SECTION 6   ALIGNMENT PROCEDURE
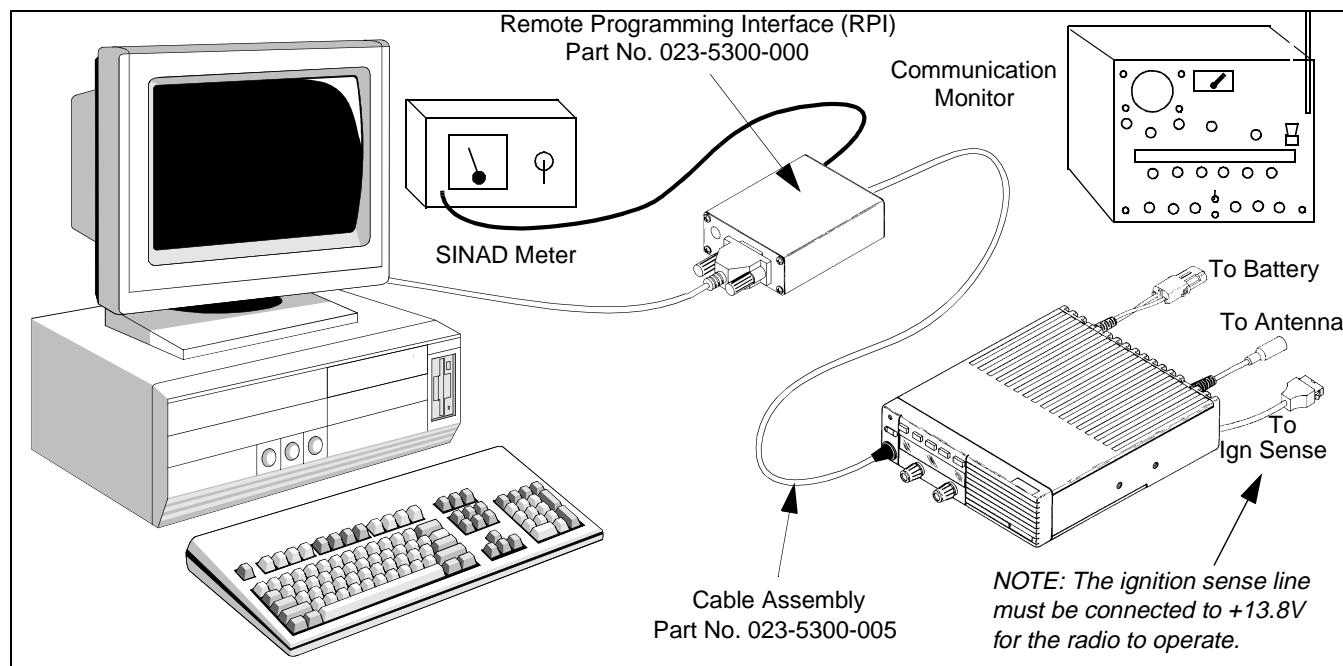

Figure 6-1   Alignment Setup

6.1 GENERAL

6.1.1 INTRODUCTION

The following alignment procedure should be performed if repairs are made that could affect the factory alignment or if adjustments may have changed for some other reason.

To perform transceiver alignment, a PC-compatible computer, Remote Programming Interface (RPI) Part No. 023-5300-000, and PCTune software are required (see Table 1-1). Earlier RPIs, such as Part No. 023-9800-000 or 023-9750-000, cannot be used. Refer to Section 4.1.3 for more RPI information. The programming setup is shown in Figure 6-1.

All adjustments are set digitally using the computer. Therefore, there is no need to disassemble the transceiver to access adjustment points. In addition, audio test signals are generated internally, so an audio generator is not required. The required test equipment is shown in Figure 6-1.

6.1.2 TUNE SOFTWARE

General

The PCTune software is a Windows$^{®}$ program. Minimum software and hardware requirements are as follows:

- Windows$^{®}$ 95/98/NT/2000 (3.1 cannot be used)
- Pentium$^{®}$ processor or equivalent
- 16 MB of RAM
- A hard disk drive with at least 3 MB of free space
- A CD-ROM drive
- An available serial port

Software Installation

Proceed as follows to install this software:

1. Close all applications that are currently running (other than Windows).

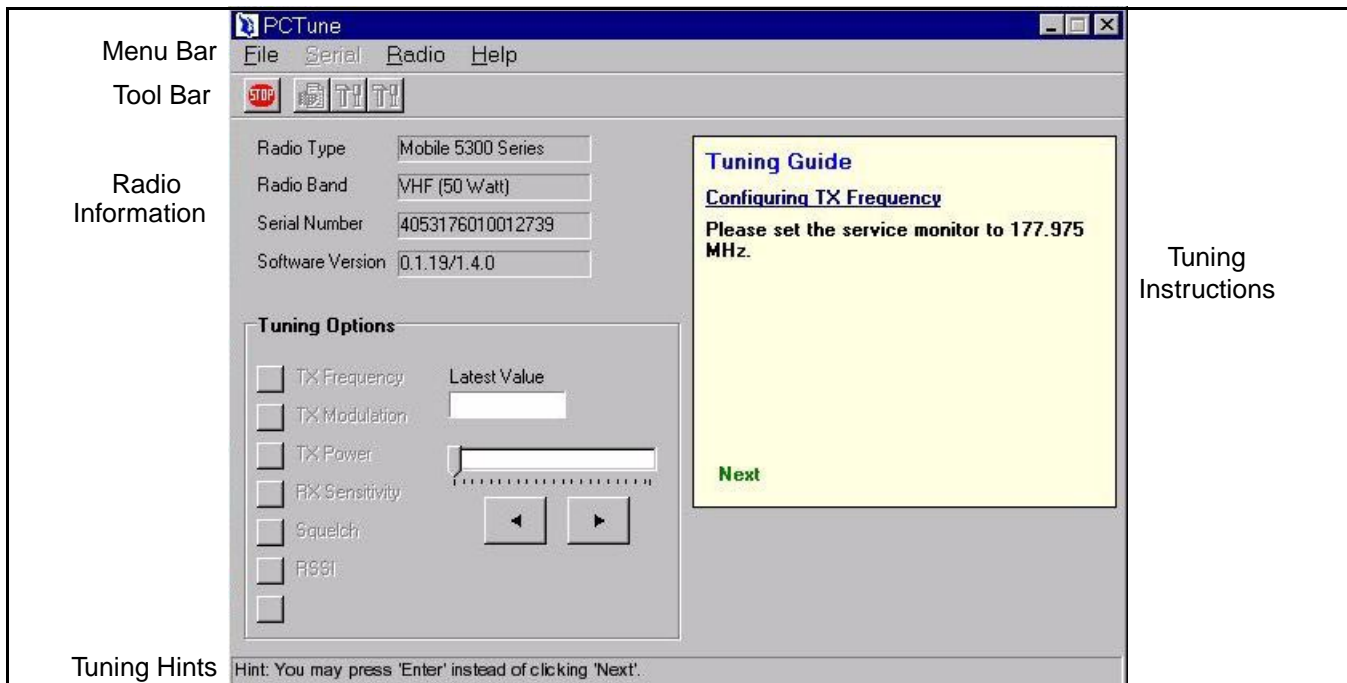2. Insert the disk containing the PCTune software in drive.

Figure 6-2   PCTune Main Screen

3. From the Windows taskbar, choose RUN and open SETUP.EXE on the drive being used. Alternatively, use File Explorer and double click SETUP.EXE.

4. Follow the instructions on the screen. The program is automatically loaded on the hard drive and start-up shortcuts or groups are created.

Starting PCTune

   Select Start in the taskbar, then Programs > PCTune > PCTune.

Exiting PCTune

   Select File > Exit or click the 🛑 or ✖ button.

On-Line Help

   On-line help is not available at this time.

6.2 MAIN SCREEN

6.2.1 GENERAL

   The main PCTune screen is shown in Figure 6-2. The main parts of this screen are as follows:

Menu Bar - Used to select the menus described in Sections 6.3.1-6.3.4.

Tool Bar - These buttons are used to quickly select functions as follows:

   🛑 - Exits the program same as File > Exit.

   📇 - Reads and displays the current parameters programmed in the radio same as Radio > Read Tune Parameters (see Section 6.3.3).

   🔧 - Selects the complete radio tune mode the same as Radio > Tune > Complete.

   🔧 - Selects the partial radio tune mode which allows manual selection of each adjustment same as Radio > Tune > Partial.

Radio Information

   Radio Type - The Radio Series selected by the Radio > Series menu function (see Section 6.3.3).

   Radio Band - The radio frequency band and power output selected by the Radio > Set Band menu function (see Section 6.3.3).

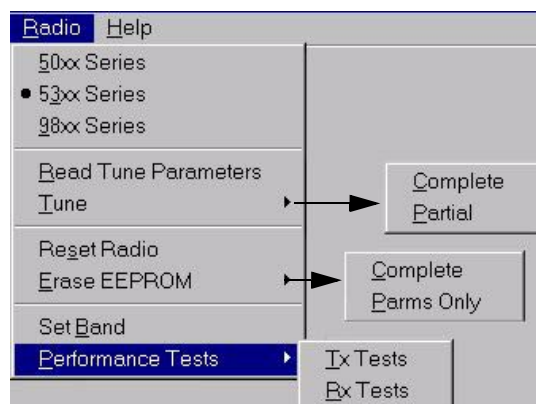<u>Serial Number</u> - The electronic serial number of the radio.

<u>Software Version</u> - The first number is the version number of the DSP (U12) software, and the second number is the version number of the ARM processor (U6) software.

Tuning Options

When the tuning mode has been enabled by Radio > Tune Complete/Partial, this part of the screen displays the current adjustment value and up/down buttons for changing the value.

In addition, when "Partial" is selected, adjustments can be individually selected by clicking the applicable button (see Section 6.3.3).

6.3 MENU BAR DESCRIPTION

6.3.1 FILE MENU

Selecting File > Exit closes PCTune as just described.

6.3.2 SERIAL MENU

<u>Port</u> - Selects the serial port used by the RPI (see Section 6.4.1).

<u>Baud</u> - Selects the data rate used for communication with the transceiver. Select "19200" as shown above.

6.3.3 RADIO MENU

<u>Series</u> - Selects the particular radio being tuned. The default may be "5300 Series", so if one of the other models is being tuned, this may need to be selected each time PCTune is started.
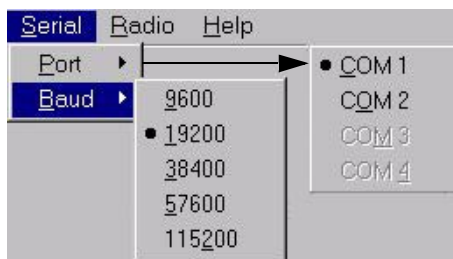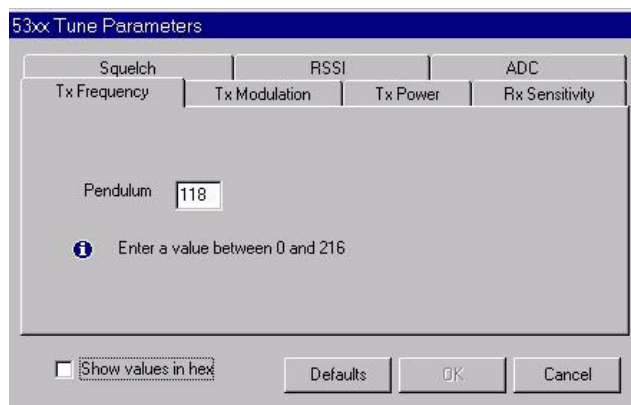
<u>Read Tune Parameters</u> - Selecting this function or clicking the 🗐 button reads the tune parameters currently programmed in the transceiver and displays them in the following screen.

Read Tune Parameters Screen

NOTE: The preceding Read Tune Parameters screen should be used for reference only. Adjustment of values should be done only by using the Complete or Partial Tune functions.

Click the tab on top to display the desired parameters. Checking the box on the bottom displays the values as hexadecimal instead of decimal.

Parameters can be changed by entering a value in the appropriate box. Clicking "Default" programs

default values, clicking "OK" closes the screen and saves the values entered, and clicking "Cancel" closes the screen without saving any values.

Tune - Selecting "Complete" or clicking the 🔧 button automatically steps through all tuning steps, and selecting "Partial" or clicking the 🔧 button allows the tuning steps to be selected manually in the "Tuning Options" box.

Reset Radio - Resets the radio control logic. This can be used, for example, to change the radio series or band or exit an adjustment before it is complete.

Erase EEPROM - Selecting "Params Only" deletes the parameters that are programmed by PCConfigure as described in Section 3. *If "Complete" is displayed, DO NOT SELECT IT*. This deletes parameters that can be programmed at the factory only. Therefore, the transceiver would have to be returned to the factory to make it operational again.

Set Band - Selects the operating band and power output of the radio being tuned and resets all tuning values to the default. Therefore, do not select this function when setting only certain adjustments.

NOTE: The Performance Tests which follow are used for Bit Error Rate Testing and require an APCO 25 Digital Service Monitor. The test procedure is currently undefined.

Performance Tests - Selects tests which test transmit and receive performance as follows:

Tx Tests - Displays the following screen which selects the modulation signal that is transmitted.
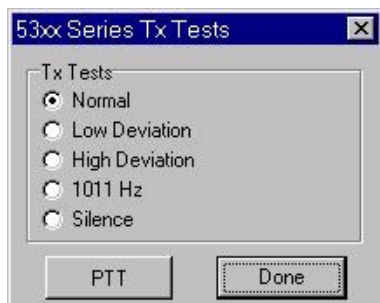
Rx Tests - Displays the following screen.

6.3.4 HELP MENU

Displays the PCTune version number.

6.4 TUNING PROCEDURE

6.4.1 CONNECTING TEST SETUP

1. With transceiver power turned off, connect the RPI to an unused serial port of the computer using a suitable cable (see Section 4.1.3).

2. Connect the RPI to the microphone jack of the transceiver using programming cable, Part No. 023-5300-005 (see Figure 6-1).

3. If the receiver squelch adjustment will be made, connect a SINAD meter to the Speaker Audio Out jack on the RPI (see Figure 6-3). This is a 2.6 mm (3/32") phone jack.

4. Connect a wattmeter and a suitable load to the antenna jack of the transceiver for the transmitter tests. For the receiver tests, connect the signal generator to the antenna jack through a 6 dB or greater pad.
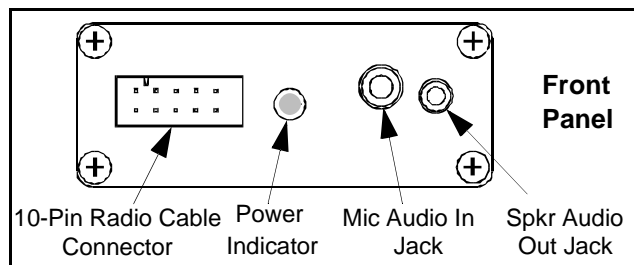

Figure 6-3   RPI Front Panel

6.4.2 STARTING AND CONFIGURING PCTUNE

Currently, several parameters must be configured each time PCTune is started. Proceed as follows:

1. Start the program as described in Section 6.1.2 and turn transceiver power on. Select Serial > Port and make sure that the correct serial port is selected. Likewise, select Serial > Baud and make sure "19200" is selected (see Section 6.3.2).

2. Select Radio > Series and make sure the correct radio series is selected.

3. Select Radio > Tune > Partial if manually selecting each adjustment or select Complete to have the program automatically step through all adjustments.

4. Follow the instructions displayed on the screen to complete the various transceiver adjustments.