Yaesu FT-8900R

Operating Manual
The W5JCK Expanded Version

Courtesy of W5JCK

Dual Band FM Transceiver

November 2006
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About this Manual

LATEST UPDATE: 28 November 2006

I made the following improvements to the Yaesu FT−8800R Operating Manual:

- Reformatted the material to make it easier to read and locate information
- Reworded some of the more difficult to understand passages and key terminology
- Greatly expanded the Hyper Memory section
- Clarified and expanded the Scanning section
- Reorganized the material into a more logical order
- Updated some of the artwork to make it more presentable
- Added cross-references

This manual is absolutely free. However, if you like, you can donate a small amount to help defray the cost of developing this (and other) HAM radio manuals. If you would like to make a donation, please goto [http://w5jck.jackswinden.com/manuals/ft-8800r/donations.html](http://w5jck.jackswinden.com/manuals/ft-8800r/donations.html).

If you have any questions or comments, please email me at w5jck@jackswinden.com.

Happy reading! Jack Swinden, W5JCK

Conventions are used in this manual

- The "Main band" is the side of the FT−8800R on which you can transmit. This band is identified on the FT−8800R's LCD screen by the MAIN symbol.
- The "Sub band" is the side of the FT−8800R on which you can receive only.
- The "Main DIAL knob" is the DIAL knob on the side of the FT−8800R currently set as the Main band.
- Menu items and key terms are shown in **bold Arial text**, and menu names (functions) and menu options or shown in monospace text.

For example: "Menu #21 LOCK can be set to OFF or ON."

- Notes are presented as below:

[Note]
This is a sample note. Notes typically contain extra information designed to clarify the information presented in a topic. Sometimes they contain **CAUTIONs** or **WARNINGs**.
Introduction

The **FT-8900R** is a ruggedly-built, high quality Quad Band FM transceiver providing 50 Watts of power output on the 29/50/144 MHz Amateur band and 35 Watts on the 430 MHz band.

The high power output of the **FT-8900R** is produced by its RD70HVF1 Power MOS FET amplifier, with a direct-flow heat sink and thermostatically-controlled cooling fan maintaining a safe temperature for the transceiver’s circuitry.

Featuring 809 memory channels, full duplex operation with independent **Volume** and **Squelch** controls, and built-in CTCSS and DCS encoder/decoder circuits, the **FT-8900R** includes provision for remote-head mounting, utilizing the optional **YSK-8900 Separation Kit**, which allows installation even in the most compact of cars.

We recommend that you read this manual in its entirety, so as to fully understand the many features of your new **FT-8900R** transceiver.

Front Panel Controls

(1) Left and Right **DIAL** knobs

These 20-position detented rotary switches are the tuning DIALs for the left and right bands.
INTRODUCTION

- Press the adjoining knob momentarily to switch the Main band to the side where the knob is located.
- When in the Memory mode, press this knob to enable rapid tuning (in 10 channel steps) using this knob.
- When in the VFO mode, press this knob to enable rapid tuning (in 1 MHz steps) using this knob.
- When in the VFO mode, press and hold in this knob for ½ second to toggle the operating band as follows:

  29 MHz → 50 MHz → 144 MHz → 350 MHz → 430 MHz → 850 MHz

(2) Left and Right VOL Knobs

The VOL (Volume) control adjusts the speaker audio level for the adjoining receiver.

- Clockwise rotation increases the audio level.
- Press this knob momentarily to switch the Internet Connection feature on and off.

(3) Left and Right SQL Knobs

The SQL (Squelch) control is used to silence background noise on the adjoining receiver.

- Clockwise rotation decreases the squelch level.
- It should be advanced clockwise just to the point where the noise is silenced (and the BUSY indicator on the display turns off), so as to provide the best sensitivity to weak signals.

(4) Hyper Memory Buttons 1... 6

- Press and hold in one of these buttons for 2 seconds to store the current total configuration of the radio into a special Hyper memory bank.
- Press the appropriate button momentarily to recall the desired Hyper memory.

(5) Left and Right Side Key

<table>
<thead>
<tr>
<th>Left Side Keys</th>
<th>Right Side Keys</th>
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<tbody>
<tr>
<td>The left side keys function as LOW, V/M, HM, and SCN.</td>
<td>The right side keys may be set to function as LOW, V/M, HM, and SCN (default) or as MHz, REV, TONE, and SUB (KEY2).</td>
</tr>
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Left Side Keys (always) and Right Side Keys when in Key Mode 1

**Key: (Default)**

- Press this key repeatedly to toggle the transmitter power output level of the adjoining band:

  LOW $\rightarrow$ MID2 $\rightarrow$ MID1 $\rightarrow$ HIGH

- When the adjoining band is set to the Memory mode or Home Channel, press and hold in this key for ½ second to switch the memory channel display between the Frequency format and the Alpha-numeric Tag format.

**Key: (Default)**

- Press this key momentarily to switch the frequency control for the adjoining band between the VFO and Memory Systems.

- When the adjoining band is set to the VFO mode, press and hold in this for ½ second to activate the Smart Search Feature.

- When the adjoining band is set to the Memory mode, press and hold in this key for ½ second to activate the Memory Tuning feature.

**Key: (Default)**

- Press this key momentarily to recall a favorite Home Channel on the adjoining band.

- Press and hold in this for ½ second to activate Priority Channel Scanning on the adjoining band.

**Key: (Default)**

- Press this key momentarily to activate the Scanner on the adjoining band.

- When the adjoining band is set to the Memory mode, press and hold in this key for ½ second to set up the Scan Skip List or Preferential Scan List.

Right Side Keys when in Key Mode 2 (**KEY2**)

To set the right side keys to Key Mode 2:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #20 KEY.MOD.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to change the setting to KEY 2.
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.
When set to **Key Mode 2**, the **KEY2** indicator is displayed and the keys function as follows:

**MHZ Key:** 
- Press this key momentarily to allow tuning in 1-MHz steps on the **Main** band **VFO**.
- Press and hold in this key for ½ second to allow tuning in 10-MHz steps on the **Main** band **VFO**.

**REV Key:** 
- Press this key momentarily to reverse the transmit and receive frequencies on the **Main** band during split-frequency (i.e. Repeater) operation.
- Press and hold in this key for ½ second to change the frequency shift direction:
  
  RPT - (minus shift) → RPT + (plus shift) → RPT OFF (simplex)

**TONES Key:** 
- Press this key momentarily to change the **Tone Squelch** mode:
  
  ENC (CTCSS Encoder) → ENC.DEC (CTCSS Tone Squelch) → DCS (DCS operation)

**SUB Key:** 
- Press this key momentarily to activate the **Sub** band function (the **MAIN** icon will blink on the **Sub** band). When the **Sub** band function is activated, any keys you press act on the **Sub** band.
- When the **Sub** band function is activated (the **MAIN** icon is blinking on the **Sub** band), press this key momentarily to deactivate the **Sub** band function.

**SET Key**
- Press this key momentarily to enter the **Set (Menu)** mode.
- Press and hold in this key for ½ second to transfer the contents of the **Main** band **VFO** into a Memory register.
LCD Display Screen

Icons

⁻: Preferential Memory Channel  

.Skip: Skip Memory Channel  

⁻: Minus Shift  

+: Plus Shift  

⁻ +: Odd Split  

ENC: Tone Encoder  

DEC: Tone Decoder  

TX: Transmission in Progress  

MAIN: Main Band  

BUSY: Busy Channel (or Squelch Off)  

MT: Memory Tune Mode  

MUTE: Audio Mute Active  

DCS: Digital Code Squelch (DCS)  

AM: AM Reception  

9600: 9600 bps Packet Mode  

L: Low TX Power Selected  

M: Middle TX Power Selected (No Icon indicates High TX Power)  

<<: Automatic Power-Off Active  

KEY2: Keypad/DIAL Lock Active  

SET: Menu (Set) Mode  

KEY2: Key Function Mode is set to KEY-2
MH–48A6J Microphone Overview

(1) PTT Switch
Press this switch to transmit, and release it to receive.

(2) Keypad
The 12 number keys generate DTMF tones during transmission.
In the receive mode, these keys can be used for direct frequency entry and/or direct numeric recall of the Memory channels.

The A, B, C, and D keys serve no function on the FT–8900R.

(3) Programmable Buttons
You can program any of the Programmable buttons for the following functions: BAND, HOME, LOW, MHz, PRI, REV, RPTR, SCAN, SQL.OFF, TCALL, TONE, VFO/MR.

(See Program the Microphone Buttons on page 13 for details.)

button: default setting is BAND function
- Press this button to switch the Main band between the Left and Right displays on the LCD screen. This is the best and easiest way to set the Main band to the side you prefer.
- Press and hold this button for ½ second to move operation to the next-highest frequency band on the Main band.

button: default setting is VFO/MR function
- Press this button momentarily to switch the frequency control for the Main band between the VFO and Memory Systems.
- When the Main band is set to the VFO mode, press and hold in this button for ½ second to activate the Smart Search Feature.
- When the Main band is set to the Memory mode, press and hold in this button for ½ second to activate the Memory Bank feature.
button: default setting is TONE function

Press this button repeatedly to select the **CTCSS** or **DCS** mode on the **Main** band:

\[ \text{ENC} \rightarrow \text{ENC.DEC (Tone Squelch)} \rightarrow \text{DCS} \]

button: default setting is LOW function

- Press this button repeatedly to select the transmitter power output level on the **Main** band:
  - **LOW**: 5 watts VHF/UHF
  - **MID2**: 10 watts VHF/UHF
  - **MID1**: 20 watts VHF/UHF
  - **HIGH**: 50 watts VHF, 35 watts UHF
- When the **Main** band is set to the **Memory** mode or **Home Channel**, press and hold in this key for ½ second to switch the memory channel display between the Frequency format and Alpha-numeric Tag format.

(4) **LAMP Switch**

This switch illuminates the Microphone keypad.

(5) **LOCK Switch**

This switch locks out the Microphone buttons (except for the keypad and PTT switch).

(6) **DWN** / **UP** buttons

Press (or hold in) either of these buttons to tune (or scan up or down) the operating frequency or through the memory channels on the **Main** band. In many ways, these buttons emulate the function of the (rotary) **DIAL** knob.
Common Tasks

This section contains a number of common tasks you might want to perform during the normal operation of your FT−8900R.

Program the Microphone Buttons

Default FT−8900R key functions have been assigned to the MH−48A6J Microphone P1, P2, P3, and P4 buttons at the factory. These may be changed by the user, if you wish to utilize another function on one of these keys. (See MH−48A6J Microphone Overview on page 11 for details.)

To program the function assigned to a key:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select the Menu Item to be configured:
   - To program the P1 button select Menu #28 PG P1
   - To program the P2 button select Menu #29 PG P2
   - To program the P3 button select Menu #30 PG P3
   - To program the P4 button select Menu #31 PG P4
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the function you wish to assign to the button you selected in the previous step.
4. Press the SET key to save the new setting, then rotate the DIAL knob to select another programmable button to modify, if desired, and repeat the above steps.
5. Press and hold the DIAL knob for ½ second to exit to normal operation.

Programming Options for the Buttons

BAND function (factory default for P1 button)
   - Press the button to toggle the Main band of operation between the Left band and right band.
   - Press and hold the button for ½ second to switch operating band on the Main band.

HOME (HM) function
   - Press the button to switch operation to the Home Channel on the Main band.
   - Press and hold the button for ½ second to activate the Priority Scanning.
COMMON TASKS

LOW function (factory default for button)
- Press the button to select the transmit power output level on the Main band.
- When the Main band is set to the Memory mode or Home Channel, press and hold in this button for ½ second to switch the memory channel display between the Frequency format and Alpha-numeric Tag format.

MHz function
- Press the button to allow tuning in 1-MHz step on the Main band VFO.
- Press and hold the button for ½ second to allow tuning in 10-MHz step on the Main band VFO.

PRI function
- Press the button to activate the Priority feature on the Main band.
- No press and hold function for this button.

REV function
- Press the button to reverse the transmit and receive frequencies during split-frequency operation.
- Press and hold the button for ½ second to select Repeater Shift direction on the Main band.

RPTR function
- Press the button to select Repeater Shift direction on the Main band.
- No press and hold function for this button.

SCAN function
- Press the button to activate the Scanner on the Main band.
- When the Main band is set to the Memory mode, press and hold the button for ½ second to set up the Scan Skip List or Preferential Scan List.

SQL.OFF function
- Press the button to open the Squelch on the Main band to allow un-muted reception.
- Press and hold the button for ½ second to open the Squelch on the Main band to allow un-muted reception.

TCALL function
- Press the button to activate 1750 Hz Tone Burst.
- Press and hold the button for ½ second to activate 1750 Hz Tone Burst.
TONE function (factory default for P3 button)
- Press the button to activate the CTCSS or DCS operation on the Main band.
- No press and hold function for this button.

VFO/MR function (factory default for P2 button)
- Press the button to switch frequency control between the VFO and Memory modes on the Main band.
- When the Main band is set to the VFO mode, press and hold the button for ½ second to activate the Smart Search Feature.
- When the Main band is set to the Memory mode press and hold the button for ½ second to shift to the Memory Tuning feature.

Select the Main Operating Band

In the factory default configuration, the FT-8900R operates in the Dual Receive mode.

During Dual Receive operation, the Main band frequency (on which transmission is possible) will be indicated by the icon.

You will observe the icon lighting up alternate sides of the display as you switch Main bands from the left side to the right side, and vice-versa. (The following illustration shows the Main band on the left side and the Sub band on the right side.)

To establish the Main band, momentarily press one of the following:
- The left or right DIAL knob
- MH-48A6J microphone’s key

To switch the frequency band, see Change the Frequency Band on page 16 for details.
Change the Frequency Band

In the factory default configuration, the FT−8900R operates in the Dual Receive mode.

The following illustration shows UHF—VHF (U-V) mode of operation.

![FT-8900R Display](image)

The FT−8900R can also be configured to operate in V-U mode (not shown), or V-V or U-U modes (shown below).

<table>
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<tr>
<th>V-V mode</th>
<th>U-U mode</th>
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<tr>
<td><img src="image" alt="V-V Mode Display" /></td>
<td><img src="image" alt="U-U Mode Display" /></td>
</tr>
</tbody>
</table>

To switch the frequency band:

- When in VFO mode, press and hold in the left DIAL knob for ½ second to cycle the operating band on the left side to the next-highest frequency band.

  29 MHz → 50 MHz → 144 MHz → 350 MHz → 430 MHz → 850 MHz

- When in VFO mode, press and hold in the right DIAL knob for ½ second to cycle the operating band on the right side to the next-highest frequency band.

  144 MHz → 430 MHz

To switch the Main band, see Select the Main Operating Band on page 15 for details.
Change the Frequency

Navigation using the Tuning DIAL

Rotating the DIAL knob allows tuning in the pre-programmed steps established for the current operating band. Clockwise rotation of the DIAL knob causes the FT-8900R to be tuned toward a higher frequency, while counter-clockwise rotation will lower the operating frequency.

On the Main band frequency, press the DIAL knob momentarily, then rotate the DIAL knob, to change the Main band frequency steps to 1 MHz per step. This feature is extremely useful for making rapid frequency excursions over the wide tuning range of the FT-8900R.

Direct Keypad Frequency Entry using the MH-48A6J Microphone

The keypad of the MH-48A6J DTMF Microphone may be used for direct entry of the Main band operating frequency.

To enter a frequency from the MH-48A6J keypad, just press the numbered digits in the proper sequence. There is no decimal point key on the MH-48A6J keypad, so if the frequency is below 100 MHz (e.g. 29.480 MHz), any required leading zeroes must be entered.

Examples:

- To enter 146.480 MHz, press 0 → 2 → 9 → 4 → 8 → 0
- To enter 433.000 MHz, press 4 → 3 → 3 → 0 → 0 → 0

Scanning

From the VFO mode, press the SCN key momentarily to initiate scanning toward a higher frequency. The FT-8900R will stop when it receives a signal strong enough to break through the squelch threshold. The FT-8900R will then hold on that frequency according to the setting of the Resume mode (Menu #34 SCAN).

If you wish to reverse the direction of the scan (i.e. toward a lower frequency, instead of a higher frequency), just rotate the DIAL knob one click in the counter-clockwise direction while the FT-8900R is scanning. The scanning direction will be reversed. To revert to scanning toward a higher frequency once more, rotate the DIAL knob one click clockwise.

Press the SCN key again to cancel scanning.
**Transmit**

To transmit, simply depress the PTT (Push To Talk) switch on the microphone.

The **FT-8900R** will transmit only on the Main band. During transmission, the **TX** icon will appear at the upper right of the Main frequency field on the display.

**Changing the Transmitter Power Level**

You can select from among a total of four transmit power levels on your **FT-8900R**.

To change the power level, press the **key** to select one of the four power settings. These power levels will be stored in memory registers at the time of memory storage.

- **LOW**: 5 watts HF/VHF/UHF
- **MID2**: 10 watts HF/VHF/UHF
- **MID1**: 20 watts HF/VHF/UHF
- **HIGH**: 50 watts HF/VHF, 35 watts UHF

During transmission, the **Bar Graph** will deflect in the display, according to the power output selected.

You may change the power level on the Main band using the **MH-48A6J** microphone’s **P4** key.

**Activate the Lock Feature**

In order to prevent accidental frequency change, the panel switches and DIAL knobs may be locked out.

To activate the Lock feature:

1. Press the **SET key** momentarily to enter the Set mode.
2. Rotate the **MAIN DIAL** knob to select **Menu #21 LOCK**.
3. Press the **MAIN DIAL** knob momentarily, then rotate the **MAIN DIAL** knob to change the setting to **ON**.
4. Press the **SET key** momentarily to save the new setting and exit to normal operation.

To unlock the panel switches and DIAL knobs, select **OFF** in step 3 above.
Activate the Key/Button Beeper

A key/button beeper provides useful audible feedback whenever a key/button is pressed.

If you want to turn the beep on:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #5 BEEP.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to change the setting to ON.
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

To turn the beep off, select OFF in step 3 above.

Select the Channel Step

The FT-8900R's synthesizer provides the option of utilizing channel steps of 5/10/12.5/15/20/25/50 kHz per step, any number of which may be important to your operating requirements. The FT-8900R is set up at the factory with different default steps on each operating band which probably are satisfactory for most operation. However, if you need to change the channel step increments, the procedure to do so is very easy; remember to get set up on the desired band before making any changes, as different steps may be programmed for each operating band.

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #37 STEP.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the new channel step size.
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.
Set the Display Brightness

The FT-8900R display illumination has been specially engineered to provide high visibility with minimal disruption of your night vision while you are driving. The brightness of the display is manually adjustable, using following procedure:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #9 DIMMER.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select a comfortable brightness level: DIM 1, DIM 2, DIM 3, or DIM.OFF (no illumination).
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

Activate the Band Linking Feature

For operation on Amateur satellites which use a normal (not inverted) FM transponder, the Band Link feature may be useful.

1. Set both sides of the radio to the VFO mode by pressing the VIM keys, if necessary.
2. Press the SET key momentarily to enter the Set mode.
3. Rotate the DIAL knob to select Menu #42 VFO.TR.
4. Press the DIAL knob momentarily, then rotate the DIAL knob to change the setting to ON.
5. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

As you rotate the DIAL knob, you will observe that the frequencies for both bands are changing together. When you are done with this operating mode, select OFF in step 3 above.

Select the Audio Muting Preference

The Audio Mute feature is useful in situation where it would be helpful to reduce the audio level of the Receive Only band whenever you receive a signal on the Main band or you transmit on the Main band during Dual Receive operation.
To activate the **Audio Mute** feature:

1. Press the **SET key** momentarily to enter the **Set** mode.
2. Rotate the **DIAL knob** to select **Menu #24 MUTE**.
3. Press the **DIAL knob** momentarily, then rotate the **DIAL knob** to choose the desired selection.
   - **TX**: Reduces the audio level of the **Receive Only** band whenever you transmit on the **Main** band
   - **RX**: Reduces the audio level of the **Receive Only** band whenever you receive a signal on the **Main** band
   - **TX/RX**: Reduces the audio level of the **Receive Only** band whenever you receive a signal on the **Main** band or you transmit on the **Main** band
   - **OFF**: Disables the **Audio Mute** feature
4. Press and hold in the **DIAL knob** for ½ second to save the new setting and exit to normal operation.

---

**Set the RF Squelch Level**

A special **RF Squelch** feature is provided on this radio. This feature allows you to set the squelch so that only signals exceeding a certain S-meter level will open the squelch.

When setting up the RF Squelch circuit for operation, note that you may set the **RF Squelch** independently for the left and right sides, using the following procedure:

1. Press the **SET key** momentarily to enter the **Set** mode.
2. Rotate the **DIAL knob** to select **Menu #32 RF SQL**.
3. Press the **DIAL knob** momentarily, then rotate the **DIAL knob** to select the desired signal strength level for the squelch threshold (**OFF**, **S-2**, **S-5**, **S-9**, or **S-FULL**).
4. Press and hold in the **DIAL knob** for ½ second to save the new setting and exit to normal operation.
5. Finally, rotate the **SQL knob** fully clockwise.

---

**Activate the Time-Out Timer**

The **Time-Out Timer (TOT)** feature is designed to force the transceiver into the **Receive** mode after a preset time period of continuous transmission (the default is 6 minutes). This feature prevents your transceiver from transmitting a dead carrier for a long period of time in the event that the microphone **PTT switch** is accidentally locked in the **TX** position.
The Time-Out Timer’s switch-to-receive time may be adjusted, in one minute increments, for any period between 1 and 30 minutes.

To change the default (6 minute) time setting, use the following procedure:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #41 TOT.
3. Press the MAIN DIAL knob momentarily, then rotate the MAIN DIAL knob to select the desired interval (between 1 and 30 minutes), or OFF.
4. Press and hold in the MAIN DIAL knob for ½ second to save the new setting and exit to normal operation.

Activate Automatic Power Off

The Automatic Power-Off (APO) feature will turn the radio completely off after a user-defined period of PTT switch or key/button inactivity. If you do not press any front panel keys or buttons, rotate the DIAL knobs or use the microphone’s keys and buttons, or transmit, and so long as the transceiver is not scanning or engaged in priority monitoring, the radio will shut itself off after the specified time period. This feature is useful in minimizing battery drain in a mobile installation if you forget to turn the transceiver off when you leave your vehicle.

To activate the APO feature, use the following procedure:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #1 APO.
3. Press the MAIN DIAL knob momentarily, then rotate the MAIN DIAL knob to set the desired switch-off time (between 1 and 12 hours in 0.5 hours increments), or OFF.
4. Press and hold in the MAIN DIAL knob for ½ second to save the new setting and exit to normal operation.

Set FM Bandwidth and MIC Gain

You can reduce the microphone input level and receiver bandwidth when operating on tightly, clustered frequencies (channel spacing of 12.5 or 15 kHz). This will reduce the transmitter and receiver deviation, thus minimizing interference to other users (and improving reception).

To configure for the narrower bandwidth, use the following procedure:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #43 WID.NAR.
3. Press the \texttt{DIAL} knob momentarily, then rotate the \texttt{DIAL} knob to change the display to \texttt{NARROW}.

4. Press and hold in the \texttt{DIAL} knob for \( \frac{1}{2} \) second to save the new setting and exit to normal operation.

To restore the normal (higher) microphone input level and normal (15 kHz) receiver bandwidth, select \texttt{WIDE} in step 3 above.

### Program Band Limits for VFO Mode

The \texttt{FT−8900R} contains five sets of band-edge memories, also known as \texttt{Programmable Memory Scan} (PMS) channels, labeled \texttt{L1/U1} through \texttt{L5/U5}.

This feature allows you to set sub-band limits for either scanning or manual VFO operation. For example, you might wish to set up a limit (in North America) of 144.300 MHz to 148.000 MHz so as to prevent encroachment into the SSB/CW “Weak Signal” portion of the band below 144.300 MHz.

Here’s how to do this:

1. Set the \texttt{FT−8900R} to the \texttt{VFO} mode by pressing the \texttt{V/M} key, if necessary.

2. Tune to 144.300 MHz on the \texttt{Main} band.

3. Press and hold in the \texttt{SET} key for \( \frac{1}{2} \) second. A memory number will appear (blinking) on the display.

4. Within ten seconds of pressing the \texttt{SET} key, use the \texttt{DIAL} knob, or the microphone’s \texttt{UP} and \texttt{DWN} buttons, to select the \texttt{PMS} channel \texttt{L1} (the “L” designates the Lower sub-band limit).

5. Press the \texttt{SET} key momentarily to save the entry and exit to normal operation.

6. Tune to 148.000 MHz on the \texttt{Main} band and repeat steps 3 through 5 to store 148.000 MHz into \texttt{PMS} channel \texttt{U1} (the “U” designates the Upper sub-band limit).
7. Switch to the **Memory** mode by pressing the \( V/M \) key momentarily, then rotate the \( DIAL \) knob to select Memory Channel L1.

8. Press and hold in the \( SCN \) key for ½ second to start PMS operation; the \( MT \) icon will appear on the display. Tuning and scanning (engaged by pressing the \( SCN \) key momentarily) will now be limited within the just-programmed range.
Operate through Repeaters

Repeater stations, usually located on mountaintops or other high locations, provide a dramatic extension of the communication range for low-powered hand-held or mobile transceivers. The **FT-8900R** includes a number of features which make repeater operation simple and enjoyable.

**Repeater Shifts**

Your **FT-8900R** has been configured at the factory for the repeater shifts customary in your country. For the 50 MHz band, this usually will be 1 MHz, while the 144 MHz shift will be 600 kHz; on 70 cm, the shift may be 1.6 MHz, 7.6 MHz, or 5 MHz (USA version).

Depending on the part of the band in which you are operating, the repeater shift may be either downward (−) or upward (+), and one of these icons will appear on the LCD (above the frequency) when repeater shifts have been enabled.

**Automatic Repeater Shifts**

The **FT-8900R** provides a convenient **Automatic Repeater Shift (ARS)** feature, which causes the appropriate repeater shift to be automatically applied whenever you tune into the designated repeater sub-bands in your country. These sub-bands are shown below.

If the **ARS** feature does not appear to be working, you may have accidentally disabled it.

To enable **ARS**:

1. Press the **SET key** momentarily to enter the **Set** mode.
2. Rotate the **MAIN DIAL** knob to select **Menu #2 ARS**.
3. Press the **MAIN DIAL** knob momentarily, then rotate the **MAIN DIAL** knob to change the setting to **ON** (to enable Automatic Repeater Shift).
4. Press and hold in the **MAIN DIAL** knob for ½ second to save the new setting and exit to normal operation.

**Manual Repeater Shift Activation**

If the **ARS** feature has been disabled, or if you need to set a repeater shift direction other than that established by the **ARS**, you may set the direction of the repeater shift manually.
To set repeater shift manually:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #33 RPT.MOD.
3. Press the MAIN DIAL knob momentarily, then rotate the MAIN DIAL knob to select the desired shift from -, +, and OFF.
4. Press and hold in the MAIN DIAL knob for ½ second to save the new setting and exit to normal operation.

Changing the Default Repeater Shifts

If you travel to a different region, you may need to change the default repeater shift so as to ensure compatibility with local operating requirements.

To do this, follow the procedure below:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #36 SHIFT.
3. Press the MAIN DIAL knob momentarily, then rotate the MAIN DIAL knob to select the new repeater shift magnitude.
4. Press and hold in the MAIN DIAL knob for ½ second to save the new setting and exit to normal operation.

If you just have one odd split that you need to program, don’t change the default repeater shifts using this Menu item. Enter the transmit and receive frequencies separately, as shown in Store Independent Transmit Frequencies on page 34.
Tone Coded Squelch

CTCSS Tone System

Many repeater systems require that a very-low-frequency audio tone be superimposed on your FM carrier in order to activate the repeater. This helps prevent false activation of the repeater by radar or spurious signals from other transmitters. This tone system, called CTCSS (Continuous Tone Coded Squelch System), is included in your FT-8900R, and is very easy to activate.

CTCSS setup involves two actions: Setting the Tone Mode and then setting of the Tone Frequency. These actions are set up by using the Set mode Menu #40 TONE M and Menu #39 TONE F.

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #40 TONE M.
3. Press the DIAL knob momentarily, then rotate the DIAL knob so that ENC appears on the display; this activates the CTCSS Encoder, which allows repeater access.

You may notice an additional DCS icon appearing while you rotate the DIAL knob in this step. (See DCS Tone System on page 28.)

4. Rotating the DIAL knob one more click clockwise in step 3 above will cause ENC.DEC to appear. When ENC.DEC appears, this means that the Tone Squelch system is active, which mutes your FT-8900R’s receiver until it receives a call from another radio sending out a matching CTCSS tone. This can help keep your radio quiet until a specific call is received, which may be helpful while operating in congested areas.

5. When you have made your selection of the CTCSS tone mode, press the DIAL knob momentarily, then rotate the DIAL knob one click counterclockwise to select Menu #39 TONE F. This Menu selection allows setting of the CTCSS tone frequency to be used.

6. Press the DIAL knob momentarily to enable adjustment of the CTCSS frequency.
7. Rotate the **main** DIAL knob until the display indicates the **Tone Frequency** you need to be using.

<table>
<thead>
<tr>
<th>CTCSS TONE FREQUENCY (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.0</td>
</tr>
<tr>
<td>94.8</td>
</tr>
<tr>
<td>131.8</td>
</tr>
<tr>
<td>171.3</td>
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<tr>
<td>203.5</td>
</tr>
</tbody>
</table>

8. When you have made your selection, press and hold in the **main** DIAL knob for ½ second to save the new setting and exit to normal operation.

(1) Your repeater may or may not re-transmit a CTCSS tone—some systems just use CTCSS to control access to the repeater, but don’t pass it along when transmitting. If the S-Meter deflects, but the FT−8900R is not passing audio, repeat steps 1 through 4 above, but rotate the **main** DIAL knob so that **ENC** is displayed—this will allow you to hear all traffic on the channel being received.

(2) You may select the **Tone Squelch** mode (**ENC**, **ENC.DEC**, or **DCS**) on the **Main** band using the microphone’s **P4** key.

### DCS Tone System

Another form of tone access control is **Digital Code Squelch** (DCS). It is a newer, more advanced tone system which generally provides more immunity from false paging than does CTCSS. The **DCS Encoder/Decoder** is built into your FT−8900R, and operation is very similar to that just described for CTCSS Tone System on page 27. Your repeater system may be configured for DCS; if not, it is frequently quite useful in Simplex operation if your friend(s) use transceivers equipped with this advanced feature.

Just as in CTCSS operation, DCS requires that you set the **Tone Mode** to DCS and that you select a tone code.

1. Press the **SET** key momentarily to enter the **Set** mode.

2. Rotate the **main** DIAL knob to select **Menu #40 TONE M**.

3. Press the **main** DIAL knob momentarily, then rotate the **main** DIAL knob until **DCS** appears on the display; this activates the **DCS Encoder/Decoder**.
4. Now, press the **MAIN** DIAL knob momentarily, then rotate the **MAIN** DIAL knob to select Menu #10 DCS.COD.

5. Press the **MAIN** DIAL knob momentarily to enable the adjustment of the DCS code.

6. Rotate the **MAIN** DIAL knob to select the desired DCS Code (a three-digit number).

<table>
<thead>
<tr>
<th>DCS CODE</th>
<th>DCS CODE</th>
<th>DCS CODE</th>
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<tr>
<td>023</td>
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<td>627</td>
<td>631</td>
</tr>
<tr>
<td>731</td>
<td>732</td>
<td>734</td>
<td>743</td>
</tr>
</tbody>
</table>

7. When you have made your selection, press and hold in the **MAIN** DIAL knob for ½ second to save the new setting and exit to normal operation.

(1) Remember that the DCS is an Encode/Decode system, so your receiver will remain muted until a matching DCS code is received on an incoming transmission. Switch the DCS off when you’re just tuning around the band.

(2) You may select the DCS mode on the Main band using the microphone’s P4 key.

---

**Tone Search Scanning**

In operating situations where you don’t know the CTCSS or DCS tone being used by another station or stations, you can command the radio to listen to the incoming signal and scan in search of the tone being used.
Two things must be remembered in this regard:

- You must be sure that your repeater uses the same tone type (CTCSS or DCS).
- Some repeaters do not pass the CTCSS tone; you may have to listen to the station(s) transmitting on the repeater uplink (input) frequency in order to allow Tone Search Scanning to work.

To scan for the tone in use:

1. Set the radio up for either CTCSS Tone System (see page 27) or DCS Tone System (see page 28) operation. In the case of CTCSS, ENC DEC will appear on the display; in the case of DCS, DCS will appear on the display.
2. Press the SET key momentarily to enter the Set mode.
3. Rotate the DIAL knob to select Menu #39 TONE F when CTCSS is selected, or Menu #10 DCS . COD during DCS operation.
4. Press the DIAL knob to enable adjustment of the selected Menu Item.
5. Press the Main band key momentarily to start scanning for the incoming CTCSS or DCS tone/code.
6. When the radio detects the correct tone or code, it will halt on that tone/code, and audio will be allowed to pass. Press the DIAL knob momentarily to lock in that tone/code, then press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

(1) If the Tone Scan feature does not detect a tone or code, it will continue to scan indefinitely. When this happens, it may be that the other station is not sending any tone. You can press the Main band SCN key to halt the scan at any time.

(2) Tone Search Scanning works either in the VFO or Memory modes.

DCS Code Inversion

The DCS system was first introduced in the commercial LMR (Land Mobile Radio) service, where it is now in widespread use. DCS is sometime referred to by its different proprietary names, such as DPL® (Digital Private Line®, a registered trademark of Motorola, Inc.).

DCS uses a codeword consisting of a 23-bit frame, transmitted (subaudible) at a data rate of 134.4 bps (bit/sec). Occasionally, signal inversion can result in the complement of a code to be sent or received. This prevents the receiver squelch from opening with DCS enabled, as the decoded bit sequence would not match that selected for the operation.
Typical situations that might cause inversion to occur are:

- Connection of an external receiver preamplifier
- Operating through a repeater
- Connection of an external linear amplifier

Note that code inversion does not mean that any of the above listed equipment is defective.

In certain amplifier configurations, the output signal (phase) is inverted from the input. Small signal or power amplifiers having an odd number (1, 3, 5, etc.) of amplification stages may result in inversion of a transmitted or received DCS code.

While under most circumstances this should not occur (amplifier designs and industry standards take this into account), if you find that your receiver squelch does not open when both you and the other station are using a common DCS code, you or the other station (but not both) can try the following:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #11 DCS.N/R.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the mode:
   - TRX N : Encoder; Normal, Decoder; Normal
   - RX R : Encoder; Normal, Decoder; Reverse (Inverted)
   - TX R : Encoder; Reverse (Inverted), Decoder; Normal
   - TRX R : Encoder; Reverse (Inverted), Decoder; Reverse (Inverted)
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

Remember to restore the default setting to TRX N (Encoder; Normal, Decoder; Normal) when done.
Regular Memory

Overview

The FT-8900R provides a wide variety of memory system resources. These include:

Independent **Regular Memory Channels** consisting of:

- 799 **Standard Memory** channels (see page 32), numbered 001 through 799
- Six **Home** channels (see page 36), providing storage and quick recall of one prime frequency on each operating band
- Five sets of band-edge memories also known as **Programmable Memory Scan** channels (see page 23), labeled L1/U1 through L50/U5
- Six **Hyper Memory** channels (see page 38)

Store a Frequency in Memory

To store a frequency in a memory channel:

1. Select the desired frequency while operating in the VFO mode on the Main band. Be sure set up any desired CTCSS or DCS tones, as well as any desired repeater offset. The power level may also be set at this time, if you wish to store it.

2. Press and hold in the SET key for ½ second. A memory number will appear (blinking) on the display.
3. Within ten seconds of pressing the SET key, use the DIAL knob, or the microphone’s UP and DWN buttons, to select the desired memory channel for storage. If the channel is already occupied by data stored previously, the channel’s frequency will appear on the display.

4. Press the SET key momentarily to save the entry and exit to normal operation.

---

**Create a Name Tag for a Memory Channel**

**To add an Alpha-numeric Name Tag to a memory:**

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #25 NAME.
3. Press the DIAL knob momentarily to select the first character location. The character at this location will blink.
4. Rotate the DIAL knob to select the Alpha-numeric character you wish to store in the blinking location, then press the DIAL knob momentarily to move on to the next character.
5. Again rotate the DIAL knob to select the desired letter, number, or symbol, then press the DIAL knob momentarily to move on to the next character location. If you make a mistake, press the microphone’s button to move back to the previous character slot, then re-select the correct letter, number, or symbol.
6. Repeat step 5 to program the remaining letters, numbers, or symbols of the desired Name Tag. A total of six characters may be used in the creation of a tag.
7. When you have completed the creation of the Name Tag, press and hold in the SET key momentarily to save the tag and exit to normal operation.

**To modify an Alpha-numeric Name Tag for a memory:**

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #25 NAME.
3. Press the DIAL knob momentarily to display the Name Tag.
4. Press the DIAL knob momentarily to select the first character location. The character at this location will blink.
5. Press the microphone’s UP and DWN buttons to move to the character location you want to modify, rotate the DIAL knob to select the Alpha-numeric character you wish to store in the blinking location, then press the DIAL knob momentarily to move on to the next character location.
6. Repeat step 5 to modify the remaining letters, numbers, or symbols of the desired Name Tag.

7. When you have completed the modification of the Name Tag, press and hold in the SET key momentarily to save the tag and exit to normal operation.

To delete/hide an Alpha-numeric Name Tag for a memory:

The only way to manually delete a Name Tag from a Memory channel is to delete the channel then re-enter it without the tag.

Store Independent Transmit Frequencies

To store independent transmit frequencies (odd splits) in a memory channel:

1. Store the receiving frequency using the instructions described in Store a Frequency in Memory on page 32.

2. Turn to the desired transmit frequency on the Main band, then press and hold in the SET key for ½ second.

3. Within ten seconds of pressing the SET key, use the MAIN DIAL knob or microphone’s UP and DWN buttons to select the same memory channel number as used in step 1 above.

4. Press and hold in the PTT switch, then press the SET key momentarily while holding the PTT switch to save the entry and exit to normal operation. (This will not cause transmission; instead, it signals the microprocessor that a separate transmit frequency is being programmed into that memory register.)

Whenever you recall a memory which contains independently-stored transmit and receive frequencies, the (odd split) indicator will be displayed.
Recall a Stored Memory

To recall (activate) a stored memory channel:

1. If operating in the VFO mode, press the V/M key momentarily to enter the Memory mode.
2. Rotate the DIAL knob to select the desired channel.

When the radio is already set to the Memory mode, an easy way to recall memories is enter the three-digit memory channel number from the MH-48A6J microphone's keypad. For example, to recall memory channel #4, press 0 → 0 → 4.

Tune from a Stored Memory

Once you have recalled a particular memory channel, you may easily tune off that channel, as though you were in the VFO mode.

1. With the FT-8900R in the MR (Memory Recall) mode, select the desired memory channel.
2. Now press and hold in the SCN key for ½ second. The MT (Memory Tune mode) icon will appear on the display.
3. Rotate the DIAL knob to tune to a new frequency. The synthesizer steps selected for VFO operation on the current band will be the steps used during Memory Tuning.
4. Press and hold in the V/M key for ½ second during Memory Tuning, the data will be copied to VFO, although the original memory contents will remain intact on the previously-stored channel.

If you wish to return to the original memory frequency, press the V/M key momentarily. The MT icon will disappear.
Delete a Memory

With 808 memories available (except memory channel #1), there are frequently situations where you may desire to delete certain memorized frequencies. The procedure for deleting a channel is quite simple:

1. If operating in the VFO mode, press the \( V/M \) key momentarily to enter the Memory mode.

2. Press and hold in the \( \text{SET} \) key for ½ second, then rotate the \( \text{MAIN DIAL} \) knob to select the memory channel to be deleted. (Note that memory channel #1 may not be deleted.)

3. Press the Main band \( SCN \) key momentarily. The display will revert to memory channel #1. If you rotate the \( \text{MAIN DIAL} \) knob to the location you just Masked, you will observe that it is now invisible.

Once deleted, the channel data cannot be recovered.

Set a HOME Channel for an Operating Band

A special one-touch HOME channel is available (one for each of the six operating bands), to allow quick recall of a favorite operating frequency on each band. To store a HOME channel:

1. Select the desired frequency while operating in the VFO mode on the Main band. Be sure to set up any desired CTCSS or DCS tones, as well as any desired repeater offset. The power level may also be set at this time.

2. Press and hold in the \( \text{SET} \) key for ½ second. A memory number will appear (blinking) on the display.

3. While the memory channel number is blinking, press the \( \text{MAIN HM} \) key. The frequency and other data will now be stored in the special HOME channel register.

You may repeat this process on the other operating bands.

To recall the HOME channel, just press the \( \text{HM} \) key while operating either in the VFO or Memory mode.
Activate Memory Only Mode

Once Memory channel programming has been completed, you may place the radio in a Memory Only mode, whereby VFO operation is impossible. This may be particularly useful during public-service events where a number of operators may be using the radio for first time, and ultimate simplicity of channel selection is desired.

To place the radio into the Memory Only mode:

1. Turn the radio off.
2. Press and hold in the Left V/M key while turning the radio on.
3. Rotate the Right DIAL knob to select the (F–5 M–ONLY MODE), then press the SET key momentarily.

To return to normal operation, repeat the above steps.
Hyper Memory

Overview

The FT−8900R uses two different types of memory systems, Regular Memory (see page 32) and Hyper Memory, that store different kinds of information. The distinction between these two memory systems is one of the most difficult concepts for users to comprehend.

The Regular Memory is a memory system that stores information specific to a memory channel. For example, the information needed to operate on a particular repeater will be stored in a Regular Memory channel. The FT−8900R contains 799 Regular Memory channels. (See the table below for the types of data that are stored in a Regular Memory channel.)

The Hyper Memory is a memory system that stores information specific to the overall configuration of your FT−8900R. That is, a Hyper Memory records, or is a snapshot of, the way you have set up your FT−8900R to operate and meet your communication needs. For most radios, you can only have one configuration setup. However, the FT−8900R has six Hyper Memory channels thus allowing you to set up six unique configurations. (See the table below for the types of data that are stored in a Hyper Memory channel.)

<table>
<thead>
<tr>
<th>REGULAR MEMORY Storage</th>
<th>HYPER MEMORY Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory channel information</td>
<td>radio configuration information</td>
</tr>
</tbody>
</table>

Each Regular Memory channel contains the information for one frequency on which you want to operate:

- Memory channel number (left/right)
- Receive/Transmit frequencies
- Operating mode (AM, FM, NFM)
- Repeater information (shift, offset, encoding method, CTCSS tone, DCS code)
- Whether to display frequency or name tag
- Transmitting power
- Scan/Skip preference
- Hyper Memory assignments

Each Hyper Memory channel contains a set of information on how you operate your FT−8900R:

- Which Memory channels to include
- ARS (activation/deactivation)
- Band edge criteria
- Sub band display format
- Packet information (Baud rate, operating band)
- Band Linking (Off, On)
- Automatically tune AM for Aircraft band (Off, On)
- Default Operating mode for each side (VFO, Memory, Home)
- Active band (left/right)
- Which Memory channel to default to (left/right)
- Which is the Active side: Main band (left or right)
Some examples of using Hyper Memory

Let's say that you frequently monitor the local HAM repeaters in your area, that you belong to the RACES organization for your county, and that you like to work Amateur Radio satellites. You could set up your Hyper Memory channels as follows:

**Hyper Memory Channel 2**  Use to operate on local HAM repeaters

| Left Side | -- start on **Regular Memory** channel 39  
|           | -- use as **Sub** band                  
|           | -- **Memory** mode (only UHF repeaters)  
|           | -- 430MHz band (when in **VFO** mode)   |

| Right Side | -- start on **Regular Memory** channel 1  
|            | -- use as **Main** band                 
|            | -- **Memory** mode (only VHF repeaters)  
|            | -- 144MHz band (when in **VFO** mode)   |

**Hyper Memory Channel 3**  Use to operate on local RACES/ARES/Skywarn repeaters

| Left Side | -- start on **Regular Memory** channel 1  
|           | -- use as **Sub** band                   
|           | -- **Memory** mode (all local, VHF/UHF HAM repeaters)  
|           | -- 430MHz band (when in **VFO** mode)    |

| Right Side | -- start on **Regular Memory** channel 501  
|            | -- use as **Main** band                
|            | -- **Memory** mode (only RACES/ARES/Skywarn repeaters)  
|            | -- 144MHz band (when in **VFO** mode)   |

**Hyper Memory Channel 4**  Use to operate on Amateur Radio satellites 
(Band Linking feature activated)

| Left Side | -- start on **Regular Memory** channel 301  
|           | -- use as **Main** band                 
|           | -- **Memory** mode (only Amateur Radio satellite frequencies)  
|           | -- 430MHz band (when in **VFO** mode)   |

| Right Side | -- start on **Regular Memory** channel 301  
|            | -- use as **Sub** band                 
|            | -- **Memory** mode (only Amateur Radio satellite frequencies)  
|            | -- 144MHz band (when in **VFO** mode)   |
With this setup, you would be ready for three of your HAM radio interests at the press of a button! You now have three complete and unique radio configurations, each catered to a specific need.

- To operate on the local HAM repeaters you will press Hyper Memory key 2.
- If a RACES activation occurs, you will press Hyper Memory key 3.
- When you get ready to work an Amateur Radio satellite, you will press Hyper Memory key 4.

**Store a Hyper Memory**

To store the current radio configuration into a Hyper Memory:

1. Set up the transceiver according to the desired configuration.
2. Press and hold in a Hyper Memory key (1 through 6) for 2 seconds. The current configuration will be stored in this Hyper Memory channel.
Recall a Hyper Memory

To recall (activate) a Hyper Memory:

Press the appropriate Hyper Memory key (1 through 6) momentarily to recall the desired Hyper Memory channel.

**Caution**

Depending on how Menu #16 (HYPER) is configured, your current configuration might be lost when you recall a Hyper Memory channel. Menu #16 (HYPER) is the Automatic Writing feature for Hyper Memory. It has two possible settings: AUTO and MANUAL.

**AUTO**

If set to AUTO, whenever you recall a Hyper Memory (1 through 6) the current configuration for your FT−8900R will be automatically stored in Hyper Memory channel 1. Any configuration already in Hyper Memory channel 1 will be overwritten.

This setting is NOT recommended if you want to preserve all of your Hyper Memories.

**MANUAL**

If set to MANUAL, recalling a Hyper Memory will not cause Hyper Memory channel 1 to be overwritten. The Auto feature is disabled, so you must manually store a configuration into a Hyper Memory channel by pressing and holding in one of the Hyper Memory keys for two seconds.

This setting IS recommended if you want to preserve all of your Hyper Memories.
Scanning

Overview

The FT−8900R allows you to scan just the Memory channels via Memory Scan Mode (see page 45), the entire operating band in VFO Scan Mode (see page 44), or a portion of that band via Programmable Memory Scan (see page 23). It will pause on signals encountered, so you can monitor the station(s) on that frequency.

Scanning operation is basically the same in each of the above modes. Before you begin, take a moment to select the way in which you would like the FT−8900R to resume scanning after it pauses on a signal.

Set the Scan-Resume Preference

Two options for the Scan-Resume mode are available:

**TIME**  In this mode, scanning will pause on a signal it encounters, and will hold there for five seconds. If you do not take action to disable scanning within five seconds, scanning will resume even if the stations are still active. This is the default setting.

**BUSY**  In this mode, scanning will pause on a signal it encounters. Two seconds after the carrier has dropped, scanning will resume.

To set the Scan-Resume mode:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #34 SCAN.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the desired Scan-Resume mode (TIME or BUSY).
4. Press and hold in the DIAL knob for ½ second to save the new setting and exit to normal operation.

Priority Channel Scanning (Dual Watch)

The FT−8900R’s scanning features include a two-channel scanning capability which allows you to operate on a VFO, Memory channel, or Home channel, while periodically checking a user-defined Priority Memory Channel for activity. If a station is received on the Priority Memory Channel which is strong enough to open the Squelch, the scanning will pause on that
station. Scanning will resume according to the Scan-Resume mode that was selected. See Set the Scan-Resume Preference on page 42 for details.

You may operate individual Priority Channel Dual Watch features on both bands at the same time, such as having the VFO Priority mode engaged on the Right band and the Memory Priority mode engaged on the Left band.

**VFO Priority**

To activate Priority Channel Dual Watch operation:

1. Recall the memory channel you wish to use as the Priority frequency.
2. Now set the FT–8900R for operation on a VFO frequency.
3. Press and hold in the key for ½ second to activate the VFO Priority mode. The display will remain on the VFO frequency, but every five seconds the FT–8900R will check the Priority Memory Channel for activity.
4. Press and hold in the key to disable the VFO Priority mode.

**Memory Priority**

To activate Priority Channel Dual Watch operation:

1. Store the frequency you wish to be the Priority Memory Channel into Memory channel 1.
2. Now set the FT–8900R for operation on another Memory channel.
3. Press and hold in the key for ½ second to activate the Memory Priority mode. The display will remain on the current Memory channel, but every five seconds the FT–8900R will check the Priority Memory Channel (Memory channel 1) for activity.
4. Press and hold in the key to disable the Memory Priority mode.

**HOME Priority**

To activate Priority Channel Dual Watch operation:

1. Recall the Memory channel you wish to use as the Priority frequency.
2. Now set the FT–8900R for operation on a HOME channel.
3. Press and hold in the key for ½ second to activate the HOME Priority mode. The display will remain on the HOME channel, but every five seconds the FT–8900R will check the Priority Memory Channel for activity.
4. Press and hold in the key to disable the HOME Priority mode.
Scan in VFO Mode

This mode allows you to scan the entire current operating band.

1. Select the VFO mode by pressing the V/M key, if necessary.

2. Press the SCN key momentarily to start scanning.

   If a signal strong enough to open the squelch is encountered during scanning, scanning will pause temporarily and the decimal point of the frequency will blink during the pause.

   • Scanning will resume according to the Scan-Resume mode that was selected. See Set the Scan-Resume Preference on page 42 for details.

3. To cancel scanning, press the SCN key momentarily again, or press the microphone’s PTT key.

   (1) When you start scanning, the FT-8900R will scan in the upward direction. If you want to change the direction of the scan while it is underway, rotate the DIAL knob one click in the opposite direction (in this case, one click counterclockwise). The scanning direction will reverse and scan downward.

   (2) Pressing and holding in the microphone’s or key will cause scanning to sweep frequencies only on the current band.

   (3) If you would like the scanner not to be restricted to the current band, set Menu #4 (BAND) to BND.OFF to cause the FT-8900R to hop to the low edge of the next-highest band when the VFO frequency reaches the high end of the current band (or vice-versa).
Scan in Memory Mode

In Memory Scan mode, you can set the type of scan to be performed and set the method in which each Memory channel will be scanned.

Set the Type of Memory Scan

You can configure the keys on the FT-8900R to perform either a Standard Memory scan (default) or a Preferential Memory scan when pressed.

<table>
<thead>
<tr>
<th>Types of Memory Scans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong> (default)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Preferential</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Standard Memory Scan

During Standard Memory Scan, scanning will pause on any signal encountered that is strong enough to open the squelch; scanning will then resume according to the Scan-Resume mode that was selected. See Set the Scan-Resume Preference on page 42 for details.

To Flag a Memory channel to be Scanned during Standard Memory Scan:

1. Set the radio to the Memory mode by pressing the V/M key, if necessary.
2. Rotate the MAIN DIAL knob to select the channel which you wish to be scanned during Standard Memory Scan.
3. Press the SCN key for ½ second twice to select OFF (skip off) and exit to normal operation.

To configure the FT−8900R for Standard Memory Scan:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #35 SCAN M.
3. Press the MAIN DIAL knob momentarily, then rotate the DIAL knob to MEM.
4. Press and hold in the MAIN DIAL knob for ½ second to save the new setting and exit to normal operation.

To initiate Standard Memory Scan:

1. Configure the FT−8900R for Standard Memory Scan, if necessary.
2. Press the SCN key momentarily to initiate Standard Memory Scanning.
3. To cancel the Standard Memory Scan, press the SCN key momentarily.
How to Skip a Channel During Memory Scan

Some continuous-carrier stations like a Weather Broadcast station will seriously impede scanning operation especially if Menu #34 SCAN is set to BUSY, as the incoming signal will not pause long enough for the FT−8900R to resume scanning.

To skip a channel during scanning:

1. Set the radio to the Memory mode by pressing the key, if necessary.
2. Rotate the DIAL knob to select the Memory Channel to be skipped during scanning.
3. Press the key for ½ second to select SKIP and exit to normal operation.

This Memory Channel will now be ignored during scanning. The SKIP indicator will appear when you manually recall this skipped memory channel.

Preferential Memory Scan

During Preferential Memory Scan, scanning will pause on any signal encountered that is strong enough to open the squelch; scanning will then resume according to the Scan-Resume mode that was selected. See Set the Scan-Resume Preference on page 42 for details.

To place a Memory channel on the Preferential Scan List:

1. Set the radio to the Memory mode by pressing the key, if necessary.
2. Rotate the DIAL knob to select the channel which you wish to add to the Preferential Scan List.
3. Press and hold the key for ½ second, several times if necessary, so as to make the icon appear by the channel designator.

To configure the FT−8900R for Preferential Memory Scan:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #35 SCAN M.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to MSM.
4. Press and hold in the [Dial] knob for ½ second to save the new setting and exit to normal operation.

Now only the channels which have the ⚫ icon displayed will be scanned.

**To initiate Preferential Memory Scan:**

1. Configure the FT-8900R for Preferential Memory Scan, if necessary.

2. Press the [SCN] key momentarily to initiate Preferential Memory Scanning. Only the channels which have the ⚫ icon displayed will be scanned.

To cancel the Preferential Memory Scan, press the [SCN] key momentarily.
Smart Search

The **Smart Search** feature may be used to load—automatically with no operator intervention—a special bank of up to 25 memory channels (per band) on activity.

The **Smart Search** function will sweep the entire band, and will load the special memory bank with the frequency and repeater shift data pertaining to those channels on which activity is found if Automatic Repeater Shifts is activated (see page 25). The channels are loaded in the order in which they are encountered, not according to signal strength or by ascending frequency.

The **Smart Search** feature is especially useful when visiting a city for the first time, where you may be unfamiliar with the repeater frequencies; **Smart Search** discovers where the local activity is to be found, and automatically loads those frequencies for you.

To activate **Smart Search** operation:

1. Set the radio to the **VFO** mode by pressing the **V/M** key, if necessary.

2. Press and hold in the **V/M** key for ½ second to cause the radio to scan upward on the current band, loading channels on which it encounters a signal strong enough to open the squelch.

3. When 25 channels are loaded, or when the scanner reaches the band edge, the scanner will stop and the transceiver will revert to the starting frequency.

To recall the **Smart Search** memories just stored, rotate the **DIAL** knob or press the microphone’s **UP** or **DWN** keys (for the **Main** band **Smart Search** memories only).

If you find a channel which you wish to store into a Regular Memory channel, follow the procedures in **Store a Frequency in Memory** on page 32.

**Note:**
1. The **Smart Search** memories are so-called soft memories; they will lost if you exit the **Smart Search** mode or initiate a new **Smart Search** sweep.

2. You may activate **Smart Search** operation on the **Main** band by pressing and holding in the microphone’s **P2** key.

3. You may activate **Smart Search** operation on the left and right bands at the same time.
Overview

The ARTS (Auto Range Transponder System) feature uses DCS signaling to inform both parties when you and another ARTS equipped station are within communications range. This may be particularly useful during Search-and-Rescue situations, where it is important to stay in contact with other members of your group.

Both stations must set up their DCS codes to the same code number, then activate their ARTS feature using the command appropriate for their radio. Alert ringers may be activated, if desired.

Whenever you push the PTT switch, or every 25 seconds after ARTS is activated, your radio will transmit a signal which includes a (subaudible) DCS signal for about one second. If the other radio is in range, the beeper will sound (if enabled) and the display will show IN.RNG as opposed to the out of range display OUT.RNG in which ARTS operation begins.

Whether you talk or not, the polling every 25 seconds will continue until you de-activate ARTS. Every 10 minutes, moreover, you can have your radio transmit your callsign via CW, so as to comply with identification requirements. When ARTS is de-activated, DCS will also be deactivated (if you were not using it previously in non-ARTS operation).

If you move out of range for more than one minute (four pollings), your radio will sense that no signal has been received, three beeps will sound, and the display will revert to OUT.RNG. If you move back into range, your radio will again beep, and the display will change back to the IN.RNG indication.

During ARTS operation, it is not possible to change the operating frequency or other settings on the Main band; you must terminate ARTS in order to resume normal operation. This is a safety feature designed to prevent accidental loss of contact due to channel change.

Set Up/Operate ARTS

To activate ARTS:

1. Set your FT-8900R and the other radio(s) to the same DCS code number. See DCS Tone System on page 28 for details.
2. Press the SET key momentarily to enter the Set mode.
3. Rotate the MAIN DIAL knob to select Menu #3 ARTS.
4. Press the MAIN DIAL knob momentarily, then rotate the MAIN DIAL knob to select the desired ARTS beep option. The available options are:
IN RNG: The beeps are issued only when the radio first confirms that you are within range, but does not re-confirm with beeps thereafter.

ALWAYS: Every time a polling transmission is received from the other station, the alert beeps will be heard.

5. Press the MAIN DIAL knob momentarily. OUT.RNG is displayed on the LCD. ARTS operation has now commenced.

Every 25 seconds, your radio will transmit a polling call to the other station. When that station responds with its own ARTS polling signal, the display will change to IN.RNG to confirm that the other station’s polling code was received in response to yours.

Press the MAIN DIAL knob momentarily to exit ARTS operation and resume normal operation.

Set Up the CW Identifier

The ARTS feature includes a CW Identifier. Every ten minutes during ARTS operation, the radio can be instructed to send DE your-callsign K if this feature is enabled. The callsign field may contain up to 6 characters.

To program the CW Identifier:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the MAIN DIAL knob to select Menu #8 CWID W.
3. Press the MAIN DIAL knob momentarily.
4. Press the MAIN DIAL knob momentarily again to enable entry of your callsign.
5. Rotate the MAIN DIAL knob one click clockwise to begin entry of the letters and numbers in your callsign.
6. Press the MAIN DIAL knob momentarily to set the first letter or number in your callsign.
7. When the correct character has been selected, press the MAIN DIAL knob momentarily to move on to the next character.
8. Repeat steps 6 and 7 as many times as necessary to complete your callsign.
9. Press the Main SCN key to delete all data after the cursor that may have been previously stored (erroneously).
10. When you have entered your entire callsign, press the MAIN DIAL knob momentarily to confirm the callsign.
11. Press the SET key momentarily, then rotate the MAIN DIAL knob one click counterclockwise to select the Menu #7 CWID.
12. Press the **MAIN DIAL** knob momentarily, then rotate the **MAIN DIAL** knob to select **TX ON** (to enable the **CW Identifier**).

13. Press the **MAIN DIAL** knob momentarily to save the setting and exit to normal operation.
Operating the DTMF Autodialer

Sixteen DTMF Autodialer memories are available on the FT-8900R. These DTMF Autodialer memories can store up to 16 digits of a telephone number for repeater autopatch or other uses.

To load DTMF Autodialer memories:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #15 DTMF W.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the DTMF Autodialer memory channel number (d-1 through d-16) into which you wish to store a telephone number.
4. Press the DIAL knob momentarily, then rotate the DIAL knob to select the first digit of the telephone number you wish to store.
5. When you have selected the correct digit, press the DIAL knob momentarily.
6. Rotate the DIAL knob to select the next number in this current DTMF Autodialer memory register.
7. When you have selected the correct digit, press the DIAL knob momentarily.
8. Repeat this steps 6 and 7 for each remaining digit in the telephone number.
9. Press the Main band key momentarily to delete any previously-stored data after the cursor. If you make a mistake, press the microphone’s key to move back to the first digit, then re-enter the correct number.
10. When entry of all digits is complete, press the SET key momentarily to save the new setting.
11. If you wish to store another DTMF string, rotate the DIAL knob to select another DTMF memory register, then repeat steps 4 through 10.
12. When all required DTMF memories are filled to your satisfaction, press and hold in the DIAL knob for ½ second to exit to normal operation.

To transmit the memorized telephone number:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #15 DTMF W.
3. Press the DIAL knob momentarily, then rotate the DIAL knob to select the DTMF Autodialer memory channel to be transmitted.
4. Press and hold in the **Main** DIAL knob for ½ second to exit to normal operation.

5. Press and hold in the PTT switch.

6. While still holding the PTT switch in, press the Main band **HM** key momentarily to transmit the tone string.

7. Once you have pressed the **HM** key in the above step, you can release the PTT switch, as the **Autodialer** will transmit the whole DTMF string automatically.

---

**To set the speed:**

The speed at which the DTMF digits are sent can be changed.

1. Press the **SET** key momentarily to enter the Set mode.
2. Rotate the **Main** DIAL knob to select **Menu #14 DTMF S**.
3. Press the **Main** DIAL knob momentarily, then rotate the **Main** DIAL knob to select the desired speed.
   - **50MS**: High: 20 digits per second
   - **75MS**: Mid: 13 digits per second
   - **100MS**: Low: 10 digits per second
4. Press and hold in the **Main** DIAL knob for ½ second to save the new setting and exit to normal operation.

---

**To set a delay time:**

You can also set a longer delay between the time you press the **HM** key (with PTT switch pressed) and when the first DTMF digit is sent.

1. Press the **SET** key momentarily to enter the Set mode.
2. Rotate the **Main** DIAL knob to select **Menu #13 DTMF D**.
3. Press the **Main** DIAL knob momentarily, then rotate the **Main** DIAL knob to select the desired time (50MS, 250MS, 450MS, 750MS, or 1000MS).
4. Press and hold in the **Main** DIAL knob for ½ second to save the new setting and exit to normal operation.
The **FT−8900R** can be used to access a repeater which has been configured to provide access to the Vertex Standard **WIRES™** (Wide-Coverage Internet Repeater Enhancement System) or other **Internet Link Systems** that use a **DTMF** string for access.

### To access a **WIRES™** repeater:

1. Press the left **VOL** knob momentarily to activate the **WIRES™** access capability. The **INT ON** message will be displayed for 2 seconds at the **Main** band. The **int** icon will appear in the memory channel field on the **Sub** band while **WIRES™** access is enabled.

2. Rotate the **DIAL** knob, while pressing and holding in the left **VOL** knob, to select the access number (**ICOD 0** through **ICOD 9**, **ICOD A** through **ICOD F**) corresponding to the **WIRES™** repeater to which you wish to establish an Internet link. Ask the repeater owner/operator if you don’t know the access numbers in the network.

With the **WIRES™** capability activated, the **FT−8900R** will generate a brief (0.1 second) **DTMF** tone according to your selection in step 2. This **DTMF** tone is sent at the beginning of every transmission to establish or maintain the link to the remote **WIRES™** repeater.

To disable the **WIRES™** access capability, press the left **VOL** knob again.

### To access other **Internet Link Systems** that use a **DTMF** string for access:

1. Press the **SET key** momentarily to enter the **Set** mode.

2. Rotate the **DIAL** knob to select **Menu #15 DTMF W**.

3. Press the **DIAL** knob momentarily, then load the **DTMF** tones which you wish to use to establish an Internet link (ask your repeater owner/operator if you don’t know the access numbers in the network) into the desired **DTMF Memory** channel.

   a. Rotate the **DIAL** knob to select the **DTMF Autodialer** memory channel number (d-1 through d-16).

   b. Press the **DIAL** knob momentarily.

   c. Rotate the **DIAL** knob to select the **DTMF** code, then press the **DIAL** knob momentarily to move the digit.

   d. Repeat step c.

   e. Press the **DIAL** knob momentarily to save the new setting.

4. Rotate the **DIAL** knob to select **Menu #17 INET**.
5. Press the **DIAL** knob momentarily, then rotate the **DIAL** knob to set this Item to **INT. MEM** (to enable the alternative **Internet Link**, and disable the **WIRES™** access option).

6. Press and hold in the **DIAL** knob for ½ second to save the new setting and exit to normal operation.

7. Press the left **VOL** knob momentarily to activate the **Internet Link System**. **INT ON** will be displayed for 2 seconds in the **Main** band frequency field. The **int** icon will then be displayed in the memory channel field on the **Sub** band while the **Internet Link System** access feature is engaged.

8. Rotate the **DIAL** knob, while pressing and holding in the left **VOL** knob, to select the **DTMF** access number (**IMEM 1** through **IMEM16**) corresponding to the **Internet Link** repeater to which you wish to establish an **Internet Link**.

9. With the **Internet Link** feature activated, press the left **VOL** knob, or microphone’s **P2** key, to send out the **DTMF** tones according to your selection in step 8 (to establish the link to the **Internet Link** repeater).

10. To disable the **Internet Link** feature, press the left **VOL** knob again.

To return to **WIRES™**, recall Menu #17 **INET**, then set it to **INT. COD**.
Operate as a Cross-Band Repeater

The FT-8900R can be set up to operate as a full-featured cross-band repeater via a simple Menu procedure. This feature is useful for emergency portable work in a remote area, and for cross-band linking.

However, remember these points before using the Cross-Band Repeater mode:

- Check the amateur radio rules and regulations for your country to ensure that this type of operation is permitted.
- Pick your frequency pair carefully, so as not to cause harmful interference to other users. The use of cross-band repeaters has the potential to cause serious disruption of communications circuits, and the creation of harmful interference to coordinated repeaters is inconsiderate and may be illegal. If you are not sure of active repeater frequencies in your area, a safe rule is to stay off of the repeater sub-bands and use the FM simplex portion of each band. Contact your area’s frequency coordinator for guidance.
- Remember that the transmit duty cycle will be much higher during repeater service, so we recommend that the transmit power level be set to a Low setting to ensure cooler operation.

Transceiver CTCSS settings (Encode/Decode) may, of course, be selected for each band, allowing selective calling for your repeater. However, keep in mind that if the channels you use are so busy as to motivate you toward CTCSS Decoding, you may not have chosen a good frequency pair on which to operate, as the potential for interference to other users is high.

To set up Cross-Band Repeater operation:

Before enabling Cross-Band Repeater operation, configure both band settings as desired, and set the squelch such that background noise is silenced.

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the DIAL knob to select Menu #44 X-RPT.
3. Press the DIAL knob momentarily, XSTART will appear on the display.
4. Press the DIAL knob again to activate the Cross-Band Repeater mode.

To exit the Cross-Band Repeater mode, Press the SET key again.
Transfer Data between two FT–8900Rs

You can transfer all data stored in one FT–8900R to another FT–8900R by utilizing the handy Cloning feature. This requires a user-constructed Cloning cable which connects the DATA jacks on the two transceivers, as shown below.

To clone from one transceiver to another:

1. Insert the Cloning Cable into the DATA jack of each transceiver.

2. Turn both transceivers off, then press and hold in the Left key on each radio while turning the power on again.

3. Rotate the Right DIAL knob on each radio to select CLONE START, then press the SET key. The display will disappear for a moment, then the CLONE notation will appear on the display.


5. Now, on the source radio, press the Left key. The CLONE –TX– indicator will appear on the display, and the cloning data transfer will immediately begin.
   - If there is a problem during the cloning process, CLONE ERROR will be displayed. Check your cable connections, and try again.
   - If cloning was successful, the CLONE –RX– and CLONE –TX– indicators will disappear.

6. Turn both transceivers off, then remove the Cloning Cable.

Channel and operating data for both radios are now identical. They both may be turned on now for normal operation.
Reset Your FT−8900R

To Reset your FT−8900R:

1. Turn the radio off.

2. Press and hold in the Left V/M key while turning the radio on.

3. Rotate the Right DIAL knob to select the Reset menu:
   - **SETMOD RESET**: Resets the Menu (Set) mode settings to their factory defaults.
   - **HYPER RESET**: Clears the Hyper Memory settings to factory defaults.
   - **MEMORY RESET**: Clears the Regular Memory settings to factory defaults.
   - **ALL RESET**: Clears all memories and other settings to factory defaults.

4. Press the SET key momentarily to complete the Reset procedure.
Menu (Set) Mode

Overview

The FT-8900R Menu (Set) mode is easy to activate and set. It may be used for configuration of a wide variety of transceiver parameters, some of which have not been detailed previously. Use the following procedure to activate the Menu (Set) mode:

1. Press the SET key momentarily to enter the Set mode.
2. Turn the MAIN DIAL knob to select the Menu Item to be adjusted.
3. Press the MAIN DIAL knob momentarily to enable adjustment of the selected Menu Item, then rotate the MAIN DIAL knob to perform the actual adjustment.
4. After completing your selection and adjustment, press and hold in the MAIN DIAL knob for ½ second to exit the Set mode and return to normal operation.

Menu Item Prefixes

Some Menu Items or preceded by either the character b or h. The b character denotes that the value for this Menu Item is to be applied separately for each Operating Band and/or Mode. The h character denotes that the value for this Menu Item is to be applied separately to each Hyper Memory Channel.
## Menu Quick Reference Table

<table>
<thead>
<tr>
<th>Item #</th>
<th>Menu</th>
<th>Function</th>
<th>Available Values</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>APO</td>
<td>Selects the Automatic Power Off time.</td>
<td>OFF, 0.5H – 12.0H</td>
<td>OFF</td>
</tr>
<tr>
<td>h 2</td>
<td>ARS</td>
<td>Activates/deactivates the Automatic Repeater Shift feature.</td>
<td>ON, OFF</td>
<td>varies</td>
</tr>
<tr>
<td>h 3</td>
<td>ARTS</td>
<td>Selects the ARTS beep mode.</td>
<td>IN RNG, ALWAYS</td>
<td></td>
</tr>
<tr>
<td>h 4</td>
<td>BAND</td>
<td>Enables/disables the VFO Band edge for the current band.</td>
<td>BND ON, BND OFF</td>
<td>BND ON</td>
</tr>
<tr>
<td>5</td>
<td>BEEP</td>
<td>Enables/disables the beeper.</td>
<td>BEP.ON, BEP.OFF</td>
<td>BEP.ON</td>
</tr>
<tr>
<td>b 6</td>
<td>CLK.SFT</td>
<td>Shifts the CPU clock frequency.</td>
<td>SFT.ON, SFT.OFF</td>
<td>SFT.OFF</td>
</tr>
<tr>
<td>7</td>
<td>CWID</td>
<td>Enables/disables the CW identifier during ARTS operation.</td>
<td>TX ON, TX OFF</td>
<td>TX OFF</td>
</tr>
<tr>
<td>8</td>
<td>CWID W</td>
<td>Stores your callsign into the CW identifier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>DIMMER</td>
<td>Sets the Display brightness level.</td>
<td>DIM 1, DIM 2, DIM 3, OFF</td>
<td>DIM 1</td>
</tr>
<tr>
<td>b 10</td>
<td>DCS.COD</td>
<td>Sets the DCS code.</td>
<td>023</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>DCS.N/R</td>
<td>Selects Normal or Inverted DCS coding.</td>
<td>TRX N, RX R, TX R, TRX R</td>
<td>TRX N</td>
</tr>
<tr>
<td>h 12</td>
<td>DSP.SUB</td>
<td>Selects the Sub Band display format.</td>
<td>FREQ, CWID, DC-F, IN, OFF</td>
<td>FREQ</td>
</tr>
<tr>
<td>13</td>
<td>DTMF D</td>
<td>Sets of the DTMF Autodialer Delay Time.</td>
<td>50MS, 250MS, 450MS, 750MS, 1000MS</td>
<td>450MS</td>
</tr>
<tr>
<td>14</td>
<td>DTMF S</td>
<td>Sets of the DTMF Autodialer Sending Speed.</td>
<td>50MS, 75MS, 100MS</td>
<td>50MS</td>
</tr>
<tr>
<td>15</td>
<td>DTMF W</td>
<td>Loads the DTMF Autodialer Memories.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>HYPER</td>
<td>Enables/disables the Automatic Writing feature for Hyper Memory.</td>
<td>MANUAL, AUTO</td>
<td>MANUAL</td>
</tr>
<tr>
<td>17</td>
<td>INET</td>
<td>Selects the Internet Connection mode.</td>
<td>INT.COD, INT.MEM</td>
<td>INT.COD</td>
</tr>
<tr>
<td>18</td>
<td>INET C</td>
<td>Selects the Access Number (DTMF digit) for WIRES™ operation.</td>
<td>CODE 0 – 9, CODE A – F</td>
<td>CODE 1</td>
</tr>
<tr>
<td>19</td>
<td>INET M</td>
<td>Selects the Access Number (DTMF code) for non-WIRES™ Internet Link System access.</td>
<td>d-1 – d-16</td>
<td>d-1</td>
</tr>
<tr>
<td>20</td>
<td>KEY.MOD</td>
<td>Selects the key functions for the <em>right</em> band function switches.</td>
<td>KEY1, KEY2</td>
<td>KEY1</td>
</tr>
<tr>
<td>21</td>
<td>LOCK</td>
<td>Enables/disables the Key/Button Lock feature.</td>
<td>ON, OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>22</td>
<td>LOCKT</td>
<td>Enables/disables the PTT Lock feature.</td>
<td>OFF, BAND R, BAND L, BOTH</td>
<td>OFF</td>
</tr>
<tr>
<td>23</td>
<td>MIC</td>
<td>Selects the microphone type to be used.</td>
<td>MH-48, MH-42</td>
<td>MH-48</td>
</tr>
<tr>
<td>Item #</td>
<td>Menu</td>
<td>Function</td>
<td>Available Values</td>
<td>Default</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>24</td>
<td>MUTE</td>
<td>Selects the Audio Mute mode.</td>
<td>OFF, TX, RX, TX/RX</td>
<td>OFF</td>
</tr>
<tr>
<td>b 25</td>
<td>NAME</td>
<td>Stores an Alpha-Numeric “Tag” for a memory channel.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h 26</td>
<td>PKT.S</td>
<td>Sets the transceiver’s circuitry for the Packet baud rate to be used.</td>
<td>1200BPS, 9600BPS</td>
<td>1200BPs</td>
</tr>
<tr>
<td>h 27</td>
<td>PKT.B</td>
<td>Sets the receiving band for Packet operation.</td>
<td>MAIN, R-FIX, L-FIX</td>
<td>MAIN</td>
</tr>
<tr>
<td>28</td>
<td>PG P1</td>
<td>Programs the MH–48A6J microphone’s P1 button.</td>
<td>BAND, VFO/MR, SCAN, SQL.OFF, TCALL, RPTR, PRI, LOW, TONE, MHz, REV, HOME</td>
<td>BAND</td>
</tr>
<tr>
<td>29</td>
<td>PG P2</td>
<td>Programs the MH–48A6J microphone’s P2 button.</td>
<td>VFO/MR</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>PG P3</td>
<td>Programs the MH–48A6J microphone’s P3 button.</td>
<td>TONE</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>PG P4</td>
<td>Programs the MH–48A6J microphone’s P4 button.</td>
<td>LOW</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>RF SQL</td>
<td>Sets the RF SQL threshold level.</td>
<td>OFF, S-2, S-5, S-9, S-FULL</td>
<td>OFF</td>
</tr>
<tr>
<td>b 33</td>
<td>RPT.MOD</td>
<td>Sets the Repeater Shift Direction.</td>
<td>RPT.OFF, RPT. –, RPT.+</td>
<td>RPT.OFF</td>
</tr>
<tr>
<td>34</td>
<td>SCAN</td>
<td>Selects the Scan-Resume mode.</td>
<td>TIME, BUSY</td>
<td>TIME</td>
</tr>
<tr>
<td>b 35</td>
<td>SCAN M</td>
<td>Selects the Memory Scan mode.</td>
<td>MEM, MSM</td>
<td>MEM</td>
</tr>
<tr>
<td>b 36</td>
<td>SHIFT</td>
<td>Sets the magnitude of the Repeater Shift.</td>
<td>0.00 – 99.50 MHz</td>
<td>varies</td>
</tr>
<tr>
<td>b 37</td>
<td>STEP</td>
<td>Sets the Synthesizer steps.</td>
<td>5.0k, 10.0k, 12.5k, 15.0k, 20.0k, 25.0k, 50.0k</td>
<td>varies</td>
</tr>
<tr>
<td>38</td>
<td>SPCONT</td>
<td>Defines the audio path to an external speaker.</td>
<td>EXT, OFF, INT, EXT, INT</td>
<td>EXT</td>
</tr>
<tr>
<td>b 39</td>
<td>TONE F</td>
<td>Sets the CTCSS Tone Frequency.</td>
<td></td>
<td>100 HZ</td>
</tr>
<tr>
<td>b 40</td>
<td>TONE M</td>
<td>Selects the Tone Encoder and/or Decoder mode.</td>
<td>OFF, ENC, ENC.DEC, DCS</td>
<td>OFF</td>
</tr>
<tr>
<td>41</td>
<td>TOT</td>
<td>Sets the Time-Out Timer.</td>
<td>1 – 30 minutes, OFF</td>
<td>6MIN</td>
</tr>
<tr>
<td>h 42</td>
<td>VFO.TR</td>
<td>Enables/disables the VFO Tracking feature.</td>
<td>ON, OFF</td>
<td></td>
</tr>
<tr>
<td>b 43</td>
<td>WID.NAR</td>
<td>Sets the MIC Gain (and Deviation).</td>
<td>WIDE, NARURAL</td>
<td>varies</td>
</tr>
<tr>
<td>44</td>
<td>X-RPT</td>
<td>Enables/disables the Cross-Band Repeater feature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b 45</td>
<td>AM</td>
<td>Enables/disables the AM mode.</td>
<td>ON, OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>h 46</td>
<td>AUT.AM</td>
<td>Selects the receiving mode.</td>
<td>AUTO, OFF</td>
<td>AUTO</td>
</tr>
</tbody>
</table>
Menu Items

The **Menu** items are listed in numeric order.

---

### Menu #1 APO

**Function:** Selects the **Automatic Power Off** time (time until power is turned off).
See **Activate Automatic Power Off** on page 22 for details.

**Values:** OFF, 0.5 H – 12.0 H in 0.5 hour multiples

**Default:** OFF (Disables the APO feature)

---

### Menu h 2 ARS

**Function:** Activates/deactivates the **Automatic Repeater Shift** feature.
See **Automatic Repeater Shifts** on page 25 for details.

**Values:** ON, OFF

**Default:** Depends on the band of operation.

---

*The value for this **Menu Item** is to be applied separately to each **Hyper Memory Channel**.*
## Menu h 3 ARTS

### Function:
Selects the **ARTS** beep mode. See **ARTS** on page 50 for details.

### Values:
- **IN RNG**, **ALWAYS**
  - **IN RNG**: Activates the ARTS feature; a high tone beep will sound when the transceiver first detects that you are within range, and a low beep will sound when the other station goes out of range.
  - **ALWAYS**: Activates the ARTS feature; a high tone beep will sound every time a polling transmission is received from the other station, and a low beep will sound once when the other station goes out of range.

### Default:

> The value for this **Menu Item** is to be applied separately to each **Hyper Memory Channel**.

## Menu h 4 BAND

### Function:
Enables/disables the **VFO Band** edge for the current band.

### Values:
- **BND. ON**, **BND. OFF**
  - **BND. ON**: When the VFO frequency reaches the high band edge of the current band, the VFO frequency will jump to the low band edge of the current band (or vice versa).
  - **BND. OFF**: When the VFO frequency reaches the high edge of the current band, the VFO frequency will jump to the low band edge of the next band (or vice versa).

### Default:
**BND. ON**

> The value for this **Menu Item** is to be applied separately to each **Hyper Memory Channel**.
**Menu #5 BEEP**

<table>
<thead>
<tr>
<th>Function:</th>
<th>Enables/disables the beeper. See <em>Activate the Key/Button Beep</em> on page 19 for details.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values:</td>
<td>BEP.ON, BEP.OFF</td>
</tr>
<tr>
<td>Default:</td>
<td>BEP.ON</td>
</tr>
</tbody>
</table>

**Menu b 6 CLK.SFT**

<table>
<thead>
<tr>
<th>Function:</th>
<th>Shifts the CPU clock frequency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values:</td>
<td>SFT. ON, SFT.OFF</td>
</tr>
<tr>
<td>Default:</td>
<td>SFT.OFF</td>
</tr>
</tbody>
</table>

(1) This function is only used to move a spurious response birdie, should it fall on a desired frequency.

(2) The value for this Menu Item is to be applied separately to each Hyper Memory Channel.

**Menu #7 CWID**

<table>
<thead>
<tr>
<th>Function:</th>
<th>Enables/disables the CW Identifier during ARTS operation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values:</td>
<td>TX ON, TX OFF</td>
</tr>
<tr>
<td>Default:</td>
<td>TX OFF</td>
</tr>
</tbody>
</table>

**Menu #8 CWID W**

<table>
<thead>
<tr>
<th>Function:</th>
<th>Stores your callsign into the CW Identifier. Up to six characters may be stored. See <em>Set Up the CW Identifier</em> on page 51 for details.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values:</td>
<td></td>
</tr>
<tr>
<td>Default:</td>
<td></td>
</tr>
</tbody>
</table>
### Menu #9 DIMMER

**Function:** Sets the Display brightness level. See *Set the Display Brightness* on page 20 for details.

**Values:** DIM 1, DIM 2, DIM 3, OFF

**Default:** DIM 1

### Menu b 10 DCS.COD

**Function:** Sets the DCS code. See *DCS Tone System* on page 28 for details.

**Values:** 104 Standard DCS codes.

**Default:** 023

> The value for this Menu Item is to be applied separately for each Operating Band / Mode.

### Menu #11 DCS.N/R

**Function:** Selects Normal or Inverted DCS coding. See DCS Code Inversion on page 30 for details.

**Values:** TRX N, RX R, TX R, TRX R

**Default:** TRX N
## Menu h 12 DSP.SUB

**Function:** Selects the **Sub** Band display format.

**Values:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQ</td>
<td>Displays the Sub band frequency (Dual band operation).</td>
</tr>
<tr>
<td>CWID</td>
<td>Displays the CW ID.</td>
</tr>
<tr>
<td>DC-IN</td>
<td>Displays the DC supply voltage.</td>
</tr>
<tr>
<td>OFF</td>
<td>No Display.</td>
</tr>
</tbody>
</table>

**Default:** FREQ

1. When this **Menu Item** is set to any selection other than the **FREQ** the **Sub** band receiver will be disabled.
2. The value for this **Menu Item** is to be applied separately to each **Hyper Memory Channel**.

## Menu #13 DTMF D

**Function:** Sets the **DTMF Autodialer Delay Time**.

See *Operating the DTMF Autodialer* on page 53 for details.

**Values:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50MS</td>
<td></td>
</tr>
<tr>
<td>250MS</td>
<td></td>
</tr>
<tr>
<td>450MS</td>
<td></td>
</tr>
<tr>
<td>750MS</td>
<td></td>
</tr>
<tr>
<td>1000MS</td>
<td></td>
</tr>
</tbody>
</table>

**Default:** 450MS

## Menu #14 DTMF S

**Function:** Sets the **DTMF Autodialer Sending Speed**.

See *Operating the DTMF Autodialer* on page 53 for details.

**Values:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50MS</td>
<td>(high speed)</td>
</tr>
<tr>
<td>75MS</td>
<td>(mid speed)</td>
</tr>
<tr>
<td>100MS</td>
<td>(low speed)</td>
</tr>
</tbody>
</table>

**Default:** 50MS
## Menu #15 DTMF W

**Function:** Loads the DTMF Autodialer Memories.  
See *Operating the DTMF Autodialer* on page 53 for details.

**Values:**

**Default:**

## Menu #16 HYPER

**Function:** Enables/disables the Automatic Writing feature for the Hyper Memory.  
See *Hyper Memory* on page 38 for details.

**Values:**

- MANUAL
- AUTO

  - MANUAL: Disables the Automatic Writing feature.
  - AUTO: Enables the Automatic Writing feature. The Hyper Memory data changes automatically when the radio’s configuration is changed (such as Mode change, Band Change, etc.).

**Default:** MANUAL

## Menu #17 INET

**Function:** Selects the Internet Connection mode.  
See *Internet Connection Feature* on page 55 for details.

**Values:**

- INT.COD
- INT.MEM

  - INT.COD: Sets up the Internet Connection mode for WIRES™ access.
  - INT.MEM: Sets up the Internet Connection mode for other (DTMF string) Internet Link System access.

**Default:** INT.COD

## Menu #18 INET C

**Function:** Selects the Access Number (DTMF digit) for WIRES™ operation.  
See *Internet Connection Feature* on page 55 for details.

**Values:**

- CODE 0 – 9, CODE A – F

**Default:** CODE 1
## Menu #19 INET M

**Function:** Selects the Access Number (DTMF code) for non-WIRES™ Internet Link System access. See *Internet Connection Feature* on page 55 for details.

<table>
<thead>
<tr>
<th>Values</th>
<th>d-1 – d-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>d-1</td>
</tr>
</tbody>
</table>

## Menu #20 KEY.MOD

**Function:** Selects the key functions for the right band function switches. See *Front Panel Controls* on page 6 for details.

<table>
<thead>
<tr>
<th>Values</th>
<th>KEY1, KEY2</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>left and right side keys function as LOW, V/M, HM, and SCN</td>
</tr>
<tr>
<td>KEY2</td>
<td>left side keys function as LOW, V/M, HM, and SCN right side keys function as MHz, REV, TONE, and SUB</td>
</tr>
<tr>
<td>Default</td>
<td>KEY1</td>
</tr>
</tbody>
</table>

## Menu #21 LOCK

**Function:** Enables/disables the *Key/Button Lock* feature. See *Activate the Lock Feature* on page 18 for details.

<table>
<thead>
<tr>
<th>Values</th>
<th>ON, OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>OFF</td>
</tr>
</tbody>
</table>

## Menu #22 LOCKT

**Function:** Enables/disables the *PTT Lock* feature.

<table>
<thead>
<tr>
<th>Values</th>
<th>OFF, BAND R, BAND L, BOTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Enables the PTT switch.</td>
</tr>
<tr>
<td>BAND R</td>
<td>Disables the PTT switch on the right band.</td>
</tr>
<tr>
<td>BAND L</td>
<td>Disables the PTT switch on the left band.</td>
</tr>
<tr>
<td>BOTH</td>
<td>Disables the PTT switch on the both band.</td>
</tr>
<tr>
<td>Default</td>
<td>OFF</td>
</tr>
</tbody>
</table>
### Menu #23 MIC

**Function:** Selects the microphone type to be used.

**Values:** MH-48, MH-42

**Default:** MH-48

### Menu #24 MUTE

**Function:** Selects the Audio Mute mode.  
See *Select the Audio Muting Preference* on page 20 for details.

**Values:**
- **OFF**  
  Disables the Audio Mute feature.
- **TX**  
  Reduces the audio level of the Sub band whenever you transmit on the Main band.
- **RX**  
  Reduces the audio level of the Sub band whenever you receive a signal on the Main band.
- **TX/RX**  
  Reduces the audio level of the Sub band whenever you receive a signal on the Main band or you transmit on the Main band.

**Default:** OFF

### Menu #25 NAME

**Function:** Stores an Alpha-Numeric Tag for a memory channel.  
See *Create a Name Tag for a Memory Channel* on page 33 for details.

**Values:**

**Default:** 

> The value for this Menu Item is to be applied separately for each Operating Band / Mode.
Menu h 26 PKT.SPD

Function: Sets the transceiver’s circuitry for the Packet baud rate to be used.

Values: 1200BPs, 9600BPs

Default: 1200BPs

The value for this Menu Item is to be applied separately to each Hyper Memory Channel.

Menu h 27 PKT.RXB

Function: Sets the receiving band for Packet operation.

Values: MAIN, R-FIX, L-FIX

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAIN</td>
<td>Packet can be operated on the Main band.</td>
</tr>
<tr>
<td>R-FIX</td>
<td>Packet can be operated on the right band only.</td>
</tr>
<tr>
<td>L-FIX</td>
<td>Packet can be operated on the left band only.</td>
</tr>
</tbody>
</table>

Default: MAIN

(1) Packet transmit band is fixed on the Main band.

(2) The value for this Menu Item is to be applied separately to each Hyper Memory Channel.

Menu #28 PG P1

Function: Programs the MH-48A6J microphone’s P1 button assignment. See Program the Microphone Buttons on page 13 for details.

Values: BAND, VFO/MR, SCAN, SQL.OFF, TCALL, RPTR, PRI, LOW, TONE, MHz, REV, HOME

Default: BAND
Menu #29 PG P2

Function: Programs the MH−48A6J microphone's P2 button assignment.
See *Program the Microphone Buttons* on page 13 for details.

<table>
<thead>
<tr>
<th>Values:</th>
<th>BAND, VFO/MR, SCAN, SQL.Off, TCALL, RPRTR, PRI, LOW, TONE, MHz, REV, HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>VFO/MR</td>
</tr>
</tbody>
</table>

Menu #30 PG P3

Function: Programs the MH−48A6J microphone's P3 button assignment.
See *Program the Microphone Buttons* on page 13 for details.

<table>
<thead>
<tr>
<th>Values:</th>
<th>BAND, VFO/MR, SCAN, SQL.Off, TCALL, RPRTR, PRI, LOW, TONE, MHz, REV, HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>TONE</td>
</tr>
</tbody>
</table>

Menu #31 PG P4

Function: Programs the MH−48A6J microphone's P4 button assignment.
See *Program the Microphone Buttons* on page 13 for details.

<table>
<thead>
<tr>
<th>Values:</th>
<th>BAND, VFO/MR, SCAN, SQL.Off, TCALL, RPRTR, PRI, LOW, TONE, MHz, REV, HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Menu #32 RF SQL

Function: Adjust the RF SQL threshold level.
See *Set the RF Squelch Level* on page 21 for details.

<table>
<thead>
<tr>
<th>Values:</th>
<th>OFF, S−2, S−5, S−9, S−FULL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>OFF</td>
</tr>
</tbody>
</table>

This Menu Item can be set independently on both the left and right bands.
Menu b 33 RPT.MOD

**Function:** Sets the Repeater Shift Direction.

**Values:** RPT.OFF, RPT.-, RPT.+ 

**Default:** RPT.OFF (simplex)

*The value for this Menu Item is to be applied separately for each Operating Band / Mode.*

Menu #34 SCAN

**Function:** Selects the Scan-Resume mode. See *Set the Scan-Resume Preference* on page 42 for details.

**Values:**

<table>
<thead>
<tr>
<th>TIME</th>
<th>BUSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME</td>
<td>Scanning will halt on a signal it encounters, and will hold five seconds. If you do not take action to disable the scanning within five seconds, scanning will resume even if the stations are still active.</td>
</tr>
<tr>
<td>BUSY</td>
<td>Scanning will halt on a signal it encounters. Two seconds after the carrier has dropped because the other station(s) ceased transmission, scanning will resume.</td>
</tr>
</tbody>
</table>

**Default:** BUSY

*This Menu Item can be set independently for each band.*
**Menu b 35 SCAN M**

**Function:** Selects the Memory Scan mode.  
See *Scan in Memory Mode* on page 45 for details.

**Values:**  
- **MEM**: Enables Memory Scanning on all memory channels.  
- **MSM**: Enables Memory Scanning on flagged Memory Channels only.

**Default:** **MEM**

The value for this Menu Item is to be applied separately for each Operating Band / Mode.

**Menu b 36 SHIFT**

**Function:** Sets the magnitude of the Repeater Shift.  

**Values:** 0.00 – 99.95 MHz (50 kHz step)

**Default:** Depends on the band of operation.

The value for this Menu Item is to be applied separately for each Operating Band / Mode.

**Menu b 37 STEP**

**Function:** Sets the Synthesizer steps. See *Select the Channel Step* on page 19 for details.

**Values:** 5.0k, 10.0k, 12.5k, 15.0k, 20.0k, 25.0k, 50.0k

**Default:** Depends on the band of operation.

The value for this Menu Item is to be applied separately for each Operating Band / Mode.
Menu #38 SPCONT

Function: Defines the audio path to the external speaker (when used).

Values:
- **EXT**: The audio is routed to external speaker (internal speaker is off).
- **OFF**: The audio is not routed (internal and external speakers are both off).
- **INT.EXT**: The audio is routed to both the internal and external speakers.
- **INT**: The audio is routed to the internal speaker only (external speaker is off).

Default: EXT

Menu b 39 TONE F

Function: Sets the CTCSS Tone Frequency.

See CTCSS Tone System on page 27 for details.

Values: 50 Standard CTCSS Tones
Default: 100 Hz

*The value for this Menu Item is to be applied separately for each Operating Band, Mode, and Memory channel.*

Menu b 40 TONE M

Function: Selects the Tone Encoder and, or Decoder mode.

See CTCSS Tone System on page 27 for details.

Values:
- **OFF**, **ENC**, **ENC.DEC**, **DCS**
  - **OFF**: No Encoder, Decoder
  - **ENC**: CTCSS Encoder
  - **ENC.DEC**: CTCSS Encoder, Decoder
  - **DCS**: Digital Code Squelch Encoder, Decoder

Default: OFF

*The value for this Menu Item is to be applied separately for each Operating Band / Mode.*
### Menu #41 TOT

**Function:** Sets the Time-Out Timer. See *Activate the Time-Out Timer* on page 21 for details.

**Values:** 1 – 30 minutes or OFF

**Default:** 6MIN

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### Menu h 42 VFO.TR

**Function:** Enables/disables the VFO Tracking feature. See *Activate the Band Linking Feature* on page 20 for details.

**Values:** ON, OFF

**Default:** OFF

The value for this Menu Item is to be applied separately to each Hyper Memory Channel.

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### Menu b 43 WID.NAR

**Function:** Reducing the MIC Gain (and Deviation). See *Set FM Bandwidth and MIC Gain* on page 22 for details.

**Values:** WIDE, NARROW

**Default:** varies

The value for this Menu Item is to be applied separately for each Operating Band / Mode.

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### Menu #44 X-RPT

**Function:** Enables/disables the Cross-Band Repeater feature. See *Operate as a Cross-Band Repeater* on page 57 for details.

**Values:**

**Default:**
### Menu b 45 AM

**Function:** Enables/disables the AM mode.

**Values:** ON, OFF

**Default:** OFF

> The value for this Menu Item is to be applied separately for each Operating Band / Mode.

### Menu h 46 AUT. AM

**Function:** Selects the receiving mode.

**Values:** AUTO, OFF

**Default:** AUTO (AM in Aeronautical Band, FM elsewhere)

> The value for this Menu Item is to be applied separately to each Hyper Memory Channel.