct contact without a repeater, the ▣ icon blinks.

Press **[REV] (1s)** to turn the ASC ON.

- When the ASC is ON, the ⊡ icon will appear on the display.
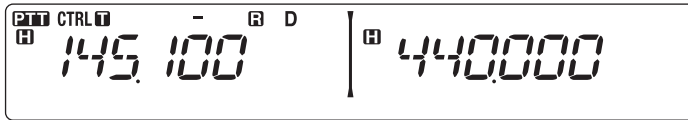
- While direct contact is possible, without the use of a repeater, the ⊡ icon will begin blinking.
- To exit ASC, press **[REV]**.

Note:
- ◆ Pressing **[PTT]** will cause the ⊡ icon to stop blinking.
- ◆ ASC does not function if you are using simplex operation.
- ◆ ASC does not function while scanning.
- ◆ Activating ASC while using Reverse will switch the Reverse function OFF.
- ◆ If you recall a Memory channel or the Call channel, and those channels are set up with the Reverse function switched ON, the ASC will switch OFF.
- ◆ ASC causes received signals to be momentarily intermitted every 3 seconds.

TONE FREQUENCY ID

This function scans through all tone frequencies to identify the incoming tone frequency on a received signal. You can use this function to find which tone frequency is required by your local repeater.

1 Press **[TONE]** to switch the Tone function ON.
- The ⊓ icon appears on the display.

2 Press **[F], [TONE] (1s)** to run the Tone Frequency ID scan.
- The ⊓ icon blinks and SCAN appears on the display.
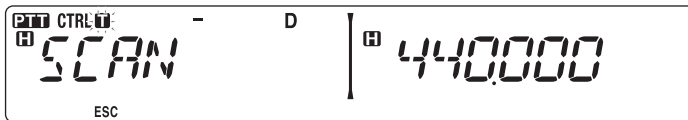
- To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan).
- To quit the function, press **[F] (ESC)**.
- When the tone frequency is identified, the identified frequency appears on the display and blinks. Press any key other than the **Tuning** control while the identified frequency is blinking, to resume scanning.
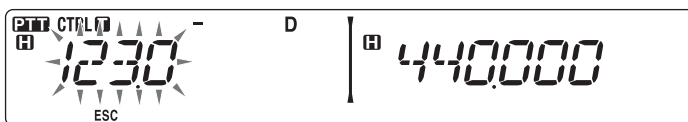
3 Press the **Tuning** control to program the identified frequency in place of the currently set tone frequency.
- The Tone function will remain ON. You can press **[TONE]** to switch the Tone function OFF.
- Press **[F] (ESC)** if you do not want to program the identified frequency.

In Memory channels, you can store frequencies and related data that you often use. Then you need not reprogram the data every time. You can quickly recall a programmed channel by simple operation. A total of 1000 Memory channels are available for bands A and B.

SIMPLEX & REPEATER OR ODD-SPLIT MEMORY CHANNEL?

You can use each memory channel as a simplex & repeater channel or as an odd-split channel. Store only one frequency to use as a simplex & repeater channel or two separate frequencies to use as an odd-split channel. Select either application for each channel depending on the operations you have in mind.

Simplex & repeater channels allow:

- Simplex frequency operation
- Repeater operation with a standard offset (if an offset direction is stored)

Odd-split channels allow:

- Repeater operation with a non-standard offset

The data listed below can be stored in each Memory channel:

Parameter	Simplex & Repeater	Odd-split
Receive frequency	Yes	Yes
Transmit frequency		Yes
Receive frequency step size	Yes	Yes
Transmit frequency step size		Yes
Offset direction	Yes	No
Tone ON/OFF	Yes	Yes
Tone frequency	Yes	Yes
CTCSS ON/OFF	Yes	Yes
CTCSS frequency	Yes	Yes
DCS ON/OFF	Yes	Yes
DCS code	Yes	Yes
Reverse ON/OFF	Yes	No
Memory channel lockout	Yes	Yes
Memory channel name	Yes	Yes
Modulation/Demodulation mode	Yes	Yes

STORING SIMPLEX AND STANDARD REPEATER FREQUENCIES

1 Press **[VFO]** to enter VFO mode.

2 Rotate the **Tuning** control to select your desired frequency.
  - Additionally, you can press the microphone **[UP]**/**[DWN]** keys to select a frequency.

3 Set up any additional data desired for the frequency.
  - Offset direction, Tone ON/OFF, Tone frequency, CTCSS ON/OFF, CTCSS frequency, DCS ON/OFF, DCS code, etc.

4 Press **[F]**.
  - A memory channel number appears.
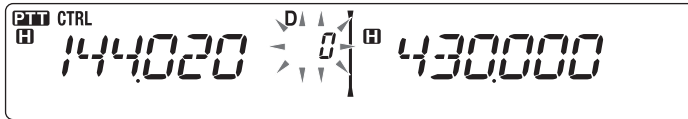
5 Rotate the **Tuning** control to select your desired channel number.
  - Additionally, you can press the microphone **[UP]**/**[DWN]** keys to select a channel.

6 Press **[MR]** to store the data in the selected Memory channel.

Note: If you store the data in a Memory channel that already has data stored in it, the old data will be cleared and the new data will be stored.

■ Call Channel Memory (Simplex)

The Call channel can be used to store any frequency and related data that you will recall often. You may want to dedicate the Call channel as an emergency channel within your group.

To store a simplex frequency and related data as the Call channel instead of in a Memory channel, after step 4 (above), press **[CALL]**.

Note: Storing new data in the Call channel will clear the old data. (The Call channel itself cannot be cleared, but data can be replaced with new data.)

STORING ODD-SPLIT REPEATER FREQUENCIES

Some repeaters use a receive and transmit frequency pair with a non-standard offset. To access those repeaters, store two separate frequencies in a memory channel. You can then operate on those repeaters without changing the offset frequency you stored in the menu.

1 Set up a simplex channel by following steps 1 to 6 of "STORING SIMPLEX AND STANDARD REPEATER FREQUENCIES", above.

2 Press **[VFO]** to enter VFO mode.

3 Rotate the **Tuning** control to select your desired transmit frequency.
  - Additionally, you can press the microphone **[UP]**/**[DWN]** keys to select a frequency.

4 Set up any additional data desired for the transmit frequency.
   - Tone ON/OFF, Tone frequency, CTCSS ON/OFF, CTCSS frequency, DCS ON/OFF, DCS code, etc.

5 Press **[F]**.
   - A memory channel number appears.

6 Rotate the **Tuning** control to select your desired channel number.
   - Additionally, you can press the microphone **[UP]/[DWN]** keys to select a channel.

7 Press **[PTT], [MR]** to store the data in the selected Memory channel.

■ Call Channel Memory (Odd-Split)

The Call channel can be used to store any frequency and related data that you will recall often. You may want to dedicate the Call channel as an emergency channel within your group.

To store an odd-split frequency and related data as the Call channel instead of in a Memory channel, after step 6 (above), press **[PTT], [CALL]**.
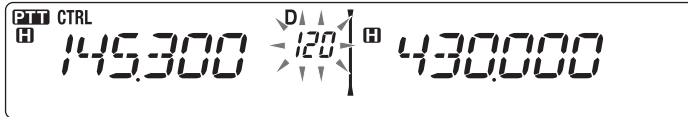
Note: You cannot store the transmit offset status and Reverse status in an odd-split Call channel.

RECALLING A MEMORY CHANNEL

1 Press **[MR]** to enter Memory Recall mode.

2 Rotate the **Tuning** control to select your desired Memory channel.
   - Additionally, you can press the microphone **[UP]/[DWN]** keys to select a channel, or you can enter a channel number using the microphone keypad.

The transceiver Menu also provides you with the option to recall Memory channels with storedfrequencies in your current band, or all Memory channels:

1 Enter Menu mode and access Menu 201 (RECALL) {page 20}.

2 Set the recall method to CURENT (current band) or ALL (all bands).
   - CURENT allows you to recall only those memory channels that have stored frequencies within the current band. ALL allows you to recall all programmed memory channels (such as recalling a 144 MHz frequency channel when operating in the 430/440 MHz band).

CLEARING A MEMORY CHANNEL

1 Press **[MR]** to enter Memory Recall mode.

2 Rotate the **Tuning** control to select your desired Memory channel.
 - Additionally, you can press the microphone **[UP]/[DWN]** keys to select a channel, or you can enter a channel number using the microphone keypad.

```
PTT CTRL          D
H   144380      45  H  430000
```
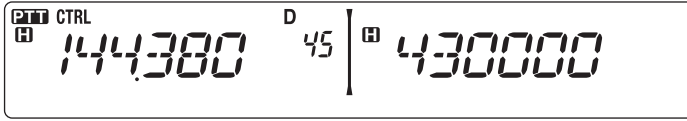
3 Turn the transceiver power OFF.

4 Press **[MR] + Power ON**.
 - A confirmation message appears on the display.

```
M 45CH        CLEAR?
      ESC
```

5 Press the **Tuning** control to clear the Memory channel.
 - To exit without clearing the channel, press **[F] (ESC)**.

NAMING A MEMORY CHANNEL

You can name Memory channels using up to 6 alphanumeric characters. When you recall a named Memory channel, its name appears on the display instead of the stored frequency. Names can be call signs, repeater names, cities, people, etc.

1 Press **[MR]** to enter Memory Recall mode.

2 Rotate the **Tuning** control to select your desired Memory channel.

3 Enter Menu mode and access Menu 200 (MNAME) {page 20}.

```
MNAME       200    *_ _ _ _ _
    ESC   BACK   ←    →    CLR
```

4 Enter your desired name for the channel {page 24}.

Note: You can overwrite a Memory channel name by performing the steps above. You can also clear a Memory channel name by clearing the Memory channel.

SWITCHING THE MEMORY NAME/ FREQUENCY DISPLAY

After storing memory names, you can switch the display between the memory name and the stored frequency. This can be useful if you need to confirm the frequency stored in named Memory channels.

1   Press **[MR]** to enter Memory Recall mode.

2   Press the **Tuning** control to toggle between the memory name and the stored frequency.

MEMORY-TO-VFO TRANSFER

Transferring the contents of a Memory channel or the Call channel to the VFO can be useful if you want to search for other stations or a clear frequency, near the selected Memory channel or Call channel frequency.

1   Press **[MR]** or **[CALL]** to enter Memory Recall mode or select the Call channel.

2   Rotate the **Tuning** control to select your desired channel. (This step is not necessary when selecting the Call channel.)

3   Press **[F], [VFO]**.

   • The entire contents of the Memory channel or Call channel are copied to the VFO, and VFO mode is selected after the transfer is complete.

   • When copying a transmit frequency from an odd-split Memory or Call channel, you must first turn the Reverse function ON before pressing **[F], [VFO]**.
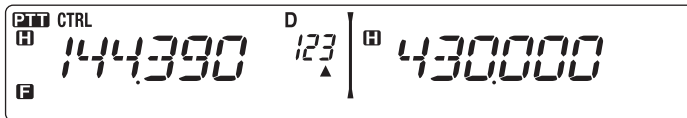
CHANNEL DISPLAY FUNCTION

When this function is switched ON, the transceiver displays only a Memory channel number instead of a frequency.

1   Turn the transceiver power OFF.

2   Press **[LOW] + Power ON** to turn the channel display ON or OFF.
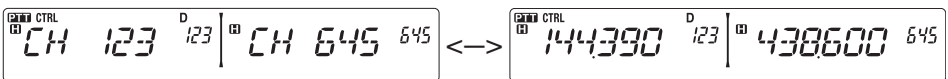
Note:

◆   If no Memory channels have saved data in them, channel display will not function.

◆   If a channel has a stored name, the name will appear on the display in place of the channel number.

◆   When using Channel Display, you cannot reset the transceiver.

While in Channel Display mode, the transceiver keys function as shown below:

Key Name	[KEY]	[F], [KEY]	[KEY] (1s)	While Transmitting	[KEY] + Power ON
⏻	Power ON/OFF	Power ON/OFF	Power ON/OFF	Power ON/OFF	Power ON/OFF
PM	PM Recall	PM In	–	–	–
VFO	VFO mode	Memory to VFO copy	VFO Scan	–	–
MR	MR mode	Store in Memory channel	Memory Scan	–	Memory Clear
CALL	Call mode	Store in Call channel	Call Scan	–	–
F	Function mode	Exit Function mode	Key Lock	–	Reset
TONE	Tone/CTCSS/DCS	Tone/CTCSS/DCS freq./code selection	–	–	Repeater/Cross/A-TX/B-TX/OFF
REV	Reverse ON/OFF	Shift ON/OFF	ASC ON/OFF	–	–
LOW	Change output power	Mute	–	Change output power	Change channel display
PF1	**E/M4:** Change frequency band **K:** Select the Weather channel	–	–	–	–
PF2	Change control band	–	–	–	Turn EchoLink ON/OFF
Tuning control	Change between the freq. and CH name	Menu mode	MHz Scan/Group Scan	–	–
BAND SEL A	A band	Change the freq. band	Change Single/Dual	–	Band Mask A
BAND SEL B	B band	Change the freq. band	Change Single/Dual	–	Band Mask B

Programmable Memory (PM) stores virtually all settings currently set on the transceiver. This transceiver provides 5 PM channels to store 5 sets of transceiver configurations. Later, you can quickly recall any one of these channels, depending on the operations you have in mind or the operating environment.

PROGRAMMABLE INFORMATION

The following programmable settings can be stored in each channel:

- Memory name
- Memory channel lockout
- Channel Display mode
- Repeater mode
- Key lock
- Password protection
- Password
- Memory channel/Call channel/Program scan memory
- DTMF memory
- EchoLink memory
- Data communications speed
- 10 MHz mode
- Mic sensitivity
- SQC data output

APPLICATION EXAMPLES

The following are examples of how you might use Programmable Memory. These examples may not represent applications useful to you, but you will understand the flexibility of this function.

Situation: You share your transceiver with other members in your family or club. However, each individual has personal preferences for how they like to set various functions. You have to keep changing many settings each time you use the transceiver.

Solution: Because 5 PM channels are available, up to 5 persons can separately program the transceiver and store their customized environment. Then each person can quickly change to his or her favorite settings, simply by recalling a PM channel. It is too much trouble to change back the settings after somebody else has reconfigured them. So this application may avoid having a feature-rich transceiver but never using many useful features.

Situation: While operating mobile on the way to work every morning, you prefer a silent transceiver that does not interrup the morning calm. In addition, you feel that a bright display is useless in the sunlight. At night when driving home, you realize the Beep function truly does serve a purpose and you acknowledge it is nice to see a bright display after dark.

Solution: In 2 PM channels, store the same operating data such as frequency, offset, tone, etcl, and store different settings for the Display brightness and Beep functions. Then you can quickly recall the best settings for day or night operation.

Situation: You cannot figure out how to exit the current transceiver mode.

Solution: Simply recall PM channel 1, which contains an exact copy of the transceiver default environment. You will not lose the contents of any memory channels.

STORING DATA IN PM CHANNELS

1 Confirm that the following conditions have been satisfied:
- The transceiver is in receive mode.
- Scan is not being used.
- Microphone Control is OFF.

2 Configure the transceiver with your desired settings.
- For data that can be stored, refer to page 38.

3 Press **[F], [PM]**.
- PM channel numbers 1 to 5 appear and blink at the bottom of the display.

```
 PTT CTRL            D
 H   144000       H  430000

     1      2     3    4    5
```
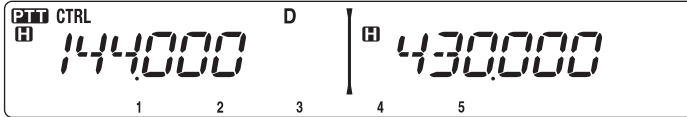
4 Enter a channel number (**[1]** to **[5]**) corresponding to your desired PM channel.
- The settings are stored in the PM channel.

RECALLING PM CHANNELS

1 Press **[PM]**.
- PM channel numbers 1 to 5 appear on the bottom of the display.

```
 PTT CTRL            D
 H   144000       H  430000

     1      2     3    4    5
```
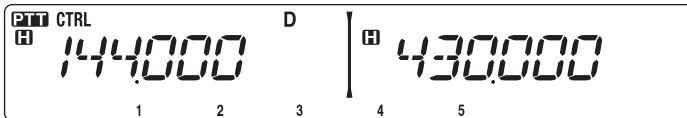
2 Enter a channel number (**[1]** to **[5]**) corresponding to your desired PM channel.
- The settings stored in the PM channel are recalled.
- The selected channel number appears on the display.

```
 PTT CTRL T     -    D
 H   145 100      H  430000
```

AUTO PM CHANNEL STORE

After you recall a PM channel, this function automatically overwrites the current PM channel with the present operating environment when:
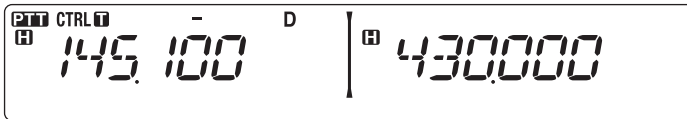
- You recall another PM channel.
- You press **[PM]**.
- You switch the transceiver power OFF.

Follow the steps below to activate the Auto PM storage function.

1 Enter Menu mode and access Menu 521 (AUTOPM) {page 20}.

```
AUTOPM  521              ON
      ESC   BACK
```

2 Set AUTOPM to ON.

PM CHANNEL RESET

To reset the PM channels to their default settings:

1 Turn the transceiver power OFF.

2 Press **[F] + Power ON**.

3 Release **[F]**.

4 Rotate the **Tuning** control and select PM.

```
RESET                    PM
      ESC
```

5 Press the **Tuning** control.

- A confirmation message appears on the display.

```
RESET               SURE?
      ESC   BACK
```

6 Press the **Tuning** control again to reset the PM channels.

- Press [TONE] (BACK) to return to the previous display.
- To exit without resetting the PM channels, press [F] (ESC).

SCAN

Scan is a useful feature for hands-off monitoring of your favorite frequencies. Becoming comfortable with all types of Scan will increase your operating efficiency.

This transceiver provides the following types of scans:

Scan Type	Scan Range
VFO Scan	Scans all frequencies on the current band.
Memory Scan	Scans all frequencies stored in the Memory channels.
Group Scan	Scans the frequencies in the Memory channels which belong to the group you have specified.
Program Scan	Scans all frequencies within the programmed range, on the current band.
MHz Scan	Scans all frequencies within a 1 MHz range from the originating frequency.
Call Scan	Scans the Call channel as well as the currently selected VFO frequency or Memory channel.

Note:
◆ Adjust the squelch level before using Scan. Selecting a squelch level too low could cause Scan to stop immediately.
◆ While using CTCSS or DCS, Scan stops for any signal received; however, you will hear audio only when the signal contains the same CTCSS tone or DCS code that you selected.
◆ When using S-meter Squelch, Scan stops when the received signal strength matches or exceeds the S-meter setting. Scan resumes 2 seconds after the signal level drops below the S-meter setting.
◆ Pressing and holding **[PTT]** causes Scan to temporarily stop if it is functioning on a non TX band.
◆ Starting Scan switches the Automatic Simplex Checker OFF.

SELECTING A SCAN RESUME METHOD

The transceiver stops scanning at a frequency or Memory channel on which a signal is detected. It then continues scanning according to which resume mode you have selected. You can choose one of the following modes. The default is Time-operated mode.

*   **Time-Operated mode**
    The transceiver remains on a busy frequency or Memory channel for approximately 5 seconds, and then continues to scan even if the signal is still present.
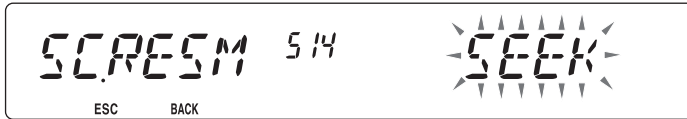*   **Carrier-Operated mode**
    The transceiver remains on a busy frequency or Memory channel until the signal drops out. There is a 2 second delay between signal drop-out and scan resumption.
*   **Seek mode**
    The transceiver remains on a busy frequency or Memory channel even after the signal drops out and does not automatically resume scanning.

Note: To temporarily stop scanning and monitor weak signals, press the microphone PF key assigned to the Monitor function {page 66}. Press the PF key again to resume scanning.

1   Enter Menu mode and access Menu 514 (SC.RESM) {page 20}.

```
SC.RESM  514          SEEK
ESC    BACK
```

2   Set the Scan Resume mode to TO (Time-Operated), CO (Carrier-Operated) or SEEK.

VFO SCAN

VFO Scan monitors all frequencies tunable on the band, using the current frequency step size.

1   Select your desired band.
2   Press **[VFO] (1s)**.
*   Scan starts at the current frequency.
*   The 1 MHz decimal blinks while scanning is in progress.
*   To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan). You can also press microphone **[UP]**/ **[DWN]**.

```
PTT CTRL         D
H  145.300    | H  439.640
```
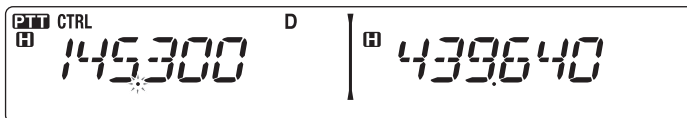
3   To quit VFO Scan, press **[VFO]** again.

MEMORY SCAN

Use Memory Scan to monitor all Memory channels programmed with frequency data.

1 Select your desired band.

2 Press **[MR] (1s)**.
- Scan starts at the current frequency.
- The 1 MHz decimal blinks while scanning is in progress.
- To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan). You can also press microphone **[UP]**/ **[DWN]**.

3 To quit Memory Scan, press **[MR]** again.

Note:
◆ At least 2 Memory channels must contain data and must not be locked out of scan.
◆ The L0/U0 to L9/U9 Memory channels will not be scanned.
◆ You can also start Memory Scan when in Channel Display mode. While Scan is paused on a channel, the channel number blinks.

■ Locking Out a Memory Channel

You can select Memory channels that you prefer not to monitor while scanning.

1 Press **[MR]**, then rotate the **Tuning** control to select your desired channel.

2 Enter Menu mode and access Menu 202 (L.OUT) {page 20}.

3 Set the lockout to ON to lock the channel out of the scanning sequence.
- To cancel lockout, set the lockout to OFF.
- The ★ icon appears on the display for a channel that has been locked out.
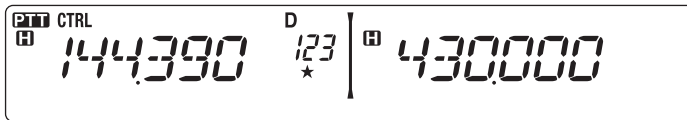
Note: The L0/U0 to L9/U9 Memory channels cannot be locked out.

GROUP SCAN

For the purpose of Group Scan, the 1000 Memory channels are divided into 10 groups, with each group containing 100 channels. Group Scan monitors only the 100 channels which belong to the specific group you are scanning. The channels are grouped as follows:

Memory Group	Channel Range	Memory Group	Channel Range
0	0 ~ 99	5	500 ~ 599
1	100 ~ 199	6	600 ~ 699
2	200 ~ 299	7	700 ~ 799
3	300 ~ 399	8	800 ~ 899
4	400 ~ 499	9	900 ~ 999

1 Press **[MR]**, then rotate the **Tuning** control to select a channel in your desired group.

2 Press **[MHz] (1s)**.
   - Scan starts at the current channel.
   - The 1 MHz decimal blinks while scanning is in progress.
   - To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan). You can also press microphone **[UP]**/ **[DWN]**.

3 To quit Group Scan, press **[MHz]** again.

Note:
◆ At least 2 Memory channels in the selected group must contain data and must not be locked out of scan.
◆ You can also start Memory Scan when in Channel Display mode. While Scan is paused on a channel, the channel number blinks.

### ■ Memory Group Link

Memory Group Link provides you with the ability to link 2 or more Memory channel groups together to act as a single group when scanning. You can link up to 6 separate groups together, or even add multiple instances of the same group to the group link, to ensure that one group is scanned more often than the other groups.

1 Enter Menu mode and access Menu 203 (GR.LINK) {page 20}.

2 Press the **Tuning** control.
   - The cursor will begin blinking.

```
GR.LINK  203  █ _ _ _ _
     ESC    BACK   ←    →    CLR
```

3 Rotate the **Tuning** control to select a group to link.

4 Press the **Tuning** control to set the group and move the cursor to the right.
  - Press **[TONE] (<)** to move the cursor back or **[LOW] (>)** to move the cursor to the right.

5 Repeat steps 3 and 4 to link additional groups together.

```
GRLINK  203   5 16 17 1
       ESC   BACK   ←    →    CLR
```
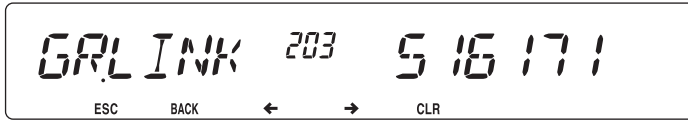
6 When you have entered your desired groups, press **[LOW] (>)** to move the cursor to the right, then press the **Tuning** control to complete the entry and exit Menu mode.
  - If you have entered the maximum of 6 groups, simply press the **Tuning** control to complete the entry and exit Menu mode.
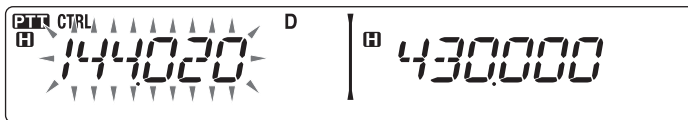
PROGRAM SCAN

Program Scan is identical to VFO Scan except that you select a frequency range for the scan.

■ Setting Scan Limits

You can store up to 10 scan ranges in Memory channels L0/U0 to L9/U9.

1 Select your desired band.

2 Press **[VFO]**.

3 Rotate the **Tuning** control to select your desired frequency for the lower limit.

```
PTT CTRL                D
H   144020              H  430.000
```

4 Press **[F]**.
  - A memory channel number appears and blinks.

5 Rotate the **Tuning** control to select a channel from L0 to L9.

```
PTT CTRL            D
H   144020    L0    H  430.000
```

6 Press **[MR]** to set the channel number.
  - The lower limit is stored in the channel.

7 Rotate the **Tuning** control to select your desired frequency for the lower limit.

8 Press **[F]**.

9 Rotate the **Tuning** control to select a matching channel number from U0 to U9.

   • For example, if you selecte channel L3 in step 5, select channel U3 here.

10 Press **[MR]** to set the channel number.

   • The upper limit is stored in the channel.

   • To confirm the stored scan limits, press **[MR]**, then select the L and U channels.

Note:
◆ The lower limit must be lower in frequency than the upper limit.
◆ The lower and upper frequency step sizes must be equal.
◆ The lower and upper limits must be selected on the same band.

■ Using Program Scan

1 Select your desired band.

2 Press **[VFO]**.

3 Rotate the **Tuning** control to select a frequency within your desired scan range.

4 Press **[VFO], (1s)**.

   • Scan starts at the current frequency.

   • The 1 MHz decimal blinks while scanning is in progress.

   • To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan). You can also press microphone **[UP]**/**[DWN]**.

5 To quit Program Scan, press **[VFO]** again.

Note:
◆ If the step size differs between the lower limit and upper limit, VFO scan will begin instead of Program Scan.
◆ If the current VFO frequency is within more than one Program Scan range, the range stored in the smallest channel number is used.

MHz SCAN

MHz Scan monitors a 1 MHz segment of the band, using the current frequency step size. The current 1 MHz digit determines the limits of the scan. For example, if the current frequency is 145.400 MHz, then the scan range would be from 145.000 MHz to 145.995 MHz (the exact upper limit depends on the current frequency step size).

1 Select your desired band.

2 Press **[VFO]**.

3 Rotate the **Tuning** control to select a frequency within your desired 1 MHz range.

4 Press and hold the **Tuning** control for 1 second to start scanning.
- Scan starts at the current frequency.
- The 1 MHz decimal blinks while scanning is in progress.
- To reverse the scan direction, turn the **Tuning** control clockwise (upward scan) or counterclockwise (downward scan). You can also press microphone **[UP]**/ **[DWN]**.

5 To quit MHz Scan, press the **Tuning** control again.

CALL SCAN

Use Call Scan to monitor both the Call channel and either the currently selected VFO frequency or the currently selected Memory channel.

1 Select your desired VFO frequency or Memory channel.

2 Press **[CALL] (1s)** to start Call Scan.
- The 1 MHz decimal blinks while scanning is in progress.
- When scanning a Memory channel, the Call channel on the same band as the selected Memory channel is used for scan.

3 To quit Call Scan, press **[CALL]** again.

Note: The Memory channel selected is scanned even if it has been locked out of scan.