Using MultiTech 5600DSVD Modems for Simultaneous Voice and Data with Series 6000 Radio Direction Finders

A Technical Application Note from Doppler Systems

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1.0 Introduction

These modems provide simultaneous voice and data over a standard telephone lines provided the quality of the line is adequate to support 14.4 kbps or higher data rates. This application note provides the setup procedure recommended to program the modems and use them with the Series 6000 radio direction finding system. You must use BearingTrack version 4.12 or later with these modems. (Download the latest version of BearingTrack from our web site)..

2.0 Programming the Modems

Connect one of the modems to the serial (COM) port of your PC using a standard (not a null modem) cable. You will probably need to use a 9 pin to 25 pin adapter at the modem. For programming, use a cable that connects all 9 pins on the 9 pin connector (not the cables shown later in this document). Connect the 9 VDC power supply and turn on the modem. The modems can be programmed using Windows Hyperterm program or the modem programming utility provided with BearingTrack.

2.1 Using HyperTerm

To program the modems using HyperTerm, first, setup Hyperterm for a direct connection to your serial port (assumed to be COM1). Configure the port for 2400 baud, 8N1 with no flow control. On the setup menu, select ANSIW and setup ASCII options for send line end with line feed, echo typed characters locally, Append line feed to incoming line end and wrap lines that exceed terminal width.

From Hyperterm, enter the command "AT". You should get the response "OK" from the modem. Select one of the modems to be programmed and mark it as an ORIGINATING modem. Enter the following string from Hyperterm:

AT &F &D0 -SMS=1 #VLS=5 $SB2400 &E3 E0 X4 &W

You should get an "OK" message afterward. Turn this modem off, disconnect it from the PC and connect the second modem which you should mark ANSWERING. Enter "AT" and verify that the modem responds with "OK". Enter the following string from Hyperterm:

AT &F &D0 -SMS=1 #VLS=5 $SB2400 &E3 E0 S0=1 &W

Note that the two strings are identical except for the S0=1 command which instructs the second modem to automatically answer after one ring.

For information, the other commands mean:

&F restore factory defaults

&D0 Ignore DTR

-SMS=1 Enable DSVD (voice + data) mode

#VLS=5 Enable headset jacks

$SB2400 Fix serial port at 2400 baud

&E3 Disable flow control

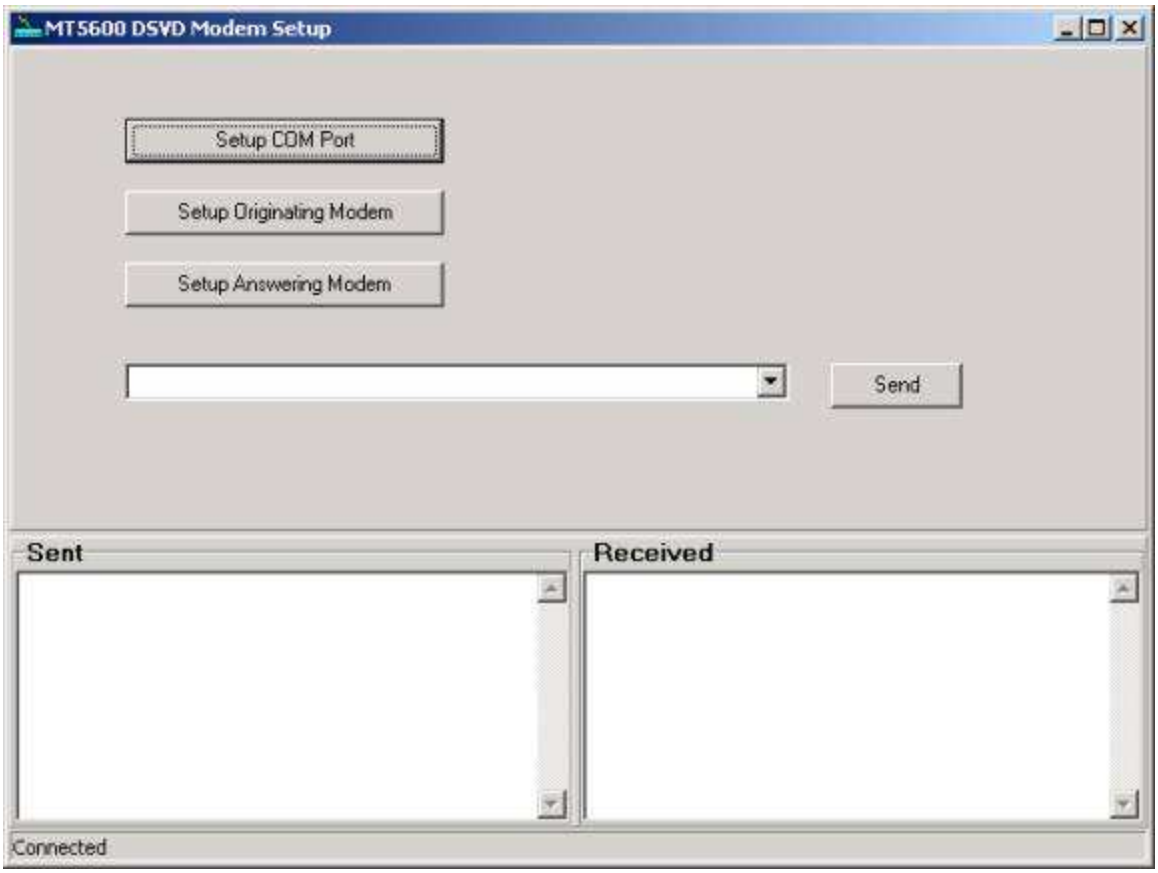
E0 Do not echo command characters

X4 Send all messages

&W Save these settings

2.2 Using the Modem Program Utility

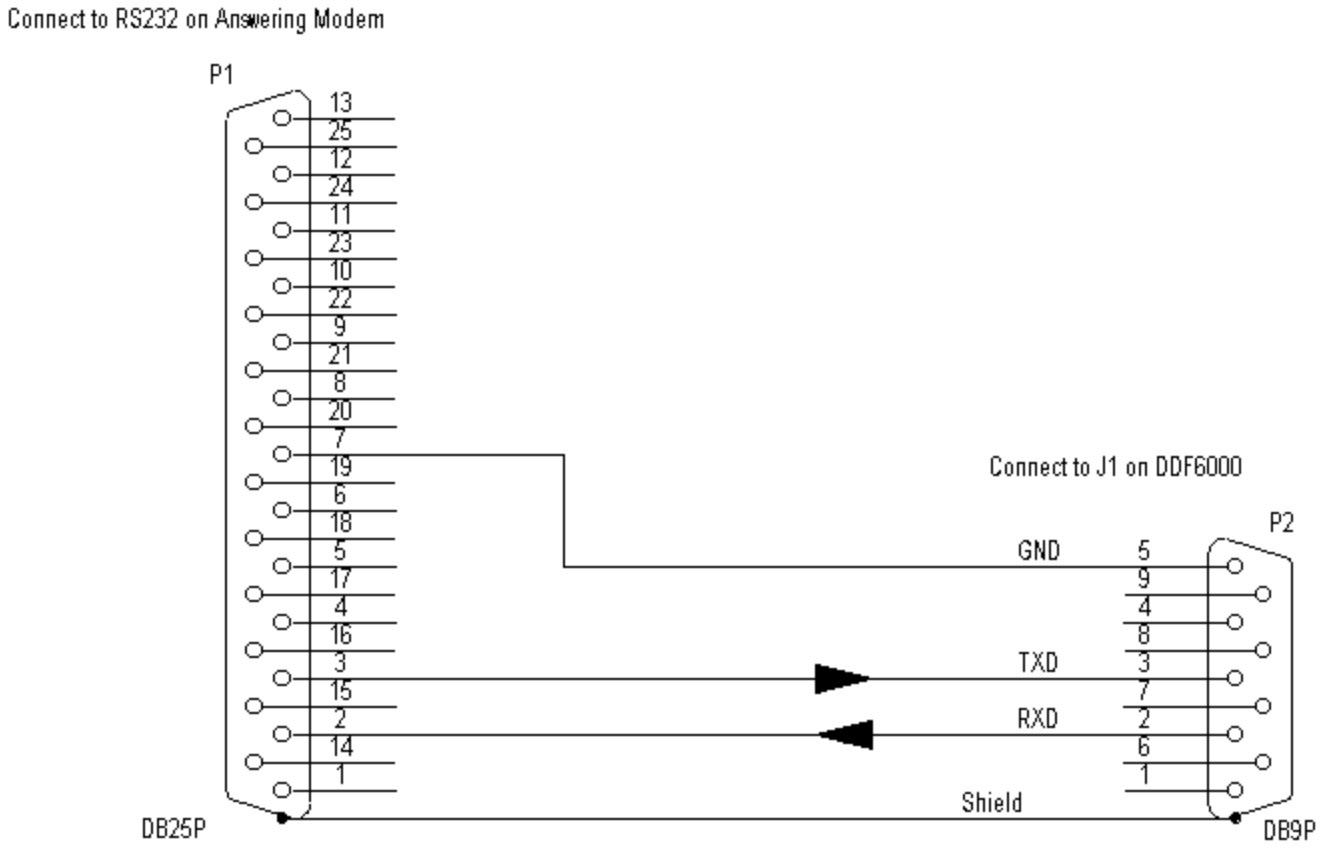
First launch Modem Programmer from the Start Menu under BearingTrack. A screen will be displayed to set up the COM port. Simply select the COM port you connected the modem to. Next, the programming screen will be displayed as shown below.



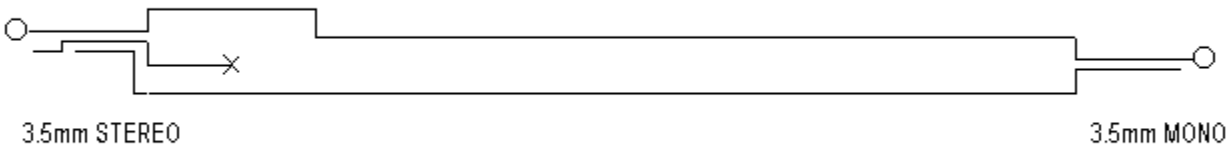
Type AT into the text box and press Send or the enter key. The modem should respond with an OK. If it does not respond make sure the modem is turned on, check your connections, and check the setup parameters of your COM port. If you are setting up an originating modem press the Setup Originating Modem button. If your are setting up an answering modem press the Setup Answering Modem button. The response from the modem to either of these commands should be an OK. If you have other modems to program, simply turn the modem off, disconnect it from the cable, connect the next modem, and turn it on. Then repeat the procedure as described in this paragraph.

3.0 Installing the Modems

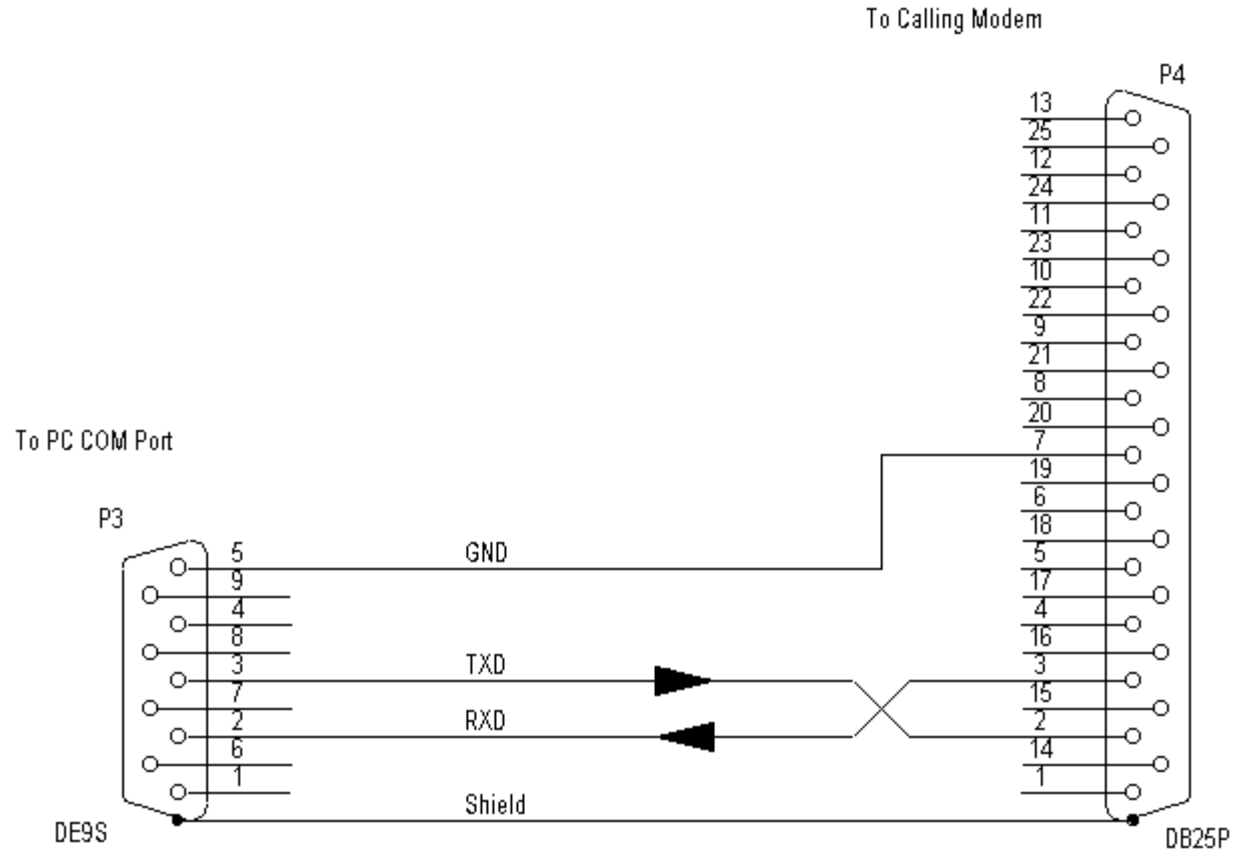
At the remote site, connect a null modem cable between the answering modem and J1 on the direction finder. The only wires that are required are RXD, TXD and GND. You can use a standard RS232 cable with adapters or make up a cable as shown in the figure below:



Also make a stereo to mono cable as shown below and connect it between the speaker input jack on the modem and the external speaker output jack (J6) on the direction finder. Adjust the audio level of the receiver so that with the external speaker plug removed, the level coming from the loudspeaker is audible but fairly quiet. Then plug in the mono plug. Do not connect anything to the headphone jack on the modem. Connect the modem RJ11 plug to a telephone circuit and turn the modem on.



At the control site, connect the calling modem to the PC using a straight through cable. Assuming your PC has a DB9 serial connector, you can use the cable shown below.



Connect an amplified stereo speaker to the headphone jack on the modem but leave the microphone jack empty. Connect the phone line to the RJ11 jack and connect the 9 VDC power supply. Turn the modem on.

If multiple remote sites are to be connected to the PC, repeat the above procedure. Connect the P3's from each calling modem to the output jacks on a serial expander (DDF6077) which is in turn connected to the PC.

4.0 Operation

Note - the following capabilities have been added to BearingTrack version 4.12.

In BearingTrack, enter the telephone numbers of the remote sites from the Setup|Site dialog box. Each phone number can be from 1 to 40 characters long and include the following characters:

0-9 Digits 0 through 9

* The "star" digit (tone dialing only)

The "pound" digit (tone dialing only)

A-D A,B,C and D tone digits. Country specific. Some countries may prohibit these digits.

P Select pulse dialing.

T Select tone-dialing.

, Pause during dialing for 2 seconds.

& Detect credit card "bong" tone. Place this character after the phone number and before the credit card number.

To connect to the modems from within BearingTrack, first turn off all the modems and press the Connect button in the upper right side of the status bar at the top of the window. BearingTrack will then step you through the connection process.