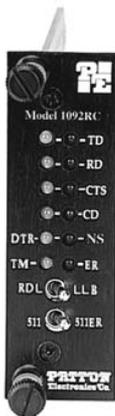


USER MANUAL

MODEL 1092RC High Speed, 2-Wire, Synchronous and Asynchronous Rack Mount Modem Card



PATTON
Electronics Co.



An ISO-9001
Certified Company

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1092RC components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

1.1 RADIO AND TV INTERFERENCE

The Model 1092RC generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model 1092RC has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 1092RC does cause interference to radio or television reception, which can be determined by disconnecting the unit, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches). In the event the user detects intermittent or continuous product malfunction due to nearby high power transmitting radio frequency equipment, the user is strongly advised to take the following steps: use only data cables with an external outer shield bonded to a metal or metalized connector; and, configure the rear card as shown in section 3.3 of this manual.

1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the European Union. A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE

All warranty and nonwarranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Support:

tel: **(301) 975-1007**;
email: **support@patton.com**.
www: **http://www.patton.com**.

NOTE: Packages received without an RMA number will not be accepted.

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 1092RC. Technical Service hours: **8AM to 5PM EST, Monday through Friday**.

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions arise during installation or use of this product, please contact Patton Electronics Technical Support at: (301) 975-1007.

2.1 FEATURES

- Synchronous data rates: 9.6, 19.2, 32, 56, 64 and 128 kbps in all clock modes
- Asynchronous data rates: 0 - 38.4 kbps
- Full duplex operation over a one or two twisted pair (2- or 4-Wires)
- Point-to-point distances up to 5 miles (8Km)
- Remote digital loopback, local line loopback diagnostics
- Internal, external or receive recovered clocking options
- LED indicators for TD, RD, CTS, CD, DTR, TM, ER and NS
- Fits in Patton's rack chassis and cluster boxes
- Made in the U.S.A.

2.2 DESCRIPTION

The Patton Model 1092RC KiloModem 2W™ baseband modem allows synchronous or asynchronous data to be transmitted up to 5 miles (8 km) over one or two twisted pair (2 or 4 Wire). Supporting synchronous speeds up to 128 kbps and asynchronous speeds up to 38.4 kbps, the 1092RC is perfect for LAN interconnection or high speed internet links.

Supporting 2B1Q encoding, Automatic Equalization and Auto Gain Control, the Model 1092RC compensates for poor line quality. Swappable interface driver boards and interface cards allow the user to easily change applications between RS-232 and V.35. Future driver boards and interface cards will include X.21, G.703, and RS-530. The Model 1092RC also features convenient front panel diagnostic switches and LEDs that allow for easy setup, configuration and testing.

The Model 1092RC is designed to fit into Patton's 2U (3.5") high rack chassis. This 16-card chassis has a switchable 120/240 VAC power supply (optional 48 VDC) and mounts cards in a mid-plane architecture: The front card can be plugged into different rear cards.

3.0 CONFIGURATION

This section describes the location and orientation of the Model 1092RC's configuration switches and jumpers, and provides detailed instructions for all possible settings.

3.1 CONFIGURING THE HARDWARE SWITCHES

The Model 1092RC Series front card defaults to the use of hardware switches for configuration. There is an interface driver board strap, and two eight-position DIP switches, on the front card (see Figure 1, below).

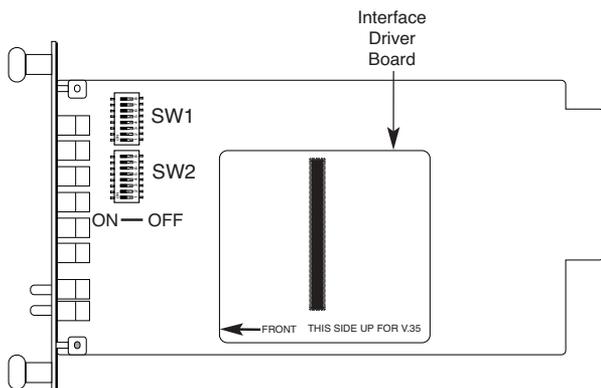


Figure 1. Model 1092RC, showing configuration switches and interface board

Figure 2 shows the orientation of the DIP switches with respect to the "ON" and "OFF" positions.

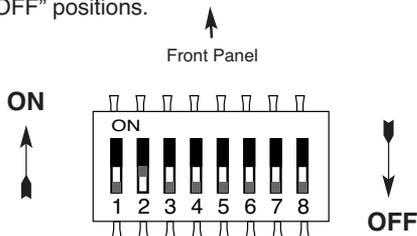


Figure 2. Close up of configuration switches (both sets are identical in appearance)

NOTE: The ON position is oriented toward the front of the Model 1092RC.

3.1.1 Reversible Interface Driver Board

The Model 1092RC Series features switchable interface driver boards that allow a wide range of DTE interface connections. Each interface driver board incorporates two interfaces -- one on each side of the driver board. Figure 3 shows the Interface Driver Board on the bottom of the 1092RC PC board.

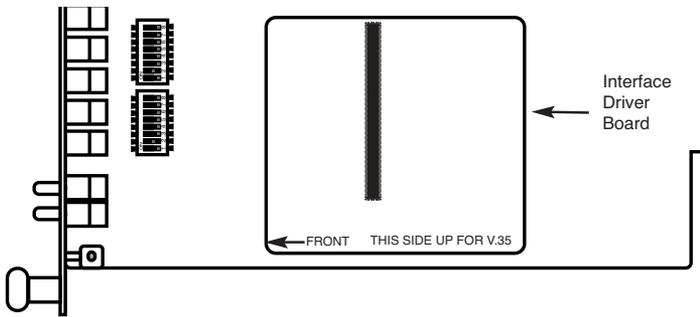


Figure 3. Closeup of Model 1092RC Interface Driver Board

Follow the instructions below to select the correct interface for your application:

1. With the 1092RC pulled out of the rack or clusterbox chassis, locate the driver board on the top of the 1092RC front card.
2. Lift the interface board gently off of the PC board.
3. Locate the correct interface on the bottom of the driver board. For example, the RS-232/V.35 interface board is marked **“THIS SIDE UP FOR RS-232”** on one side and **“THIS SIDE UP FOR V.35”** on the other side .
4. Re-orient the interface board into the socket with the appropriate interface pointed UP and with the arrow pointing toward the front panel of the Model 1092RC PC board.
5. Push the Interface Driver Board gently onto the socket and re-install into the rack or cluster system.

3.1.2 Configuration DIP Switch Set “S1”

The configuration switches on S1 allow you to specify the data rate, async/sync data format, transmit clock source and response to RDL request. Default settings of S1 are shown in the table below.

S1 SUMMARY TABLE		
Position	Function	Factory Default
S1-1	Data Rate	On } 64K Sync
S1-2	Data Rate	Off }
S1-3	DSR during Local Line Loop	On DSR Enable
S1-4	Async/Sync Data Format	Off } Async/Sync
S1-5	Async/Sync Data Format	Off }
S1-6	Tx Clock Source	On } Internal Clock
S1-7	Tx Clock Source	On }

Switches S1-1 and S1-2: Data Rate

Use Switches S1-1 and S1-2 to configure the data rate of the Model 1092RC. Each setting represents one synchronous data rate and one asynchronous data rate.

<u>S1-1</u>	<u>S1-2</u>	<u>Sync Data Rate</u>	<u>Async Data Rate</u>
On	On	32 Kbps	Reserved
Off	On	56 Kbps	Reserved
On	Off	64 Kbps	Reserved
Off	Off	19.2 or 128 Kbps*	0 - 38.4 kbps

***NOTE:** Model 1092RC operates either at a synchronous rate of 19.2 kbps *or* 128 kbps depending on the orientation of Switch S2. To operate synchronously at 19.2 kbps, set Switch S2-1 ON. To operate at 128 kbps, set Switch S2-1 OFF. See Section 3.1.3 for more information.

Switch S1-3: Data Set Ready During Local Line Loopback Test

Use Switch S1-3 to control the behavior of the DSR signal at the EIA interface during the local line loopback test.

<u>S1-3</u>	<u>Setting</u>	<u>Description</u>
On	Enabled	DSR is on during local line loop (default)
Off	Disabled	DSR is off during local line loop

Switches S1-4 and S1-5: Async/Sync Operation

Use Switches S1-4 and S1-5 to configure the Model 1092 for async/sync operation. Both switches must be set in the "Off" position. There is no other valid setting.

<u>S1-4</u>	<u>S1-5</u>	<u>Setting</u>
Off	Off	Allows sync/async control
On	Off	Reserved
Off	On	Reserved
On	On	Reserved

Switches S1-6 and S1-7: Transmit Clock Source

Use Switches S1-6 and S1-7 to configure the 1092 for internal, external, or receive recover clock mode.

<u>S1-6</u>	<u>S1-7</u>	<u>Setting</u>	<u>Description</u>
On	On	Internal	Transmit Clock derived internally
Off	On	External	Transmit Clock derived from the terminal interface
On	Off	Receive Recover	Transmit clock derived from the received line signal
Off	Off	hardware reset	

Important: A pair of Model 1092s communicate synchronously across the twisted pair line connection. Therefore, **you must set these switches whether your application is async or sync.** For X.21 or Async applications, please configure one Model 1092 for internal clock mode and the other Model 1092 for receive recover clock mode.

Switch S1-8: Respond to Local and Remote Loop from DTE

Use Switch S1-8 to determine whether the DTE can initiate a local or remote loopback test. When Switch S1-8 is in the On position, the DTE may activate a local or remote loopback test by raising the appropriate interface signal (see Appendix C to determine the local and remote loopback signals).

<u>S1-8</u>	<u>Setting</u>
On	Respond to loop request from DTE Interface
Off	Do not respond to loop request from DTE Interface

3.1.3 DIP Switch Set “S2” - Control Port Address and 19.2 kbps Sync.

The Model 1092RC may be configured by a menu-driven software system when used with the Patton **Model 1000CC** (for ordering information, see Appendix B). In order to configure the Model 1092RC by software commands, you must set its control port address.

The control port address is defined by a two digit decimal number. Switches S2-1 through S2-4 define the least significant digit or the “ones” digit, and Switches S2-5 through S2-7 define the “tens” digit. Valid addresses are 0 through 79. Use the table below and the instructions that follow the table to set the the control port to the desired address.

S2 SUMMARY TABLE								
Address Digit	Switch S2 Settings							
	1*	2	3	4	5	6	7	8
0	ON	ON	ON	ON	ON	ON	ON	ON
1	OFF	ON	ON	ON	OFF	ON	ON	ON
2	ON	OFF	ON	ON	ON	OFF	ON	ON
3	OFF	OFF	ON	ON	OFF	OFF	ON	ON
4	ON	ON	OFF	ON	ON	ON	OFF	ON
5	OFF	ON	OFF	ON	OFF	ON	OFF	ON
6	ON	OFF	OFF	ON	ON	OFF	OFF	ON
7	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
8	ON	ON	ON	ON	N/A	N/A	N/A	ON

NOTE: Default Settings Shown in **Bold Italics**; Default Address is “10”

Switches S2-1, S2-2, S2-3, S2-4: Control Port Address -- LSD

Use Switches S2-1, S2-2, S2-3 and S2-4 to set the least significant digit of the the Model 1092RC control port address. For example, using the table above, if the desired address is “63”, the “3” is the least significant digit in the address, set Switches S2-1, S2-2, S2-3 and S2-4 to OFF OFF ON ON, respectively.

***NOTE:** You may also use Switch S2-1 to enable **19.2 kbps synchronous** operation by setting Switch S2-1 to the ON position. However, when Switch S2-1 is in the ON position, LSD addresses 0, 2, 4, 6, and 8 may not be used for the Control Port Address.

Switches S2-5, S2-6, S2-7: Control Port Address -- MSD

Use Switches S2-5, 2-6 and S2-7 to set the most significant digit of the Model 1092RC control port address. For example, using the table above, if the desired address is “62”, the “6” is the most significant digit in the address, set Switches S2-5, S2-6, and S2-7 to ON, OFF, OFF, respectively.

Switch S2-8: *Reserved for Factory Use*

Switch S2-8 is reserved for factory use and must in the ON position.

3.2 CONFIGURING THE SOFTWARE SWITCHES

The Model 1092RC features a menu-driven command system that allows you to configure either the local or remote 1092RC. The software control port signals of the 1092RC are carried to each card in the rack along the internal power bus board. Access to all rack card control ports is provided by a single PATTON Model 1000CC Control Card (see Model **Model 1000CC User Manual**). After setting the control port address (Section 3.1.3), use the following instructions to configure the unit:

- 1) Connect the serial RS-232 port of a V100 or similar DTE with terminal emulation to the EIA-561 control port on the Model 1000CC control card. To construct an RS-232 to EIA-561 patch cable, refer to the control port pinout diagram in Appendix D. Refer to Appendix C to order a pre-made cable.
- 2) Power up the terminal and set its RS-232 port as follows:
 - 9600 Baud
 - 8 data bits, 1 stop bit, no parity
 - Local echo
 - CR-CR/LF on inbound data
 - ANSI, VT-100 emulation
3. Press [CTRL+B] on the terminal followed by the two-digit control port address and press [RETURN].
4. To make a selection from any menu, enter the option number. To exit any menu without making a selection, press the [ESC] key or the [SPACE] key.
- 5) After the Model 1092RC is powered on, the control port will send out this message:

2W BBMRC, ver. x.x

- 6) Press [ESC] on the terminal.
- 7) The 1092RC will then display the MAIN MENU screen. You may configure the LOCAL Model 1092RC from this screen. To configure the REMOTE Model 1092RC, press '\$' (Shift-4 on most keyboards).

Important!!: To make a selection from any menu, enter the option number. To exit any menu without making a selection, or to return to the previous menu, press the [ESC] key or the [SPACE] key.

3.2.1 Configuring the Local 1092RC

To configure the local 1092RC, make a selection from the following MAIN MENU. To configure the remote 1092 or 1092RC, type [\$] (Shift-4) and refer to **Section 3.2.2**.

```
*****
*                               *
*           MAIN MENU           *
*                               *
* 1. Display Active Configuration *
* 2. Display Hardware Configuration *
* 3. Display Software Configuration *
* 4. Setup Software Configuration *
* 5. Select Hardware/Software Control *
* 6. Display Modem Status *
* 7. Test Modes *
* 8. Restart Unit *
*****
Enter your selection(1-8)>
```

MAIN MENU Option 1: Display Active Configuration

Select Option 1 to display the most recent configuration of the local Model 1092RC (See below). The Model 1092RC uses the active configuration for its operation. If you make changes to the configuration, you must select MAIN MENU Option 8. This will update the unit to the new active configuration.

```
*****
* ACTIVE CONFIGURATION - Esc to MAIN MENU *
*                               *
* Configuration Control:           Hardware *
* DTE Rate:                        64 Kbps *
* Data Format:                      Synchronous *
* Clock Mode:                      Internal *
* DSR during Local Line Loop:     Enabled *
* Response to Remote Digital Loop: Enabled *
* DTE controlled Local Line Loop: Enabled *
* DTE controlled Remote Digital Loop: Enabled *
* Control Port Address:           00 *
*****
```

3.2.2 MAIN MENU Option 2: Display Hardware Configuration

Select Option 2 to display the configuration of the hardware DIP-switches. To use the Hardware Configuration for the Active Configuration, select MAIN MENU Option 5. Then select "Use Hardware DIP-Switches". Finally, select MAIN MENU Option 8 to save.

```
*****
* HARDWARE CONFIGURATION - Esc to MAIN MENU *
*                               *
* Configuration Control:           Hardware *
* DTE Rate:                        64 Kbps *
* Data Format:                      Synchronous *
* Clock Mode:                      Internal *
* DSR during Local Line Loop:     Enabled *
* Response to Remote Digital Loop: Enabled *
* DTE controlled Local Line Loop: Disabled *
* DTE controlled Remote Digital Loop: Disabled *
*****
```

MAIN MENU Option 3: Display Software Configuration

Select Option 3 to display the configuration of the software switches. To use the software configuration for the Active Configuration, select MAIN MENU, Option 5. Then select "Use Software Switches". Finally, select MAIN MENU Option 8 to save.

```
*****
* SOFTWARE CONFIGURATION MENU - Esc to MAIN MENU *
*
* 1. DTE Rate *
* 2. Data Format (Async/Sync) *
* 3. Clock Mode *
* 4. DSR during Local Line Loop *
* 5. Response to Remote Digital Loop *
* 6. DTE controlled Local Line Loop *
* 7. DTE controlled Remote Digital Loop *
*****
Enter your selection(1-7)>
```

MAIN MENU Option 4: Setup Software Configuration

Select Option 4 to edit the software configuration of the Model 1092RC. To save changes after editing the software configuration, select MAIN MENU Option 5, then select "Use Software Switches" and then select MAIN MENU Option 8.

```
*****
* SOFTWARE CONFIGURATION MENU - Esc to MAIN MENU *
*
* 1. DTE Rate *
* 2. Data Format (Async/Sync) *
* 3. Clock Mode *
* 4. DSR during Local Line Loop *
* 5. Response to Remote Digital Loop *
* 6. DTE controlled Local Line Loop *
* 7. DTE controlled Remote Digital Loop *
*****
Enter your selection(1-7)>
```

1. DTE Rate

Select Option 1 in the SOFTWARE CONFIGURATION menu to select the async. or sync. DTE Rate of the Model 1092RC. Different DTE Rate menu screens will display for async. or sync. bit rates. The selections are shown below.

a) This menu is displayed when the data format is synchronous:

```
*****
* DTE RATE - Esc to SOFTWARE CONFIG MENU *
*
* 1. 32 Kbps *
* 2. 56 Kbps *
* 3. 64 Kbps (Default) *
* 4. 128 Kbps *
*****
Enter your selection(1-4)>
```

b) This menu is displayed when the data format is asynchronous:

```
*****
* DIE RATE - Esc to SOFTWARE CONFIG MENU *
*
* 1. 0-38,400 bps (default)      3. Reserved *
* 2. Reserved                    4. Reserved *
*****
Enter your selection(1-4)>
```

2. Data Format

Select Option 2 in the SOFTWARE CONFIGURATION Menu to select the async or sync data format (See below). This option controls whether the unit operates in asynchronous or asynchronous data formats.

```
*****
* DATA FORMAT - Esc to SOFTWARE CONFIG MENU *
*
* 1. Asynchronous, 8 bits + no parity *
* 2. Asynchronous, 7 bits + parity *
* 3. Asynchronous, 7 bits, no parity *
* 4. Synchronous *
*****
Enter your selection(1-4)>
```

3. Clock Mode

Select Option 3 in the SOFTWARE CONFIGURATION Menu to select the sync clock mode (See below).

```
*****
* CLOCK MODE - Esc to SOFTWARE CONFIG MENU *
*
* 1. Master Clock - Internal (default) *
* 2. Master Clock - External (DTE provided)*
* 3. Slaved to Receive Clock *
*****
Enter your selection(1-3)>
```

Set this option as follows:

Master Clock - Internal: Selection 1 allows the Model 1092RC to generate an internal clock as the timing source.

Master Clock - External: Selection 2 allows the Model 1092RC to Derive the system clock from the locally connected DTE.

Slaved to Receive Clock: Selection 3 to allows the Model 1092RC to derive the timing source from the incoming data stream from the remote Model 1092RC.

4. DSR During Local Line Loop

Select Option 4 in the SOFTWARE CONFIGURATION to configure the behavior of the local Data Set Ready (DSR) signal during the Local Line Loop test mode (below).

```
*****
*           DSR DURING LOCAL LINE LOOP           *
*           Esc to SOFTWARE CONFIG MENU           *
*           *                                     *
* 1. DSR ON during Local Line Loop <default> *
* 2. DSR OFF during Local Line Loop           *
*****
Enter your selection<1-2>>
```

5. Response to Remote Digital Loop

Select Option 5 in the SOFTWARE CONFIGURATION Menu to instruct the Model 1092RC to either respond or ignore the Remote Digital Loop request from the remote 1092RC.

```
*****
*  RESPONSE TO REMOTE DIGITAL LOOP  *
*  Esc to SOFTWARE CONFIG MENU      *
*  *                                 *
* 1. ENABLE <default>      2. DISABLE *
*****
Enter your selection<1-2>>
```

6. DTE Controlled Local Line Loop

Select Option 6 in the SOFTWARE CONFIGURATION Menu to instruct the Model 1092RC to either respond or ignore Local Line Loop requests from the DTE. To instruct the Model 1092RC to respond to Local Line Loop requests from the DTE, select Enable (Option 1). To instruct the 1092RC to ignore Local Line Loop requests from the DTE interface, select Disable (Option 2).

```
*****
*  DTE CONTROLLED LOCAL LINE LOOP  *
*  Esc to SOFTWARE CONFIG MENU      *
*  *                                 *
* 1. ENABLE <default>      2. DISABLE *
*****
Enter your selection<1-2>>
```

7. DTE Controlled Remote Digital Loop

Select Option 7 in the SOFTWARE CONFIGURATION Menu to enable DTE control of the Remote Digital Loop Menu (See below). The Remote Digital Loop on the 1092RC can be controlled from the DTE interface by selecting Enable (Option 1). To instruct the 1092RC to ignore this request from the DTE interface, select Disable (Option 2).

```
*****
* DTE CONTROLLED REMOTE DIGITAL LOOP *
*   Esc to SOFTWARE CONFIG MENU   *
*                                  *
* 1. ENABLE (default)      2. DISABLE *
*****
Enter your selection<1-2>
```

3.2.5 MAIN MENU Option 5: Select Hardware/Software Control

Select Option 5 from the MAIN MENU selects whether the Model 1092RC will use the hardware switch settings or the software switch settings for its active configuration. If Options 1 or 2 are selected, the 1092RC will use the current hardware or software switch settings as the active configuration. After changing this setting select MAIN MENU Option 8 to implement the changes.

```
*****
* HARDWARE/SOFTWARE CONFIGURATION CONTROL *
*   Esc to MAIN MENU   *
*                                  *
* 1. Use Hardware Dip-switches (default) *
* 2. Use Software Switches *
*****
Enter your selection<1-2>
```

3.2.6 MAIN MENU Option 6: Display Modem Status

Select Option 6 from MAIN MENU to display the Modem Status (below). Press RETURN on the keyboard to update and redisplay the screen.

```
*****
* MODEM STATUS - Esc to TEST MENU *
*                                  *
* Handshake status:   UNDER TEST *
* Data Terminal Ready: OFF *
* Request To Send:   OFF *
* Carrier Detect:    ON *
* Data Set Ready:    ON *
* Clear To Send:     OFF *
* Test Mode:         Local Line Loop and 511 *
* 511 Error Count:   4430 *
*****
Enter "C" to clear error count>
```

Valid Model 1092RC Handshake status conditions are listed below:

1. Handshaking - This status occurs when the 1092RC is in the process of establishing a link with another 1092RC.
2. Data Mode - This status occurs when the 1092RC successfully establishes a link with another 1092RC allowing the data to flow.

3.2.7 MAIN MENU Option 7: Test Modes

Select Option 7 from the MAIN MENU to select the test mode status of the Model 1092RC. (below). The Model 1092RC Test Mode settings help to verify the integrity of the data link and isolate communication difficulties.

```
*****
*   TEST MODE MENU - Esc to MAIN MENU   *
*                                         *
* 1. OFF                                 *
* 2. 511                                  *
* 3. 511 w/errors                         *
* 4. Local Line Loop                      *
* 5. Local Line Loop and 511              *
* 6. Local Line Loop and 511 w/errors     *
* 7. Remote Digital Loop                  *
* 8. Remote Digital Loop and 511         *
* 9. Remote Digital Loop and 511 w/errors *
*****
Enter your selection<1-9>>
```

NOTE: The 1092RC control port displays an error counter in all test modes except options 4 and 7 listed above.

To run or terminate a particular test, key in the option to get to that screen menu. If a particular test cannot be invoked, the unit displays the message:

“Attempt unsuccessful!”.

Test Mode options 2,3,7,8 and 9 require the 1092RC to be in Data Mode with the remote 1092RC. The Model 1092RC Test Modes are described below:

OFF	Terminates all tests
511	Initiates the built-in test pattern generator and detector.
511 with Errors	Initiates the built-in test pattern generator and detector. The test pattern generator also injects intentional errors approximately once per second.
Local Line Loop and 511	Initiates the Local Line Loop test and starts the internal 511 generator and detector.
Local Line Loop and 511 w/errors	Initiates the Local Line Loop test and starts the internal 511 generator and detector. In this test, the 511 pattern generator injects intentional errors into the data stream.
Remote Digital Loop	Initiates the Remote Digital Loopback test. Any data sent to the remote 1092RC is returned to the originating device.
Remote Digital Loop and 511	Initiates the Remote Digital Loopback test and starts the internal 511 generator and detectors.
Remote Digital Loop and 511 with errors	Initiates the Remote Digital Loopback test and starts the 511 test patterns. In this test the 511 pattern generator will inject initial errors into the data stream.

The Modem Status Screen is displayed upon initiating a test. A 511 error counter is displayed to indicate errors. Press the 'C' key to clear the counter and redisplay the Modem Status Screen. Pressing 'ESC' returns you to the Test Mode Menu.

3.2.2 Configuring the Remote 1092RC

To configure the remote 1092RC, make a selection from the following REMOTE UNIT CONFIGURATION MAIN MENU. To return to the LOCAL 1092RC MAIN MENU screen, press [ESC] and refer to Section 3.2.1.

```
*****
*                REMOTE UNIT CONFIGURATION                *
*                MAIN MENU                                *
*                                                        *
* 1. Display Remote Unit Configuration                    *
* 2. Setup Remote Unit Configuration                    *
* 3. Display Remote Modem Status                        *
* 4. Select Hardware /Software Control                  *
* 5. Restart Remote Unit                                *
*                                                        *
*****
```

REMOTE MAIN MENU Option 1: Display Remote Unit Configuration

Select Option 1 to display the configuration of various parameters in the remote Model 1092RC.

```
*****
*                REMOTE CONFIGURATION                    *
*                CONFIGURATION DISPLAY MENU              *
*                                                        *
* 1. Display Configuration of:                          *
*     DSR during Local Line Loop                        *
*     Response to Remote Digital Loop                   *
*     Clock Mode                                         *
*                                                        *
* 2. Display Configuration of:                          *
*     Configuration Control                              *
*     DTE Rate                                           *
*                                                        *
* 3. Display Configuration of:                          *
*     DTE Controlled Local Line Loop                    *
*     DTE Controlled Remote Digital Loop                *
*                                                        *
*****
```

REMOTE MAIN MENU Option 2: Remote Unit Configuration

REMOTE MAIN MENU Option 2 allows you to edit the software configuration of the REMOTE Model 1092RC. Please note that after editing the software configuration, you must select REMOTE MAIN MENU Option 4, the select "Use Software Switches" and then select MAIN MENU Option 5 to implement the most recent changes.

```
*****
*          REMOTE UNIT CONFIGURATION MENU          *
*                                                    *
* 1. DTE Rate                                       *
* 2. Clock Mode                                     *
* 3. DSR during Local Line Loop                     *
* 4. Response Remote Digital Loop                   *
* 5. DTE Controlled Local Line Loop                 *
* 6. DTE Controlled Remote Digital Loop             *
* 7. 2-Wire/4-Wire Selection (ONLY FOR 1092A)      *
*****
```

REMOTE MAIN MENU Option 3: Display Remote Modem Status

Select REMOTE MAIN MENU Option 3 to display the status of the REMOTE unit.

REMOTE MAIN MENU Option 4: Display Hardware/Software Control

Select REMOTE MAIN MENU Option 4 to select whether the remote Model 1092RC will use the hardware switch settings or the software switch settings for its active configuration.

REMOTE MAIN MENU Option 5: Restart Remote Unit

Select REMOTE MAIN MENU Option 5 to restart the remote unit.

<p>NOTE: All REMOTE CONFIGURATION sub-menus are similar to the LOCAL CONFIGURATION sub-menu screens. See Section 3.2.1 for details.</p>
--

3.3 CONFIGURING THE REAR INTERFACE CARD

The Model 1092RC Series has two interface card options: the Model 1000RCM12592 (DB-25/RJ-45) and the Model 1000RCM13492 (M/34/RJ-45). Each of these options supports one DTE interface connection and one 2-wire line connection. Figure 4 below illustrates the two different interface options for the Model 1092RC Series.

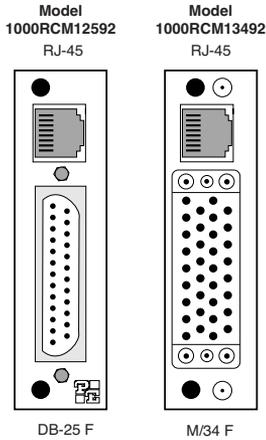


Figure 4. Model 1092RC Series interface card options

NOTE: The 1092RC Series rear cards are specifically designed to operate with the Model 1092RC function card and must not be swapped with other Patton function cards.

Prior to installation, you will need to examine the rear card you have selected and make sure it is properly configured for your application. Each rear card is configured by setting straps located on the PC board. To configure the rear cards, you must set the configuration straps. Figure 5 below shows the orientation of these straps. Each strap can either be on pegs 1 and 2, or on pegs 2 and 3. Sections 3.3.1 and 3.3.2 describe the strap locations and possible settings for each rear card.

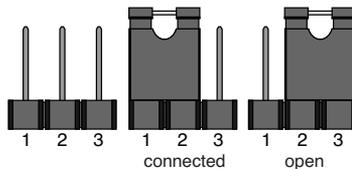


Figure 5. Orientation of Interface Card Straps

3.3.1 Model 1000RCM12592 Strap Settings

Figure 6 shows strap locations for the Model 1000RCM12592 (DB-25/RJ-45S) rear cards. These straps determine various grounding characteristics for the terminal interface and twisted pair lines. JB3 and JB4 are user configurable. JB2 **must** be set on pgs 1 and 2.

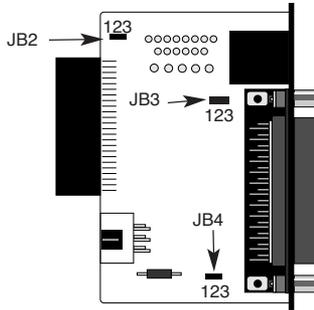


Figure 6. DB-25/RJ-45S strap locations

The table below provides an overview of interface strap functions for the rear interface cards. Following the table overview are detailed descriptions of each strap's function.

INTERFACE CARD STRAP SUMMARY TABLE #1			
Strap	Function	Position 1&2	Position 2&3
JB3	DTE Shield (Pin1) & FRGND	Connected	Open*
JB4	FRGND & SGND	Connected	Open*

* Indicates default setting

DTE Shield (DB-25 Pin 1) & FRGND (JB3)

In the connected position, this strap links DB-25 pin 1 & frame ground. In the open position, pin 1 is disconnected from frame ground.

JB3

Position 1&2 = DTE Shield (Pin 1) and FRGND Connected

Position 2&3 = DTE Shield (Pin 1) and FRGND Not Connected

SGND & FRGND (JB4)

In the connected position, this strap links DB-25 pin 7 (Signal Ground) and frame ground. In the open position, pin 1 is disconnected from frame ground.

JB4

Position 1&2 = SGND (Pin 7) and FRGND Connected

Position 2&3 = SGND (Pin 7) and FRGND Not Connected

3.3.2 Model 1000RCM13492 Strap Settings

Figure 7 shows the strap location for the Model 1000RCM13492 (M/34/RJ-45) rear card. This strap determines whether Signal Ground and Frame Ground will be connected.

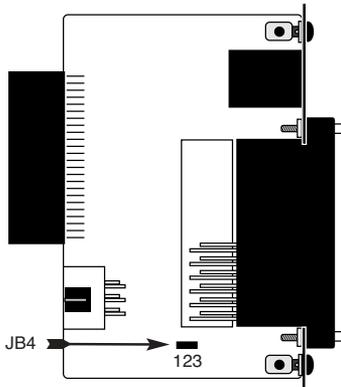


Figure 7. M/34/RJ-45 strap locations

SGND & FRGND (JB4)

In the connected position, this strap links Signal Ground and frame ground. In the open position, signal ground is disconnected from frame ground.

JB4

Position 1&2 = SGND and FRGND Connected

Position 2&3 = SGND and FRGND Not Connected

4.0 INSTALLATION

This section describes the functions of the Model 1000R16 rack chassis, tells how to install front and rear Model 1092RC Series cards into the chassis, and how to connect to the twisted pair interface and the serial interface.

4.1 THE MODEL 1000R16 RACK CHASSIS

The Model 1000R16 Rack Chassis (Figure 8, below) has sixteen short range modem card slots, plus its own power supply. Measuring only 3.5" high, the Model 1000R16 is designed to occupy only 2U in a 19" rack. Sturdy front handles allow the Model 1000R16 to be extracted and transported conveniently.

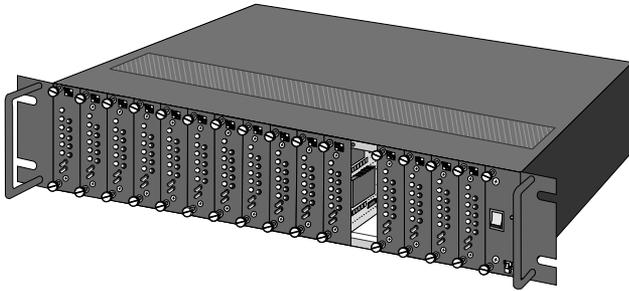


Figure 8: Model 1000R16 Rack Chassis with power supply

4.1.1 The Rack Power Supply

The power supply included in the Model 1000R16 rack uses the same mid-plane architecture as the modem cards. The front card of the power supply slides in from the front, and the rear card slides in from the rear. They plug into one another in the middle of the rack. The front card is then secured by thumb screws and the rear card by conventional metal screws.

WARNING! There are no user-serviceable parts in the power supply section of the Model 1092RC Series. Voltage setting changes and fuse replacement should only be performed by qualified service personnel. Contact Patton Electronics Technical support at (301)975-1007 for more information.

Switching the Power Supply On and Off

The power switch is located on the front panel. When plugged in and switched on, a red front panel LED will glow. Since the Model 1000R16 is a "hot swappable" rack, *it is not necessary for any cards to be installed before switching on the power supply*. The power supply may be switched off at any time without harming the installed cards.

NOTE: Please refer to the Model 1000RP Series User Manual *AC and DC Rack Mount Power Supplies* for fuse and power card replacement information.

4.2 INSTALLING THE MODEL 1092RC SERIES INTO THE CHASSIS

The Model 1092RC Series is comprised of a front card and a rear card. The two cards meet inside the rack chassis and plug into each other by way of mating 50 pin card edge connectors. Use the following steps as a guideline for installing each Model 1092RC Series into the rack chassis:

1. Slide the rear card into the back of the chassis along the metal rails provided.
2. Secure the rear card using the metal screws provided.
3. Slide the front card into the front of the chassis. It should meet the rear card when it's almost all the way into the chassis.
4. Push the front card *gently* into the card-edge receptacle of the rear card. It should "click" into place.
5. Secure the front card using the thumb screws.

4.3 WIRING THE MODEL 1092RC SERIES

Each of the rear interface cards compatible with the Model 1092RC Series has one terminal interface port and one 2-wire (twisted pair) port. For specific interface pin-outs, refer to the diagrams in **Appendix C** of this manual.

4.3.1 Connection to a “DTE” Device

Regardless of the interface module you choose, the Model 1092RC’s serial port is always wired as a DCE. Therefore it “wants” to plug into a DTE such as a terminal, PC or host. When making the connection to your DTE device, use a *straight through* cable of the shortest possible length that is appropriate to the interface you are using. When purchasing or constructing an interface cable, please refer to the pin diagrams in **Appendix C** as a guide.

4.3.2 Connection to a “DCE” Device

Since the Model 1092RC’s serial port is always wired as a DCE, you must use a *null modem* cable when connecting to another DCE device such as a CSU/DSU, modem or multiplexer. This cable should be of the shortest possible length that is appropriate to the interface you are using. When purchasing or constructing a null modem interface cable, use the pin diagrams in **Appendix C** as a guide.

Notice! Any terminal cable connected to the Model 1092RC must be shielded cable, and the outer shield must be 360 degree bonded—at both ends—to a metal or metalized backshell.

4.3.3 Connection to the Twisted Pair Interface

The Model 1092RC supports communication between two DTE devices at distances to 5 miles (8 km) over 24AWG (.5mm) twisted pair wire. There are two essential requirements for installing the Model 1092RC:

1. These units work in **pairs**. Therefore, you must have one Model 1092RC (or a compatible model) at each end of a single twisted pair interface.
2. To function properly, the Model 1092RC needs one **twisted** pair of metallic wire. This twisted pair must be **unconditioned**, dry, metallic wire, between 19 (.9mm) and 26 AWG (.4mm) (the higher number gauges may limit distance somewhat). Standard dial-up telephone circuits, or leased circuits that run through signal equalization equipment, or standard, flat modular telephone type cable, are *not acceptable*.

4.3.4 Two-Wire Cable Connection Via RJ-45

1. The RJ-45 connector on the Model 1092RC's twisted pair interface is polarity insensitive and is wired for a two-wire interface. The signal/pin relationships are shown in Figure 9 below.

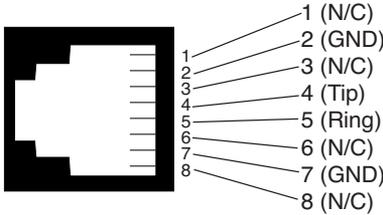


Figure 9. Model 1092RC twisted pair line interface.

2. Proper wiring of pairs between the two modems is as follows:

SIGNAL	PIN#		PIN#	SIGNAL
TIP	4-----		4	TIP
RING	5-----		5	RING

Notice! Any modular twisted pair cable connected to the Model 1092RC must be shielded cable, and the outer shield must be properly terminated to a shielded modular plug on both ends of the cable.

4.3.5 Connection to the Control Port Interface

Please refer to the Model 1000CC Control Card user manual for cable requirements of the Control Port Interface.

5.0 OPERATION

Once the Model 1092RC is properly configured and installed, it should operate transparently. This sections describes functions of the LED status indicators, and the use of the built-in loopback test modes.

5.1 LED STATUS INDICATORS

The Model 1092RC features twelve front panel LEDs that monitor power, the DTE signals, network connection and test modes. Figure 10 (below) shows the front panel location of each LED. Following Figure 10 is a description of each LEDs function.

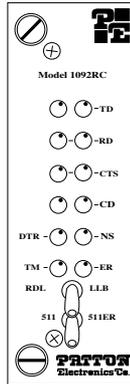


Figure 10. The Model 1092RC Series' front panel LEDs

- | | |
|--------------------|---|
| TD & RD | glow red to indicate an idle condition of Binary "1" data on the respective terminal interface signals. Green indicates Binary "0" data. |
| CTS | consists of 2 LEDs, 1 red, 1 green. CTS glows green to indicate that the Clear to Send signal from the modem is active. Red indicates inactive CTS. |
| CD | consists of 2 LEDs, 1 red, 1 green. CD glows red if no carrier signal is being received from the remote modem. Green indicates that the remote modem's carrier is being received. |
| DTR | glows green to indicate that the Data Terminal Ready signal from the terminal is active. |

- ER** glows red to indicate the likelihood of a Bit Error in the received signal. During the 511 or 511/E test, ER flashes to indicate that the Test Pattern Detector has detected a bit error.
- TM** glows red to indicate that the Model 1092RC has been placed in Test Mode. The unit can be placed in test mode by the local user or by the remote user.
- NS** (No Signal) glows red to indicate that the local Model 1092RC has not yet connected with the remote Model 1092RC.

5.2 TEST MODES

The Model 1092RC offers two proprietary loopback test modes, plus a built-in V.52 BER test pattern generator, to evaluate the condition of the modems and the communication link. These tests can be activated physically from the front panel, or via the interface.

5.2.1 Using Local Line Loopback (LLB)

The Local Line Loopback (LLB) test checks the operation of the local Model 1092RC, and is performed separately on each unit. Any data sent to the local Model 1092RC in this test mode will be echoed (returned) back to the user device (see Figure 11, below). For example, characters typed on the keyboard of a terminal will appear on the terminal screen.

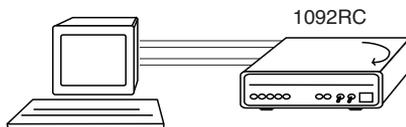


Figure 11 Local Line Loopback

To perform an LLB test, follow these steps:

1. Activate LLB. This may be done in one of two ways: First, by moving the front panel toggle switch to the right to "Local". Second, by raising the LLB signal on the interface (see Appendix C). Once LLB is activated, the Model 1092RC transmitter output is connected to its own receiver. The "TM" LED should be lit.

NOTE: Switch S1-8 must be in the “ON” position).

2. Verify that the data terminal equipment is operating properly and can be used for a test.
3. Perform a V.52 BER (bit error rate) test as described in **Section 5.2.3**. If the BER test equipment indicates no faults, but the data terminal indicates a fault, follow the manufacturer’s checkout procedures for the data terminal. Also, check the interface cable between the terminal and the Model 1092RC.

5.2.2 Using Remote Digital Loopback (RDL)

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote Model 1092RCs, and the communication link between them. Any characters sent to the remote Model 1092RC in this test mode will be returned back to the originating device (see Figure 12, below). For example, characters typed on the keyboard of the local terminal will appear on the local terminal screen after having been passed to the remote Model 1092RC and looped back.

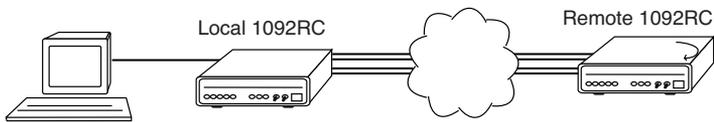


Figure 12. Remote Digital Loop

To perform an RDL test, follow these steps:

1. Activate RDL. This may be done in two ways: first, by moving the front panel toggle switch to the Left to “Remote”. Second, by raising the RDL signal on the interface (see Appendix C).
NOTE: Switch S1-8 must be in the “ON” position.
2. Perform a V.52 BER test as described in **Section 5.2.3**. If the BER test equipment indicates a fault, and the Local Line Loopback test was successful for both Model 1092RCs, you may have a problem with the twisted pair line between the modems. You should then check the twisted pair line for proper connections and continuity.

5.2.3 Using the V.52 (BER) Test Pattern Generator

To use the V.52 BER tests in conjunction with the Remote Digital Loopback tests* (or with Local Line Loopback tests), follow these instructions:

1. Locate the "511/511E" toggle switch on the front panel of the 1092RC and move it to the left. This activates the V.52 BER test mode and transmits a "511" test pattern into the loop. If any errors are present, the local modem's red "ER" LED will blink sporadically.
2. If the above test indicates no errors are present, move the V.52 toggle switch to the right, activating the "511/E" test with errors present. If the test is working properly, the local modem's red "ER" LED will glow. A successful "511/E" test will confirm that the link is in place, and that the Model 1092RC's built-in "511" generator and detector are working properly.

***NOTE:** The above V.52 BER tests can be used independently of the Remote Digital Loopback tests. This requires two operators: one to initiate and monitor the tests at the local Model 1092RC, and one to do the same at the remote Model 1092RC. In this case, the test pattern sent by each Model 1092RC will not be looped back, but will be transmitted down the line to the other Model 1092RC.

APPENDIX A

PATTON MODEL 1092RC SPECIFICATIONS

Transmission

Format:	Synchronous or asynchronous
Transmission Line:	Single unconditioned twisted pair
Clocking:	Internal, external or receive recover
Distance:	Up to 10.8 miles (17.3Km), all data rates, 19 AWG (.9mm) Up to 7.2 miles (11.5Km), all data rates, 22 AWG (.6mm) Up to 5 miles (8Km), all data rates, 24AWG (.55mm) Up to 3.41 miles (5.45Km), all data rates, 26 AWG(.4mm)
Data Rates:	<i>Sync</i> 32, 56, 64 & 128 kbps; <i>Async</i> 0 - 38.4 kbps
Diagnostics:	V.52 compliant bit error rate pattern (511/511E pattern) generator and detector with error injection mode; Local Line Loopback and Remote Digital Loopback, activated by front panel switch or via serial interface
LED Indicators:	TD, RD, CTS, CD, DTR, NS(no signal), ER (error) and TM (test mode)
Connectors:	RJ-45 on line side; DB-25 female or M/34 female on serial interface side, depending upon which interface rear card is installed.
Temperature:	32-140°F (0-60°C)
Altitude:	0-15,000 feet (0-4572 meters)
Humidity:	5 to 95% noncondensing
Dimensions:	Front Card: 4.81" x 3.10" x 0.95" (12.2 x 7.8 x 2.4cm) Rear Card: 3.33" x 2.8" x 0.95" (8.4 x 7.1 x 2.4cm)
Weight:	Front Card: 0.22 lbs (.10Kg) Rear Card (M/34 with V.35 interface): 0.16 lbs (.07Kg) Rear Card (DB-25/RS-232 interface): 0.12 lbs. (.05Kg)

APPENDIX B

PATTON MODEL 1092RC FACTORY REPLACEMENT PARTS AND ACCESSORIES

<u>Patton Model #</u>	<u>Description</u>
1000RCM12592.....	Rear card w/DB25F & RJ45 (V.24 interface)
1000RCM12492.....	Rear card w/ M/34F & RJ45 (V.35 interface)
1000RPEM	120/240V Rear Power Entry Module
1000RPSM-2	120/240V Front Power Supply Module
1000RPEM-DC	DC Rear Power Entry Module
1000RPSM-48A.....	48V Front Power Supply Module
1000RPEM-V.....	120/240V CE Compliant Rear Power Entry Module
1000RPEM-V.....	120/240V CE Compliant Rear Power Supply Entry Module
1000CC.....	Control Card
IM1RC/A	Interface daughter card, V24/V.35
0805US.....	American Power Cord
0805EUR	European Power Cord CEE 7
0805UK.....	United Kingdom Power Cord
0805AUS	Australia/New Zealand Power Cord
0805DEN	Denmark Power Cord
0805FR.....	France/Belgium Power Cord
0805IN	India Power Cord
0805IS	Israel Power Cord
0805JAP	Japan Power Cord
0805SW.....	Switzerland Power Cord

APPENDIX C

MODEL 1092RC TERMINAL INTERFACE PIN ASSIGNMENT

M/34F Connector-DCE (V.35 Interface)

<u>Pin #</u>	<u>Signal</u>
B	SGND (Signal Ground)
C	RTS (Request to Send)
D	CTS (Clear to Send)
E	DSR (Data Set Ready)
F.....	CD (Carrier Detect)
H	DTR (Data Transfer Ready)
L.....	LLB (Local Line Loop)
M	TM (Test Mode)
N	RDL (Remote Digital Loop)
P	TD(Transmit Data)
R	RD (Receive Data)
S	TD/ (Transmit Data-B)
T.....	RD/ (Receive Data-B)
U	XTC (External Transmit Clock)
V	RC(Receive Timing)
W	XTC/ (External Transmit Clock)
X	RC/ (Receive Timing)
Y	TC(Test Control-A)
AA	TC/ (Test Control-B)

APPENDIX C (Continued)

**PATTON MODEL 1092RC
TERMINAL INTERFACE PIN ASSIGNMENT**

**DB-25F Connector-DCE
(RS-232 Interface)**

<u>Pin #</u>	<u>Signal</u>
1.....	FG (Frame Ground)
2.....	TD (Transmit Data)
3.....	RD (Receive Data)
4.....	RTS (Request to Send)
5.....	CTS (Clear to Send)
6.....	DSR (Data Transfer Rate)
7.....	SGND (Signal Ground)
15.....	TC (Test Control-A)
17.....	RC (Receive Timing)
18.....	LLB (Local Line Loop)
20.....	DTR (Data Transfer Rate)
21.....	RDL (Remote Digital Loop)
24.....	XTC (External Transmit Clock)
25.....	TM (Test Mode)

APPENDIX D
PATTON MODEL 1092RC
CONTROL PORT PIN ASSIGNMENT
(RJ-45 CONNECTOR ON 1000CC CARD)

<u>Pin Function</u>	<u>RJ-45 Pin Number</u>
Transmit data (from DTE).....	7
Receive date (to DTE).....	6
Ground.....	5

APPENDIX E
LINE INTERFACE PIN ASSIGNMENT
(RJ45 Connector)

<u>Pin Number</u>	<u>Signal</u>
1.....	N/C (No Connection)
2.....	N/C (No Connection)
3.....	N/C (No Connection)
4.....	Tip
5.....	Ring
6.....	N/C (No Connection)
7.....	N/C (No Connection)
8.....	N/C (No Connection)

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