USER MANUAL

MODEL 2400

56/64 Kbps, 4-Wire DDS and Clear Channel CSU/DSU

PATTON Electronics Co.

An ISO-9001 Certified Company

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Doc# 099041UB
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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 2400 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 2400 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 2400 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 2400 does cause interference to radio or television reception, which can be determined by disconnecting the RS-232 interface, 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 only use data cables with an external outer shield bonded to a metal or metalized connector.

1.2 FCC INFORMATION

The Model 2400 Series has been tested and registered in compliance with the specifications in Part 68 of the FCC rules. A label on the equipment bears the FCC registration number. You may be requested to provide this information to your telephone company.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper operation of the Model 2400 Series. If this happens, the telephone company should give you advance notice to prevent the interruption of your service.

The telephone company may decide to temporarily discontinue your service if they believe your Model 2400 Series may cause harm to the telephone network. Whenever possible, they will contact you in advance. If you elect to do so, you have the right to file a complaint with the FCC. The telephone company may ask you to disconnect the equipment from the telephone network until the problem has been corrected or until you are certain that the Model 2400 Series is not malfunctioning.

The following information may be required when applying to your local telephone company for leased line facilities.

Service Type	**Digital Facility Interface Code**	**Service Order Code**	**Network Jacks**
56 Kbps	04DU5-56	6.0F	RJ48S
64 Kbps	04DU5-64	6.0F	RJ48S

1.3 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 Union European (EU). A Certificate of Compliance is available by contacting Patton Technical Support.

1.4 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 Support: **(301) 975-1007**; **http://www.patton.com**; or, **support@patton.com**. **Notice**: *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 2400. 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 the 2400, contact Patton Electronics Technical Support at (301) 975-1000.

2.1 FEATURES

- Synchronous data rates of 56 or 64 Kbps
- Full duplex communication over two dedicated twisted pairs
- Supports distances to 3.4 miles (5.5 km) over 26 AWG (.4 mm)wire
- Selectable internal, external, network receive recover, or campus clock options
- Built-in V.54 loopback tests and V.52 BER test patterns
- Works with 56 Kbps DDS, 64 Kbps Clear Channel, or private twisted pair circuits
- Switchable Circuit Assurance feature
- Seven front panel LEDs monitor power, communication and test status
- RJ-48S jack provided for line connection
- RS-232 version has a DB-25 connector
- V.35 version has an M/34 connector
- Ultra-compact enclosure fits in tight spaces

2.2 DESCRIPTION

The Model 2400 DDS & Clear Channel CSU/DSU is a miniature CSU/DSU that is designed for 56 kbps or 64 kbps Clear Channel communications over a synchronous DDS circuit -- or over dedicated twisted pair. The Model 2400 also supports distances up to 3.4 miles (5.5 km) over a dedicated twisted pair circuit.

The Model 2400 provides switch selectable timing options of internal, external, and network receive-recovered clock. Connecting directly to the RS-232/V.24 (Model 2400/A) or V.35 (Model 2400/C) port, the ultra-compact Model 2400 attaches without using additional cables.

The Model 2400's built-in V.54 loopback test modes and V.52 BER test patterns are accessed using two front panel switches. Seven LEDs monitor power, test modes and communication status. Twisted-pair line connections are facilitated by a modular RJ-48S jack on the rear of the unit.

3.0 CONFIGURATION

The Model 2400 is easy to install and is ruggedly designed for excellent reliability. The following instructions will help you set up and install the Model 2400 properly.

Both versions of the Model 2400 use a mini DIP switch package and jumper strap that allow configuration to a wide range of applications. To configure the Model 2400 for use in your application, you must first configure the unit. To do so, first open the case by inserting a flat head screw driver into an open slot on either side of the case, as in Figure 1.

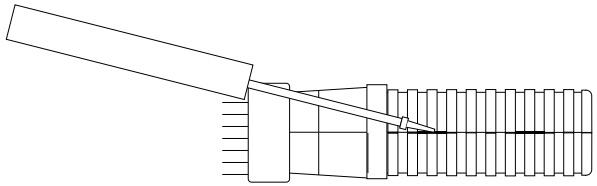

Figure 1. How to Use a Small Flathead Screwdriver to Begin to Open the Model 2400 Case

Twist the screw driver head slightly and the top half of the case will separate from the lower half, as in Figure 2. You now have access to the internal switches used to configure the unit.

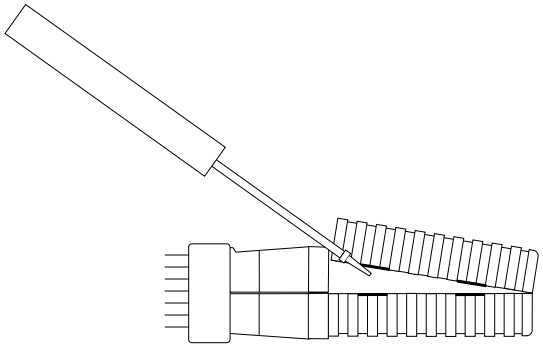

Figure 2. How to Use a Small Flathead Screwdriver to Finish Opening the Model 2400 Case

After opening the case, please refer to Sections 3.1 and 3.2 to set the configuration switches and jumpers.

To close the case, fit the 2 halves together snugly and snap them back in place.

3.1 CONFIGURATION SWITCH SET 'S1'

The Model 2400 uses a set of eight internal switches to set clocking mode, circuit assurance, RTS control, data rate and loop control. Figures 3 (Model 2400/A) and 4 (Model 2400/C) show the switch and jumper locations with respect to the other components on bottom side the PC board.

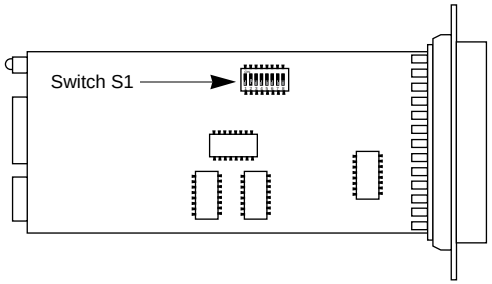

Figure 3. Position of the DIP Switches on the 2400/A PC board

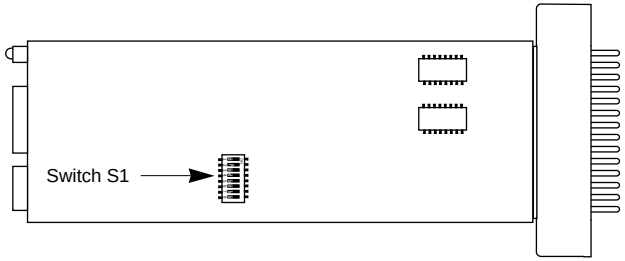

Figure 4. Position of the DIP Switches on the Model 2400/CM PC board

Figure 5 (below) shows a close-up of DIP Switch S1 with respect to ON and OFF positions. Default switch settings are shown in the table on the following page. Descriptions of each switch follow the table.

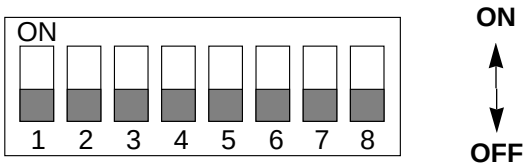

Figure 5. Close-up of DIP Switches Showing "ON" and "OFF" Positions

SWITCH SET 1 SUMMARY TABLE		
Position	**Function**	**Factory Default**
S1-1	Clock Mode	Off } Network
S1-2	Clock Mode	On }
S1-3	Circuit Assurance	Off Disabled
S1-4	RTS	On Forced On
S1-5	Data Rate	Off 56 Kbps
S1-6	Front Panel Switch Control	Off Enable Front Panel Switches
S1-7	DTE Loop Control	On Loop Control From DTE Disabled
S1-8	Receive RDL	Off Receive RDL Enabled

Switches S1-1 and S1-2: Clock Mode

The setting for switches S1-1 and S1-2 determines the transmitter clocking mode for the Model 2400.

S1-1	S1-2	Clock Mode	Description
On	Off	External (DTE)	Transmit clock derived from terminal interface
Off	On	Network (Looped)	Transmit clock derived from the received line signal; Use this mode for Dedicated DDS operation
Off	Off	Internal (Master)	Transmit clock derived internally
On	On	Campus Clock	Transmit clock derived from received line signal. Allows remote device (in **campus clock** mode) to initiate V.54 loopback. For use only in campus short-haul configuration (**Note:** Opposite device must be in **internal** clock mode).

Switch S1-3: Circuit Assurance

On dedicated circuits, the transmitter and the CTS output can be configured to go on only when a working communication circuit is established. If Circuit Assurance is used, enable it on only one end of the communication link.

S1-3	Circuit Assurance	Description
On	Enabled	CTS will go low and the transmitter will be held off if the receiver is in the No Signal state or CD is low
Off	Disabled	The transmitter and CTS will operate without regard to the receiver state

Switch S1-4: RTS Control

The RTS input can be forced on, ignoring the terminal's RTS signal. RTS controls the transmitter by either sending the user's data or sending an idle code.

S1-4	RTS	Description
On	Forced On	Transmitter is always ON
Off	Follows DTE Signal	The RTS input controls the transmitter

Switch S1-5: Data Rate

This switch controls the data rate on the line (RJ-48S port) and should match the speed of your digital service.

S1-5	Setting
Off	56 Kbps
On	64 Kbps

NOTE: Power must be cycled off and then on to reset the Data Rate.

Switch S1-6: Front Panel Switch Enable/Disable

Switch S1-6 determines whether the front panel switches may be used to perform diagnostic functions.

S1-6	Activation	Description
Off	Enabled	Front panel switches may be used to activate/terminate diagnostics
On	Disabled	Front panel switches will have no effect on operation of the unit

Switch S1-7: DTE Loop Request Line Enable/Disable

The setting for switch S1-7 determines whether the front panel switches (and DTE lines) can be used to activate/terminate the loopback diagnostic modes and BER test patterns.

S1-7	DTE TM Line Activation	Description
Off	Enabled	DTE Loop request line switches may be used to activate/terminate diagnostics.
On	Disabled	DTE loop request lines will have no effect on operation of the unit.

Switch S1-8: Receive RDL Enable/Disable

Switch S1-8 determines whether or not the unit will respond to loop requests from the remote device.

S1-8	Activation	Description
Off	Enabled	Unit will respond to loop requests from the remote device.
On	Disabled	Unit will ignore loop requests from the remote device.

3.2 INTERFACE POWER OPTION JUMPERS

Both versions of the Model 2400 can be powered from the supplied AC power source, from DC power supplied to the power supply jack or directly from the local RS-232/V.24 (Model 2400/A) or V.35 (Model 2400/C) interface. To configure the unit to receive power from the local interface, please refer to Sections 3.2.1 (Model 2400/A) and 3.2.2 (Model 2400/C).

WARNING: The Model 2400 will be damaged and will not be covered by warranty if any other power supply input than 5VDC ±5% is used with the Interface Power Option.

3.2.1 Interface Power Option (Model 2400/A)

Two jumper straps (JP1 and JP2) are used in combination to set the Model 2400/A to receive its power from the RS-232 interface. Figure 6 shows the position of JP1 and JP2 on the top side of the Model 2400/A PC board.

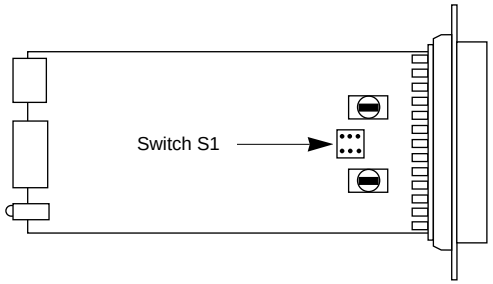

Figure 6. Position of the DIP Switches on the 2400/A PC board

Figure 7 below shows the orientation of the pins on the six pin jumper block and possible settings of jumper straps JP1 and JP2.

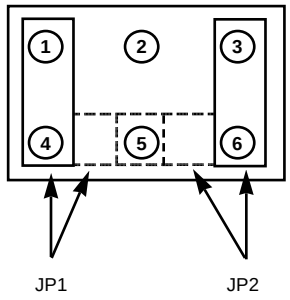

Figure 7. Possible Settings of Jumper Strap JP1 for Model 2400/A

POSSIBLE SETTING COMBINATIONS FOR JP1 & JP2		
JP1	**JP2**	**Function**
1 & 4	5 & 6	DC Powered by Pin 21
1 & 4	3 & 6	Normal*
4 & 5	3 & 6	DC Powered by Pin 9

NOTE: "*" indicates Factory Default Setting

JP1: DC Power Supplied by Pin 9

The Model 2400/A may be configured to receive its operating power from by pin 9 on the RS-232 interface. In the normal setting, pin 9 is not used for interface power.

JP1

Position 1 & 4 — Normal *(default)*

Position 4 & 5 — Pin 9 Used for Interface Power. In this setting the 2400/A is powered from the DTE interface. Power should be applied to pin 9 at +5VDC (±5%), 200mA. **The AC wall-mount transformer must not be connected in this setting.**

NOTE: The only allowable positions for Jumper JP1 are as listed above.

JP2: DC Power Supplied by Pin 21

The Model 2400/A may be configured to receive its operating power from by pin 21 on the RS-232 interface. In the normal setting, pin 21 is used for its normal function.

JP2

Position 5 & 6 — Pin 21 Used for Interface Power. In this setting the 2400/A Series unit is powered from the DTE interface. Powered should be applied to pin 9 at +5VDC (±5%), 200mA. **The AC wall-mount transformer must not be connected in this setting.**

Position 3 & 6 — Normal *(default)*

NOTE: The only allowable positions for Jumper JP2 are as listed above.

3.2.2 Interface Power Option (Model 2400/C)

One jumper strap (JP1) is used to set the Model 2400/C to receive its power from the V.35 interface. Figure 8 shows the position of JP1 on the bottom top of the Model 2400/C PC board.

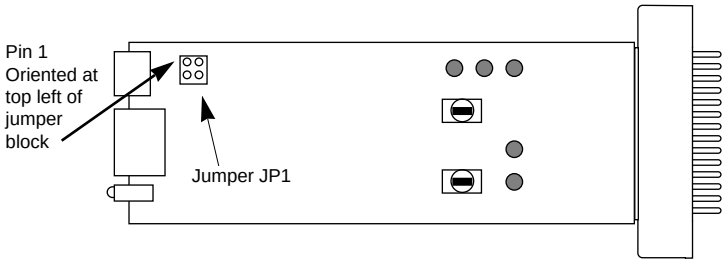

Figure 8 Position of the DIP Switches on the 2400/C PC board

Figure 9, below, shows the orientation of the pins on the six pin jumper block and possible settings of jumper straps JP1 and JP2.

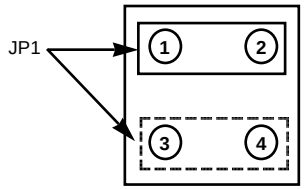

Figure 9. Possible Settings of Jumper Strap JP1 for Model 2400/C

JP1: DC Power Supplied by Pin KK

The Model 2400/C may be configured to receive its operating power from pin KK on the V.35 interface. In the normal setting, pin KK is not used for interface power.

JP1	
Position 1&2	Interface Power Option. In this setting the 2400/A Series unit is powered from the DTE interface. Powered should be applied to pin 9 at +5VDC (±5%), 200mA. **The AC wall-mount transformer must not be connected in this setting.**
Position 3&4	Normal

The Model 2400 is designed for 4-wire, full duplex communication over a DDS or Clear Channel carrier circuit, or over dedicated twisted pair. This section will describe proper connection of the line interface, the DTE (terminal) interface, and the AC power supply.

4.1 LINE (NETWORK) CONNECTION

The RJ-48S port on a Model 2400 CSU/DSU is prewired for a standard TELCO wiring environment as in Figure 4, below. Connect this port to the RJ-48S jack provided by your digital service carrier using a **straight through** twisted pair cable between 19 and 26 AWG. To be sure you have the right wiring, use Figure 10, below, as a guide.

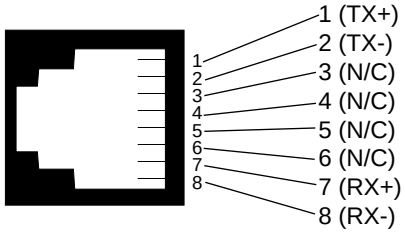

Figure 10. Prewired TELCO Wiring on the RJ-48S Port on Patton Model 2400

4.1.1 CONNECTING OVER PRIVATE TWISTED PAIR

If you are using a pair of Model 2400s as short range modems over private twisted pair, make the connection between them using a twisted pair **crossover cable** pinned according to Figure 11, below.

RJ-48S Cable (4-Wire)

SIGNAL	PIN#	PIN#	SIGNAL
TX+	1	7	RX+
TX-	2	8	RX-
RX+	7	1	TX+
RX-	8	2	TX

Figure 11. RJ-48S Cable Signal and Pin Numbers for the Model 2400

4.2 DTE (TERMINAL) CONNECTION

The Model 2400 is wired to connect to a DTE. If your terminal device is DCE, contact Patton Electronics Technical Support: **(301) 975-1007**; **http://www.patton.com**; or, **support@patton.com**. for specific installation instructions.

The Model 2400 is designed for direct connection to the DTE without the use of a cable and is available in two interface options -- RS-232/V.24 and V.35. If it is necessary to construct or purchase your interface cable, refer to the pinout diagrams in **Appendix D**.

4.3 POWER CONNECTION

The Model 2400 can be powered from the supplied AC power source, from DC power supplied to the power supply jack or directly from the local RS-232/V.24 (Model 2400/A) or V.35 (Model 2400/C) interface. This section describes the available power options.

120 VAC Power (US)

The 120 VAC adapter supplied with the standard version of the Model 2400 is a wall mount type and may be plugged into any approved 120 VAC wall plug.

230 VAC Power (IEC)

The Universal Input Adapter adapter supplied with the "International" version of the Model 2400 is equipped with an IEC-320 shrouded male connector. This connects with one of several available country-specific power cords (see the ordering information in **Appendix C**). You may purchase these power cords from Patton Electronics, or from a local vendor of your choice.

(continued)

4.3.2 DC POWER CONNECTION

You may bypass the AC wall adapters and supply DC power directly to the Model 2400 power supply jack or via the DTE Supplemental Power Input pins. **The AC wall-mount transformer must not be connected when the Model 2400 is powered by DC.**

DC Power Supplied to Power Jack

You may supply DC power directly to the power supply jack. DC power supplied must be 5VDC ±5%, 200mA, center positive, and can be supplied via a barrel type plug with 2.1/5.5/10mm I.D./O.D./Shaft Length dimensions.

Interface Power

The Model 2400 may also be powered by means of the RS-232/V.24 (Model 2400/A) or V.35 (Model 2400/C) interface signals. DC Power supplied to the interface pins must be at +5VDC (±5%), 200mA. See Sections 3.2.1(Model 2400/A) and 3.2.2 (Model 2400/C) to configure the unit to receive interface power.

NOTE: DC power source must be SELV (Circuit, Safety Extra Low Voltage) specified. (See CENELEC EN60950, Section 1.2.8.5)

WARNING: The Model 2400 will be damaged and will not be covered by warranty if any other power supply input than 5VDC ±5% is used with the Interface Power Option.

5.0 OPERATION

Once you have configured the Model 2400 properly (see Section 3.0) and made line, DTE and power connections correctly (see Section 4.0), you are ready to operate the unit(s). This section describes the LED status monitors, and use of the built-in V.54 and V.52 test modes.

5.1 FRONT PANEL LED STATUS MONITORS

The Model 2400 features five front panel status LEDs that indicate the condition of the unit and communication link. Figure 12 below shows the front panel location of each LED. Following Figure 12 is a description of each LED.

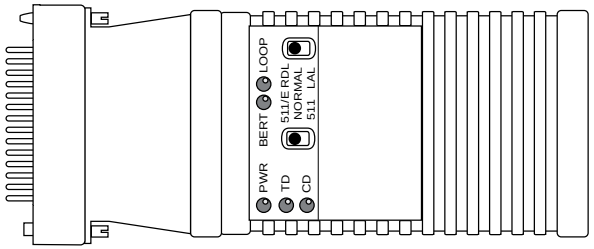

Figure 12. Model 2400's front panel LED indicators and test switches

- PWR (Power) glows green when power is supplied to the unit. The unit is operational as soon as power is applied--there is no power switch.

- TD (Transmit Data) is off to indicate an Idle condition or Binary "1" data. Red indicates Binary 0 data.

- CD (Carrier Detect) glows red when carrier is active. In 64 Kbps mode, CD is off if there is no carrier. In 56 Kbps mode, CD is off if there is no carrier, if an Out-of-Service or Out-of-Frame violation occurs, or if idle code is detected.

- BERT glows red when errors are detected in test mode during the 511and 511/E tests. This indicator also glows during normal operation to indicated framing errors and/or bipolar violations in 64 Kbps mode, or invalid bipolar violations in 56 kbps mode.

- LOOP glows red when the V.54 loopback tests or V.52 BER tests are initiated or when CO loopback is initiated by the service provider.

5.2 BACK PANEL LED STATUS MONITORS

The Model 2400 also features two LEDs that are located on the back panel. Figure 8 below shows the positions of the LEDs. Following Figure 13 is a description of each LED.

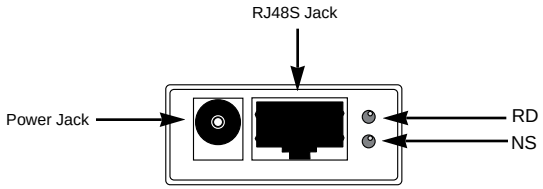

Figure 13. Model 2400's back panel LED indicators

- RD (Receive Data) is off to indicate an Idle condition or Binary "1" data. Green indicates Binary 0 data.

- NS (No Signal) glows green when there is no valid carrier. This means the Model 2400 receiver does not detect a valid signal from the digital service provider, or, in the case of short-haul operation, from the remote Model 2400. If NS is lit, check for an unplugged cable, broken wire or an incorrect Line Rate selection.

5.3 TEST MODES

The Model 2400 offers two V.54 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.

5.3.1 Using Local Analog Loopback (LAL)

The Local Analog Loopback (LAL) test checks the operation of the local Model 2400, and is performed separately on each unit. Any data sent to the local Model 2400 from the DTE in this test mode will be echoed (returned) back to the DTE. For example, characters typed on the keyboard of a terminal will appear on the terminal screen. To perform a LAL test, follow these steps:

1. Activate LAL. This may be done in one of two ways: First, by moving the front panel toggle switch DOWN to “LAL.” ; second, by raising the appropriate pin on the terminal interface (pin 18 for Model 2400/A, pin L for Model 2400/C). Make sure DIP switches S1-6 and S1-7 are OFF. Once LAL is activated, the Model 2400 transmitter output is connected to its own receiver. The test LED should be lit.

2. Verify that the data terminal equipment is operating properly and can be used for a test. If a fault is indicated, call a technician or replace the unit.

3. Perform a V.52 BER (bit error rate) test as described in Section 5.3.3. 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 2400.

5.3.2 Using Remote Digital Loopback (RDL)

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote Model 2400s, and the communication link between them. Any characters sent to the remote Model 2400 in this test mode will be returned back to the originating device. 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 2400 and looped back. 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 UP to “RDL”; second, by raising the appropriate pin on the terminal interface (pin 21 for Model 2400/A, pin N for Model 2400/C). Make sure S1-6 and S1-7 are OFF.

NOTE: to activate RDL by pin 21 on the Model 2400/A, Jumper JP2 must be set in the “NORMAL” setting (see Section 3.2.1)

2. Perform a V.52 BER test as described in Section 5.3.3. If the BER test equipment indicates a fault, and the Local Analog Loopback test was successful for both Model 2400s, 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.

5.3.3 Using the V.52 BER Test

To use the V.52 BER tests in conjunction with the V.54 loopback tests, follow these instructions:

1. Locate the 511/511E toggle switch on the front panel of the 2400 and move it **DOWN**. 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 “Error” LED will blink sporadically.

2. If the above test indicates no errors are present, move the V.52 toggle switch **UP**, activating the “511/E” test with errors present. If the test is working properly, the local modem's red BERT LED will glow. A successful “511/E” test will confirm that the link is in place, and that the Model 2400’s built-in 511 generator and detector are working properly.

NOTE: The above V.52 BER tests can be used independently of the V.54 loopback tests. This requires two operators: one to initiate and monitor the tests at the local Model 2400, and one to do the same at the remote Model 2400. In this case, the test pattern sent by each Model 2400 will not be looped back, but will be transmitted down the line to the other Model 2400. Both operators must initiate and monitor the tests simultaneously.

APPENDIX A

PATTON MODEL 2400 SPECIFICATIONS

DDS Type:	Dedicated
Transmission Format:	Synchronous, full duplex
Maximum Operating Distance:	3.4 miles (5.5 km) over 26 AWG (.4mm) twisted pair
DTE Interface:	RS-232 (DB-25 female or DB-25 male), or V.35 (M/34 male)
DDS Line Interface:	RJ-48S jack
Standards:	AT&T 62310 compliant
DTE Rates:	56 and 64 kbps
Transmission Line:	4-wire
Applications:	DDS, point-to-point or multipoint; Clear Channel, point-to-point; campus-area point-to-point
Indicators:	LED indicators for TD, RD, CD, No Signal, Error, Test Mode, and Power
Diagnostics:	V.54 compliant local and remote loopback tests; V.52 compliant 511/511E BER test
Power Supply:	120 VAC, 60 Hz to 5VDC 200mA wall mount transformer or UI 100-240VAC, 50 Hz to 5 VDC, 2A wall mount transformer
Dimensions:	V.35 version - 4.9”L X 2.0”W X 0.9”H (12.4cmL x 5.1cmW x 2.3cmH); RS-232 version - 3.5”L x 2.1”W x 0.8”H (9.0cmL x 5.3cmW x 2.0cmH)

APPENDIX B

PATTON MODEL 2400 CABLE RECOMMENDATIONS

The following statements apply to the Model 2400 when used as a short range modem over private twisted pair:

All Patton Electronics Company Short Range Modems (SRMs) are tested to the distances published in our Catalogs and Specification Sheets on twisted-pair cable with the following characteristics:

Wire Gauge	Capacitance	Resistance
19 AWG	83nF/mi or 15.72 pF/ft.	.0163Ω/ft.
22 AWG	83nF/mi or 15.72 pF/ft.	.0326Ω/ft.
24 AWG	83nF/mi or 15.72 pF/ft.	.05165Ω/ft.
26 AWG	83nF/mi or 15.72 pF/ft.	.08235Ω/ft.

We fully expect that the Short Range Modems will operate on lines with specifications different from those tested, but to reduce the potential difficulties in the field, one should ensure that the cable being used has similar or better characteristics (lower capacitance or lower resistance).

Wire with capacitance of 20pF/ft. or less is suitable for all our Short Range Modems however, distances may vary from those published in our catalog. Resistance will also affect distance but not functionality. Wire should be 26 AWG or larger (smaller AWG#).

Patton products are designed to withstand normal environmental noise and conditions; however, other environmental factors too numerous to discuss in this format may affect proper operation of the SRM’s.

Selection of the proper SRM for an application is critical to maintaining Customer Satisfaction and must be taken seriously. Certain models are better suited for particular applications and environments than others.

APPENDIX C

PATTON MODEL 2400
FACTORY REPLACEMENT PARTS AND ACCESSORIES

Patton Model #	Description
2400/AM/120	MicroLink (RS-232, DB-25 Male Connector, 120V Power)
2400/AF/120	MicroLink (RS-232, DB-25 Female Connector, 120V Power)
2400/CM/120	MicroLink (V.35, M/34 Male Connector, 120V Power)
10-2500	DDS Cable, RJ48 - RJ48, 6 foot
0805VDC	120V Wall Mount AC Adapter
08055DCUI	UI 110-250VAC adapter (No Power Cord)
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
07M2400-A	User Manual

APPENDIX D

MODEL 2400 INTERFACE PIN ASSIGNMENT
DDS/CLEAR CHANNEL INTERFACE

The DDS/Clear Channel Interface is an RJ-48S modular jack.

Pin #	Signal
1	TX+ (Line Transmit Positive)
2	TX- (Line Transmit Negative)
3	NC(No Connection)
4	NC (No Connection)
5	NC (No Connection)
6	NC (No Connection)
7	RX+ (Line Receive Positive)
8	RX- (Line Receive Negative)

PATTON MODEL 2400/C
M/34 CONNECTOR (V.35), TERMINAL 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)
L	LAL (Local Analog 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-B)
X	RC/ (Receive Timing-B)
Y	TC(Transmit Clock-A)
AA	TC/ (Transmit Clock-B)
KK	Supplemental Power Input

APPENDIX D (Continued)

MODEL 2400/A
DB-25 CONNECTOR (RS-232/V.24), TERMINAL INTERFACE

Pin #	Signal
1	Frame Ground
2	TD(Transmit Data)
3	RD (Receive Data)
4	RTS (Request to Send)
5	CTS (Clear to Send)
6	DSR (Data Set Ready)
7	SGND (Signal Ground)
8	CD (Carrier Detect)
9	User Selectable: Supplemental Power Input or Not Used
15	TC(Transmit Clock)
17	RC (Receive Clock)
18	LL (Local Loop)
21	User Selectable: Supplemental Power Input or RL (Remote Loop)
24	XTC (External Transmit Clock)
25	TM (Test Mode)