

Chapter 5

INTRODUCTION

The information in this section of the manual provides the step-by-step procedures for conducting any testing necessary for the start up of the 289H-M monitor. This section also discusses the procedures used to test and replace a blown fuse.

Using a network connection for communication between the 289H-M and PressureMAP requires programming the network address for the 289H-M equipment. Procedures for configuring the 289H LAN Controller Card are described in this section.

289H-M START-UP

Once all of the devices have been cut over to the 289H-M monitor and the PressureMAP database for the office has been established following the procedures in the *PressureMAP System Data Entry Manual*, the system can be placed in operation. It is important to note that the 289H-M does not require external calibration. The 289H-M automatically calibrates its measurement circuit against built-in, precision stable resistance values before the relay card is accessed. The calibration process compensates for changes in supply voltage and system conditions. Calibration constants are routinely supplied to PressureMAP for the relay card before the data points are accessed.

However, if you wish to manually check the 289H-M monitor before it is put into operation, the following procedures suggest a method to check the integrity of the installation. These procedures are divided into two sections: one consisting of an overall system check and the other, covering card testing. All of the tests referred to in the card testing procedures are explained in depth in Appendix 5, 289H Diagnostics Tests. Please refer to this manual section for additional help when running the tests.

System Check Procedures

The following simple procedures should be performed prior to testing the 289H-M relay card:

1. Check to see if the power supply indicator light on the right front of the monitor is lit. If it is, remove the front panel of the chassis and set the ON/OFF switch on the Utility Card to the OFF (right) position. This ON/OFF switch is located near the front right corner of the top circuit board, as shown in FIGURE 5-1. (Please note that the Utility Card shown in FIGURE 5-1 is the older, “non-tone” model.)
2. Check that the necessary communications connection for the 289H-M equipment has been set up—a phone line if the Controller Card is equipped with a modem, or a network connection if the 289H-M will use a LAN Controller Card.

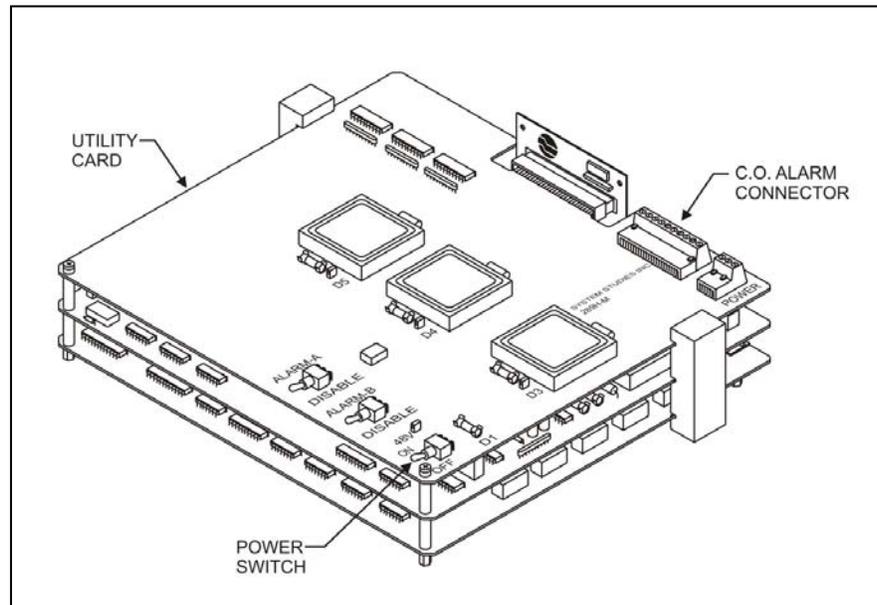


FIGURE 5-1: 289H-M LSS POWER SWITCH LOCATION

- Modem communications—Check for a dial tone on the telephone line assigned for use with the 289H-M monitor before connecting the telephone cord to the Controller Card. On the newer model Controller Card with the dipswitch module, make sure that both switches are in the down position, ON. (Refer to Section 1 of this manual for a description of the 289H-M Controller Card models.)
 - Network communications—Configure the 289H-M's IP address information. For the 289H LAN Controller Card, please refer to the setup instructions presented later in this section. For more information, please contact System Studies Technical Support.
3. Turn the main power switch ON. For a modem Controller Card: after verifying the line is working, plug the RJ-11 connector into the jack on the Controller Card (FIGURE 5-2).
 4. Once communications is working and connected to the 289H-M and the power is on, you can now proceed with card testing, using the 289H Diagnostic tests in the PressureMAP software.

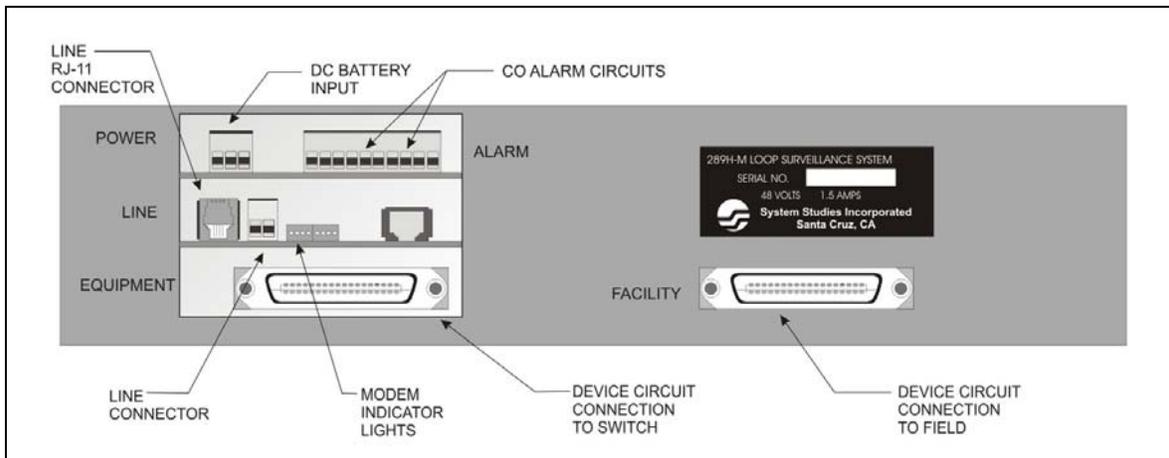


FIGURE 5-2: 289H-M LINE CONNECTIONS

Card Testing Procedures

The following procedures should be performed as a final check of the installation process:

1. Using a personal computer or remote printer, access the PressureMAP computer that contains the 289H-M office and device information. At the MAP Programs Menu, select Option 6, CPAMS Diagnostics.

Note: If you have any questions about accessing the PressureMAP program, please contact your PressureMAP System Administrator or call System Studies Technical Support for assistance.
2. Select the office number or name for the 289H-M when prompted by the PressureMAP program and wait for the 289H Diagnostics Menu to appear on your computer or printer. Refer to the 289H LSS Diagnostics Tests in Appendix 5 for instructions and expected readings when running the diagnostic tests.
3. When the Diagnostics Menu is displayed, select option 1, System Configuration. A System Configuration Screen similar to the one shown in SCREEN 5-1 will be displayed. Check the Inventory field of the configuration screen, verifying that the relay card in the 289H-M is correctly identified in the Inventory slot 1 field. If the monitor you are testing is equipped with a SPDR card, verify that the card's configuration is correct; the standard configuration for the 289H-M is A (SRA).

If the inventory of the 289H-M is correct, proceed to step 5; if an installed card is not listed, go to step 4.

4. If the inventory indicates that there is no relay card in slot 1 when, in fact, there is a card installed, call System Studies Technical Support for further assistance.

```

System Configuration for Salt Creek                CPAMS Diagnostics XX.XX.XX
01/02/1999 13:37                               System Studies Incorporated
-----
LSS Engine:      289-H                          Version:        A.00/A.00
Password:       Set                             System Reset:   No
Exit State:     Wait ACK2 State                 Exit Status:    Retry Exceeded
Inventory:
  Slot  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16
Chassis ---
  1 | SUB
  2 |
  3 |

Hit <Return> to return to the 289H LSS Diagnostics menu.
    
```

SCREEN 5-1: SYSTEM CONFIGURATION FOR THE 289H-M

- The next test to run from the 289H Diagnostic Menu is Test 3, Realtime Reading Test. By testing each device, you can compare the device readings from the old monitor's device log to the realtime 289H-M readings, verifying the correct installation of device pairs.

If the readings from the old monitor and the 289H-M correlate, you have successfully completed the 289H-M installation. However, if the 289H-M does not give the expected readings or reads OPNI, follow the procedures described in steps 6 through 9.

- If the readings are not what is expected from the devices, run a Ping Relay Test (Option 6 in the 289H Diagnostic Menu) for the 289H-M's relay card. This test will check that the card is being addressed correctly and that each on-board relay is operating properly. The displayed output of this test is a sequence of ones and zeros—one digit for each relay/pair. The first digit displayed corresponds to the first relay on the card. A value of 0 indicates that the relay is operative, whereas a value of 1 indicates that either the relay cannot be accessed or, in the case of a subscriber card, that the pair was found to be busy. After comparing the relays that were found to be busy during the test from the list of relays that did not “ping” when tested, you can determine which relays are faulty.

An example of the Ping Relay Test output from a 289H-M subscriber card is shown in SCREEN 5-2. In this example, all of the lines to the on-board relays were found to be on hook except line 9, which was found to be busy all four times that the test was run.

```

Ping Relays Test for Salt Creek                CPAMS Diagnostics XX.XX.XX
01/02/1999 13:42                               System Studies Incorporated
-----
Pairs 1-25  00000 00010 00000 00000 00000
    
```

SCREEN 5-2: PING RELAYS TEST DISPLAY

If the card only partially passes the Ping Relay Test and the unresponsive relay pairs are not busy, call System Studies Technical Support for further assistance.

If the relay card passes the Ping Relay Test, but one or more device pairs consistently has a reading of OPNI, check to see if the ring side of the pair is grounded. If it is, remove the ground. If there is no ground on the ring side, the relay card may need to be replaced. Please call System Studies Technical Support.

7. If the card passes the Ping Relay Test, but the device readings are not as expected, double-check the wiring on the connector block. It is possible when installing a 289H-M to incorrectly wire a connector block or attach a connector to the wrong side of the block. Refer to Section 4 of this manual for complete wiring and cabling procedures.
8. If there is still a problem with the card and/or device readings, call System Studies Technical Support for assistance.

Testing and Replacing a Blown Fuse

One of the more common repair procedures needed for the 289H-M is the replacement of a blown fuse. If the 289H-M is not answering, and you have followed the troubleshooting steps in the first section of Appendix 1, you may need to replace a fuse. All of the fuses used on the 289H-M Utility Card are standard 5 by 20mm fuses, available at most electronics stores.

The Tone Utility Card (P/N 9800-0016) has two 1.6 amp “slo-blo” fuses, one .5 amp slo-blo fuse, two 4.0 amp fast-acting fuses, and one 3.15 amp fast-acting fuse. The older Utility Card (P/N 9800-0004) has one 1.6 amp slo-blo fuse, one .5 amp slo-blo fuse, and two 1.6 amp fast-acting fuses. To find the fuse locations on each card, refer to the appropriate card layout diagram below.

The following procedures describe testing and replacement of fuses:

1. To access the Utility Card, loosen the two front panel screws. Pulling the cover toward the front of the 289H-M, slide the cover off the monitor.
2. Verify that the -48 volt supply indicator light located at the front of the card is on and that the switch below the light is in the ON position. If the light is not on, check that a filtered source of -48 volts DC and ground is applied to the power connector. (Please refer to Section 2 of this manual for an explanation of 289H-M power requirements.)

If the switch is on and power is applied to the power connector, but the Power On LED does not glow, the main fuse may be blown. For instructions on replacing the 1.6 amp fuse, go to step 4.

3. Verify that the 3 LEDs in the middle of the Utility Card are on. Refer to FIGURE 5-3 or 5-4 for the location of the LEDs. On the Tone Utility Card the LEDs are labeled D3 (Diode 3), D4, and D11 (see FIGURE 5-3). On the older Utility Card the LEDs are labeled D3, D4, and D5 (see FIGURE 5-4). If any of these LEDs is out, either the fuse is blown or the power supply is faulty. In this case, first replace the fuse as described below starting at step 4. If the LED does not come on after replacing the fuse(s), call System Studies Technical Support for further assistance.

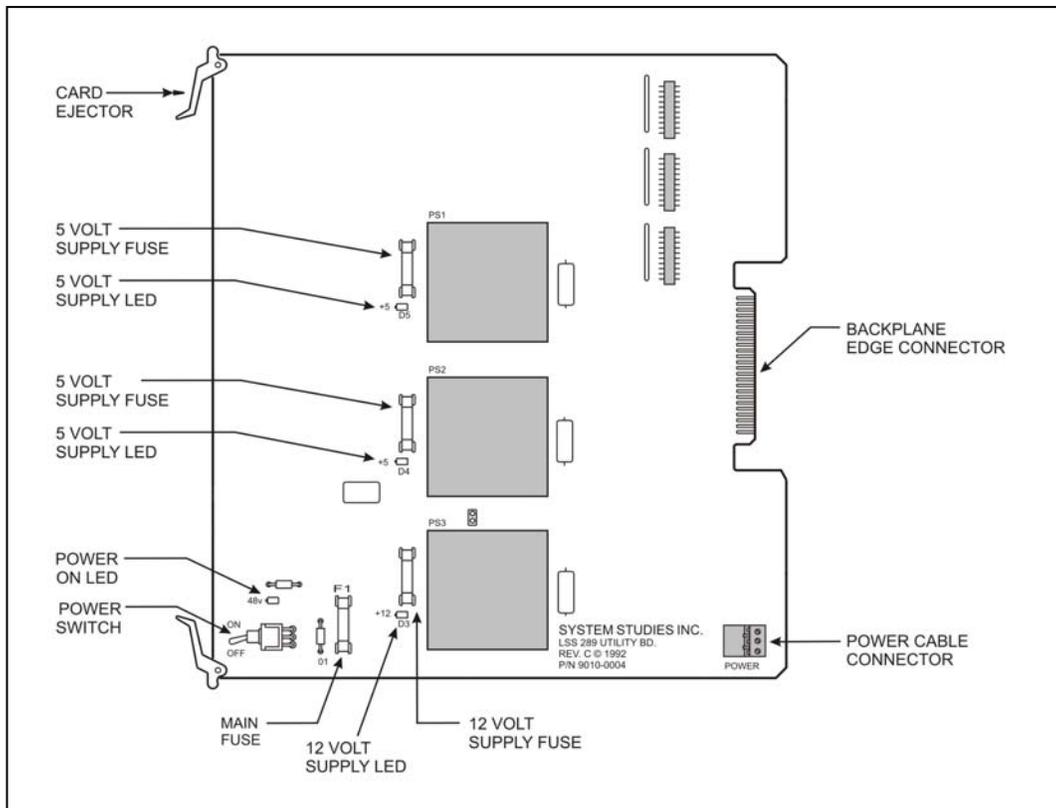


FIGURE 5-3: STANDARD UTILITY CARD

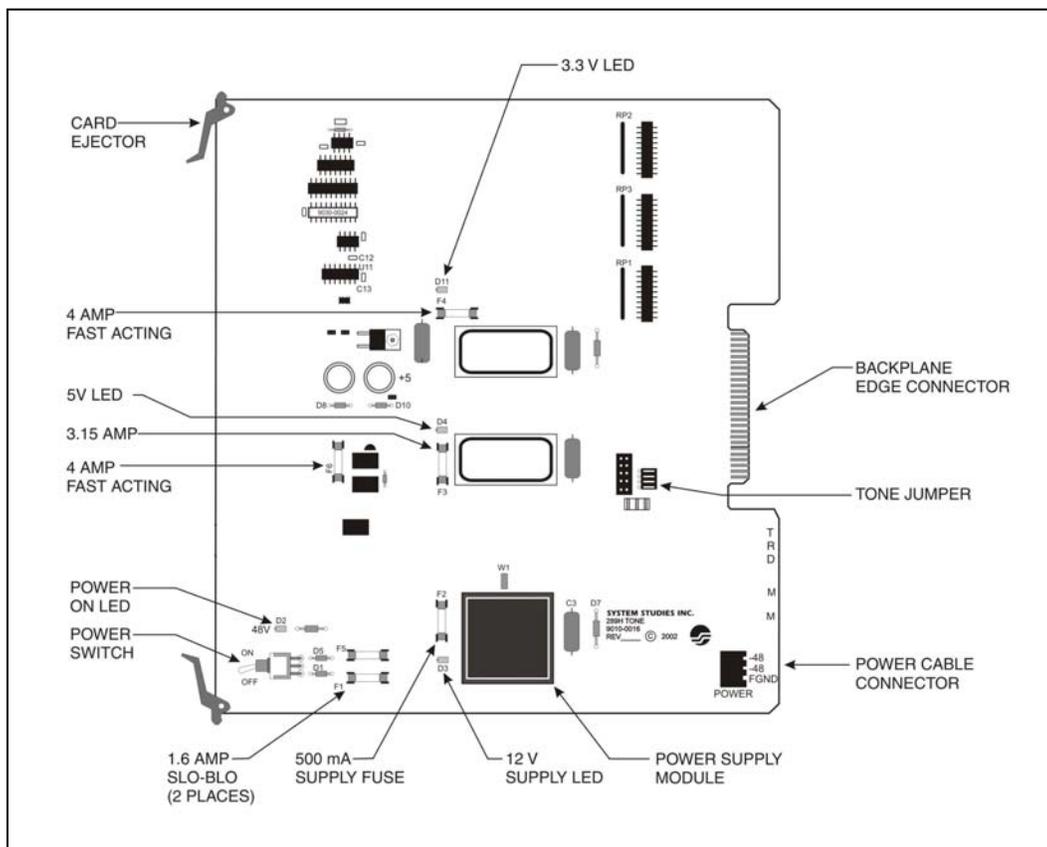


FIGURE 5-4: TONE UTILITY CARD

4. To remove the blown fuse, turn the power switch on the Utility Card to the OFF position.

Note: Never remove a fuse in the 289H-M when the power is ON!

5. Identify the fuse that needs to be replaced. When a fuse has blown, the metal strip that is in the fuse is usually broken. Pull the fuse out of the clips that hold it in the card and insert a replacement fuse with the same amp rating. Refer to FIGURE 5-3 or 5-4 for the location and size of fuses used on the 289H-M Utility Card.
6. After the fuse is secure in the card, turn the power switch located on the front of the card to the ON position and replace the monitor cover. Then run the tests described in Appendix 1 of this manual to ensure that the 289H-M is ready for operation.

SETTING UP THE 289H LAN CONTROLLER CARD

This procedure explains how to set up the LAN Controller Card for communication between a 289H-M LSS monitor and PressureMAP server connected to a network. The 289H LAN Controller setup process requires the following items:

- A LAN Controller Card (P/N 9800-0030) equipped with Firmware EPROM Rev. F02 (P/N 9030-0050) or higher
- A Windows PC or laptop computer with a DB9 serial connection and the HyperTerminal communications package
- A standard DB9 straight-through serial cable (P/N 9800-6002)
- A Cat. 5 Ethernet cable

To configure the LAN Controller, you will need a computer running Windows 95 (or greater) with HyperTerminal. You will also need to obtain a local IP address, Port Number, Gateway address and Subnet address information for the 289H LAN Controller from your network administrator. For your reference during the procedures that follow, record the information in the spaces in TABLE 5-1. (At the end of this section is a worksheet for sharing information between the network administrator and the air pressure technician who is installing the 289H with LAN Controller card.)

IP ADDRESS	_____	_____	_____	_____
	IP BYTE 1	IP BYTE 2	IP BYTE 3	IP BYTE 4
PORT NUMBER	_____			
GATEWAY	_____	_____	_____	_____
	GW BYTE 1	GW BYTE 2	GW BYTE 3	GW BYTE 4
SUBNET	_____	_____	_____	_____
	SN BYTE 1	SN BYTE 2	SN BYTE 3	SN BYTE 4

TABLE 5-1: REQUIRED NETWORK COMMUNICATIONS INFORMATION

The LAN Controller uses 10 Mbps Ethernet. The network hub or Ethernet adapter to which the LAN Controller is connected must be either a 10 Mbps unit or a 10/100 unit that can adapt to either 10 or 100 Mbps.

Configuring the LAN Controller

These instructions describe the process for programming an IP address into the LAN Controller Card (P/N 9010-0030). The information for **Local IP Address**, **Port Number**, **Gateway Address**, and **Subnet Mask** should be obtained from your Network Administrator.

1. Make sure that the 289H LSS monitor is powered off. If the unit is on, turn off the power switch SW1 at the front of the Utility Card.
2. Identify the S3 dipswitch set module that controls communication mode, located in the lower left corner of the LAN Controller card (see FIGURE 5-5).

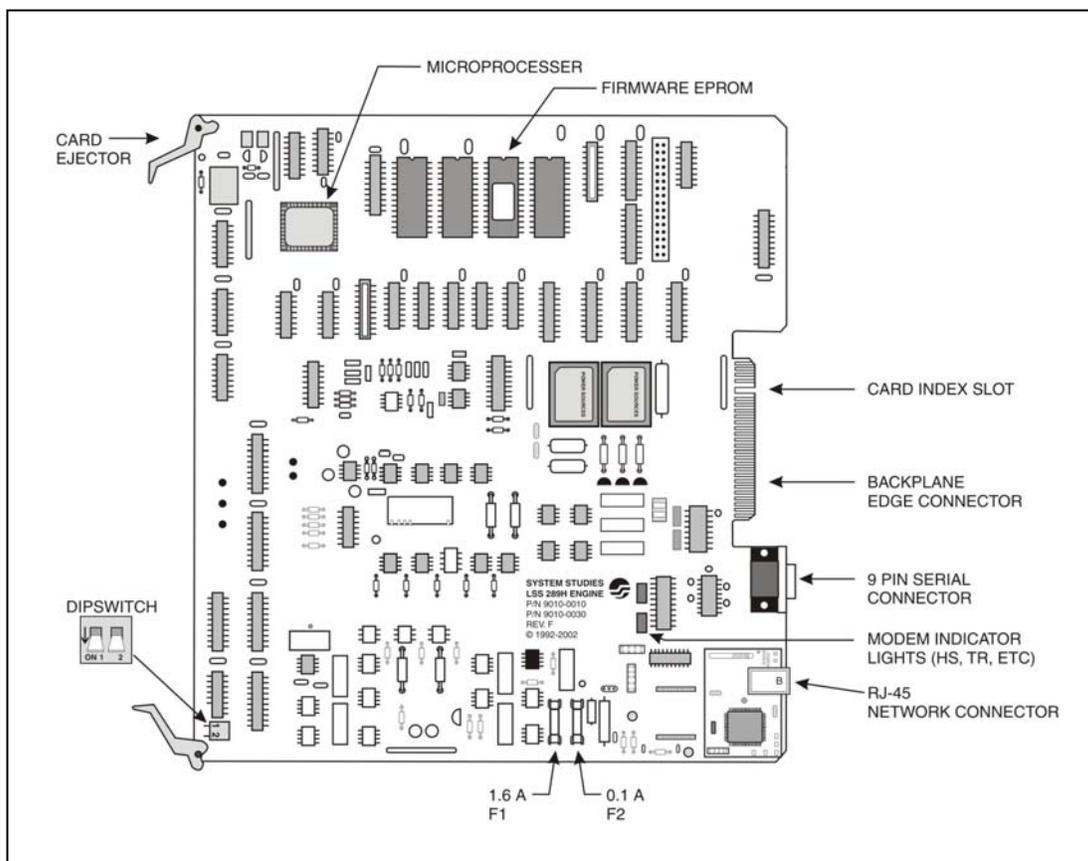


FIGURE 5-5: LAN CONTROLLER CARD (9800-0030)

Switch 1 is the upper switch (away from edge of card), and Switch 2 is the lower switch (closer to edge of card). Set the two dipswitches to Configure Mode (see illustration on next page):

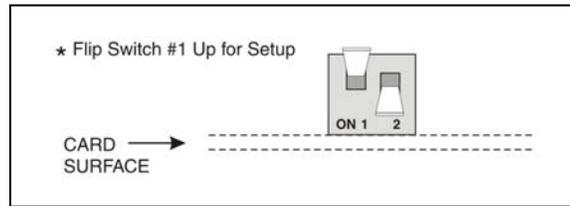


FIGURE 5-6: LAN CARD DIPSWITCH SETTINGS FOR CONFIGURE MODE

1 = up (OFF), away from card surface
 2 = down (ON), toward card surface

- Using the 9800-6002 serial cable, connect the DB9 connector (**J8** at the back of the LAN Controller Card) to the DB9 connector on the computer.

The HyperTerminal screens displayed may vary slightly from those described in the following steps, depending on the Windows version running on the workstation computer.

- On the Windows workstation, click **Start, Programs, Accessories, HyperTerminal**. From the HyperTerminal window, double-click on the HYPERTERM.EXE icon. This will launch the HyperTerminal program.
- In the Connection Description box, choose a name (such as "LAN_Controller") and an icon for the setup. Click **OK**. In the Connect To box that appears, click the "Connect using" drop-down menu, then select "Direct to Com1". Click **OK**.
- In the COM1 Properties box, configure the Port Settings as follows:

Bits per second: **9600 Baud**
 Data bits: **8**
 Parity: **None**
 Stop bits: **1**
 Flow Control: **None**

Click **OK**.

- Power on the 289H-M LSS using the power switch at the front of the Utility Card. On power-up, HyperTerminal will display the initial message prompt to enter the LAN Controller setup menus.
- Type **SETUP** (or just type **S**) and hit **<Return>**. HyperTerminal will display a screen similar to the one shown in SCREEN 5-3.

Note: Your typed input will not display at the prompt on the screen.

```

Your Typing Input will not echo to the screen.

For SETUP:

    Type SETUP and press <ENTER>

=>
*****
***** SSI NETMODEM 2.00 p/n 9010-0030 *****
*****

INSTRUCTIONS :Type "MENU OPTION" NUMBER (0 - 4) then <ENTER>

MENU OPTIONS                                CURRENT SETTINGS
-----
0 - To SAVE and EXIT SETUP
1 - Local IP Address                        0.0.0.0
2 - Port Number                            0000
3 - Gateway Address                        0.0.0.0
4 - Subnet Mask                            0.0.0.0

Enter=>

```

SCREEN 5-3: LAN CONTROLLER SETUP MENU

9. To enter the IP address, type **1** and press **<Return>**. If you enter an invalid command (such as 9), the screen will display an error message and re-prompt you to enter a command option.

The program will then prompt you to enter the Local IP Address. Type the IP address and press **<Return>**. The program will return to the setup menu. The **CURRENT SETTINGS** column will reflect the new value that you just entered.

Note: Using the side scrollbar allows you to review earlier information in your HyperTerminal session.

10. To enter the Port, type **2** and press **<Return>**. The program will then prompt you to enter the Port Number. Type **3001** and press **<Return>**. The program will return to the setup menu. The **CURRENT SETTINGS** column will reflect the new value that you just entered.
11. To enter the Gateway, type **3** and press **<Return>**. The program will then prompt you to enter the Gateway Address. Type the gateway address and press **<Return>**. The program will return to the setup menu. The **CURRENT SETTINGS** column will reflect the new value that you just entered.
12. To enter the Subnet, type **4** and press **<Return>**. The program will then prompt you to enter the Subnet Address. Type the subnet mask and press **<Return>**. The program will return to the setup menu. The **CURRENT SETTINGS** column will reflect the new value that you just entered.
13. After completing the IP settings, you are ready to exit the setup program. Type **0** and press **<Return>**.

14. You will then see the following message:

```
SAVE & EXIT selected! Are CURRENT SETTINGS correct?
Press 'y' to SAVE & EXIT, OR 'n' to EXIT w/o saving, then <ENTER>
```

If you do not save the changes you made, the LAN Controller will use the previously programmed settings. To save your changes and exit setup, type Y and <Return>. The screen will display the following message:

```
SAVING SETTINGS.....SETTINGS SAVED!
```

To use these new settings:

1. Please wait.
2. After 15 seconds turn off the 289H LSS System.
3. Disconnect the serial cable from the 289H DB9 connector J8.
4. Move Dip Switch #1 down on Switch S3.
5. Verify that a network cable is attached to the RCM module RJ45 jack J2.

Thank you for waiting

If you do not wish to save your changes, type **N** and <Return>. The screen will display the following message:

```
EXITING w/o Saving...      To Re-enter SETUP:
Turn OFF the 289H LSS System, then back ON.
Type SETUP and press <ENTER>
```

To use PREVIOUSLY SAVED settings:

1. Please wait.
2. After 15 seconds turn off the 289H LSS System.
3. Disconnect the serial cable from the 289H DB9 connector J8.
4. Move Dip Switch #1 down on Switch S3.
5. Verify that a network cable is attached to the RCM module RJ45 jack J2.

Thank you for waiting

If you enter an invalid choice, the program will prompt you again to enter Y or N.

15. After exiting the setup program, power off the 289H-M monitor using the power switch SW1 at the front of the Utility Card. If you wish to re-enter the setup program, go back to step 7.
16. Disconnect the 9800-6002 serial cable from the DB9 connector on the LAN Controller and the computer. Keep the serial cable for later use in checking or changing IP address settings.
17. Move the #1 switch on the S3 Dipswitch set module to the down (ON) position (FIGURE 5-7). This puts the LAN Controller in Server Mode for normal communication with the PressureMAP system.

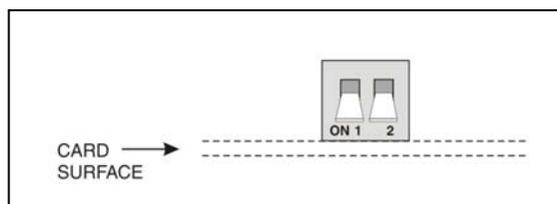


FIGURE 5-7: LAN CARD DIPSWITCH SETTING FOR SERVER MODE

18. Power on the 289H-M using the power switch on the Utility Card. The setup is complete.

Note: Use only ONE connector. Do not change the LAN connection while the 289H-M is powered on.

PressureMAP Data Entry Requirements

Whether this setup is part of an upgrade to a 289H LSS or a new install, the PressureMAP Office Information screen needs to be modified or created with the correct IP address information for this LAN Controller in the *Phone Number* data field. Both the *Baudrate* and *MAP Alert Baudrate* data fields should be set to 9600, and if desired, the correct *MAP Alert #* information entered in order to enable the 289H to call PressureMAP with Alerts. (Please refer to SCREEN 5-4 on next page.) For more detailed information regarding these settings, please refer to Section 2 of the *PressureMAP System Data Entry Manual*.

When this data entry is done, a PressureMAP host should be able to reach the LAN Controller and communicate with the 289H LSS. Communication can be verified by performing a Realtime Reading via CPAMS Diagnostics, as described in Appendix 6 of this manual.

```

Info about <OFFICE NAME>: Keypad Field Control, <Esc> finish screen,
                        <Return> next field, <Backsp> delete char, <Ctrl B> previous field

Enter Office Information
-----

File date:      05/17/02  (137)                Last edited:      05/15/02
Office name:    289 BOONIES                    Monitor type:     289H LSS
Phone number: IP=10.3.0.40:3001
Office mode:    ENABLED
Baudrate:      9600                        User Defined Devices: ON
Password 1:    HELLOW                          Trunk/Toll Tolerance: 80 ohms
MAP alert #:  T192.168.0.1:3002:T          MAP alert baudrate:  9600
                                                Alert sensitivity:  3

Remarks:

Pressure:      PSI           Flow:           SCFH           Distance:     S-K
Aerial std:    2.0           Buried std:     3.0           Undgnd std:   5.0
Delivery std:  7.5           Flow std:       1.25

-----
                                           PressureMAP XX.XX.XX
    
```

SCREEN 5-4: SAMPLE OFFICE INFORMATION SCREEN FOR LAN CONTROLLER CARD OFFICE

Troubleshooting

When attempting to connect from PressureMAP to a 289H office equipped with a LAN Controller Card, verify that the necessary communication data has been entered for the office as outlined in the preceding section. See the *PressureMAP System Data Entry Manual* for detailed instructions on configuring office data.

If you verified that the necessary communication data has been entered for the office as outlined in the previous section, check the following:

- Dip switches are set correctly.
- Communication parameters are set correctly.
- Power the 289H off and back on, using the power switch on the Utility Card.
- Power is available (an LED is on).
- Network cable from local network hub is connected to the LAN RCM Module's RJ45 jack (J2) on the LAN Controller Card.

The most common problems in running the configuration program are due to using incorrect serial cable or the Windows HyperTerminal program not operating correctly.

Before testing any equipment settings, check that the RJ-45 network cable is connected correctly. Do not change the LAN network connection while the 289H monitor is powered on. Verify that the network cable between the LAN Controller and the hub is in good condition.

Use the setup procedure described previously in *Configuring the LAN Controller* to check the LAN Controller's IP settings for incorrect values and make corrections. For example, if a LAN Controller Card has been moved from one office to another, the IP address information will need to be reconfigured for the new office.

Note: When examining the IP settings, you need to be on site with the 289H monitor so that you can set the LAN Controller Card dipswitches in Configure Mode before re-entering the desired information. You will need to make the serial connection between the LAN Controller and a PC that has the HyperTerminal program.

After reconfiguring the IP settings, reconnect and power up the equipment as described previously in this section.

If you have any questions regarding this procedure, please call System Studies Technical Support at (831) 475-5777 or (800) 247-8255. You may also e-mail your questions to support@airtalk.com.

Network Information for LAN Controller Operation

The LAN Controller uses 10 Mbps Ethernet. The network hub or Ethernet adapter to which the LAN Controller is connected must be either a 10 Mbps unit or a 10/100 unit that can adapt to either 10 or 100 Mbps.

The LAN Controller normally works in "server" or listen mode. In server mode, a 289H with a LAN Controller receives calls from PressureMAP. When the 289H sends an alert to the PMAP system, the LAN Controller switches to "client" or call mode. During alerting, the PMAP system becomes the "server."

For the LAN Controller to work properly on a telephone company network, all network firewalls must be configured to allow PMAP calls to the 289H with the LAN Controller. For alerting to work properly, network firewalls must also be configured to allow the 289H with the LAN Controller to call the PMAP system.

To help the network administrator configure the network to allow two-way communication between the LAN Controller and PressureMAP, fill out the following two-part worksheet (TABLE 5-2). Provide the completed worksheet to the network administrator.

LAN CONTROLLER INFORMATION	
IP Address	
Port Number	3001
Gateway	
Subnet Mask	
Location of LAN Controller	
Information Below Supplied by Network Administrator	
Default Route for LAN Controller	

PMAP INFORMATION	
IP Address	
Port Number	3002
Gateway	
Subnet Mask	
Location of LAN Controller	
Information Below Supplied by Network Administrator	
Default Route for LAN Controller	

TABLE 5-2: NETWORK CONFIGURATION WORKSHEET