PYRAMID
COMMUNICATIONS

Programming Instructions for:

Motorola CDM-1250 / 1550
W/ Scholer-Johnson PassPort/LTR Option Board

For use with:

Pyramid Communications
Model 2012/2016/Merlin

Revision A
February 10, 2004

Introduction

Before you begin, you will need to have a copy Scholer-Johnson RSS software, Motorola Professional RSS software and a Motorola RIB available to program the mobile radio. Also, you will need a copy of the Pyramid programming software and FY-1 programming cable to program the Pyramid device.

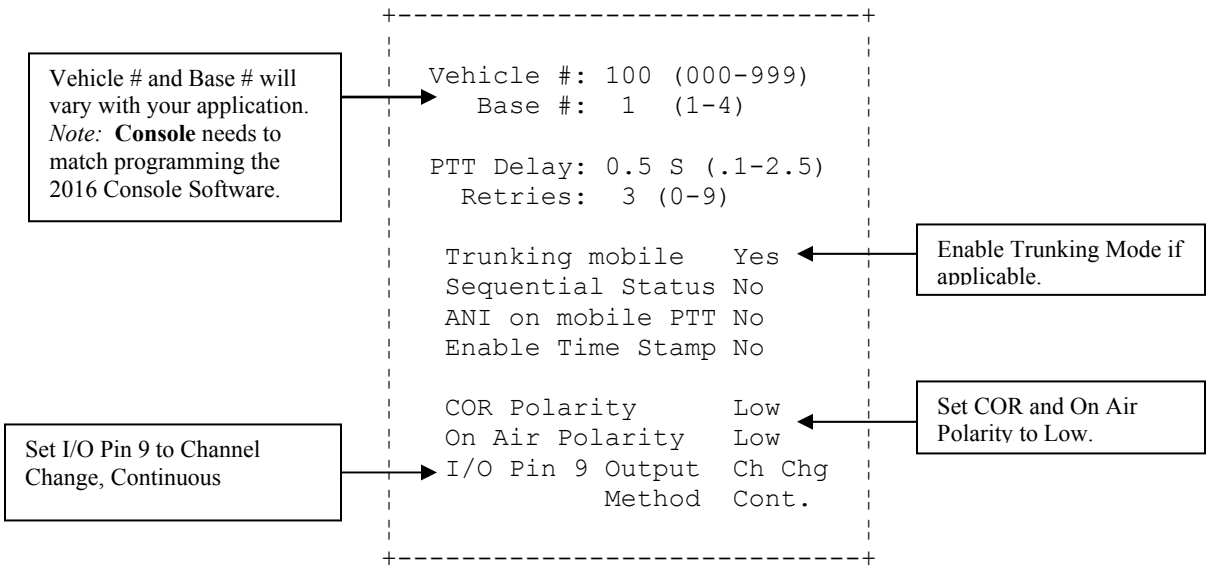
Note: You will need to contact Scholer-Johnson to obtain the firmware for use with Pyramid Communications mobile data products.

Programming the Pyramid 2012/Merlin

The mobile data terminal needs to be programmed to accommodate the polarities of signal that the Motorola CDM will provide it.

If you have not already done so, install the programming software on to your PC by following the instructions in the 2012/Merlin service manual.

Start running the Pyramid 2012/Merlin programming software on your PC. From the ***Data*** pull down menu, under the ***System Data*** screen, program the unit as shown the figure below.



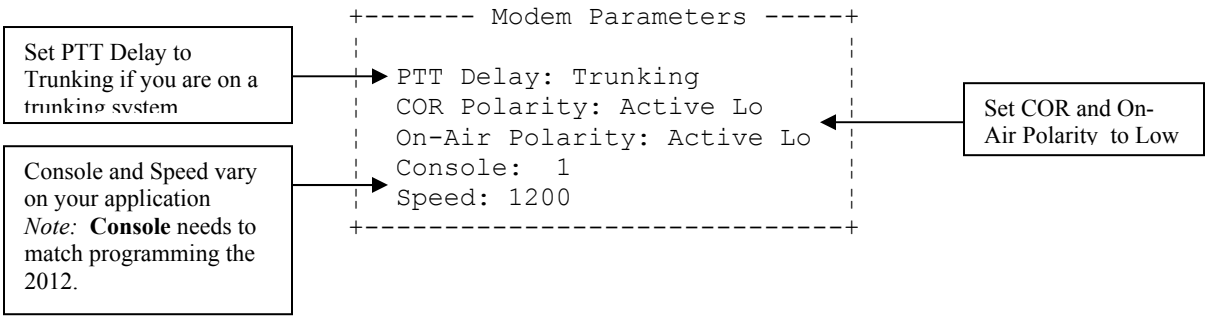
From the ***Data*** pull down menu, select your ***Data Format*** in the ***Format Screen***. There are three signaling format choices. Chose the format to fit your application.

More programming instructions are available in the 2012/Merlin Service Manual.

Programming the Pyramid 2016

Programming of the Pyramid 2016 base modem is done through the console interface. Typically, the parameters are set in the Pyramid Console software, and then automatically sent to the 2016.

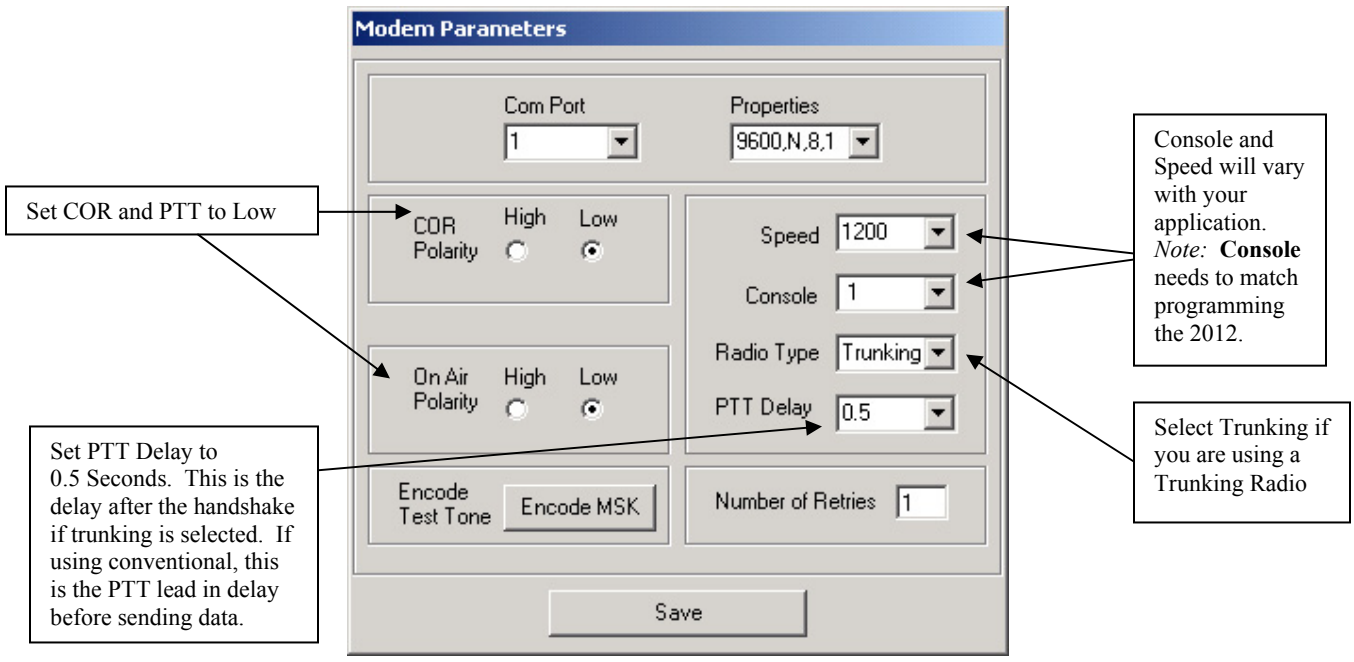
The figure below shows how a typical Pyramid Console software would be set up when connected to a 2016 and CDM radio. To access the ***Modem Parameters*** menu, select ***Configure*** from the pull down menu.



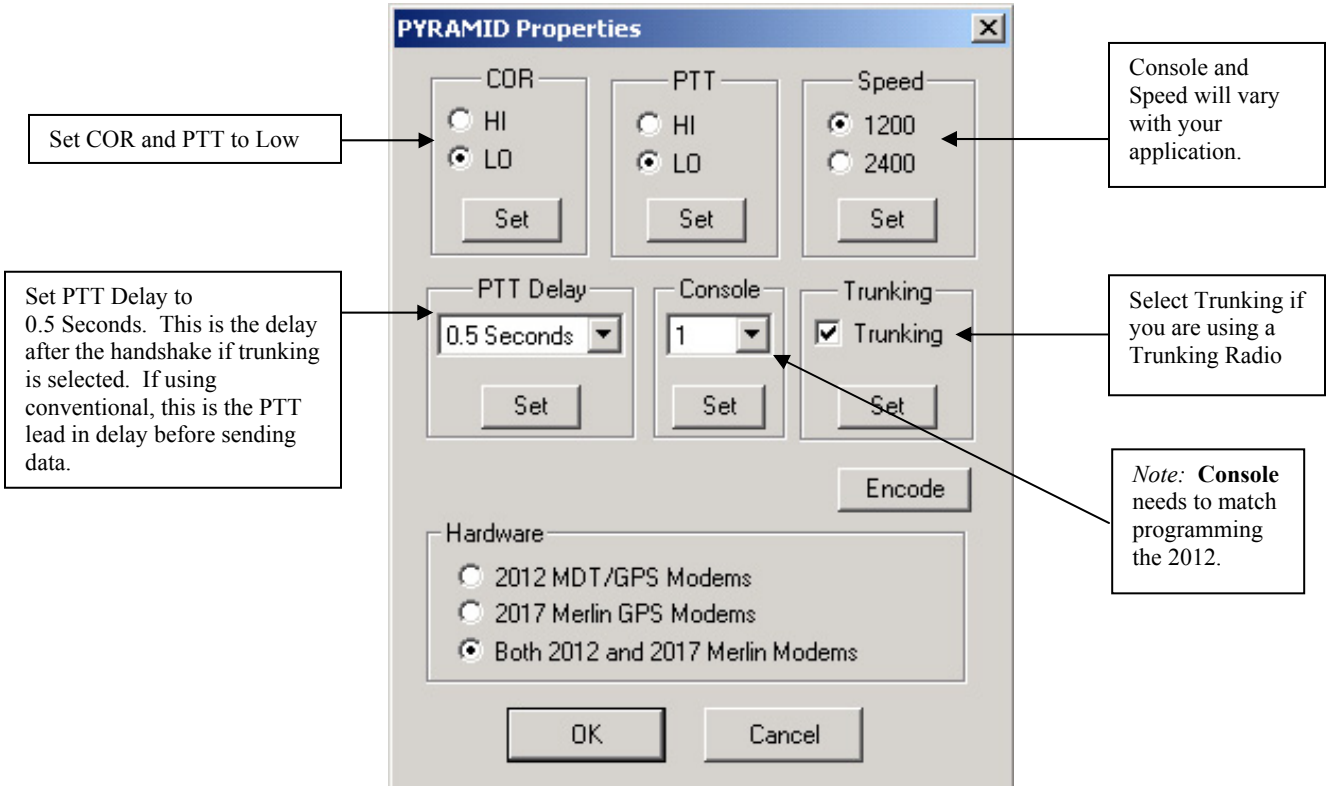
See the Pyramid 2016 service manual for further Pyramid Console software information.

Programming the Pyramid 2016 (Continued)

The figures below shows how Street Smarts modem parameters will be set up when connected to a 2016 and CDM radio. To access this configuration screen, select the ***Configure*** pull down menu in Street Smarts. Then click ***Modem Parameters*** to configure the 2016.



The figures below shows how a typical RasTrac I/O processor will be set up when connected to a 2016 and CDM radio. To access the I/O configuration, select the ***Edit*** pull down menu from the RasTrac I/O Processor. From the ***Input/Output Configuration*** screen, select the ***Protocol*** to be **PYRAMID**. Then click ***Properties*** to configure the 2016.



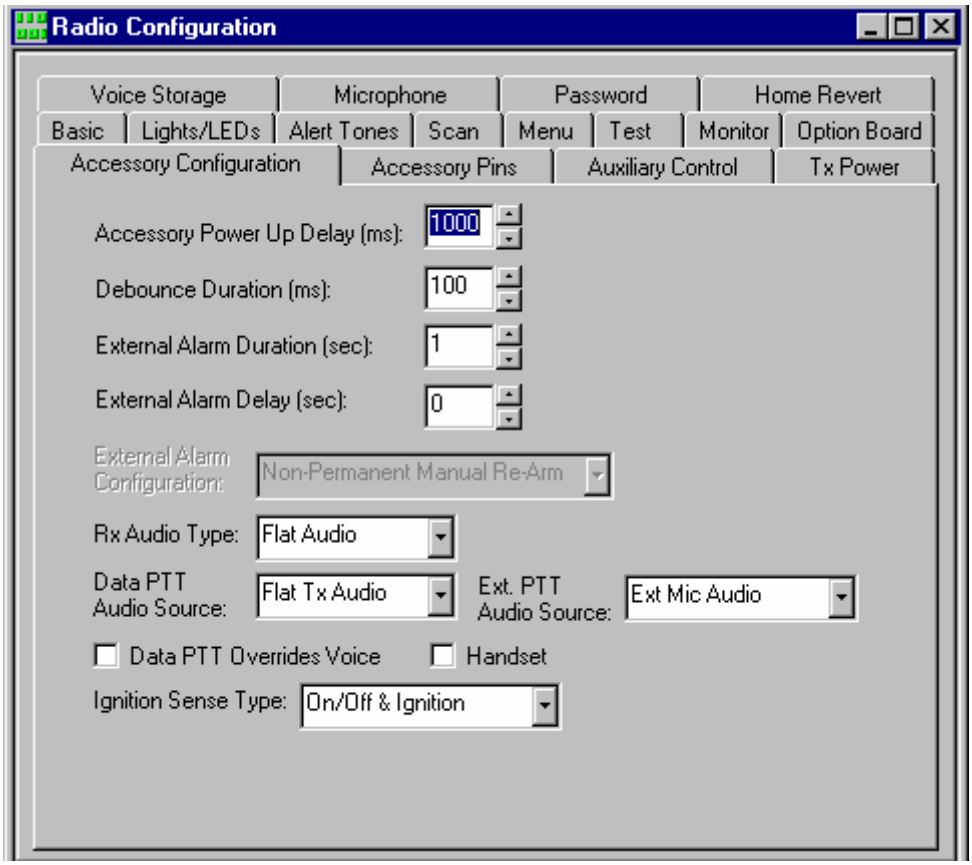
Note: **If your I/O Processor does not include a "check box" parameter for enabling trunking, contact Manning Navcomp to obtain the latest version of I/O Processor.**

Note: You will need to contact Scholer-Johnson to obtain the firmware for use with Pyramid Communications mobile data products.

Initial programming of the CDM Mobile – Motorola RSS

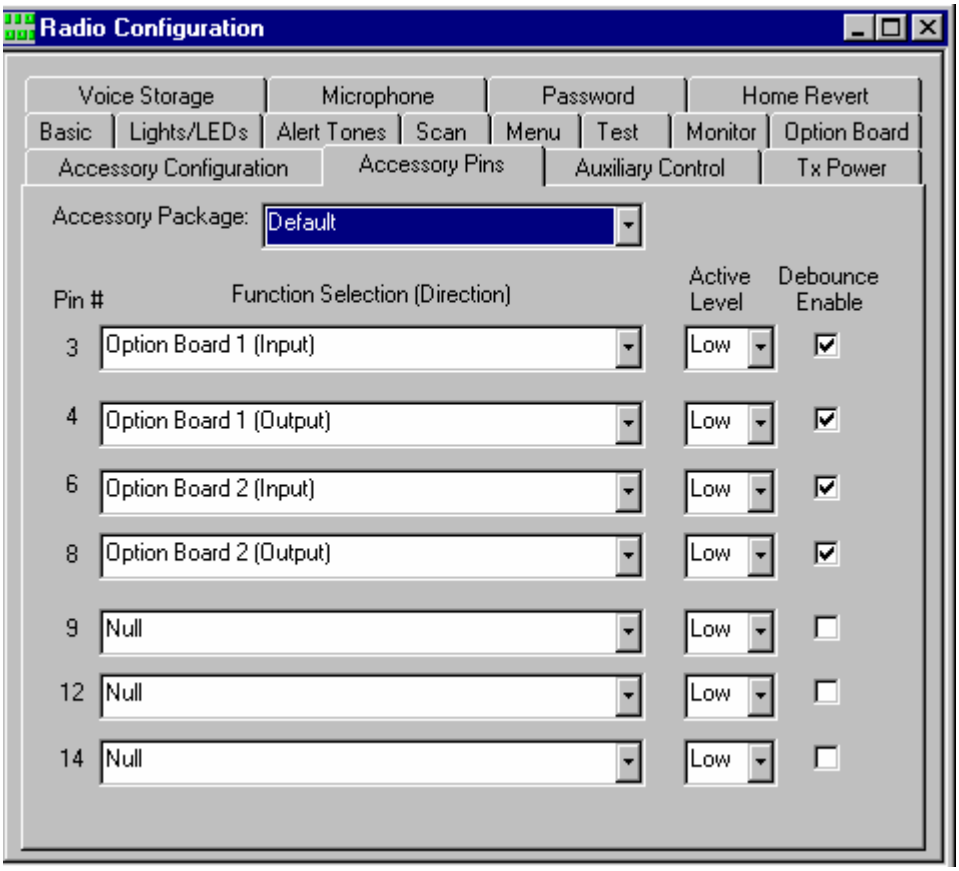
Follow any instructions for installing the Scholer-Johnson PassPort/LTR option board into the Motorola CDM radio. It is important to follow the next programming step in order to get RX audio onto the Accessory connector for the data system to operate properly. You will need to perform the following to **ALL** radios that will be connected to any Pyramid Communications equipment.

Access the Accessories Configuration menu by first reading the personality out of the CDM radio with the **Motorola Professional RSS** software. Select the ***Radio Configuration*** menu and click on ***Accessory Configuration*** tab.



1. Set the ***Rx Audio Output*** to "**Flat Audio"**. This will enable all RX audio from the discriminator of the radio to be available on the accessory connector of the radio.
2. Set the ***Data PTT Audio Source*** to **"Flat TX Audio"**. This ensures that the radio will not filter or distort any of the data audio.

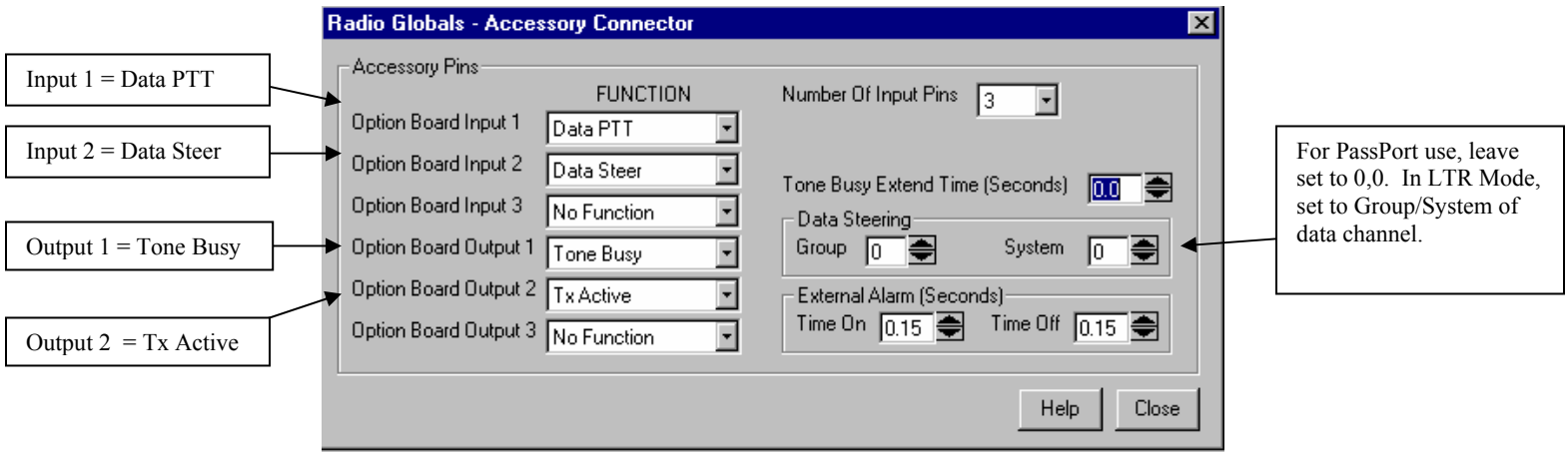
Access the Accessories Pins menu by first reading the personality out of the CDM radio with the **Motorola Professional RSS** software. Select the ***Radio Configuration*** menu and click on ***Accessory Pins*** tab.



1. Program ***Pin 3*** of the accessory connector for ***"Option Board 1 (Input)" Active Low***
2. Program ***Pin 4*** of the accessory connector for ***"Option Board 1 (Output)" Active Low***
3. Program ***Pin 6*** of the accessory connector for ***"Option Board 2 (Input)" Active Low***
4. Program ***Pin 7*** of the accessory connector for ***"Option Board 2 (Output)" Active Low***

Programming Option Board – Scholer-Johnson RSS

Using the Scholer-Johnson Option board RSS software, select the ***Radio*** pull down menu, and then select ***Globals***. Click on ***Accessory Connector*** to access the Accessory Connector configuration screen. From this screen, you will need to program the I/O configuration of the Scholer-Johnson Accessory Connector controls.



5. Program ***Input 1*** of the accessory connector for ***"Data PTT"***
6. Program ***Input 2*** of the accessory connector for ***"Data Steer"***
7. Program ***Output 1*** of the accessory connector for ***"Tone Busy"***
8. Program ***Output 2*** of the accessory connector for ***"Tx Active"***
9. If LTR mode, set Data Steering the Group/System of LTR data talk group.

Programming Option Board – Scholer-Johnson RSS (continued)

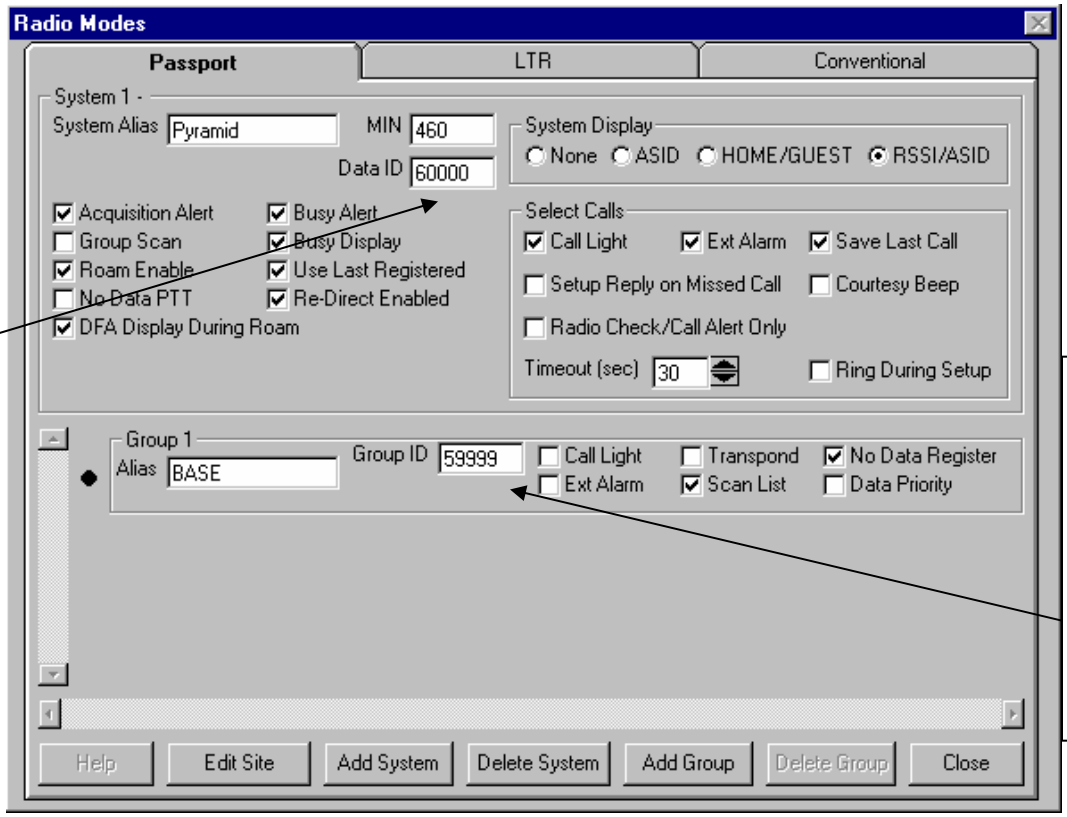
Programming the *Base* Radio - PassPort

Program the Site information as you normally would for you PassPort trunking system.

In the base radio, you will be setting the radio to receive all inbound messages from mobile units on the **primary group id** code. This primary group id code will also be used to send acknowledge messages back to the mobile units.

When the dispatch software sends outbound messages (e.g. GPS Poll, Text Message, Horn Honk, etc.) the radio will switch to a voice group to send these messages. Normally, this is where all mobile units will be monitoring for traffic.

See Appendix A for details on the Base Channel Change scheme.



This is the main **voice** group id code for the fleet.

This is the Group ID code used to receive data from the mobile units. It is also used to send acknowledgements to mobile units. This should be the Primary Group ID as programmed in your NTS system for the PassPort Fleet.

Example:
When the 2016 base modem receives a message on group 59999, it will assert the external PTT of the accessory connector and the radio will key on Group 59999 to send the acknowledgment.

If the dispatcher sends text message or GPS poll, the 2016 will assert the external PTT and the Data Steer pin to switch the radio to group id 60000 (main voice group). Since the mobile radios normally are listening to the voice group 60000, the MDT's will receive the message and reply back on the data group 59999.

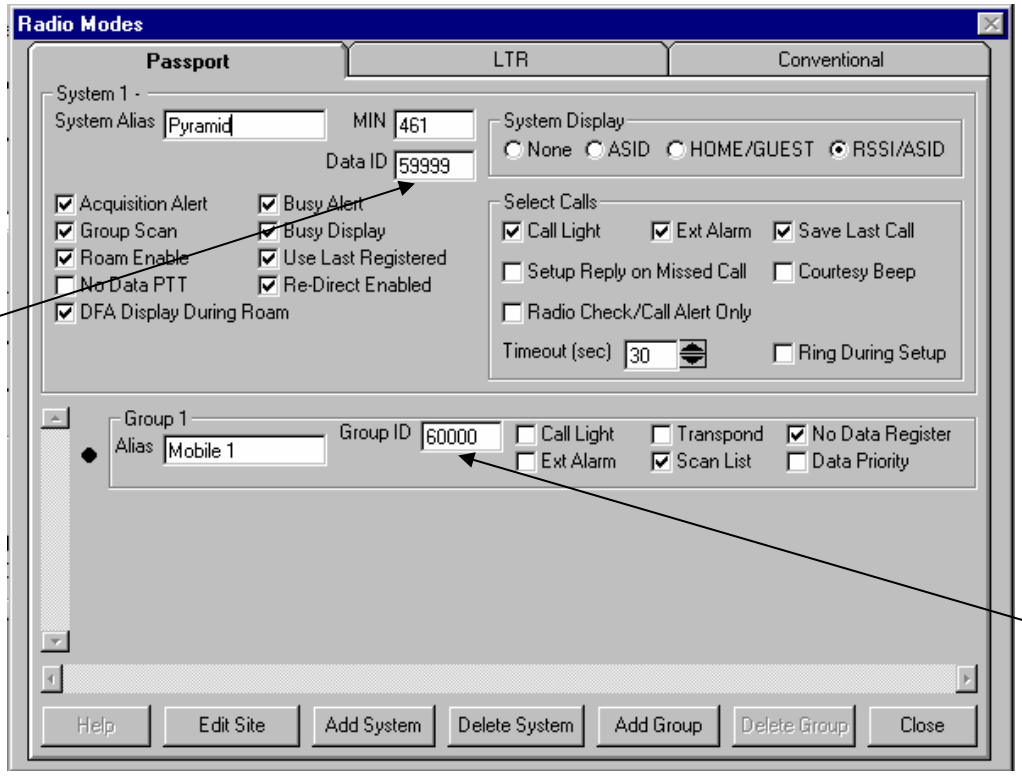
Programming the *Mobile* Radio - PassPort

Program the Site information as you normally would for you PassPort system.

In the mobile radio, you will be setting the radio to receive all inbound messages and voice traffic on the voice group id. All data transmitted by the mobile data terminal will be sent out on the **primary group id** code. This primary group id code will also be used to send acknowledge messages back to the base unit.

When a transmission is initiated by the mobile unit, the radio will switch to the defined data group id code send the data, then revert to the voice group id to listen for other voice traffic. If the message initiated by the mobile requires and acknowledgement from the base modem, the radio will remain on the data group id until the acknowledgement is received or a timeout has occurred.

This is the Group ID code used to receive data from the base unit. It is also used to send acknowledgements to the base unit. This should be the Primary Group ID as programmed in your NTS system for this PassPort Fleet.



This is the main **voice** group id code for the fleet.

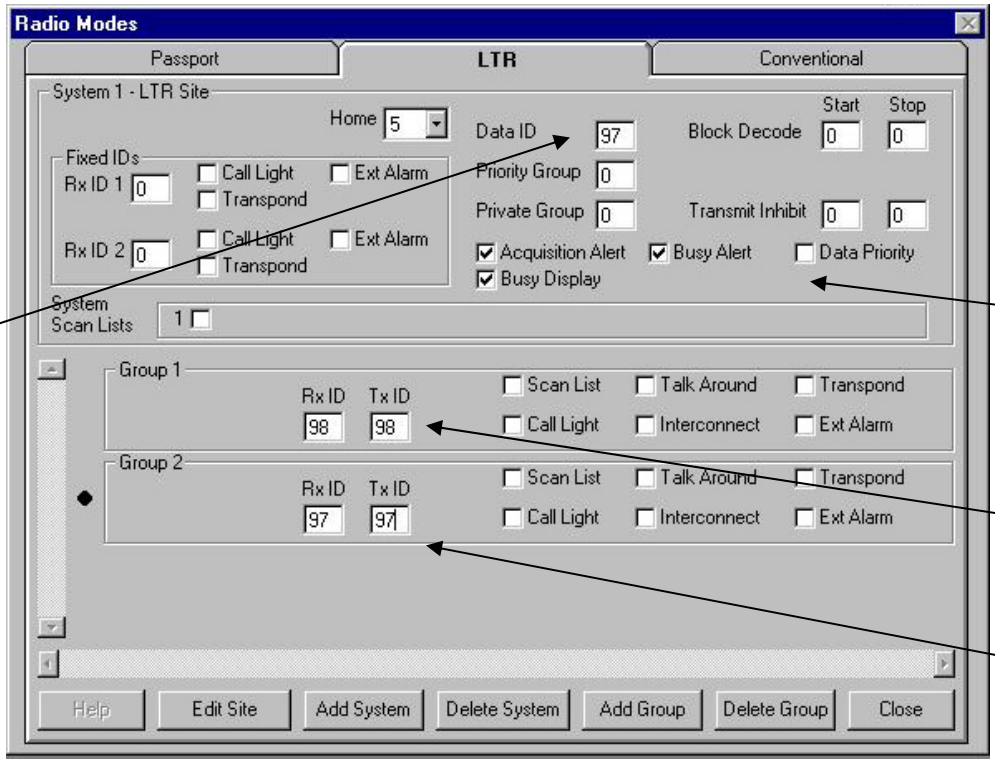
Programming the *Base* Radio - LTR

Program the Site information as you normally would for you LTR trunking system.

In the base radio, you will be setting the radio to receive all inbound messages from mobile units on the **Data LTR ID** code. This Data LTR ID code will also be used to send acknowledge messages back to the mobile units.

When the dispatch software sends outbound messages (e.g. GPS Poll, Text Message, Horn Honk, etc.) the radio will switch to a Voice LTR Group ID to send these messages. Normally, this is where all mobile units will be monitoring for traffic.

See Appendix A for details on the Base Channel Change scheme.



This is the main **Voice LTR Group ID** code for the fleet, but it is actually where the base modem will send outbound data to the mobile units on

Do not check Data Priority

This is the Data Group ID code used to receive data from the mobile units. It is also used to send acknowledgements to mobile units.

This is the Voice Group ID code used to send data to the mobile units if the dispatcher initiates data such as GPS Poll.

Example:
When the 2016 base modem receives a message on LTR Data Group 1, it will assert the external PTT of the accessory connector and the radio will key on LTR Data Group 1 to send the acknowledgment.

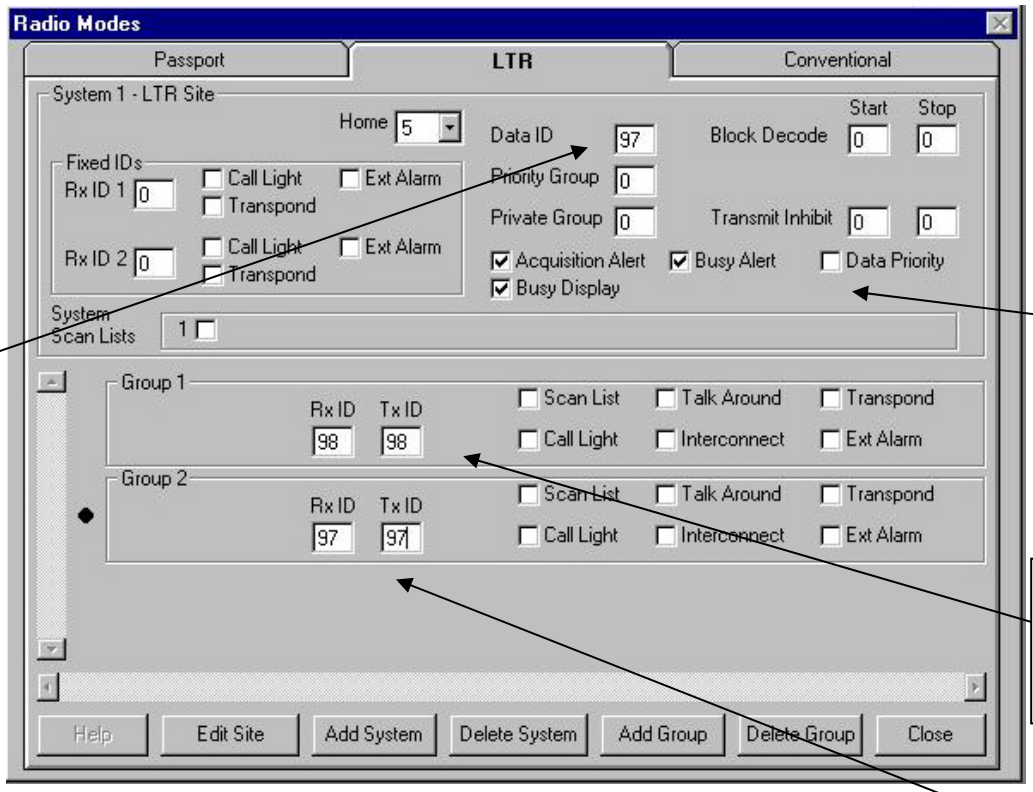
If the dispatcher sends text message or GPS poll, the 2016 will assert the external PTT and the Data Steer pin to switch the radio to LTR Talk Group 2 (the main voice group). Since the ***mobile*** radios normally are listening to LTR Talk Group 2, the MDT's will receive the message and reply back on the Group 1.

Programming the *Mobile* Radio - LTR

Program the Site information as you normally would for you LTR trunking system.

In the mobile radio, you will be setting the radio to receive all inbound messages and voice traffic on the voice group id. All data transmitted by the mobile data terminal will be sent out on the **Data LTR ID** code. This Data LTR ID code will also be used to send acknowledge messages back to the base unit.

When a transmission is initiated by the mobile unit, the radio will switch to the defined data group id code send the data, then revert to the Voice LTR Group ID to listen for other voice traffic. If the message initiated by the mobile requires and acknowledgement from the base modem, the radio will remain on the data group id until the acknowledgement is received or a timeout has occurred.



This is the Group ID code used to send data to the base unit. This should be the **Data LTR Group.**

Do not check Data Priority

This is the main **Voice LTR Group ID** code for the fleet.

This is **Data LTR Group ID** code for the fleet. It is best to assign the Data group as the last group in the list.

Connecting the Pyramid to the CDM Mobile

Once all of the programming has been completed, it is time to connect the units to the radios.

Connecting the 2012/Merlin MDT to the CDM

The following are the pin outs for 16 Pin Accessory Connector located on the rear of the CDM Mobile. These connections must be made to the corresponding color-coded cable from the 2012/Merlin.

Connections:	**2012/Merlin**	**Function**	**CDM 16 Pin Accessory Connector**
	Black/Shield	Ground	Pin 7
	White	Tx Audio Out	Pin 5
	Blue	On-Air Detect	Pin 8
	Green	PTT Out	Pin 3
	Red	Switched B+	Pin 13
	Yellow	Rx Audio In	Pin 11
	Violet	COR	Pin 4
	Brown	Audio Mute Out	N/C
	Grey	Mic Mute/Channel Select	Pin 6

Jumper Settings in the 2012/Merlin/2016

J1 [Out] Tx audio level
J2 [Out] Local PTT Loop

Connecting the 2016 base to the CDM

Connections:	**2016**	**Function**	**CDM 16 Pin Accessory Connector**
	Black/Shield	Ground	Pin 7
	White	Tx Audio Out	Pin 5
	Blue	On-Air Detect	Pin 8
	Green	PTT Out	Pin 3
	Red	Switched B+	Pin 13
	Yellow	Rx Audio In	Pin 11
	Violet	COR	Pin 4
	Brown	Audio Mute Out	N/C
	Grey	Mic Mute/Channel Select	Pin 6
	Teal	Base Group Enable	Ground (Pin 7)

Alignment

Follow the alignment procedures located in your Pyramid Communications service manual for the product installed. It is important to align all of the Pyramid equipment prior to installing in field.

The easiest way to align the Pyramid units it to add an extra conventional/simplex channel into the mobile radio. Use this channel, in conjunction with the service equipment to perform the alignment.

Appendix A

In order to understand the operation of data channel change you have to realize that the mobile units are using a dedicated PassPort/LTR ID code for ***data*** and a separate PassPort/LTR ID code(s) for ***voice*** communication. When the MDT sends a message, the mobile radio is switched to the defined ***data*** PassPort/LTR ID; after the transmission is complete, the radio reverts back to the ***voice*** ID code. The 2016 base unit receives and responds on the ***data*** PassPort/LTR ID code.

A problem arises when the dispatcher needs to send an outbound message (e.g. GPS Poll, Text Message, Horn Honk, etc.). At most times, the mobile units are idle and therefore on the ***voice*** PassPort/LTR ID code. When a message from the base is sent, it is sent on the ***data*** PassPort/LTR ID code, thus the targeted mobile unit does not receive the command from the dispatcher because it is listening on a different PassPort/LTR ID code.

To overcome this obstacle, the 2016 can be configured to change to the ***voice*** PassPort/LTR ID code when sending outbound, base originated messages. As with all base modem installations, a dedicated radio is required for the 2016 base modem.

Enabling your 2016 for Voice Channel Change

There is a simple wiring harness change is needed to enable the 2016 to activate the channel change line out of the 2016 Base Modem. From the 2016 wiring harness, connect the Teal wire ground. This activates the Grey wire as the Voice Channel Select line.

If not already done, crimp a pin onto the Grey wire from the Pyramid Communications Model 2016 wiring harness and connect it to the 16 pin accessory connector pin 6.