70-1470

TITAN MOBILE PROGRAMMING SOFTWARE

USER'S MANUAL

70-998225
10/01

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INTRODUCTION

The 70-1470 PC Programming Software allows the user to program Midland Titan Mobile Radios. It runs under Windows 95/98. It cannot run under DOS or Windows 3.xx.

MINIMUM REQUIREMENTS

IBM-Compatible PC
Windows 95
1 MB Hard Drive Space

INSTALLATION

Use Windows Explorer to create a new folder (directory) on your hard drive, for example, C:\70-1470. Copy the 70-1470-3.5 disk contents to this directory.

GETTING STARTED

NOTE: The display should be set to at least 800x600 pixels for proper viewing. In general, it is a good idea to upload a radio, or open a saved file, rather than create a new file from scratch. There are many settings on the *Edit Channel* and *Edit Option* windows that affect proper radio operation.

From the start menu select Run and type C:\70-1470\Titan320.exe where C:\70-1470 is the directory the disk contents were copied to in Installation above. The program will start at the Model screen. From the *Utility* menu select *Comport Set* and select the communications port 70-1309 programming cable is plugged into.

1. To upload the contents of a radio into the program select *Radio Comm* from the *Utility* menu.

2. Make sure the radio is not in scan then turn the radio off. Plug the programming cable into the microphone jack. Turn the radio back on.

3. Click the *Up Load* button. A *Please wait* dialog box will pop up and the radio display will read COPY (CPY). If an error occurs repeat step 2.

4. After successful upload an *EEPROM copy complete* dialog box will pop-up. Click the *OK* button.

5. To edit the programming select Model from the Edit menu. A *Copy OK?* dialog box will pop-up. Select *OK* to overwrite any configuration data that is already resident in the program (At this point only the default configuration data is resident. This process is necessary so the *Verify* function can work properly).

6. Select *Channel* from the *Edit* menu to check and/or edit channel data. Select other screens (Option, 2 Tone, etc.) to edit other parameters as required.

7. Select *Radio Comm* from the Utility menu. Click the *Down Load* button to write the edited configuration data to the radio EEPROM. The radio will display PROG (PRG) while downloading. When the download is complete an *EEPROM program complete* dialog box will pop-up and the radio will display SCI. Click the *OK* button, turn the radio off and unplug the programming cable.

FILE MENU

OPEN

Select *Open* from the *File* menu to bring up an *Open* dialog box to retrieve a previously created data file. The file extension is .dmp.

SAVE

Select *Save* from the *File* menu to bring up a *Save As* dialog box to save the current configuration data to a file. The file extension is .dmp.

PRINT

Select *Print* then *Text Format* from the *File* menu to bring up a print preview dialog box of the current configuration data. Click the *Print* button to bring up the *Print* dialog box, or click the *Close* button to cancel and return to the previous window. Select Print then Hex Dump to print a listing of the hexadecimal data that the program sends to the EEPROM.

CLEAR

Select *Clear* from the *File* menu to reset all current configuration data to default values. All current configuration data will be lost if it has not been previously saved.

DIRECTORY

Select *Directory* from the *File* menu to specify the default *Open* and *Save As* directories used by the program.

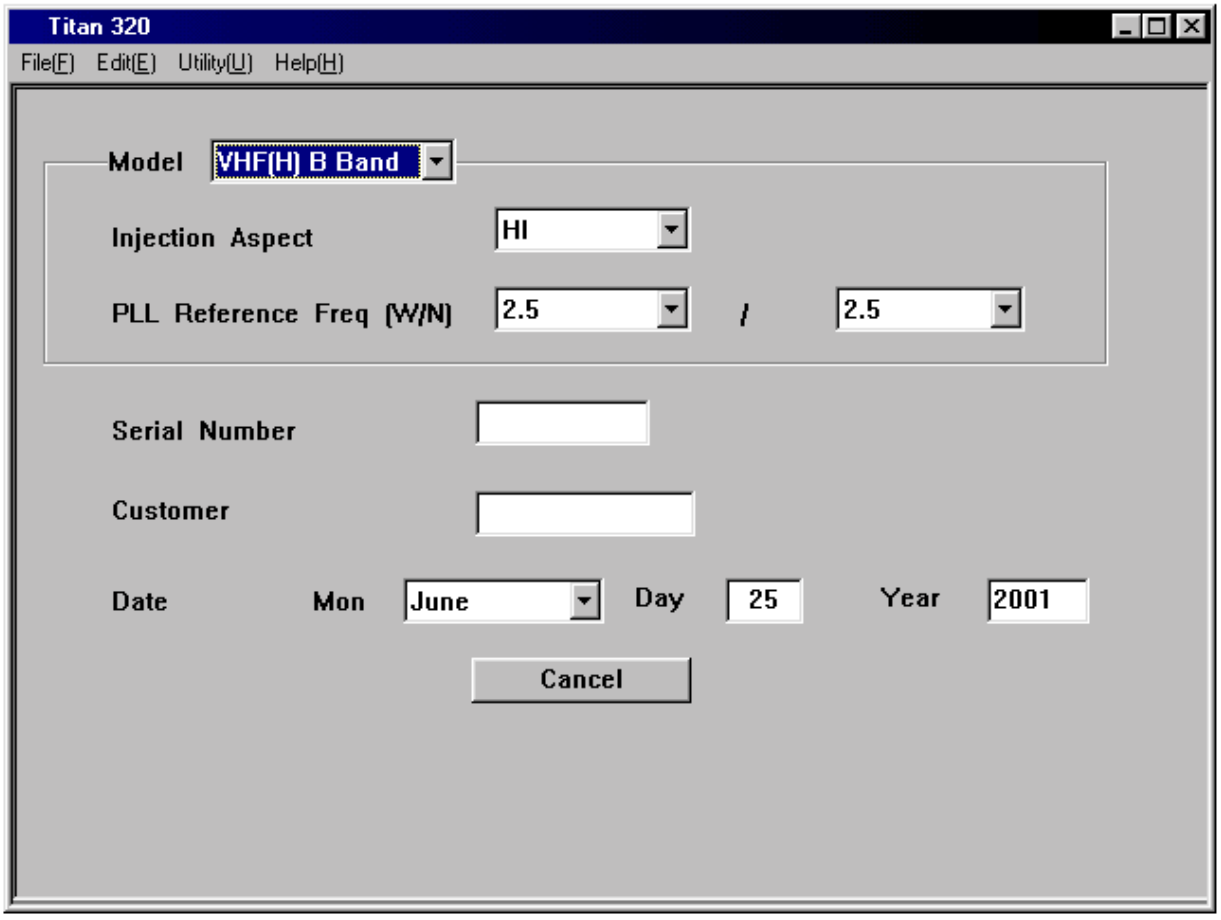
EXIT

Select *Exit* from the *File* menu to close the program. All current configuration data will be lost if it has not been previously saved.

EDIT MENU

MODEL

Select *Model* from the *Edit* menu to open the *Model* window. A model must be selected in the *Model* drop box before you will be able to select any of the remaining *Edit* menu items.



- **Model**

Click on the *Model* drop box and select the desired model. The following table summarizes current model numbers and their corresponding *Model* drop box selection.

Radio Model Numbers	*Program Model Selection*
70-0511B, 70-0514B, 70-0611B, 70-0614B, 70-0571B, 70-0574B, 70-0671B, 70-0674B	VHF(L) B Band
70-0511C, 70-0514C, 70-0611C, 70-0614C, 70-0571C,70-0574C, 70-0671C, 70-0674C	VHF(L) C Band
70-1341B, 701344B, 70-1441B, 70-1444B, 70-1391B, 70-1394B, 70-1491B, 70-1494B	VHF(H) B Band
70-1541B, 70-1544B, 70-1641B, 70-1644, 70-1591B, 70-1594B, 70-1691B, 70-1694B	UHF B Band

- **Injection Aspect**

The *Injection Aspect* drop box will automatically be completed when the *Model* is selected. Do not change it unless an alternate injection kit has been installed in the radio.

- **PLL Reference Freq**

Click on the *PLL Reference Freq* drop boxes to select the prescaler reference frequencies for wide band (*W*) and narrow band (*N*). Available selections vary by the *Model* selected. All receive and transmit frequencies to be programmed into the radio must be evenly divisible by the selected reference frequencies.

- **Serial Number**

(Optional) Enter a serial number to be associated with the radio in the *Serial Number* box. Enter up to 8 alphanumeric characters.

- **Customer**

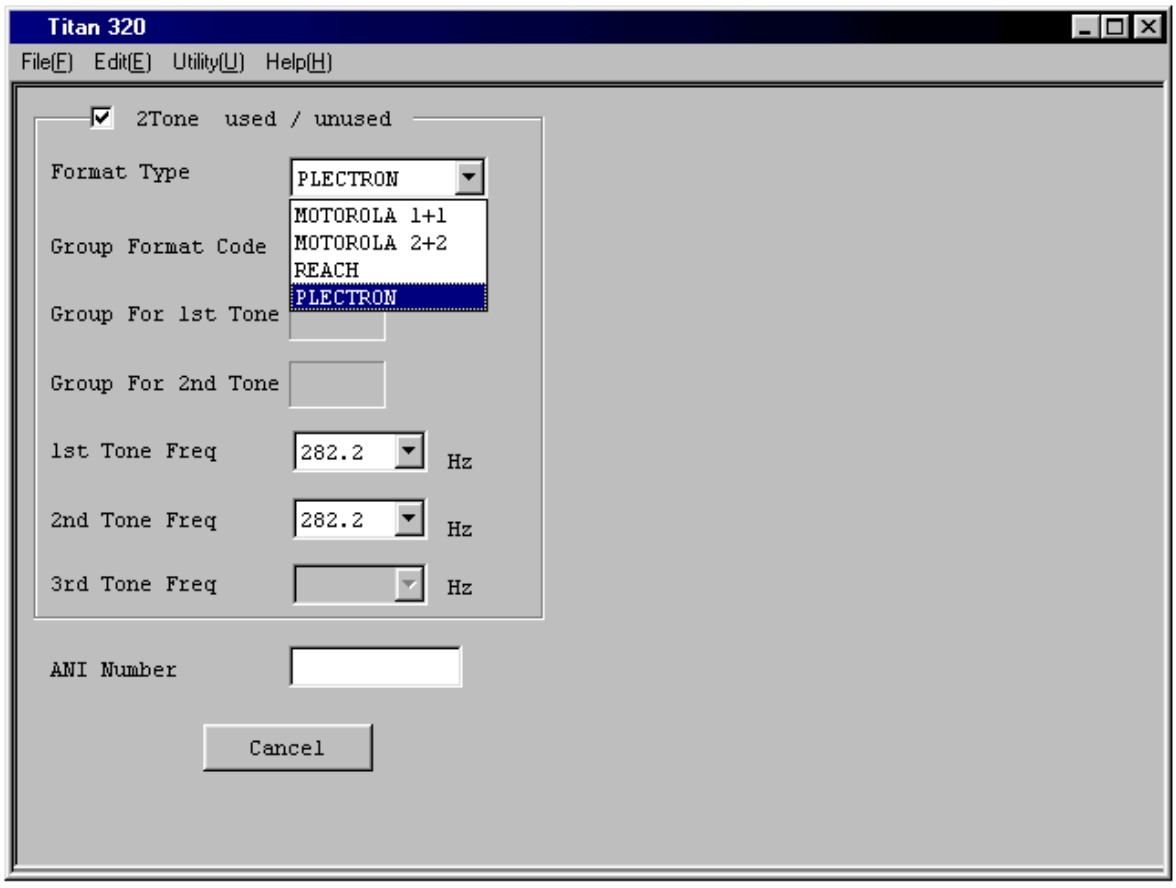
(Optional) Enter a customer name to be associated with the radio in the *Customer* box. Enter up to 10 alphanumeric characters.

- **Date**

The current system date will automatically be entered in the *Date* boxes, but can be edited if desired.

2 TONE

Select 2tone from the *Edit* menu to set 2-tone signaling options and the DTMF ANI code.



- **2-Tone Used/Unused**

Check the *2Tone used/unused* to enable 2-tone decode on the radio. In addition to setting the format and frequencies, the *Dtone* drop box on the *Edit Channel* window must be enabled for any channel on which 2-tone decode is desired. Refer to the operator's manual for instructions on how to mute to radio until it decodes the 2-tone signal.

- **Format Type**

Select the desired 2-tone format from the Format Type drop box. Timing parameters, group parameters and possible frequency selections will vary depending on the format selected.

- **Group Format Code**

For "Motorola 1+1" or "Reach" *Format Types*, click on the *Group Format Code* (sometimes referred to as the first digit of the pager code) drop box to select the groups (sometimes referred to as the Reed group) from which the 1st and 2nd tone frequencies can be selected. The actual groups for the selected *Group Format Code* will be displayed in the *Group For 1st Tone* and *Group For 2nd Tone* boxes.

- **1st, 2nd and 3rd Tone Freq**

Click on the *1st Tone Freq* and *2nd Tone Freq* drop box to select the 1st and 2nd tone frequencies. 3rd tone frequency selection is available for ""Motorola 2+2" *Format Type*.

- **ANI Number**

Enter up to 10 DTMF digits in the *ANI Number* box that will be sent upon PTT press when ANI is enabled. In addition to entering the DTMF code in the *ANI Number* box, the DTMF timing should be set on the *Edit Option* window and the *ANI* box on the *Edit Channel* window may be enabled for any channel. Note that ANI can be enabled in two ways:

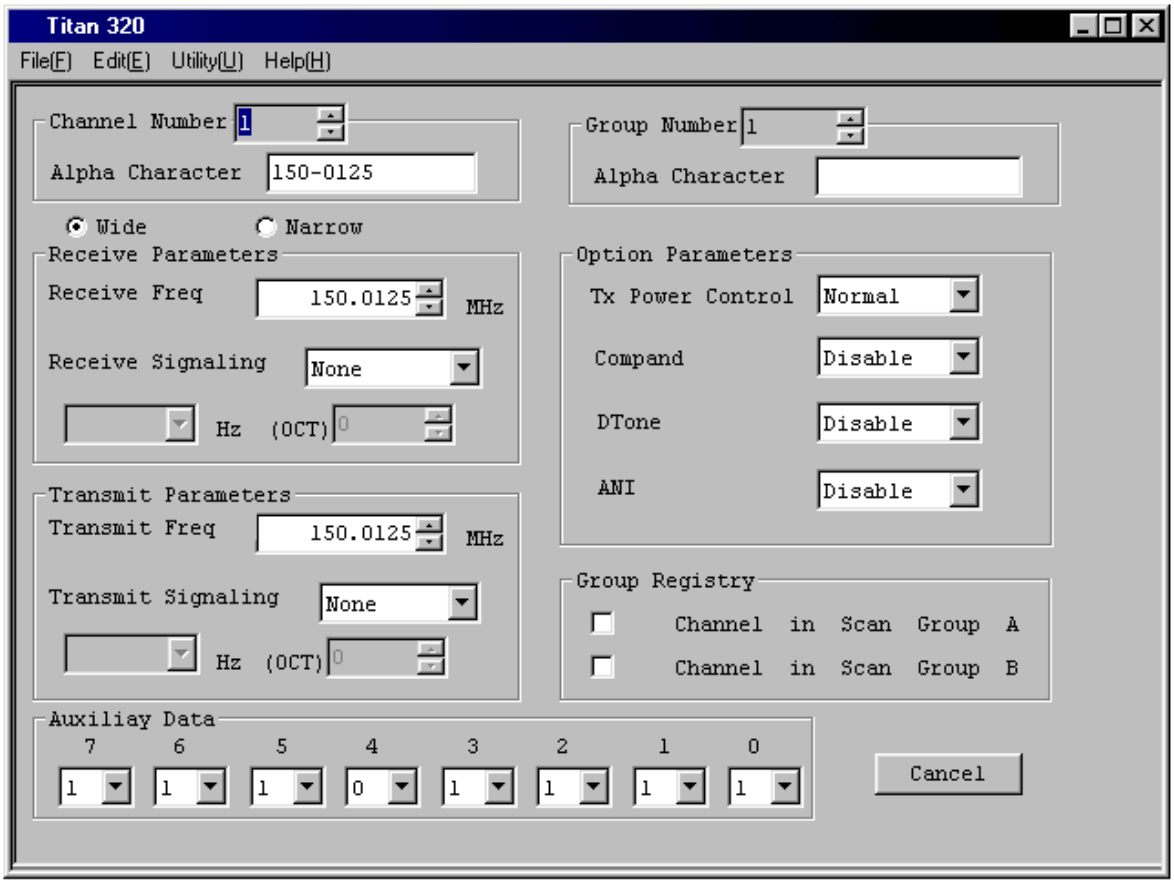
1. As long as a DTMF code has been entered in the *ANI Number* box and the *ANI* box on the *Edit Channel* window is disabled for the channel, ANI may be enabled by the user through the menu functions on the channel knob. When the radio is turned off ANI will be disabled until the user turns it back on using the menu function.

2. As long as a DTMF code has been entered in the *ANI Number* box and the *ANI* box on the *Edit Channel* window is enabled for the channel, ANI will always be enabled for the channel.

Note: Each time PTT is released a 25 second timer will be started. ANI will not be sent on the next PTT press unless this timer has expired.

CHANNEL

Select *Channel* from the *Edit* menu to set per channel programmable data.



- **Channel Number**

Use the *Channel Number* arrows to choose the channel to be edited.

- **Alpha Character (channel box)**

Optional: Enter up to 12 (only the first three will be displayed on the standard control head) characters (0—9, A—Z.*,+,- and =) to be displayed on the control head instead of the channel number. The alpha name can also be used to create the appearance of out of sequence channel selection or the channel being in more than one channel group (the same name is given to an identical channel programmed in each group).

- **Group Number**

Use the *Group Number* arrows to quickly switch to the next available channel group. The Group Number will automatically update as the *Channel Number* is incremented. The number of groups available equals the total number of channels (120 or 320) divided by the number selected in the *Group Count* drop box on the *Edit Option* window. The channels are equally and incrementally divided among the number of available groups. For example, if 4 groups are selected on a 120-channel radio, channels 1 through 30 are in channel group 1, 31 through 60 are in channel group 2, etc.

The channel groups can be used to bring the number of channels a user has available and/or is scanning at one time down to a more manageable size. The menu functions on the channel knob allow the user to select the current group and whether the radio scans just the current group or all groups.

- **Alpha Character (group box)**

Optional: Enter up to 12 (only the first three will be displayed on the standard control head) characters (0—9, A—Z.*,+,- and =) to be displayed on the control head instead of the group number when the user performs group selection.

- **Wide/Narrow**

Click the *Wide* or *Narrow* bullet to select the occupied bandwidth desired for the current channel.

- **Receive Channel Freq**

Click on the *Receive Freq* arrows, or directly enter the desired receive frequency (in MHz) in the *Receive Freq* box.

- **Receive Signaling**

Click on the *Receive Signaling* drop box and select *CTCSS* to set a receive CTCSS decode frequency. Then use the left drop box to select the desired CTCSS frequency (67.0 – 254.1 Hz).

Click on the *Receive Signaling* drop box and select *DCS* to set a receive DCS decode code. Then use the arrows on the right box to select the desired DCS code (0-777).

Click on the *Receive Signaling* drop box and select *None* to clear any previously selected signaling type.

- **Transmit Channel Freq**

Click on the *Transmit Freq* arrows, or directly enter the desired transmit frequency (in MHz) in the *Transmit Freq* box.

- **Transmit Signaling**

Click on the *Transmit Signaling* drop box and select *CTCSS* to set a transmit CTCSS encode frequency. Then use the left drop box to select the desired CTCSS frequency (67.0 – 254.1 Hz).

Click on the *Transmit Signaling* drop box and select *DCS* to set a transmit DCS encode code. Then use the arrows on the right box to select the desired DCS code (0-777).

Click on the *Transmit Signaling* drop box and select *None* to clear any previously selected signaling type.

- **TX Power Control**

Click on the *TX Power Control* drop box then select *Lowpower* or *Normal* to set the transmit power level used on the channel. The actual power level corresponding to each selection may be adjusted on the *Edit Adjust* window.

- **Compand**

Click on the *Compand* drop box to *Enable* or *Disable* the compander circuit.

- **Dtone (2-Tone)**

Click on the *Dtone* drop box to *Enable* or *Disable* 2-tone decode on the current channel.

- **ANI**

Click on the *ANI* drop box and select *Enable* or *Disable* for ANI operation.

1. As long as a DTMF code has been entered in the *ANI Number* box on the *Edit 2tone* window **and** the *ANI* box on the *Edit Channel* window is set to *Disable* for the channel, ANI may be enabled by the user through the menu functions on the channel knob. When the radio is turned off ANI will be disabled until the user turns it back on using the menu function.

2. As long as a DTMF code has been entered in the *ANI Number* box on the *Edit 2tone* window **and** the *ANI* box on the *Edit Channel* window is set to *Enable* for the channel, ANI will always be enabled for the channel.

Note: Each time PTT is released a 25 second timer will be started. ANI will not be sent on the next PTT press unless this timer has expired.

- **Group Registry**

Check the *Channel in Scan Group A* box to initially register the channel in the scan list when using Type A and Type P/S scan types. The scan type depends on the *Scan Type* selected on the *Edit Option* window and the scan type selected on the channel knob menu selections by the user. The user may also set the radio to scan only channels in the selected *Channel Group* (See *Group Count* on the *Edit Option* window) or all programmed channels registered in the *Scan Group A*. Channels may also be added or deleted from the scan list by the user. The conditions under which the user additions and deletions are reset are programmable under the *Scan List Clear* on the *Edit Option* window.

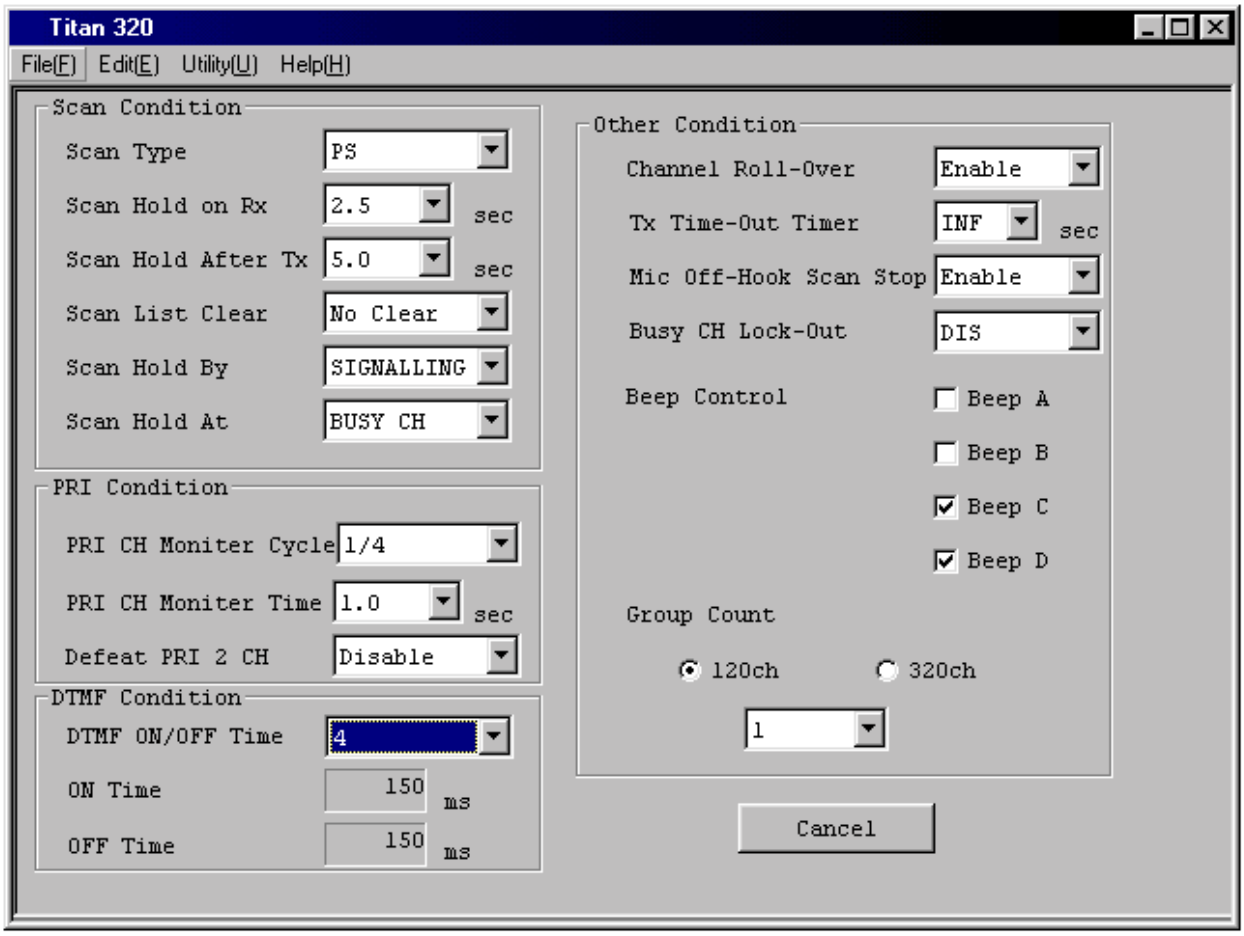
Check the *Channel in Scan Group B* box to initially register the channel in the scan list when using Type B or Type B' scan types. The scan type depends on the *Scan Type* selected on the *Edit Option* window and the scan type selected on the channel knob menu selections by the user. The user may also set the radio to scan only channels in the selected *Channel Group* (See *Group Count* on the *Edit Option* window) or all programmed channels registered in the *Scan Group B*. Channels may also be added or deleted from the scan list by the user. The conditions under which the user additions and deletions are reset are programmable under *Scan List Clear* on the *Edit Option* window.

- **Auxiliary Data**

Click on an *Auxiliary Data* drop box to select either 0 or 1 for each of the 8 bits of auxiliary data (used only for optional functions). This auxiliary data is sent in serial form for each channel when the channel is selected. When AUX STB pin (J903 pin 1) is pulsed, the previous 8 bits on the DATA pin (J401 pin 3, using DCLK to clock the data) correspond to the *Auxiliary Data* settings.

OPTION

Select *Option* from the *Edit* menu to set scan options and other conditions.



- **Scan Conditions**

Scan Type Click on the drop box to select the desired scan type (Normal, Modify, Second, or PS). This selection along with the channel knob menu selection made by the user determines the type of scan in use. If *Normal* scan is selected the user may select A Scan or B Scan. If *Modify* is selected the user may select A Scan, B' Scan or GRP A Scan. If *Second* is selected the user may select S CH Scan, B' Scan or A Scan. If *PS* is selected only PS scan will be available to the user. See the table below to determine the scan type and Appendix A for a description of each scan type.

Programmed Scan Type	*Normal*	*Modify*	*Second*	*PS*
User Selected PRI	A Scan	A Scan	S CH Scan	PS Scan
User Selected SCN	B Scan	B' Scan	B' Scan	N/A
User Selected P/S	N/A	GRP A Scan	A Scan	N/A

Scan Hold on RX — Click on the drop box to select the length of time, in seconds, that scan waits after a signal has been received before resuming. The time interval begins upon loss of the signal that stopped scan. Choose *0.5, 2.5, 5.0,* or *Infinite* (if *Infinite* is selected, can will not resume until the operator rotates the Channel Knob).

Scan Hold on TX — Click on the drop box to select the length of time, in seconds, that scan waits before resuming after PTT has been released. Choose *0.5, 2.5, 5.0*, or *Infinite* (if *Infinite* is selected, scan will not resume until the operator rotates the Channel Knob).

Scan List Clear — Click on the drop box to select the condition that clears the scan list (*Power/Scan*, *When Power On*, *When Scan Off*, *No Clear*). The list will be reset to the settings of the *Channel in Scan Group A* or *B* check boxes on the *Edit Channel* screen and the One Group Scan/All Group Scan channel knob menu selection.

Scan Hold By — Click on the drop box to select *NSQ* (scan holds when carrier is present) or *SIGNALING* (scan holds when a CTCSS tone or DCS code is present).

Scan Hold At — Click on the drop box to choose if scan holds on a *VACANT CH* or *BUSY CH*.

- **PRI Condition**

PRI Ch Monitor Cycle — Click on the drop box to select the priority channel sampling ratio (1/4 or 1/8). This determines the number of non-priority channels that will be scanned with each sampling of a priority channel.

PRI Ch Monitor Time — Click on the drop box to select the number of seconds (0.5, 0.75, 1.0 or 1.5) between each priority channel sampling.

Defeat PRI2 CH — Click on the drop box to enable/disable use of a Priority 2 channel. If *Defeat PRI2 CH* is chosen as *Disable* and a PRI2 channel has been assigned, the PRI2 channel will be checked every third priority sampling. If Defeat PRI2 CH is selected as *Enable*, there will be no PRI2 channel sampling.

- **DTMF Condition**

DTMF On/Off Time — Click on the drop box to select a number code, 1—7, corresponding to the desired *DTMF On* and *Off Time*, as follows:

Selected Code	*On Time (ms)*	*Off Time (ms)*
0	600	600
1	600	300
2	300	300
3	300	150
4	150	150
5	150	75
6	75	75
7	75	30

- **Other Condition**

Channel Roll-Over — Select Enable from the drop box to allow channel scroll to start over when the highest or lowest channel is reached.

TX Time Out Timer

Click on the drop box to select the length of time, in seconds, that the PTT may be held on continuously before the transmitter is shut down. Choose 90, 120, 150, 180, 210 or INF.

Mic Off-Hook Scan Stop

Select Enable from the drop box to stop scan when the microphone is removed from the hang-up box or the hanger button on the 70-2328A microphone is not grounded.

Note: To use the 70-2328A hanger button for the hang-up function, JP1 must be removed and JP2 must be installed in the control head. The hang-up jumper in the accessory plug on the back of the radio should also be removed.

Busy CH Lock-Out

Click on the drop arrow to select the conditions for which a transmit is inhibited occurs. Choose None (lock-out disabled), NSQ (when carrier is received), SGNL (when correct CTCSS tone or DCS code is received) or SPCL (when carrier is present without the correct CTCSS tone or DCS code).

Beep Control

Click to enable/disable beep controls A—D.

Beep Control	***Description***	
A	Signal on PRI1 Signal on PRI2	(3 short beeps) (1 short beep)
B	TX Time-Out-Timer Expire Busy Channel Lock-Out	(1 long beep) (1 medium beep)
C	Key Press Channel Change	(1 very short beep) (1 very short beep)
D	Wake-up Test OK Error Indication	(1 short beep) (5 short beeps)

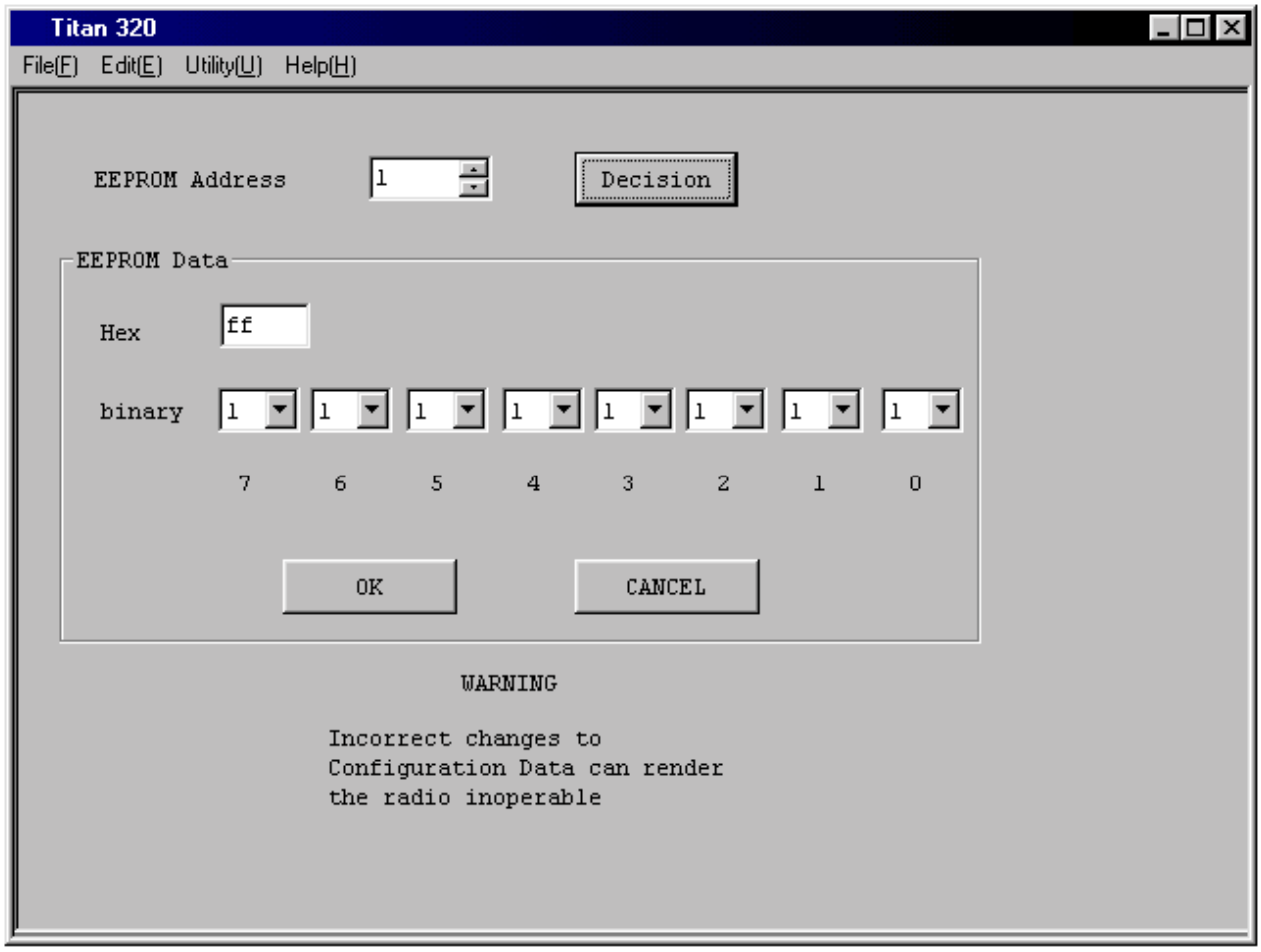
Group Count

Select either 120 or 320 channels, then click on the drop arrow to decide how many groups these channels will be equally and sequentially divided into.

MANUAL

Select *Manual* from the *Edit* menu to open the *Manual* window. Manual programming provides direct access the configuration data in the computer, which you can then send to the radio's EEPROM. **NOTE:** Make sure the radio is not in scan mode before downloading or uploading data.

> **WARNING:** It is important to note that no check is performed to make sure that only safe changes have been made to the configuration data. You should never change Configuration Data unless you have access to specific details as to what values to change, as you can make the radio inoperable if incorrect values are entered.
>
> Press the "OK" button to save any changes made to the address being edited.



- **EEPROM Address**

This is the location of the memory that you wish to view or modify. The memory range is 0 to FFF.

- **Decision Button**

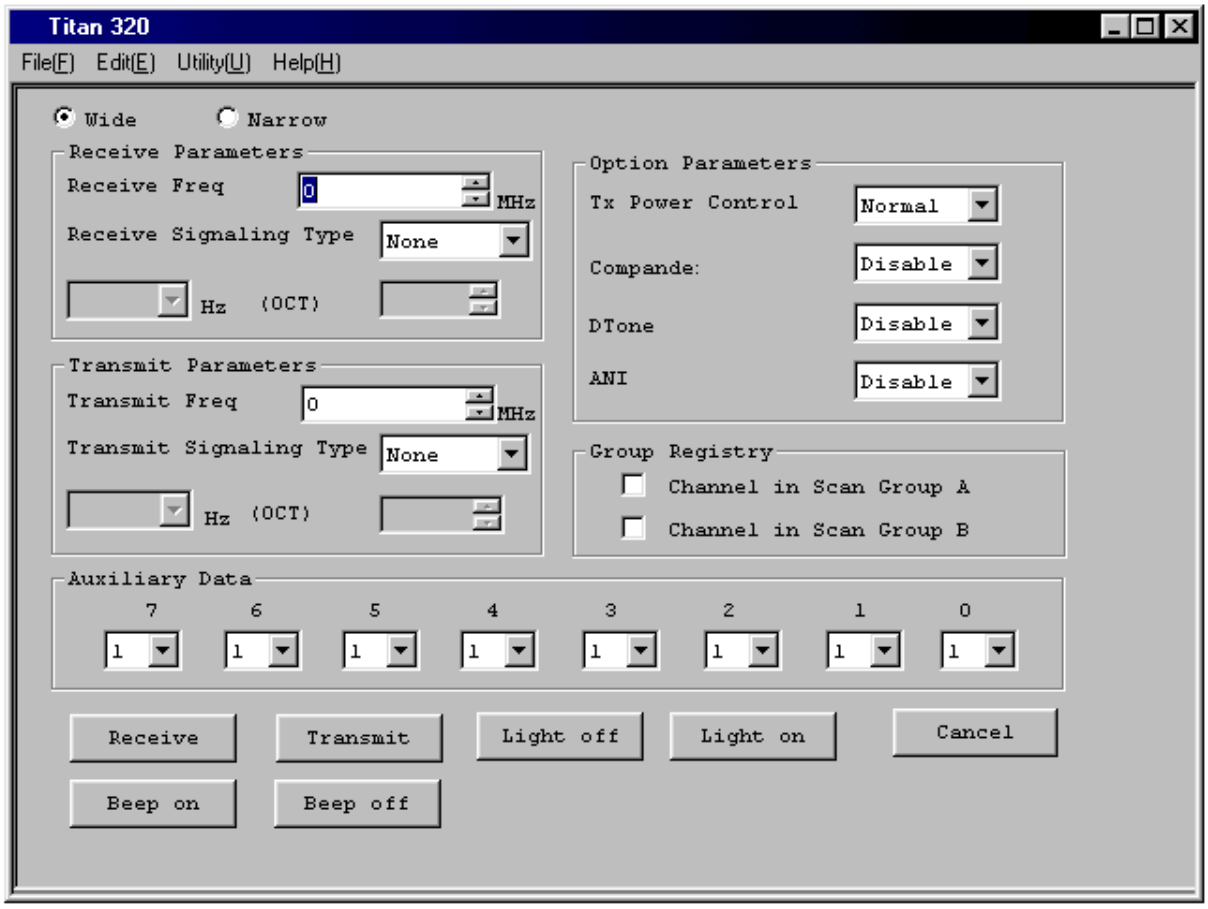
Click on the *Decision* button to view the EEPROM data at the address in the *EEPROM Address* window.

- **EEPROM Data**

The EEPROM data may be entered as a hex number (0—FF) or a binary number (00000000—11111111). Press the *OK* button to save any changes to the data.

TEST

Select *Test* from the *Edit* menu to open the *Test* window. This will allow you to test the radio's performance and adjustments may be made from the *Edit Adjust* window. Make sure to terminate the radio antenna connector with the proper 50-ohm load before initiating any receive or transmit tests, and only leave the transmitter on for a short time.



To prepare the radio for programming: First make sure the radio is not in scan mode, turn it off, then attach the programming cable and turn it back on. Upload the radio to get the current *Adjust*ment settings from the radio. After finishing with any adjustments, turn the radio off and unplug the programming cable.

- **Wide/Narrow**

Click on the appropriate selection.

- **Receive Parameters**

Receive Channel Freq	Click on the drop box, or manually enter the receive frequency (in MHz).
Receive Signaling Type	Click on the drop box to select the signaling type (None, CTCSS, DCS).
Receive Signaling Data	If you selected CTCSS as the *Receive Signaling Type*; use the left hand box to select the desired CTCSS frequency (67.0—254.1 Hz).

If you selected DCS as the *Receive Signaling Type*, use the right box to select the desired DCS code (0 to 777).

- **Transmit Parameters**

Transmit Channel Freq	Click on the drop box, or manually enter the transmit frequency (in MHz).
Transmit Signaling Type	Click on the drop box to select the signaling type (None, CTCSS, DCS).
Transmit Signaling Data	If you selected CTCSS as the *Transmit Signaling Type*; use the left hand box to select the desired CTCSS frequency (67.0—254.1 Hz). If you selected DCS as the *Transmit Signaling Type*, use the right box to select the desired DCS code (0 to 777).

- **Option Parameters**

TX Power	Click on the drop box to select *Low* or *Normal* power level.
Compander	Click on the drop box to *Enable* or *Disable* compander operation.
Dtone	Click on the drop box to *Enable* or *Disable* 2 Tone operation.
ANI	Click on the drop box to *Enable* or *Disable* ANI operation.

- **Group Registry**

Channel in Scan Group A	Click to put the channel in scan group A.
Channel in Scan Group B	Click to put the channel in scan group B.

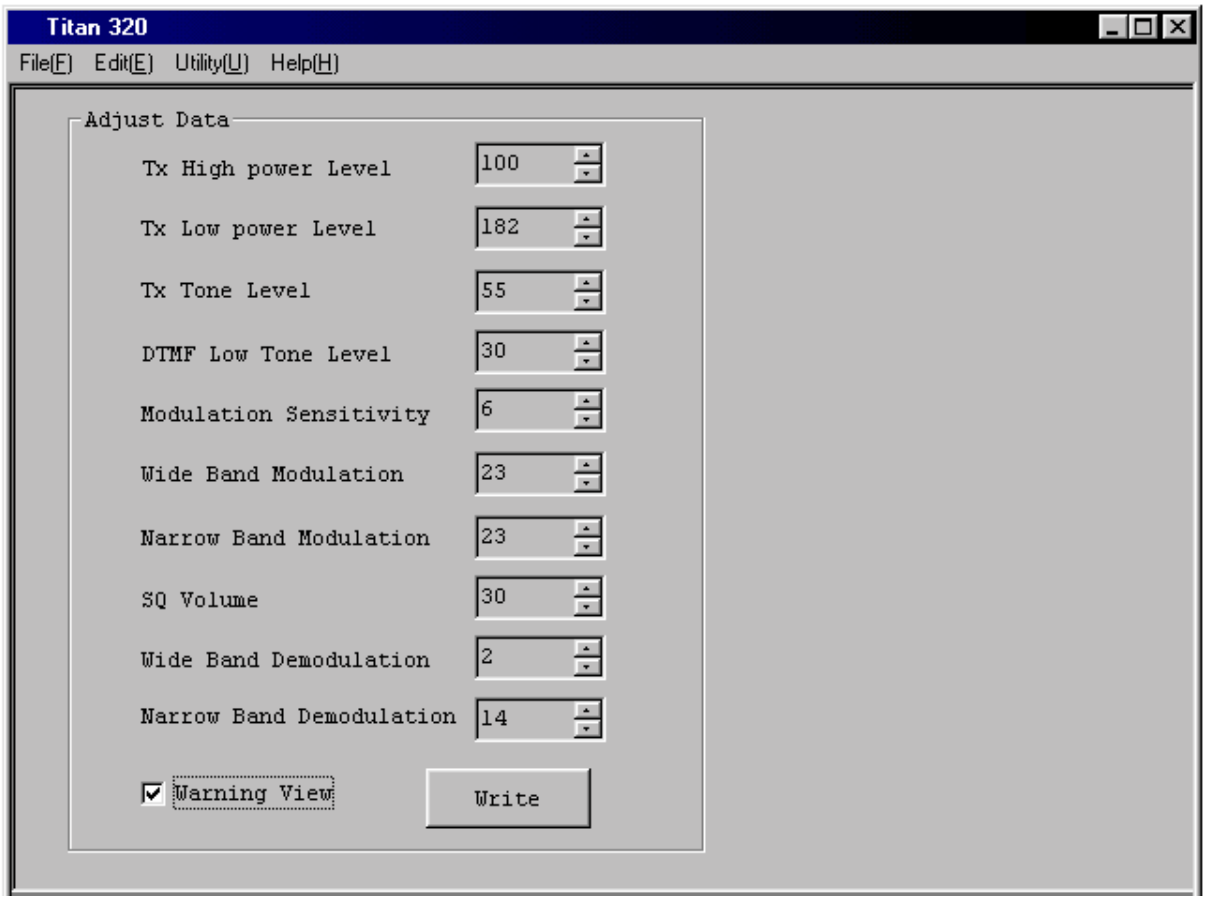
- **Auxiliary Data**

Click on the drop box and select either 0 or 1 for each of the 8 bits of auxiliary data.

- **Buttons**

Receive Button	Click on this button to initiate a receive test.
Transmit Button	Click on this button to initiate a transmit test.
Light (LCD) On	Start light test.
Light (LCD) Off	End light test.
Beep On	Start beep test.
Beep Off	Stop beep test.
Cancel	Cancel the test mode.
Write	Sends the data to the radio's EEPROM.

ADJUST



NOTE: These settings are made at the factory and do not normally need to be changed. Be sure to upload the current data (*Utility Radio Comm* menu) from the radio to change the settings. The *Adjust* data is always read from the radio on *Upload* and is always saved with a saved file, but is not written to the radio when using the *Download* button on the *Utility Radio Comm* menu. The *Adjust* data is only sent to a radio by clicking the *Write* button on the *Adjust* window. Please note that all *Adjust* data is sent when the *Write* button is clicked.

TX High Power Level	Sets the standard transmit power level. Use the arrows to adjust the value from 0 to 255. Uncheck the *Warning View* check box to scroll more than one increment or decrement at a time.
TX Low Power Level	Sets the low transmit power level. Use the arrows to adjust the value from 0 to 255. Uncheck the *Warning View* check box to scroll more than one increment or decrement at a time.
TX Tone Level	Sets the signaling modulation level. Use the arrows to adjust the value from 0 to 127. Uncheck the *Warning View* check box to scroll more than one increment or decrement at a time.
DTMF Low Tone Level	Sets the DTMF tone level. Use the arrows to adjust the value from 0 to 127. Uncheck the *Warning View* check box to scroll more than one increment or decrement at a time.

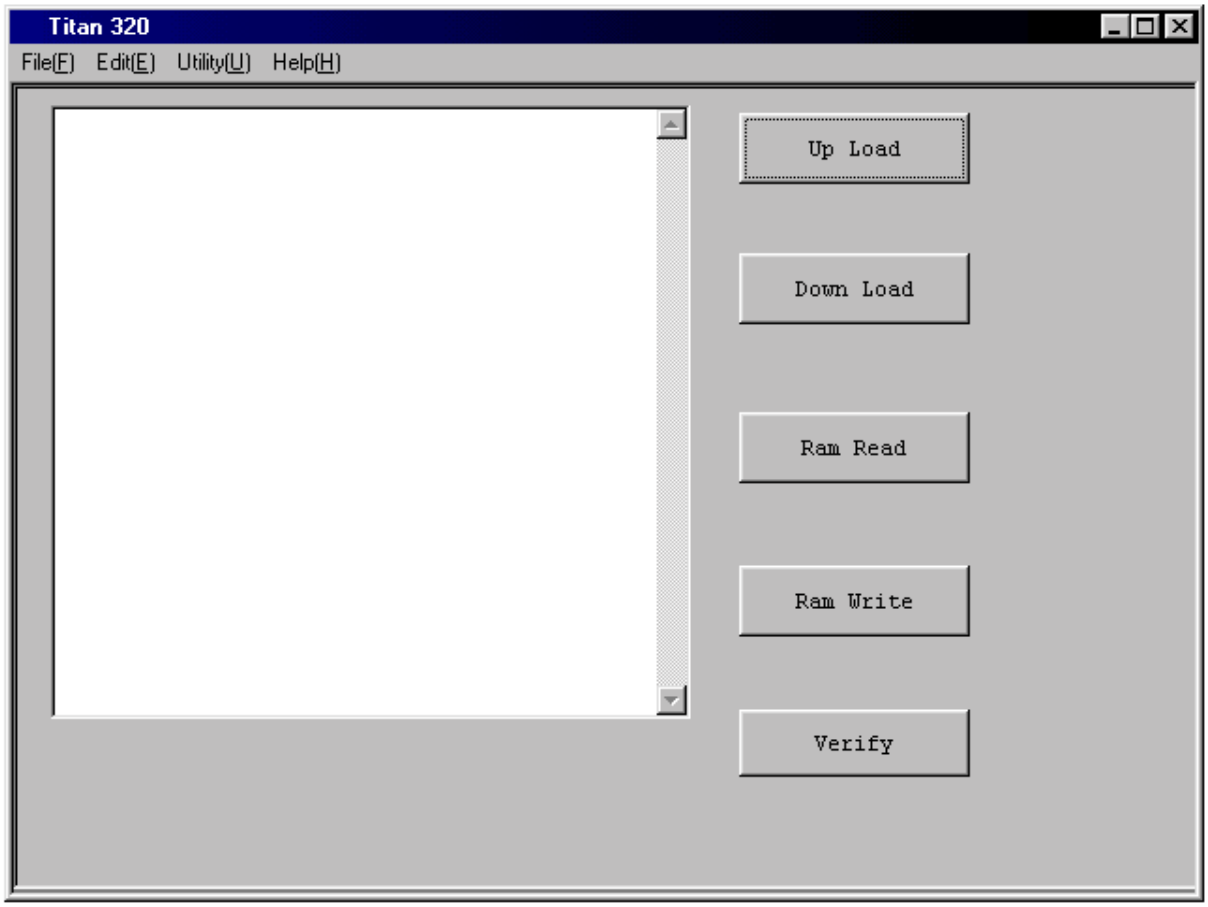
Modulation Sensitivity	Sets the microphone sensitivity. Use the arrows to adjust the value from 0 to 15. Uncheck the *Warning View* check box to scroll more than one increment or decrement at a time.
Wide Band Modulation	Sets the maximum modulation sensitivity for wideband. Use the arrows to adjust the value from 0 to 31. Uncheck the *Warning View* check box to scroll more than increment or decrement at a time.
Narrow Band Modulation	Sets the maximum modulation sensitivity for narrow band. Use the arrows to adjust the value from 0 to 31. Uncheck the *Warning View* check box to scroll more than increment or decrement at a time. The wide and narrow band settings may be used to change the perceived transmit audio balance when switching between narrow and wide band channels.
SQ Volume	Sets the initial squelch level after programming. This is the same setting that is adjusted by the user on the channel knob menus. Use the arrows to adjust the value from 0 to 80.
Wide Band Demodulation	Sets the demodulation sensitivity for channels programmed as wide band. Use the arrows to adjust the value from 0 to 15.
Narrow Band Demodulation	Sets the demodulation sensitivity for channels programmed as narrow band. Use the arrows to adjust the value from 0 to 15. The wide and narrow band settings may be used to change the perceived receive audio balance when switching between narrow and wide band channels.

Click the *Write* button to write any adjustment data changes into the radio's EEPROM. If adjustments are made without clicking the *Write* button, the original adjustment data settings will be restored after the radio is turned off.

UTILITY MENU

RADIO COMM

Opens the Radio Comm dialog box. Radio Comm provides direct access to the radio's EEPROM.



To prepare the radio for programming: First turn it off, then attach the programming cable before turning it back on. After programming is complete, you will need to turn the radio off, unplug the programming cable, and then turn the radio back on for the new settings to take effect.

- **Upload**

Loads the data stored in the radio's EEPROM.

- **Download**

Loads the current data settings into the radio's EEPROM. All settings, except for the *Adjust* data, are sent to radio.

- **Ram Read**

Read Address	Input a hexadecimal address to read, from 000 to FFF.
Read Byte	Input the decimal number of the byte to be read, from 1 to 8. Press OK to read the data from the radio.

- **Ram Write**

Write Address	Input a hexadecimal address to write, from 000 to FFF.
Write Byte	Input the decimal number of the byte to be written, from 1 to 8. Press OK to write the data to the radio.

- **Verify**

Compare the contents of the radio's EEPROM to the data settings in the computer.

If different data is found, the address and data are indicated. Press Continue to compare the remaining data, or Finish to end Verify.

Press OK to Copy the data from the radio's EEPROM to the PC.

> **WARNING:** It is important to note that no check is performed to make sure that only safe changes have been made to the configuration data. You should never change Configuration Data unless you have access to specific details as to what values to change, as you can make the radio inoperable if incorrect values are entered.
>
> Be sure any changes you make are correct before downloading the new data to the radio.

COMPORT SET

Select COM1 or COM2. The value you choose will be saved in the config file by the program.

APPENDIX A – SCAN TYPE DESCRIPTIONS

Many of the buttons and knobs have a secondary function when in scan mode. The particular characteristics of a button are dependent on the type of scan selected. A brief description of the six types of scan and the function of the various knobs and buttons when in scan, follows.

A Scan

The radio will scan the channels in the *Group Registry A*, with the modifications that have been made by the user from Add/Delete Mode. Priority monitoring of up to two channels is possible. The PRI 1 channel is assigned as the display channel when scan was activated. The PRI 2 channel is assigned by pressing and holding the SCAN button while scan is off. PRI 2 assignment may not be possible because of programming. The display will show a solid PRI icon and --- for the channel display while scanning.

CH/MENU Knob

When scan is holding on a busy channel, CH UP will restart scan from the next channel in the scan list. Note that the channel is not removed from the scan list. When programmed for *Mic Off-Hook Scan Stop* (Figure 1) and the microphone is off hook, CH UP/DN will change the PRI 1 channel.

PTT Bar

Pressing PTT, while in A Scan, will transmit on the PRI 1 channel.

SCAN Button

Press and release the SCAN button to exit scan and go to the PRI 1 channel.

MON Button

Press and release the MON button to enter monitor mode.

A/D Button

When scan is holding on a busy channel, press and release the A/D button to remove the channel from the scan list and restart scan from the next channel. The PRI 1 channel can not be deleted. Depending on programming of *Scan List Clear* the deleted channel(s) may be added back to the scan list when scan is turned off, when power is turned off, or when either occurs. When programmed for *Mic Off-Hook Scan Stop* and the microphone is off hook, press and hold the A/D button to initialize the scan list to its *Group Registry* programming.

AUX Button

Press and release the AUX button to activate the auxiliary function. If Scan Escape is set up as the auxiliary function, scan will stop and the radio will switch to the last busy channel. Press and release the AUX button to resume scanning from Scan Escape mode without changing the PRI 1 channel.

B Scan

The radio will scan the channels in the *Group Registry B*, with the modifications that have been made by the user from Add/Delete Mode. Priority monitoring is not possible. The display will show a solid SCAN icon and --- for the channel display while scanning.

CH/MENU Knob

When scan is holding on a busy channel, CH UP will restart scan from the next channel in the scan list. Note that the channel is not removed from the scan list.

PTT Bar

Pressing PTT, while in B Scan, will transmit on the last busy channel. If there is no last busy channel, transmit will occur on the displayed channel when scan was activated.

SCAN Button

Press and release the SCAN button to exit scan and go to the last busy channel.

MON Button

Press and release the MON button to enter monitor mode.

A/D Button

When scan is holding on a busy channel, press and release the A/D button to remove the channel from the scan list and restart scan from the next channel. Depending on programming of *Scan List Clear* the deleted channel(s) may be added back to the scan list when scan is turned off, when power is turned off, or when either occurs. When programmed for *Mic Off-Hook Scan Stop* and the microphone is off hook, press and hold the A/D button to initialize the scan list to its *Group Registry* programming.

AUX Button

Press and release the AUX button to activate the auxiliary function. Scan Escape is not possible in B Scan.

B' Scan

The radio will scan the channels in the *Group Registry B*, with the modifications that have been made by the user from Add/Delete Mode. Priority monitoring is not possible. The display will show a solid SCAN icon and --- for the channel display while scanning.

CH/MENU Knob

When scan is holding on a busy channel, CH UP will restart scan from the next channel in the scan list. Note that the channel is not removed from the scan list.

PTT Bar

Pressing PTT, while in B' Scan, will transmit on the last busy channel. If there is no last busy channel, transmit will occur on the displayed channel when scan was activated.

SCAN Button

Press and release the SCAN button to exit scan and go to the channel displayed when scan was activated.

MON Button

Press and release the MON button to enter monitor mode.

A/D Button

When scan is holding on a busy channel, press and release the A/D button to remove the channel from the scan list and restart scan from the next channel. Depending on programming of *Scan List Clear* the deleted channel(s) may be added back to the scan list when scan is turned off, when power is turned off, or when either occurs. When programmed for *Mic Off-Hook Scan Stop* and the microphone is off hook, press and hold the A/D button to initialize the scan list to its *Group Registry* programming.

AUX Button

Press and release the AUX button to activate the auxiliary function. Scan Escape is not possible in B' Scan.

PS Scan

The radio will scan the channels in the *Group Registry A*, with the modifications that have been made by the user from Add/Delete Mode. Priority monitoring of up to two channels is possible. The PRI 1 channel is assigned as the displayed channel. The PRI 2 channel is assigned by pressing and holding the SCAN button while scan is off. PRI 2 assignment may not be possible because of programming. The display will show a blinking PRI icon and the PRI 1 channel while scanning.

CH/MENU Knob

CH UP/DN will change the PRI 1 channel. When programmed for *Mic Off-Hook Scan Stop* and the microphone is off hook, CH UP/DN will change the PRI 1 channel.

PTT Bar

Pressing PTT, while in PS Scan, will transmit on the PRI 1 channel.

SCAN Button

Press and release the SCAN button to exit scan and go to the PRI 1 channel.

MON Button

Press and release the MON button to enter monitor mode.

A/D Button

When scan is holding on a busy channel, press and release the A/D button to remove the channel from the scan list and restart scan from the next channel. The PRI 1 channel can not be deleted. Depending on programming of *Scan List Clear* the deleted channel(s) may be added back to the scan list when scan is turned off, when power is turned off, or when either occurs. When programmed for *Mic Off-Hook Scan Stop* and the microphone is off hook, press and hold the A/D button to initialize the scan list to its *Group Registry* programming.

AUX Button

Press and release the AUX button to activate the auxiliary function. Scan Escape is not possible in PS Scan.

GRP A Mode

GRP A mode is a non-scan mode. No priority channels may be assigned or monitored. When in this mode the display will show solid PRI and SCAN icons and the currently selected channel. The radio will receive and transmit only on the displayed channel. CH UP/DN will change the displayed channel. Press and release the SCAN button to exit GRP A mode and go to the displayed channel.

S CH Mode

S CH mode is a non-scan priority monitor mode. The PRI 1 channel is assigned as the channel displayed when scan was activated. The PRI 2 channel may be assigned when scan is off, by pressing and holding the SCAN button. In S CH mode the radio will receive and transmit on the displayed channel (the Secondary channel) while sampling the PRI 1 and PRI 2 channels. While holding on a priority channel the radio will transmit on the channel it is holding on. When in S CH mode the display will show a solid PRI icon and the Secondary channel. CH UP/DN will change the current displayed channel (the Secondary channel). Press and release the SCAN button to exit scan and go to the PRI 1 channel. When scan is next activated it will again assign the displayed channel as PRI 1 and go to the channel displayed when scan was last exited (the Secondary channel).

APPENDIX B – TRANSCEIVER ERROR CODES

E1	MCU ROM/RAM Error
E2	No Model Number and/or Channel Data Programmed
E3	Synthesizer Unlock
E4	Channel Data Checksum Error
E6	EEPROM Write Counter is Over 100000
E7	EEPROM Backup Data Lost
E8	Program Communication Error
E9	Cloning Error

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