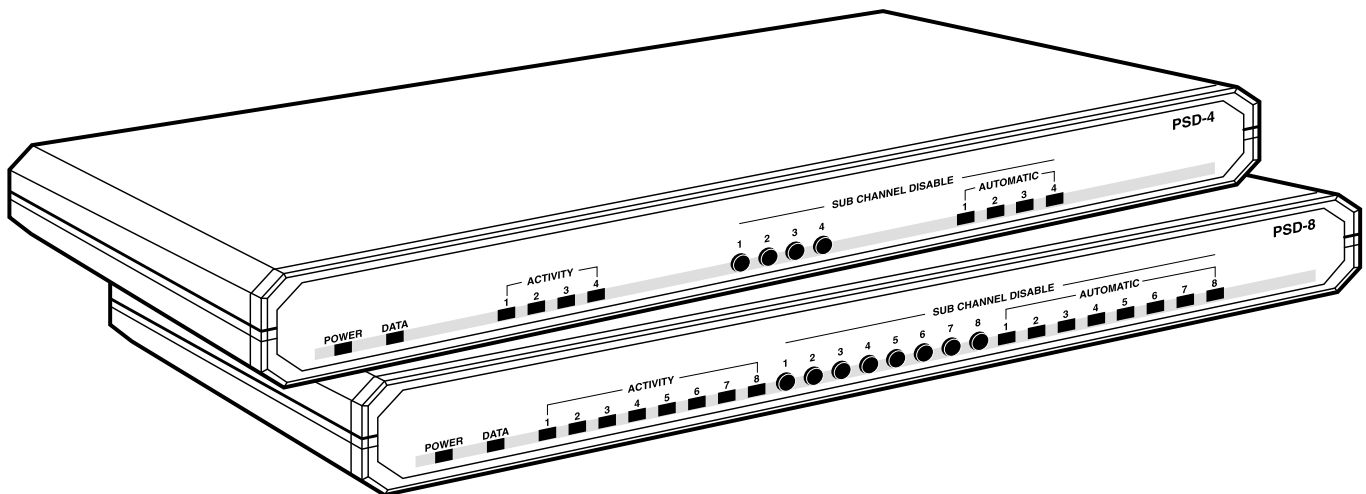




# PSD-4 PSD-8



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FEDERAL COMMUNICATIONS COMMISSION  
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RADIO FREQUENCY INTERFERENCE STATEMENTS

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

*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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# 1. Specifications

## Number of Sub-Channels —

<b>PSD-4:</b>	4
<b>PSD-8:</b>	8

## Channel Configuration —

<b>Lowest Priority:</b>	Sub-channel 1
<b>Highest Priority:</b>	PSD-4: Sub-channel 4 PSD-8: Sub-channel 8

**Sub-Channel Selection** — RTS/DCD on or data transitions (strap-selectable)

**Sub-Channel Deselection** — RTS/DCD off or 16 bits of idle data (strap-selectable)

## Sub-Channel Dialing —

<b>Manual:</b>	Press in the front-panel pushbutton switch
<b>Automatic:</b>	If a sub-channel stays connected for more than a pre-set period of time (strap-selectable—1.7, 13.5, or 108), the PSD automatically disables it

**Clock Source** — Internal, external from main channel, or external from sub-channel 1

## Data Rates —

<b>Asynchronous:</b>	Up to 19.2 kbps
<b>Synchronous:</b>	Internal Clock: 1.2, 2.4, 4.8, 7.2, 9.6, 14.4, or 19.2 kbps External Clock: Up to 19.2 kbps

**Connectors** — IEIA RS-232-C/CCITT V.24; DCE or DTE (strap-selectable)

**Controls** — Front-panel SUB-CHANNEL DISABLE pushbutton switch for each sub-channel; rear-panel POWER rocker switch; rear-panel 110/220 VAC selector

<b>LED Indicators</b> —	<b>POWER:</b>	Lights when the unit is receiving AC power
	<b>DATA:</b>	Lights when data is broadcast from the main channel to the sub-channels
	<b>ACTIVITY:</b>	Lights when the sub-channel accesses the main channel
	<b>AUTOMATIC:</b>	Lights when sub-channel has been automatically disabled

**Temperature** — 32 to 122°F (0 to 50°C)

**Humidity** — 30 to 90%, non-condensing

**Power** — 110/220 VAC switchable  $\pm 10\%$

**Size** — 11.7"H x 17"W x 8.2"D (4.3 x 43.1 x 20.8 cm)

**Weight** — 4.4 lb (2.0 kg)

## 2. Introduction

The Programmable Sharing Device enables up to 4 (TL304A) or 8 (TL305A) modems or terminals to share a master modem, multiplexor, or computer port in an asynchronous or synchronous multipoint environment. (Asynchronous and synchronous equipment cannot be mixed on the same PSD.)

### MAIN CHANNEL

The main channel transmits information to all sub-channels in parallel.

### SUB-CHANNELS

Sub-channels contend to transmit to the main channel by activating RTS/DCD (Request to Send/Data Carrier Detect) or by data transitions (strap-selectable). When the sub-channel is active, the sub-channel's transmit data and control signals are connected to the main channel. When RTS/DCD drops, data transitions stop, or 16 idle bits are received, the PSD will disconnect and monitor other sub-channels.

Sub-channels can be disabled either manually by front-panel pushbuttons or automatically. If a sub-channel is streaming and staying active for longer than a configured amount of time, the PSD will automatically disable that sub-channel. A front-panel LED will illuminate to indicate that the sub-channel has been automatically disabled. The sub-channel will be reset when RTS/DCD drops or 16 idle bits are transmitted to it from the attached device.

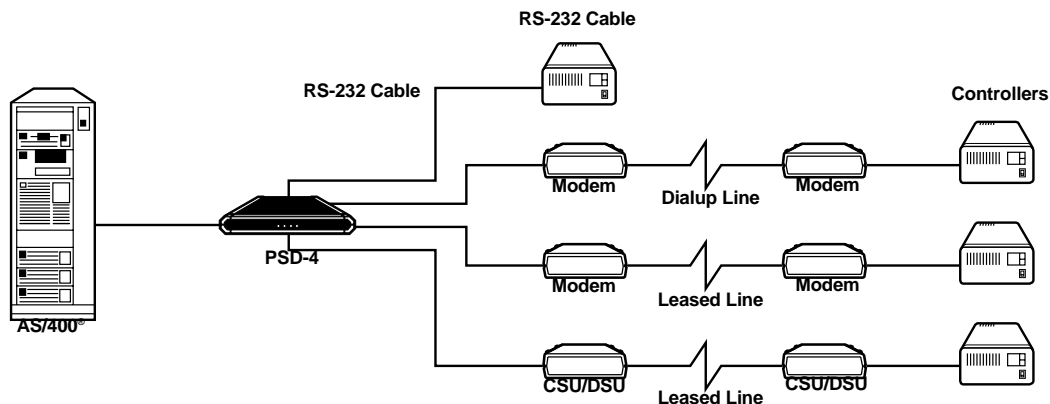
### CLOCK MODES

Three clock modes are supported: internal, external from the main channel, or external from sub-channel 1.

### BUFFER

A built-in-buffer compensates for phase differences between the clocks of modems connected to the sub-channels and the PSD main-channel transmit clock.

An extra-buffer option on the PSD-8 can be activated when the PSD is connected to equipment that cannot accept an external clock. Examples include DDs (United States) or other digital lines and modems that cannot be set to an external clock. This additional buffer compensates for phase differences between the PSD clock and sub-channel clock(s).



**Figure 1. The Programmable Sharing Device allows multiple devices to share a master port.**

## 3. Installation

### 3.1 Choosing a Site

- The PSD must be installed within five feet (1.5 m) of a grounded AC outlet.
- The PSD must be within 50 feet (15 m) of the equipment that will be attached to the main channel and each sub-channel.
- Allow 36 inches (91 cm) frontal clearance for operating and maintenance accessibility.
- Allow four inches (10 cm) rear-panel clearance for the power and interface cables.
- Side-panel brackets can be used to install the unit in a 19" rack. (The brackets can be removed without harming the PSD.)

### 3.2 Configuring the PSD Printed Circuit Board

Table 1 on the following page explains each of the configurable jumpers or switches on the PSD printed circuit board. Figures 3 and 4 show the locations of each of the jumpers and switches for the PSD-4 and PSD-8.

There are two EXT. BUFFER switches on the PSD-8. These are extra buffers—not external buffers. Use the extra buffers when the PSD is connected to equipment that cannot accept an external clock from the PSD. The extra buffers compensate for phase differences between clocks. There are many applications where this might be necessary, but one example would be where multiple CSU/DSUs (each attached to its own leased line that provides clocking) are connected to the PSD.

Switch S1 controls the buffer for sub-channels 1 through 4, and switch S2 controls the buffer for sub-channels 5 through 8.

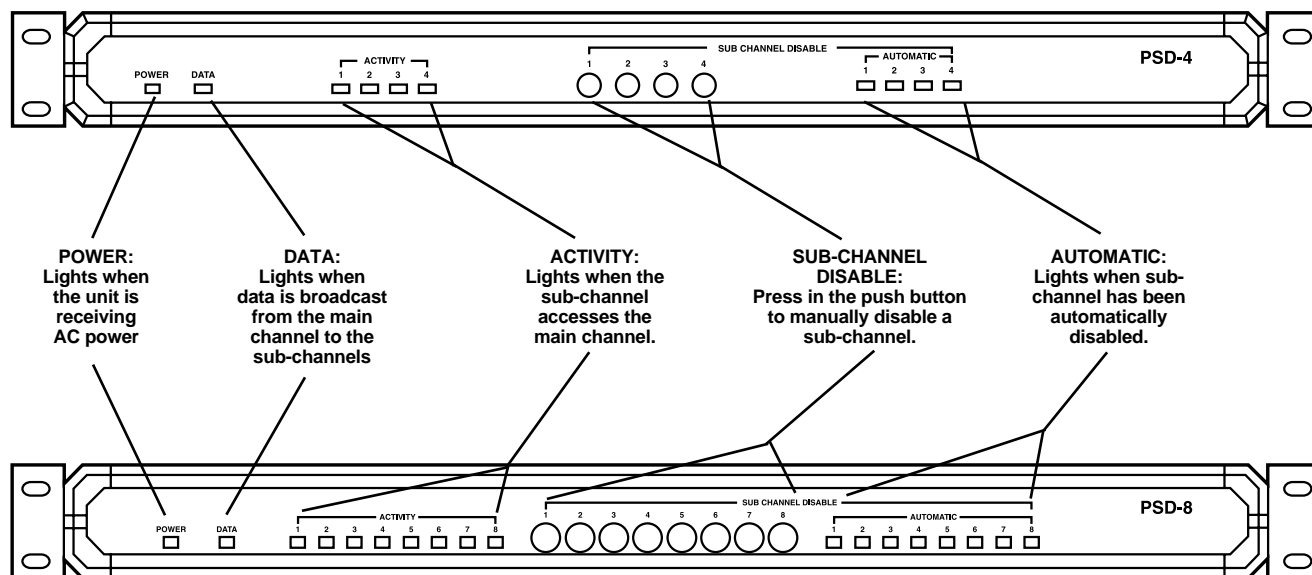


Figure 2. The front panels of the PSD-4 (top) and the PSD-8 (bottom).

**Table 1. Printed Circuit-Board Switch and Strap Settings**

Stap Identity	Location	Possible Settings	Factory Setting	Function
MAIN DCE/DTE switch		DTE DCE	DTE	Determines the PSD's Main Channel interface as either DTE (straight connection to a modem) or as DCE (straight connection to a computer or terminal).
Sub-channel DCE/DTE switches		DTE DCE	DTE	Determines the PSD's sub-channel interface as either DTE or DCE.
DATA RATE (kbps) (rotary switch)	BR1	19.2 14.4 9.6 7.2 4.8 2.4 1.2 CLK 1	9.6	Selects the PSD's internal data rate or external clock from sub-channel 1.  NOTE: When using CLK 1 mode, the main channel cannot be connected to a modem working in internal clock.
Chas. GND	J1	CONNECT DISCONNECT	DISCONNECT	The CONNECT setting connects signal ground to chassis ground. The DISCONNECT setting isolates them.
PIN 24 DIS	J1A	ENABLE (jumpered) DISABLE (NO jumper)	ENABLE	Exits main channel when PIN 24 is disabled.
TIME OUT	J2	1.7 13.5 108 DISABLE	108	Selects the time-out period (in seconds) after which the PSD will automatically disable the sub-channel. Selecting DISABLE will stop the PSD from automatically disabling any sub-channels.
CONTENTION	J5	RTS DATA	RTS	Determines the sub-channel selection and deselection.
FORMAT	J6	ASYNC SYNC	SYNC	Selects the data format.
CLOCK	J7	NORMAL FROM EXT DTE	NORMAL	Determines the source of the clock for synchronous data. Set to NORMAL for internally derived clock. Set to FROM EXT DTE for externally derminded clock from a connected DTE.
EXT. BUFFER (PSD-8 only)	S1 S2	ON OFF	OFF	Activates or deactivates the extra buffer.



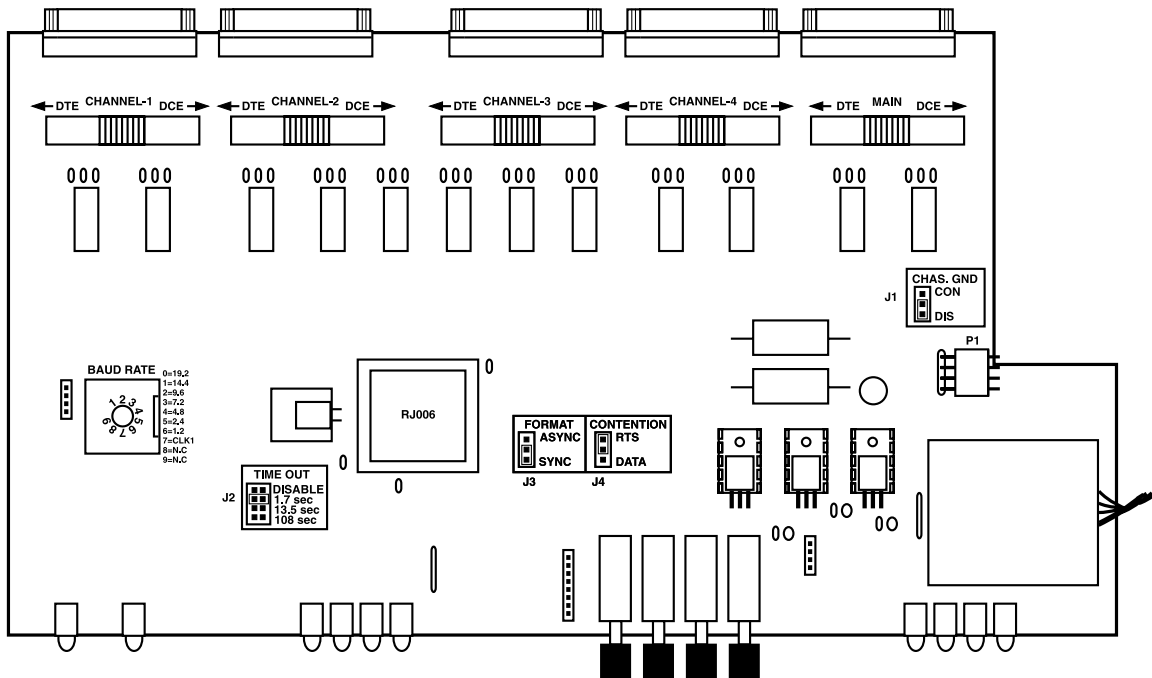


Figure 3. The Printed Circuit Board of the PSD-4.

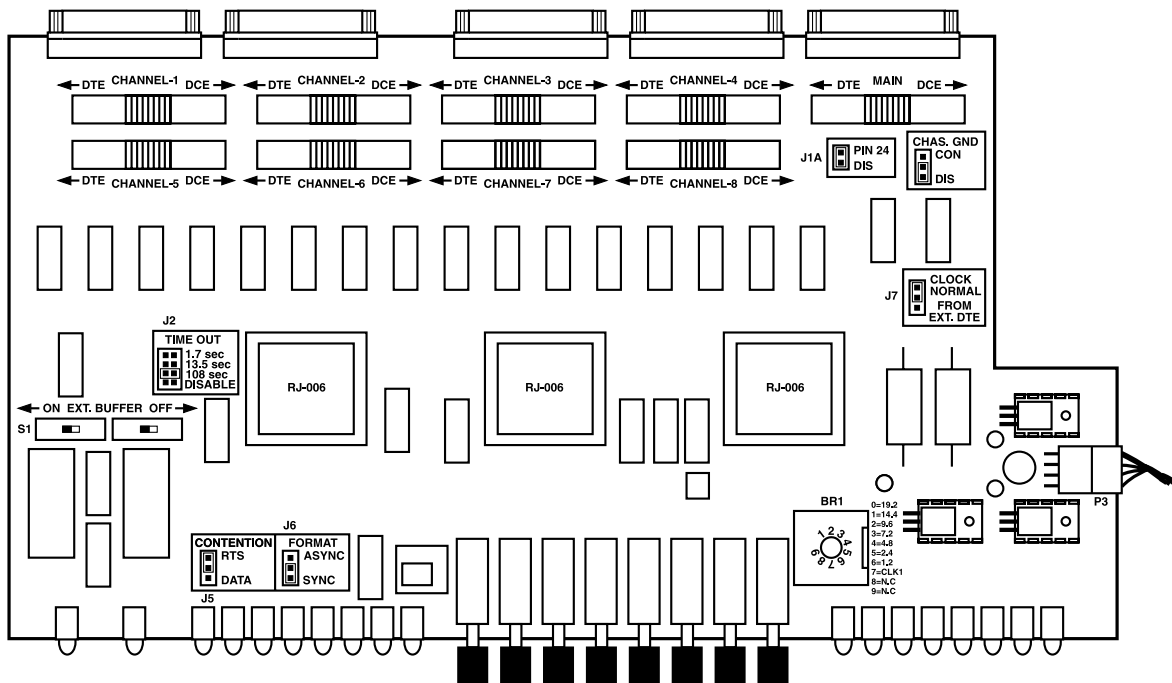


Figure 4. The Printed Circuit Board of the PSD-8.

### 3.3 System Synchronization

#### ASYNCHRONOUS MODE

Strap the J6 jumper over the ASYNC pins. All attached equipment must be asynchronous. Turn the BIT RATE rotary switch (BRI) to the correct system speed. No other adjustments to the PSD are necessary.

#### SYNCHRONOUS MODE

Strap the J6 jumper over the SYNC pins (this is the factory-default setting). All attached equipment must be synchronous. There are four ways to synchronize the system:

##### 1. Synchronization on the PSD's internal clock.

- Main channel: Equipment attached to the main channel should be set to external clock.
- Sub-channel: Equipment attached to the sub-channels should be set to external clock.
- BIT RATE rotary switch: Set BRI to the correct system speed.

##### 2. Synchronization on the equipment attached to the main channel.

- Main channel: Equipment attached to the main channel should be set to internal clock.
- Sub-channels: Equipment attached to the sub-channels should be set to external clock.
- BIT RATE rotary switch: Set BRI to the correct system speed.
- Jumper J7: If the equipment attached to the main channel is DCE, strap to NORMAL. If the equipment is DTE, strap to FROM EXT DTE.

##### 3. Synchronization on the equipment attached to sub-channel 1.

- Main channel: Equipment attached to the main channel should be set to external clock.
- Sub-channel 1: Equipment attached to sub-channel 1 should be set to internal clock.
- Sub-channel 2 through 8: Equipment attached to the sub-channels 2 through 8 should be set to external clock.
- BIT RATE rotary switch: Set BRI to position 7 (CLK1).
- Jumper J7: If the equipment attached to the sub-channel 1 is DCE, strap to NORMAL. If the equipment is DTE, strap to FROM EXT DTE.

**NOTE:** Synchronization on sub-channel 1 is not recommended when the device attached to sub-channel 1 operates in switched carrier mode. This will cause fluctuations in clock frequency and phase.

##### 4. Synchronization on equipment attached to any sub-channel (PSD-8 only).

- Main channel: Equipment attached to the main channel can be set to internal or external clock.
- Sub-channels: Equipment attached to the sub-channels can be set to internal or external clock.

## PSD-4 AND PSD-8

- **BIT RATE rotary switch:** Set BRI to the correct system speed.
- **EXT. BUFFER:** If any of the devices connected to the sub-channels numbered 1 through 4 are set to internal clock, then switch S1 should be ON. If any of the devices connected to the sub-channels numbered 5 through 8 are set to internal clock, then switch S2 should be ON.
- **Jumper J7:** If the equipment attached to the sub-channel 1 is DCE, strap to NORMAL. If the equipment is DTE, strap to FROM EXT DTE.

### 3.4 AC Power

On the rear panel of your unit, locate the 110/220 VAC selector. Set the selector to match your main power source.

After configuration is complete and the cover to the unit is replaced, plug the power cord into the PSD. Plug the other end into a grounded AC power jack.

**NOTE: There is a 0.25A slow-blow fuse in your unit. Do not replace this fuse with a repaired fuse. Do not short-circuit the fuse holder.**

Turn the POWER rocker switch on.

# 4. Operation and Troubleshooting

## 4.1 Operation

Turn on the rear-panel POWER rocker switch. The front-panel POWER LED will light.

The PSD operates automatically. Except for manually disabling a sub-channel, you will not need to attend to the PSD.

## 4.2 Changing Setting During Operation

If you have to reconfigure the PSD for a different type of operation, turn off the PSD and unplug it from its AC power source *before* taking off the cover to change settings.

## 4.3 Troubleshooting

### POWER SUPPLY

If the unit is attached to an AC power source and the green Power LED does not light up, check the following:

- Make sure the rear-panel rocker switch is on and is lit.
- Verify that the 110/220 selector is set correctly.
- Unplug the unit and check the fuse (see Figure 5 for location of the fuse).
- Remove the top cover and verify that the 4-pin power connector is attached to the transformer on the printed circuit board (PSD-8 only).

### PSD MALFUNCTION

If the Power LED is lit, but the PSD is not functioning, unplug your unit. Take off the cover and check the following:

- Verify that all the DCE/DTE switches are set according to the data-system requirements.
- Double-check each of your strap settings.
- Visually inspect the large chips labeled RJ-006. Make sure that they are securely attached to the printed circuit board.

# PSD-4 AND PSD-8

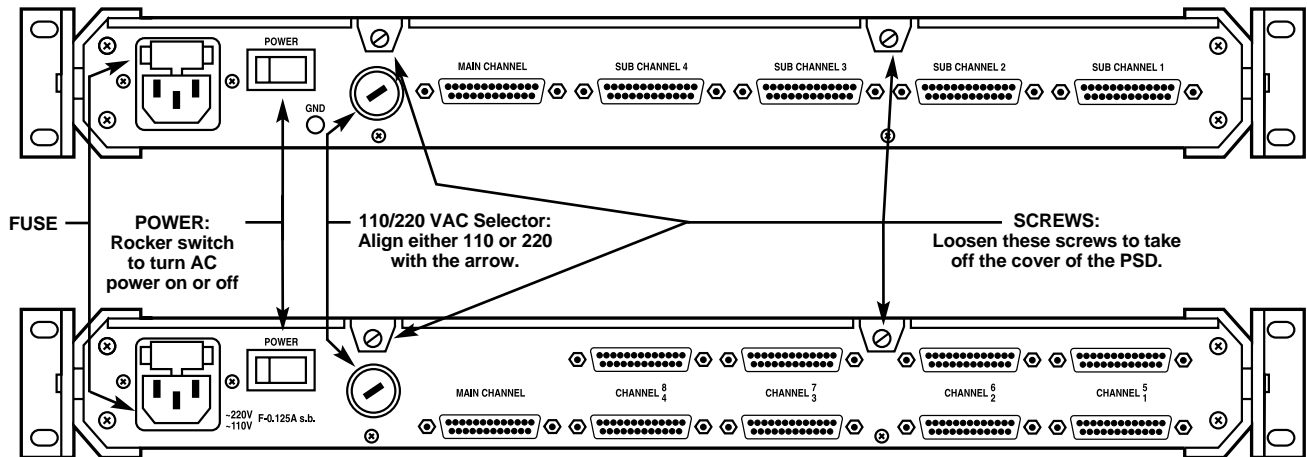


Figure 5. The back panels of the PSD-4 (top) and the PSD-8 (bottom).

# 5. Technical Guide

## 5.1 Control Signals

### MAIN CHANNEL CONTROL SIGNALS

#### RTS (DCD)

- In RTS/DCD contention mode: follows RTS (DCD) of the selected sub-channels.
- In Data Contention mode: ON if one of the sub-channels RTS (DCD) is ON.

#### CTS

On only when the CTS signals of all active sub-channels are ON. A sub-channel is active if it is connected to a modem and the DSR signal is ON (enables connection of dialup modems to the PSD).

#### DSR (DTR)

ON if one of the sub-channel's DTR (DSR) is ON.

### SUB-CHANNEL CONTROL SIGNALS

#### RTS (DCD)

- Follows the main channel RTS (DCD) (unless the sub-channel is disabled).

#### CTS

- In RTS contention mode: selected sub-channel follows DTS signal of main channel.
- In Data Contention mode: sub-channel receives CTS from main channel immediately after it raises RTS (unless the sub-channel is disabled).

#### DSR (DTR)

Follows the main channel DSR (DTR).

## 5.2 Block Diagrams

Figures 6 through 9 illustrate the flow of data and control signals in the PSD, in different DTE/DCE configurations:

Figure Number	Main Channel Configuration	Sub-Channel Configuration
6	DTE	DCE
7	DTE	DTE
8	DCE	DCE
9	DCE	DTE

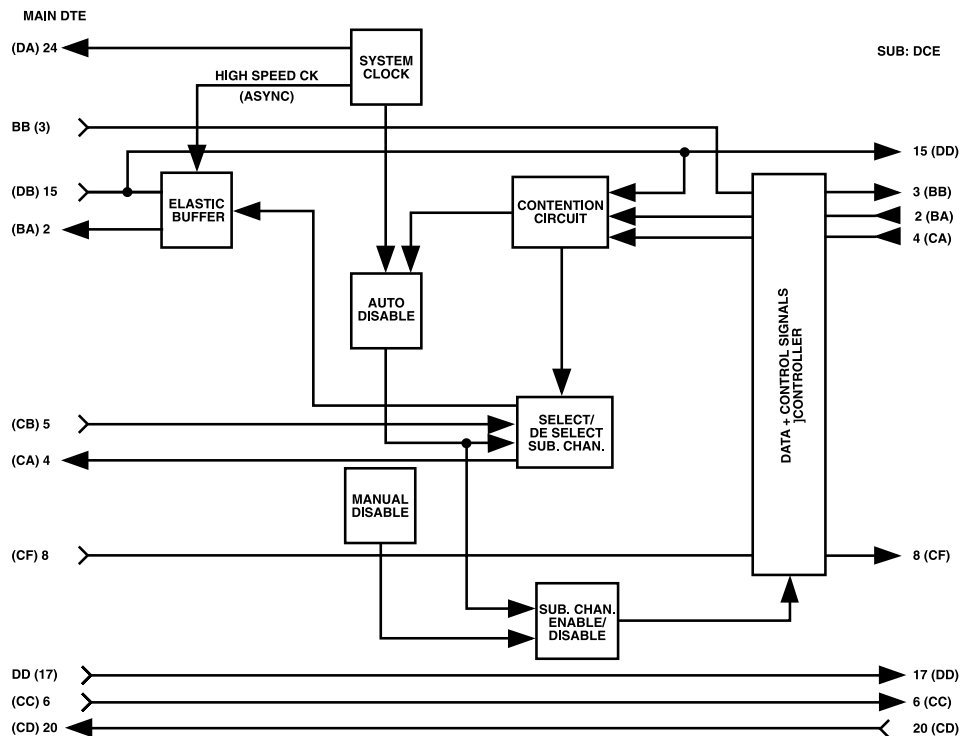


Figure 6. Main Channel DTE with Sub-Channel DCE.

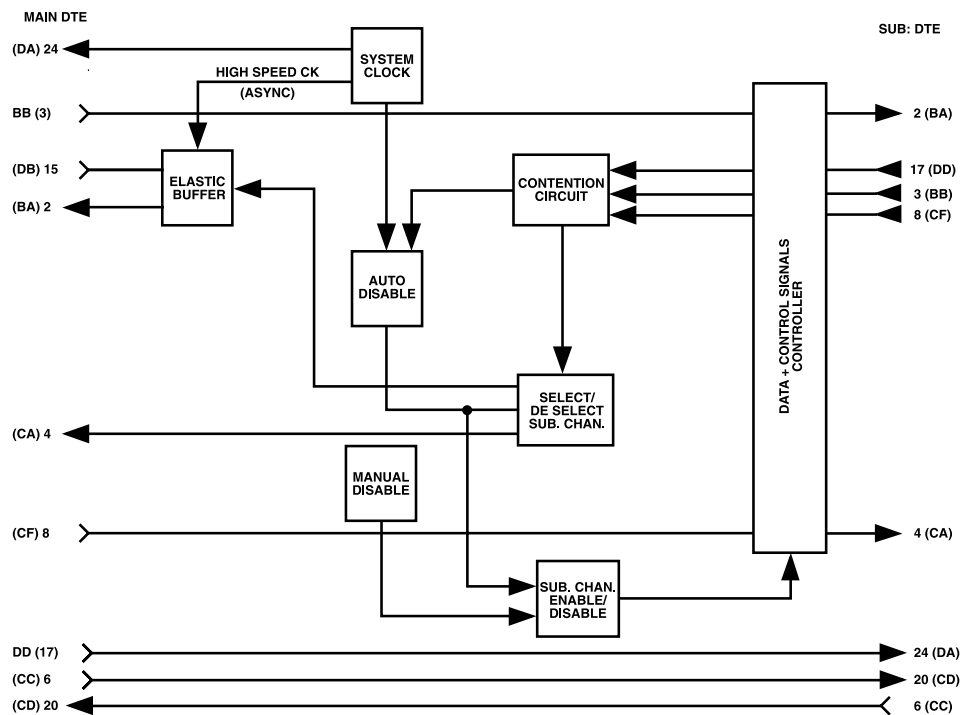


Figure 7. Main Channel DTE with Sub-Channel DTE.

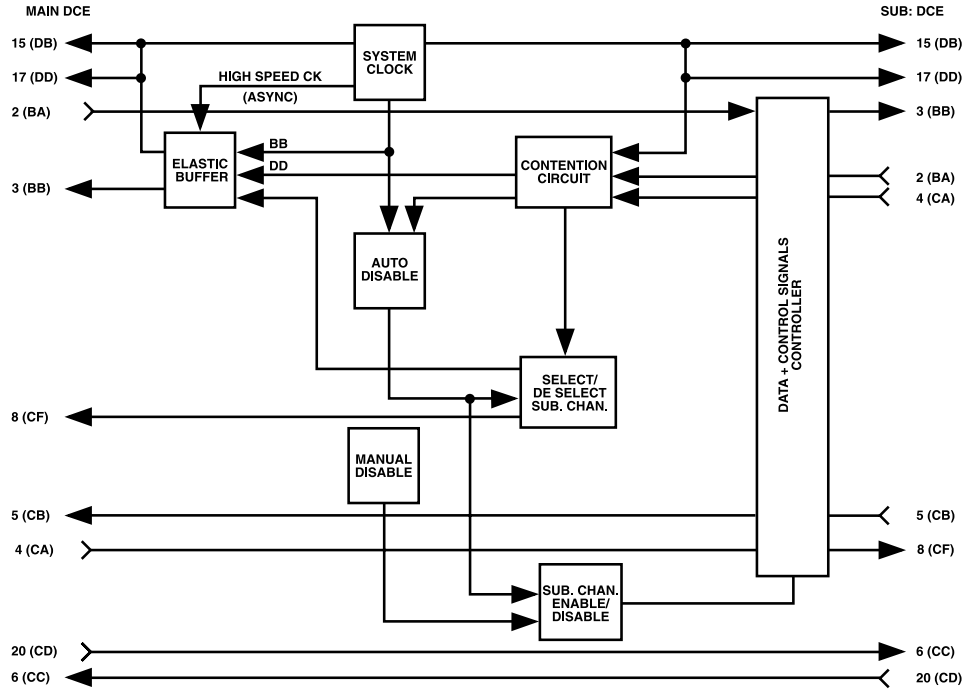


Figure 8. Main Channel DCE with Sub-Channel DCE.

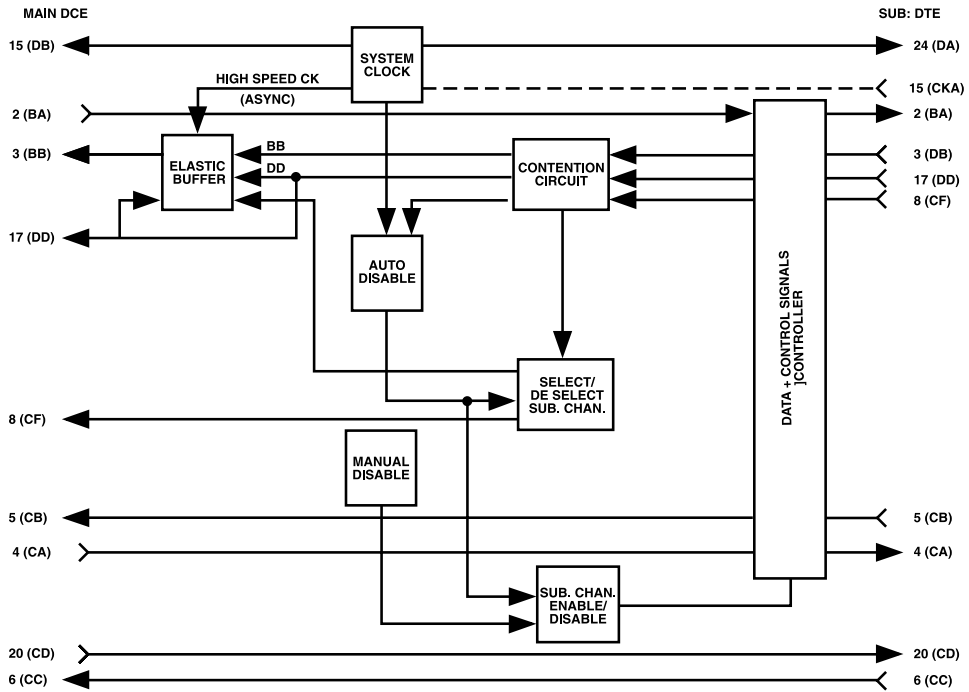


Figure 9. Main Channel DCE with Sub-Channel DTE.





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