



70-1488W-CD
VERSION 2.1.4
STII/XTR WINDOWS PROGRAMMING SOFTWARE
USER'S MANUAL



The 70-1488W-CD STII/XTR Programming Software allows users to program STII, XTR and Bantam mobile radios using the 70-1308A (70-1309 for Bantam) programming cable.

Minimum Requirements

Windows 95 or later
40 MB Hard Drive Space
CD-ROM Drive

Installation

1. Insert the CD into the CD-ROM drive.
2. If AutoOpen is not enabled, from the start menu select Run and type D:\Setup.exe, where D is the drive letter that the installation CD is in.
3. Follow the instructions on the screen to install the software.

Getting Started

1. To run the program, choose Start, Programs, Midland Programmers, XTR and STII Mobile Programmer.
2. From the *What Do You Want To Do* screen click the *Options* button and choose the appropriate communications port from the *Select a Commport* drop-down box. Then click the *OK* button to return to the *What Do You Want To Do* screen.
3. Choose *Syn-Tech II* from the drop down menu if you want to program a Syn-Tech II radio. Choose *Syn-Tech XTR* from the drop down menu to program a Syn-Tech XTR (or Bantam Mobile) radio.
4. Click the *Program The Radio* button to make a program file from scratch.

For XTR (and Bantam Mobile) Radios

1. Select a model type from the list and click the *Next* button.
2. Use the *Next* and *Back* buttons to step through the programming screens.
3. As a minimum, a receive channel frequency must be entered for at least one channel on the *Channel Data* screen.
4. Click the *Next* or *Finish* button to get to the *Finish* screen.
5. Make sure the radio is turned off and plug the 70-1308A programming cable into the programming port of the radio.
6. Turn the radio on.
7. Click the *Write To Radio* button to program the radio.
8. When the programming is finished turn the radio off and then unplug the programming cable.

For Syn-Tech II Radios

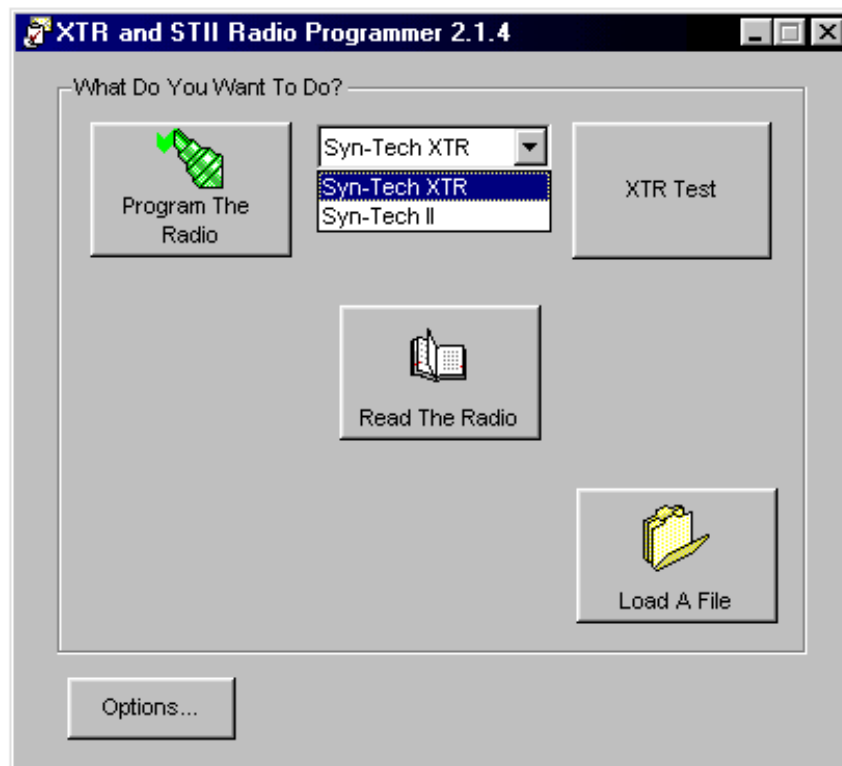
1. Enter a valid model number in the *Selected Model Number* box and click the *Next* button. **Note: this model number is not the model number printed on the nameplate.**
2. Use the *Next* and *Back* buttons to step through the programming screens.

3. As a minimum, a receive channel frequency must be entered for at least one channel on the *Channel Data* screen and the channel must be entered in a *Channel List* from the *Select Detailed Group Part 3 of 3* screen.
4. Click the *Next* or *Finish* button to get to the *Finish* screen.
5. Make sure the radio is turned off and plug the 70-1308A programming cable into the programming port of the radio.
6. Turn the radio on.
7. Click the *Write To Radio* button to program the radio.
8. When the programming is finished turn the radio off and then unplug the programming cable.

Overview

Syn-Tech XTR (**Syn-Tech II** begins on page 12)

What Do You Want To Do?



The program will start at the *What Do You Want To Do?* screen. This screen contains a drop down box to select either *Syn-Tech XTR* or *Syn-Tech II* models.

Program The Radio

To begin making a program from scratch click the *Program The Radio* button. The program will then switch to the *Select Radio Model* screen.

Read The Radio

To upload programming from a radio click the *Read The Radio* button.

Load A File

To load a previously saved file, click the *Load A File* button. This will open the *Load Radio File* dialog box.

XTR Test

To perform RX or TX tests and make adjustments on XTR radios click the *XTR Test* button. This will open the test screen. On Syn-Tech XTR the test screen allows adjustment of Maximum Modulation, High and Low Power levels, Reference Frequency and Crystal Type.

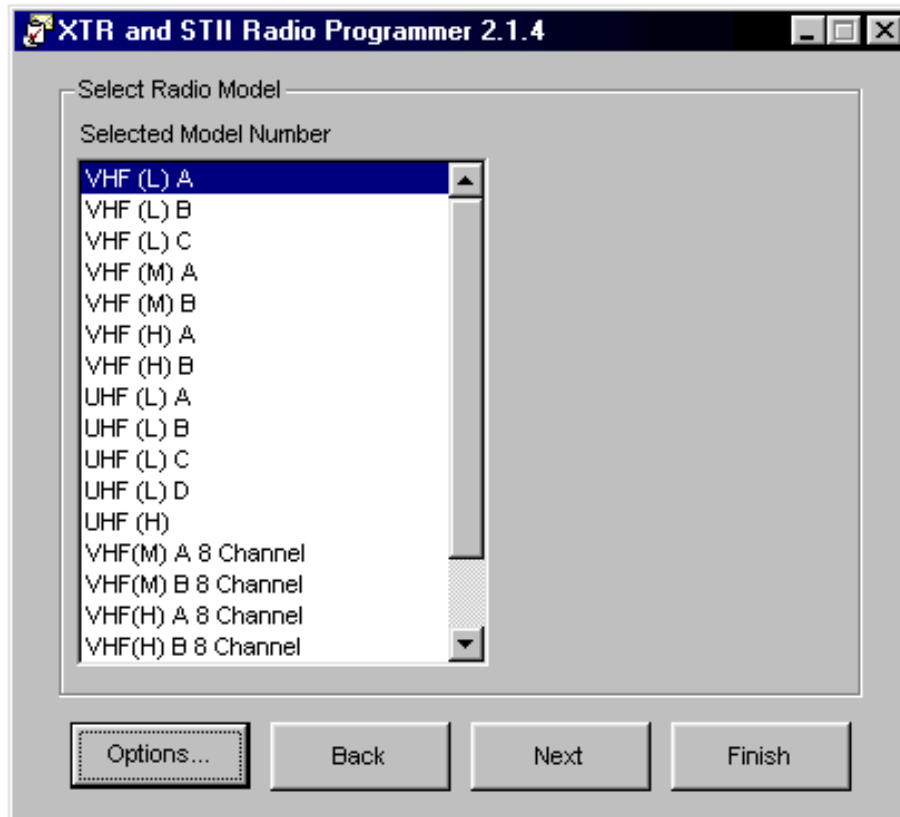
Options

To set the communications port to which the 70-1308A is attached click the *Options* button.

Click the *Next* button to continue to the *Select Radio Model* screen.

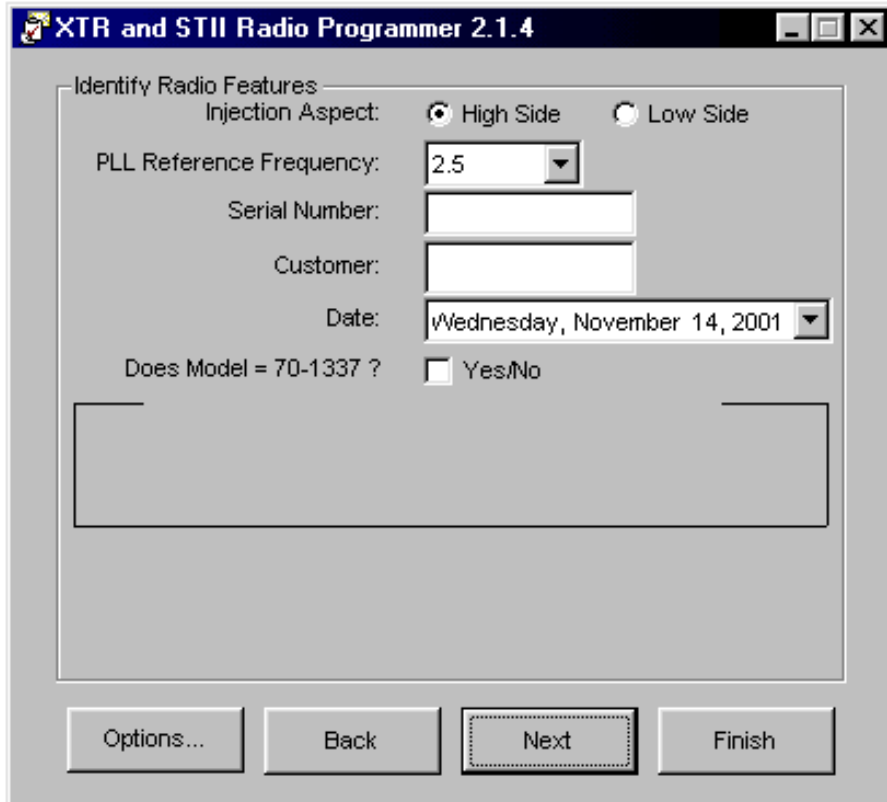
Select Radio Model

Highlight the band of the radio to be programmed from the list and click the *Next* button to continue to the *Identify Radio Features* screen.



Identify Radio Features

The *Identify Radio Features* screen allows changing the injection aspect (if an injection kit has been installed), changing the PLL reference frequency and inputting an optional serial number, customer name and date. The *70-1337?* check box should be checked if the radio to be programmed is 70-1337 Bantam Mobile.



The screenshot shows a window titled "XTR and STII Radio Programmer 2.1.4". Inside the window, the "Identify Radio Features" section contains the following controls:

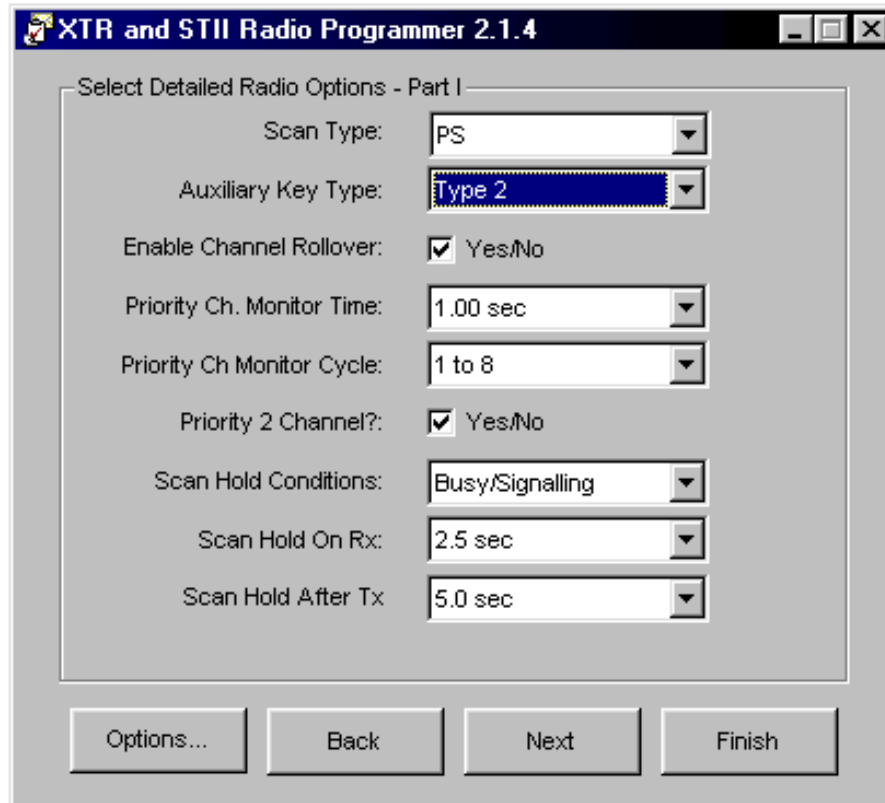
- Injection Aspect:** Two radio buttons, "High Side" (selected) and "Low Side".
- PLL Reference Frequency:** A dropdown menu currently showing "2.5".
- Serial Number:** An empty text input field.
- Customer:** An empty text input field.
- Date:** A date picker dropdown menu showing "Wednesday, November 14, 2001".
- Does Model = 70-1337 ?** A checkbox labeled "Yes/No" which is currently unchecked.

At the bottom of the window, there are four buttons: "Options...", "Back", "Next" (highlighted with a dashed border), and "Finish".

Click *Next* to continue to the *Select Detailed Radio Options - Part I* screen.

Select Detailed Radio Options - Part 1

The *Select Detailed Radio Options – Part I* screen allows selection of *Scan Type*, *Auxiliary Key Type*, *Channel Rollover*, priority channel options and scan hold options.



The screenshot shows a software window titled "XTR and STII Radio Programmer 2.1.4". Inside the window is a dialog box titled "Select Detailed Radio Options - Part I". The dialog box contains the following settings:

- Scan Type: PS
- Auxiliary Key Type: Type 2
- Enable Channel Rollover: Yes/No
- Priority Ch. Monitor Time: 1.00 sec
- Priority Ch Monitor Cycle: 1 to 8
- Priority 2 Channel?: Yes/No
- Scan Hold Conditions: Busy/Signalling
- Scan Hold On Rx: 2.5 sec
- Scan Hold After Tx: 5.0 sec

At the bottom of the dialog box are four buttons: "Options...", "Back", "Next", and "Finish".

Scan Type

The *Scan Type* drop box allows selection of *Normal*, *Modified*, *Secondary* and *PS* scan types.

- Normal Scan

When an XTR is programmed for *Normal* scan, two scan modes may be accessed, P SCAN and N SCAN. In P SCAN the Priority 1 channel is the selected channel when scan was activated. The radio will scan the SCAN A list and transmit will always occur on the Priority 1 channel. The Priority 2 channel will be sampled if it has been assigned. When N SCAN is activated the radio will scan the SCAN B list with no priority and will transmit on the last received channel.

When an 8-channel mobile is programmed for *Normal* scan, the radio will scan the SCAN A list. The Priority 1 channel will be the channel selected when scan was activated and the radio will always transmit on the Priority 1 channel. The Priority 2 channel will be sampled if it has been assigned.

- Modified Scan

When an XTR is programmed for *Modified* scan, two scan modes may be accessed P SCAN and N SCAN. The N SCAN button is normally replaced with an ESCape button for this scan type. When the ESC button is pressed while in P SCAN, scan is stopped on the last received channel. The Priority 1 channel is retained in memory and becomes active when ESC is pressed again. The Priority 1 channel is the selected channel when scan was activated. In P SCAN the radio will scan the SCAN A list while sampling the Priority 1 (and Priority 2 if it has been assigned) channel.

When an 8 channel mobile is programmed for *Modified* scan, operation is the same as *Normal* scan

type.

- **Secondary Scan**

When an XTR is programmed for *Secondary* scan, P MON and N SCAN modes are available. Activating the P MON mode allows the user to transmit and receive on the displayed channel (the secondary channel) while sampling the Priority 1 (and Priority 2 if assigned) channel. The Priority 1 channel will be the channel selected when P MON was activated. Transmit will occur on the displayed channel, so Priority 1 (and 2) transmit is possible during scan hold time. The N SCAN mode will operate the same as N SCAN under the Normal Scan type.

When an 8-channel mobile is programmed for *Secondary* scan, transmit and receive will occur on the displayed channel when scan is activated. The Priority 1 (and Priority 2 if assigned) will be sampled and the radio will transmit on the priority channel during scan hold time.

- **PS Scan (default)**

When an XTR is programmed for *PS* scan type, P SCAN is the only mode available. The radio will scan the SCAN A list while sampling the Priority 1 (and Priority 2 if assigned) channel. The Priority 1 channel is the displayed channel while scanning and may be changed using the channel knob. Transmit will always occur on the Priority 1 channel.

When an 8-channel mobile is programmed for *PS* scan type, the radio will scan the SCAN A list while sampling the Priority 1 (and Priority 2 if assigned) channel. The Priority 1 channel is the displayed channel while scanning and may be changed using the UP and DN buttons. Transmit will always occur on the Priority 1 channel.

Auxiliary Key Type

Select *Type 1* from the *Auxiliary Key Type* box to allow the AUX button to control the Aux Out line. Select *Type 2* to allow the AUX button to function as the A/D SEL switch as well as control the Aux Out line.

Channel Rollover

Check the *Channel Rollover* box to enable rollover from the last channel programmed to the first channel programmed when scrolling through the channels.

Priority Ch Monitor Time

Select the priority channel sampling rate while scan is stopped on a non-priority channel in the *Priority Ch Monitor Time* drop box. Priority 2 channel sampling will occur at half this rate.

Priority Ch Monitor Cycle

Select the priority channel sampling rate while scanning in the *Priority Ch Monitor Cycle* drop box. Priority 2 channel sampling will occur at half this rate.

Priority 2 Channel?

Check the *Priority 2 Channel?* box to allow the user to assign a priority 2 channel.

Scan Hold Conditions

Select the condition that will cause scan to stop on a channel from the *Scan Hold Conditions* drop box.

Scan Hold On RX

Select the delay before scan resumes after the scan hold condition is no longer valid from the *Scan Hold or RX* drop box.

Scan Hold On TX

Select the delay before scan resumes after transmitting in scan mode from the *Scan Hold On TX* drop box.

Click the *Next* button to continue to the *Select Detailed Radio Options – Part II* screen.

The Select Detailed Radio Options – Part II

The *Select Detailed Radio Options – Part II* screen allows selection of scan table restore conditions, Mic Off-Hook scan stop, busy channel lock out, time out timer and beep controls.



When Table Is Deleted

Select the condition(s) when the scan table will be restored to the programmed SCAN A or SCAN B list. Choose to restore the scan list when power is turned off, when scan is turned off or when either scan or power is turned off. Choose *No Clear* to never restore deleted channels to the scan list.

Scan Stop w/Mic Off-Hook

Check the box to stop scan when the Mic Off-Hook line is no longer grounded.

Busy Channel Lockout

Choose *NSQ* to inhibit transmission when carrier is present. Choose *Signaling* to inhibit transmission when the programmed CTCSS or DCS is present. Choose *Special* to inhibit transmission when carrier is present but the programmed signaling is not present.

TX Time-Out Timer

Select the maximum length of time for continuous transmission in the *TX Time-Out Timer* box.

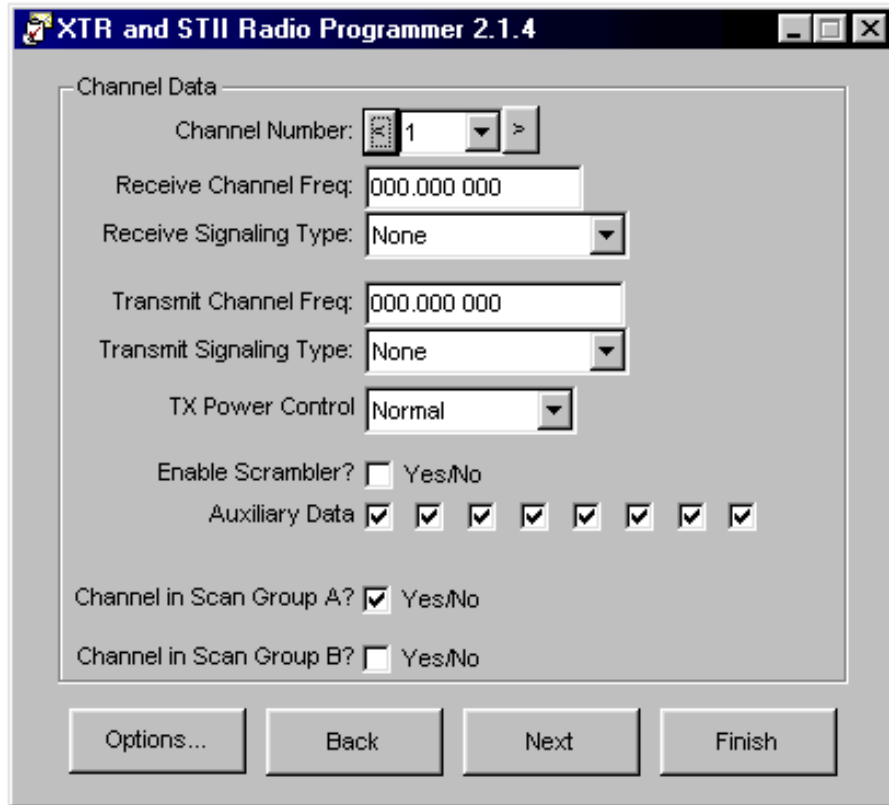
Beep Control

Check the *Beep A* box to enable PRI1 and PRI2 receive beeps. Check the *Beep B* box to enable Time-out timer and busy channel lockout beeps. Check the *Beep C* box to enable button press and channel change feedback beeps. Check the *Beep D* box to enable power-up test and error beeps.

Press the *Next* button to continue to the *Channel Data* screen.

Channel Data

Use the *Channel Number* arrows or drop down box to step through the available channels. The *Channel Data* screen allows entry of the *Receive Channel* frequency and *Signaling Type*, *Transmit Channel* frequency and *Signaling Type*, TX power level, scrambler enable, auxiliary data and scan group selection.



Channel Data

Channel Number: 1

Receive Channel Freq: 000.000 000

Receive Signaling Type: None

Transmit Channel Freq: 000.000 000

Transmit Signaling Type: None

TX Power Control: Normal

Enable Scrambler? Yes/No

Auxiliary Data

Channel in Scan Group A? Yes/No

Channel in Scan Group B? Yes/No

Options... Back Next Finish

Tx Power Control

If *Normal* is selected the radio will transmit at the normal power setting unless an optional front panel button has switched it to the low power setting. If *Low Only* is selected the radio will always transmit at the low power setting.

Enable Scrambler?

Check the box to allow an optional scrambler to be used on the channel being programmed.

Auxiliary Data

This data is used to control some options. Refer to the option instructions for programming these bits.

Channel in Scan Group A?

Check this box to place the channel in the SCAN A list by default. This is the default scan list for all scan types except N SCAN on XTR radios.

Channel in Scan Group B?

Check this box to place the channel in the SCAN B list by default. This is the default scan list for N SCAN on XTR radios.

Click the *Next* or *Finish* button to continue to the *Finish* screen

Finish

Click the *Write To Radio* button to download the configuration data to the radio EEPROM. Click the *Print Settings* button to bring up the *Print* dialog box. Click the *Save To File* button to bring up the *Save File As* dialog box. Click the *Test* button to make adjustments for various software programmable levels.



Syn-Tech II

What Do You Want To Do?

The program will start at the *What Do You Want To Do?* screen. This screen contains a drop down box to select either *Syn-Tech XTR* or *Syn-Tech II* models.



Program The Radio

To begin making a program from scratch click the *Program The Radio* button. The program will then switch to the *Select Radio Model* screen.

Read The Radio

To upload programming from a radio click the *Read The Radio* button.

Load A File

To load a previously saved file, click the *Load A File* button. This will open the *Load Radio File* dialog box.

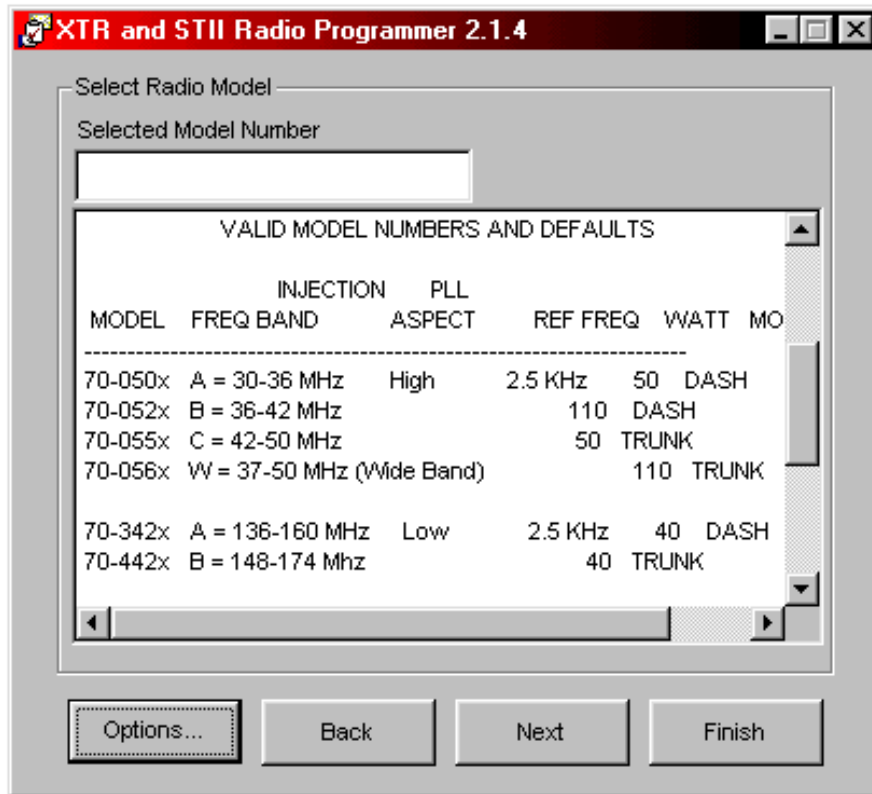
Options

To set the communications port to which the 70-1308A is attached click the *Options* button.

Click the *Next* button to continue to the *Select Radio Model* screen.

Select Radio Model

Use the chart to make a valid model number for the radio to be programmed.



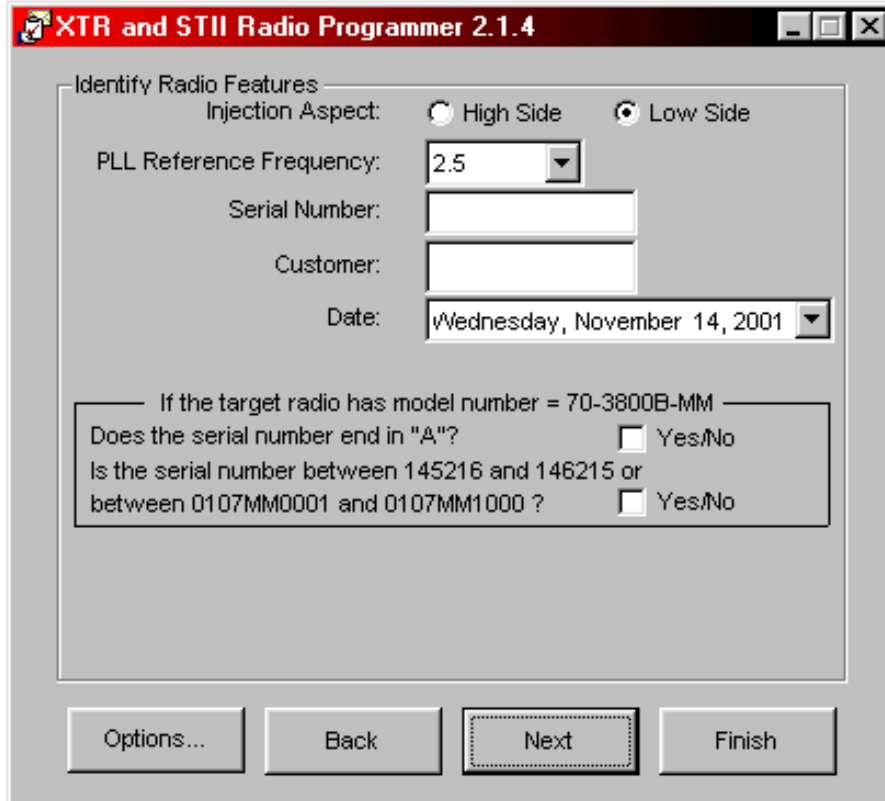
MODEL	FREQ BAND	INJECTION	PLL ASPECT	REF FREQ	WATT	MO
70-050x	A = 30-36 MHz	High		2.5 KHz	50	DASH
70-052x	B = 36-42 MHz			110		DASH
70-055x	C = 42-50 MHz			50		TRUNK
70-056x	W = 37-50 MHz (Wide Band)				110	TRUNK
70-342x	A = 136-160 MHz	Low		2.5 KHz	40	DASH
70-442x	B = 148-174 Mhz			40		TRUNK

Note: this model number is not the same as the model number on the name plate. The 6th digit of the model number sets the control head type.

Once the model number is entered click the *Next* button to continue to the *Identify Radio Features* screen.

Identify Radio Features

The *Identify Radio Features* screen allows changing of the *Injection Aspect*, selection of the *PLL Reference Frequency* and optional inputting of the *Serial Number*, *Customer* and *Date*.



The screenshot shows a window titled "XTR and STII Radio Programmer 2.1.4". Inside the window, the "Identify Radio Features" section contains the following controls:

- Injection Aspect:** Two radio buttons, "High Side" (unselected) and "Low Side" (selected).
- PLL Reference Frequency:** A dropdown menu currently showing "2.5".
- Serial Number:** An empty text input field.
- Customer:** An empty text input field.
- Date:** A date picker showing "Wednesday, November 14, 2001".

Below these fields is a section with a title "If the target radio has model number = 70-3800B-MM" and two questions, each with a "Yes/No" checkbox:

- Does the serial number end in "A"? Yes/No
- Is the serial number between 145216 and 146215 or between 0107MM0001 and 0107MM1000 ? Yes/No

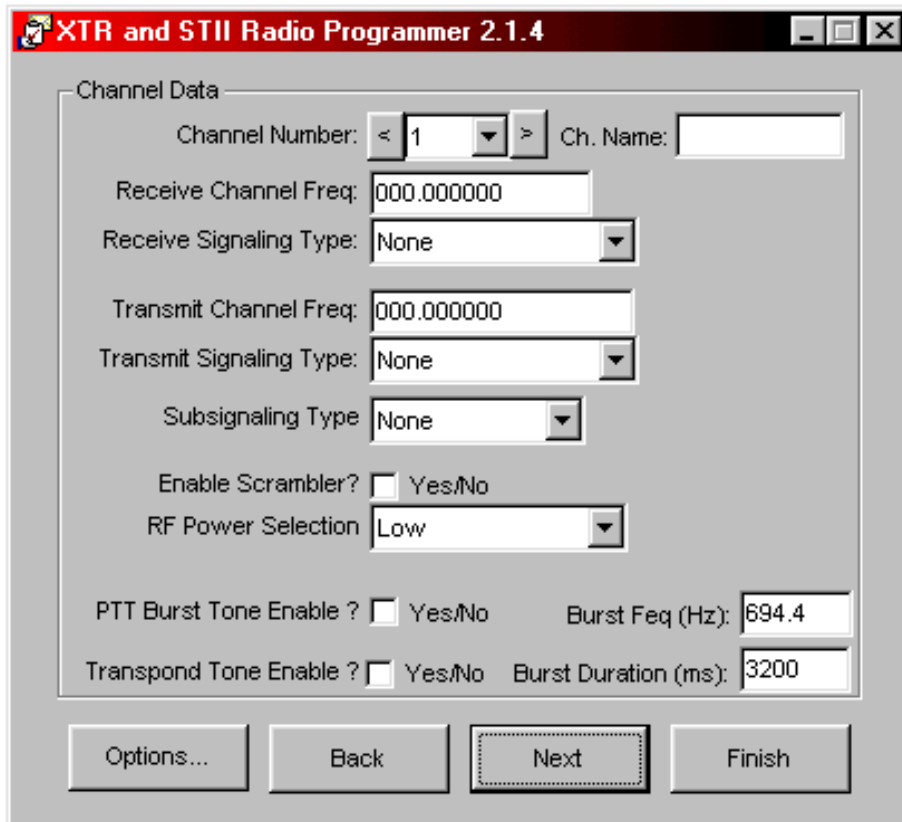
At the bottom of the window are four buttons: "Options...", "Back", "Next" (which is highlighted with a dashed border), and "Finish".

Note: If the model being programmed has been identified as a high band VHF radio, two check boxes will also appear. These boxes should only be checked for radios bought after January 2000, with nameplate model number 70-3800B-MM and the appropriate serial numbers. On these 70-3800B-MM models, failure to check the boxes correctly will result in incorrect PLL data calculations and synthesizer out of lock errors.

Click the *Next* button to continue to the *Channel Data* screen.

Channel Data

The *Channel Data* screen allows entry of *Receive* and *Transmit Channel* frequency and signaling type, *Subsignaling Type*, scrambler enable, RF power selection, burst tone settings and transpond tone enable. Use the *Channel Number* arrows or drop down box to select the channel to edit. Enter the appropriate receive and transmit channel frequencies and signaling data in the appropriate boxes.



The screenshot shows the 'Channel Data' window of the 'XTR and STII Radio Programmer 2.1.4' software. The window contains the following fields and controls:

- Channel Number:** A numeric field with left and right arrow buttons, currently set to '1'.
- Ch. Name:** An empty text input field.
- Receive Channel Freq:** A numeric input field set to '000.000000'.
- Receive Signaling Type:** A dropdown menu set to 'None'.
- Transmit Channel Freq:** A numeric input field set to '000.000000'.
- Transmit Signaling Type:** A dropdown menu set to 'None'.
- Subsignaling Type:** A dropdown menu set to 'None'.
- Enable Scrambler?:** A checkbox that is currently unchecked, with the text 'Yes/No' to its right.
- RF Power Selection:** A dropdown menu set to 'Low'.
- PTT Burst Tone Enable?:** A checkbox that is currently unchecked, with the text 'Yes/No' to its right.
- Burst Freq (Hz):** A numeric input field set to '694.4'.
- Transpond Tone Enable?:** A checkbox that is currently unchecked, with the text 'Yes/No' to its right.
- Burst Duration (ms):** A numeric input field set to '3200'.

At the bottom of the window are four buttons: 'Options...', 'Back', 'Next' (which is highlighted with a dashed border), and 'Finish'.

Subsignaling Type

Select *Type 1-3* or for installed options.

Enable Scrambler?

Check the box to tag the channel for scrambler operation.

Note: The scrambler is an option that is usually enabled by a front panel button; this check box enables scrambler operation on the channel being edited.

RF Power Selection

If *Low* is selected from the drop-down menu the radio will transmit only at the Low Power setting on this channel. If *Normal* is selected the radio will default to the normal power setting and may be switched to the low power setting by the Hi/Lo button option.

PTT Burst Tone Enable?

Check the *PTT Burst Tone Enable?* box to enable the radio to transmit a tone burst of *Burst Freq* and *Burst Duration* when PTT is pressed.

Transpond Tone Enable?

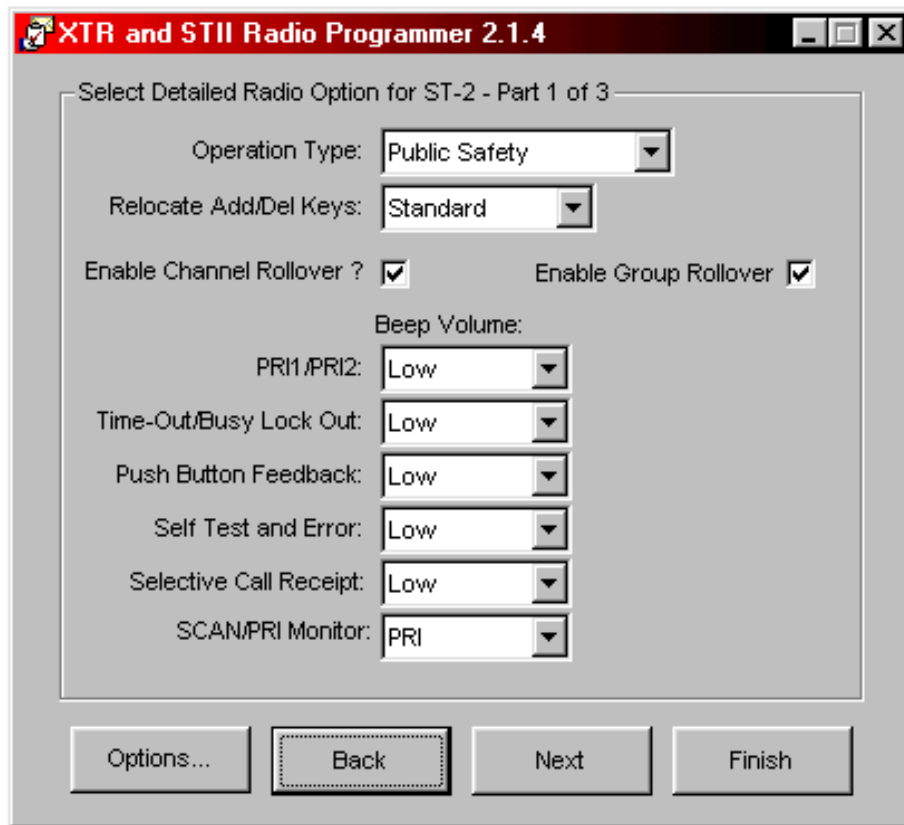
Check the *Transpond Tone Enable?* box to enable the radio to send a tone burst acknowledgement of



Burst Freq and Burst Duration after a selective signaling call is received.

Click the *Next* button to continue to the *Select Detailed Radio Option for ST-2 – Part 1 of 3* screen.

Select Detailed Radio Option for ST-2 – Part 1 of 3



Operation Type

Select *General Purpose* if the radio is equipped with the original Syn-Tech II operating software. Select *Public Safety* if the radio is equipped with P/S-2 or P/S-3 type operating software (selecting *General Purpose* will not change the scan operation but will set *SCAN/PRI Monitor* as *Hold/Bkup*). Either *General Purpose* or *Public Safety* may be chosen with P/S-1A operating software.

Relocate Add/Del Keys

Select *Special* to relocate the ADD and DEL buttons to below the MON and SCAN buttons.

Enable Channel Rollover?

Check the *Enable Channel Rollover?* box to allow the radio to rollover from the last channel programmed to the first channel programmed when the selector is rotated.

Enable Group Rollover (Public Safety mode only)

Check the *Enable Group Rollover* box to allow the radio to rollover from the last group programmed for the first group programmed when the selector is rotated.

Beep Volume

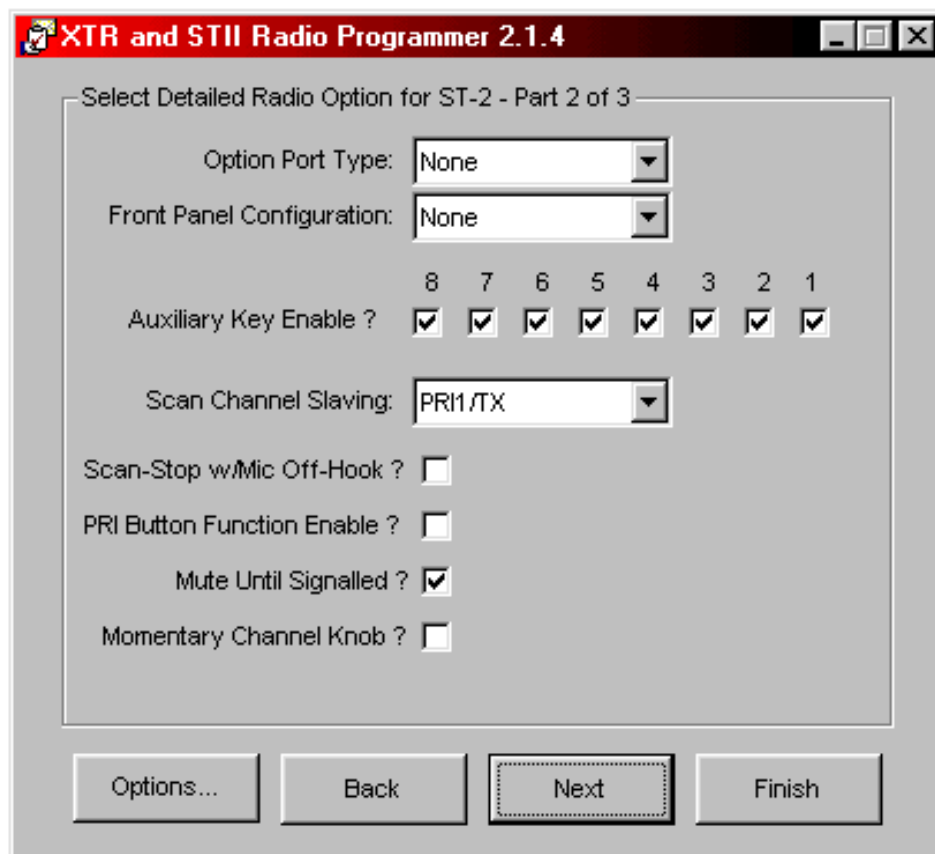
Select *Low*, *High* or *None* (off) volume level for the indicated beeps.

SCAN/PRI Monitor (Public Safety mode only)

Select *PRI* or *HOLD/BKUP* to select the operation of the PRI button. Refer to *PRI Button Function Enable* for more details.

Click the *Next* button to continue to the *Select Detailed Radio Option for ST-2 – Part 2 of 3*.

Select Detailed Radio Option for ST-2 – Part 2 of 3



The screenshot shows a software window titled "XTR and STII Radio Programmer 2.1.4". The main area is titled "Select Detailed Radio Option for ST-2 - Part 2 of 3". It contains several configuration options:

- Option Port Type: None (dropdown menu)
- Front Panel Configuration: None (dropdown menu)
- Auxiliary Key Enable?: A row of eight checkboxes labeled 8 through 1, all of which are checked.
- Scan Channel Slaving: PRI1/TX (dropdown menu)
- Scan-Stop w/Mic Off-Hook?:
- PRI Button Function Enable?:
- Mute Until Signalled?:
- Momentary Channel Knob?:

At the bottom of the window are four buttons: "Options...", "Back", "Next" (which is highlighted with a dashed border), and "Finish".

Option Port Type

Select the option port configuration for add-on options the radio may be equipped with. Refer to the option kit instructions for the configuration. If no option is plugged into the option port make sure None is selected.

Front Panel Configuration

Select *Type 1-4* for additional basic button configurations. The actual configuration depends on the control head type and operating software (original, P/S1A, P/S2 or P/S3) installed in the radio. In general if the front panel trimplate kit ends in a "-1" then program the front panel configuration for *Type 1*. "-2", "-3" and "-4" trimplate kits are likewise programmed as *Type 2-4*. Other front panel configurations are possible through manual entries. Refer to the kit instructions for further details.

Auxiliary Key Enable?

Any of the additional buttons enabled by selecting *Types 1-4* in *Front Panel Configuration*, may be disabled individually by unchecking the appropriate box.

Scan Channel Slaving

Select whether the channel selector knob changes just the TX channel or whether it changes the PRI1 receive channel and the TX channel during scan operation.

Scan-Stop w/Mic Off-Hook?

Check the *Scan-Stop w/Mic Off-Hook?* box to stop scan when the Mic Off-Hook line is no longer grounded.

PRI Button Function Enable?

The function of the PRI button depends on the *PRI Button Function Enable?* box as well as the radio operating software and scan mode.

- General Purpose scan mode (G/P or P/S-1A software): If the box is checked the PRI button will activate scan and priority monitoring. Priority monitoring without scanning is not possible. If the box is not checked the PRI button will activate priority monitoring.
- Public Safety scan mode (P/S-1A software): If the box is checked the PRI button will activate scan and priority monitoring simultaneously. If the box is not checked and the *SCAN/PRI Monitor* field is "PRI" the PRI button will activate priority monitoring. If the box is not checked and the *SCAN/PRI Monitor* field is "HOLD/BKUP" the PRI button will activate priority monitoring when not scanning and activate ESCape mode when scanning.
- Public Safety scan mode (P/S-2 or P/S-3 software): If the box is checked and the *SCAN/PRI Monitor* field is "PRI" the PRI button is disabled. If the box is checked and the *SCAN/PRI Monitor* field is "HOLD/BKUP" the PRI button will activate ESCape mode when scanning and be disabled when not scanning. If the box is not checked and the *SCAN/PRI Monitor* field is "PRI" the PRI button will activate priority monitoring without scan. If the box is not checked and the *SCAN/PRI Monitor* field is "HOLD/BKUP" the PRI button will activate priority monitoring when not scanning and ESCape mode when scanning.

Note: If General Purpose mode is selected on P/S-2 or P/S-3 software (scan mode is still priority and can't be changed) the *SCAN/PRI Monitor* field is automatically set to "HOLD/BKUP" and PRI button operation will be as described.

Mute Until Signaled?

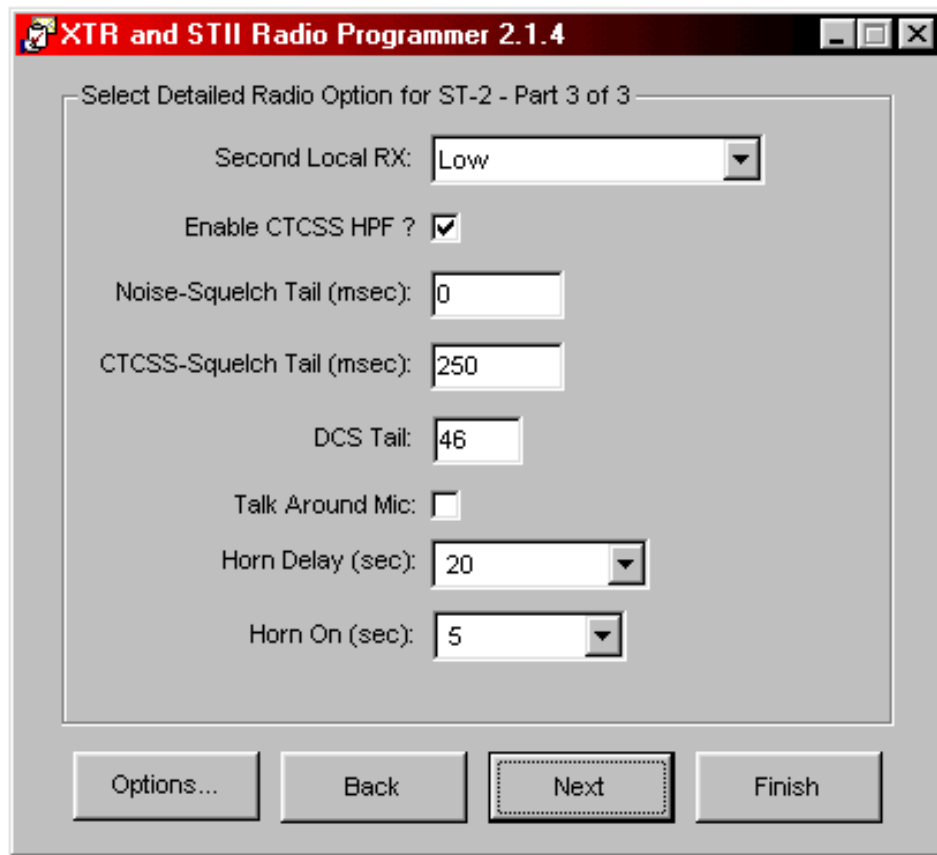
Check the *Mute Until Signaled?* box to mute receive audio until an optional signaling decoder receives the correct signal. Other programming will be required for the correct Option Port Type.

Momentary Channel Knob

Check the *Momentary Channel Knob?* box if the radio is equipped with an optional momentary channel selector.

Click the *Next* button to continue to the *Select Detailed Radio Option for ST-2 – Part 3 of 3* screen.

Select Detailed Radio Option for ST-2 Part 3 of 3



Second Local RX

Leave *Second Local RX* at default unless an alternate 2nd IF aspect kit has been installed.

Enable CTCSS HPF?

Uncheck *Enable CTCSS HPF?* box if you wish to have the receive high pass filter turned off on channels that have not been programmed for CTCSS.

Noise-Squelch Tail

Enter the time between loss of received carrier and receive audio muting in the *Noise-Squelch Tail* box. Should be left at zero unless a change is required for special applications.

CTCSS-Squelch Tail

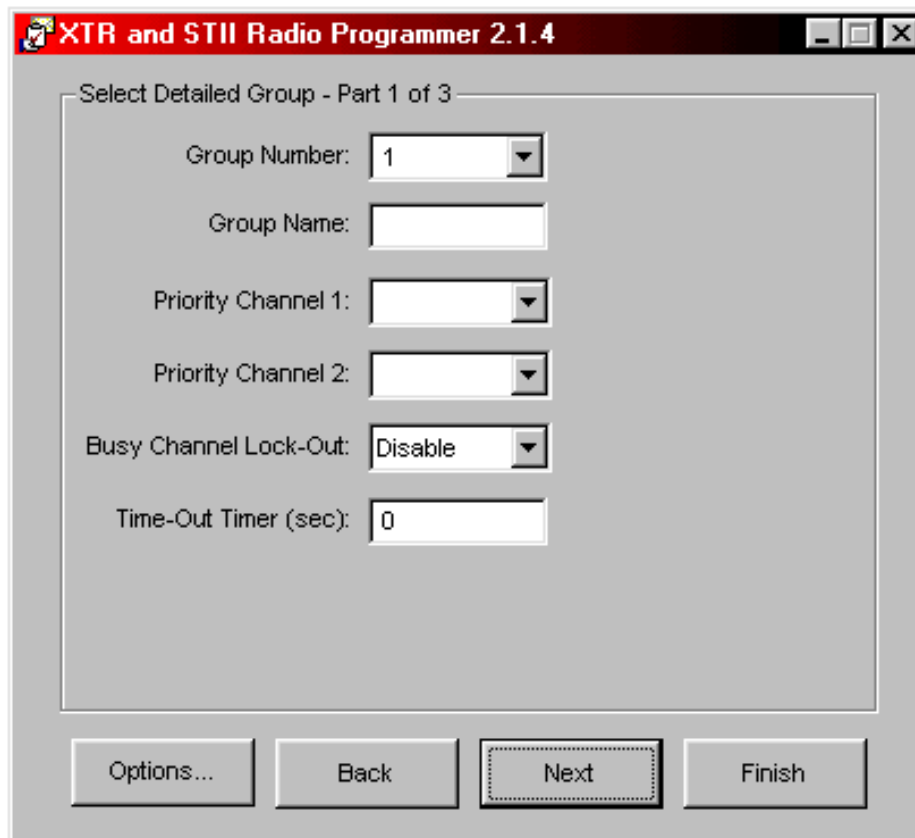
Enter the time between loss of the CTCSS signal and receive audio muting in the *CTCSS-Squelch Tail* box. Should be left at 250 milliseconds unless a change is required for special applications.

DCS Tail

Enter the time divided by 7.5 between loss of the DCS signal and receive audio muting in the *DCS Tail* box. This entry is actually the number of DCS code bits that would be missing before muting (each DCS code is 23 bits and the default length is 46 bits or 2 DCS code periods or 345 milliseconds).

Click the Next button to continue to the *Select Detailed Group - Part 1 of 3* screen.

Select Detailed Group – Part 1 of 3



The screenshot shows a software window titled "XTR and STII Radio Programmer 2.1.4". Inside the window, the title "Select Detailed Group - Part 1 of 3" is displayed. The interface contains several input fields and buttons:

- Group Number:** A dropdown menu with "1" selected.
- Group Name:** A text input field.
- Priority Channel 1:** A dropdown menu.
- Priority Channel 2:** A dropdown menu.
- Busy Channel Lock-Out:** A dropdown menu with "Disable" selected.
- Time-Out Timer (sec):** A text input field with "0" entered.

At the bottom of the window, there are four buttons: "Options...", "Back", "Next" (which is highlighted with a dashed border), and "Finish".

Group Number

Select group number 1 through 16 from the *Group Number* drop box for the group to be edited. All the data on this screen and the next two screens is for the group number currently displayed in the *Group Number* box.

Group Name

Enter a group name to be displayed on deluxe control head equipped radios in the *Group Name* box. Up to three digits may be displayed on radios with P/S-2 or P/S-3 operating software; all others display only two digits.

Priority Channel 1

A valid channel may be assigned as the priority 1 channel in the *Priority Channel 1* drop box (after channels have been entered into the group) for certain types of operating software and option programming. This box is generally left blank to allow the user to assign the priority 1 channel.

If the radio has been programmed for *General Purpose* scan type (valid only for original Syn-Tech II and P/S-1A operating software) the priority 1 channel may be assigned in the box or left for the user to assign. For P/S-2 or P/S-3 operating software the priority 1 channel should only be assigned in the box if *TX Channel Slaving* has been selected in options programming.

Priority Channel 2

A valid channel may be assigned as the priority 2 channel in the *Priority Channel 2* drop box (after channels have been entered into the group) or the box may be left blank to allow user assignment of the priority 2 channel.

Busy Channel Lock-Out


Select *NSQ* from the *Busy Channel Lock-Out* box to inhibit transmit while carrier is detected. Select *Signaling* to inhibit transmit while the programmed CTCSS tone or DCS code is being received. Select *Special* to inhibit transmit while carrier is being received without the programmed CTCSS tone or DCS code.

Time-Out Timer

Enter the maximum number of seconds of continuous transmission the radio will allow in the *Time-Out Timer* box.

Click the *Next* button to continue to the *Select Detailed Group – Part 2 of 3* screen.

Select Detailed Group – Part 2 of 3



XTR and STII Radio Programmer 2.1.4

Select Detailed Group - Part 2 of 3

Scan Timing

Interval A (msec): 20

Interval B DCS: 0

Interval B CTCSS: 0

RX Scan Hold (sec): 0.0

TX Scan Hold (sec): 0.0

Pri Ch Sampling Ratio: 8

Pri Ch Sampling Rate: 0

Scan-Holding Events: Busy/Sig

TX on Priority Channel ?

Options... Back Next Finish

Scan Timing

Select the time allotted for the receiver to detect carrier presence after synthesizer lock on a channel during scan from the *Interval A* drop box.

Select the number to be added to *Interval A* from the *Interval B DCS* drop box to allow for DCS decoding on channels programmed for DCS. The actual time is $200 + (7.44 \times \text{selected number})$ milliseconds and should only be programmed for special requirements.

Select the number to be added to *Interval A* from the *Interval B CTCSS* drop box to allow for CTCSS decoding on channels programmed for CTCSS. The actual time is $270 - (10 \times \text{selected number})$ milliseconds or $27000/\text{CTCSS frequency} - (10 \times \text{selected number})$ if the CTCSS is below 100 Hz. This box should only be programmed for special requirements.

RX Scan Hold

Enter the length of time after loss of received signal before resuming scan in the *RX Scan Hold* box. If left at zero, scan will not resume until the operator rotates the channel knob.

TX Scan Hold

Enter the length of time after transmission before resuming scan in the *TX Scan Hold* box. If left at zero, scan will not resume until the operator rotates the channel knob.

Pri Ch Sampling Ratio

Select the number plus one of channels that will be sampled between each priority channel sampling from the *Pri CH Sampling Ratio* drop box. Every third priority sampling will be the priority 2 channel if one has been assigned.

Pri Ch Sampling Rate

Enter the number of seconds between each priority sampling while holding on a non-priority channel in the *Pri Ch Sampling Rate* box. The valid range is 0.1 to 2.0 seconds. Every third priority sampling will be the priority 2 channel if one has been assigned.

Scan-Holding Events

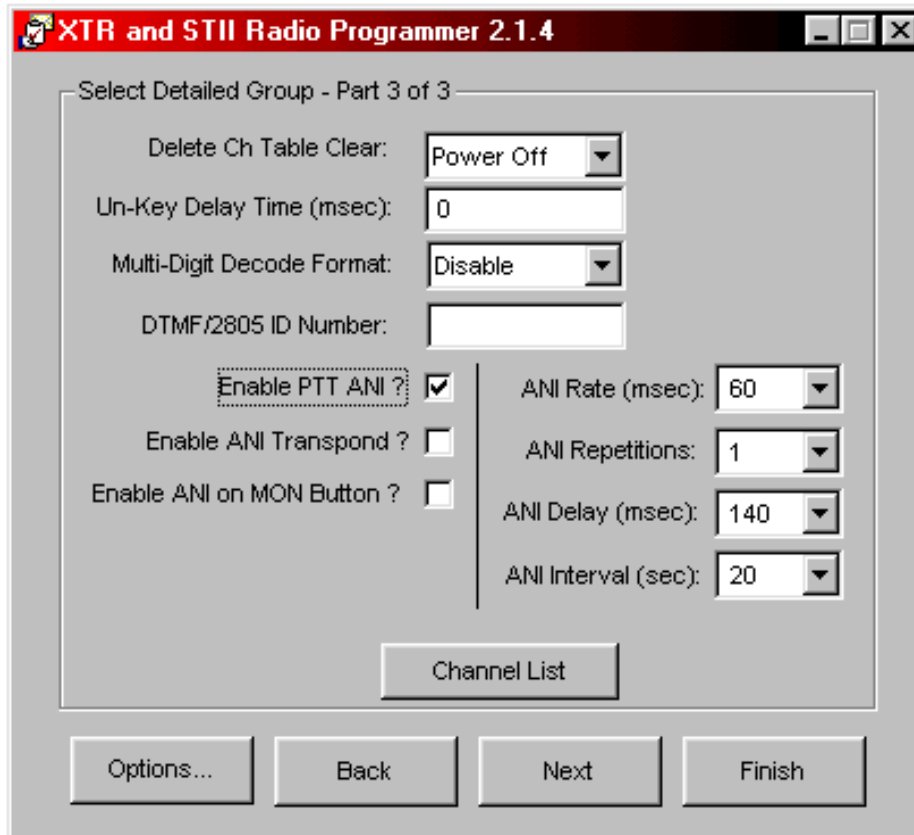
Select *Busy/NSQ* in the *Scan-Holding Events* box to cause scan to hold on a channel whenever carrier is detected. Select *Busy/Sig* to cause scan to hold on a channel when the programmed CTCSS or DCS is detected. Select *Open/NSQ* to cause scan to hold when there is no carrier while sampling for carrier presence on a priority channel. Select *Open/Sig* to cause scan to hold when there is no carrier while sampling for programmed CTCSS/DCS on a priority channel.

TX on Priority Channel

Uncheck the *TX on Priority Channel* box to cause the radio to transmit on the last hold channel when priority sampling is active. When the box is checked the radio will transmit on the priority 1 channel during priority sampling.

Click the *Next* button to continue to the *Select Detailed Group – Part 3 of 3*.

Select Detailed Group – Part 3 of 3



The screenshot shows the 'XTR and STII Radio Programmer 2.1.4' window. The title bar is red with white text. The main window has a grey background and contains the following settings:

- Delete Ch Table Clear: Power Off (dropdown)
- Un-Key Delay Time (msec): 0 (text box)
- Multi-Digit Decode Format: Disable (dropdown)
- DTMF/2805 ID Number: (empty text box)
- Enable PTT ANI?: (checkbox)
- Enable ANI Transpond?: (checkbox)
- Enable ANI on MON Button?: (checkbox)
- ANI Rate (msec): 60 (dropdown)
- ANI Repetitions: 1 (dropdown)
- ANI Delay (msec): 140 (dropdown)
- ANI Interval (sec): 20 (dropdown)

At the bottom of the main window is a 'Channel List' button. Below the main window are four buttons: 'Options...', 'Back', 'Next', and 'Finish'.

Delete Ch Table Clear

Select *Power Off* in the *Delete Ch Table Clear* box to have user deleted channels added back to the scan group when the radio is powered off. Select *Scan Off* to have user deleted channels added back to the scan list when scan is turned off. Select *Power/Scan* to have user deleted channels added back to the scan list when either scan or the radio is turned off. Select *No Clear* to have user deleted channels remain deleted until they are manually added back or memory back-up power is lost.

Un-Key Delay Time

Enter a time in milliseconds that the transmitter will remain on after the release of PTT in the *Un-Key Delay Time* box.

Multi-Digit Decode Format

Select *2805* in the *Multi-Digit Decode Format* box to enable 2805 type selective call decoding. Select *DTMF* to enable DTMF type selective call decoding. Select *Disable* to disable selective call decoding.

DTMF/2805 ID Number

Enter the code that will be sent by the DTMF ANI encoding feature, decoded by the optional DTMF decoder or decoded by the 2805 type decoding feature. The DTMF encoder uses only digits 0-9 plus * and #. The DTMF decoder uses only digits 0-9 plus *, # and A-D. The 2805 decoder uses only digits 0-9.

Enable PTT ANI?

Check the *Enable PTT ANI?* box to send the DTMF/2805 ID Number code in DTMF tones when PTT is pressed.

Enable ANI Transpond?

Check the *Enable ANI Transpond?* box to send the DTMF/2805 ID Number code when an optional Type-2 or Type-4 DTMF decodes a valid signal.

Enable ANI on MON Button

Check the *ANI on MON Button?* box to send the DTMF/2805 ID Number code when the MON button is pressed for more than one second.

Channel List

Click the *Channel List* button to build an ordered list of channels to be scanned for the *Group Number* currently being edited. Click the *Add* button to select a channel from a list of all programmed channels. Any channel can be a member of multiple groups. Click the *Remove* button to delete the highlighted channel from the list and move all subsequent channels up one slot. Click the *Edit* button to change the highlighted channel and place another channel number in that slot. When finished editing the group channel list, click the *OK* button to save changes and return to the *Select Detailed Group – Part 3 of 3* screen. Click the *Cancel* button to exit without saving changes made to the group channel list.

Click the *Back* button twice and select another *Group Number* to program an additional scan group.

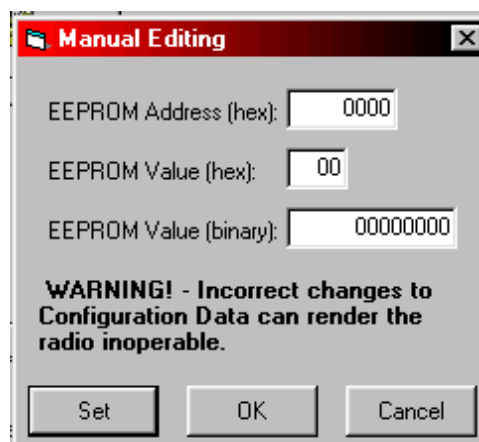
Click the *Next* or *Finish* button to continue to the *Finish* screen.

Finish

Click the *Write To Radio* button to download the configuration data to the radio EEPROM. Click the *Print Settings* button to bring up the *Print* dialog box. Click the *Save To File* button to bring up the *Save File As* dialog box.

Click the *Manual* button to manually change data in certain EEPROM addresses as instructed by certain option installation instructions. Enter the EEPROM address to be edited in the *EEPROM Address* box. Then enter the value desired for that address in either hexadecimal or binary format in the appropriate box. Then click the *Set* button to write changes to the EEPROM.

Click *OK* to return to the finish screen.

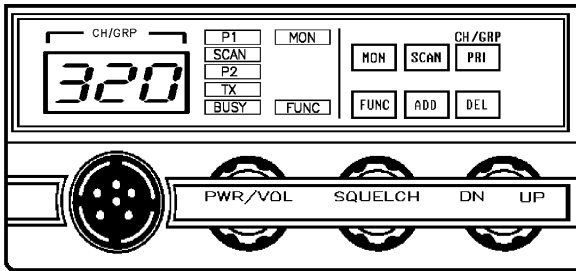


SYN-TECH II TRANSCEIVER ERROR CODES

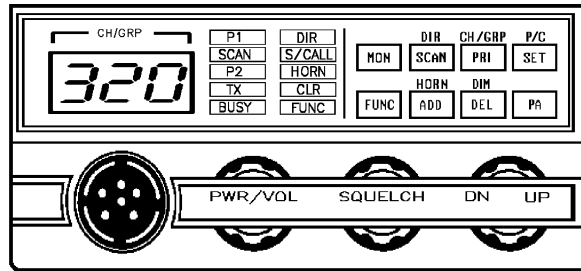
When the SYN-TECH II radio is turned on, it performs a self-test that reports success by illuminating all displays and indicators momentarily. If a problem occurs, an error code appears in the channel display with an identifiable beep. Please note that multiple error codes will be displayed in sequence when the radio is turned on if multiple conditions exist. In many cases, the error display can be cleared by pressing any button, but will re-occur at next unit power up.

<i>CODE</i>	<i>MEANING</i>	<i>COMMENTS</i>
E00	Microcomputer error - Master Program ROM	
E01	Microcomputer error – RAM	
E02	Model number not defined in programming Data-Packet	
E03	No Channel Groups defined	At least one channel must be assigned to at least one group.
E04	No channels defined	At least one channel must be defined by entering a receive frequency for normal radio operation. E04 will also result if Channel 1 is deleted from the channel list but not from the group assignment, even if other channels are defined.
E05	Memory-check error	
E06	An undefined channel is assigned to a group	This will most commonly occur if a channel was defined, assigned to a group, then deleted from the channel list but not the group assignment.
E07	P/S mode has been chosen and a Priority 1 channel has been programmed into a group, or G/P mode has been chosen and an undefined channel is assigned as the Priority 1 channel P/S-2 and P/S-3: No direct tones programmed	P/S mode: the Priority 1 channel is user selectable only and must not be programmed into any group. The Priority 2 channel may be programmed. P/S-2 & P/S-3 only: If one touch tone selection is made without programming any tones on the buttons. G/P mode: E07 will occur if the channel is deleted from the channel list but is not deleted from the Priority 1 channel assignment within a group.
E08	An undefined channel is selected as the Priority 2 channel in a group	This can occur if a channel is deleted from the channel list but not from the Priority 2 assignment within a group.
E09	Manual mode entries have been incorrectly made	If the incorrect entries cannot be identified, it is recommended that a known good data packet be cloned or transferred from another radio, or, as a last resort, the programming data can be re-entered.
E10	Synthesizer unlocked at center frequency	
E11	Synthesizer unlocked	
E12	Duplex synthesizer unlocked	
E50	Programmer interface error	
E51	Cloning interface error	

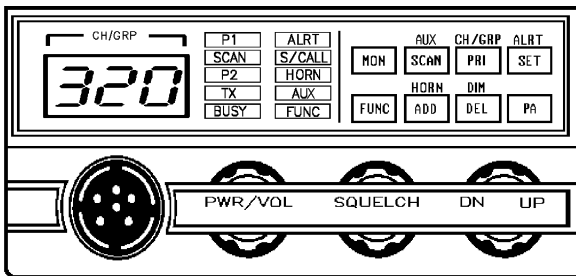
ST-II CONTROL HEAD CONFIGURATIONS



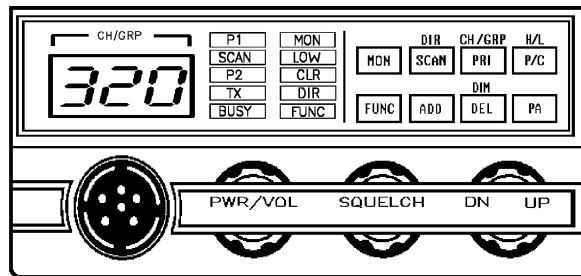
P/S-2 or P/S-3 Standard Pattern



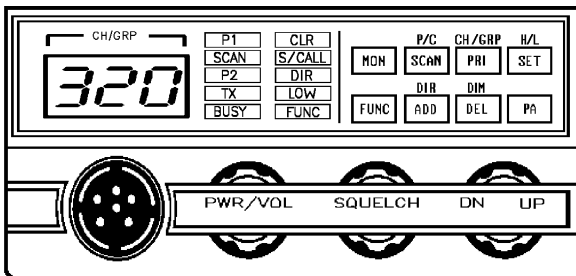
P/S-2 or P/S-3 Type 1 Pattern



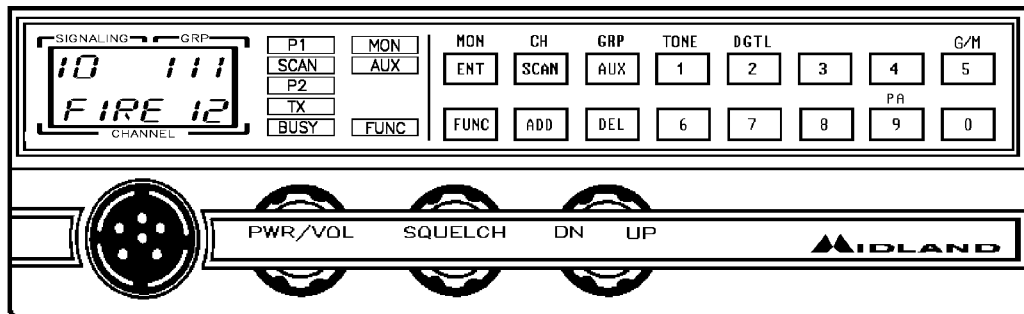
P/S-2 or P/S-3 Type 2 Pattern



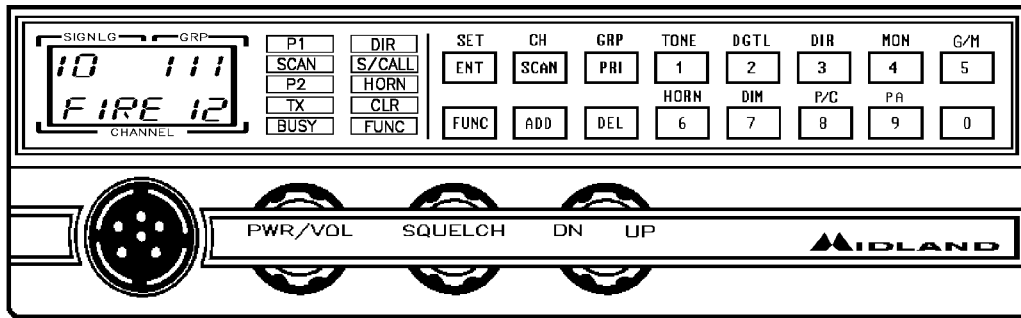
P/S-2 or P/S-3 Type 3 Pattern



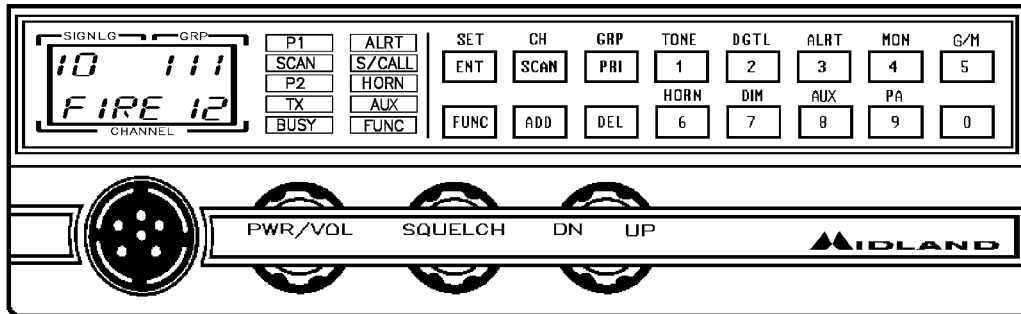
P/S-2 or P/S-3 Type 4 Pattern



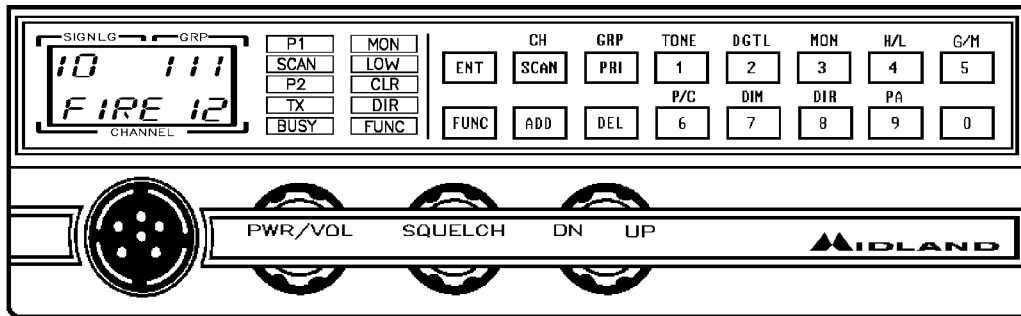
P/S-2 and P/S-3 Standard Pattern



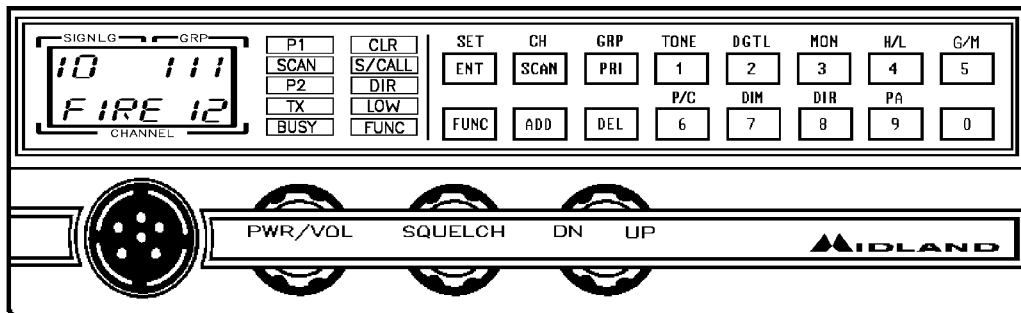
P/S-2 and P/S-3 Type 1 Pattern



P/S-2 and P/S-3 Type 2 Pattern



P/S-2 and P/S-3 Type 3 Pattern



P/S-2 and P/S-3 Type 4 Pattern

SYN-TECH XTR TRANSCEIVER ERROR CODES

When the SYN-TECH XTR radio is turned on, it performs a self-test that reports success by illuminating all displays and indicators momentarily. If a problem occurs, an error code appears in the channel display with an identifiable beep. Please note that multiple error codes will be displayed in sequence when the radio is turned on if multiple conditions exist. In many cases, the error display can be cleared by pressing any button, but will re-occur at next unit power up.

<i>CODE</i>	<i>MEANING</i>
E1	MCU ROM/RAM Error
E2	No Model Number and/or Channel Data Programmed
E3	Synthesizer Unlock
E4	Channel Data Checksum Error
E7	EEPROM Backup Data Lost
E8	Program Communication Error
E9	Cloning Error



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