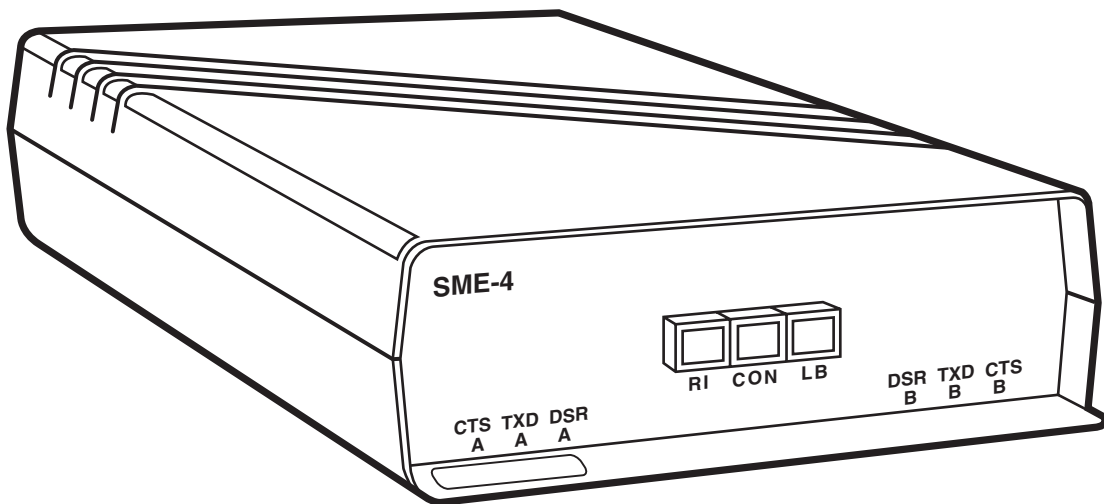




DECEMBER 2001
ME251A-R3
ME251AE-R3
ME251C-R3
ME253A-R2
ME253AE-R2
ME253C-R2
ME255A-R2
ME255AE-R2
ME255C-R2

Synchronous Modem Eliminator (SME-4M)



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This equipment generates, uses, and can radiate 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 communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

INSTRUCCIONES DE SEGURIDAD (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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Contents

Chapter	Page
1. Specifications	5
2. Description	6
3. Installation	8
3.1 LED Displays	10
4. Digital Loopback Test	12
5. Application Notes	13
6. RS-232 Interface	14
7. Nonstandard Transmission Speeds	17

1. Specifications

AC Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz, 10 watts

Wallmount No load output voltage: 18 VAC nominal

Transformer Output — Voltage at rated current 16 ± 0.5 VAC rated

Load Current 0.13 amps (part number PS154)

Size — Standalone Unit: 1.8"H x 5.5"W x 8.5"D (4.5 x 13.9 x 21.5 cm)

Weight — Standalone Unit: 2 lb. (0.9 kg)

Enclosure — High-impact plastic

Connectors — (2) DB25 female, mounted on rear panel

Interface — RS-232C (CCITT V.24/V.28) serial synchronous or asynchronous

Indicators — (6) LEDs: TX Data, CTS and DSR for each of the two ports

External Controls — RI button, loopback switch and DSR control

Operating Environment — 32 to 122°F (0° to 50°C), Up to 95% relative humidity, non-condensing

RM008 Rack Dimensions — 5.22"H x 19"W x 9.25"D (13.2 x 48.2 x 23.4 cm)

(For Standard Equipment Rack)

RM008 Rack Weight (with no cards installed) — 9.5 lb. (4.3 kg)

2. Description

The SME-4M Synchronous Modem Eliminator is designed to replace two modems in point-to-point applications. As shown below, a single SME-4M allows asynchronous, synchronous or bisynchronous communications between two items of data terminal equipment (DTE) over EIA RS-232C cable.

In the synchronous mode, the SME-4M operates at speeds up to 38,400 bps, 56,000 bps or 64,000 bps depending on the model. In either synchronous or asynchronous mode, the SME operates transparently.

The small size and light weight of the SME-4M minimize logistics problems and simplifies installation and replacement in the field. Since no special tools are required, the SME-4M unit is designed for o-it-yourself installation.

Six indicators and three front panel switches facilitate operation and do-it-yourself troubleshooting. The indicators (three for each item of DTE) monitor Transmitted Data, Data Set Ready and Clear To Send signals. The front panel switches control Data Set Ready (DSR) and Ring Indicator (RING) signals as well as select the digital loopback (DLB) test mode.

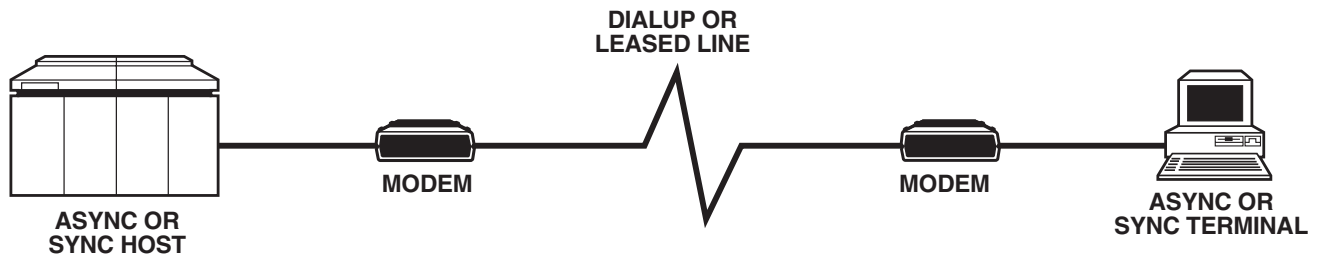


Figure 2-1. Typical Point-to-Point Application with Modems

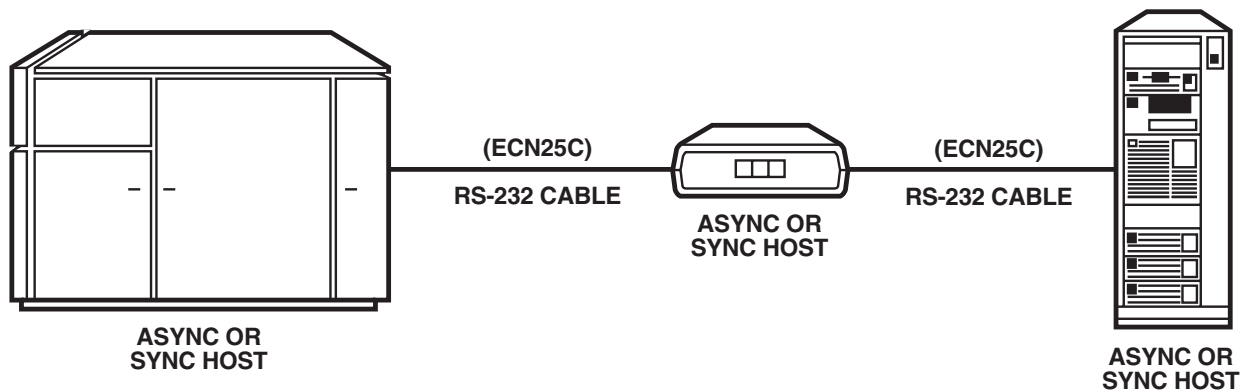


Figure 2-2. Typical Point-to-Point Application without Modems

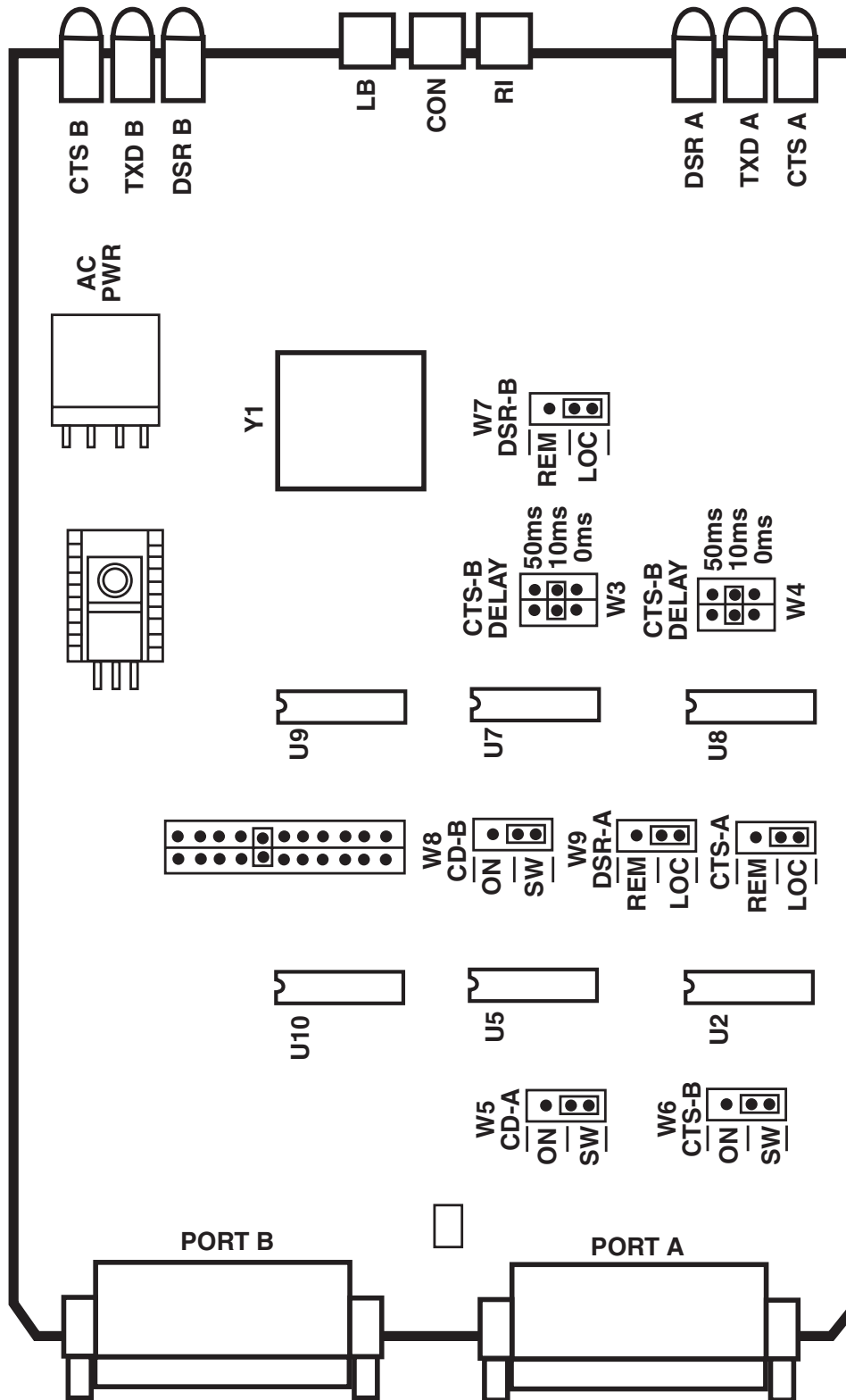


Figure 2-3. Location of Controls, Indicators and Straps

3. Installation

Proceed as follows to install the SME-4M:

1. Remove the release screw located on the bottom center of the unit and separate the cover from the unit.
2. Plug in the cord from the transformer to the male power connector, J3, on the card.
Do not plug the transformer into an AC outlet.
3. Using the cables supplied with your terminal's or computer's ports, connect them to the 25-pin connectors (J1 and J2) at the rear of the unit. (If no cables are available, use pin-for-pin EIA RS-232C cables having at least pins 1-8, 15, 17, 20, 21, 22, and 24 wired (these are the minimum number of pins that can be connected for the unit to function properly).
4. Select the operating mode by installing the speed selection strap (W2 in Figure 2-3) to async or the desired synchronous speed as shown below. For more information see **Chapter 7**.

PART NUMBER	SPEED	STRAP POSITION
ME251A-R3, ME251AE-R3, ME251C-R3	1200, 2400, 4800 9600, 19,200 or 38,400 bps	Shown on board
ME253A-R2, ME253AE-R2, ME253C-R2	56,000 bps	a
ME255A-R2 ME255AE-R2 ME255C-R2	64,000 bps	a

5. For synchronous operation, select the clock source for both DTE devices. For external clock to be supplied by the device connected to Port A, install the "XA" external clock strap. For external clock to be supplied by the device connected to Port B, install the "XB" external clock strap.
6. The following strapping will work in most configurations including IBM® System AS/400™, System 36, and System 38:
 - CTS A = SW
 - CTS B = SW
 - CD A = SW
 - CD B = SW
 - CTS Delay = 10 MS
 - CD Delay = 10 MS
 - DSR A = Local
 - DSR B = Local

Set all front panel pushbuttons in the OUT position.

NOTE

The IBM device parameters should be set for non-switched/leasedline.

If different settings are required, see steps 7 through 10.

7. Select the CTS control by installing both the “A” and “B” CTS constant/switched straps. In the switched position, a CTS signal is generated when the SME-4M receives an RTS signal (in the digital loopback test mode, the control signals always will be ON). In the constant position, CTS and Carrier Detect (of the respective port), and Signal Quality of the other port are always ON.
8. For switched CTS applications, select the CTS delay for Port A and B by installing the CTS delay selection straps. Delays of 0, 10, and 50 milliseconds are available.
9. Select the DSR control by installing the “A” and “B” DSR remote/local straps. In the remote position, the DSR signal is generated when the other port receives a DTR signal. In the local position, DSR is always on.
10. The CD (Carrier Detect) option is controlled by setting the “A” and “B” Switched or Constant straps. In the Switched position, a CD signal is generated when the other port receives a RTS signal. In the Constant position, CD is always on.

NOTE

If the CTS options are set to Constant, the CD options have no effect.

11. Install the top cover.
12. Connect the communication devices to ports A and B.
13. Plug in the transformer.
14. If the local DSR control was selected by the configuration straps, the CON front panel switch must be in the OUT position to turn DSR ON. Set the CON switch to the IN position to turn DSR OFF.
15. If required by your application, press then release the momentary RING switch to send Ring Indicator signal.
16. Observe the indicators for each item of DTE to monitor the status.
17. The SME-4M is now ready for operation.

3.1 LED Displays

TXD	ON	Transmitted Data in space
	OFF	Transmitted Data in mark
TXA	ON	data flow from port B to port A
	OFF	no data flow from port B to port A
TXB	ON	data flow from port A to port B
	OFF	no data flow from port A to port B
DSR	ON	Data Set Ready signal ON
	OFF	Data Set Ready signal OFF
DSR A	ON	indicates a DSR signal (pin 6) out from port A
	OFF	indicates no DSR signal (pin 6) out from port A
DSR B	ON	indicates a DSR signal (pin 6) out from port B
	OFF	indicates no DSR signal (pin 6) out from port B

NOTE

In DSR remote mode, the DSR LEDs also indicate the reception of DTR (pin 20) from the opposite port.

CTS ON Clear To Send signal ON
OFF Clear To Send signal OFF

CTS A ON indicates a CTS signal (pin 5) out from port A
OFF indicates no CTS signal (pin 5) out from port A

CTS B ON indicates a CTS signal (pin 5) out from port B
OFF indicates no CTS signal (pin 5) out from port B

NOTE

In the CTS switched mode, the CTS LEDs also indicate the reception of RTS (pin 4) from the same port.

4. Digital Loopback Test

The digital loopback test is for asynchronous applications only. Proceed as follows to initiate the test.

1. Press the loopback switch (the switch must remain in the IN position) on the front panel to loopback at the digital interfaces for both devices connected to the SME-4M.
2. Enter data at the terminal or computer. The data should be returned to the DTE device exactly as it was entered.
3. Release the DLB switch (the switch must remain in the OUT position) to end the test.

5. Application Notes

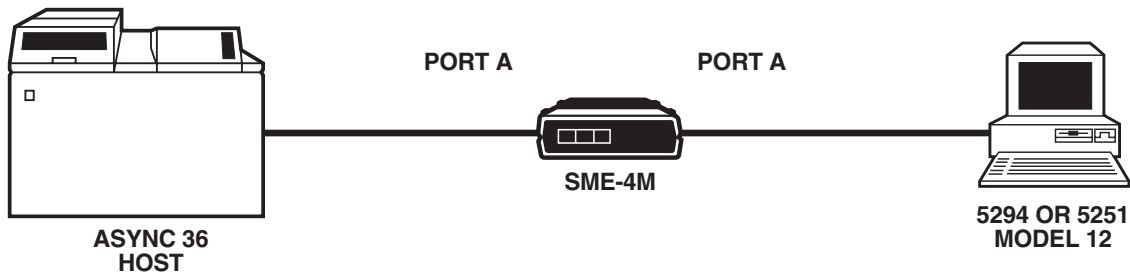


Figure 5-1. Typical IBM Application

For most applications (including the one shown in Figure 5-1) the following configuration is recommended:

1. Select the appropriate baud rate for which the system is configured (modem clocking).
2. Since the modem eliminator is always connected, it is recommended to configure the computer equipment for point to point, non-switched phone line (leased line).
3. The following strapping will work in most configurations including IBM System AS/400, System 36, and System 38:

- | | |
|--------------|---------------------|
| • CTS A = SW | • CTS Delay = 10 MS |
| • CTS B = SW | • CD Delay = 10 MS |
| • CD A = SW | • DSR A = Local |
| • CD B = SW | • DSR B = Local |

Set all front panel pushbuttons in the OUT position.

NOTE

The IBM device parameters should be set for non-switched/leased line.

4. With DSR A and B configured "Remote", the DSR A and B LEDs will indicate the opposite ports DTR signal (generated by the connecting equipment). Therefore, if DSR A is not lit, check the computer device connected to B and vice-versa. The connected device may not be ready to communicate, may be configured incorrectly or may have a cable problem.

The SME-4M printed circuit card is made to be installed in the RM008 rack. The rack fits into a standard 19" equipment rack and can hold up to 16 SME-4M printed circuit cards. The RM008 rack is available for either 115 VAC, 60 Hz or 230 VAC, 50 Hz power.

6. RS-232 Interface Pinning

Table 6-1 RS-232 Interface Pinning

PIN	CIRCUIT	DESCRIPTION	SIGNAL TYPE	DIRECTION
1	AA	Protective Ground	Ground	—
2	BA	Transmitted Data	Data	To DCE
3	bb	Receive Data	Data	From DCE
4	CA	Request To Send	Control	To DCE
5	CB	Clear To Send	Control	From DCE
6	CC	Data Set Ready	Control	From DCE
7	AB	Signal Ground	Ground	
8	CF	Data Carrier Detect	Control	From DCE
9	—	+ DC Test Voltage	—	—
10	—	- DC Test Voltage	—	—
11	—	Unassigned	—	—
12	SCF	Secondary Data Carrier Detect	Control	From DCE
13	SCB	Secondary Clear To Send	Control	From DCE
14	SBA	Secondary Transmit Data	Data	To DCE
15	DB	Transmit Signal Element Timing (DCE)	Timing	From DCE
16	SBB	Secondary Receive Data	Data	From DCE
17	DD	Receiver Signal Element Timing	Timing	From DCE

Table 6-1. RS-232 Interface Pinning (continued)

PIN	CIRCUIT	DESCRIPTION	SIGNAL TYPE	DIRECTION
18	—	Local Loopback	Test	To DCE
19	SCA	Secondary Request To Send	Control	To DCE
20	CD	Data Terminal Ready	Control	To DCE
21	CG	Signal Quality Detector	Control	From DCE
22	CE	Ring Indicator	Control	From DCE
23	CH	Data Signal Rate Selector (DTE)	Control	To DCE
	CI	or Data Signal Rate Selector (DCE)	Control	From DCE
24	DA	Transmitter Signal Element Timing (DTE)	Timing	To DCE
25	—	Test Mode/No Signal	—	—

NOTE

The above chart shows all pins on the DB25 connector. The SME-4 only uses Pins 1 through 8, 15, 17, 20, 21, 22, and 24.

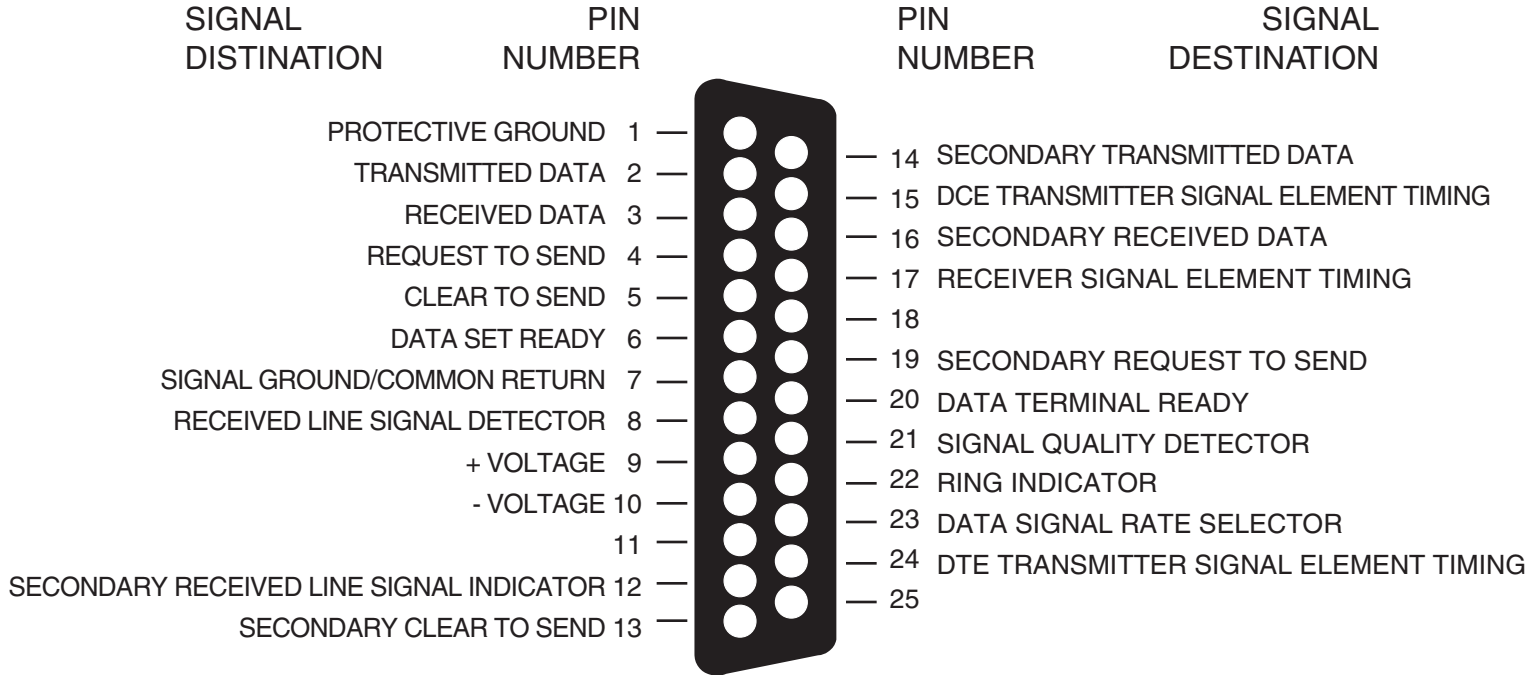


Figure 6-1. RS-232 Interface Female Connector

7. Nonstandard Transmission Speeds

The SME-4M can be configured to operate at some nonstandard data transmission speeds depending upon the model and the frequency of the installed crystal. To set the SME-4M for one of these different speeds, configure the unit according to the chart below.

Table 7-1. SME-4M Synchronous Transmission Speeds

	ME251	ME253	ME255
CRYSTAL FREQUENCY	2.4576 MHz	1.792 MHz	2.048 MHz
STRAP POSITION	TRANSMISSION RATE (bps)		
a	76,800	56,000	64,000
b	153,600	112,000	128,000
38,400	38,400	28,000	32,000
19,200	19,200	14,000	16,000
9600	9600	7000	8000
4800	4800	3500	4000
2400	2400	1750	2000
1200	1200	875	1000



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