USER MANUAL
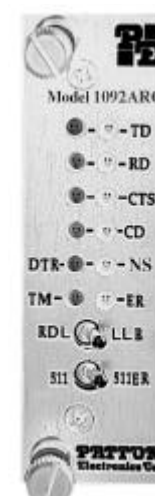

MODEL 1092ARC
High Speed, 2-Wire/4-Wire, Synchronous and Asynchronous Rack Mount Modem Card

PATTON Electronics Co.

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1092ARC 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 1092ARC 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 1092ARC 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 1092ARC 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 (EU). A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE iNFORMATION

All warranty and non-warranty 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 Services at:

tel: (301)975-1007;
email: **support@patton.com,** or;
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 1092ARC. 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: 19.2, 32, 56, 64 and 128 kbps in all clock modes
• Asynchronous data rates: 0 - 38.4 kbps
• **SNMP manageable** using Patton Model 1001MC Card
• Full duplex operation over <u>one or two</u> twisted pair (2- or 4-Wires)
• Point-to-point distances up to 11 miles (17.6Km)
• 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 1001 2u (3.5") rack chassis
• Made in the U.S.A.

2.2 DESCRIPTION

The Patton Model 1092ARC *KiloModem 2W/4W*™ baseband modem allows synchronous or asynchronous data to be transmitted up to 11 miles (17.6 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 1092ARC is perfect for LAN interconnection or high speed internet links.

To compensate for poor line quality, the Model 1092ARC supports 2B1Q encoding, Automatic Equalization, and Auto Gain Control. The 1092ARC is fully SNMP manageable using Patton's Model 1001MC Management Card. Software configuration is performed via the VT100 screens. Swappable interface driver boards and interface cards allow the user to easily change applications between RS-232, V.35, X.21, G.703, RS-530, 10Base-T, or Ethernet. The Model 1092ARC also features convenient front panel diagnostic switches and LEDs that allow for easy setup, configuration and testing.

The Model 1092ARC is designed to fit into Patton's 1001 2U (3.5") high rack chassis. This chassis uses a mid-plane architecture allowing front cards to be plugged into different rear cards. Please see the Model 1001RP14 manual for more information on the power supply options.

2.3 1092A SNMP MANAGEMENT SOLUTIONS

Model 1092A is **SNMP manageable** when it is connected to a rack-mounted Model 1092ARC . SNMP management is enabled through a 1001MC rack management card located in the Patton Electronics Rack System.

2.3.1 HTTP/HTML Management

The 1001MC maintains HTML pages that can be viewed through a web browser. You can display remote statistics and configure Model 1092A parameters simply by entering the 1001MC's IP address into the browser
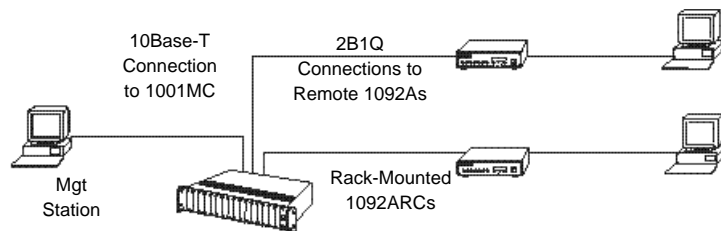
3.0 CONFIGURATION

This section describes the hardware and software configuration switches and jumpers, and provides detailed instructions for all possible settings. Refer to the Model 1001MC SNMP Management Card User Manual for SNMP options.

3.1 Configure the Hardware Switches

The Model 1092ARC Series front card <u>defaults</u> to the use of hardware switches for configuration. The Model 1092ARC has an interface driver board, two eight-position DIP Switches, and one 4-position DIP Switch on the front card (see Figure 1, below). Figure 2 shows the orientation of the DIP switches with respect to the "ON" and "OFF" positions.

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

Figure 2. Close up of configuration switches
NOTE: The ON position is oriented toward the front of the Model 1092ARC.

3.1.1 Reversible Interface Driver Board

The Model 1092ARC Series features switchable interface driver boards that allow a wide range of DTE interface connections. Figure 3 shows the Interface Driver Board on the top of the 1092ARC PC board.
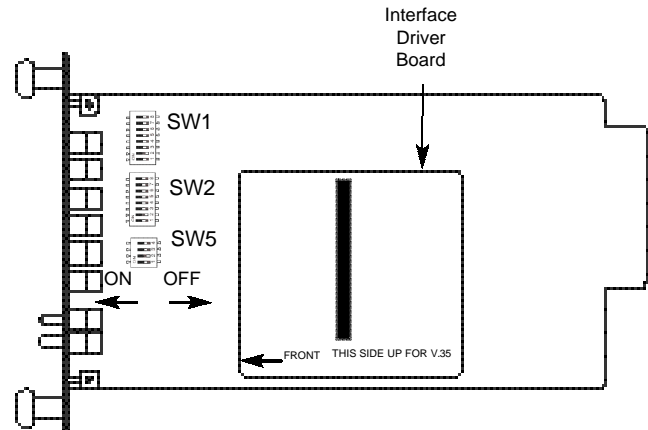
Figure 3. Close up of Model 1092ARC Interface Driver Board

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

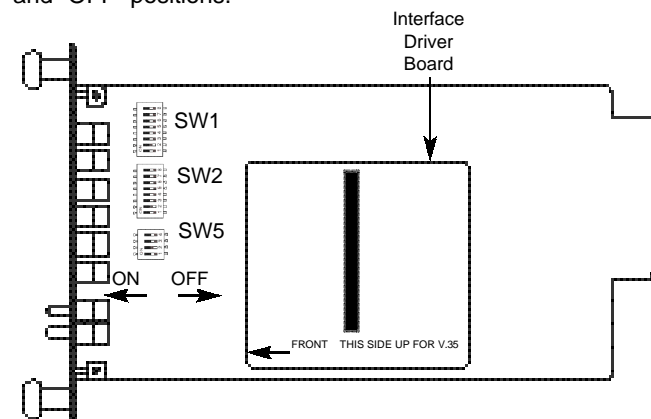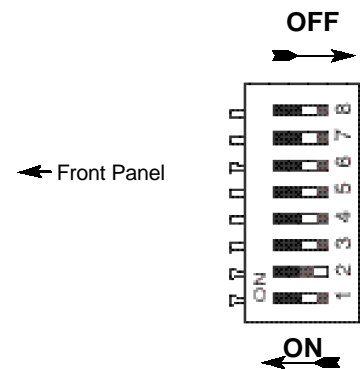1. With the 1092ARC pulled out of the rack or clusterbox chassis, locate the driver board on the top of the 1092ARC front card.

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 1092ARC 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 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
S1-2	Data Rate	Off
		64K Sync
S1-3	DSR during Local Line Loop	On **DSR Enable**
S1-4	Mangement Setting	Off **VT 100 Management**
S1-5	Reserved	Off
S1-6	Tx Clock Source	On
S1-7	Tx Clock Source	On
		Internal Clock
S1-8	Respond RDL Request	On **Enable**

Switches S1-1 and S1-2: Data Rate

Use Switches S1-1 and S1-2 **with Switch S5-1** to determine the operable Sync or Async bit rate for Model 1092ARC. The settings shown below are the **only applicable bit rate settings**.

Possible Bit Rate Settings - Switch S1-1, S1-2 and S5-1				
S1-1	**S1-2**	**S5-1**	**Sync Data Rate**	**Async Data Rate**
On	On	Off	32 kbps	Reserved
Off	On	Off	56 kbps	Reserved
On	Off	Off	64 kbps	Reserved
Off	Off	Off	128 kbps	0-38.4 kbps
On	ON	On	Reserved for Netlink Management Mode	
Off	On	On	Reserved	Reserved
On	Off	On	Reserved	Reserved
Off	Off	On	19.2 kbps	Reserved

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.

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

Switches S1-4: Management Setting

When setting the SNMP Management, the DTE rate switches (S1-1, S1-2, and S2-1) are also needed to be at the ON position. Therefore, to set a 1092A unit SNMP management mode, the following switches have to be at the ON position, S1-1, S1-2, S2-1, and S1-4.

Use Switch S1-4 to configure the 1092ARC's management setting.

S1-3	Setting	Description
On	SNMP Management	Using Netlink Management System
Off	Control Port Management	Using VT100 Control Port Management

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

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

S1-6	S1-7	Setting	Description
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	Reset to use hardware switches for configuration

Switch S1-8: Response to Remote Loop Request

Use Switch S1-8 to allow the Model 1092ARC to enter the Remote Digital Loopback diagnostic test when requested to do so by the far end modem. For example, when Switch S1-8 is set to "ON", it will enter RDL mode (See Section 5.2.2) when requested to do so by the remote modem.

S1-8	Setting
On	Response to RDL Request Enabled
Off	Response to RDL Request Disabled

3.1.3 Configuration Switch Set "S2" - Management Port Address

If the address is 0 (all ON positions ON S2), then the unit will run completely from its' dip-switch configuration. This can be useful for testing circuits independently of the management system.

In order to use the SNMP or control port management, an address is required. If an address is placed on the switch, the unit will boot from its stored flash configuration. It begins looking for POLL commands from the Model 1001MC (SNMP management mode).

Switch S2 allows an 7 bit address to be assigned to a link. The following rules apply to setting the address. Bit S2-1 is the least significant bit. A bit set to "ON" is considered a "0". A bit set to "OFF" is considered a "1". Patton Electronics suggests that you set your addresses starting with address 1 at the far left of your rack (farthest away from the power supplies) and increment the numbers by one as you go from left to right. Setting the addresses in this manner will make configuration easier as you start using the web page management. An example of this is shown in table A-1.

Table A-1. Starting Address Setting

1- 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - NMS - PS2 - PS1

The following table A-2 shows the bit setting to configure the address.

Table A-2. Bit Setting to Configure the Address

Upper (Lower) Nibble	(S2-4)	S2-7 (S2-3)	S2-6 (S2-2)	S2-5 (S2-1)
0	ON	ON	ON	ON
1	ON	ON	ON	OFF
2	ON	ON	OFF	ON
3	ON	ON	OFF	OFF
4	ON	OFF	ON	ON
5	ON	OFF	ON	OFF
6	ON	OFF	OFF	ON
7	ON	OFF	OFF	ON
8*	OFF	ON	ON	ON
9*	OFF	ON	ON	OFF
A*	OFF	ON	OFF	ON
B*	OFF	ON	OFF	OFF
C*	OFF	OFF	ON	ON
D*	OFF	OFF	ON	OFF
E*	OFF	OFF	OFF	ON
F*	OFF	OFF	OFF	OFF

* 8 - F are *only* available for Lower Nibble.

Address (Dec.)	S2-7	S2-6	S2-5	S2-4	S2-3	S2-2	S2-1
0x01 (1)	ON	ON	ON	ON	ON	ON	OFF
0x10 (16)	ON	ON	OFF	ON	ON	ON	ON
0x35 (53)	ON	OFF	OFF	ON	OFF	ON	OFF

3.1.4 Configuration Switch Set "S5"

The configuration switches on S5 allow you to specify the data rate, 2-wire/4-wire selection, and enable or disable loopback diagnostics. Default settings of S5 are shown in the table below.

Switch S5-1: Data Rate

S5 SUMMARY TABLE		
Position	Function	Factory Default
S5-1	Data Rate	Off
S5-2	2-Wire/4-Wire	Off 2-wire
S5-3	Enable LAL or RDL from DTE	On Enable
S5-4	Front Panel Switch Control	Off Enable

Use Switch S5-1 with Switches S1-1 and S1-2 to enable additional data rates. The table in Section 3.1.2 shows all possible bit rate settings for Switches S1-1, S1-2, and S5-1.

Switch S5-2: 2-Wire/4-Wire

Use Switch S5-2 to configure 2-Wire or 4-Wire operation.

S5-2	Setting	Description
Off	2-Wire	2-Wire Operation
On	4-Wire	4-Wire Operation

Switch S5-3: Enable LAL and RDL from DTE

Use Switch S5-3 to enable or disable the Local Analog Loopback and Remote Digital Loopback control from the DTE.

S5-3	Setting	Description
On	Enabled	LAL and RDL enabled
Off	Disabled	LAL and RDL disabled

Switch S5-4: Enable Front Panel Swtiches

Use Switche S5-4 to enable or disable the front panel switches.

S5-4	Setting	Description
On	Enabled	Front Panel Switches enabled.
Off	Disabled	Front Panel Switches disabled.

3.2 CONFIGURE THE SOFTWARE SWITCHES

The Model 1092ARC features a menu-driven command system that allows you to configure the local 1092ARC. The software control port signals of the 1092ARC 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 1001CC Control Card (see Model **Model 1001CC 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 1001CC 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.

4. To make a selection from any menu, enter the option number. To exit any menu without making a selection, press the [ESC] key.

5) After the Model 1092ARC is powered on, the control port will send out this message:

Model: 1092ARC software version xx
Patton Electronics Copyright © 2000

6) Press [ESC] on the terminal.

7) The 1092ARC will then display the MAIN MENU screen. You may configure the LOCAL Model 1092ARC from this screen.

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.

3.2.1 Configure the Local 1092ARC

To configure the LOCAL 1092ARC, make a selection from the following MAIN MENU.

```
********************************************
*               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                           *
********************************************
Enter your selection(1-7)>>
```

MAIN MENU Option 1: Display Active Configuration

Select Option 1 to display the most recent configuration of the local Model 1092ARC (See below). The Model 1092ARC 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                     *
****************************************************************
```

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 - 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 4: Setup Software Configuration

Select Option 4 to edit the software configuration of the Model 1092ARC. 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 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 Digital Loop                         *
*  8. 4-Wire/2-Wire selection                             *
*                                                         *
***********************************************************
```

1. DTE Rate

Select Option 1 in the SOFTWARE CONFIGURATION menu to select the sync. DTE Rate of the Model 1092ARC. The selections are shown below.

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

2. Data Format

Select Option 2 in the SOFTWARE CONFIGURATION Menu to select the sync data format (See below).

```
***************************************************
* 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: Select Item 1 to use the Model 1092ARC internal reference clock as the timing source.

Master Clock - External: Select Item 2 to use the DTE supplied transmit clock.

Slaved to Receive Clock: Select Item 3 to have the Model 1092ARC Series derives a transmit clock from the incoming data stream.

> *Important:* One 1092ARC must be a Master Clock (either internal or external) and the other must be Slaved to the Receive Clock.

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 1092ARC to either respond or ignore the Remote Digital Loop request from the remote 1092ARC.

```
*****************************************************
*    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 1092ARC to either respond or ignore Local Line Loop requests from the DTE. To instruct the Model 1092ARC to respond to Local Line Loop requests from the DTE, select Enable (Option 1). To instruct the 1092ARC 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 1092ARC can be controlled from the DTE interface by selecting Enable (Option 1). To instruct the 1092ARC 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)>>
```

8. 2-Wire/4-Wire Selection

Select Option 8 in the SOFTWARE CONFIGURATION Menu to configure 2-Wire or 4-Wire operation.

```
*****************************************************
*      2-Wire/4-Wire Selection                     *
*        1. 4-Wire Mode                            *
*        2. 2-Wire Mode                            *
*                                                  *
*****************************************************
```

MAIN MENU Option 5: Select Hardware/Software Control

Select Option 5 from the MAIN MENU selects whether the Model 1092ARC will use the hardware switch settings or the software switch settings for its active configuration. If Options 1 or 2 are selected, the 1092ARC 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)>>
```

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.

Valid Model 1092ARC Handshake status conditions are listed below:

```
****************************************************************
*              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>
```

1. Handshaking - This status occurs when the 1092ARC is in the process of establishing a link with another 1092ARC.

2. Data Mode - This status occurs when the 1092ARC successfully establishes a link with another 1092ARC allowing the data to flow.

   Press the space bar to refresh the modem status page.

MAIN MENU Option 7: Test Modes

Select Option 7 from the MAIN MENU to select the test mode status of the Model 1092A. (below). The Model 1092A 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)>
```

To run or terminate a particular test, key in the option to get to that screen menu.

Test Mode options 2,3,7,8 and 9 require the 1092ARC to be in Data Mode with the remote 1092ARC.   The Model 1092ARC 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 1092 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 511test 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. Press 'ESC' to return to the Test Mode Menu. Press the space bar to refresh the modem status page.

3.3 CONFIGURE THE REAR INTERFACE CARD

The Model 1092ARC Series has several interface card options: the Model 1001RCM12545 (DB-25/RJ-45), 1001RCM13445 (M/34/RJ-45), 1001RCM11545 (DB-15/RJ-45), IM2RC/IA, or IM2R/F. Each of these options supports one DTE interface connection and one 2-Wire/4-Wire twisted pair line connection. Figure 4 below shows three interface options. If you are using the IM2RC/IA or IM2RC/F rear cards, refer to the IM2RC/IA or IM2RC/F manuals for configuration instructions.
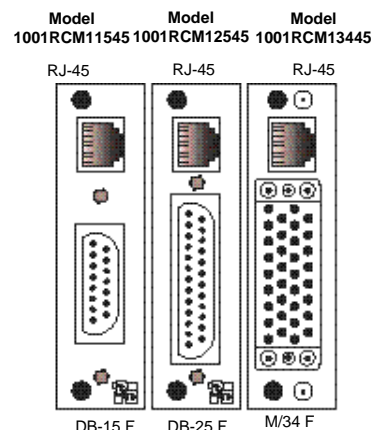

Figure 4. Model 1092ARC Series interface card options

Prior to installation, you will need to examine the rear card you have selected to be 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.
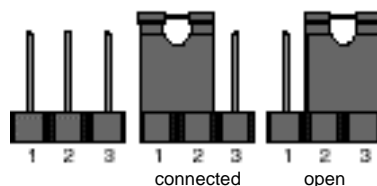

Figure 5. Orientation of Interface Card Straps

3.3.1 Model 1001RCM12545 Rear Card Strap Settings

Figure 6 shows strap locations for the Model 1001RCM12545 (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 pegs 1 and 2.
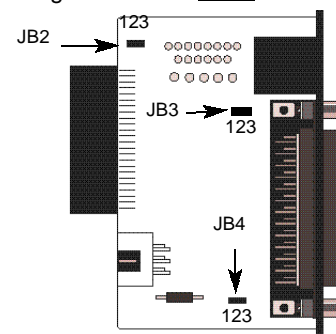

Figure 6. DB-25/RJ-45S strap locations

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 1001RCM13445 Rear Card Strap Settings

Figure 7 shows the strap location for the Model 1001RCM13445 (M/34/RJ-45) rear card. This strap determines whether Signal Ground and Frame Ground will be connected.
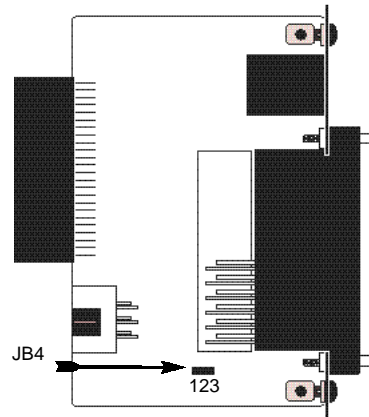

Figure 7. M/34/RJ-45 strap locations

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
*indicates default setting

3.3.3 Model 1001RCM11545 Rear Card Strap Settings

Figure 8 shows strap locations for the Model 1001RCM11545 (DB-15) rear cards. These straps determine various grounding characteristics for the terminal interface and twisted pair lines. JB3 and JB4 are user configurable.
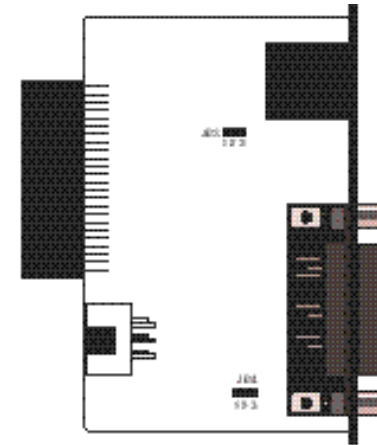

Figure 8. 1001RCM11545 strap locations

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 #2			
Strap	**Function**	**Position 1&2**	**Position 2&3**
JB3	DTE Shield (Pin1) & FRGND	Connected*	Open
JB4	FRGND & SGND (Pin 8)	Connected*	Open

* Indicates default setting

DTE Shield (DB-15 Pin 1) & FRGND (JB3)

In the connected position, this strap links DB-15 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-15 pin 8 (Signal Ground) and frame ground through a 100 ohm resistor. In the open position, pin 8 is connected directly to frame ground.

JB4

Position 1&2 = SGND (Pin 8) and FRGND connected through a 100 ohm resistor

Position 2&3 = SGND (Pin 8) and FRGND directly connected

4.0 INSTALLATION

This section describes the functions of the Model 1001R14 rack chassis, tells how to install front and rear Model 1092ARC Series cards into the chassis, and how to connect to the twisted pair interface and the serial interface.

4.1 THE MODEL 1001R14 RACK CHASSIS

The Model 1001R14 Rack Chassis (Figure 9, below) has 16 card slots, plus its own power supply. Measuring only 3.5" high, the Model 1001R14 is designed to occupy only 2U in a 19" rack. Sturdy front handles allow the Model 1001R14 to be extracted and transported conveniently.
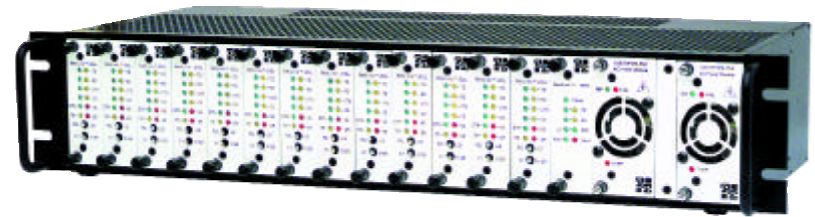

Figure 9: Model 1001R14 Rack Chassis with power supply

4.1.1 The Rack Power Supply

The power supply included in the Model 1001R14 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.

4.2

4.2 INSTALL THE MODEL 1092ARC SERIES INTO THE CHASSIS

The Model 1092ARC 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 1092ARC 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 WIRE THE MODEL 1092ARC SERIES

Each of the rear interface cards compatible with the Model 1092ARC Series has one terminal interface port and one 2-wire/4-wire (twisted pair) port. For specific interface pin-outs, refer to the diagrams in the **Appendix** of this manual.
.

4.3.1   Connect to a "DTE" Device

Regardless of the interface module you choose, the Model 1092ARC'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 B** as a guide.

4.3.2   Connect to a "DCE" Device

Since the Model 1092ARC'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 B** as a guide.

4.3.3 Connect the Twisted Pair Interface

The Model 1092ARC 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 1092ARC:

1. These units work in ***pairs***. Both units at the end of the twisted pair must have the same two-wire/four-wire setting. For instance, if you are operating in two-wire mode, both units must be in the two-wire setting. Similarly, if you are operating in four-wire mode, both units must be in the four-wire setting.

2. To function properly, the Model 1092ARC needs one or two **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*.

The RJ-45 connector on the Model 1092ARC'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.
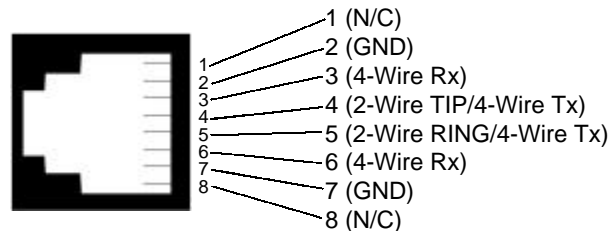

1 (N/C)
2 (GND)
3 (4-Wire Rx)
4 (2-Wire TIP/4-Wire Tx)
5 (2-Wire RING/4-Wire Tx)
6 (4-Wire Rx)
7 (GND)
8 (N/C)

Figure 10. Model 1092ARC twisted pair line interface.

3. **Proper 2-Wire Pairing** between the two modems is as follows:

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

4. **Proper 4-Wire Pairing** between the two modems is as follows:

SIGNAL	PIN#	PIN#	SIGNAL
Tx	4--- 3		Rx
Tx	5--- 6		Rx
Rx	3--- 4		Tx
Rx	6--- 5		Tx

4.3.4 Connection to the Control Port Interface

Please refer to the Model 1001CC Control Card user manual for cable requirements of the Control Port Interface.

5.0 OPERATION

Once the Model 1092ARC 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 1092ARC features twelve front panel LEDs that monitor power, the DTE signals, network connection and test modes. Figure 11(below) shows the front panel location of each LED. Following Figure 11 is a description of each LED function.
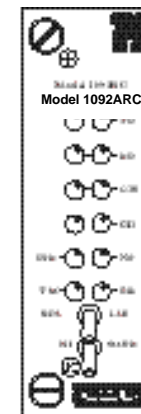
Model 1092ARC

Figure 11. The Model 1092ARC Series' front panel LEDs

Note: LEDs described as yellow are red in earlier versions of the 1092ARC.

TD & RD   glow yellow 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 yellow, 1 green. CTS glows green to indicate that the Clear to Send signal from the modem is active. Yellow indicates inactive CTS.

CD   consists of 2 LEDs, 1 yellow, 1 green. CD glows yellow 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 yellow to indicate that the Model 1092ARC 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 1092ARC has not yet connected with the remote Model 1092ARC.

5.2 TEST MODES

The Model 1092ARC 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 Local Line Loopback (LLB)

The Local Line Loopback (LLB) test checks the operation of the local Model 1092ARC, and is performed separately on each unit. Any data sent to the local Model 1092ARC in this test mode will be echoed (returned) back to the user device (see Figure 12, below). For example, characters typed on the keyboard of a terminal will appear on the terminal screen.
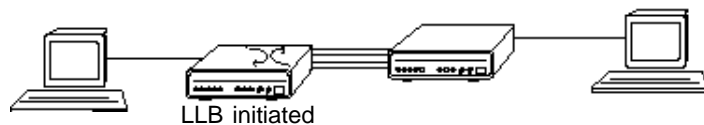

LLB initiated

Figure 12. Local Line Loopback

To perform an LLB test, follow these steps:

1. Activate LLB. This may be done in one of three ways:

    - Move the front panel toggle switch to the right to "Local".
    - Raise the LLB signal on the interface (see Appendix B).
    - Set Local Loop from the VT100 screen.

Once LLB is activated, the Model 1092ARC transmitter output is connected to its own receiver. Data is also looped back to the line. The "TM" LED should be lit.

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 1092ARC.

5.2.2 Remote Digital Loopback (RDL)

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote Model 1092ARCs, and the communication link between them. Any characters sent to the remote Model 1092ARC in this test mode will be returned back to the originating device (see Figure 13, 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 1092ARC and looped back.

Local 1092ARC   Remote 1092ARC
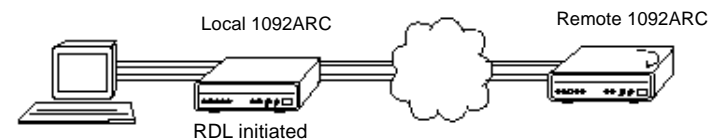RDL initiated

Figure 13. Remote Digital Loop

Important! <u>Do not</u> send a 511 test pattern from the test equipment when you connect external test equipment to the 1092ARC .

To perform an RDL test, follow these steps:

1. Activate RDL. This may be done in three ways:

   - Move the front panel toggle switch to the Left to "Remote".
   - Raise the RDL signal on the interface (see Appendix C).
   - Set Remote Loopback from the VT100 screen.

   > Note: Remote Loopback cannot be activated until approximately 45 seconds after the two modems have linked to each other.

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 1092ARCs, 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 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 1092ARC 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 blink approximately once per second. A successful "511/E" test will confirm that the link is in place, and that the Model 1092ARC's built-in "511" generator and detector are working properly.

<div align="center">

APPENDIX A

PATTON ELECTRONICS MODEL 1095RC
FACTORY REPLACEMENT PARTS
AND ACCESSORIES

</div>

Patton Model #	Description
1001RPEM-RAC	120/240V Rear Power Entry Module
1001RPSM-RUI	120/240V Front Power Supply Module
1001RPEM-RDC	DC Rear Power Entry Module
1001RPSM-R48A	48V Front Power Supply Module
1001R14P	Rack 14 Slot 2U Chassis Only
1001R14P/R48V	Rack 14 Slot 2U w/Dual Universal Input 48VDC Power Supplies
1001R14P/RUIA	Rack 14 Slot 2U w/Dual Universal Input 90-260VAC Power Supplies European Power Cord
1001R14P/RUIC	Rack 14 Slot 2U w/Dual Universal Input 90-260VAC Power Supplies Austrialia Power Cord
1001R14P/RUID	Rack 14 Slot 2U w/Dual Universal Input 90-260VAC Power Supplies UK Power Cord
1001R14P/RUIG	Rack 14 Slot 2U w/Dual Universal Input 90-260VAC Power Supplies India Power Cord
1001R14P/RUIK	Rack 14 Slot 2U w/Dual Universal Input 90-260VAC Power Supplies US Power Cord
1001RCM12545	DB-25/RJ-45 Rear Card
1001RCM125TB	DB-25/TB Rear Card
1001RCM13445	M/34/RJ-45 Rear Card
1001RCM134TB	M/34/TB Rear Card
1001RCM11545	DB-15/RJ-45 Rear Card
1001RCM115TB	DB-15/TB Rear Card
1001MC	Management Card
IM2RC/F	64K/G703 Rear Card
IM2RC/B	RS-530 Interface Rear Card
IM2RC/D	X.21 Interface Rear Card
1180RC DB	V.35 Daughter Board
0516FPB1	Single Width Blank Front Panel
0516FPB4	4-Wide Blank Front Panel
0516RPB1	Single Width Blank Rear Panel
0516RPB4	4-Wide Blank Rear Panel
056S1	Set of 16 #4 pan head screws/washers
10-25M/35M-1	Cable, 6 ft, DB-25 male to M/34 male
1010-10	Terminal Block, 2 Position, Male
07M1092ARC	User Manual

MODEL 1092ARC TERMINAL INTERFACE PIN ASSIGNMENT

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

Pin #   Signal
  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 Terminal Ready)
  L..................................LLB (Local Line Loop)
  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 (Transmit Timing-A)
 AA ....TC/ (Transmit Timing-B)

PATTON MODEL 1092ARC
TERMINAL INTERFACE PIN ASSIGNMENT

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

Pin #   Signal

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 Send Ready)
7...........................SGND (Signal Ground)
15........................TC (Transmit Timing-A)
17........................RC (Receive Timing)
18........................LLB (Local Line Loop)
20........................DTR (Data Terminal Ready)
21........................RDL (Remote Digital Loop)
24........................XTC (External Transmit Clock

APPENDIX C

PATTON MODEL 1092ARC
CONTROL PORT PIN ASSIGNMENT

(RJ-45 CONNECTOR ON 1000CC CARD)
EIA 561

<u>Pin Function</u>   <u>RJ-45 Pin Number</u>

Transmit data (from DTE)...............................7

Receive date (to DTE)...................................6

Ground...5

APPENDIX D

LINE INTERFACE PIN ASSIGNMENT

(RJ45 Connector)

<u>**Pin Number**</u>   <u>**Signal**</u>

1...N/C (No Connection)
2...N/C (No Connection)
3...4 Wire Tip
4...Tip
5...Ring
6...4 Wire Ring
7...N/C (No Connection)
8...N/C (No Connection)