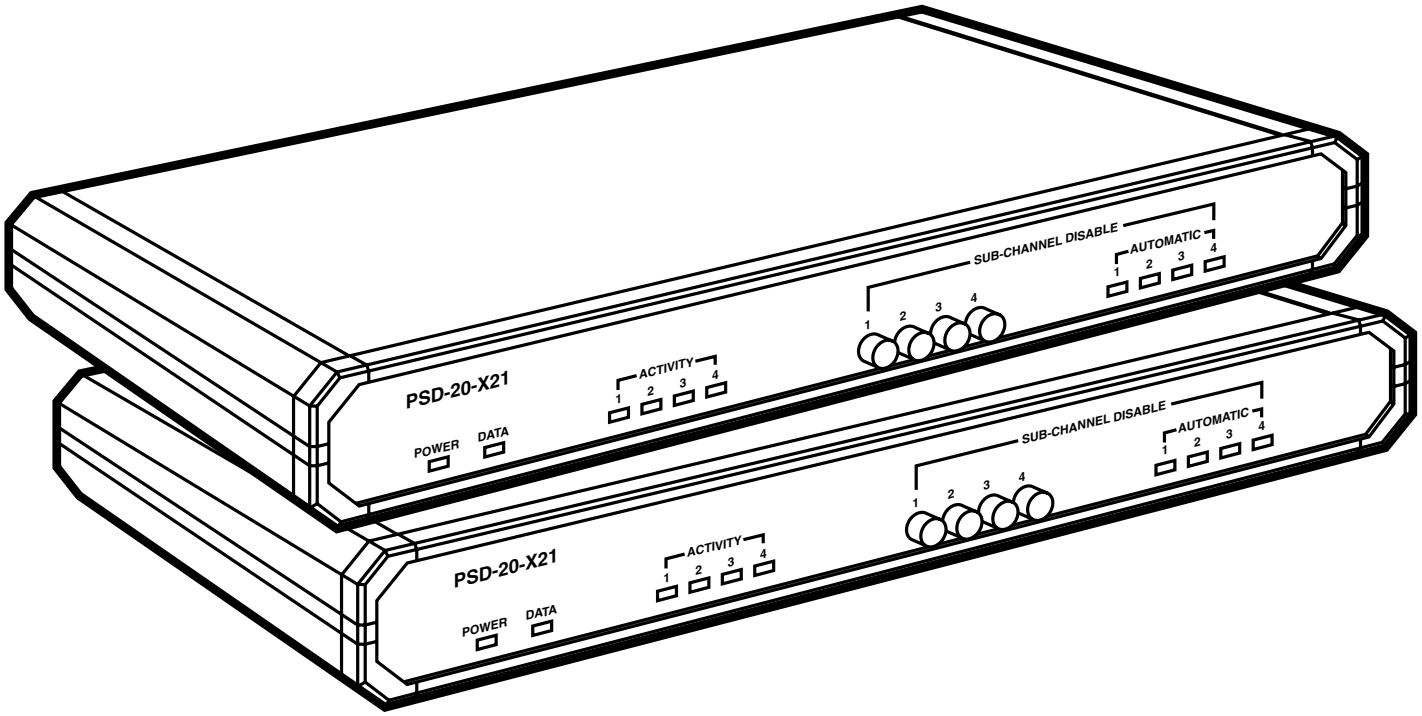
BLACK BOX®
NETWORK SERVICES

SEPTEMBER 1999
TL571A
TLF9521-R2

V.35 Data Sharer Plus
PSD-20-X21



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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.

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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.
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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.
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11. El aparato eléctrico deberá ser connectado 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 fisica y la polarización del equipo no sea eliminada.
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14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
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18. Servicio por personal calificado deberá ser provisto cuando:
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    - B: Objectos 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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The manufacturer shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

DECLARATION OF CONFORMITY

The manufacturer declares that the V.35 Data Sharer Plus and the PSD-20-X21 conform to the following standards:

EMC:	EN 55022 (1994)	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.
	EN 50082-1 (1992)	Electromagnetic compatibility — Generic immunity standards for residential, light commercial, and light industry.
Safety:	EN 60950 (1992/93)	Safety of information technology equipment, including electrical business equipment.

The products herewith comply with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC. The products were tested in a typical configuration.

CE

Contents

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1. Specifications

Compliance — CE, FCC Part 15 Subpart B Class A, IC Class/classe A, UL®, CUL

Input and Output Interface — TL571A: ITU-T V.35;
TLF9521-R2: ITU-T X.21

Protocol — Synchronous

Transmit Clock Source — Internal, external from device on main channel, or external from device on sub-channel 1, user-selectable

Data Rates — Using internal clock: 48 or 64 kbps, user-selectable;
Using external clock from main channel: Determined by clock signal coming from attached device;
Using external clock from sub-channel 1: Determined by clock signal coming from attached device (up to 128 kbps)

Sub-Channel Configuration — Four, arranged by priority from 1 (lowest) to 4 (highest)

Sub-Channel Selection — When contention is set to CONTROL: When control signal (RTS or DCD for TL571A, CONTROL or INDICATION for TL9521-R2) goes high;
When contention is set to DATA: On data transitions (switches to the highest-priority port trying to send data)

Sub-Channel Deselection — When contention is set to CONTROL: When control signal (RTS or DCD for TL571A, CONTROL or INDICATION for TL9521-R2) goes low;
When contention is set to DATA: 16 bits of idle data

Sub-Channel Disabling — Manual: Using front-panel switches;
Automatic: If sub-channel stays connected for longer than a preset time period (32.4, 4, or 0.5 sec.)

User Controls — (4) Front-mounted DISABLE pushbutton switches, one for each sub-channel;
(1) Rear-mounted ON/OFF rocker switch;
(1) Rear-mounted 110/220-VAC selection screwdial

Indicators — (10) Front-mounted LEDs: (1) DATA, (1) POWER, (4) ACTIVITY (one for each sub-channel), (4) AUTOMATIC (one for each sub-channel)

Connectors — TL571A: (5) Rear-mounted M/34 female;
TLF9521-R2: (5) Rear-mounted DB15 female

Power —	From utility-power (mains) outlet through detachable power cord and rear-mounted IEC 320 inlet: 110 or 220 VAC (user-selectable, default is 110 VAC) ±10%, 47to 63 Hz; Consumption: 10 W
Fuse —	0.4-amp slow-blow
MTBF —	121,770 hours
Operating Temperature —	32 to 122°F (0 to 50°C)
Humidity Tolerance —	10 to 90%, noncondensing
Size —	1.8"H (1U) x 17"W x 8.2"D (4.4 x 43.1 x 20.8 cm)
Weight —	4.4 lb. (2 kg)

2. Introduction

Despite their different names and product codes, the V.35 Data Sharer Plus (product code TL571A) and the PSD-20-X21 (product code TL9521-R2) are two versions of the same product: The V.35 Data Sharer Plus is for V.35 applications, while the PSD-20-X.21 is for X.21 applications. They both enable up to four high-speed modems, terminals, or controllers to share a master modem, a multiplexor, or a computer port in a multipoint environment. They are compatible with synchronous V.35/X.21 equipment at data rates of 48 or 64 kbps. (Versions that use 56 kbps instead are available on a special-quote basis.)

The main channel of "the Sharer" (as we'll call both of these products throughout the rest of this manual) transmits information to all sub-channels in parallel. Sub-channels contend to transmit to the main channel by activating RTS/DCD (V.35) or CONTROL/INDICATION (X.21) or by transmitting data (strap-selectable). If the control signal or sub-channel data is active, the data and control signals of the sub-channels are connected to the main channel. When the control signal drops or data transmission stops, the control circuitry is switched to monitor other sub-channels. A sub-channel is disconnected immediately after it drops the control signal or transmits 16 idle bits.

A sub-channel can be automatically disabled if it stays active for longer than a preset time, blocking all other sub-channels (streaming). The automatic disable resets itself as soon as the sub-channel control signal drops or transmits 16 idle bits. An indicator on the front panel will light for each sub-channel that is disabled by automatic circuitry. Manual disabling of a sub-channel is also possible via a front-panel button.

Three clock modes are supported:

1. Internal
2. External from the main channel
3. External from sub-channel 1

A built-in buffer overcomes phase differences between the clocks of modems connected to the sub-channels and the Data Sharer's main-channel transmit clock.

NOTE

V.35 Data Sharer Plus (TL571A) *only*: An additional buffer option is available as a special quote. This buffer is required when the equipment connected to more than one sub-channel must provide a clock and is unable to accept an external clock. Examples are DDS in the United States, any digital service in other countries, or modems that cannot be set to an external clock. This buffer compensates for phase differences between the clocks of the modems connected to the sub-channel and the clock of the V.35 Data Sharer Plus. For additional information on this buffer option, see Table 3-1.

It's simple to install and configure the Sharer. Minimal strapping adjustments allow for easy installation and operation. A DCE/DTE switch for the main channel and each sub-channel eliminates the need for crossover cables. Only straight-through cables are used to connect the modems or terminals to the Sharer.

The Sharer is a desktop unit, with special hardware available for mounting it in a 19-inch rack.

3. Configuration and Installation

3.1 Package Contents

You should have received one V.35 Data Sharer Plus or PSD-20-X21, this user's manual, and one set of rackmount ears.

3.2 Site Preparation

The Sharer must be installed within 5 feet (1.5 m) of a grounded AC outlet, and within 50 feet (15 m) of the associated data terminals or modems.

Allow at least 36 inches (90 cm) of frontal clearance for operating and maintenance accessibility. Make sure that there is a minimum of 4 inches (10 cm) of clearance behind the unit for power and interface cables.

3.3 Description

The Sharer is designed for placement on a tabletop, or for mounting in a 19-inch rack. It is equipped with special brackets already assembled for mounting. These brackets can be easily removed, as described below.

1) Disconnect the power cord.
2) Unfasten the rear-panel screw and slide back the top cover.
3) Unfasten the two screws from the bracket and remove the single bolt.

3.4 Electrical Installation

3.4.1 AC Power

AC power is supplied to the Sharer through a 5-foot (1.5-m) cord terminated with a grounded 3-prong plug. The AC cord is fused at the rear panel of the unit. A 0.4-amp slow-blow fuse is required.

3.4.2 Rear Panel

Six connectors are located on the rear panel of the Sharer, consisting of five channel connectors (four for the sub-channels and one for the main channel) and one IEC 320 power connector, which also includes the fuse holder. On the V.35 Data Sharer Plus, the five channel connectors are M/34 (34-pin M-block) female connectors; on the PSD-20-X21, they are DB15 female connectors. An ON/OFF power switch and a 110/220-VAC selection screwdial are also located also on the rear panel (see Figures 3-1 and 3-2). *The factory-default voltage is 110 VAC; 220-VAC users must change the voltage-dial setting.*

3.4.3 Internal Switches and Strap Selection

The internal switches and straps on the Sharer should be configured to meet system requirements. In order to change the settings of these controls, take these steps:

1) *Very important:* Turn the Sharer OFF and disconnect its AC power cable.
2) Loosen the two screws on the rear panel that secure the Sharer's top cover in place, then slide back the cover.
3) Identify the straps according to Table 3-1 and Figures 3-3 and 3-4.
4) Set the straps/switches to your desired positions.
5) Reinstall the top cover.

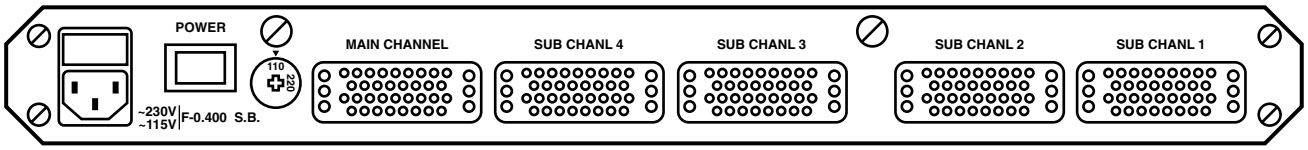

Figure 3-1. Rear panel of the V.35 Data Sharer Plus.

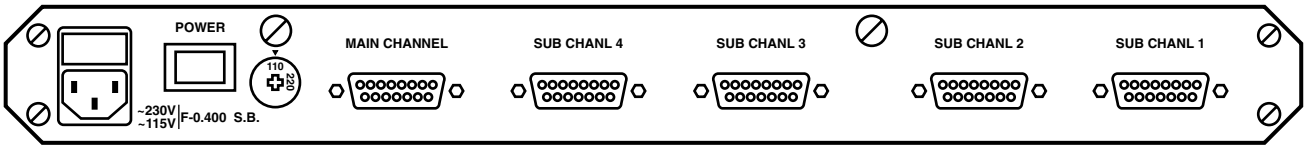

Figure 3-2. Rear panel of the PSD-20-X21.

Table 3-1. PC Board Switch and Strap Selection

Strap Identity	Function	Possible Settings	Standard Factory Setting
Main DCE/DTE Switch(es)	Determine the Sharer's main-channel interface as DTE (straight connection to modem) or as DCE (straight connection to computer or terminal). Note; For V.35, the three switches for the main channel should be set to the same position.	DTE or DCE	DTE
Sub-channels 1–4 DCE/DTE Switches (one switch or switch set for each sub-channel)	Determines the Sharer's sub-channel interface as DTE or DCE. Note: For V.35, the three switches for each sub-channel should be set to the same position.	DTE or DCE	DTE
Data Rate	Selects the Sharer's internal data rate or external clock from sub-channel 1 (CLK-1). Note: When you use CLK-1 mode, the main channel cannot be connected to a modem using its own internal clock.	48 or 64 kbps or CLK-1	64 kbps
Contention	Determines sub-channel selection and deselection.	RTS/CONTROL or DATA	RTS/CONTROL
C/I to Sub-channel (X.21 only)	Determines whether C/I signal output to the sub-channels follows the input from the main channel or is always ON.	MAIN CHANNEL or ON	MAIN CHANNEL
C/I to Main (X.21 only)	Determines whether C/I signal output to the main channel follows the input from the sub-channels or is always ON.	SUB-CHANNEL or ON	SUB-CHANNEL
Time Out	Selects (or disables) the timeout period after which a streaming sub-channel is automatically disabled.	32.4, 4, or 0.5 sec. or DISABLE	32.4 seconds
Chassis GND	The CONNECT setting connects signal ground to chassis ground. The DISCONNECT setting isolates them from each other.	CONNECT or DISCONNECT	DISCONNECT
Extra Buffer (special order, V.35 only)	Activates or deactivates the extra buffer. The switch controls four sub-channels.	ON or OFF	OFF

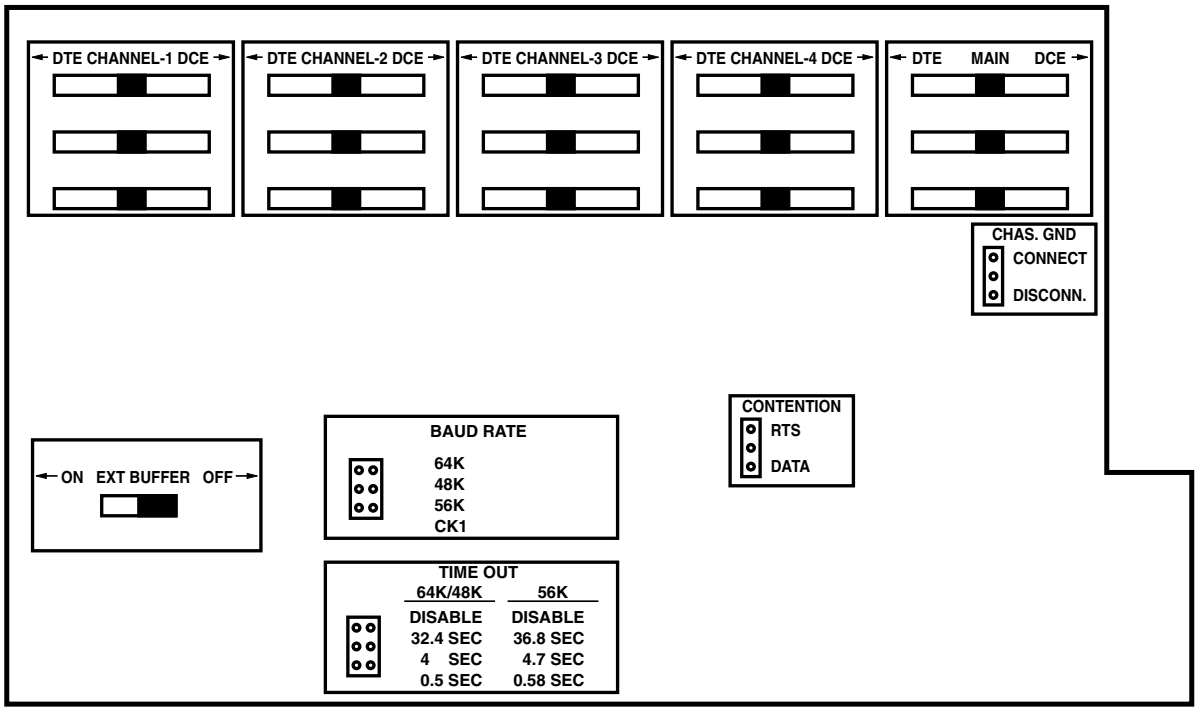

Figure 3-3. PCB layout for the V.35 Data Sharer Plus.

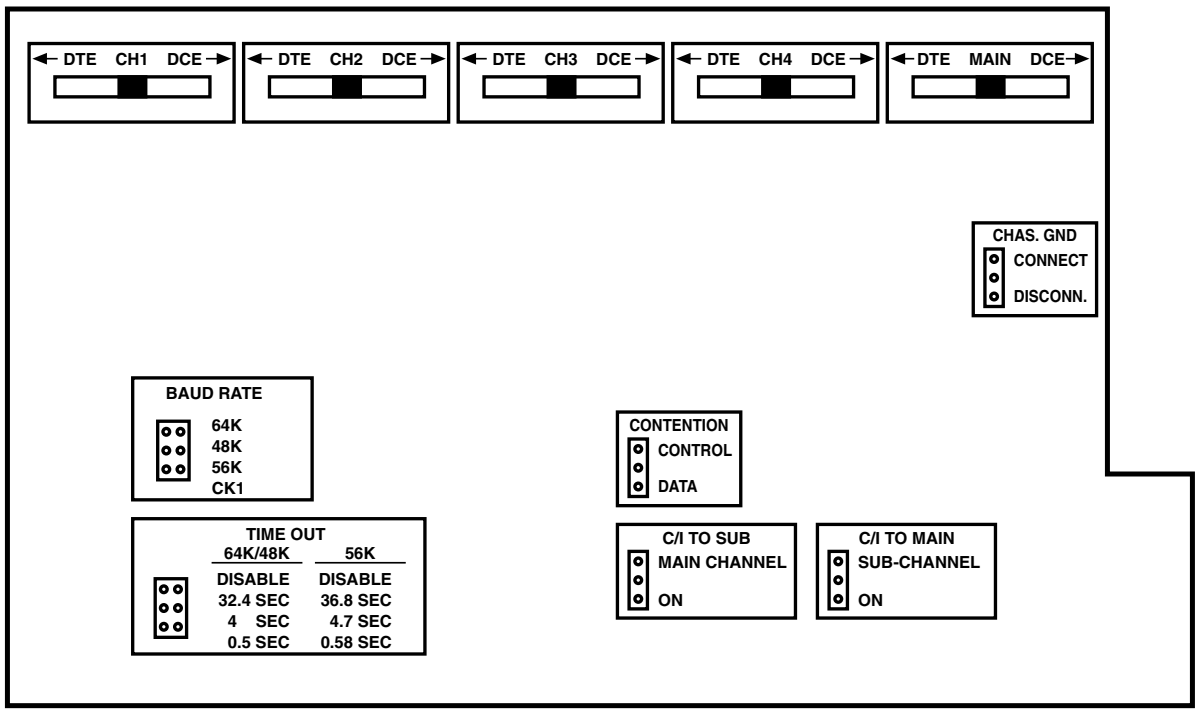

Figure 3-4. PCB layout for the PSD-20-X21.

3.5 System Synchronization and Clock Distribution for the V.35 Data Sharer Plus (TL571A)

Three alternatives are available for synchronization of the V.35 Data Sharer Plus's system:

1. Main-channel modem's timing signals (see **Section 3.5.1**).
2. Sharer's internal clock (see **Section 3.5.2**).
3. Sub-channel 1 modem's timing signals (see **Section 3.5.3**).

3.5.1 Synchronization on Main-Channel Modem's Clock

1. Main-channel modem is strapped to internal clock.
2. DCEs attached to sub-channels are strapped to external clock.
3. Sharer's data-rate setting is ignored (data rate is determined by main-channel modem's clock).

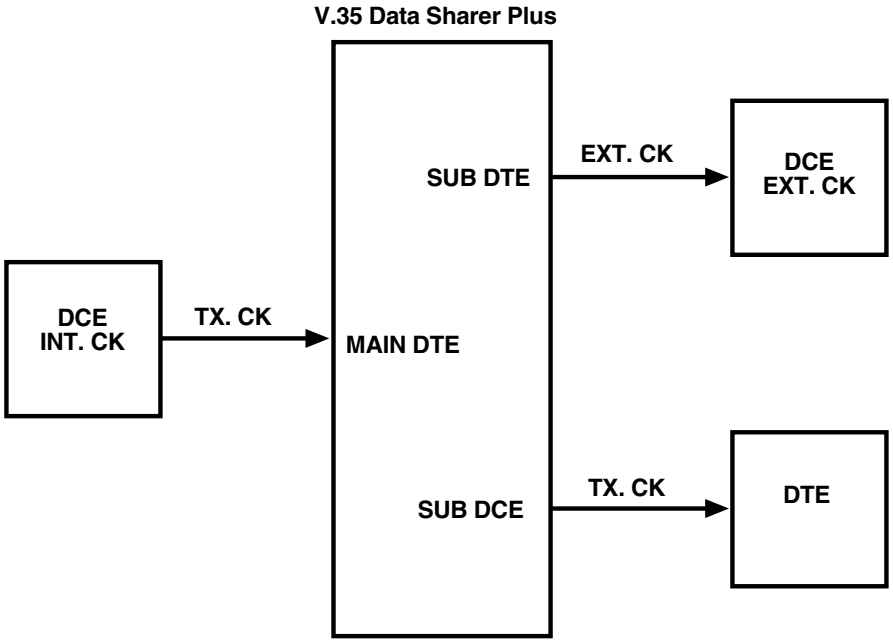

Figure 3-5. Synchronization on main-channel modem's clock.

3.5.2 Synchronization on Sharer's Internal Clock

1. Sharer's data rate should be strapped to the required speed.
2. DCEs attached to sub-channels should be strapped to external clock.
3. DCE attached to main channel should be strapped to external clock.

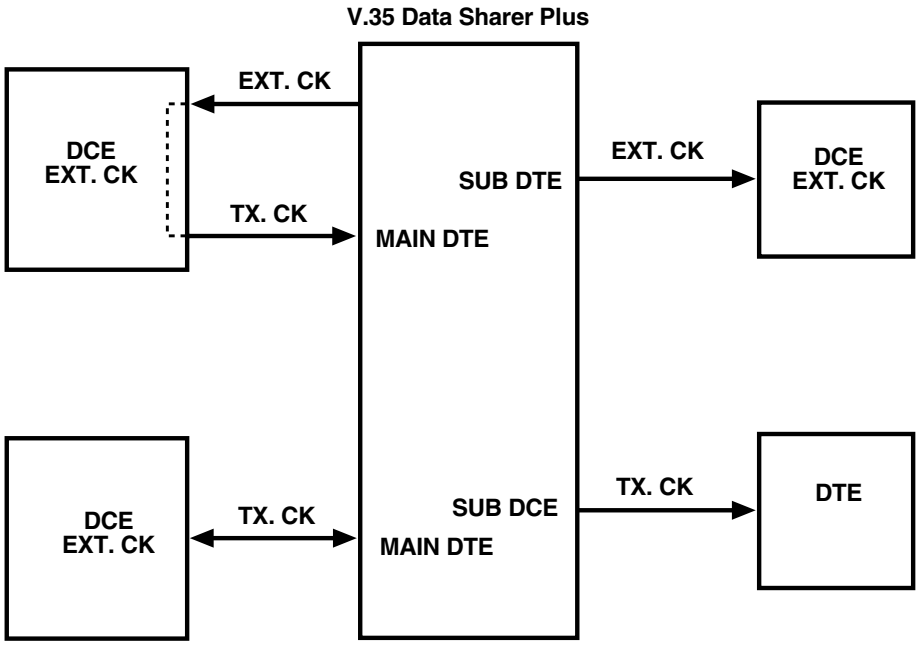

Figure 3-5. Synchronization on internal clock.

3.5.3 Synchronization on Sub-Channel 1's Clock

1. Sharer's data rate should be strapped to CLK-1.
2. DCE attached to main channel should be strapped to external clock.
3. DCEs attached to sub-channel 1 should be strapped to internal clock or receive clock.

NOTE

Synchronization on sub-channel 1 is not recommended when the modem connected to sub-channel 1 operates in switched carrier mode, as it causes fluctuations in clock frequency and phase.

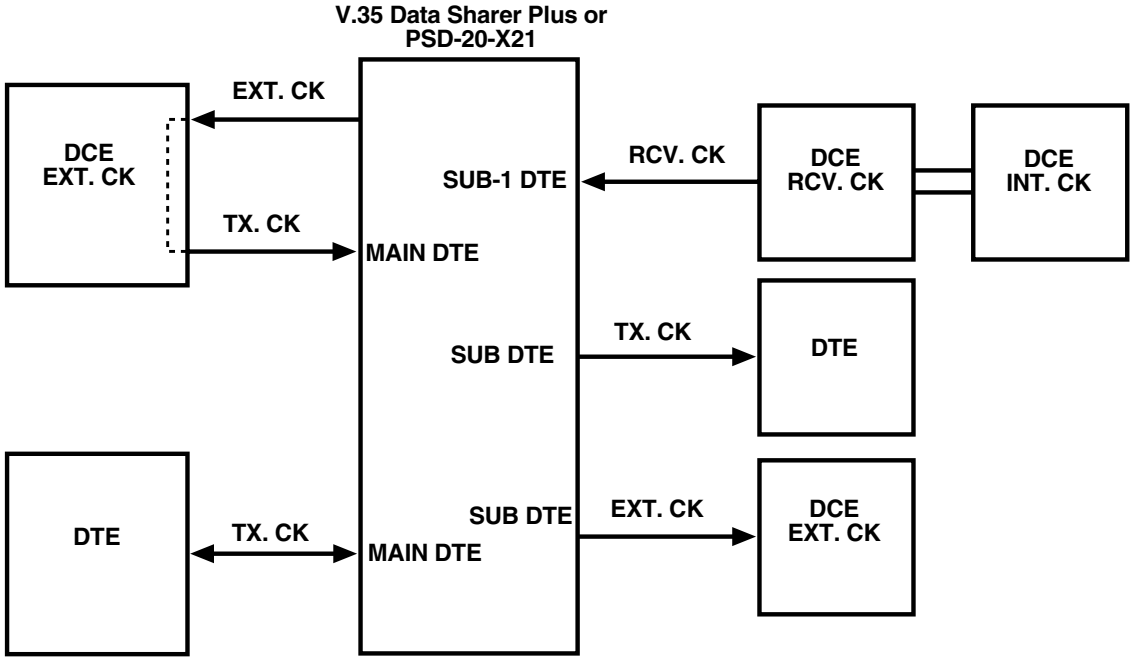

Figure 3-6. Synchronization on sub-channel 1.

NOTE

There is one other alternative available for synchronization of the system: an external clock for more than one sub-channel. This option requires an additional buffer option, which is only available as a special order.

This option enables connection of more than one sub-channel to the line from the P.T.T. service (phone company). Generally, the P.T.T. modems supply clock to every line—that is, the P.T.T. has to provide the clock. Since the modems are all from the same service, the clocks are synchronized. The external buffer will compensate for phase differences between the clocks received from the sub-channels. However, the external buffer option will not compensate for the clock differences, if different clock sources are used.

3.6 System Synchronization and Clock Distribution for the PSD-20-X21 (TLF9521-R2)

The X.21 standard states that DCEs and DTEs will only have one clock signal (signal timing). The direction of this clock is always from the DCE to DTE. This signal timing is used for the transmit clock and receive clock. According to this standard, four alternatives are available for the synchronization of the system when working with the PSD-20-X21:

1. Main channel is DTE (attached to a modem). See **Section 3.6.1**.
2. Main and all sub-channels are DCE (attached to terminals or computer ports). See **Section 3.6.2**.
3. Main channel is DCE (attached to a terminal or computer port) and all sub-channels are DTE (attached to modems). See **Section 3.6.3**.
4. Main channel is DCE and sub-channels are mixed (DTEs and DCEs). See **Section 3.6.4**.

Note, however, that when any channel (main channel or sub-channel) is set to DTE, the PSD-20-X21 can supply external clock to the attached DCE on Pins 7 and 14. (This is proprietary rather than standard X.21, but it can be very useful if you attach any DCEs that also support this feature, such as the LDM-MR Line Driver Card—our product code ME445C-X21.)

3.6.1 If Main Channel is DTE (Attached to a Modem)

In this mode the PSD-20-X21 operates according to the signal timing of the main-channel modem's clock. DTEs attached to the PSD-20-X21 sub-channels are synchronized to the main-channel clock. DCEs attached to sub-channels are synchronized on their own signal timing. A special buffer in the PSD-20-X21 compensates for the phase difference between the clocks of the modems on the sub-channels and the main-channel modem.

3.6.2 If Main Channel and All Sub-Channels are DCE (Attached to DTEs)

In this mode the PSD-20-X21 itself provides the clock to all ports attached to the main and sub-channels. The PSD-20-X21's data rate should be strapped to the appropriate system data rate.

3.6.3 If Main Channel is DCE (Attached to a DTE) and All Sub-Channels are DTE (Attached to Modems)

In this mode the PSD-20-X21's data rate is strapped to CLK-1. The DTE attached to the main channel is synchronized to the PSD-20-X21's clock. The modems attached to sub-channels 2, 3, and 4 should be strapped to external clock, while the modem attached to sub-channel 1 should be strapped to internal clock.

NOTE

It is also possible to work with the PSD-20-X21's internal clock in this mode, but we recommend that you use CLK-1.

3.6.4 If Main Channel is DCE and Sub-Channels are Mixed (DTE and DCE)

In this mode one of the modems attached to the sub-channels (configured as DTE) should be attached to sub-channel 1, and the PSD-20-X21's data rate should be strapped to CLK-1. The DTEs attached to the main channel and sub-channels are synchronized to the PSD-20-X21's clock; the modems attached to the sub-channels are synchronized to their own clocks; and the internal buffer compensates for the phase difference between the clocks of the modem on sub-channel 1 and the rest of the modems.

NOTE

It is also possible to work with the PSD-20-X21's internal clock in this mode, but we recommend that you use CLK-1.

4. Operation

NOTES

The installation procedures described in *Chapter 3* must be completed and checked before attempting operation.

For an explanation of all of the Sharer's possible system-installation types, refer to *Appendix A*.

4.1 Controls and Indicators

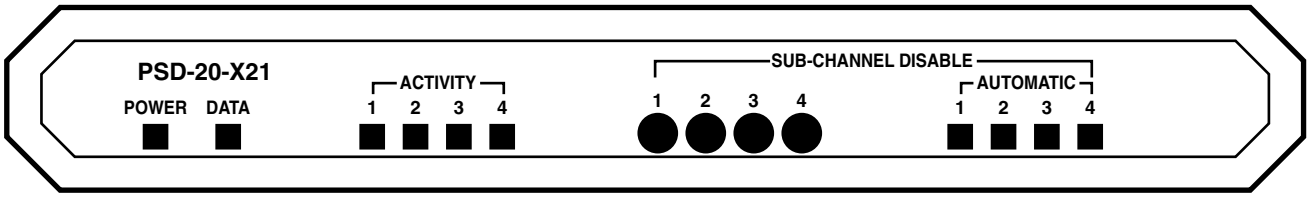

Figure 4-1. The front panel.

Three controls and ten indicators are located on the front panels of the V.35 Data Sharer Plus and the PSD-20-X21. Their functions (and the functions of the rear-panel controls) are described in Tables 4-1 and 4-2.

Table 4-1. Control Functions

Control	Location	Function
Power switch (with lamp) ON/OFF	Rear Panel	Turns AC power ON or OFF.
110/220 VAC Selector	Rear Panel	Selects main power source: 110 or 220 VAC.
Four manual DISABLE buttons	Front Panel	Manually deactivate sub-channels connected to defective terminals or modems. When a button is pressed in, that sub-channel is disabled.

Table 4-2. Indicator Functions

Indicator	Function
Power	Green LED is ON when power is present and the DC power supply is OK.
Data (for main channel activity)	Yellow LED flickers in response to XMT data on the main channel.
Activity 1–4	Four yellow LEDs flicker in response to sub-channels' XMT data.
Automatic Disable 1–4	Four red LEDs light when the corresponding sub-channel has been automatically disabled (after preset timeout—see "Time Out" in Table 3-1).

4.2 Operating Procedures

WARNING!

Before plugging in the Sharer, the protective ground (earth) terminals must be connected to the protective conductor of the (mains) power cord. The mains plug should only be inserted in a socket outlet provided with a protective ground (earth) contact. The protective action must not be negated by use of an extension cord (power cable) without a protective conductor (grounding).

Make sure that only fuses with the required rated current and of the specified type (slow blow, 0.4-A) are used for replacement. The use of repaired fuses, and the short-circuiting of fuse holders, must be avoided.

Whenever it is likely that the protection offered by fuses has been impaired, the Sharer must be made inoperative and secured against unintended operation.

With the unit power turned on, operating personnel are not exposed to voltages in excess of 30 volts on any I/O pin, provided that the equipment connected to the Sharer is safe. You should still take all available precautions against shock, however.

4.2.1 Turning On the Power

1) Making sure that the Sharer's power switch is set to OFF, set the 110/230 selector screwdial (located on the rear panel) to the main AC voltage used in your country. The white arrow should point to the correct main voltage; the default setting is for 110 VAC.

2) Apply AC power: Connect the Sharer's power cord to the IEC 320 inlet on its rear panel, then plug the power cord into an AC source.

3) Turn the Sharer's rear-mounted power switch ON. The power switch should light up, indicating that the Sharer is receiving power; the power LED on the front panel should also light, indicating that the internal power supply is okay.

4.2.2 Operation

The Sharer operates unattended, unless the user needs to manually disable one or more of its sub-channels.

4.2.3 Turning Off the Power

To turn off the AC power to the Sharer, simply switch off the power switch.

4.3 Reconfiguring

If it becomes necessary to reconfigure the Sharer for a different type of operation, the internal straps must be changed to correspond to the new operating mode. For guidance in repositioning the straps, refer to **Chapter 3**.

CAUTION!

Do not open the top cover for strap changes before removing the AC power from the unit.

5. Troubleshooting

WARNING!

These service instructions should be used by qualified personnel only. To avoid shock, do not perform any servicing other than that outlined in the operating instructions, unless you are qualified to do so.

5.1 Problems with the Power Supply

If AC power has been applied to the Sharer but the green power LED does not light up, check these possibilities:

1. Verify that the 110/220 selector dial is set for the proper voltage.
2. Verify that the power-switch light is on.
3. Unplug the power cord and then pull out the fuse (located above the Sharer's power inlet). Check the fuse and replace it if necessary (0.4-A slow-blow).
4. Remove the top cover of the unit and check that the internal 5-pin power connector (connecting the secondary wires of the transformer to the main card) is connected properly.

5.2 Other Problems

If the Power LED is ON but the Sharer is not functioning in the system:

1. Unplug the Sharer's power cord, turn the unit OFF, and remove the unit's top cover.
2. Verify that all the DCE/DTE switches are set according to the data-system requirements. (In the V.35 Data Sharer Plus, make sure that the main channel's and sub-channels' sets of three switches are all set to the same position.)
3. Verify that the strap settings are correct.
4. **Exercise caution:** Check the three large LSI chips (marked RJ-006); if any of them have become unseated, *very carefully* reseat them in their sockets.
5. Close the unit back up, plug it in, and turn it on. If it still fails to operate properly, call Black Box for technical support as directed in the next section.

5.3 Calling Black Box

If you determine that your Sharer is malfunctioning, *do not attempt to alter or repair the unit.* It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.
- the results of any testing you've already done.

5.4 Shipping and Packaging

If you need to transport or ship your Sharer:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Sharer for repair, make sure you include its power cord. If you are returning the Sharer, make sure you include everything you received with it. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Appendix A: Theory of Operation and Applications

A.1 Contention

Sub-channels contend for access to the main channel for data transmission by either:

- Raising RTS or DCD (the V.35 Request to Send or Data Carrier Detect signal, on the V.35 Data Sharer Plus) or C or I (the X.21 CONTROL or INDICATION signal, on the PSD-20-X21), or
- Sending data.

When sub-channels are selected and active, their data and timing signals pass through the contention circuit and the SELECT/DESELECT circuit of the sub-channels to the elastic buffer, where data is clocked in and out of the main channel.

If the Sharer is strapped for data contention, when it detects a continuous mark, the SELECT/DESELECT circuit breaks the data path of the active sub-channel. It then selects another sub-channel and resets the buffer. Otherwise the sub-channel will remain connected until RTS/DCD or C/I goes low.

A.2 Disabling Sub-Channels

Manual or automatic disabling of streaming sub-channels is possible. If the sub-channel is DTE (connected to a modem) the Sharer drops RTS (V.35) or CONTROL (X.21); if the sub-channel is DCE (connected to a computer or terminal), the Sharer drops DCD and CTS (V.35) or INDICATION (X.21). In addition, the Sharer will stop transmitting data to the sub-channel, and will ignore any data received from it.

A.2.1 Manual Disabling

Manual disabling is activated by four pushbutton switches on the Sharer's front panel, one for each sub-channel. Disable a sub-channel by pressing the appropriate switch. The sub-channel will remain inactive until the switch is released by pressing it again.

A.2.2 Automatic Disabling

A streaming sub-channel is disabled automatically if it has stayed active for longer than a preset period of time, thereby blocking all other sub-channels. The timer resets itself each time RTS/DCD or data (in data contention mode) drops. You can select one of three different time delays, or you can simply disable the timeout function itself, as indicated on the PCB (see Table 3-1).

A.3 Control Signals

Sub-channel control signals are combined to provide a composite signal to the main channel. Control signals from the main channel are passed to all sub-channels in parallel.

A.3.1 Main-Channel Control Signals

V.35:

RTS (DCD):
In RTS/DCD-contention mode—Follows RTS (DCD) of the selected sub-channel.
In data-contention mode—"ON" if RTS (DCD) of one of the sub-channels 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" (which enables connection of dial-up modems to the Sharer).

DSR (DTR):
"ON" if DTR (DSR) of one of the sub-channels is "ON."

X.21:

C/I (CONTROL/INDICATION):
Depends on the contention mode and the setting of the Sharer's "C/I to MAIN" jumper:

- If the "C/I to MAIN" jumper is selected for the "sub-channel" state, and the contention mode is "data," then the C/I signal to the main channel is "ON" only if the C/I of one of the sub-channels is "ON".
- If "C/I to MAIN" jumper is in the "ON" state, then the C/I signal to the main channel is always "ON", regardless of the contention mode.

A.3.2 Sub-Channel Control Signals

V.35:

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

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

DSR (DTR): Follows the main channel DSR (DTR).

X.21:

C/I (CONTROL/INDICATION):
Depends on the setting of the Sharer's "C/I to Sub-channel" jumper:

- If the "C/I to Sub-channel" jumper is set to "MAIN CHANNEL," the C/I signal to the sub-channel follows the main channel's C/I (unless the sub-channel is disabled, in which case the C/I to it is OFF).
- If the "C/I to Sub-channel" jumper is set to "ON," all of the sub-channels' C/I signals are always ON irrespective of the main channel C/I.

A.4 Block Diagrams

Figures A-1 through A-4 on the next two pages show how the circuitry of the Sharer operates differently depending on whether its ports are set to DTE or DCE.

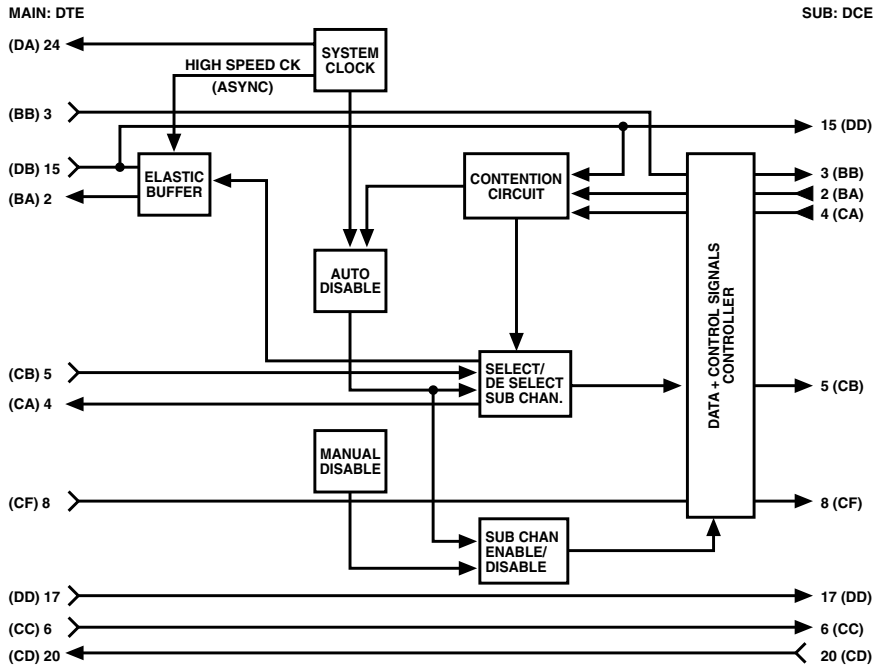

Figure A-1. Main channel DTE with sub-channel DCE.

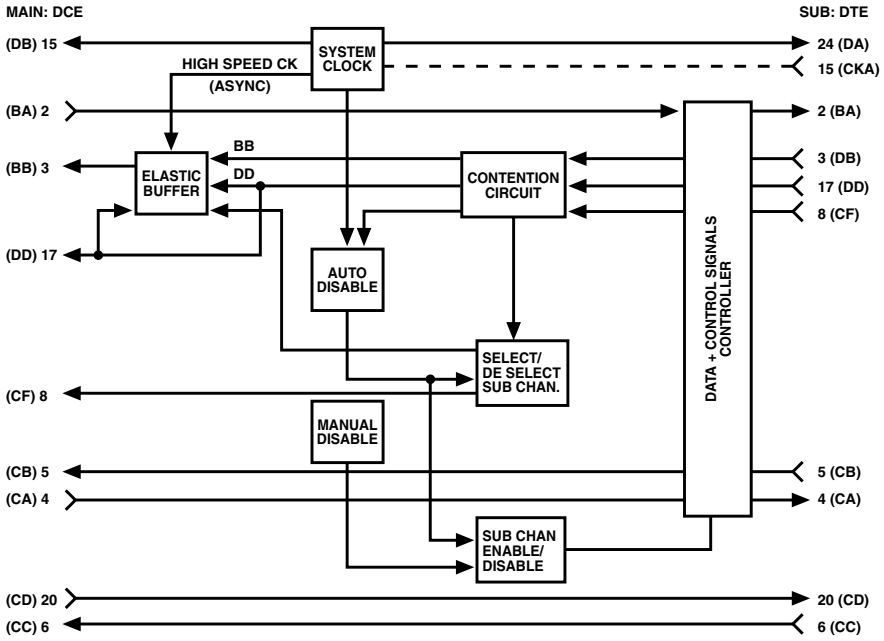

Figure A-2. Main channel DCE with sub-channel DTE.

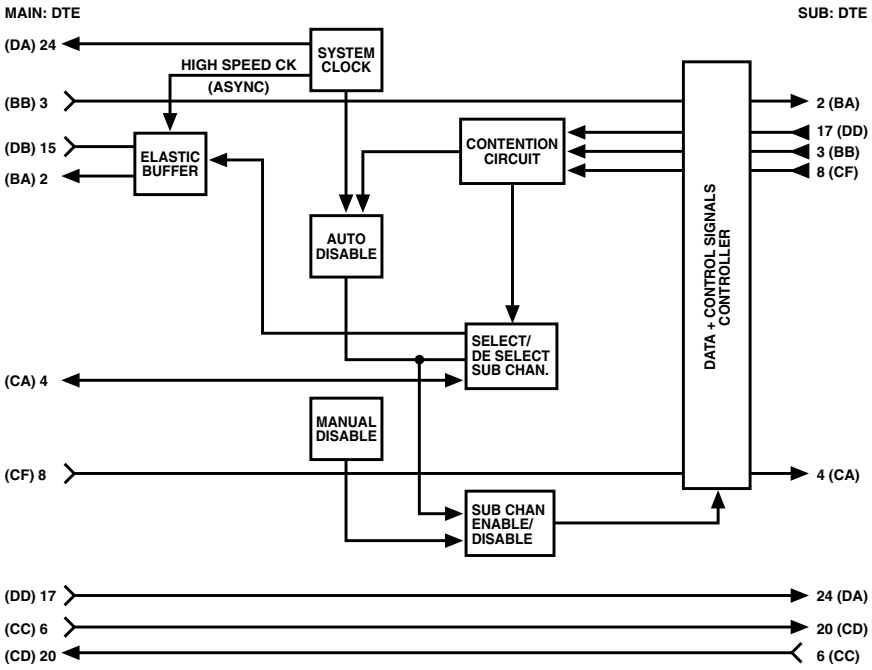

Figure A-3. Main channel DTE with sub-channel DTE.

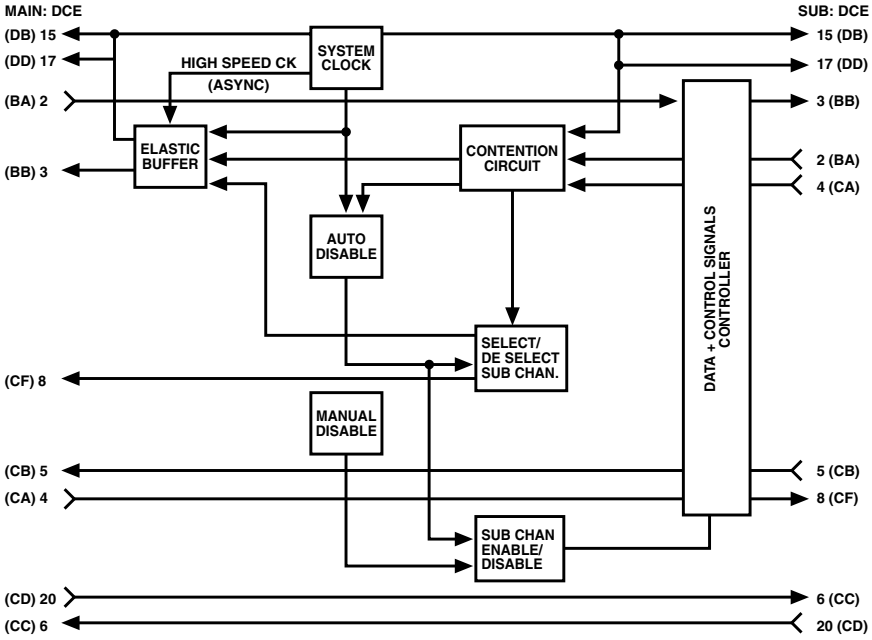

Figure A-4. Main channel DCE with sub-channel DCE.

A.5 Applications

The Sharer operates in one of six modes: modem sharing, port sharing, remote port sharing, local port sharing, mixed modem sharing, and mixed port sharing. System configurations incorporating the Sharer in each operating mode are shown in Figure A-5.

Take into consideration when configuring a Sharer system that the rates of the sub-channel and main-channel modems and/or host ports must be equal to the data rate strapped within the Sharer.

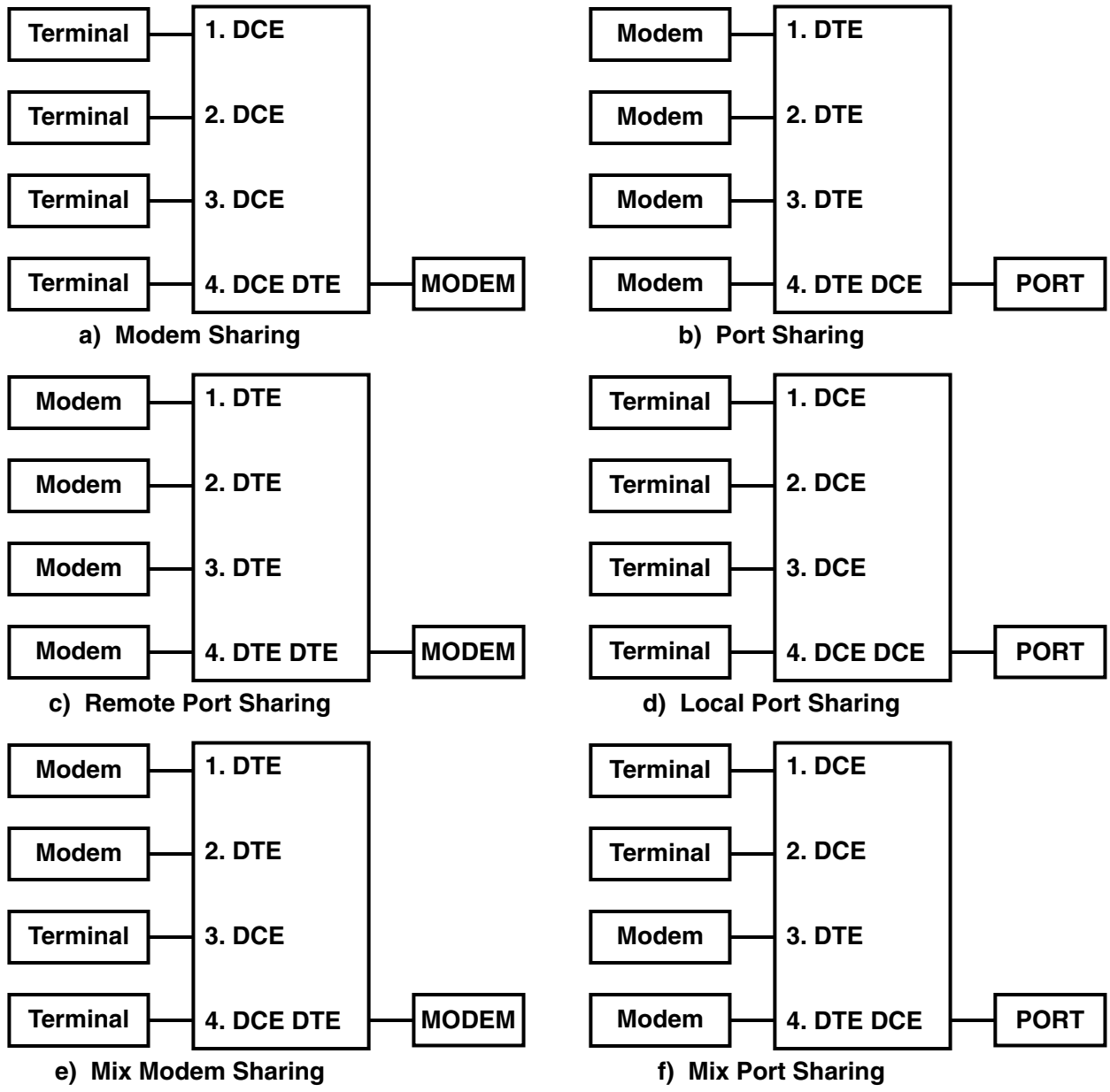

Figure A-5. Sharer operating modes.

Appendix B: V.35 Pinout

Signal Function	M/34 Pin	Abbreviation	Circuit
Protective Ground	A	FGND	101
Signal Ground	B	SGND	102
Transmitted Data	S	TD(B)	103
	P	TD(A)	103
Received Data	R	RD(A)	104
	T	RD(B)	104
Request to Send	C	RTS	105
Clear to Send	D	CTS	106
Data Set Ready	E	DSR	107
Data Terminal Ready	H	DTR	108
Carrier Detect	F	DCD	109
External Transmit Clock	U	SCTE(A)	113
	W	SCTE(B)	113
Transmit Clock	Y	SCT(A)	114
	a	SCT(B)	114
Receive Clock	X	SCR(A)	115
	V	SCR(B)	115

Appendix C: The X.21 Pinout

DB15 Pin	Signal Abbreviation	Signal Name
1	—	Shield
2	T A	Transmit A
3	C A	Control A
4	R A	Receive A
5	I A	Indication A
6	S A	Signal Timing A
7	—	External Clock A*
8	G	Ground
9	T B	Transmit B
10	C B	Control B
11	R B	Receive B
12	I B	Indication B
13	S B	Signal Timing B
14	—	External Clock B*

*These are not standard X.21 signals, but because X.21 has no provision for external clocking, we substitute these signals for the B A and B B (Byte Timing A and B) signals, which are almost never used.

NOTES

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