FT-8900R Operating Manual

Front Panel Controls & Switches

(1) "Left" DIAL knob

This 20-position detended rotary switch is the tuning dial for the "***left***" band.

Press this knob momentarily to switch the "Main band" to the "***left***" band.

When the "***left***" band is set to the "Main band" with the VFO mode, press this knob to enable the rapidly tuning (in 1 MHz step) by this knob.

Press and hold this knob for 1/2 second, move the operating band on the ***"left***" band as following:

144 MHz → 430 MHz → 29 MHz → 50 MHz → 144 MHz ……

(2) "Left" VOL -/- SQL Knob

The inner VOL (Volume) control adjusts the speaker audio level form the "***left***" receiver. Clockwise rotation increases the audio level.

Press this knob momentarily to switch the Internet Connection feature "on" and "off."

The outer SQL (Squelch) control is used to silence background noise on the "***left***" receiver. 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.

(3) Hyper Memory Button ([1] ~ [6])

Press and hold the one of these buttons for 2 seconds, store the total current configuration of the radio into a special "Hyper" memory bank.

Press the appropriate button momentarily, recall the desired "Hyper" memory.

(4) "Left" [LOW] Key

Press this key momentarily to select the transmitter power output level of the "***left***" band ("LOW," "MID2," "MID1," or "HIGH").

When the "***left***" band is set to the Memory mode or Home Channel, press and hold this key for 1/2 second to switch the memory channel display between the "Frequency" and "Alpha-numeric Tag."

(5) "Left" [V/M] Key

Press this key momentarily to switch the frequency control for the "***left***" band between the VFO and Memory System.
When the "***left***" band is set to the VFO mode, press and hold this for 1/2 second to activates the Smart Search Feature.
When the "***left***" band is set to the Memory mode, press and hold this key for 1/2 second to shift the "memory Tuning" feature.

(6) "Left" [HM] Key

Press this key momentarily to recall a favorite "Home" frequency memory.
Press and hold this for 1/2 second to activates the Priority Channel Scanning.

(7) "Left" [SCN] Key

Press this key momentarily to activates the Scanner on the "***left***" band.
When the "***left***" band is set to the Memory mode, press and hold this key for 1/2 second to setup the Scan Skip List or Preferential Scan List.

(8) [SET] Key

Press this key momentarily to enter the Set mode.
Press and hold this for 1/2 second to transfer the contents of the "Main band" VFO into a Memory register.

Important Note: The "right" side ([LOW], [V/M], [HM], and [SCN]) keys may be select two functions via the Menu #21 (KEY.MOD). See page ?? for selecting procedure.

(9) "Right" [LOW] Key ([MHz] Key)

Key Mode "1" (Default)

Press this key momentarily to select the transmitter power output level of the "***right***" band ("LOW," "MID2," "MID1," or "HIGH").
When the "***right***" band is set to the Memory mode or Home Channel, press and hold this key for 1/2 second to switch the memory channel display between the "Frequency" and "Alpha-numeric Tag."

Key Mode "2"

Press this key momentarily to allows tuning in 1-MHz step on the "Main" band VFO.
Press and hold this key for 1/2 second to allows tuning in 10-MHz step on the

"Main" band VFO.

(10) "Right" [V/M] Key ([REV] Key)

Key Mode "1" (Default)

Press this key momentarily to switch the frequency control for the "***right***" band between the VFO and Memory System.

When the "***right***" band is set to the VFO mode, press and hold this for 1/2 second to activates the Smart Search Feature.

When the "***right***" band is set to the Memory mode, press and hold this key for 1/2 second to shift the "memory Tuning" feature.

Key Mode "2"

Press this key momentarily to reverses the transmit and receive frequencies on the "Main" band during split-frequency operation.

Press and hold this key for 1/2 second to change the frequency shift direction: RPT – (minus shift), RPT + (plus shift), RPT OFF (simplex).

(11) "Right" [HM] Key ([TONE] Key)

Key Mode "1" (Default)

Press this key momentarily to recall a favorite "Home" frequency memory.

Press and hold this for 1/2 second to activates the Priority Channel Scanning.

Key Mode "2"

Press this key momentarily to change the Tone Squelch mode: ENC (CTCSS Encoder), ENC.DEC (CTCSS Tone Squelch), or DCS (DCS) operation.

(12) "Right" [SCN] Key ([SUB] Key)

Key Mode "1" (Default)

Press this key momentarily to activates the Scanner on the "***Right***" band.

When the "***Right***" band is set to the Memory mode, press and hold this key for 1/2 second to setup the Scan Skip List or Preferential Scan List.

Key Mode "2"

Press this key momentarily to make a following key act on the "Sub" band ("MAIN" icon blinks on the "Sub" band).

(13) VOL -/- SQL Knob (Right)

The inner VOL (Volume) control adjusts the speaker audio level form the "***right***" receiver. Clockwise rotation increases the audio level.

Press this knob momentarily to turn the radio "on" and "off."

The outer SQL (Squelch) control is used to silence background noise on the "***right***" receiver. 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.

(13) DIAL knob (Right)

This 20-position detended rotary switch is the tuning dial for the "***right***" band.

Press this knob momentarily to switch the "Main band" to the "***right***" band.

When the "***right***" band is set to the "Main" band with the VFO mode, press this knob to enable the rapidly tuning (in 1 MHz step) by this knob.

Press and hold this knob for 1/2 second, switch the operating band on the "***right***" band between 144 MHz and 430 MHz.

Rear Panel Connections

(1) Antenna Jack

Connect your antenna here, using a type-M (PL-259) plug and coaxial cable.

(2) DATA Jack

This 6-pin mini-DIN connector provides simple interfacing to a packet Terminal Node Controller (TNC) for 1200 bps or 9600 bps operation.

(3) 13.8V DC Cable Pigtails w/Fuse

This is the DC power supply connection for the transceiver. Use the supplied DC cable to connect this pigtail to the car battery or base station DC power supply capable of at least 9 Amperes (continuous duty). Make certain that the Red lead connects to the Positive (+) side of the power source, and that the Black lead connects to the Negative (-) side of the power source.

(4) EXT SP Jack

This 2-conductor, 3.5-mm mini phone jack provides audio output for an optional

speaker. The optimum load impedance is 8-ohm. Insert a plug into this jack, disable audio from the transceiver's internal speaker.

MH-48A6J Microphone

(1) PTT Switch

Press this switch to transmit, and release it to receive.

(2) Keypad

These 16 keys generate DTMF tones during transmission.

In the receive mode, these 16 keys can be used for direct frequency entry and/or direct numeric recall of the Memory channels.

(3) [P1]/[P2]/[P3]/[P4] Buttons

[P1] button: Press this button to switch the "Main band" between "Left" band and "right" band.

Press and hold this button for 1/2 second, moves operation to the next-highest frequency band on the "Main" band.

[P2] button: Press this button momentarily to switch the frequency control for the "Main" band between the VFO and Memory System.

When the "Main" band is set to the VFO mode, press and hold this button for 1/2 second to activates the Smart Search Feature.

When the "Main" band is set to the Memory mode, press and hold this button for 1/2 second to shift the "memory Tuning" feature.

[P3] button: Pressing this button repeatedly allows selection of the CTCSS and DCS mode on the "Main" band. The selections available are:

ENC → ENC.DEC (Tone Squelch) → DCS → OFF → ENC ……

[P4] button: Press this button momentarily to select the transmitter power output level on the "Main" band ("LOW," "MID2," "MID1," or "HIGH").

You can reprogram the [P1], [P2], [P3], and [P4] buttons for other functions, if desired. See page ?? for details.

(4) LAMP Switch

This switch illuminate the MH-48A6J keypad.

(5) LOCK Switch

This switch locks out the MH-48A6J buttons (except keypad and PTT switch).

(6) [UP]/[DWN] Button

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

Basic Operation

Turning the Transceiver On and Off

1. To turn the transceiver on, press and hold in the "left" VOL knob for 2 seconds. When you turn on the FT-8900, the current DC supply voltage is indicated on the LCD for 2 seconds. After this interval, the display resume its normal indication of the operating frequency.
2. To turn the transceiver off, again press and hold in the "left" VOL knob for 2 seconds.

Adjusting the Audio Volume Level

The audio volume level is set independently for the "left" and "right" sides of the transceiver. The "left" VOL knob provide adjustment for the "left" side of the FT-8900, while the "right" VOL knob adjustment for the "left" side of the FT-8900.

Adjusting the Squelch Setting

The squelch is also set independently for the "left" and "right" sides of the transceiver. The "left" SQL knob provide adjustment for the "left" side of the FT-8900, while the "right" VOL knob adjustment for the "left" side of the FT-8900.

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.

To set up the RF Squelch circuit for operation, of cause, you may set the RF Squelch independently for the "left" and "right" sides, use the following procedure:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main band" DIAL knob to select Menu #34 (RF SQL).
3. Press the "Main band" DIAL knob momentarily, then rotate the "Main" 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 "Main band" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

Selecting the Operating Band

In the factory default configuration, The FT-8900 operates in the "Dual Receive" mode. During Dual Receive operation, the "Main" band frequency (which transmission is possible) will be indicate the "MAIN" icon.

To establish the "Main" band, simply press the microphone's [P1] key or press the DIAL knob for the "***left***" or "***right***" side momentarily, as appropriate. You will observe the "MAIN" icon lighting up alternate sides of the display as you switch "Main" bands from the "***left***" side to the "***right***" side, and vice-versa.

Selecting the Frequency Band

Press and hold in the "***left***" DIAL knob to move the operating band on the "***left***" band

144 MHz → 430 MHz → 29 MHz → 50 MHz → 144 MHz ……

Press and hold in the "***right***" DIAL knob to switch the operating band on the "***right***" band between the 144 MHz and 430 MHz.

R.F. Says: You may select the operating band on the "Main" band by press and holding the microphone's [P1] key.

Frequency Navigation

1) Tuning Dial

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

On the "Main" band frequency, press the DIAL knob momentarily, then rotate the DIAL knob, the "Main" band frequency steps of 1 MHz will be selected. This feature is extremely useful for making rapid frequency excursions over the wide tuning range of the FT-8900.

2) Direct Keypad Frequency Entry (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 on the 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 29.480 MHz, press [0] → [2] → [9] → [4] → [8] → [0]
To enter 433.000 MHz, press [4] → [3] → [3] → [0] → [0] → [0]

3) Scanning

From the VFO mode, press the [SCN] key momentarily, the FT-8900 will begin scanning toward a higher frequency, and will stop when it receives a signal strong enough to break through the squelch threshold. The FT-8900 will then hold on that frequency according to the setting of the resume mode (Menu #36 [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-8900 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 the scanning.

Transmission

To transmit, simply close the PTT (Push To Talk) switch on the microphone.
The FT-8900 is transmitted on the "Main" band. During transmission, the "TX" icon indicate at the upper right of the "Main" frequency.

Changing the Transmitter Power Level

You can select between a total of four transmit power levels on your FT-8900.

	LOW	MID 2	MID 1	HIGH
29/144 MHz	5 W	10 W	20 W	50 W
50 MHz	5 W	10 W	20 W	35
430 MHz	5 W	10 W	20 W	30

To change the power level, press the [LOW] key to select one of four power setting. These power levels will be stored in memory registers, at the time of memory storage (see page ?? for details on Memory operation).

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

R.F. Says: You may change the power level on the "Main" band by the microphone's [P4] key.

Advanced Operation

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" band DIAL knob to select Menu #22 (LOCK).
3. Press the "Main" band DIAL knob momentarily, then rotate the "Main" DIAL knob to change the setting to "ON."
4. Press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.
5. To unlock the panel switches and DIAL knobs, select "OFF" in step 3 above.

Keyboard Beeper

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

If you want to turn the beep off:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" band DIAL knob to select Menu #5 (BEEP).
3. Press the "Main" band DIAL knob momentarily, then rotate the "Main" DIAL knob to change the setting to "OFF."
4. Press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

5. To back on again the beep, select “ON” in step 3 above.

Channel Step Selection

The FT-8900’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-8900 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.

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” band DIAL knob to select Menu #39 (STEP).
3. Press the “Main” band DIAL knob momentarily, then rotate the “Main” DIAL knob to select the new channel step size.
4. Press and hold in the “Main” DIAL knob for 1/2 second to save the new setting and exit to normal operation.

Display Brightness

The FT-8900 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 “Main” band DIAL knob to select Menu #9 (DIMMER).
3. Press the “Main” band DIAL knob momentarily, then rotate the “Main” 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 “Main” DIAL knob for 1/2 second to save the new setting and exit to normal operation.

Band Linking

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

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” band DIAL knob to select Menu #44 (VFO.TR).
3. Press the “Main” band DIAL knob momentarily, then rotate the “Main” DIAL knob

to change the setting to "ON."

4. Press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

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

Audio Muting

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 "Main" band DIAL knob to select Menu #25 (MUTE).
3. Press the "Main" band DIAL knob momentarily, then rotate the "Main" DIAL knob to select the desired selection.
   - TX: Reduce the audio level of the "Receive Only" band whenever you transmit on the "Main" band
   - RX: Reduce the audio level of the "Receive Only" band whenever you receive a signal on the "Main" band.
   - TX/RX: 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
   - OFF: Disable the Audio Mute feature
4. Press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

Repeater Operation

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-8900 includes a number of features which make repeater operation simple and enjoyable.

Repeater Shifts

Your FT-8900 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 at the bottom of the LCD when repeater shifts have been enabled.

Automatic Repeater Shift (ARS)

The FT-8900 provides a convenient Automatic Repeater Shift 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 re-enable ARS:

1. Press the SET key momentarily to enter the Set mode.
2. Rotate the “Main” band DIAL knob to select Menu #2 (ARS).
3. Press the “Main” band 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 1/2 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 do this:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” band DIAL knob to select Menu #35 (RPT.MOD).
3. Press the “Main” band DIAL knob momentarily, then rotate the “Main” DIAL knob to select the desired shift among “–,” “+,” and “OFF.”
4. Press and hold in the “Main” DIAL knob for 1/2 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" band DIAL knob to select Menu #38 (SHIFT).
3. Press the "Main" band 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 1/2 second to save the new setting and exit to normal operation.

R.F. Says: If you just have one "odd" split that you need to program, don't change the "default" repeated shifts using this Menu Item! Enter the transmit and receive frequencies separately, as shown on page ??.

Checking the Repeater Uplink (Input) Frequency

It often is helpful to be able to check the uplink (input) frequency of a repeater, to see if the calling station is within direct ("Simplex") range.

To do this, just press the [HM/RV(EMG)] key. You'll notice that the display has shifted to the repeater uplink frequency. Press the [HM/RV(EMG)] key again to cause operation to revert to normal monitoring of the repeater downlink (output) frequency.

RF Says: The configuration of this key may be set either to "RV" (for checking the input frequency of a repeater, or "HM" (for instant switching to the "Home" channel for the band you are operating on). To change the configuration of this key, use Menu Item "Misc. Setup #2 [HOM/REV]. See page ??.

CTCSS/DCS Operation

CTCSS Operation

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-8900,

and is very easy to activate.

R.F. Says: CTCSS setup involves two actions: setting the Tone Frequency and then setting of the Tone Mode. These actions are set up by using the Set mode #42 (TONE M) and #41 (TONE F).

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" band DIAL knob to select Menu #42 (TONE M).
3. Press the "Main" band DIAL knob momentarily, then rotate the "Main" DIAL knob so that "ENC" appears on the display; this activates the CTCSS Encoder, which allows repeater access.

   R.F. Says: You may notice an additional "DCS" icon appearing while you rotate the "Main" DIAL knob in this step. We'll discuss the Digital Code Squelch system shortly.
4. Rotate the "Main" DIAL knob one click clockwise in step "3" above will occasionally cause "ENC.DEC." When "ENC.DEC" appears, this means that the Tone Squelch system is active, which mutes your FT-8900'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 "Main" DIAL knob momentarily then rotate the "Main" DIAL knob one click counter-clockwise to select Menu #41 (TONE F). This Menu selection allows setting of the CTCSS tone *frequency* to be used.
6. Press "Main" DIAL knob momentarily to enable the adjustment of the CTCSS frequency.
7. Rotate the "Main" DIAL knob until the display indicates the Tone Frequency you need to be using.
8. When you have made your selection, press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

R.F. Says: 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-8900 is not passing audio, repeat steps "1" through "4" above, but rotate the "Main" DIAL knob so that "ENC" appears - 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 by the microphone's [P3] key.

DCS Operation

Another form of tone access control is Digital Code Squelch, or 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-8900, and operation is very similar to that just described for CTCSS. 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.

R.F. Says: 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" band DIAL knob to select Menu #42 (TONE M).
3. Press the "Main" band 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. 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).
7. When you have made your selection, press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

R.F. Says: 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 Tone Squelch mode (ENC, ENC.DEC, or DCS) on the "Main" band by the microphone's [P3] 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 vs. 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 or DCS Decoder operation (see the previous discussion). 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 "Main" DIAL knob select the Menu #41 (TONE F) when CTCSS is selected, or Menu #10 (DCS.COD) during DCS operation.
4. Press the "Main" DIAL knob to enable adjustment of the selected Menu Item.
5. Press the "Main" [SCN] 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 "Main" DIAL knob momentarily to lock in that tone/code, then press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

R.F. Says: 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 [SCN] key to halt the scan at any time.

Tone Scanning works either in the VFO or Memory modes.

Memory Operation

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

- ❒ Regular Memory Channels, which made up of:
  - ❍ 799 "Standard" memory channels, numbered "001" through "799."
  - ❍ Four Home channels, 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, labeled "L1/U1" through "L5/U5."
- ❒ Six "Hyper-Memory" Channels

Regular Memory Channel Operation

Memory Storage

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 be also be set at this time, if you wish to store it.
2. Press and hold the [SET] key for 1/2 second. A memory number will appear (blinking) on the display.
3. Within ten seconds of pressing the [SET] key, use the "Main" DIAL knob or microphone's [UP]/[DOWN] buttons to select the desired memory for storage (if the channel is already occupied by data stored previously, the "channel frequency" notation will appear on the display.
4. To attach an alpha/numeric name "Tag" to the memory, press and hold the [SET] key for 1/2 second, then proceed to the next step; otherwise press the [SET] key momentarily to save the entry and exit to normal operation.

To append an Alpha-numeric "Tag" to a Memory

1. After press and holding the [SET] key in step 4 above, rotate the "Main" DIAL knob to select the first character in the name you wish to store, the press the "Main" DIAL knob momentarily to move on to the next character. Letters, numbers, and symbols are available for storage.
2. Again rotate the "Main" DIAL knob to select the desired letter, number, or symbol, then press the "Main" DIAL knob momentarily to move on to the next character's slot.

   If you make a mistake, press the microphone's [DWN] key to move back to front character's slot, then re-select the correct letter, number, or symbol.
3. Repeat above step to program the remaining letter, number, or symbol of the desired label. A total of six characters may be used in the creation of a label.
4. When you have completed the creation of the label, press the [SET] key momentarily to save the label and exit to normal operation.

Storing Independent Transmit Frequencies ("Odd Split")

1. Store the receiving frequency using the method already described.
2. Turn to the desired transmit frequency on the "Main" band, then press and hold the [SET] key for 1/2 second.
3. Within ten seconds of pressing the [SET] key, use the "Main" DIAL knob or microphone's [UP]/[DOWN] buttons to select same memory channel number as

used in step1 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.

R.F. Says: Whenever you recall a memory which contains independently-stored transmit and receive frequencies, the "[–+]" indication will appear in the display.

Memory Recall

1. While 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.
3. To return to the VFO mode, press the [V/M] key momentarily again.

R.F. Says: 1) When the radio is already set to the Memory mode, an easy way to recall memories is to enter the microphone's key in the memory channel number. For example, to recall memory channel #4, press [0] → [0] → [4].

2) Memory channels on which you may have stored frequencies on the 29 MHz and 50 MHz amateur bands cannot be recalled on the "***right***" band.

Masking Memories

There may be situations where you want to "Mask" memories so they are not visible during memory selection or scanning. For example, several memories used only in a city you visit infrequently may be stored, then "Masked" until you visit that city, at which time you can "Unmask" them for normal use.

1. Press the [V/M] key, if needed, to enter the Memory mode.
2. Press and hold the [SET] key for 1/2 second, then rotate the "Main" DIAL knob to select the memory channel to be "Masked" from view.
3. Press the "Main" [SCN] key momentarily. The display will revert to memory channel #1. If you rotate the "Main" DIAL knob to the location you just "Masked," you will observe that it is now invisible.
4. To Unmask the hidden memory, repeat the above procedure: press and hold in the [SET] key for 1/2 second, rotate the "Main" DIAL knob to select the masked memory's umber, then press "Main" [SCN] to restore the memory channel's data.

R.F. Says: Watch out! You can manually store data over a "Masked" memory, deleting previous data, if you're not careful.

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" and "right" [V/M] keys 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 Mode

The FT-8900 usually stores, into memory, the operating frequency and some aspects of operating status (such as CTCSS/DCS data, repeater shift, power level etc.). However, the "Hyper Memory" Mode allows you to store the total current configuration of the radio into a special "Hyper" memory bank.

For example, a Hyper Memory location may store the frequencies of both the "Left" and "right" bands, plus Smart Search operational status, Scanning features, etc.

Hyper Memory Storage

1. Set up the transceiver according to the desired configuration.
2. Press and hold in the Hyper Memory key ([0] through [6]), corresponding to the Hyper Memory channel into which you wish to store this configuration, for 2 seconds.

Hyper Memory Recall

Press the appropriate Hyper Memory key ([0] through [6]) to recall the desired Hyper Memory channel.

Scanning

The FT-8900 allows you to scan just the memory channels, the entire operating band, or a portion of that band. It will halt on signals encountered, so you can talk to the station(s) on that frequency, if you like.

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 scanner to resume scanning after it halts on a signal.

Setting the Scan-Resume Technique

Two options for the Scan-Resume mode are available:

TIME: In this mode, the scanner will halt on a signal it encounters, and will hold five seconds. If you do not take action to disable the scanner within five seconds, the scanner will resume even if the stations are still active.

BUSY: In this mode, the scanner will halt on a signal it encounters. Two seconds after the carrier has dropped because the other station(s) ceased transmission, the scanner will resume.

To set the Scan-Resume mode:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" band DIAL knob to select Menu #36 (SCAN).
3. Press the "Main" band DIAL knob momentarily, then rotate the "Main" DIAL knob to select the desired scan-resume mode.
4. Press and hold in the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

R.F. Says: The default condition for this Menu Item is "TIME."

VFO Scanning

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.
3. If and when the scanner encounters a signal strong enough to open the squelch, the scanner will halt temporarily; the decimal point of the frequency display will blink during this "Pause" condition.
4. The scanner will then resume according to the Scan-Resume mode selected in the previous section.
5. To cancel scanning, press the [SCN] key momentarily again.

R.F. Says: When you start scanning, the FT-8900 will be changing frequency in the upward direction. If you want to change direction of the scan while it is underway, rotate the DIAL knob one click in the opposite direction (in this case, one click counter-

clockwise). You'll see the scanner turn around and change frequency downward!

You may change the scanning operation so that the VFO frequency will jump to the low band edge of the ***next band*** when the VFO frequency reaches the high edge of the current band (or vice versa). See page xx regarding Menu #4 (BAND).

Memory Scanning

Programmable (Band Limit) Memory Scan (PMS)

This feature allows you to set sub-band limits for either scanning or manual VFO operation. For example, you might with 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 radio to the VFO mode by pressing the [V/M] key, if necessary.
2. Using the techniques learned earlier, store (per the above concept) 144.300 MHz into Memory Channel #L1 (the "L" designates the Lower sub-band limit).
3. Likewise, store 148.000 MHz into Memory Channel #U1 (the "U" designates the Upper sub-band limit).
4. Switch to the Memory mode by pressing the [V/M] key once, then rotate the DIAL knob to select Memory Channel # L1.
5. Press and hold in the [V/M] key for 1/2 second to start PMS operation; the "MT" label will be appears on the display. Tuning and canning will now be limited within the just-programmed range.
6. Five pairs of Band Limit memories, labeled L1/U1 through L5/U5 are available. You therefore can set upper and lower operation limits on a number of bands, if you like.

"Priority Channel" Scanning (Dual Watch)

The FT-8900's scanning features include a two-channel scanning capability which allows you to operate on a VFO or Memory channel, while periodically checking a user-defined Memory Channel for activity. If a station is received on the Memory Channel which is strong enough to open the Squelch, the scanner will pause on that station in accordance with the Scan-Resume mode set via Set mode (Menu #36: SCAN). See page xx.

Here is the procedure for activating Priority Channel Dual Watch operation:

1. Press the [V/M] key momentarily to enter the Memory Recall mode, if you are not using memories already.
2. Press and hold in the [MON/F] key for 1/2 second, then select the memory channel you wish to be the "Priority" channel.
3. Press the [BAND(BND DN)] key. The "P" icon (for the "Main" band priority channel) or "p" icon (for the "Sub" band priority channel) will appear to the right of the "MR" icon, indicating it is the Priority channel.
4. Now set the **VX-7R** for operation on another memory channel, or on a VFO frequency.
5. Press the [MON/F] key, then press the [2(DW)] key. The display will remain on the VFO or memory channel selected, but every four seconds the **VX-7R** will check the Priority Channel for activity.

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 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 Shift is activated). The channel are loaded in 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.

Smart Search operation is simple to activate:

1. Set the radio to the VFO mode by pressing the [V/M] key, if necessary.
2. Press and hold the [V/M] key, cause the radio to scan upward on current band, loading channels on which it encounters a signal strong enough to open the squelch.
3. When 25 channels are loaded or scanner is reached band edge, the scanner will stop and the transceiver will revert to the starting frequency.
4. To recall the Smart Search memories just stored, rotate the DIAL knob or press the

microphone's [UP]/[DWN] keys (for the "Main" band Smart Search memories only).

5. If you found particular channels which you wish to store into the "regular" memory channel, follow the memory storage procedures described on page ??.

R.F. Says: 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 the Smart Search operation on the "Main" band by press and hold the microphone's [P2] key.
3) You may activate the Smart Search operation on the "left" and "right" bands at the same time.

ARTS™: Auto Range Transpond System

The ARTS 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 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 1 second. If the other radio is in range, the beeper will sound (if enabled) and the display will show "INRNG" as opposed to the out of range display "OUTRNG" 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 "OUTRNG." If you move back into range, your radio will again beep, and the display

will change back to the “INRNG” 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, etc. Here is how to activate ARTS:

Basic ARTS Setup and Operation

1. Set your radio and the other radio(s) to the same DCS code number, per the discussion on page ??.
2. Press the [SET] key momentarily to enter the Set mode.
3. Rotate the “Main” band DIAL knob to select Menu #3 (ARTS).
5. Press the “Main” band DIAL knob momentarily, then rotate the “Main” DIAL knob to select the desired ARTS beep option. The available options are:
   IN RANGE: 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.
6. Press the “Main” band DIAL knob momentarily. You will observe the “OUT. RNG” display on the LCD. ARTS operation has now commenced.
7. 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.
8. Press the “Main” band DIAL knob momentarily to exit ARTS operation and resume normal functioning of the transceiver.

CW Identifier Setup

The ARTS feature includes a CW identifier, as discussed previously. 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 16 characters.

Here’s how to program the CW Identifier:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” DIAL knob to select the Menu #8 (CWID W).
3. Press the “Main” DIAL knob momentarily.

4. Press the “Main” DIAL knob momentarily again to enable entering your callsign.
5. Rotate the DIAk 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 counter-clockwise to select the Menu #7 (CWID).
12. Press the “Main” DIAL knob momentarily, then rotate “Main” DIAL knob to select “TX ON” (to enable the CW identifier).
13. Press the “Main” band DIAL knob momentarily to save the setting and exit to normal operation.

DTMF Autodialer Operation

16 DTMF Autodialer memories are available on the FT-8900. 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, use following procedure:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” DIAL knob to select the Menu #15 (DTMF W).
3. Press the “Main” DIAL knob momentarily, then rotate the “Main” DIAL knob to select the DTMF Autodialer memory channel number (“d-1” through “D-16”) into which you wish store a telephone number.
4. Press the “Main” DIAL knob momentarily, then rotate the “Main” 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 “Main” DIAL knob momentarily. Now, rotate the “Main” DIAL knob to select the second of the 16 available numbers in this current DTMF Audodialer memory register.

6. Repeat this procedure for each digit in the telephone number.
   Press the "Main" [SCN] key momentarily to delete the previously-stored data after the cursor. If you make a mistake, press the microphone's [DWN] key to move back to front digit, then re-enter the correct number.
7. When entry of all digits is complete, press the [SET] key momentarily to save the new setting.
8. If you wish to store another DTMF string, rotate the "main" DIAL knob to select the another DTMF memory register, then repeat steps 4 through 7 above.
9. When all required DTMF memories are filled to your satisfaction, press and hold the "Main" DIAL knob for 1/2 second to exit to normal operation.

To transmit the memorized telephone number, use the following procedure:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" DIAL knob to select the Menu #15 (DTMF W).
3. Press the "Main" DIAL knob momentarily, then rotate the "Main" DIAL knob to select the DTMF Autodialer memory channel to be transmitted.
4. Press and hold the "Main" DIAL knob for 1/2 second to exit to normal operation.
5. Press the PTT switch.
6. While still holding the PTT switch in, press the "Main Band" [HM] key momentarily to transmit the tone string.

Once you have press the [HM] key above step, you can release the PTT switch, as Autodialer transmit the whole DTMF string automatically.

To speed at which the DTMF digits are sent can be changed. Three speed levels are available: 50 ms (High: 20 digits per second), 75 ms (Mid: 13 digits per second), and 100 ms (Low: 10 digits per second).

To select the speed, use the following procedure:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" DIAL knob to select the Menu #14 (DTMF S).
3. Press the "Main" DIAL knob momentarily, then rotate the "Main" DIAL knob to select the desired speed.
4. Press and hold the "Main" DIAL knob for 1/2 second to save the new setting and exit to normal operation.

You can also set a longer delay between the time you press the [SCN] key (with PTT

switch pressed) and the first DTMF digit is sent.

To set a delay time, use the following procedure:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the “Main” DIAL knob to select the Menu #13 (DTMF D).
3. Press the “Main” DIAL knob momentarily, then rotate the “Main” DIAL knob to select the desired time (50/250/450/750/1000 ms).
4. Press and hold the “Main” DIAL knob for 1/2 second to save the new setting and exit to normal operation.

Internet Connection feature

The FT-8900 can be used to access the repeater which provide the Vertex Standard WIRES™ (Wide-Coverage Internet Repeater Enhancement System).

1. Press the “left” DIAL knob momentarily to activate the Internet Connection feature.
   The “INT ON” will appear for 2 seconds at the “Main” band frequency display.
   The “int” icon appears at the memory channel indicating area on the “Sub” band while activating the Internet Connection feature.
2. Press the [SET] key momentarily to enter the Set mode.
3. Rotate the “Main” DIAL knob to select the Menu #19 (INET C).
4. Press the “Main” DIAL knob momentarily, then rotate the “Main” DIAL knob to select the access number corresponding to the WIRES™ repeater to which you wish to establish an Internet link (ask your repeater owner/operator if you don 稚 know the access numbers in the network).
5. Press and hold the “Main” DIAL knob for 1/2 second to save the new setting and exit to normal operation.
6. With the Internet Connection feature activated (as in step 1 above), the FT-8900 will generate a brief (0.1 second) DTMF tone according to your selection in step 4. This DTMF tone is sent at the beginning of every transmission to establish or maintain the link to the remote WIRES™ repeater.
7. To disable the Internet Connection feature, press the “left” DIAL knob again.

Miscellaneous Settings

Time-Out Timer

The “Time-Out Timer” (TOT) feature is designed to force the transceiver into the

"receive" mode after a present 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" condition.
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 as follows:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" DIAL knob to select the Menu #43 (TOT).
3. Press the "Main" DIAL knob momentarily, then rotate the "Main" DIAL knob to desired interval (between 1 and 30 minutes) or OFF.
4. Press and hold the "Main" DIAL knob for 1/2 second to save the new setting and to normal operation.

Automatic Power-Off

The "Automatic Power-Off" (APO) feature will turn the radio completely *off* after a user-defined period of the 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 as follows:

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

FM Bandwidth & MIC Gain Control

You can reduce the microphone input level and receiver bandwidth when operation 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.

To reducing the microphone input level as follow:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" DIAL knob to select the Menu #45 (WID.NAR).
3. Press the "Main" DIAL knob momentarily, then rotate the "Main" DIAL knob to change the display to "WIDE."
4. Press and hold the "Main" DIAL knob for 1/2 second to save the new setting and to normal operation.

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

R.F. Says: This feature is ignored on the 29 MHz and 50 MHz bands.

Programming the key assignment

Default FT-8900R key functions have been assigned to Microphone's [P1]/[P2]/[P3]/[P4] buttons at the factory. These may be changed by the user, if you wish to make another function.

To programming the function:

1. Press the [SET] key momentarily to enter the Set mode.
2. Rotate the "Main" DIAL knob to select the Menu Item to be assigned ("#29 PG P1," "#30 PG P2," "#31 PG P3," or "#32 PG P4").
3. Press the "Main" DIAL knob momentarily, then rotate the "Main" DIAL knob to select the function you wish to assign to the button you selected in the previous step. The available choices are:

   SQL.OFF: Open the Squelch on the "Main" band to allow un-muted reception.
   TCALL: Activates 1750 Hz Tone Burst.
   RPTR: Selects Repeater Shift direction on the "Main" band.
   PRI: Activates the Priority feature on the "Main" band.
   LOW: Selects the transmit power output level on the "Main" band.
   TONE: Activates the CTCSS or DCS operation on the "Main" band.
   MHz: Allows tuning in 1-MHz step on the "Main" band VFO.
   REV: Reverses the transmit and receive frequencies during split-frequency operation.
   HOME: Switches operation to the "Home" channel on the "Main" band.
   BAND: Select the "Main" band of operation between "Left" band and "right"

band.

VFO/MR: Switches frequency control between the VFO and Memory mode on the "Main" band.

4. Press the [SET] key to save the new setting, then rotate the "Main" DIAL knob to select another programmable button to modify, if desired, and repeat the above steps.
5. Press and hold the "Main" DIAL knob for 1/2 second to exit to normal operation.

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®, 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 prevent receiver squelch from opening with DCS enabled, as the decoded bit sequence would not match that selected for 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 detective !

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 “Main” DIAL knob to select the Menu #11 (DCS.N/R).
3. Press the “Main” DIAL knob momentarily, then rotate the “Main” DIAL knob to select the following mode.
   TRX N: Encoder; Normal, Decoder; Normal
   RX R: Encoder; Normal, Decoder; Reverse (Invert)
   TX R: Encoder; Reverse (Invert), Decoder; Normal
   TRX R: Encoder; Reverse (Invert), Decoder; Reverse (Invert)
4. Press and hold the “Main” DIAL knob for 1/2 second to exit to normal operation.

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

Reset Procedure

1. Turn the radio off.
2. Press and hold in the “left” and “right” [V/M] keys while turning the radio on.
3. Rotate the “right” DIAL knob to select the resetting menu:
   SETMOD RESET: reset the Set (Menu) mode settings to their factory defaults.
   HYPER RESET: clear the Hyper Memories settings to factory defaults.
   MEMORY RESET: clear the Regular Memories settings to factory defaults.
   ALL RESET: clear the all memories and other settings to factory defaults.
4. Press the [SET] key momentarily to reset to their factory defaults.

Cloning

You can transfer all data stored in one FT-8900 to another FT-8900 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, use the following procedure:

1. Insert the Clone Cable into the DATA jack of each transceiver.
2. Turn both transceivers off, then press and hold in the “left” and “right” [V/M] keys 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. Disappear the display for a moment, then “CLONE” notation will appear on the display.

4. On the "***destination***" radio, press the "left" [LOW] key. The "CLONE -RX-" indicator will appear on the display.
5. Now, on the "***source***" radio, press the "left" [V/M] key. The "CLONE -TX-" indicator will appear on the display, and the cloning data transfer will immediately begin.
6. If there is a problem during the cloning process, "CLONE ERROR" will be displayed. Check your cable connections, and try again.
7. If cloning was successful, the "CLONE -RX-" and "CLONE -TX-" indicator will disappear.
8. Turn both transceivers off, then remove the Clone Cable. Channel and operating data for both radios are now identical. They both may be turned on now for normal operation.

1. Changes or modifications to this device not expressly approved by VERTEX STANDARD could void the user's authorization to operate this device.
2. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference including interference that may cause undesired operation.
3. The scanning receiver in this equipment is incapable of tuning, or readily being altered, by the User to operate within the frequency bands allocated to the Domestic public Cellular Telecommunications Service in Part 22.

DECLARATION BY MANUFACTURER

The Scanner receiver is not a digital scanner and is incapable of being converted or modified to a digital scanner receiver by any user.

WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.