SRX Multidrop

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1.   DESCRIPTION

General

The DCB multidrop multiplexer configuration uses an SRX platform at the host location (called HOST) and an SPL platform for remote units (called DROPs). The objective of this multidrop configuration is to provide reasonable performance at the remote sites in those applications where a dedicated line from the host is not cost justified. Using high speed digital multidrop service, many distributed site applications can benefit from this configuration.

Performance

The SRX provides excellent performance for asynchronous interactive terminals when using multidrop digital lines, especially at a composite speed of 128 Kbps. The SRX multidrop is engineered to provide a quarter second or less echo time in typical configurations. This short echo time gives each terminal the appearance of direct connection to its computer port.

Single Host Configuration

The SRX multidrop host multiplexer can have up to 32 ports in increments of 8 ports. Network configuration is set from the front panel LCD display or via the Network Management port. Network configuration (mapping) is determined solely by the host multiplexer. Each host port is mapped internally to a drop port and the host multiplexer handles all translation between host and drop port numbers.

Multiple Host Configuration

The SRX multidrop firmware also allows the host site to expand to more than a single SRX host. Multiple SRX hosts share the line using an MSU-4 modem sharing unit. A maximum of 64 ports is recommended to maintain satisfactory performance.

Configuration Planning

The network configuration must be mapped before the system will operate. If no host port is assigned to a particular drop, that drop is not polled for input. Host ports must be mapped to drop ports before those drop ports become active. For this reason, some amount of planning is necessary before implementing a multidrop network.

The network and port configurations are stored in battery backed RAM to survive power failures. To reset all ports to the factory defaults and clear all local IDs and port mappings, press and hold the OK! switch while pressing RESET.
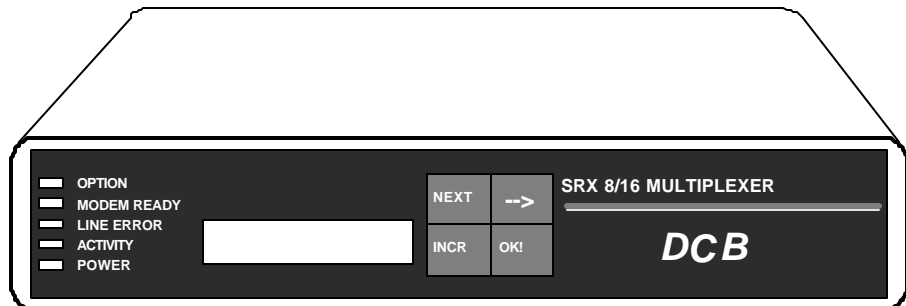
SRX Host Multiplexer, 8 and 16 Channels

2.   SPECIFICATIONS

2.1   Product

2.1.1   Data Ports

      Port Speeds
          Asynchronous only
          300, 1200, 2400, 4800, 9600, 19,200 or 38,400 bps

      Data Format
          10 bits/character, 1 start, 1 stop, 8 data (including parity)

      Interface
          RS-232D, implemented in RJ-45, 8 position connectors

2.1.2   Composite Port

      Speed
          Synchronous to 128 Kbps
          Asynchronous at 1200, 2400, 4800, 9600, 19,200 or 38,400 bps

      Interface
          RS-232D, implemented in RJ-45, 8 position connector

2.2   Environmental

      Operation: 0 to 65° C, 10 to 85% relative humidity
      Storage: -40 to 85° C, 10 to 85% relative humidity

2.3   Physical / Electrical

      10¼" W x 9¾" D x 2½" H - 8 and 16 channel units
      10¼" W x 9¾" D x 4¼" H - 24 and 32 channel units
      120 VAC external power supply
      30 watts, .25 amps

2.4 Network Management Port Commands

Show Configuration
Show ID
Show Map
Show Drop Map
Show Network Configuration
Show Status
Change Configuration
Change ID
Change Map
Change Network Configuration
Change Restart Timer
Activity Counts
Drop Activity
Zero Activity Counts
Flow Control
Test Tools
    Capture Port
    Copy Command
    Show RS232
    Test Message
    Remote Test Loop
    Monitor Port TX
    Monitor Port RX
    NM Parity
    Drop History
    Drop Restart
    Kill Drop
    Suspend Drop
    Poll ALL Drops
    Port Reset
    Reset Mux
Type
Repeat Last Command
Disconnect NMP

3. INSTALLATION

3.1 Unpacking

The following is included with each SRX Multiplexer:

- Multiplexer and external power supply
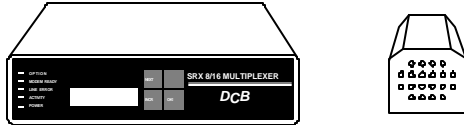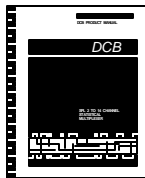

- Cables for connecting a modem or DSU/CSU and a Network Management terminal.

- Manual

- Information regarding warranty, maintenance contracts and repair

If a multiple host system was ordered, additional equipment is supplied.

- Modem Sharing Unit (one for each combination of Host multiplexers up to a recommended total of 64 ports)

- Male to female RS-232 cable (one per MSU)

3.2   Location

Place the multiplexer in a clear area where you can reach the front
panel for setup and the rear panel to connect the cables. The
multiplexer has an external power supply that requires a properly
grounded 120 VAC outlet. The total power cord length is about 12 feet.

3.3   Setup

Setup of the SRX Host Multiplexer can be done using the front panel
controls and LCD display or by using a terminal connected to the
Network Management port. Front panel operation is covered in Section
4, the Network Management port is discussed in Section 5.

3.4   Connections

3.4.1   Single Host

Connection to the host modem or DSU/CSU is made using the supplied
"Modem to Composite" cable. The host modem or DSU/CSU should be
set for constant carrier operation (RTS forced ON). For information
regarding host computer port connections, see Section 6.
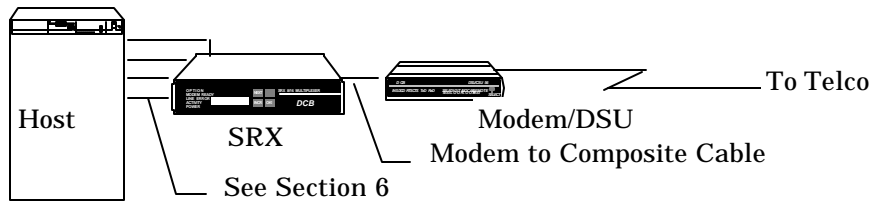
3.4.2   Multiple Host

The multiple host configuration allows more than one host multiplexer to be connected to the multidrop line. This requires a Modem Sharing Unit. The SRX Host multiplexers are connected to the MSU ports using the "Modem to Composite" cable. The MSU is connected to the Modem or DSU/CSU using the male to female RS-232 cable. The modem or DSU/CSU should be set for constant carrier operation (RTS forced ON). For information regarding host computer port connections, see Section 6.
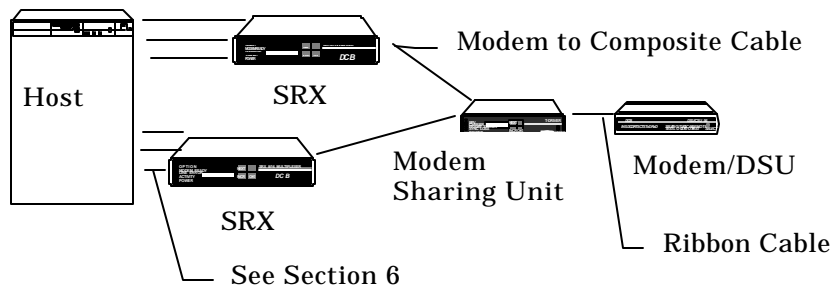

Host

SRX

Modem to Composite Cable

SRX

Modem Sharing Unit

Modem/DSU

Ribbon Cable

See Section 6

3.5   Installation Summary

1. Set the host modem or DSU/CSU for constant carrier operation. (RTS forced ON)

2. Connect the host modem or DSU/CSU to the phone line. If this is a multiple host installation, connect the Modem Sharing Unit composite port to the modem or DSU/CSU.

3. Configure the host SRX multiplexer(s).
   a. Map at least one port to each drop to be installed.
   b. Configure the SRX ports for correct speed, parity and flow control.
   c. Connect the SRX to modem or DSU/CSU using the Modem to Composite cable supplied. If this is a multiple host installation, connect the SRXs to the Modem Sharing Unit.
   d. Connect a properly configured CPU port to each mapped SRX port. See Section 6 for host port cabling information.

4. Go to each remote site and follow the steps in Section 3.5 of the SPL Multidrop manual.

4.   FRONT PANEL CONTROLS AND INDICATORS

4.1   Controls

4.1.1   Keys

The **NEXT** key is used to cycle between top level displays.

The **ARROW** key (→) moves the cursor to the next parameter field.

The **INCR** key is used to cycle through the various options available.

The **OK!** key is pressed to accept the selected value or to enable or disable the selected test.
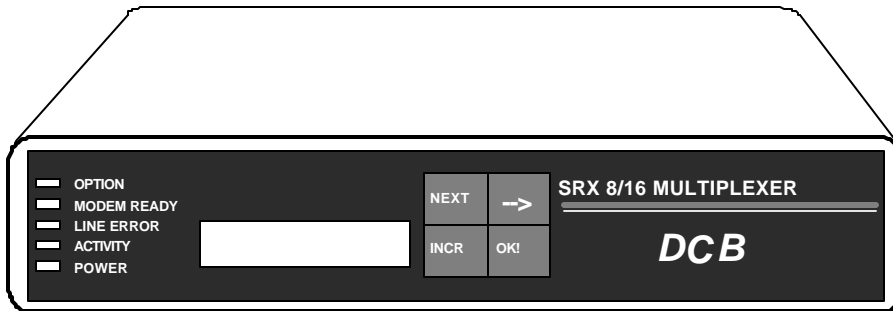
Front Panel Layout

4.1.2   Display Tree

Use the **NEXT** key to go between these displays.

Home
MAP Host Port
Con**FiG**ure (single port)
Con**FiG**ure **All** (ports)
TEST Msg
NETwork (activity)
DRo**P** (activity)
FLOW (port)

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Home Display

The HOME display is the SRX default display. It shows the product name and the number of ports. Pressing the Arrow key will display firmware version information. Press Arrow again to return to the home display.

MAP Host Port

The MAP Host Port screen shows the mapping between the local port numbers and remote port numbers. As each local port is selected, the corresponding remote drop and port numbers are listed on the lower line. If the port is not mapped, dashes (--) will be displayed. Instructions for changing settings are contained in Section 4.1.3.

Configure Port Parameters

The CFG screen selects the port configuration parameters for either local or remote ports one port at a time. Both local and remote configurations are referenced to the local (host) port number. Configurable parameters include port loopback (LP/OFF), flow control and speed.

Configure All Port Parameters

The CFG All screen selects the port configuration parameters for all local or remote ports. Configurable parameters include port loopback, flow control and speed. The default parameters are; loop off, flow control Xon/Xoff, Space parity and 9600 bps.

Test Message

The TEST Msg screen transmits a Quick Brown Fox (QBF) message to any local or remote port. All port numbers refer to local (host) ports. Once the desired port is selected, the OK! key starts the test. A 15 minute timer begins on the far right side of the display. The test continues until any front panel key is pressed or for 15 minutes, whichever happens first.

Network Activity

The NETwork activity display shows the number of data blocks sent and received for all drops. The INCR key toggles this display between the block count and the error count.

Drop Activity

      The DRoP activity display shows the poll/fail counts, the block counts, and the error counts for any active drop. The INCR key selects which drop and count to display. There are three options; Poll/Fail, Blocks, and Errors.

Flow Status

      The FLOW status screen shows the flow control status for each host port. The INCR key changes the host port number. Only mapped ports are displayed.

4.1.3   Operation

      To change a setting, first press the **NEXT** key until you see the desired display. The parameter will be flashing. Press **INCR** to change the parameter. Use the ⊗ key to go to the next parameter. When you have the desired values displayed, press **OK!** to write the change into memory. Press the **NEXT** key again to go to the next screen.

4.2   Indicators

OPTION   Not Used

MODEM READY
    ON   Modem is on line.
    OFF   No DCD from the attached modem.
    FLASHING FAST   Composite link is active but there are ten
                          blocks of data outstanding without a response
                          from the remote multiplexer.
    FLASHING SLOW   Problem with the composite link.

LINE ERROR   Flashes when data error is detected.

ACTIVITY
    ON   Multiplexing mode with no data activity.
    FLICKERING   Multiplexing mode with data activity.
    FLASHING SLOW   Major composite link problem.

POWER   ON when power is applied to the unit.

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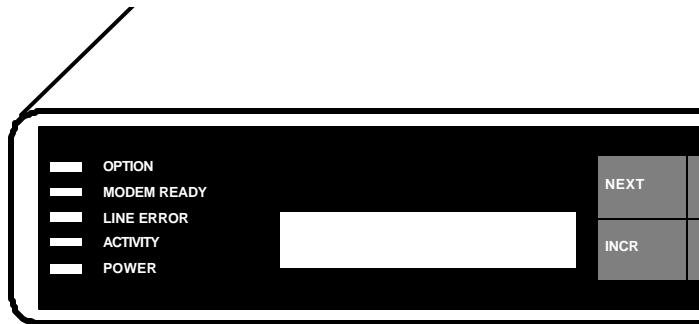
5.   NETWORK MANAGEMENT PORT

5.1   Introduction

The Network Management port (NMP) provides all of the front panel
functions plus the following:

- Show Network Status
- Change Network Configuration
- Assign IDs to both the local and remote multiplexer and to
  individual ports
- Set or change the restart timer
- Zero the activity counts
- Capture a local or remote port
- Copy to a local or remote port
- Show the RS-232 status of a local or remote port
- Perform remote test loops
- Monitor local transmit or receive data
- Change Network Management port parity
- Force a poll of all unassigned drop numbers
- Suspend, Kill or Restart polling to an individual drop
- Reset an individual port
- Reset the remote multiplexer
- Set local time and date

5.2   Connections and Setup

The NMP is accessed through an RJ-45 connector on the rear of the
unit. To connect to the NMP, use the cable provided or one of the cables
shown in paragraph 6.3.3.

5.2.1   Using a Terminal

Set your terminal for 9600 bps, 8,N,1. Use the cable supplied to connect
the NMP to the terminal.

5.2.2   Using a Modem

To use a dial-in modem for remote access you must fix the DTE
interface speed of the modem at 9600 bps, 8,N,1. Refer to your modem
manual for appropriate setup procedures. Connection to the modem
must be made using the NMP to modem cable shown in paragraph
6.3.3.

5.3   Using the Network Management port

        To activate the NMP, press the ENTER key. When you see **AT YOUR COMMAND >>**, the NMP is active and ready for your commands. Type H <Enter> to display the command set.

5.4   Commands

5.4.1   Help

COMMAND		LOCAL	REMOTE	PARAGRAPH
Show:	Config	SC		5.4.2
	ID	SI		5.4.5
	Map	SM		5.4.7
	Map (Drop#)	SMD#		5.4.7
	Network Config	SN		5.4.9
	Status	SS		5.4.11
Change:	Config	CP	RCP	5.4.3 & 4
	ID	ID		5.4.6
	Map	CM		5.4.8
	Network Config	CN		5.4.10
	Restart Timer	CT		5.4.12
Activity Counts		AC		5.4.13
Drop Activity		DA		5.4.14
Zero Activity Counts		Z		5.4.14
Flow Control		FC		5.4.15
Test Tools		TT		5.4.19
Type		TY	RTY#	5.4.16
Repeat Last Command		*		5.4.17
Disconnect NMP		BYE		5.4.18

5.4.2   Show Config

        The Show Config (SC) command shows the current port configuration settings for both the local and the remote ports. Port numbers may be included with this command to limit the display range. If no port numbers are included, settings for all ports are shown. Use this command to verify proper port configuration.

NOTE

Several commands allow port numbers or port number ranges to be included on the command line. When port numbers are included, the syntax is as follows:

(Command)1	Port 1
(Command)1,2,6	Ports 1, 2 & 6
(Command)1 2 6	Ports 1, 2 & 6
(Command)2-6	Ports 2 thru 6
(Command)1,5-8	Ports 1 and 5 thru 8

5.4.3   Change Port Config

The Change Port Config (CP) command sets the local port loopback, flow control and rate configuration. One or more ports may be set with a single command by selecting a range of port numbers. The factory default setting is Xon/Xoff Space, 9600 bps.

5.4.4   Remote Change Port Config

The Remote Change Port Config (RCP) command sets the   remote port configuration. This command requires a **local** (Host) port number argument. The host multiplexer sends the configuration to the proper remote drop and port number based on the system map. One or more ports may be set with a single command by selecting a range of port numbers. The syntax is the same as the CP command.

5.4.5   Show ID

The Show ID (SI) command is used to view either multiplexer or port identifiers. If (M)ux is selected, both host and drop multiplexer IDs are displayed. If (P)ort is selected, both host and drop port IDs are displayed.

5.4.6   Change ID

The Change ID (ID) command allows you to set or change both host and drop multiplexer or port identifiers. Port IDs are entered in pairs referenced to the host port number. Pressing <Enter> with no entry will leave the ID unchanged.

5.4.7 Show Map

The Show Map (SM) command shows the mapping, IDs and status of all host ports. If mapping for a particular port(s) or range is desired, that port number or range may be added to the command line. If mapping for a specific drop is desired, use the SMD# command.

5.4.8 Change Map

The Change Map (CM) command is used to map the local host ports to the drop ports. Ports must be mapped in the host multiplexer before that channel can be used. Note that any host port may be mapped to any drop port. The only restriction is with multiple host installations, where each port for a specific drop must be mapped to a single host.

5.4.9 Show Network Configuration

The Show Network Config (SN) command displays the current network port configuration (synchronous or asynchronous).

5.4.10 Change Network Configuration

The Change Network Config (CN) command is used to set the network port for synchronous or asynchronous operation. If asynchronous is selected, the speed must be set. The command is also used to select full duplex or half duplex operation. Half duplex operation may be required in 2-wire applications. An additional selection enables or disables poll sequence numbers. Poll sequence numbers are used in radio applications.

5.4.11 Show Status

The Show Status (SS) command shows the current network status including the number of active drops and ports, and the current poll response timeout values for each drop.

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5.4.12 Change Restart Timer

The (Change) Restart Timer (CT) setting determines how frequently the host polls drops that have been removed from the from active list. When this time interval expires, the SRX polls each inactive drop once. If the drop responds, that drop is returned to the active polling list. If the drop fails to respond, it remains on the inactive list. The timer can be set for intervals of N x 15 seconds, "0" disabled (inactive drops will never be restarted) or "C" continuous (drops will always remain active whether they respond to polls or not). The default is 15 seconds

In addition, Drop Timeout (the time the SRX waits for a poll response before removing the drop from the active list) can be set to AUTO or fixed at 10-10000ms. The default is AUTO.

5.4.13 Activity Counts

The Activity Counts (AC) command shows the current statistics for all ports. The drop port error counts are requested from the drops when this command is issued. The host multiplexer waits until the responses are received from all the active drops before showing the counts; inactive drops are not polled. A range of ports may be included with this command to reduce the number of ports shown.

The Z command is used to zero the counters so that current activity can be monitored

5.4.14 Drop Activity

The Drop Activity (DA) command shows polling statistics and status for all mapped drops. The Zero Activity Counts (Z) command is used to zero the counters.

5.4.15 Flow Control

The Flow Control (FC) command displays the current port flow control status for both host and drop ports. A port range may be included with this command.

5.4.16 Type

The Type (TY) command displays information about the host multiplexer. The Remote Type (RTY#) command is used to display similar information about a specific drop. The drop number must be included on the command line.

5.4.17 Repeat Last Command

To repeat the last command, simply press the * key. This is handy for repeating screens of constantly changing data.

5.4.18 Disconnect NMP

The BYE command toggles the RTS output from the Network Management port. This is used to disconnect equipment such as dial-up modems or the DCB Access Switch.

5.4.19 Test Tools

The Test Tools (TT) menu summarizes the test and troubleshooting commands. These commands are listed separately to reduce the clutter in the main help list, but are always active at the command prompt.

COMMAND	LOCAL	REMOTE	PARAGRAPH
Capture Port	CA#	RCA#	5.4.20 & 21
Copy Command	CC#	RCC#	5.4.22 & 23
Show RS232	SR	RSR	5.4.24 & 25
Test Message	TM#	RTM#	5.4.26 & 27
Remote Test Loop		RTL#	5.4.28
Monitor Port TX	MT#		5.4.29
Monitor Port RX	MR#		5.4.29
NMP Parity	P		5.4.30
Drop History/Clear	DH/CH		5.4.31
Drop Restart Polling	DR		5.4.32
Kill Drop Polling	KD		5.4.33
Suspend Drop Polling	SD		5.4.34
Poll ALL Drops	PA		5.4.35
Port Reset	PR		5.4.36
Reset MUX	RESET	RRESET	5.4.37

5.4.20 Capture Port

The Capture Port command (CA#) permits the network management port to capture any of the local ports. While this command is active, the normal data path is interrupted and a two-way communication link is established between the network management port and the captured host port. A port number must be included on the command line.

The Capture command is active until two consecutive ESC characters are issued.

5.4.21 Remote Capture Port

The Remote Capture port command (RCA#) connects the network management port to any mapped drop port. During this time, normal data communications are suspended and the NMP terminal can talk directly to the remote DTE device. The number argument must be a mapped host port number.

The Remote Capture command is active until two consecutive ESC characters are issued.

5.4.22 Copy Command

The Copy Command (CC#) is used for training. This command is used when the instructor is at the host site and the trainee is at the remote. The command is followed by a port number which must be the host port that is mapped to the remote port used by the trainee.

After the command is entered, all data from the local port will be displayed on both terminals. Keyboard inputs from either terminal will be sent to the host port.

The Copy command is active until two consecutive ESC characters are issued by the instructor.

5.4.23 Remote Copy Command

The Remote Copy Command (RCC#) performs the same function when the instructor is located at the remote site. In this case, the port number is the port to which the trainee's terminal is attached. This command is used only at the remote site.

The Remote Copy command is active until two consecutive ESC characters are issued by the instructor.

5.4.24 Show RS-232

The Show RS-232 (SR) command shows the current state of RS-232 control signals on the local ports. A range of port numbers may be included to limit the display.

5.4.25 Remote Show RS-232

The Remote Show RS-232 (RSR) command shows the status of RS-232 control signals at the remote ports. As with the SR command, a range of port numbers may be included on the command line.

5.4.26 Test Message

The Test Message (TM#) command sends a Quick Brown Fox... message to a local port. The QBF message continues until any key is pressed on the network management port terminal.

5.4.27 Remote Test Message

The Remote Test Message (RTM#) command sends a QBF test message to a remote (Drop) port. The message continues until any key is pressed on the network management port terminal. A local port number must be included on the command line. If the port is not mapped, an error message is returned.

5.4.28 Remote Test Loop

The Remote Test Loop (RTL#) command is used to test a data path from end to end. This command enables port loopback in the remote (Drop) multiplexer, then sends a test message to that port. If all is working correctly, the test message is displayed on the network management port terminal. A local port number must be included on the command line. If the port is not mapped, an error message is returned.

5.4.29 Monitor Port TX or RX

The Monitor Port TX (MT#) command monitors data transmitted from the selected port to the corresponding port of the remote (Drop) multiplexer. The Monitor Port RX (MR#) command monitors data received by the selected port from the corresponding port of the remote multiplexer. A local port number must be included on the command line. When port monitor is active, two ESC characters are needed to end the test.

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5.4.30 Parity

The Parity command (P) sets the parity for the network management port. The factory default is SPACE.

5.4.31 Drop History

Drop History (DH) displays a table of the last 64 occurrences of a Drop being dropped from the poll sequence (inactive) or being reinstated (active). A Drop is dropped from the normal polling sequence when it fails to respond to three consecutive polls from the SRX. After that, it is polled once every N x 30 seconds, depending on the setting of the restart timer (see the CT command). When it responds to a poll, it is reinstated in the polling sequence.

5.4.32 Drop Restart Polling

Use the DR command to restart polling to drops that have been suspended or killed during troubleshooting. Killed drops must be restarted, suspended drops will restart automatically after 15 minutes.

5.4.33 Kill Drop Polling

Kill Drop Polling (KD) is used during troubleshooting to stop polling to a specific drop. This causes the TEST light to flash on the drop multiplexer. Drops that are killed must be restarted using the Drop Restart command.

5.4.34 Suspend Drop Polling

Similar to Kill Drop, Suspend Drop (SD) is used to suspend polling to a specific drop. While suspended, the TEST light on the drop multiplexer will flash. Suspended drops will automatically restart after 15 minutes.

5.4.35 Poll ALL Drops

The Poll ALL Drops command (PA) forces the host to poll all **unmapped** drops. Active or inactive mapped drops are not polled with this command. This can be used to find drops that are on the line but have not been mapped at the host.

5.4.36 Port Reset

The Port Reset (PR) command is used to reset flow control to hung ports. A range of host port numbers or ALL may be included with this command. Flow control leads at both the host and drop ports are reset.
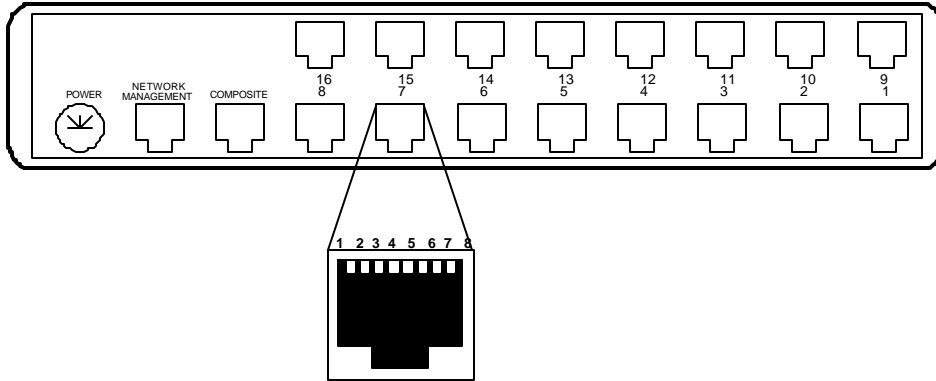
5.4.37 Reset Mux

The Reset Mux (RESET) command performs a local multiplexer reset.

The Remote Reset (RRESET) command resets a remote drop, and requires a drop number.

6.   INTERFACE SIGNALS AND CABLING

6.1   Connector Location and Pin Reference

SR-16 Rear Panel and RJ-45 Jack
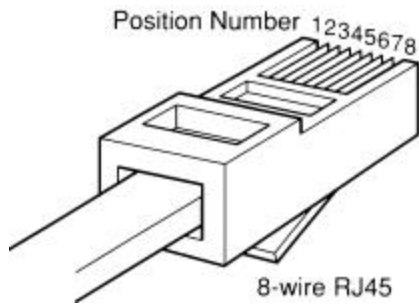
RJ-45 Plug Positions

6.2   Port Interface

6.2.1   Composite Port (RJ-45)

Pin	Signal	In/Out
1	Receive Clock	IN
2	Transmit Clock	IN
3	Data Carrier Detect	IN
4	Signal Ground	
5	Transmit Data	OUT
6	Receive Data	IN
7	Request to Send	OUT
8	Clear to Send	IN

6.2.2   Data Ports (RJ-45)

Pin	Signal	In/Out
1	Data Set Ready	OUT
2	Data Carrier Detect	OUT
3	Busy	IN
4	Signal Ground	
5	Receive Data	OUT
6	Transmit Data	IN
7	Clear to Send	OUT
8	Request to Send	IN

6.2.3   Network Management Port (RJ-45)

Pin	Signal	In/Out
1	Not Used	
2	Not Used	
3	Data Carrier Detect	IN
4	Signal Ground	
5	Transmit Data	OUT
6	Receive Data	IN
7	Request to Send	OUT
8	Clear to Send	IN

6.3   Cables

6.3.1   Composite Port to Modem

A two foot composite to modem cable is included with each SRX
multiplexer. The configuration is as follows:

```
        SRX                 Modem
        RJ-45               DB-25P

         1 ──────────────── 17
         2 ──────────────── 15
         3 ──────────────── 8
         4 ──────────────── 7
         5 ──────────────── 2
         6 ──────────────── 3
         7 ─────────────┐── 4
                        └── 20
         8 ──────────────── 5
```
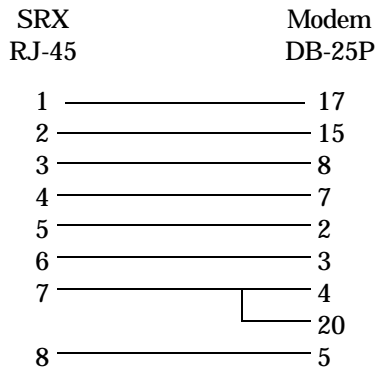
6.3.2   Data Ports to Host Computer

Configured as DTE

```
        SRX                 Computer
        RJ-45               DB-25

         1 ──────────── 6
         2 ──────────── 8
         3 ──────────── 20   (or other flow control output pin)
         4 ──────────── 7
         5 ──────────── 3
         6 ──────────── 2
         7 ──────────── 5    (or other flow control input pin)
         8 ──────────── 4    (or 20 if 4 is flow control)
```
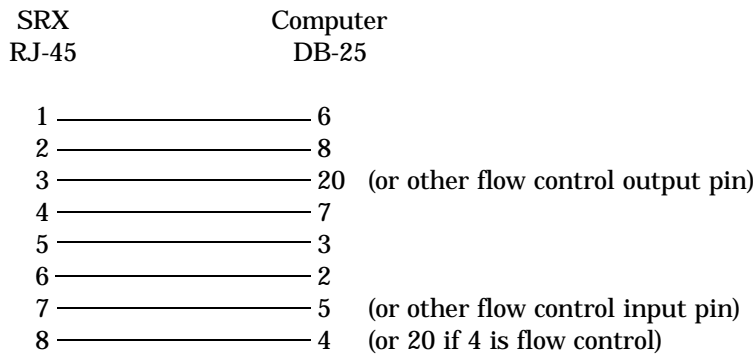
6.3.2   Data Ports to Host Computer, continued

Configured as DCE

```
     SRX                     Computer
     RJ-45                   DB-25

      1
      2 ———————————————— 20   (or 4 if 20 is flow control)
      3 ———————————————— 5    (or other flow control output pin)
      4 ———————————————— 7
      5 ———————————————— 2
      6 ———————————————— 3
      7 ———————————————— 4    (or other flow control input pin)
      8 ———————————————— 8
```

To a PC Com Port

```
     SRX                       Computer
     RJ-45                     DB-25S     DE-9S

      1 ———————————————— 6    or    6
      2 ———————————————— 8    or    1
      3 ———————————————— 4    or    7
      4 ———————————————— 7    or    5
      5 ———————————————— 3    or    2
      6 ———————————————— 2    or    3
      7 ———————————————— 5    or    8
      8 ———————————————— 20   or    4
```
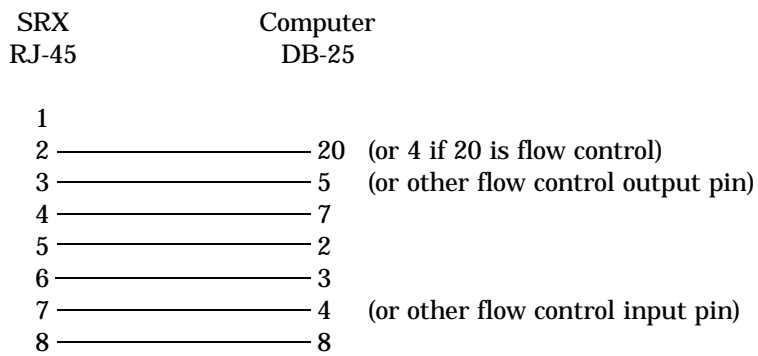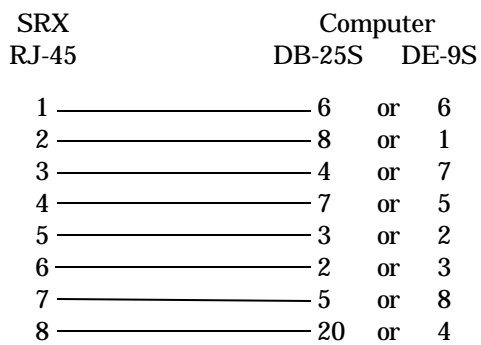
6.3.3 Network Management Port

To a TERMINAL

```
NMP                 Terminal
RJ-45               DB-25P

3 ————————————— 20
4 ————————————— 7
5 ————————————— 3
6 ————————————— 2
7 ——————————┐   5
            ├── 6
            └── 8
8 ————————————— 4
```
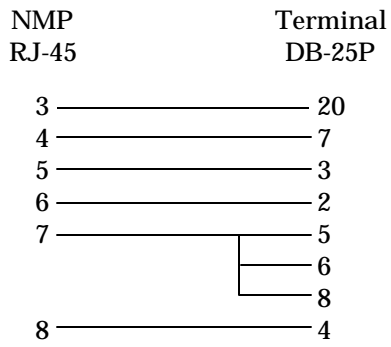
To a PC using terminal emulation

```
NMP                         Computer
RJ-45                   DE-9S      DB-25S

3 ————————————— 4      or     20
4 ————————————— 5      or     7
5 ————————————— 2      or     3
6 ————————————— 3      or     2
7 ——————————┐   8      or     5
            ├── 6      or     6
            └── 1      or     8
8 ————————————— 7      or     4
```
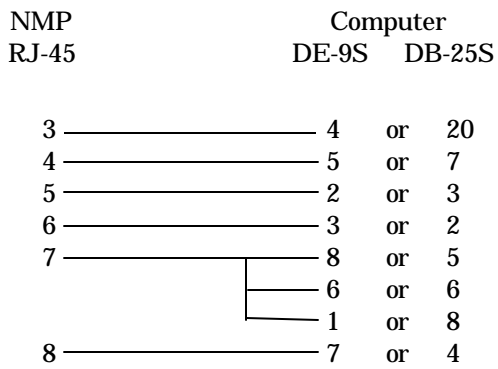
To a dial-up MODEM for remote access

```
NMP                 Modem
RJ-45               DB-25P

3 ————————————— 8
4 ————————————— 7
5 ————————————— 2
6 ————————————— 3
7 ——————————┐   4
            └── 20
8 ————————————— 5
```
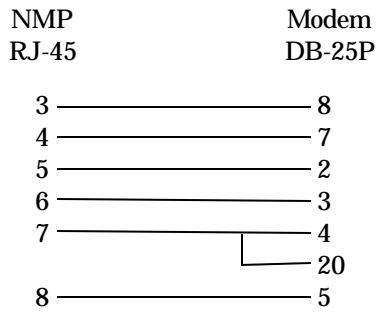
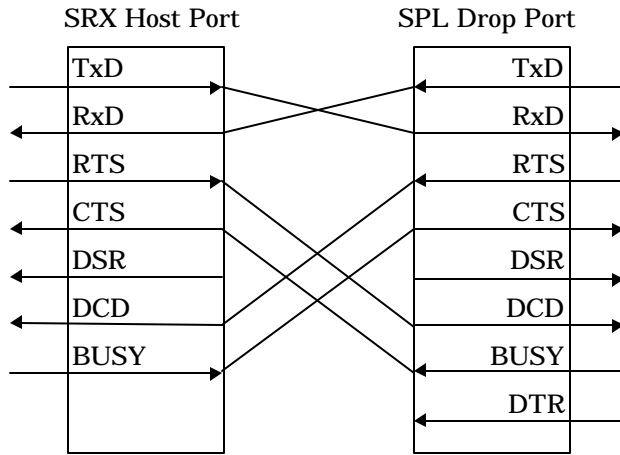## 6.4   Signal Paths through Multiplexers

The following diagram shows the signal flow between data ports of an
SRX Host multiplexer and an SPL Drop multiplexer.

SRX Host Port		SPL Drop Port
TxD		TxD
RxD		RxD
RTS		RTS
CTS		CTS
DSR		DSR
DCD		DCD
BUSY		BUSY
		DTR

Transmit Data to Receive Data is the normal required path for data
flow.

RTS to DCD is a hardware handshake path used to wake up the remote
device. Many host computers require DCD to issue a login prompt.

Busy to CTS is the hardware flow control path. For CTS/Busy flow
control, the hardware flow control pin of the attached device must be
wired to Busy on the multiplexer.

The DSR output of the multiplexer port is always asserted (high).

Data Terminal Ready (DTR) is an input to the SPL Drop data ports
which is passed through to the attached modem

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7.   TROUBLESHOOTING

7.1   General Approach

When troubleshooting problems, a rational plan can save you many hours of frustration. The following is a brief outline of standard troubleshooting procedures.

1. Gather the facts to determine the exact nature of the problem.

2. Draw a picture of the system showing the equipment at both the host and remote ends and the phone lines or in-house wiring. Use this as a reference to note your observations, test steps and test results. A picture keeps you focused and often saves duplicate effort.

3. Record the front panel indications before changing anything. This is an important part of fact gathering

4. If you change anything, change only one thing at a time.

5. Use the built-in test functions, especially the loopback tests and record your results.

7.2   Loopback Tests

It is best to begin loopback testing at the remote terminal and work toward the host. If all the loopbacks are successful, the data communications equipment and the terminal are working correctly.

Put the SPL Drop multiplexer port in loopback and have someone type alpha characters on the keyboard of the affected terminal. If the data appears correctly on the screen, the port is working. Next loop the associated port of the SRX host multiplexer. If data again appears correctly, the communications link and the ports on both multiplexers are working correctly. The problem then is with the host computer port or the cable between the host computer and the multiplexer.

Loopbacks can be turned on and off from the Network Management port of the SRX multiplexer. See paragraphs 5.4.3 and 5.4.4 for details. If a NMP terminal is not available, drop multiplexer port loopback can be enabled using a DIP switch on the multiplexer. Refer to Figure 1 and paragraph 4.1.2.1 of the SPL Multidrop manual for switch location and operation.

7.3   Installation Troubleshooting, Modems or DSUs

First, set up the DSUs without connecting the multiplexers. The host DSU should be set to constant carrier, also called forced Request To Send, or constant RTS. The remote DSUs must be set to Request To Send controlled by the terminal. In this case, the SPL Drop multiplexer.

Carrier Detect should be ON at all the remote drops, even before the SRX Host and the SPL Drops are connected.

Carrier Detect should be OFF at the host, with or without SPL Drops connected at the drop sites. For testing the line and DSUs only, you may wish to momentarily force Request To Send on at a remote DSU to see if it results in Carrier Detect turning on at the host.

7.4   Installation Troubleshooting, Multiplexers

Before trying terminals, make sure the multiplexers are polling. The SRX Host should be polling the SPL Drop multiplexers. The host DSU Send Data, Receive Data and Carrier Detect lights should be flashing. The polling on DSUs is often so fast that the lights appear to be constantly on, but dimly. Use the "SS" command from the Network Management port for a quick check. See paragraph 5.4.9.

Double check the SPL Drop multiplexers. Insure you have drop firmware installed and the address is set correctly. See paragraph 4.1.1 of the SPL Multidrop manual for address information.

Make sure the SRX host is properly mapped. An SPL Drop must be mapped in the host before it will be polled and become active.

7.5   Installation Troubleshooting, Terminals

Terminal problems typically fall into four categories:

    1.   The terminal or printer gets no data
    2.   The terminal or printer gets "garbage" data
    3.   Blocks of data are lost
    4.   Terminals or printers seem to "hang".

When a terminal gets no data, check to see the cables are wired correctly and that flow control is set properly.

If the terminal gets "garbage" data, check the speeds of the host and remote multiplexers, the terminal and the computer ports to make sure they match.

Blocks of data are lost most often when data is sent to a printer or a lot of data is being displayed on a terminal. Most of these problems are due to flow control not matching between the printer or terminal and the multiplexer.

If terminals and printers work for a while and then "hang", check the flow control settings. When Xon/Xoff flow control is set to a different parity on the multiplexer than on the terminal or printer, the result is either a "hung" device that is flow controlled off but never back on, or a device that is never flowed off causing buffer overflow and lost data.

8.   WARRANTY

All DCB multiplexers are warranted to be free of defects in materials and workmanship for two years. DCB of Champaign, Inc. will repair or replace any equipment proven to be defective within the warranty period. All warranty work is F.O.B. Dewey, IL. This warranty is exclusive of abuse, misuse, accidental damage, acts of God or consequential damages, etc. DCB liability shall not exceed the original purchase price.

All equipment returned for repair must be accompanied by a Returned Material Authorization (RMA) number. To receive an RMA number, call (217) 897-6600 between the hours of 8 AM and 5 PM central time. Equipment must be shipped prepaid to DCB and will be returned at DCB's expense.

Ship returned items to:

Data Comm for Business
2949 CR 1000E
Dewey, IL 61840

Data Comm for Business, Inc.
PO Box 6329
Champaign, IL 61826-6329

Tel   (217) 897-6600
Fax   (217) 897-1331
Email   support@dcbnet.com

DCB MultiDrop Multiplexer Map Worksheet

Host Port #	Host Port ID	Remote Drop #	Remote Port #	Remote Port ID
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
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