

USER MANUAL

MODEL 2065/66RC Miniature RS-232/V.35 to X.21 Interface Converter: Rack Mount Card



PA PATTON
IE Electronics Co.

Part# 07M2065/66RC-B
Doc# 077071UB
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SALES OFFICE
(301) 975-1000
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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 2065/66RC 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 2065/66RC 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 2065/66RC 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 2065/66RC does cause interference to radio or television reception, which can be determined by turning the power off or disconnecting the unit, the user is encouraged to try to correct the interference by one 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).

If the user detects intermittent or continuous product malfunction due to nearby high power transmitting radio frequency equipment, the user is advised to use data cables with an external outer shield bonded to a metal or metalized connector, and to configure the rear card as shown in Section 3.3 in this manual.

1.2 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: **(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 52X. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

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

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 during installation or use of this product, contact Patton Electronics Technical Support: **(301) 975-1007**; <http://www.patton.com>; or, support@patton.com.

2.1 FEATURES

- Synchronous operation, full or half duplex
- Allows an X.21 DCE to communicate bi-directionally with an RS-232/V.35 DCE or DTE
- V.35 data rates up to 2.048 Mbps (Model **2066RC**)
- RS-232 data rates up to 128 kbps (Model **2065RC**)
- RS-232/V.35 interface is DTE/DCE switchable
- Built-in 16 bit elastic buffers

- Seven bi-color LED indicators on front card
- Receives timing from the X.21 DCE device
- Dual UD-26 Connectors on rear card
- Fits in Patton's rack chassis and Cluster Boxes

2.2 DESCRIPTION

The **Patton Model 2065/66RC** Interface Converter Rack Card lets an X.21 DCE to communicate bi-directionally with an RS-232/V.35 DCE or DTE. Operating synchronously, full or half duplex, the Model 2065/66RC is protocol independent and incorporates two 16-bit elastic buffers. For extra flexibility, the Model 2065/66RC is DTE/DCE switchable on the RS-232/V.35 interface (the X.21 interface is configured as a DTE). Clocking is supplied by the X.21 DCE device.

This interface converter is available in two versions: The **Model 2065RC** converts from X.21 to RS-232, and supports sync data rates to 128 kbps. The **Model 2066RC** converts from X.21 to V.35 and supports sync data rates to 2.048 Mbps. Both versions use Patton's mid-plane architecture and are equipped with dual UD-26 connectors on the rear interface card (adapter cables are available from Patton Electronics).

The Model 2065/66RC is designed to mount in Patton's 2U high 19" rack chassis and 2/4/8 slot Cluster Boxes. Available power supplies include 120/230V AC and 48/24/12V DC. The Model 2065/66RC is made in the USA.

3.0 CONFIGURATION

This section describes the location and orientation of the Model 2065/66RC's configuration switches and jumpers, and details all possible settings. This section also identifies factory default configuration settings.

3.1 FRONT CARD CONFIGURATION

The Model 2065/66RC front card uses a single four-position DIP switch (S1), plus a DCE/DTE strap, to configure the unit for a wide range of applications. Figure 1 (below) shows the location of switch set S1 and the DCE/DTE strap on the Model 2065/66RC front card. Figure 2 (below) shows the orientation of DIP switch set S1.

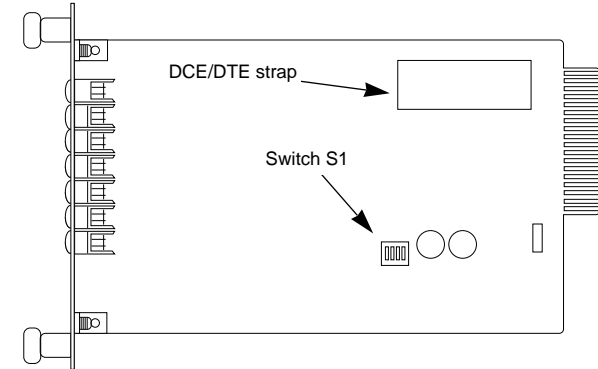


Figure 1. Model 2065/66RC front card, showing location of DIP switch and DCE/DTE strap.

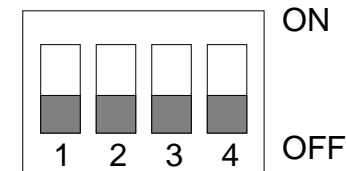


Figure 2. Orientation of front card switch set S1

3.1.1 SWITCH SET S1

DIP switch set S1 has 4 switches and is used to define which control signals will be passed between the two interfaces. Depending upon the setting of the DCE/DTE strap, the function of the four switches

will change. The summary table below describes DIP switch S1 settings, including factory defaults.

3.1.2 SETTING THE DCE/DTE STRAP

The RS-232/V.35 interface on the Model 2065/66RC is DCE/DTE switchable. The default setting is “RS-232/V.35 DCE to X.21 DTE”, based upon how the converter sees its *own* orientation. When

S1 SUMMARY TABLE		
Position	RS-232/V.35 = DCE	RS-232/V.35 = DTE
S1-1	<p>ON = “DTR from the RS-232/V.35 DTE must be ON in order for the X.21 CONTROL signal to turn ON”</p> <p>OFF = “DTR from the RS-232/V.35 DTE has no effect on the CONTROL signal going to the X.21 DCE”</p>	<p>ON = “CD from the RS-232/V.35 DCE must be ON in order for the X.21 CONTROL signal to turn ON”</p> <p>OFF = “CD from the RS-232/V.35 DCE has no effect on the CONTROL signal going to the X.21 DCE”</p>
S1-2	<p>ON = “RTS from the RS-232/V.35 DTE must be ON in order for the X.21 CONTROL signal to turn ON”</p> <p>OFF = “RTS from the RS-232/V.35 DTE has no effect on the CONTROL signal going to the X.21 DCE”</p>	<p>ON = “CTS from the RS-232/V.35 DCE must be ON in order for the X.21 CONTROL signal to turn ON”</p> <p>OFF = “CTS from the RS-232/V.35 DCE has no effect on the CONTROL signal going to the X.21 DCE”</p>
S1-3	(not applicable) Set to OFF	<p>ON = “DSR from the RS-232/V.35 DCE must be ON in order for the X.21 CONTROL signal to turn ON”</p> <p>OFF = “DSR from the RS-232/V.35 DCE has no effect on the CONTROL signal going to the X.21 DCE”</p>
S1-4	(not applicable) Set to ON	<p>ON = “INDICATION from the X.21 DCE controls RTS and DTR going to the RS-232/V.35 DCE”</p> <p>OFF = “INDICATION from the X.21 DCE controls RTS only going to the RS-232/V.35 DCE. DTR is always ON”</p>

Note: **Bold** indicates factory default setting

configured this way, the Model 2065/66RC will want to connect to an RS-232/V.35 DTE device. Changing the DCE/DTE strap orientation will enable the Model 2065/66RC to connect to an RS-232/V.35 DCE device. (**Note:** the X.21 port on the Model 2065/66RC is *always* wired as a DTE and is *not* switchable. This port always wants to connect to an X.21 DCE device.)

The RS-232/V.35 DCE/DTE strap is located near the rear of the Model 2065/66RC front card's PC board (see Figure 3, below). The arrows on the top of the strap indicate the configuration of the Model 2065/66RC. For example, if the “DCE” arrows are pointing toward the edge of the card (up), then the Model 2065/66RC is wired as a DCE and wants to connect to an RS-232/V.35 DTE device.

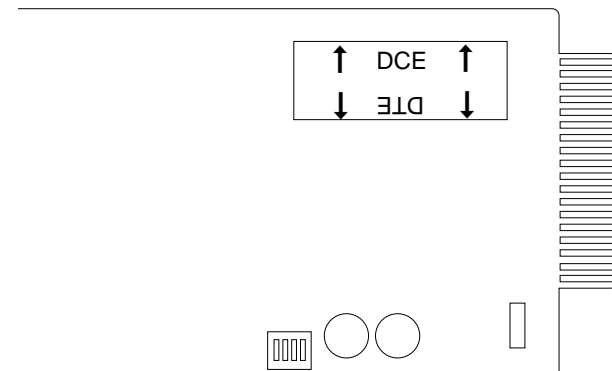


Figure 3. Model 2065/66RC front card, with close-up of DCE/DTE strap.

To change the DCE/DTE orientation of the Model 2065/66RC's RS-232/V.35 interface, simply remove the strap and rotate it 180°, so that the appropriate arrows are pointing toward the edge of the card.

4.0 INSTALLATION

3.3 REAR CARD CONFIGURATION

The rear interface card for the Model 2065/66RC is equipped with two female UD-26 connectors: one for each port. This card has one configuration jumper (JB4). Figure 4 (below) shows the location of this jumper on the PC board.

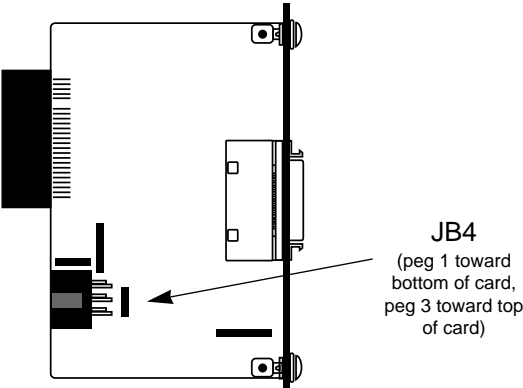


Figure 4. Rear card jumper location

As Figure 5 (below) shows, jumper JB4 has two possible positions: strap covering posts 1 & 2, or strap covering posts 2 & 3. The orientation of the jumper with respect to pin positions is shown in Figure 4 (above).



Figure 5. Possible function card strap positions

SGND & FRGND (JB4)

In the connected position, this jumper links UD-26 pin 7 (Signal Ground) and frame ground. In the open position, pin 1 is "lifted" from frame ground.

JB4

Position 1&2 = SGND (UD-26 pin 7) and FRGND Connected

Position 2&3 = SGND (UD-26 pin 7) and FRGND Not Connected

This section describes the functions of the Model 1000R16P rack chassis, tells how to install front and rear Model 2065/66RC cards into the chassis and provides diagrams for wiring up the interface connections correctly.

4.1 THE MODEL 1000R16P RACK CHASSIS

The 1000R16P Rack Chassis (shown in Figure 6, below) has sixteen short range modem card slots, plus its own power supply. Measuring only 3.5" high, the 1000R16P is designed to occupy only 2U in a 19" rack. Sturdy front handles allow the 1000R16P to be extracted and transported conveniently.

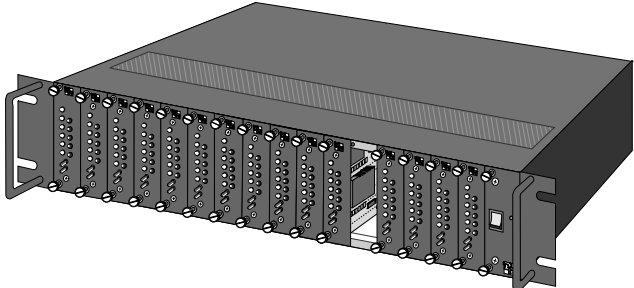


Figure 6. Model 1000R16P Rack Chassis with Power Supply

4.1.1 THE RACK POWER SUPPLY

The power supply included in the Model 1000R16P 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 spring loaded 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 2065/66RC. 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.

(continued)

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 1000R16P 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.

4.2 INSTALLING THE MODEL 2065/66RC INTO THE CHASSIS

The Model 2065/66RC is comprised of a front Function card and a rear Interface card. The two cards connect in the rack chassis via mating 50 pin card edge connectors. Use the following steps as a guideline for installing each Model 2065/66RC into the Model 1000R16P rack chassis:

1. Slide the rear Interface card into the back of the chassis along the metal rails.
2. Secure the rear card using the metal screws provided.
3. Slide the Function 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 spring loaded thumb screws.

Note: *Since the Model 1000R16P chassis allows "hot swapping" of cards, it is not necessary to power down the rack when you install or remove a Model 2065/66RC.*

4.3 DCE/DTE CONNECTION

The Model 2065/66RC rear card has two UD-26 connectors, labeled "A1" and "B1" (see figure 7, below). Port A1 connects to the RS-232 device (Model 2065RC) or the V.35 device (Model 2066RC). Port B1 connects to the X.21 device in all cases. Port A1 may be configured as either a DCE or DTE. Port B1 is always configured as a DTE.

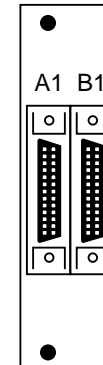


Figure 7. Model 2065/2066RC rear interface card, showing connectors

To connect computing devices to ports A1 and B1 on the Model 2065/2066RC, follow these instructions:

1. Configure the Model 2065/2066RC for your specific application according to the instructions in **Section 3.0** of this manual.
2. Connect computing devices to the Model 2065/2066RC using multipair adapter cables (see **Appendix B** for a list of custom adapter cables available from Patton Electronics). In all cases, the X.21 DCE must supply the system timing, and the RS-232/V.35 device must accept external clock. The wiring of your adapter cables should support this requirement.

Notice! Any terminal cable connected to the Model 2065/66RC must be shielded cable, and the outer shield must be 360 degree bonded—at both ends—to a metal or metalized backshell.

5.0 OPERATION

Once you have configured each Model 2065/66RC and connected the cables, you are ready to operate the unit. This section describes the LED status monitors, clocking requirements and the power-up procedure.

5.1 LED STATUS MONITORS

The Model 2065/66RC features seven front panel LEDs that indicate the condition of the modem and communication link. Figure 8 (below) shows the positions of the LEDs, and the bullets describe their functions.

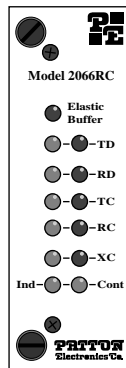


Figure 8. The Model 2065/66RC front panel, showing LED positions

- **Elastic Buffer** - monitors elastic buffer status, and operates only when the Model 2065/66RC's RS-232/V.35 port is configured as a DTE (i.e. the converter is connected between two DCE devices). When configured in this manner, the two internal 16-bit elastic buffers are enabled. If either of these buffers becomes full or empty (due to clock loss or slip), the LED will briefly glow red to indicate data loss. The buffer will then reset to half-full and the LED will stop glowing. When the Model 2065/66RC's RS-232/V.35 port is configured as a DTE, this LED has no function.

- **TD** (Transmit Data) - indicates status of transmit data at RS-232/V.35 interface. If the DCE/DTE strap is set for "Converter = DCE", then transmit data is an input to the converter. If the DCE/DTE strap is set for "Converter = DTE", then transmit data is an output from the converter. Red indicates a mark or idle state. Green indicates a space or active state.

- **RD** (Receive Data) - indicates status of receive data at RS-232/V.35 interface. If the DCE/DTE strap is set for "Converter = DCE", then receive data is an output from the converter.

(continued)

If the DCE/DTE strap is set for "Converter = DTE", then receive data is an input to the converter. Red indicates a mark or idle state. Green indicates a space or active state.

- **TC** (Transmit Clock) - indicates status of transmit clock at RS-232/V.35 interface. If the DCE/DTE strap is set for "Converter = DCE", then transmit clock is an output from the converter. If the DCE/DTE strap is set for "Converter = DTE", then transmit clock is an input to the converter. Red indicates a mark or idle state. Green indicates a space or active state.

- **RC** (Receive Clock) - indicates status of receive clock at RS-232/V.35 interface. If the DCE/DTE strap is set for "Converter = DCE", then receive clock is an output from the converter. If the DCE/DTE strap is set for "Converter = DTE", then receive clock is an input to the converter. Red indicates a mark or idle state. Green indicates a space or active state.

- **XC** (External Clock) - indicates status of external clock at RS-232/V.35 interface. If the DCE/DTE strap is set for "Converter = DCE", then external clock is an input to the converter (see Note¹). If the DCE/DTE strap is set for "Converter = DTE", then external clock is an output from the converter (see Note²). Red indicates a mark or idle state. Green indicates a space or active state.

Note¹: When configured this way, an external clock output from the RS-232/V.35 DTE to the converter is not required.

Note²: When configured this way, the external clock output from the converter must be used by the RS-232/V.35 DCE as the clock source.

- **IND** (Indicate) - glows green when INDICATE from the X.21 DCE is active.

- **CONT** (Control) - glows green when CONTROL to the X.21 DCE is active.

5.2 CLOCKING

The Model 2065/66RC *always* connects to an X.21 DCE device. In all applications the X.21 DCE must supply the system timing. Consequently, the RS-232/V.35 device (DCE or DTE) *must* be configured to accept an external clock input. Any other equipment clock settings will likely cause clock slip and/or data loss.

5.2 POWER-UP

There is no power switch on the Model 2065/66RC: Power is automatically applied to the 2065/66RC when its card-edge connector touches the chassis' mid-plane socket, or when the chassis' power is turned on. *Note: The 2065/66RC is a "hot swappable" card—it will not be damaged by plugging it in or removing it while the rack is powered up.*

APPENDIX A

MODEL 2065/66RC SPECIFICATIONS

Transmission Format:	Synchronous
External Interface:	Dual UD-26 high density connectors
Internal Interface:	Connection to Model 1000R16P rack chassis via male card edge
Electrical Interface:	X.21 - EIA RS-422/V.11 compatible; RS-232 - RS-232/V.24 compatible; V.35 data and clock signals: receivers - V.35 compliant, drivers - 0.55V differential signal; V.35 control signals - RS-232/V.24 compatible
Data Rates:	Model 2065RC (RS-232), up to 128 kbps; Model 2066RC (V.35), up to 2.048 Mbps.
Clocking:	RS-232/V.35 DCE or DTE receiving timing from an X.21 DCE device
DCE to DCE buffering:	Dual 16-bit buffers for full duplex operation - set to 8 bits in case of underflow or overflow.
Controls:	Switchable, custom control settings (see Section 3.0)
Indicators:	Bi-level LED indicators for TD, RD, TC, RC and XC; single green indicator for INDICATION and CONTROL; single red indicator for elastic buffer status.
Power Supply:	Rack-mount power supply is switchable between 120V and 240V AC; chassis supplies 10V AC to the Model 2065/2066RC, typical consumption is 1.2 watts
Temperature:	0-50°C / 32-122°F
Humidity:	5-95%, noncondensing
Dimensions:	0.95" w x 3.1" h x 5.4" l

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APPENDIX B

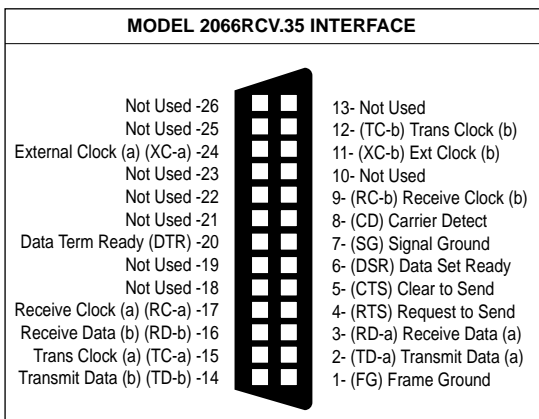
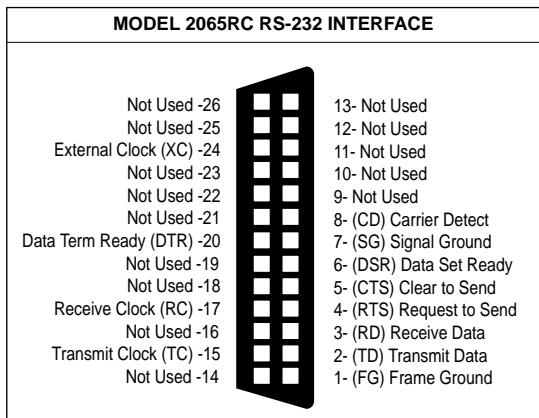
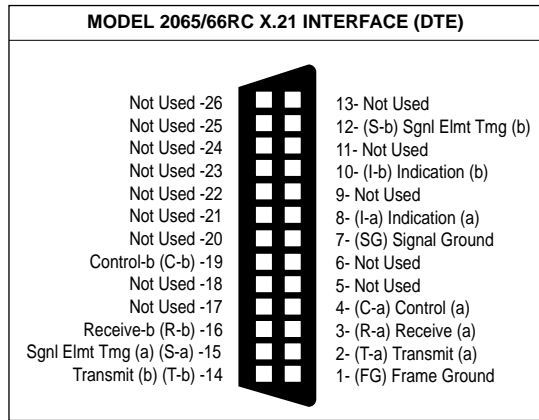
PATTON MODEL 2065/66RC FACTORY REPLACEMENT PARTS

The Patton Model 2065/66RC rack system features interchangeable rear half cards, power cords/fuses for international various operating environments and other user-replaceable parts. Model numbers and descriptions for these parts are listed below:

<u>Patton Model #</u>	<u>Description</u>
2065-26M/15F.....	Cable, 6 ft, UD-26M to DB-15F
2065-26M/15M.....	Cable, 6 ft, UD-26M to DB-15M
2065-26M/25F.....	Cable, 6 ft, UD-26M to DB-25F
2065-26M/25M.....	Cable, 6 ft, UD-26M to DB-25M
2065-26M/34F.....	Cable, 6 ft, UD-26M to M/34F
2065-26M/34M.....	Cable, 6 ft, UD-26M to M/34M
1000RPEM.....	120/240V Rear Power Entry Module
1000RPSM-1.....	120/240V Front Power Supply Module
1000RPEM-DC.....	DC Rear Power Entry Module
1000RPSM-48A.....	48V Front Power Supply Module
0805US.....	American Power Cord
0805EUR.....	European Power Cord CEE 7
0805EURP.....	Europlug Power Cord CEE 7/16
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
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

APPENDIX C

MODEL 2065/66RC INTERFACE SETTINGS AND ORIENTATION



APPENDIX D

PATTON MODEL 2065/66RC BLOCK DIAGRAM

