PARADYNE™

COMSPHERE 3800*Plus* **Modems**
Synchronous Data Compression Feature
Document Number 3980-A2-GZ40-20

November 1996

Overview

The Paradyne proprietary Synchronous Data Compression (SDC) feature allows an increase of throughput in data transmission, and has an error correcting procedure so that transmitted data is less sensitive to channel disturbances.

The ITU-T recommendations V.42bis and V.42 have data compression and error correcting (EC) procedures for DCEs connected to asynchronous DTEs. These procedures form the basis of Paradyne's SDC feature.

With the SDC feature, two DTEs can exchange data via a synchronous protocol (Figure 1) while the DCE provides the new synchronous data compression and error correction functions (Figure 2). The synchronous data from the local DTE, after compression, is inserted into DCE frames which are sent to the remote DCE. Inverse operations then occur at the remote DCE.

SDC can be used with V.34 and V.32 family modulations on dial or leased lines, and in a dial backup or standby mode.

SDC is available as an installable option beginning with firmware Release 3.0.
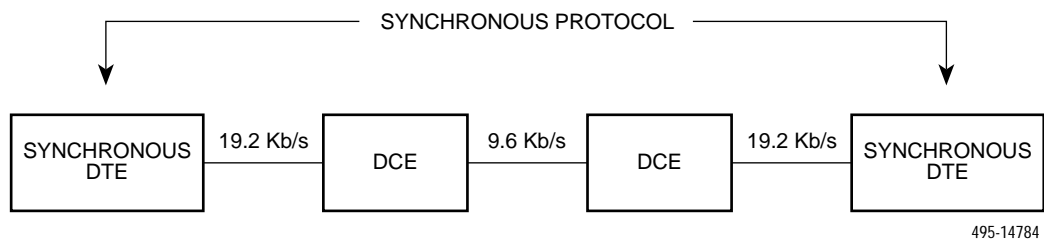
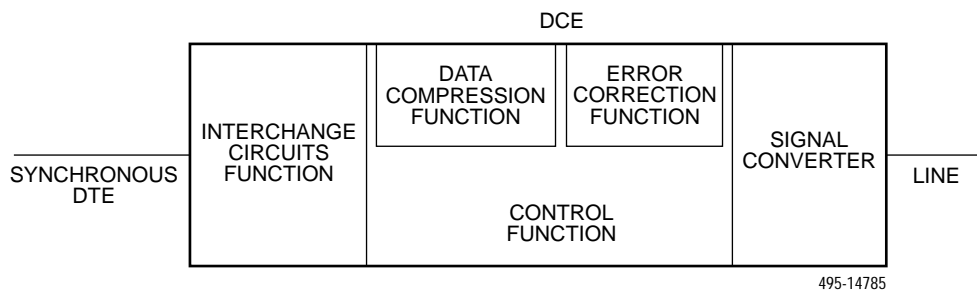**Figure 1. Sample DTE Exchange of Data via Synchronous Protocol and SDC**

DCE

SYNCHRONOUS DTE — INTERCHANGE CIRCUITS FUNCTION | DATA COMPRESSION FUNCTION | ERROR CORRECTION FUNCTION | CONTROL FUNCTION | SIGNAL CONVERTER — LINE

495-14785

Figure 2. Synchronous Data Compression

Installing the SDC Feature

The SDC feature can be installed using AT commands or the DCP.

Installing the SDC Feature Using the DCP

To install SDC using the DCP, use this procedure.

1. Press the ▷ key until **Control** appears. Press **F1**.

2. Press the ▷ key until **Install** appears. Press **F1**.

3. If the SDC option is not visible, press the ▷ key until **SDC** appears.

   NOTE: If SDC has been installed on this modem, SDC will not appear.

4. Press the function key (**F1**, **F2**, or **F3**) directly beneath **SDC**.

5. Enter the Product Authorization Code for SDC:

   - Use the ▷ and ◁ keys to move the cursor to each digit position.

   - Press **F2** to increment each digit to the required value. The Product Authorization Code for SDC is:

     0 1 1 9 9 3

6. Once the digits are set to the required values, press **F1** (to select **Ent**).

7. Press the △ key to go to the top of the menu tree, then press the ▷ key until **Status** appears. Press **F1**.

8. Press the ▷ key until **Options** appears. Press **F2** or **F3**.

9. Scroll through the installed options. **SDC** is listed among them.

10. Perform a power reset:

- For a standalone modem, turn the Power switch to the Off position, then to the ON position, or

- For a carrier-mounted modem, release the lock, slide the modem part of the way out of the carrier, then replace it and lock it in place.

11. Set the SDC configuration options suitable for your environment. See Tables 1 and 2.

Installing the SDC Feature Using AT Commands

To install SDC using AT commands, use this procedure.

1. Attach a DTE to the modem.

2. Load the Async Dial factory template:

- From the DCP, select Async Dial from the Factory group of the Configure branch, or

- If AT commands are enabled, enter the **AT&F0** command.

3. Install the SDC feature. Enter the command: **AT&&I12=011993**

   The modem responds **OK**.

4. Perform a power reset. Enter the command: **ATZ9**

5. Check the installed features. Enter the command: **AT&&I0**

   The modem responds with a list of features installed in your modem, including **SDC**.

6. Set the SDC configuration options suitable for your environment. See Tables 3 and 4.

Menu Status and Result Codes

When SDC is active and the modem is online, the top line of the DCP display shows **Online:***mr***V42t**, **Leased:***mr***V42t**, **Backup:***mr***V42t**, or **Stndby:***mr***V42t**, where *mr* is the modem rate. For example, **Online:33.6V42t** is displayed on the DCP of a modem using SDC and connected to a dial line at 33,600 bits per second (bps).

When extended result codes are set to contain the data compression protocol, and SDC is active, connect messages include the characters **V42t**. For example, when a modem with SDC active connects to a dial line at 33,600 bps, the result code **CONNECT 33600/V42t/RX=33600/TX=33600** is sent to the DTE.

SDC User Interface

When SDC is enabled, the following configuration options are available to set up the SDC feature. Some of the configuration options are not displayed unless SDC is enabled.

V.42/MNP/Buffer (see Table 1)

- Sync Comp Mode
- SDC Negotiation
- SDC Idle Fill
- SDC Bit Encoding
- Sync DTE CRC
- SDC Delay Min
- Sync Flow Control
- TX Buff Disc Delay
- RX Buff Disc Delay
- Max Frame Size
- Cellular Enhance

DTE Interface (see Table 2)

- Sync DTE Rate
- Tx Clock Source

Table 1
(1 of 3)
V.42/MNP/Buffer Configuration Options for SDC

Sync Comp Mode: DirectMode **Nxt   DirectMode   HDLC/SDLC**
This configuration option only appears if Async/Sync Mode is configured for Sync. Synchronous Compression Mode. Enables and disables synchronous data compression. **DirectMode** – Disables the Synchronous Data Compression mode. **HDLC/SDLC** – Enables the Synchronous Data Compression mode The AT command for Sync Comp Mode is #SC*n*. See Table 3, page 9.
SDC Negotiation: LAPM_Buffer **Nxt   LAPM_Buffer   LAPM_Discon**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Negotiation. Determines the type of negotiation used when the modem attempts to connect using SDC. See Table 5, page 15. **Link Access Procedure for Modems or Buffer** – The modem attempts to establish an SDC connection. If the remote modem has SDC capability, then the connection is established with SDC active. If the remote synchronous modem does not have SDC capability, then the local connection is made in Buffer mode. **Link Access Procedure for Modems or Disconnect** – The modem attempts to establish an SDC connection. If the remote modem has SDC capability, then the connection is established with SDC active. If the remote modem does not have SDC capability, then no connection occurs and the modem generates a disconnect. The AT command for SDC Negotiation is S28=*n*. See Table 4, page 10.
SDC Idle Fill: Flag_Fill **Nxt   Flag_Fill   Mark_Fill**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Idle Fill. Determines whether the modem uses an HDLC flag or mark to fill the time between DTE frame transfers. **Flag_Fill** – Causes the modem to fill the time between DTE frame transfers with HDLC flags. **Mark_Fill** – Causes the modem to fill the time between DTE frame transfers with marks. The AT command for SDC Idle Fill is S29=*n*. See Table 4, page 10.
SDC BitEncoding: NRZ **Nxt   NRZ   NRZI**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Bit Encoding. Determines the type of bit encoding scheme (NRZ or NRZI) the modem uses when transmitting synchronous DTE data. **NRZ** – Causes the modem to use the standard Non Return to Zero bit encoding scheme. **NRZI** – Causes the modem to use the Non Return to Zero Inverted bit encoding scheme. The AT command for SDC Bit Encoding is S31=*n*. See Table 4, page 11.

Table 1
(2 of 3)
V.42/MNP/Buffer Configuration Options for SDC

SyncDTE CRC: Ignore **Nxt   Ignore   CRC16**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous DTE CRC. Determines whether the CRC of the DTE frame is transmitted from modem to modem. **Ignore** – No assumption is made about the CRC type. The CRC is transmitted along with the other data in the frame. **CRC16** – The CRC is known to be the 16-bit CRC for HDLC frames defined by ITU-T (generator polynomial $x^{16} + x^{12} + x^5 + 1$). It is removed from the DTE frame by the sending modem and added to the DTE frame by the receiving modem. The AT command for SyncDTE CRC is S32=*n*. See Table 4, page 11.
SDC Delay Min: Off **Nxt   Off   Rx_Clock**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Delay Minimization. Allows the modem to transmit a DTE frame to its DTE in a discontinuous way to minimize the delay introduced by SDC processing. **Off** – The modem does not begin transmitting a frame to its DTE until the entire frame has been received. **Rx_Clock** – The modem begins to transmit data from a DTE frame to its DTE even if the end of the DTE frame has not yet been received by the modem. The receive clock (circuit 115) is clamped when the beginning of a DTE frame has been transmitted to the DTE and no other data from this DTE frame has been received by the modem. As soon as data from the current DTE frame can be transmitted to the DTE, the receive clock is released. The Rx_Clock option appears only if the Tx Clock Source configuration option is set to Internal. The AT command for SDC Delay Min is #DM*n*. See Table 3, page 9.
Sync Flow Cntrl: None **Nxt   None   Tx_Clock   CTS_SyncDTE**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Flow Control. Controls the type of synchronous data flow control while using data compression. **None** – Modem does not control the flow from the synchronous DTE. **Tx_Clock** – The transmit clock (circuit 114) clamps when the modem is unable to accept supplementary data from the DTE. Tx_Clock appears only if the Tx Clock Source configuration option is set to Internal. **CTS_SyncDTE** – CTS signal circuit (106) is set to OFF when the modem is unable to accept supplementary data from the DTE. The AT command for Sync Flow Cntrl is #Q*n*. See Table 3, page 9.

**Table 1
(3 of 3)
V.42/MNP/Buffer Configuration Options for SDC**

TXBuffDiscDelay: 10sec
Nxt   10sec   Disable   60sec

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Transmit Buffer Disconnect Delay. Determines how long the modem continues to transmit data stored in its Transmit buffer when the modem is commanded to disconnect by a locally attached DTE.

Disable – Modem disconnects immediately without attempting to send data stored in its buffer.

10, 60 sec – Maximum amount of time the modem tries to empty its buffer before disconnecting. In both cases (10 sec and 60 sec), the modem disconnects much sooner if it can empty its buffer.

The AT command for TXBuffDiscDelay is S49=*n*.

RXBuffDiscDelay: 10sec
Nxt   10sec   Disable   60sec

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Receive Buffer Disconnect Delay. Determines how long the modem continues to send to the DTE data stored in its Receive buffer when the modem is commanded to disconnect by a locally attached DTE, or detects a line disconnect.

Disable – Modem disconnects immediately without attempting to send data stored in its buffer.

10, 60 sec – Maximum amount of time the modem tries to empty its buffer before disconnecting. In both cases (10 sec and 60 sec), the modem disconnects much sooner if it can empty its buffer.

The AT command for RXBuffDiscDelay is S39=*n*.

Max Frame Size: 256
Nxt   256   192   128   64   32   16

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for BufferMode or DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Maximum Frame Size. Sets the maximum frame size for V.42 and MNP. For MNP operation, 64 is the minimum value. Any value less than that will automatically default to 64. For cellular applications, at least one of the sides should be set to a low value. A setting of 32 is recommended. Only one modem needs this setting; both modems will automatically default to the greatest common value.

The AT Command for Max Frame Size is \A*n*.

CellularEnhance: Disable
Nxt   Disable   Enable

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is configured for V42/MNPorBfr, V42MNPorDsc, LAPM_or_Disc, or LAPM_or Bfr, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Cellular Enhancement. When enabled, the modem uses non-standard techniques to enhance V.42 operation for cellular applications. It is still compatible, however, with modems which do not have the cellular enhancement implemented or enabled.

The AT command for CellularEnhance is S91=*n*.

Table 2
DTE Interface Configuration Options for SDC

Sync DTE Rate: 128000
Nxt 128000 115200 112000 96000 76800 72000 64000 57600 56000 48000 38400 28800 19200 14400   9600 4800 2400 1200

This configuration option does not appear when:
- **Async/Sync Mode configuration option is set to Async.**
- **Sync Comp Mode configuration option is set to DirectMode.**
- **Tx Clock Source configuration option is set to External.**
- **The SDC feature is disabled.**

Synchronous DTE Data Rate. Identifies the synchronous DTE's operating rate to the modem. Data rates from 128,000 bps to 1200 bps are supported.

NOTE: A cable less than fifty feet in length is required for rates over 19,200 bps. Data synchronization at rates over 57,600 bps is sensitive to cable length and capacitance, and the DTE's drivers and receivers. External transmit clocking may be required.

The AT command for Sync DTE Rate is S30=*n*. See Table 4, page 10.

Tx Clock Source: Internal
Nxt   Internal   External   RXC_Loop

This configuration option only appears when Async/Sync Mode is configured for Sync.

Transmit Clock Source. Determines the source of timing for synchronous data transmitted from the DTE.

Internal – The transmit data's clock source is derived from the modem's internal clock. This clock is available as an output on Pin 15 (TXC) of the EIA-232-D interface.

External – The transmit data's clock source is provided by the DTE on Pin 24 (XTXC) on the EIA-232-D interface.

Receive Clock Loop – The modem's transmit clock is derived from its received analog signal. The derived clock is available as an output on Pin 15 (TXC) of the EIA-232-D interface.

NOTE: RXC_Loop does not appear if SDC is enabled.

NOTE: TMp tributaries are forced to RXC_Loop.

The AT command for Tx Clock Source is &X*n*.

Table 3
AT Commands for SDC

AT Command	Description	DCP LCD Command Sequence
#DM*n*	SDC Delay Minimization. Minimizes the delay introduced by SDC by allowing the modem to transmit a DTE frame to its DTE in a discontinuous way. #DM0 No delay minimization. The modem does not begin transmitting a frame to its DTE until the entire frame has been received. #DM1 Delay minimization. The modem begins to transmit data from a DTE frame to its DTE even if the end of the DTE frame has not yet been received by the modem. The factory setting is No Delay Minimization.	Configure\Edit\ V42/MNP/Buffer
#Q*n*	Sync Flow Ctrl. Synchronous Flow Control of DTE. Controls the type of synchronous data flow control while using data compression. #Q0 No flow control. #Q1 Flow control using transmit clock (circuit 114). #Q2 Flow control using CTS (circuit 106). The factory setting is No Flow Control.	Configure\Edit\ V42/MNP/Buffer
#SC*n*	Sync Comp Mode. Synchronous Compression Mode. Enables and disables synchronous data compression. #SC0 Disable Synchronous Data Compression mode. #SC1 Enable Synchronous Data Compression mode. The factory setting is Disable.	Configure\Edit\ V42/MNP/Buffer

Table 4
(1 of 2)
S-Registers for SDC

S-Register	Description	DCP LCD Command Sequence

S28	SDC Negotiation.
	
	Controls negotiation between two modems attempting to connect using SDC.
	
	Register has the following values:
	    0 = LAPM_Buffer
	    1 = LAPM_Discon
	
	The factory setting is LAPM_Buffer.
		Configure\Edit\ V42/MNP/Buffer

S29	SDC Idle Fill.
	
	Determines whether the modem uses an HDLC flag or mark to fill the time between DTE frame transfers.
	
	Register has the following values:
	    0 = Flag_Fill
	    1 = Mark_Fill
	
	The factory setting is Flag_Fill.
		Configure\Edit\ V42/MNP/Buffer

S30	Sync DTE Rate. Synchronous DTE Rate.
	
	Identifies the synchronous DTE's operating rate to the modem.
	
	Register has the following values:
	    0 = 128,000 bps
	    1 = 115,200 bps
	    2 = 112,000 bps
	    3 = 96,000 bps
	    4 = 76,800 bps
	    5 = 72,000 bps
	    6 = 64,000 bps
	    7 = 57,600 bps
	    8 = 56,000 bps
	    9 = 48,000 bps
	   10 = 38,400 bps
	   11 = 28,800 bps
	   12 = 19,200 bps
	   13 = 14,400 bps
	   14 = 9600 bps
	   15 = 4800 bps
	   16 = 2400 bps
	   17 = 1200 bps
	
	The factory setting is 128,000 bps.
		Configure\Edit\ DTE Interface

Table 4
(2 of 2)
S-Registers for SDC

S-Register	Description	DCP LCD Command Sequence

S31	SDC Bit Encoding.
	
	Determines the type of bit encoding used when transmitting synchronous DTE data.
	
	Register has the following values:
	    0 = NRZ
	    1 = NRZI
	
	The factory setting is NRZ.
		Configure\Edit\ V42/MNP/Buffer

S32	SyncDTE CRC.
	
	Determines whether the CRC of the DTE frame is transmitted from modem to modem.
	
	Register has the following values:
	    0 = Ignore
	    1 = CRC16
	
	The factory setting is Ignore.
		Configure\Edit\ V42/MNP/Buffer

Synchronous Data Format

The SDC feature supports the High-level Data Link Control (HDLC) and Synchronous Data Link Control (SDLC) type protocols for synchronous DTE data. An HDLC frame is composed of an information field containing the data to transmit, plus an overhead (address, control, and FCS fields) used by the DTE protocol. Flags opening and closing the HDLC frame serve as frame delimiters (Figure 3).
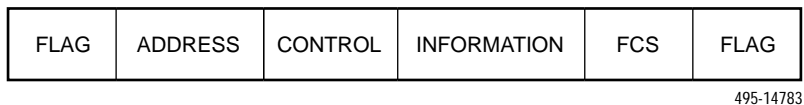
FLAG	ADDRESS	CONTROL	INFORMATION	FCS	FLAG

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Figure 3. Synchronous Data Format

A 3800*Plus* modem with the SDC feature supports DTE frame sizes up to 4300 bytes. This conforms to the X.25 recommendation which defines a maximum size of data packets as equal to 4096 bytes.

If the modem has the SDC Delay Min configuration option set to Rx_Clock, there is no limitation on the DTE frame size for the DTE frames transmitted from the remote modem to this local modem, since the whole frame need not be buffered.

The SyncDTE CRC configuration option determines whether the CRC of the DTE frame (the FCS field) is transmitted. If the CRC type is known to be the 16-bit CRC for HDLC frames as defined by ITU-T (generator polynomial $x^{16} + x^{12} + x^5 + 1$), the CRC can be removed by the local modem and added to the DTE frame by the remote modem.

SDC Algorithm

The compression algorithm is based on V.42bis British Telecom Lempel ZIV (BLTZ).

DTE and DCE Frames

Data exchanged between the local and remote DCEs is according to the LAPM protocol. The structure of a LAPM frame (DCE frame) is identical to the HDLC frame. The data from the DTE is compressed into the information field of the DCE frame. After compression, one DTE frame is segmented into one or several DCE frames.

Data Synchronization

Data exchanged between the synchronous DTE and the modem is synchronized by two clock signals. Data coming from the DTE is synchronized by the transmit clock and data received by the DTE is synchronized by the receive clock. The transmit clock is provided by the modem on circuit 114 or by the synchronous DTE on circuit 113. The receive clock is provided by the modem on circuit 115.

When the transmit clock is provided by the modem, the transmit and receive clocks are locked on the same clock source internal to the modem. In this configuration, the user can select rates on the DTE-DCE line (or clock frequencies) in the range from 1.2 kHz to 128 kHz.

When the transmit clock is provided by the DTE, the receive clock is set by the modem equal to the DTE clock (Figure 4). When SDC is in use, the Tx Clock Source configuration option cannot be set to Receiver Clock Loop.
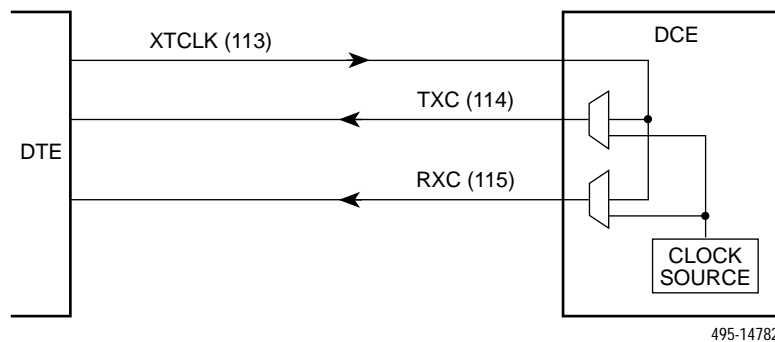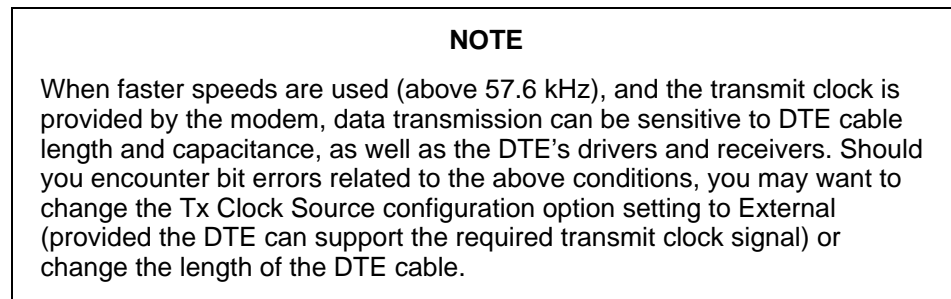

NOTE

When faster speeds are used (above 57.6 kHz), and the transmit clock is provided by the modem, data transmission can be sensitive to DTE cable length and capacitance, as well as the DTE's drivers and receivers. Should you encounter bit errors related to the above conditions, you may want to change the Tx Clock Source configuration option setting to External (provided the DTE can support the required transmit clock signal) or change the length of the DTE cable.

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Figure 4. Clocks at the DTE–DCE Interface

Flow Control Method

The data transmitted from the DTE is sent to the DCE at a rate determined by the transmit clock frequency. When SDC is active, this data is then compressed in the DCE and sent to the remote DCE at the line rate less than the rate between the DTE and DCE (usually twice, three, or four times less). If the data sent by the DTE is not compressible, or bad line conditions cause retransmissions between the two DCEs, then the transmitting DCE must indicate to the transmitting DTE its temporary inability to accept more data; this is flow control. Flow control is also required in Buffer mode since the DTE rate and line rate can be different. Three methods are used to control the DTE flow:

- Hardware signal CTS (circuit 106).

- Transmit clock (circuit 114). If the transmit clock is clamped, then the DTE stops sending data. This method only works when the transmit clock is provided by the modem.

- Natural flow control. Some DTEs can only send a limited number of information frames without any acknowledgment from the remote DTE. This number is the acknowledgment window size. If the DCE buffers this number of DTE frames, it will not receive another DTE frame. This is equivalent to the SyncFlowControl configuration option being set to None.

SDC Negotiation

The use of SDC and the values of the associated parameters are negotiated at link establishment via a protocol. The three associated parameters have the same meaning as those used for asynchronous data compression:

- Dictionary size parameter

- Maximum string length parameter

- Data compression request parameter

The SDC Negotiation configuration option determines how two modems connect when one or both modems have SDC enabled. Two settings are available in the SDC Negotiation configuration option: LAPM_Buffer and LAPM_Discon.

Table 5 shows the six possible SDC Negotiation configuration scenarios.

Table 5
SDC Negotiation Configuration Scenarios

| Originating Modem	Answering Modem	Negotiation Results
SDC enabled with LAPM_Buffer negotiation.	SDC enabled.	SDC connection.
SDC enabled with LAPM_Discon negotiation.	SDC enabled.	SDC connection.
SDC enabled with LAPM_Buffer negotiation.	SDC disabled.	Buffer mode connection.*
SDC enabled with LAPM_Discon negotiation.	SDC disabled.	Disconnect.**
SDC disabled.	SDC enabled with LAPM_Buffer negotiation.	Buffer mode connection.*
SDC disabled.	SDC enabled with LAPM_Discon negotiation.	Disconnect.***

  * If during the negotiation phase, the modem with SDC enabled receives data from the remote modem indicating that it has SDC disabled, the link will not be established between the two modems. For example, the link will not be established if the remote modem is configured for Async mode with an EC mode of V42/MNPorBfr, V42/MNPorDsc, LAPM_Buffer, or LAPM_Discon.

 ** On a leased line, the originating modem sends an endless EC negotiation sequence with the SDC request parameter. Data cannot be successfully transmitted.

*** On a leased line, the answering modem waits indefinitely for an EC negotiation sequence with an SDC request parameter. Data cannot be successfully transmitted.

Monitoring SDC Performance

If SDC is enabled, six performance measurements related to SDC can be displayed on the DCP. These measurements are available in the SDC submenu of the Status branch and are divided into two groups: TX (transmit) measurements and RX (receive) measurements.
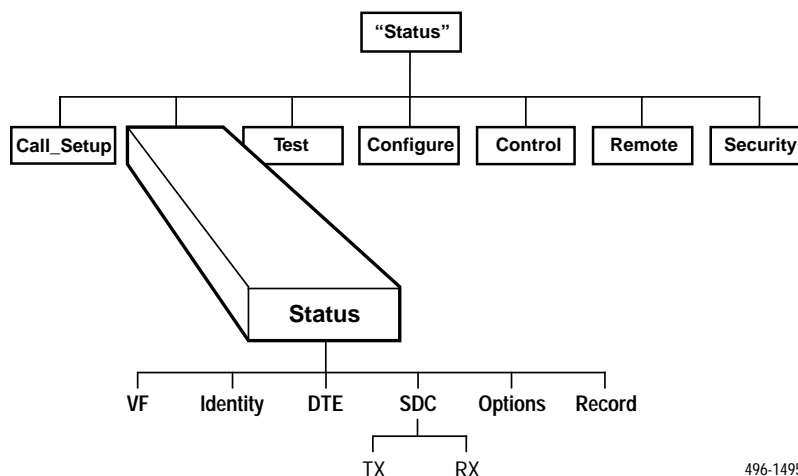
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Both groups have DTE Rate, Compression Ratio, and Line Efficiency measurements. Each measurement is an average of the last ten seconds' data, and is updated every second. See Table 6.

Table 6
SDC Performance Measurements

Group	DTE Rate	Compression Ratio	Line Efficiency
TX	The number of bits per second received from the DTE. This number takes into account only the data between the opening and closing flags of the HDLC frames. Flags and DTE interframe time fill are ignored.	The ratio between the number of bits in the input and output of the compression algorithm. The calculation does not include the overhead of the LAPM frame or the DTE flags and DTE interframe time fill.	The ratio between the number of bits per second sent on the line, and the line rate. The calculation does not include the DCE interframe time fill.
RX	The number of bits per second sent to the DTE. This number takes into account only the data between the opening and closing flags of the HDLC frames. Flags and DTE interframe time fill are ignored.	The ratio between the number of bits in the output and input of the decompression algorithm. The calculation does not include the overhead of the LAPM frame or the DTE flags and DTE interframe time fill.	The ratio between the number of bits per second received from the line, and the line rate. The calculation does not include the DCE interframe time fill.

Tuning SDC Efficiency

SDC efficiency is dependent on the configuration parameters of the DTE and the modem.

DTE Configuration

The way DTE parameters are changed, and whether they can be changed, depends on your DTE. See the documentation that came with your DTE.

DTE rate configuration parameter. The nominal DTE rate (the Tx/Rx clock's frequency at the DTE/DCE interface) can be a bottleneck. Increase the nominal DTE rate:

- If the DTE rate measurement reported by your modem is close to the nominal DTE rate.

- If the Line Efficiency measurement reported by your modem is substantially less than 100 percent.

- If the ratio between the nominal DTE rate and the line rate is less than the Compression Ratio.

DTE acknowledgment window size configuration parameter. This is the number of information frames the DTE will send without awaiting positive acknowledgment. Increase the DTE acknowledgment window size if your modem reports a low DTE rate and a comparatively high Compression Ratio (and therefore a Line Efficiency measurement substantially less than 100 percent). Set it to the maximum possible value.

DTE frame size configuration parameter. If SDC modems are used between synchronous DTEs, then the DCE frame size (and not the DTE frame size) must take into account the line error rate. Set the DTE frame size to as large a value as your DTE and your DTE application can handle. This reduces the significance of DTE frame overhead, and reduces the delay (expressed in number of DTE frames) for positive acknowledgment.

Modem Configuration

There are also configuration options in the V42/MNP/Buffer branch of the 3800*Plus* modem which affect SDC efficiency.

(LAPM) Max Frame Size. Except in environments where line impairments are known to be unusually high, set this to the maximum (256).

Sync DTE CRC. If the CRC type of the DTE frame is the 16-bit CRC for HDLC frames as defined by ITU-T, set this to CRC16.

SDC Delay Min. If clamping of the receive clock (circuit 115) is accepted by your DTE, then set this to Rx_Clock.

Sync Flow Cntrl. The Tx_Clock selection is suitable for most synchronous DTEs. If your DTE interprets transmit clock clamping or a drop in CTS as a problem (resulting in an aborted frame), set Sync Flow Cntl to None. Selecting None should not be a problem if the entire acknowledgment window of DTE frames does not exceed 5 kilobytes, so that it can be buffered by the modem.

Software License Agreement

THIS AGREEMENT CONTAINS THE PARADYNE CORPORATION LIMITED USE SOFTWARE LICENSE TERMS FOR THE SYNCHRONOUS DATA COMPRESSION FEATURE FOR COMSPHERE 3800PLUS MODEMS (HEREINAFTER THE "SOFTWARE").

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