FT-10R (VHF)
FT-40R (UHF)

Hand-Held Transceivers with Digital Voice Option

Important Notice!

FT-10/-40 Receive Frequency Range Expansion

Please Note: The normal receive frequency coverage is 140~174 MHz (FT-10) or 420~470 MHz (FT-40). If you reset the transceiver, the frequency range returns to the factory-default limits (144~148 MHz, or 430~450 MHz).

Should this occur, perform the following steps to restore the expanded frequency range:

☐ Turn off the radio.

☐ Press down the top **DIAL** knob while simultaneously pressing the side-mounted **LAMP** button as you turn on the radio.

Repeating this procedure ***erases all memories***, and returns amateur-only band limits.

E06985000

Contents

Quick Start

These steps are provided to get you on the air right away. If you experience a problem, refer to the indicated page or section for more details.

Note: The smaller inner knob is used in these steps to adjust squelch and repeater settings. These can also be set from the high-end keypads, but we use the knob method here since it applies to all versions.
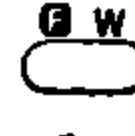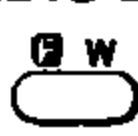
> ### *Changing Settings with the Knob*
>
> Use the knob to change most function settings, like this:
> - ☐ Press it down and hold it in for ½ second, until 2 beeps sound.
> - ☐ Release the knob, then turn it to select a function.
> - ☐ Press the knob again, momentarily, to display the current setting.
> - ☐ Turn the knob to change the setting.
> - ☐ Press the knob once more momentarily to accept the change.
> - ☐ Press PTT to return to the operating display.

☐ Charge the battery pack, or install batteries in the FBA-15 case (page 58).

☐ Mount the battery pack on the back of the radio: hold it with the rounded top edge 1/3 -inch (8 mm) lower than top edge of the radio, press the four tabs on the battery into the slots on the radio, and slide the battery up until it clicks.
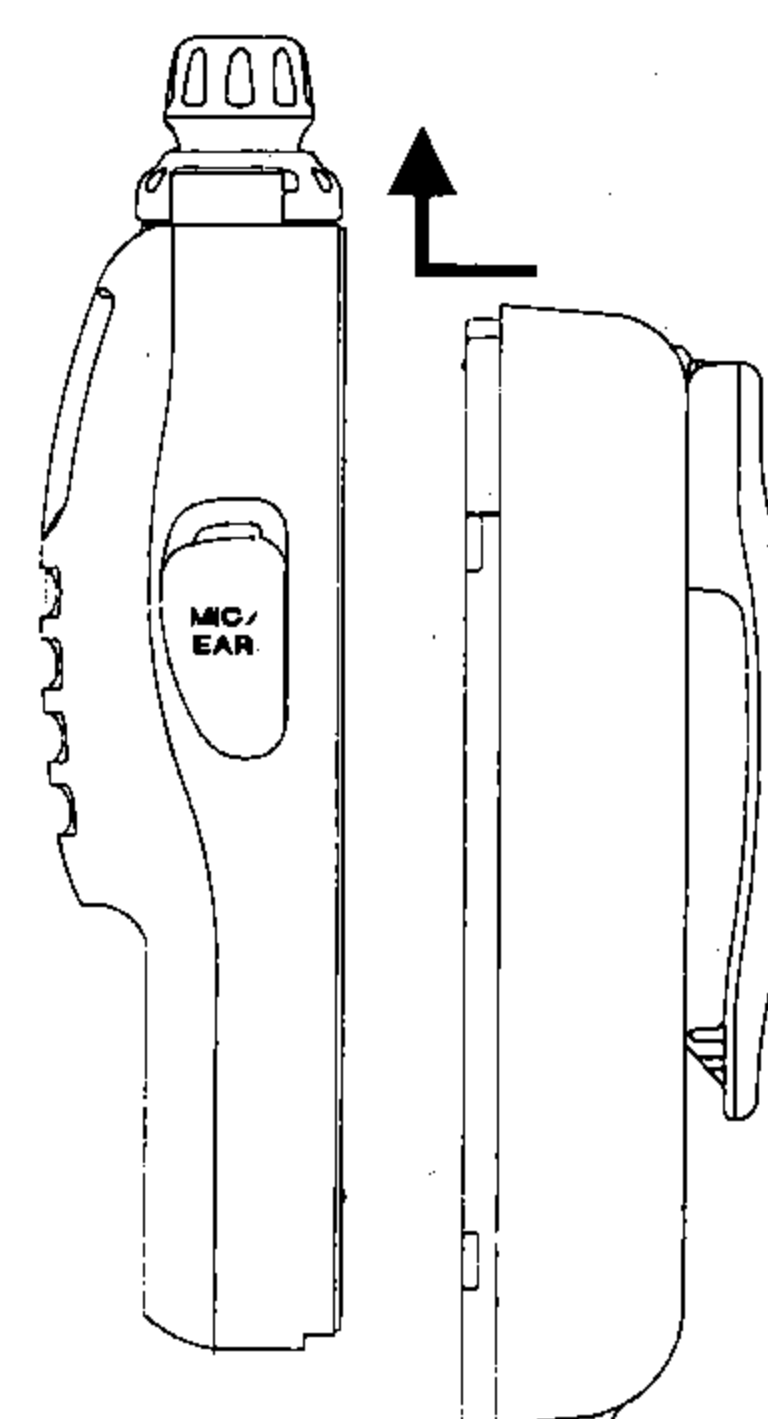
☐ Screw the antenna onto the top connector.

☐ Hold the orange PWR button ½ second to turn the radio on. If nothing happens, check the battery.

☐ Adjust the volume, as necessary, with the outer knob.

☐ Tune to the desired frequency using the inner knob: press ⏻ at the lower right momentarily, and turn the knob to select the MHz range, then wait 5 seconds or press ⏻ again and turn the knob to select the frequency.

☐ To adjust the squelch, hold the knob down for ½ second, then turn it, if necessary, so that *SQL -01-* is displayed. Press the 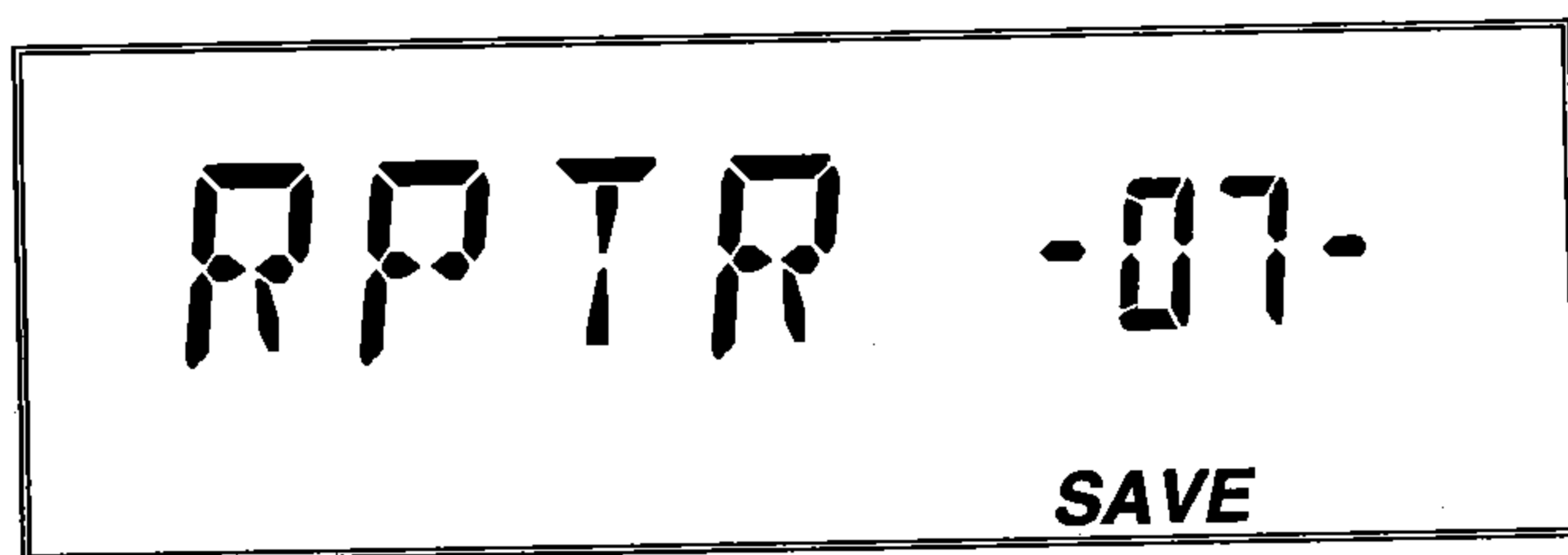knob again momentarily, then turn it to set the squelch threshold (*0* to *15*) so the receiver is silenced. Press the PTT momentarily when done (page 8).

SQL   -01-

>>> SAVE
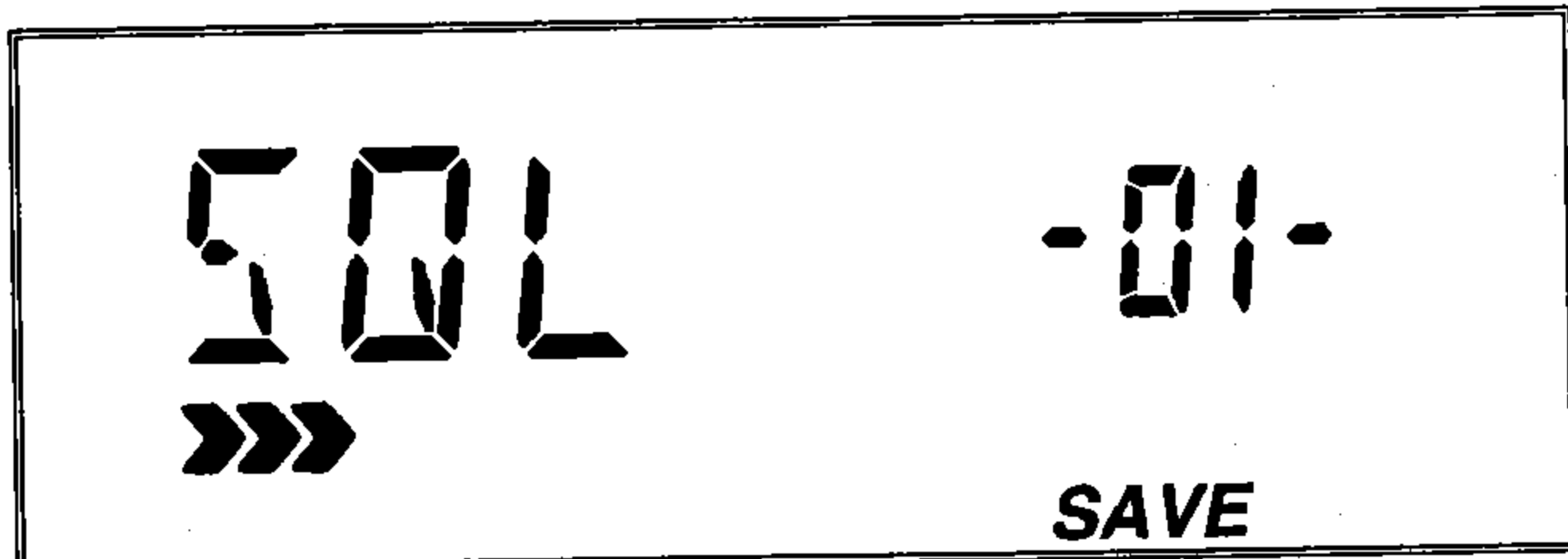
For repeater operation, set the shift direction and offset:

☐ Hold the knob in for ½ second, then turn it so that *RPTR -07-* is displayed.

RPTR   -07-

SAVE

☐ Press the knob momentarily, and turn it to set the required repeater shift direction (*↑RPT*, *SIMP* or *RPT*).

☐ Press the knob once more momentarily, and then the PTT.

☐ Repeat the same procedure to display *SHFT -08-*, and select the appropriate offset: *0.60* MHz for VHF, or as required for UHF (usually *5.00*, *1.60*, or *7.60* MHz). Press the PTT when done.

SHFT   060

SAVE

2
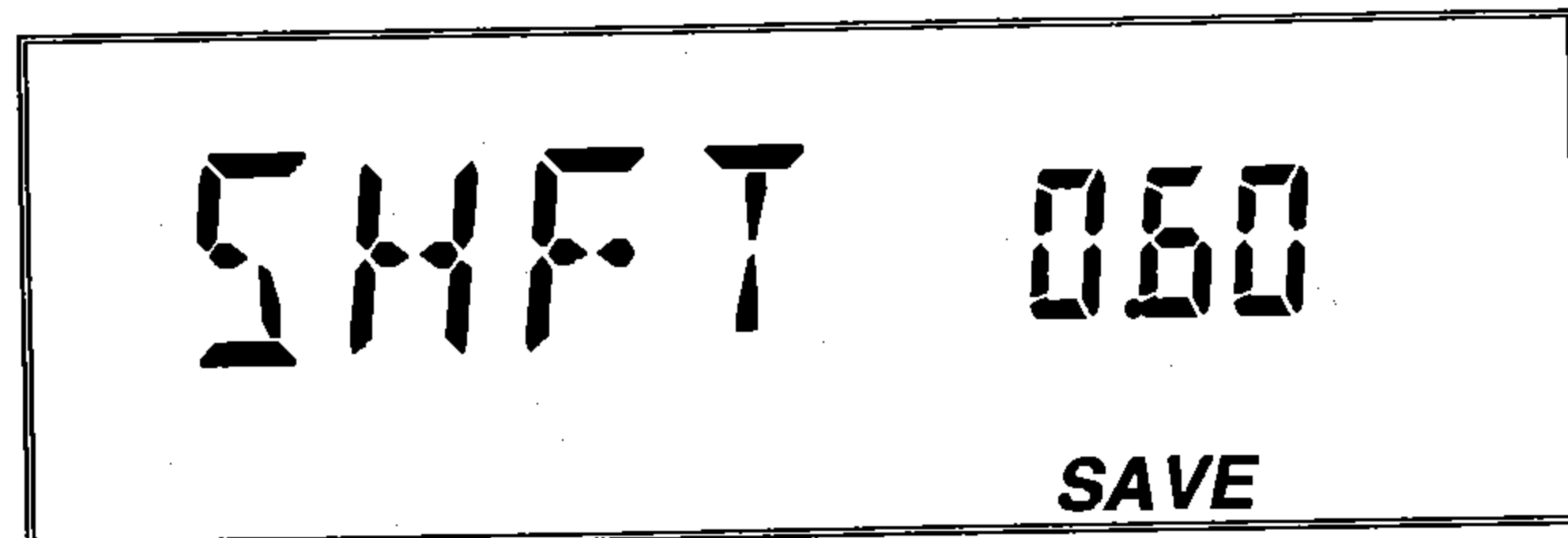
Description

The 2-m FT-10R and 70-cm FT-40R compact FM hand-held transceivers provide up to 5 watts of transmitter output on the VHF and UHF amateur bands. Four different keypads provide a choice of tone systems and digital voice functions, while all versions include Digital Code Squelch (DCS) encoding and decoding, CTCSS encoding, and a wide range of battery preserving features.

The compact "clamshell" design mounts the battery on the rear, for optimum simplicity and portability. A multi-function knob with concentric volume control allows setting most functions, minimizing the need for complex key sequences. The front half of the case is die-cast alloy, while a choice of 3 rechargeable Ni-Cd packs or a dry cell battery case made of thick high-impact polycarbonate plastic can be attached to the rear. Rubber gaskets protect against dust and rain or spray. The LCD (display) has selectable lighting modes, and shows all significant frequency digits and most programmable functions, plus relative signal strength and power output.

Two independent VFOs and up to 99 freely tunable memories (30 memories in A06 and A16 versions) can be grouped in up to nine banks, and are programmable from the knob and 16-button keypads. Memory features include independent tx/rx frequencies or programmable offsets, up to nine pairs of subband limits for band scanning, selectable scan skip for busy channels, scan resume on carrier drop or after 5-second pause, and an instant-recall HOME channel. Memories also store tuning steps, tone selections, and transmit power level. Standard channel steps from 5 to 50 kHz, and 1-MHz steps, are available for tuning. All versions let you assign 4-character names to memory channels.

All versions include a DCS encoder and decoder, and a 39-tone CTCSS (Continuous Tone-Coded Squelch System) encoder. The DCS tone system (and CTCSS decoder provided with the high-end keypads) can be set to sound an alert tone when a selective call opens the squelch. DCS includes the ARTS (Auto Range Transpond System), which polls each station to indicate when they are within or out of range, and with high-end keypads, can automatically ID with your callsign in Morse code every five minutes.

3

In addition to the 4-step power output selection, unique features to extend battery charge life include Yaesu's ABS (Automatic Battery Saver), which optimizes save duration according to operating history; TX Save, which automatically reduces transmit power during periods of high incoming signal strength; selectable-period APO (Automatic Power Off), to turn off the radio after a period of inactivity; and selectable always-on or 5-second illumination of the display.

In 16-key versions, the keypad serves as a DTMF generator during transmission, and in the high-end versions, up to 10 DTMF memories can store 15 digits each for quick playback of commonly used numbers. Also in the high-end versions, DTMF-based selective calling and private paging capabilities let you select any of 999 three-digit ID codes for your transceiver, and then have it stay quiet until your code is received (from any standard DTMF-equipped transceiver). Upon receiving the DTMF ID code, you can have a paging beeper sound (1, 3, or 5 times). In the paging mode, your display shows the DTMF ID code of the calling party. Nine 3-digit code memories store your ID plus those of eight other stations or groups you wish to monitor, and an extra code memory always stores the last 3-digit DTMF code heard.

The high-end keypad provides 20 seconds of voice recording from the microphone or receiver, for playback through the speaker or the transmitter. Voice recording can be activated manually or by an incoming signal, and, when used together with DTMF paging, the radio can reply to calls automatically with a pre-stored voice message and CW identifier.

Please read this manual carefully to familiarize yourself with the transceiver's features.

Using this Manual

You can refer to this page and the table of contents as a guide to this manual and the transceiver capabilities. The manual consists of four parts:

Introduction

The Quick Start, and Description sections give you an overview of the transceiver design concepts and features. Reading this part should get you on the air, and give you a sense of what to expect from the radio and the manual.

Operation

This part takes you through every function of the transceiver that concerns operation. It consists of two sections: Basic Operation, covering the standard features in all versions like repeater shifts and memories; and Advanced Operation, which covers dual watch, tone systems and digital voice, some of which are only available in high-end keypads.

Special Features & Applications

This describes battery saving features, using the transceiver for packet radio, and data cloning between two transceivers.

Appendix

This part begins with troubleshooting information, and provides important figures, tables, and other reference material that you will need when learning transceiver functions. It also includes details on installing and using batteries, keypads and other accessories. At the end is a list of specifications, and a glossary of terms.

Note: Where necessary for clarity, features that are applicable only to certain keypads are designated by special markings, as follows:

    🎙 = FTT-10/A16S

    ♨ = FTT-10/A16D

    ☎ = FTT-10/A16

    ⁝⁝⁝ = FTT-10/A06

If you encounter a term or abbreviation that is unfamiliar, refer to the Glossary at the back of the manual.

This chapter begins with the most essential operating features, and progresses to more exotic features.

Important Notes on Operation

We use the term 'knob' to refer to the inner DIAL knob on the top of the transceiver. Note that this knob also acts as a dual-action switch when pressed down: pressing it momentarily can do one thing, and holding it down for ½ second does something else. *In no case should you turn the knob while it is pressed*. When turning the knob, be careful not to disturb the outer volume control.

Normal key presses should be very quick — just tap the key. If you hold a key down, even briefly, it can fail to work, or do something unexpected. The instructions specify when a key is to be held down.

To indicate when several keys have to be pressed in sequence, we show an arrow (→) between them. Do not press more than one key at time unless the instructions say so.

One or more beeps indicate key contact has been made (if the key has a function). You can disable the beeper as described on page 47, but we recommend keeping it enabled while getting to know the key functions, since the pitch and number of beeps can be useful feedback.

A several-second timer starts when you press ⌚, and automatically restarts when you turn the knob. Pressing other keys may *shut off* the timer as the resulting change in operation occurs, or *restart* the timer so you can select various functions.

Also, after changing a setting, you can usually return to the operating frequency display by pressing the PTT button at the top left corner of the radio. It does not transmit unless the operating frequency is displayed.

The 16-key pads generate DTMF tones according to the table on page 66 when you transmit.

While reading about operation, if you are unsure about the location or function of a button or display item, refer to the *Controls and Connectors* and *Display* sections in the Appendix.

If you have trouble getting the transceiver to work as described, see *In Case of Problems*, on page 53.

Basic Operation

First Steps

Before operating the transceiver the first time:

☐ Charge the battery pack completely (if using a rechargeable pack) as described on page 58. New battery packs are shipped from the factory completely discharged. If using an FBA-15 dry-cell battery case, install alkaline batteries as described on page 58.

☐ Screw the supplied antenna onto the antenna jack. *Never operate the transceiver without an antenna connected.*

☐ If you have a speaker/mic, we suggest you not connect it until you are familiar with basic operation.

To turn the transceiver on, hold the orange PWR button for ½ second. If the radio has not been used before, the display should look something like that illustrated to the right (the frequency display is different for different models).
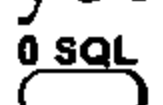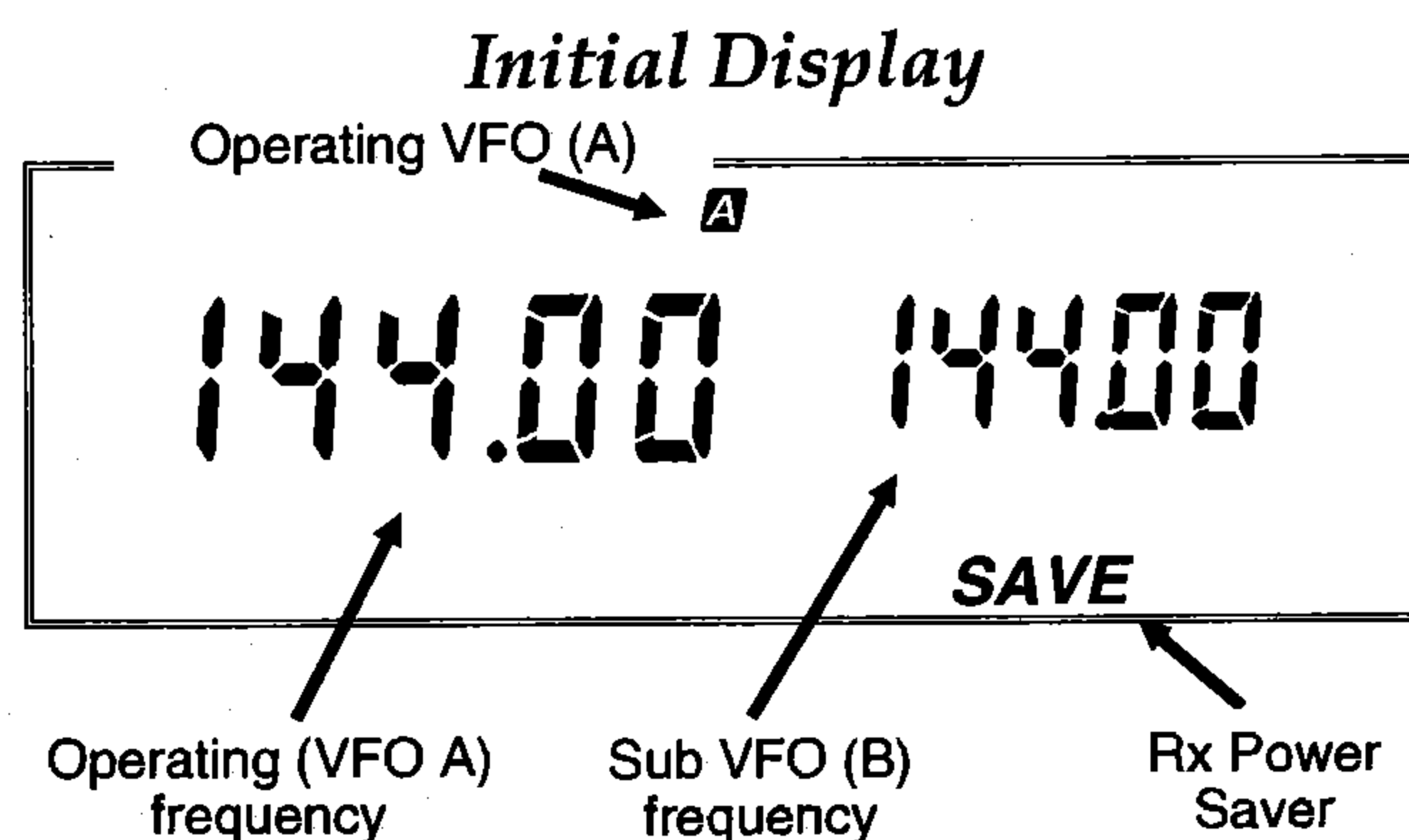
Volume Setting

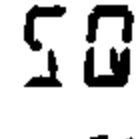Turn the outer ring of the knob on the top panel control to adjust the volume. If there is no signal, you can normally override the squelch by holding the center button (on the left side below the PTT switch), to adjust the volume on background noise.

Squelch Setting

The squelch silences background noise when no signal is present. When a signal opens the squelch, the BUSY/TX indicator on the top of the radio glows green. You can adjust the squelch as described on the *Quick Start* page at the front of the manual.

☙ ☛ The high-end keypads include a ⌚SQL key as a shortcut for squelch adjustment: you can adjust the squelch by pressing ⌚ → ⌚SQL and

Initial Display

Operating VFO (A)

```
 144.00    14400
                   SAVE
```

Operating (VFO A) frequency   Sub VFO (B) frequency   Rx Power Saver

turning the knob (press the PTT or $\overset{\text{0 SQL}}{\bigcirc}$ when done). While setting the squelch, SQL appears followed by a number ($0 \sim 15$) indicating the squelch level.

To use either method, first set the volume to mid range, then adjust the squelch (when no signal is being received): just to the point where background noise is silenced and the LED is extinguished, (if set higher, sensitivity to weak signals is reduced).

Frequency Selection Modes

You have two main frequency selection modes. These affect the behavior of the knob and keys when tuning or keying in frequencies, scanning coverage, and the right half of the display.

VFO Mode

Use this mode to find a clear or an active channel, when you don't have a specific frequency in mind. The knob tunes the band in the selected step size (or in 1-MHz steps if you press $\overset{\text{B W}}{\bigcirc}$ or $\overset{\text{W}}{\bigcirc}$ first), and scanning tunes in the selected step size. The transceiver has two independent VFOs, A and B, which you select by pressing your VFO key ($\overset{\text{#VFO DW}}{\bigcirc}$, $\overset{\text{0 VFO DW}}{\bigcirc}$, or $\overset{\text{VFO DW}}{\bigcirc}$, depending on your keypad) when receiving on either VFO. The display shows **A** or **B** near the top center to indicate which VFO is select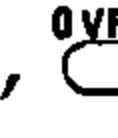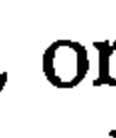ed for tuning, displayed in large numbers at the left. The frequency of the other VFO is displayed in small numbers at the right.

Memory Mode

Use this mode to operate on specific channels you have stored in the memories. For example, after storing the frequencies of your local repeaters, you can limit operation to those channels with the memory mode. The knob, keys, and scanning select only stored memories. The FT-10R and FT-40R provide either 30 or 99 memories, each of which stores repeater shift, transmit power level, tone settings, and tuning steps (for the Memory Tune mode), and can also hold a name tag and a separate transmit frequency. Either the operating frequency or the memory name, if assigned, is displayed in large letters at the left, and the memory number is displayed at the right. The memory number consists of two parts: a bank number (1 to 9) and a slot number (01 to 97) or symbol (PL or PU).

Each memory can be used in the *Memory Tune* mode, which works like VFO mode. Special memory mode functions like this are described later, but you should keep these terms in mind.

To tell whether the VFO or Memory mode is active, look for **A** or **B** at the top of the display. If either is present, that VFO is active. Otherwise, you are in Memory mode.

The Memory key ($\overset{\text{*MR MW}}{\bigcirc}$ or $\overset{\text{MR MW}}{\bigcirc}$) switches from the VFO mode to the last-used memory, and the VFO key ($\overset{\text{#VFO DW}}{\bigcirc}$, $\overset{\text{0 VFO DW}}{\bigcirc}$, or $\overset{\text{VFO DW}}{\bigcirc}$) switches from the memory mode to the last-used VFO. While in the memory mode, your previous VFO mode selections are preserved.

Tuning

Turn the knob to tune in the selected step size, or press $\overset{\text{B W}}{\bigcirc}$ first to tune in 1-MHz steps. You can select a new frequency from a VFO, or by tuning a memory. For now, use the VFO mode: press your VFO key. You can enter a frequency by turning the knob, or by numeric key entry (on the high-end keypads). See *Locking the Controls* on page 26 if the keys or knob don't work.

Direct Keypad Entry (❤ ✎)

With the high-end keypads, you can enter a frequency by keying in four or five digits: the last two MHz (10's and 1's) digits, and two or three kHz (100's and 10's) digits. How many digits you need to enter depends on your tuning steps, described next. With 5- and 15-kHz steps, you have to enter five digits. When you press the first number key, the display clears and only the new digit appears. When you press the last key, the display reverts to normal, showing up to 7 digits of the new operating frequency (if it's valid), or the original frequency (if it was not valid, 3 beeps sound).

Ex: To operate on 146.94 MHz (with the FT-10R):

☐ Press $\overset{\text{4 SAVE}}{\bigcirc} \rightarrow \overset{\text{6 RPT}}{\bigcirc} \rightarrow \overset{\text{9 BEEP}}{\bigcirc} \rightarrow \overset{\text{4 SAVE}}{\bigcirc}$.

You should see 146.94 displayed. If your channel steps are 5-kHz (the default), you have to enter a trailing zero ($\overset{\text{0 SQL}}{\bigcirc}$). If this frequency is out of band, you heard 3 beeps, and the display returned to its previous frequency (try an in-band frequency). If your set is using 12.5- or 25-kHz steps, *nothing happened* when you pressed the second $\overset{\text{4 SAVE}}{\bigcirc}$, since this frequency is not a multiple of these steps. Just press any other number (except $\overset{\text{9 BEEP}}{\bigcirc}$) to get the nearest valid 12.5-kHz channel.

You can enter 12.5-kHz splinter channels this way, but subsequent tuning is still in the selected step size, if it is larger. *Note* - pressing $\overset{\text{#VFO DW}}{\bigcirc}$ during frequency entry truncates remaining decimal places to zero, and can be used as a shortcut for keypad entry. For example, to enter 146.00 MHz, simply press $\overset{\text{4 SAVE}}{\bigcirc} \rightarrow \overset{\text{6 RPT}}{\bigcirc} \rightarrow \overset{\text{#VFO DW}}{\bigcirc}$.
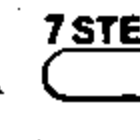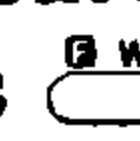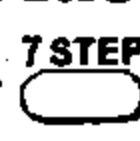
Tuning Steps

Default channel (tuning) steps are 5 or 12.5 kHz in the FT-10R, and 25 kHz in the FT-40R. To avoid confusion and interference, you should set your tuning steps to match the standard channel spacing in your region: typically 25 kHz on UHF (and on VHF in Europe), and 15 or 20 kHz on VHF in America. Note that coarser steps tune and scan faster, and that 5- and 15-kHz steps require an extra digit when entered from the keypad (in the FT-10R). Each VFO and memory has its own tuning step setting.

To change step size:

☐ Press the knob ½ second.

☐ Turn it to $STEP$ -03-.

☐ Press it again momentarily to display the current step size.

☐ Turn it to choose the new step size (in kHz).

☐ Press it again momentarily to accept the new size.

☐ Press PTT.

🐟 🐟 The high-end keypads also include a ⁷ˢᵀᴱᴾ key, which you can use as a shortcut in place of the above procedure: just press ᴮ ᵂ → ⁷ˢᵀᴱᴾ, turn the knob for the desired steps, and press the ⁷ˢᵀᴱᴾ again to return to the operating display.

Transmitting

Press ᴸᵂᴸᶜᴷ so that *LOW* appears below the center of the display. To transmit, wait until the channel is clear (BUSY/TX LED off), then press and hold the PTT while speaking into the microphone (at the right side of the front panel). The BUSY/TX indicator glows red when transmitting, and the bargraph shows relative transmitter power output. Release the PTT to receive.

If you need more power to maintain communications, you can select another power setting as described in the box. However, remember that your batteries last longer and you cause minimum interference by using the lowest level possible.

Note that each VFO and memory retains its own power setting.

Repeater Splits

You have three ways to set up split transmit/receive operation for repeaters: manual, automatic, and independent tx frequency memory. Manual and automatic methods shift the transmit frequency above or below the receive frequency by a programmable offset, stored independently in each memory and VFO. Use the independent transmit frequency method to store odd-step offsets, such as frequencies of repeaters with splits that are not a multiple of 50 kHz. This is described later under *Memory Operation*.

Power Output Selection

You can select the power output level to be activated when low power is enabled:

☐ Hold the knob down ½ second, then turn it to select $TXPO$ -02-.

☐ Press the knob momentarily, then turn it to select $L1$, $L2$, $L3$, or HI.

☐ Press the knob momentarily, and press the PTT to exit.

Power Level	FNB-41, -42 or 12-V DC	FNB-40 or FNB-49	FBA-15
HI	5.0/5.0*	2.5/2.5	2.0/2.0
L3	2.8/2.5	2.5/2.5	2.0/2.0
L2	1.0/1.0	1.0/1.0	1.0/1.0
L1	0.1/0.1	0.1/0.1	0.1/0.1
*note - values listed are in watts for FT-10R/FT-40R			

Setting Standard Repeater Offset

If your transceiver has not been used before, the repeater offset must first be set:

☐ Hold the knob in for ½ second, then turn it so that `5HF7 -08-` is displayed.

☐ Press the knob momentarily, and turn it to select the appropriate offset: `0.60` MHz for VHF, or as required for UHF (usually `5.00`, `1.60`, or `7.60` MHz).

☐ Press the knob again momentarily, and the PTT when done.

You probably want to keep the repeater offset programmed to the most commonly used split in your area. If you're not sure what that is, leave it set to 600 kHz for VHF, and ask around for the UHF offset.

Manual Repeater Shift

When repeater shift is active, either ⊞ or ⊟ is displayed at the top left. If neither appears when tuned to a repeater output frequency, you can activate the shift manually:

☐ Hold the knob in for ½ second, then turn it so that `RPTR -07-` is displayed.

☐ Press the knob momentarily, and turn it to set repeater shift direction (`+RPT`, `5IMP` or

---

Tone Burst

If your local repeaters need a 1750-Hz burst tone for access (such as in Europe), you can set the monitor/T. Call button below the PTT so that it sends the tone:

☐ Hold the knob down ½ second.

☐ Turn it to select `KEY -20-`.

☐ Press the knob momentarily.

☐ Turn it to select `M/T` (Monitor/Tone).

☐ Press the knob momentarily.

☐ Turn it to select `TCAL` (Tone Call).

☐ Press the PTT to exit.

You can use the same procedure to change the function of the button back to 'monitor', by selecting `MON` instead of `TCAL`.

`RPT`). Press the knob again momentarily to accept your change, and then PTT.

☞ The 🔘 key on high-end keypads is a shortcut for the above: Press 🔘 → 🔘, turn the knob to select the shift, and press 🔘 again.

Note that the offset used will be the "standard repeater offset" selected above.

With repeater split activated, you can temporarily reverse transmit and receive frequencies by pressing 🔘 → 🔘 (or 🔘 → 🔘 on the 6-button keypad). Use this to display the transmit frequency without transmitting, and to check a signal's strength on a repeater uplink frequency (to see if you can work them direct). The repeater shift sign blinks while reverse split is selected. Press 🔘 → 🔘 (or 🔘 → 🔘) again to return to the normal shift direction.

Note that each VFO and memory has its own repeater shift settings.
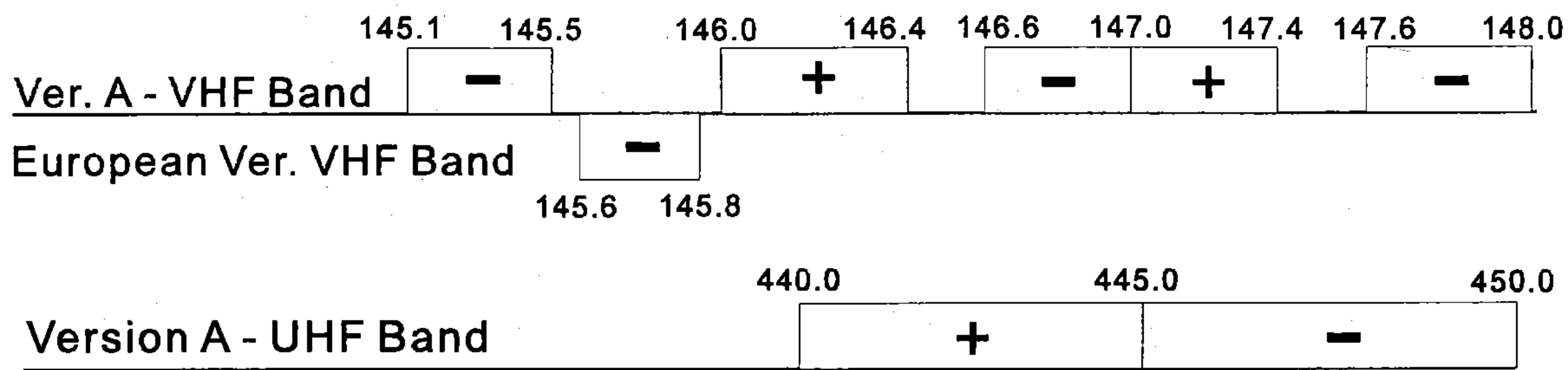
Automatic Repeater Shift

ARS (Automatic Repeater Shift) activates repeater shift whenever you tune to a frequency in a standard repeater subband. With this feature enabled, ⊟ or ⊞ at the upper left of the display indicates that repeater shift is active (without

your having to activate repeater shift manually), and closing the PTT changes to the (offset) transmit frequency. The subband range over which ARS operates is determined by the version of your set, as shown below.

ARS is enabled at the factory. To disable it:

☐ Press the knob down ½ second, then turn it to display `RRS -06-`. Now press it again momentarily, and turn it to select `oFF`.

☐ Press the knob once more to accept your setting, and the PTT to return the display to the operating frequency.

As already mentioned, you can use manual shift at any time to select a new shift state, whether ARS is activated or not. However, if you change frequency with ARS activated, manual repeater shift selections are ignored.

	145.1	145.5	146.0	146.4	146.6	147.0	147.4	147.6	148.0
Ver. A - VHF Band		−		+		−	+		−

	145.6	145.8
European Ver. VHF Band		−

	440.0	445.0	450.0
Version A - UHF Band		+	−

Simple Memory Storage

The FTT-10/A16D and -A16S high-end keypads provide 99 programmable memory channels, and the FTT-10/A16 and -A06 keypads provide 30 channels. These can be partitioned into groups (or banks) as described later, but for now, let's look at how memories are displayed, and the procedures to store and recall data.

When you store a memory, the current tuning step, displayed receive frequency, repeater shift, transmitter power level, DCS, and CTCSS tone settings are copied into a memory slot. The slots are labeled numerically from 1 up to 28 or 97 (for the 30 and 99-channel keypads, respectively), and PL or PU, for the lower and upper limits of programmable scanning (PMS, described later).

To store a frequency in memory:

☐ Select the desired frequency, repeater split (if desired), and power level in the VFO mode as already described.

☐ Hold 🔘 for ½ second (until a second beep sounds). A bank and slot number (eg., $I \cdot 0 I$) appears blinking at the right.

☐ Within five seconds of releasing 🔘, turn the knob to select the desired slot for storage. If you select one that was already used, it will be overwritten with new data in the next step.

☐ Press 🔘 (or 🔘) to store the displayed data into the selected memory slot. The memory number stops blinking for a second, and then disappears as operation continues in the VFO mode.

If you timed out, operation switched to the memory mode. Simply press 🔘 (or 🔘 or 🔘) to return to the VFO, and start again.

Example: Store the 146.34/146.94 repeater data in memory slot 5 (with the FT-10R).

☐ First perform the steps in the example on page 10 to set up the desired frequency and offset on the VFO.

☐ Hold 🔘 for ½-second to display the memory slot (blinking) at the right, then do the next step within 5 seconds.

☐ Turn the knob, if necessary, so that $I \cdot 05$ (the memory number to store) blinks at the right.

☐ Press 🔘(or 🔘) again, momentarily. That's it. The VFO data has been stored in bank 1/slot 5, and you are left operating on the VFO.

To confirm this worked, turn the knob to change the VFO frequency (to anything new), then press 🔘 (or 🔘) to change from VFO to memory mode. The bank and slot number ($I \cdot 05$) should appear at the right, and $I46.34$ (the receive frequency) at the left. You can press 🔘→🔘 (or 🔘→🔘) to confirm the transmit frequency of 146.34 MHz.

Notice that pressing 🔘 (or 🔘) from the VFO mode always recalls the *last stored or used* memory.

Recalling Memories

In confirming the results of the last example, we used 🔘 to change from the VFO mode to the memory after it was stored. The bank and slot number appear at the right when operating on a memory, unless you assign a name to a memory, or activate Dual Watch (both described later).

After storing several memories, you can select one for operation by turning the knob, or by direct keypad access if you have a high-end keypad. Simply enter the number of the memory

slot you want, followed by 🔘. If the memory you want is in a different bank, enter the bank number, followed by the slot number (for slots 01 ~ 09, enter a zero between the bank and slot numbers). If you hear three beeps and return to the previous display, the memory you requested is empty. To exit the memories and return to the last-used VFO, press 🔘 (or 🔘 or 🔘).

Copying a Memory to a VFO

After storing memories, you may want to copy one to a VFO. You can copy the current memory into the last-used VFO by holding 🔘 for ½ second, and pressing your VFO key.

HOME Channel Memory

Although invisible to the procedures just described, the HOME channel memory can be instantly recalled by the 🔘 (or 🔘 or 🔘) key: **HOME** appears above the frequency at the left. There is a default simplex frequency stored in the HOME channel, but you can reprogram it with any frequency, repeater, power, and tone settings, or even a separate transmit frequency.

To copy the displayed VFO settings into the HOME channel memory, hold 🔘 for ½ second until the right half of the display blinks, then press 🔘 (or 🔘 or 🔘).

Storing an Independent Tx Frequency

All memories can store an independent transmit frequency, for operation on repeaters with non-standard shift. To do this:

☐ Store the receive frequency using the method already described under *Simple Memory Storage* (any repeater offset will be ignored).

☐ Tune to the desired transmit frequency.

☐ Press and hold ⌷ for ½ second to display a slot at the right again.

☐ Press and *hold* the PTT switch while pressing *MRMW momentarily (this does not key the transmitter). Or course, if you're storing this in the HOME channel, you press ⌷ when holding the PTT).

When a separate transmit frequency memory is displayed, ▬ and ➕ appear together at the top corner. You can press ⌷→⌷ (or ⌷ or ⌷) to display the transmit frequency, and the shift symbols blink. You can also change the repeater shift direction to cancel repeater shift temporarily until you change channels.

After storing a memory with a separate transmit frequency, if you rewrite the receive frequency in that memory, the separate transmit frequency is deleted.

Memory Tuning

While receiving on a memory, you can re-tune it and change other settings (like repeater shift or power output) by first pressing ⌷ (or ⌷). *MT* appears at the left edge of the display, and you can tune in the same ways as described before (including 1-MHz steps). You can store the new frequency and settings in the current or another memory slot. Just hold ⌷ for ½-second, then select the new slot (if desired), and press *MRMW (or ⌷). Operation remains on the new memory as the old memory reverts to its original state.

Once you have re-tuned a memory, if you don't want to save your changes, just press *MRMW (or ⌷) to return to the original memory data.

Scanning

Before scanning, make sure the squelch is set to silence background noise. You can scan either your stored memories (in the current bank), or each frequency on the band at the selected tuning step. To scan only memories, first recall a memory, then hold *MRMW (or ⌷) for ½ second. To scan every step of the band, begin at a VFO (press #VFODW or 0VFODW or VFODW momentarily), then press and hold the same key for ½ second.

The scanner pauses when a signal opens the squelch, and the decimal point in the frequency display at the left blinks. When band scanning, a double beep sounds each time the scanner reaches the band edge, unless you have disabled the beeper (⌷→9BEEP on the high-end keypads). Scanning resumes according to how you set the scan resume mode, described in the box.

You can stop the scanner manually by pressing the PTT to stay on the current frequency, or the *MRMW or #VFODW keys. *Note* - You can change scan *direction* (downward/upward) by rotating the knob (CCW/CW) while memory or VFO scanning is active.

Memory Skip Scanning

When you have some very busy channels stored in memories, you may wish to skip them

Scan Resume Modes

You can choose how you want scanning to resume after pausing on a signal: either after 5 seconds, or after the signal stops transmitting (carrier drops):

☐ Press the knob ½ second, then turn it to $RESM$ - 10 -.

☐ Press it again momentarily to display the current setting (5 or $CArr$).

☐ Turn it to choose the desired setting, and press again momentarily to accept the new setting.

☐ Press PTT to return to the operating display. Your scan resume setting applies globally: that is, the one setting applies to all scanning.

when scanning, but still have them available for manual selection. You can mark a memory to be skipped by pressing ⌷→*MRMW (or ⌷→⌷) while receiving on the memory. *SKIP* appears at the lower left.

To cancel scan-skip and allow the memory to be scanned, just repeat the step used to disable it: select the memory manually, and press ⌷→*MRMW (or ⌷→⌷).

Programmable Subband (PMS) Limits

Besides band and memory scanning, you can set the transceiver to tune or scan within a frequency range of your choice (with the selected channel steps). The limits are stored in two special memory slots labeled PL and PU:

☐ Store the lower edge of the desired scanning range in memory slot PL, and the upper edge in slot PU.

☐ With either memory recalled, press ☐*MR MW* (or ☐) to enable memory tuning (**MT** must be blinking at the upper left). Your tuning range is now limited to the programmed subband.

☐ To scan the subband, hold ☐*#VFO DW* (or ☐*0 VFO DW* or ☐*VFO DW*) for ½ second to start scanning.

If ARS or manual repeater shift is activated, the offset is applied automatically when you transmit (even if the resulting transmit frequency is outside the subband limits).

Note: The frequency resolution of subband limits is 100 kHz, although the channel resolution of the PL and PU memories is the selected channel step size. Therefore, the actual limits are the frequencies stored in these memories *rounded down* to the nearest 100 kHz. Since the memories themselves are not limited to a specific fre-quency, you can still use them for other purposes anywhere within the 100-kHz range above the intended limit.

Example: To limit reception to 145.0 ~ 145.9 MHz (in the FT-10R).

☐ Tune a VFO to *any channel between 145.000 and 145.095 MHz.*

☐ Hold ☐*B W* for ½-second, tune the knob so that the desired PMS memory channel (let's use I-PL in this example) appears at the right, and then press ☐*MR MW* (or ☐*MR MW*). The displayed frequency is now stored to provide a lower subband limit of 145.000 MHz.

☐ Re-tune the VFO to *any channel between 145.900 and 145.995 MHz.*

☐ Repeat the second step, selecting I-PU at the right. This stores the effective upper PMS limit of 145.900 MHz.

☐ Press ☐*MR MW* (or ☐) to change to memory operation, and then ☐*MR MW* (or ☐*MR MW*) again to activate the 145.000 ~ 145.900 limits. Hold ☐*#VFO DW* (or ☐*0 VFO DW* or ☐*VFO DW*) for ½ second to start scanning.

Note that with PMS, as with regular band scanning, a double beep sounds each time the scanner reaches the subband edge, unless you have disabled the beeper (page 47).

To release subband limits press ☐*MR MW* (or ☐) to return to memory operation, ☐*#VFO DW* (or ☐*0 VFO DW* or ☐*VFO DW*) to return to a VFO, ☐*HM RV* (or ☐*9 HM RV* or ☐*HM RV*) to switch to the HOME channel.

Once you have stored the memory limits, you can reactivate PMS scanning and tuning just by recalling any PMS memory and pressing ☐*MR MW* (or ☐*MR MW*) again. However, you cannot activate the subband if either PMS memory is marked for skip-scanning, or hidden.

If you segment the memories into banks as described later, each bank has its own pair of PL and PU slots.

Disabling the Subchannel Display

You can disable the subchannel display, so that the alternate VFO is not displayed at the right when operating on a VFO. By default, the subchannel display is enabled.

☐ Press the knob down for ½ second, then turn it to display SUB $-05-$.

☐ Press the knob momentarily, then turn it to display oFF (or on if you want the subchannel display enabled).

☐ Press the knob down for ½ second, then release it and press the PTT.

When the subchannel display is disabled, the right side of the display shows the bank/slot number (instead of the frequency) of the last-used memory during Dual Watch operation on a VFO.

Other items that appear at the right side, such as memory numbers, frequencies of named memories, tone selections and DTMF Codes are unaffected by whether the subchannel display is enabled or disabled.

Advanced Operation

Dual Watch

Dual Watch automatically checks for activity on a 'subchannel' memory every five seconds while you are receiving on another frequency. The subchannel frequency is displayed at the right (if the subchannel display is enabled: see the box on the facing page). When the receiver detects a signal on the subchannel, operation automatically shifts to that frequency while the signal is present. If you want to talk on the subchannel, you have to recall it, or press ⊂⊃ to quit Dual Watch operation.

To set up Dual Watch:

☐ Set the squelch, and select the memory channel to watch (if you will be operating on memories, this must be memory slot 1-01).

☐ Select either the VFO or memory you want for your main operating channel: press your VFO key (⊂⊃, ⊂⊃ or ⊂⊃) to operate on a VFO, or select the memory you want to operate on.

☐ Press ⊂⊃ → ⊂⊃ (or ⊂⊃ → ⊂⊃ or ⊂⊃ → ⊂⊃).

DW appears at the bottom left, with your main channel at the left side and the subchannel at the right. About every five seconds the channels briefly switch positions as the receiver checks the subchannel.

As long as no signal opens the squelch on the subchannel, you can tune, transmit and receive on the VFO, or select other memories in the same bank. If you hear a station you wish to talk with on the subchannel, press ⊂⊃ to cancel Dual Watch operation (or dial memory 1-01 if you are in bank 1), and then the PTT. Otherwise, when a signal appears on the subchannel, two beeps sound, the receiver jumps to the subchannel and the decimal on the display blinks. Checking resumes according to how you set the scan-resume mode: either after five seconds, or after the carrier drops. To cancel Dual Watch manually, press your VFO, MR or HM key.

Note that you can use any memory as a subchannel for Dual Watch when operating on a VFO, but only memory 1-01 when operating on memories. You can use Memory Tune during Dual Watch, if you activate Memory Tune first, although it may be easier to copy the memory into a VFO instead. You cannot, however, switch VFOs or memory banks, or between memory and VFO operation (pressing the necessary buttons cancels Dual Watch).

Naming Memories

You can assign name tags up to 4 characters long to the memories, and have those memories displayed by both name and frequency. Use this to identify channels by the names of friends, locations, ham clubs and repeater callsigns, or by whatever mnemonics you like. You have a choice of 48 different characters for naming, including a space and 11 special symbols:

```
0  !  2  3  4  5  6  7
8  9  A  B  C  D  E  F
G  H  I  J  K  L  M  N
O  P  Q  R  S  T  U  V
W  X  Y  Z  (  )  +
:  *  /  ⌂  P  [  ¦
```

Before naming a memory, you need to store its frequency and other settings as described previously. Then:

☐ Recall the memory you wish to name.

☐ Press and hold the knob for ½ second, then turn it to display *NAME -03-*.

☐ Press the knob momentarily, then turn it so that *on* appears at the right. If this memory has been named previously, that name now appears at the left. Otherwise, ¨ ¨ ¨ appears.

☐ Press the knob again momentarily. An underline cursor appears at the leftmost digit location. Now turn the knob to select a character.

☐ With the desired character displayed, press the knob momentarily. The cursor moves one digit to the right. Turn the knob to select the next character. If you accidentally enter the wrong character, just keep going.

☐ Repeat the above step until you have entered all the characters you want (up to four). If you want to change any characters, press the knob momentarily to step the cursor through the characters to get to the one to change. Entered characters disappear when the cursor is on them, but reappear when the cursor moves.

☐ Hold the knob down ½ second to store the name in memory, then press the PTT to return to the operating display: the name appears at the left, and the frequency at the right.

When naming memories, note that blank spaces can be entered in place of characters, and names do not need to begin at the first (left-most) character location.

If you want to suspend the display of memory names, press and hold the knob for ½ second, turn it to display *NAME -03-*, then press it

again momentarily, and turn it so that o۴۴ appears at the right. Press the PTT to quit.

You can always turn the names back on. They are preserved with the memories.

Grouping Memories (Banks)

Initially, the transceiver is configured with one bank of 30 memory slots. You can program up to nine memory banks to store different groups of memories (as you may want to do if you sometimes move from one area to another), or to store up to nine pairs of subband limits, or even to store the same frequencies with different power levels or tone settings. The memory grouping features are very flexible, but it takes some time to get familiar with the them.

Important notes on memory bank configuration:

- No matter how you configure memory banks, data that you have stored in memories is never deleted, although reconfiguration might make stored memories temporarily inaccessible.

- Note that the number of memory slots allocated to a bank is not related to the number of memories that you have stored: only the number that you can store in that bank.

- If you allocate only one slot to a bank, it displays as slot 01.

Grouping Memories into Banks (Example for 30-ch Versions)

Memories	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Slots for 1-Bank Grouping	۱-۵۱ ۱-۵۲ ۱-۵۳ .... ۱- ۲۷ ۱-۲۸ ۱-PL ۱-PU
Slots for 2-Bank Grouping	
Bank 1:	۱-۵۱ ۱-۵۲ ۱-۵۳ .... ۱-۱۳ ۱-PL ۱-PU
Bank 2:	۲-۵۱ ۲-۵۲ ۲-۵۳ ..... ۲-۱۳ ۲-PL ۲-PU
Slots for 4-Bank Grouping	
Bank 1:	۱-۵۱ _ ۱-PL ۱-PU
Bank 2:	۲-۵۱ _ ۲-PL ۲-PU
Bank 3:	۳-۵۱ _ ۳-PL ۳-PU
Bank 4:	۴-۵۱ _ ۴-PL ۴-PU

23

- If you allocate only two slots to a bank, they display as PL and PU (because of their capability for use as programmable subband limits, described previously).

- If you allocate more than two slots to a bank, the last two display as PL and PU, and all others are numbered sequentially from 01. For example, if you allocate ten slots to bank 1, they display as ۱-۵۱, ۱-۵۲ ... ۱-۵۸ and then ۱-PL and ۱-PU.

- If you change the size of a bank (that is, the number of slots allocated to it), the contents of any higher-numbered banks are shifted accordingly. For example, if you have already allocated ten slots to bank 1 and stored data in each, then you reduce bank 1 to five slots, the upper five memories will appear in bank 2, assuming it was allocated at least five slots. If bank 2 had fewer than 5 slots, the remaining slots will be moved to bank 3, and so forth.

- Once you have allocated all available slots, if you have used fewer than nine banks, you still cannot select a new bank: you first have to decrease the slots allocated to the other banks. So, for example, if you are using the 30-memory FTT-10/A16 or -06 keypad, all available slots are allocated to bank 1 by default. You must decrease the number of slots allocated to bank 1 before you can set up another bank.

To store data in different banks, you first have to allocate some slots to them. Here's an example to allocate five slots to banks 1 and 2:

☐ Press the knob in for ½ second.

☐ Turn the knob to display ԳRP -۱۹-, then press it again momentarily to display bank 1's slot allocation.

☐ Press the knob again to clear bank 1 to zero slots, then turn the knob to allocate five slots (ԳRP ۱-۵۵).

☐ Press the knob again to display bank 2 (it always shows 0 slots at this point), and turn the knob to allocate five slots here (ԳRP ۲-۵۵).

☐ Press the knob again momentarily to display bank 3 with 0 slots, and then press and hold the knob for ½ second to accept your new allocations for all banks. Finally, press the PTT to return to the operating display.
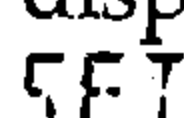
Now, whenever you hold ⊖ for ½ second to select a slot during memory storage, and turn the knob, you will find slots labeled ۱-۵۱, ۱-۵۲, ۱-۵۳, ۱-PL and ۱-PU.

24

To access another bank, just press ⬚ momentarily while a **F** is displayed, and turn the knob. Then, to select a slot within the bank, press ⬚ again momentarily and turn the knob. In this example, you can select from the bank 2 slots: *2-01*, *2-02*, *2-03*, *2-PL* and *2-PU*.

Memory Hiding & Unhiding

You can hide some memories so they cannot be recalled by the knob or keypad. If you store a memory and hide it, the data you stored is still there and can be unhidden, until you overwrite it or reset the CPU. You can also unhide memories that have never been stored, in which case you will find they are set to the bottom edge of the band. You can use this feature to easily check which memories you have not yet stored. You cannot hide bank 1 slot 1 (this memory must always be accessible).

To hide a memory:
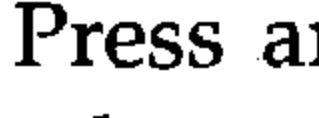
☐ Press and hold the knob for ½-second, then release it, and turn it to display *MCLR -04-*.

☐ Press the knob momentarily, then turn it to display the memory slot to hide at the right. *SET* appears at the left if the memory slot is not hidden. If *CLR* appears instead, it indicates that the selected slot is already hidden (or has not yet been used).

☐ Press the knob momentarily, then turn the knob one click, so that *CLR* is displayed.

☐ Hold the knob down for ½ second, then release it, and press the PTT to quit.

If you were previously operating on the memory you just hid, operation shifts to bank 1 slot 1.
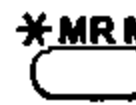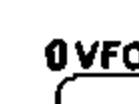
To unhide a memory:

☐ Press and hold the knob for ½-second, then release it, and turn it to display *MCLR -04-*.

☐ Press the knob momentarily, then turn it to display the memory slot you want to unhide, at the right. *CLR* appears at the left if the memory slot is hidden. If *SET* appears, it indicates that the selected slot is already unhidden.

When you have hidden some memories, be careful not to overwrite them accidentally: you will not be able to recover the previous contents. **25**

Memory-Only Mode

Use this feature when you need very simple operation on only stored memories, which are displayed as the memory name (if stored) at the left, and the bank & slot number at the right. No frequency is displayed, and only hyphens appear if you haven't assigned a name to a memory. Repeater shift and tone setting indicators are displayed, although they cannot be changed. In fact, *the alternate functions of most keys are disabled, as well as the functions accessed by holding the knob down.* Only these functions are available, as indicated:

- Hi/Low TX Power: ⬚
- Lock: ⬚ → ⬚
- Channel Selection: knob or keypad
- Memory Scanning: ⬚
- Reverse Repeater Split: ⬚, ⬚ or ⬚
- Dual Watch: ⬚, ⬚ or ⬚
- Digital Voice (🔰)

After programming memories, you can toggle memory-only operation on and off by turning the radio off, then holding the PTT and LAMP buttons (top and bottom buttons on the left side) while holding the PWR button for ½ second to turn it on again.

Locking the Controls

The keypad buttons, knob and PTT can each be 'locked' (disabled), to prevent inadvertent transmissions or adjustments. Any of ⬚, ⬚, or ⬚ are displayed at the top right when any of these are locked.

By default, only the keypad locks. To activate or deactivate the lock, press ⬚ → ⬚ (or ⬚ → ⬚ or ⬚ → ⬚, depending on your keypad).
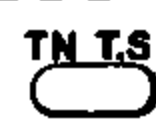
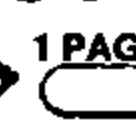To change the locking scheme to lock the knob or PTT:

☐ Hold the knob for ½ second, then turn it to display *LOCK -15-*.

☐ Press the knob momentarily, and turn it to select the items to lock:

  ⬚ = keypad,

  ⬚ = DIAL (knob),

  ⬚ = PTT button.

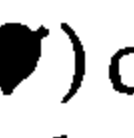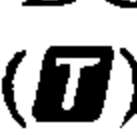These appear in the available combinations as you turn the knob.

☐ Press the knob again momentarily to accept your setting, and press the PTT to return to the operating display.
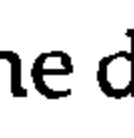
26

Tone Systems

Subaudible tone systems (CTCSS and DCS) are activated and deactivated by � (or �). These systems may not be usable between stations working through some repeater systems (especially linked repeaters), because the subaudible tones are filtered out by the repeater. However, when both stations access the same repeater, both CTCSS and DCS may be usable by choosing the higher-numbered tones. The ARTS (Auto Range Transpond System) variant of DCS provides automatic polling of a station, with automatic CW IDing in the high-end keypads.

DTMF Code Squelch and Paging systems are activated and deactivated by pressing �→�. As these use audible tones, they should work fine through most repeater systems. Answer-Back DTMF Paging allows automatic CW IDing and automatic voice IDing with the high-end keypad.

CTCSS Operation
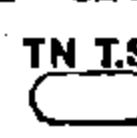
All versions can access repeaters or other stations that require a CTCSS (continuous, subaudible) tone. The high-end keypads (🏃, ♦) can also use this to monitor silently for calls on busy channels (all versions can also use DCS for the same purpose). The CTCSS encode (**T**) function superimposes a subaudible tone (at a frequency too low to be heard) on the transmitted carrier. The decode (**TSQ**, tone squelch) function monitors receiver audio through a narrow filter at the same subaudible frequency, keeping the squelch closed until you receive a matching tone.
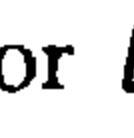
To check or set the current CTCSS tone frequency:

☐ Press � (or �) so that **T** (CTCSS encoder) appears at the top center of the display. This key cycles through different tone selections, so you may need to press it several times.

☐ Press �→� (or �→�) to display the current tone frequency, in Hz, at the right.

☐ To change the selected tone, turn the knob to display the tone frequency you require (the display steps through 39 standard tones, listed in the Appendix).

☐ Press � (or �) again alone to return to the operating display.

🏃 ♦ With CTCSS encoding activated as above, if you have a high-end keypad, you can press � again to activate the tone decoder as well (**TSQ** displayed at the top center). Now the tone squelch system is activated for both transmit and receive (only incoming signals 'en-

---

Ringer Function

When using either CTCSS tone squelch (in the high-end keypads) or DCS, the Ringer function displays ♦ below the right side of the display while you are waiting for a call. When someone calls you, your radio rings to get your attention, and ♦ starts blinking so you will know someone called if you didn't hear the ring.

To enable the Ringer function:

☐ Hold the knob down for ½ second, then turn it to display *BELL · 16 ·*.

☐ Press the knob momentarily, then turn it to select *on*.

☐ Press the knob again, then press the PTT.

Note that ♦ appears only if tone squelch or DCS is activated (by �), the same icon appears for Paging operation, but this is not affected by the *BELL · 16 ·* setting.

When you press the PTT to answer a call, ♦ disappears as the Ringer is turned off.

When you finish your conversation, you can press � momentarily to turn the Ringer back on for the next call.

coded' with the matching tone open the squelch; other signals cause your BUSY/TX LED to light and your S-meter to pulse, but you will not hear them). To turn off CTCSS functions, press � or � two or three times, so that neither **T**, **TSQ** or **DCS** is displayed.

You can store CTCSS tones (and encode/decode states) in each memory in the same manner (and at the same time) as storing channel frequencies. To change the tone or state stored in a memory, just recall it, reset the tone frequency or function, and store the memory again (press and hold � or � for ½-second, release it, and press � or �). If you activate CTCSS on a subband limit memory, it will be active when *that* memory is used to start PMS operation.
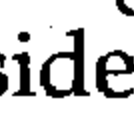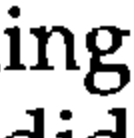
CTCSS Ringer Function 🏃 ♦

With the high-end keypads, you can enable the Ringer function for tone squelch as described in the box.
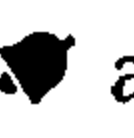
CTCSS Tone Scanning 🏃 ♦

The CTCSS decoder can scan through the EIA tones to determine the CTCSS tone frequency of a signal being received. See the Tone Scanning Box on the next page.

DCS (Digital Code Squelch)
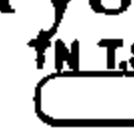
The DCS system, provided in all versions, is similar to CTCSS tone squelch in that it also uses subaudible tones to allow silent monitoring of busy channels, so your squelch opens only for calls directed to you. The Ringer function and Tone Scanning are also available with DCS. However, it offers some very powerful features that can make semi-private operation even more convenient. First the basics:

To use DCS, both stations must be on the same frequency, and have selected the same DCS tone code. DCS tone codes consist of three digits each, and are listed in the Appendix.

Note: Choose the higher-numbered tone codes if you plan to use DCS through a repeater: the lower-numbered DCS tones may not pass through repeater audio filtering. Also note that DCS may not work at all through linked repeater systems.

To check or set the DCS tone code:

☐ Activate DCS: Press ᵀᴺ ᵀˢ (or ◡) two or three times momentarily, so that **DCS** appears above the right side of the display.

☐ Press ᴮ ᵂ → ᵀᴺ ᵀˢ (or ᴮ ᵂ → ◡) to see the current DCS tone code.

Tone Scanning

When using either CTCSS tone squelch (in the high-end keypads) or DCS, you can have the radio scan through the tones or tone codes to determine which one is present on a received signal.

Before tone scanning, either tone squelch or DCS must be activated (press ᵀᴺ ᵀˢ as necessary until either **T SQ** or **DCS** is displayed).

☐ Press ᴮ ᵂ → ᵀᴺ ᵀˢ to display the CTCSS tone frequency or DCS tone code at the right.

☐ Press and hold ᵀᴺ ᵀˢ for ½ second to start scanning for a matching tone or code.

Scanning slows when a signal is present, and pauses as the tone frequency/code blinks when a match is found. To accept the displayed tone frequency or code for operation and return to the operating display, press ᵀᴺ ᵀˢ twice, momentarily.

☐ To change the selected code, turn the knob until to display the code you require.

☐ Press ᵀᴺ ᵀˢ (or ◡) again alone to return to the operating display.

Now only those stations who have also selected the same DCS tone code will open your squelch, and vice-versa. Other signals cause your BUSY/TX LED to light and your S-meter to pulse, but you will not hear them.

DCS Ringer Function

The Ringer Function can be enabled for DCS operation as described in the box on page 28.

DCS Tone Scanning

The DCS decoder can scan through all DCS tone codes to determine the DCS tone code of a signal being received. See the box on the previous page.

ARTS (Auto Range Transpond System)

ARTS uses the DCS system to allow two radios to automatically poll one another every 25 seconds, and to indicate when they are within range, and when they are not. It works like this:

• Of course both radios must be tuned to the same frequency, and also set to the same DCS tone code (the ringer can be activated or not, as desired).

• Whenever you push the PTT, or about 25 seconds after ARTS is activated, your radio transmits a (subaudible) DCS signal for about 1 second.

• If the other ARTS-equipped radio is in range, it beeps twice and his display shows *RANG* ('range') at the left (or yours does if his radio polls you first).

• Whether you begin a conversation or not, the radios continue polling each other every 25 seconds (and if your CW ID is turned on, your radio IDs in Morse code every 16 pollings). As long as your stations remain within range, the radios beep once each time a poll is received (or each time he presses his PTT).

• If you move out of range for more than about a minute, your radio senses that no signal has

been received, beeps three times, and $RRNG$ begins flashing.

- If you then move back into range, as soon as he transmits (or his radio polls) your radio beeps twice, and $RRNG$ stops flashing.

Note: During ARTS operation, your frequency is displayed at the right, but you cannot change it or other settings (except to select high/low transmit power). Also note that radios in ARTS operation do not open the squelch until a signal is received for about one second, so if you talk, you have to remember to pause before speaking after pressing the PTT. Of course, ARTS does not work if the PTT lock is activated.

To use ARTS:

☐ Activate DCS (press ⏚ or ⏛, repeatedly if necessary, until **DCS** appears above the right side of the display).

☐ Display the DCS tone code (press ⏚→⏚ (or ⏛→⏛), and set if it necessary to match the other station.

☐ Press ⏚ (or ⏛). $R ꓘ$ (receive-only), $T ꓘ$ (transmit-only), $TR ꓘ$ (transceive) or just your operating frequency appears at the left, indicating the current ARTS mode (described at the right). Press ⏚ again if you want to

change it (the operating descriptions assume both radios are set to $TR ꓘ$).

☐ Press ⏚ or ⏛ alone when done. The display returns to normal, except that now **DCS** is blinking (indicating ARTS is enabled, as opposed to regular DCS operation).

☐ Finally, to activate ARTS, press ⏚ (or ⏛), and then press down on the knob and hold it for ½ second. Two beeps sound, and your ARTS mode selection appears at the left, with your operating frequency at the right, and with **DCS** blinking.

To cancel ARTS operation, repeat the above step, or just turn the radio off and back on.

ARTS Modes

The ARTS description above assumes both radios are set to the $TR ꓘ$ ARTS mode. You can also use the $R ꓘ$ mode if you want your radio to listen only and not poll the other station (in which case their radio should be set to the $T ꓘ$ mode). In this case, while your radio will beep and display $RRNG$ to indicate the state of connection, theirs only shows $T ꓘ$ at the left side. This can be convenient for the transmit-only station since he won't hear the polling beeps (of course he can still hear you when you talk).

Caution

The transmit and transceive modes of ARTS entail transmitting without operator intervention (automatic transmission). Make sure this type of operation is legal in your country before using it, as the radio can transmit without any operator present.

Your ARTS mode selection is retained by the VFOs and can be stored in memories. If you want to use normal DCS operation, you have to cancel the ARTS mode by selecting the operating frequency when the DCS tone number is displayed (by pressing ⏚→⏚ or ⏛→⏛).

ARTS Polling Speed & Beep

You can increase the ARTS polling rate, if you want to have the radio check propagation state more frequently, such as when one or both stations are mobile. You can also disable the single beep that sounds every time a poll signal is received, although you might wish to leave it enabled until familiar with the system (the two beeps at signal acquisition and the three at loss of signal are not affected).

☐ Hold the knob for ½ second, then turn it to display $RRTS$ $-25-$.

☐ Press the knob momentarily, and turn it to select $SPED$ (polling speed) or $BEEP$ (ARTS polling beeper).

☐ Press the knob again momentarily, and turn it to change the setting: 15 or 25 second polling intervals, or beeper on/off.

Hold the knob for ½ second to accept your settings, then press the PTT to return to the operating display.