

375A Dual DS1 Monitor Operation Manual

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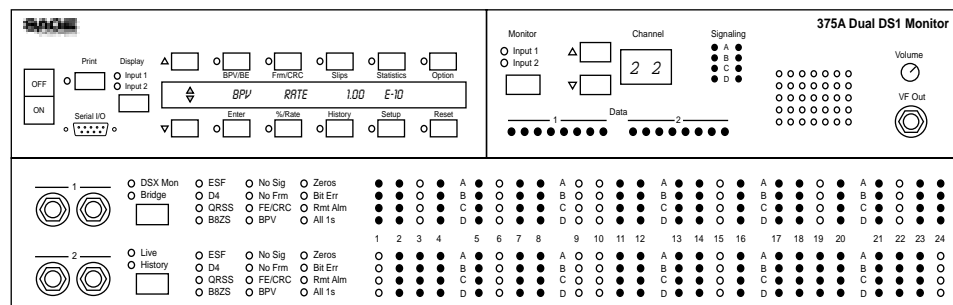
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Overview

The Sage Instruments 375A is a DS1 data stream monitor that performs non-intrusive measurements on both directions of a T1 span. Additionally, the 375A can simultaneously monitor two independent DS1 data streams, allowing each DS1 data stream to have its own framing type and line coding. The 375A is designed for use at the DSX bay or similar access point; the features are described in the following sections.

The Sage Instruments 375A incorporates three functional monitors into one package. Each monitor operates independently of the others, yet all share data and remote control information.



Signaling Bit Monitor

The lower half of the front panel is the Signaling Bit Monitor. This area provides a quick way to determine the error status of each DS1 line and the activity status of each of the 24 channels. The following functions and connections are found in this area (described from left to right).

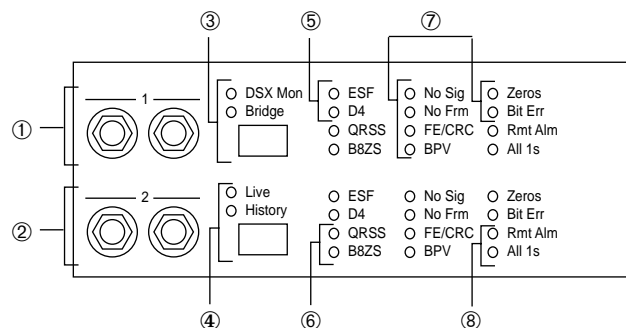


Figure 1-1 Signaling Bit Monitor area of the 375A front panel

- A pair of parallel input jacks for the number one DS1 data stream. ①
- A pair of parallel input jacks for the number two DS1 data stream. ②
- A key for DSX Mon and Bridge and two associated LEDs used to select and identify a line termination value across the input jack tip and ring connectors. ③

- An LED History mode key and two associated LEDs used to select and identify the latched LED operating mode. ④
- For the number one and number two data streams each:
 - Two LEDs that indicate the framing type—ESF or D4. ⑤
 - Two LEDs that indicate the coding—QRSS or B8ZS. ⑥
 - Six LEDs that indicate the error type—No Sig, No Frm, FE/CRC, BPV, Zeros, or Bit Err. The Zeros LED is labeled “>15 0s” on some older units. ⑦
 - Two LEDs that indicate the alarm type—RMT Alm or All 1s. ⑧
- A matrix of LEDs (rows A, B, C, D and columns 1 through 24) that indicate the current state of the associated supervision signaling bit with the associated channel number.

For operational details, see Section IV.

Audio Channel Monitor

The upper right area of the front panel is the Audio Channel Monitor, which can drop one channel from each DS1 stream, display its data and signaling, and monitor the audio on that channel. The following functions and connections are found in this area (described from left to right).

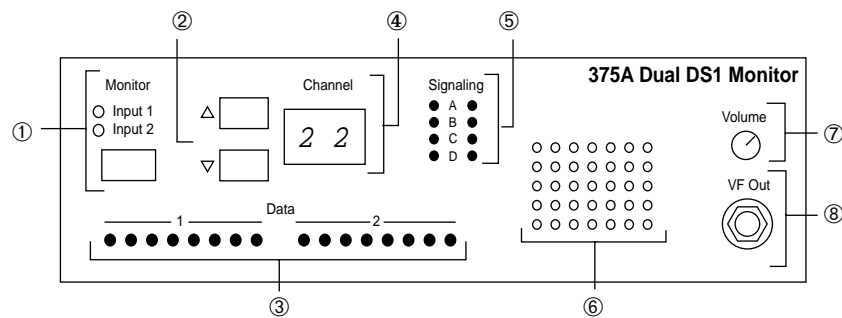


Figure 1-2 Audio Channel Monitor area of the 375A front panel

- A Monitor Input key and two LEDs used to select which DS1 data stream is referenced by the channel number indicator. ①
- Up and Down arrow keys for scrolling up and down to select the channel number to be monitored. ②
- Sixteen Data LEDs to live-monitor the channel data for the number one and number two DS1 data streams; eight LEDs are used for each stream. ③
- A two-digit numeric display indicating the selected channel in the frame and whether DID channel sequencing is active. ④
- Eight Signaling LEDs for the selected channel on the number one and number two DS1 data streams; four LEDs are used for each stream. ⑤
- A speaker for audio monitoring the selected channel. ⑥
- A volume knob to control the loudness of the speaker. ⑦
- A 600 Ohm, 0 dBm TLP jack labeled VF Out to send the monitored audio to another instrument. ⑧

For operational details, see Section V.

Error Monitor

The upper left area of the front panel is the Error Monitor, which has a character display and keys to access error counts and statistics. This area complies with CCITT Recommendation G.821; the area also provides special features in control and reporting capabilities. The following functions and connections are found in this area (described from left to right).

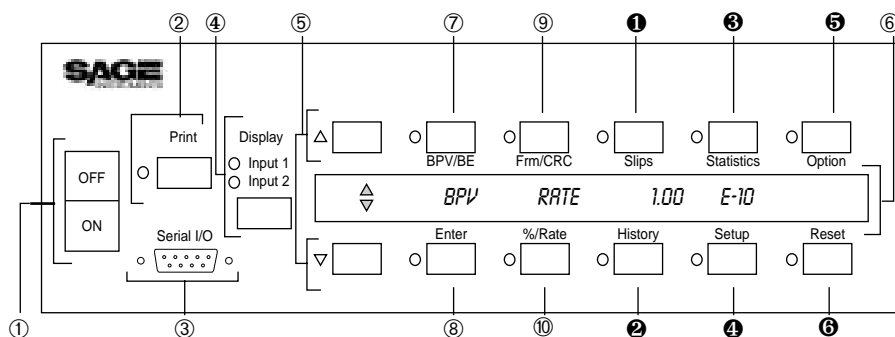


Figure 1-3 Error Monitor area of the 375A front panel

- A color coded On/Off switch to control the system power. ①
- A Print key and associated LED to access the print selection menus. ②
- A Serial I/O connector to interface with a printer or computer. ③
- A Display Input key and two LEDs used to select the DS1 data stream that is referenced in the alphanumeric display information. ④
- Up and Down arrow keys for scrolling the contents of the alphanumeric display to the next display item or menu selection. ⑤

When the flashing Up/Down arrow icon appears on the alphanumeric display, you can use either the Up or Down arrow key.

- A 24-character alphanumeric display. ⑥
- A BPV/BE key and associated LED to access bipolar violation and bit error (in QRSS) information. ⑦
- An Enter key and associated LED to verify menu items. ⑧
- An Frm/CRC key and associated LED to access the Frame and CRC error information. ⑨
- A %/Rate key and associated LED to switch the information format on the alphanumeric display from counts or values to percentages or rates. ⑩
- A Slips key and associated LED to access the bit and frame slip information. ①
- A History key and associated LED to select previous blocks of error information to inspect. ②
- A Statistics key and associated LED to access the CCITT G.821 calculations. ③
- A Setup key and associated LED to access the system-wide permanent configuration menus. ④
- An Option key and associated LED to access the temporary special system features. ⑤
- A Reset key and associated LED to clear the error counters and history blocks, and exit QRSS reception mode. ⑥

For operational details, see Section VI.

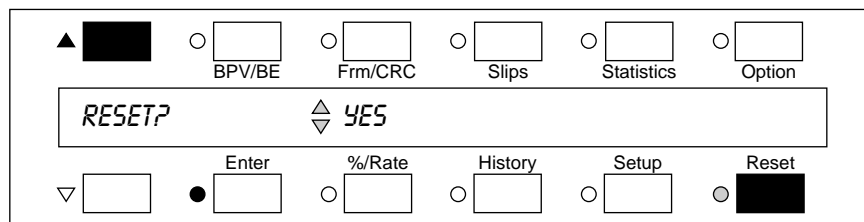
Typographic Conventions

The following typefaces and graphics are used in this manual.

Typeface or Graphic	Usage
Press the Statistics key.	This typeface is used to denote a key or LED on the 375A front panel.
Frame Errors is displayed.	This typeface is used in reference to a text that is displayed on the 375A front panel.
○	This symbol represents an LED that is not illuminated.
●	This symbol represents an LED that is illuminated.
◐	This symbol represents an LED that is flashing .
▲ ▼	This symbol represents the location of the flashing Up and Down arrow icon on the display. You can scroll the text that is displayed by using the arrow keys.
□	This symbol represents a key that has not been pressed.
■	This symbol represents a key that has been pressed.

Example

The following example shows how the key and LED graphics are used together in context with a series of keystroke operations.



- The Reset key has been pressed and its LED is flashing.
- The Up arrow key has been pressed to scroll the display contents to its current state.
- The flashing Up and Down arrow icon indicates the YES text item to its right can be scrolled to NO using the arrow keys.
- The Enter key has not been pressed, but its LED is illuminated to indicate that you can press it to confirm the current display action.

Installation

Inspection

The following items should be included with your 375A:

- Universal rack mount ears for a 19- or 23-inch rack
- Four Phillips-head screws
- A 375A Reference Guide (this document)

Site Installation

The universal rack mount ears can be used to install the 375A in a 19- or 23-inch rack in the mid- or front-rack mount positions.

There are two sets of holes in the side panels of the 375A. To mount the unit flush with the rack, use the front set of holes. To mid-mount the unit in the rack, use the rear set of holes.

If you are mounting the 375A in a 19-inch rack, attach the long side of the rack ears to the unit. If you are mounting the 375A in a 23-inch rack, attach the short side of the rack ears to the unit.

For table-top installation or portable usage, the unit has four, factory-installed rubber feet.

Power

AC power is via a standard, three prong, 115 V AC line cord on the back of the unit. If your unit is equipped for DC power, a -48 V DC supply is attached to a three-post terminal strip on the back of the unit (see Figure 1-4).

The power switch is located in the upper left corner of the front panel. A 1.5-amp, 250-volt fuse is located on the rear panel.

The 375A is shipped with its clock set to Pacific time and the current date. The serial port is not configured. For further information on setting up the system in a non-default configuration, see Sections VI and VII.

Rear Panel Access Connection

Units equipped with Option 5, Rear Panel Access (7375-0005-01), have an 8-pin wirewrap connector near the upper right corner of the rear panel.

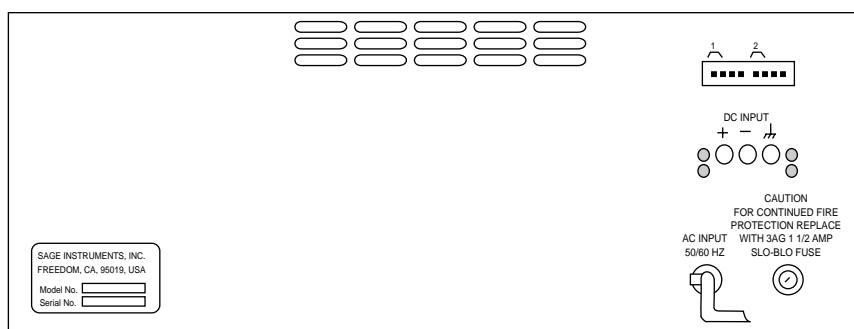


Figure 1-4 Back panel of the 375A

The rear panel connections function the same as the 310 jacks on the front panel of the 375A. The front panel jacks are still "live" when the rear panel connections are used. Table 1-1 shows how you can use the connections on the front and rear panels.

Table 1-1 Using front and rear panel connections

Front Panel Connections	Rear Panel Connections
1 and 2	none
1 only	2 only
2 only	1 only
none	1 and 2

- 1** Connect a cable from the CSU or DSX monitor jack for any DS1 line to the two pins labeled "1" on the rear panel.
- 2** If you want to monitor both sides of a T1 span, connect a second cable from the monitor jack that corresponds with the other side of the span, to the two pins labeled "2" on the rear panel.

The four unlabeled pins on this connector are not used.

Contacting Sage Instruments

Be sure to specify model 375A when asking for technical support. Customers located outside of the US may also contact their nearest Sage distributor for assistance.

By mail

Sage Instruments, Inc.
240 Airport Blvd.
Freedom, CA 95019-2614

By e-mail

sales@sageinst.com or support@sageinst.com

By fax

831-761-9246

By phone

831-761-1000
M-F, 9 a.m. to 5 p.m., Pacific Time

By WWW

To receive company and product information via the World Wide Web, visit our home page at:

<http://www.sageinst.com>

If You Never Read Manuals

If you never read manuals and just want to get your new gear working, take a few moments to read at least this chapter. Many functions of the 375A are explained here. We recommend that you take time to investigate all of the unique features of the 375A when you are ready.

Setup

Use this procedure to quickly setup the 375A. You should have followed the Site Installation instructions in Section 2.2.

1 Turn on the 375A.

The system takes about three seconds to complete its internal check, and then the LEDs illuminate.

2 Connect a cable from the CSU or DSX monitor jack for any DS1 line to the 310 input jack labeled “1”.

For 375A units equipped with Option 5, rear panel access wirewrap connections, see Figure 1-4 on page 5.

3 If you want to monitor both sides of a T1 span, connect a second cable from the monitor jack that corresponds with the other side of the span, to the 310 input jack labeled “2”.

4 If the 375A is not terminated by another piece of equipment, use the DSX Mon/Bridge key to select the termination (DSX or Mon) or to bridge across the line if no termination is desired.

The DSX Mon/Bridge key is located next to the 310 jacks (see ① in Figure 2-1). The 375A will terminate the line from the DSX Monitor jack in a 100 Ohm characteristic impedance.

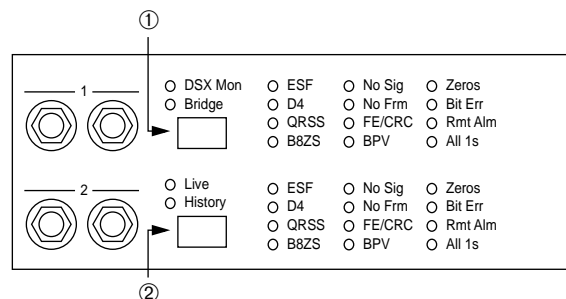


Figure 2-1 Signaling Bit Monitor area of the front panel

5 Press the Live/History key until the LED indicating Live is selected.

The Live/History key is next to the 310 jacks (see ② in Figure 2-1).

6 Clear the Error Counters and prepare the 375A for monitoring.

To do this:

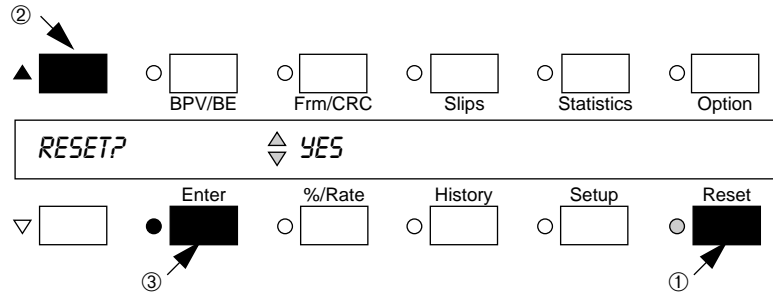


Figure 2-2 Error Monitor area of the front panel

- Press the Reset key (see ① in Figure 2-2).
- Press the Up arrow key (see ② in Figure 2-2).
- Press the Enter key (see ③ in Figure 2-2).

This answers YES to the reset question.

Signaling Bit Monitor

The Signaling Bit Monitor is the lower half of the unit.

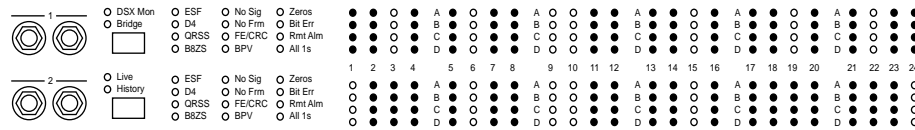


Figure 2-3 Signaling Bit Monitor area of the front panel

Framing Indicators

After resetting the unit, the 375A automatically detects the framing type in use and lights the appropriate LED. Table 2-1 shows what signaling is being detected when certain combinations of LEDs are illuminated.

Table 2-1 Signaling bit detection as shown by the LEDs

LEDs Illuminated	What is Detected
ESF	ESF
D4	D4
ESF and D4	D4 with a SLC-96 [®] data link
QRSS	unframed QRSS
QRSS and ESF	QRSS with ESF
QRSS and D4	QRSS with D4
B8ZS ⁱ	B8ZS

i. For each B8ZS code detected, the LED illuminates for one second.

Once QRSS is detected and synchronized to, to take it out of QRSS reception mode, you must use the reset command or cycle the power of the unit. The reset command consists of the following key presses in the Error Monitor area of the front panel.

- Press the Reset key.
- Press the Down arrow key.
- Press Enter.

To disable automatic detection of QRSS, use the Option key to select the QRSS detect control menu.

B8ZS line coding ties in with the excess Zeros alarm indicator as follows:

When signal is first received from the line, the 375A assumes that B8ZS framing is not present, and excess zeros is defined as a string of more than 15 consecutive zeros. The Zeros LED is labeled “>15 0s” on some older units.

If B8ZS framing is detected for five consecutive seconds (for example, at least one B8ZS code word per second), then the 375A assumes B8ZS framing is present. In this case, excess zeros is defined as a string of more than seven consecutive zeros.

To disable automatic detection of B8ZS or forcing the B8ZS status, use the Option key to select the B8ZS detect control menu.

Error and Alarm Indicators

The remaining error and alarm indicators on the lower left of the front panel are

- no signal
- frame error/CRC error
- bit (logic) error in QRSS
- unframed all 1s alarm
- no framing
- bipolar violation
- remote alarm

The LEDs illuminate upon detection of the labeled condition and stay illuminated for one second or until the condition is removed, whichever is longer.

Signaling Bit Indicators

To the right of the error and alarm LEDs are the signaling bit indicators for all 24 channels on both DS1 lines. They display the status of the supervision bits in real time. During QRSS reception, these LEDs are all turned off because no supervision signaling bits are valid.

If you want to capture and hold the activation of all the LEDs as they occur in the signaling bit monitor, repeatedly press the Live/History key located next to the 310 jacks until the LED indicates History is selected. The History LED flashes as a reminder that it is selected.

If you press the Live/History key again, the unit remains in History mode and clears the inactive LEDs. For a complete explanation of signaling bit monitor usage and a full discussion of all LED states, see Section IV.

Audio Channel Monitor

The Audio Channel Monitor is the upper-right area of the front panel.

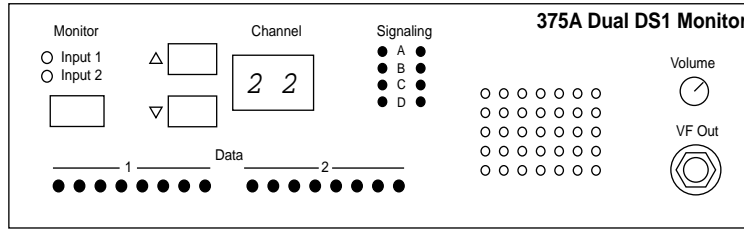


Figure 2-4 Audio Channel Monitor area of the front panel

The channel number indicator (the red, two-digit display) shows the selected channel time slot in the DS1 data stream to be monitored.

The Up and Down arrow keys, located to the left of the number in the display, are used to change the channel number.

The Monitor Input key chooses which DS1 data stream will be converted to analog audio. It can be monitored on the speaker or at the VF OUT jack. The volume knob controls the loudness of the monitored audio at the speaker, but does not affect the VF out jack. Each stream can be monitored independently or both can be monitored simultaneously. The Monitor Input LEDs show which inputs are selected. The monitor input selection does not affect the Data or Signaling LEDs.

The digital data for the selected channel is shown in real time by the Data LEDs, and the supervision bits for that channel are displayed on the Signaling LEDs. For a complete explanation of audio channel monitor usage, see Section V.

Error Monitor

The Error Monitor is the upper-left area of the front panel.

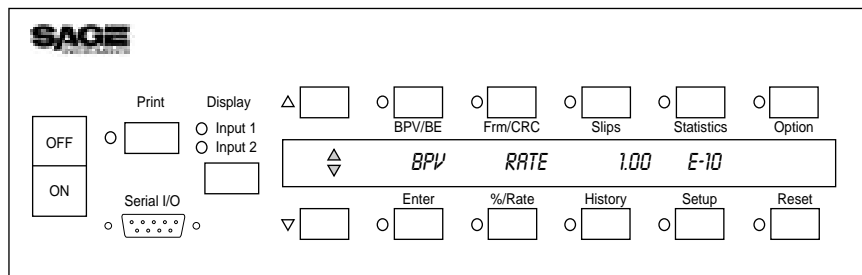


Figure 2-5 Error Monitor area of the front panel

If the LED next to a key is illuminated, that item is active. The Alphanumeric display show the selected item.

The Up and Down arrow keys scroll among items in any menu. The text to the right of the flashing Up and Down arrow icon is what changes as you scroll.

All information in the error monitor is on a per-DS1-stream basis. The Display key selects which DS1 data stream's information you will look at. Information on both data streams is continuously being collected, regardless of which is being displayed.

The BPV/BE, Frm/CRC, Slips, and Statistics keys are used to access error and analysis information for the currently displayed DS1 line. Pressing each key displays the current information for that type of error. Pressing the Up and Down arrow keys scrolls through the related error types.

For example, pressing the Slips key displays frame slip information, and the arrow keys move to bit slip information.

You can view error information in terms of counts or rates (% of total is grouped with rates). Pressing the %/Rate key toggles the display between counts and rates.

The Reset key resets all error conditions and counters for both DS1 data streams. It is also used to exit QRSS reception mode. After pressing Reset, you must press an arrow key to scroll to the YES choice and press Enter to confirm the reset. Pressing any other key cancels the reset request.

The Option, Setup, and Enter keys work together to configure the 375A to your unique requirements. Pressing the Option or Setup key brings up a scrollable list of system configuration choices.

Use the Up and Down arrow keys to find the item you want to modify, and press the Enter key to select it. Use the arrow keys and the Enter key to configure all the options of the active item.

▣ All Setup menu items are remembered when the unit is powered down. All Option menu items revert to their default values when the unit is powered down.

The five menu keys across the top of the alpha-numeric display (BPV, Frm/CRC, Slips, Statistics, Option) have a feature called “sticky positions”. Using this feature, you can scroll into a menu, then leave to scroll into a new menu, and return back the first menu where you left off.

Example

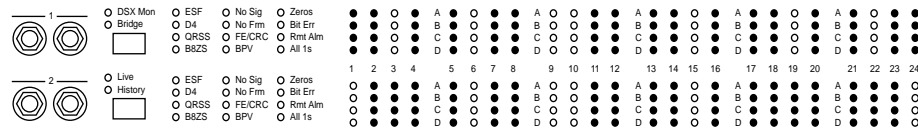
- 1** Push the Statistics key.
- 2** Scroll to the Available Seconds menu item (AVS)
Use the down arrow key to scroll.
- 3** Push the Slips key and the down arrow key to the BIT SLIPS menu item.
- 4** Push the Statistics key.
The display returns to the AVS menu item.
- 5** To get to the top of the Statistics menu list:
 - scroll to the top using the Up and Down arrow keys, **or**
 - push the Statistics menu key twice.

To quickly get to the top menu item in any menu with “sticky positions”, press that menu key twice.

The History and Print keys are covered in Sections VI and VII, respectively. A complete explanation of the error monitor usage is in Section VI.

The Serial I/O connector is a nine-pin, D-shell, female connector. It can be used to connect the 375A to a printer or a computer. It can be configured to run from 300 bits per second (bps) to 38,400 bps. Sections VI and VII cover the Serial I/O connector usage in the context of its target operation.

The Signaling Bit Monitor gives a visual reference of the entire span's activity at a single glance.

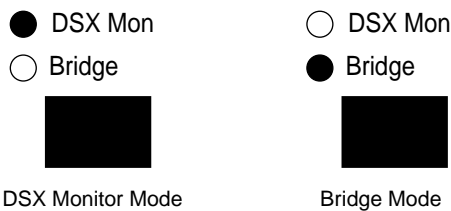


DS1 Line Hook-up

The 375A can monitor a T1 span in both directions. The inputs on the 375A are labeled 1 and 2 over the 310 jacks on the left side of the unit. Both jacks for a given span are common, allowing additional equipment to be connected to the span in parallel with the 375A. (For 375A units equipped with Option 5, rear panel access wirewrap connections, see Figure 1-4 on page 5.)

The impedance selector is located next to the number 1 set of 310 jacks.

Repeatedly pressing the key under the DSX Mon and Bridge labels, cycles the DSX Mon and Bridge LEDs.



When the DSX Mon LED is illuminated, 100 Ohm termination resistors are connected across the tip and ring of the 310 connector.

When the Bridge LED is on, the resistors are disconnected. The impedance presented to the span by the 375A is greater than 1000 Ohms.

NOTE Both sets of inputs are simultaneously affected by the termination selection key.

Use DSX Mon mode when the 375A is jacked into a DSX monitor point that is resistively isolated and when no additional equipment is connected to the line via the second 310 jack on the 375A.

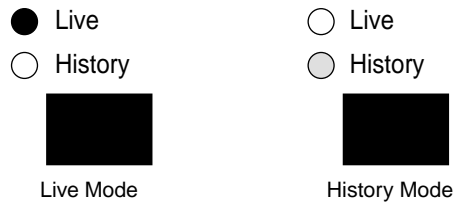
If additional equipment is connected, use Bridge mode. The other equipment should provide the required 100 Ohm termination. Also use Bridge mode if you are jacking across the actual span or the DSX monitor points are not resistively isolated.

Cables are available from Sage Instruments to connect the 375A to standard DSX and CSU monitor jacks. For connecting to 310-type jacks, order Sage part number 9400-0004-01

(60-inch, 310 male to 310 male). For connecting to Bantam jacks, order Sage part number 9400-0006-01 (60-inch, 310 male to Bantam male).

History Mode

The Live/History key is located next to the number 2 set of 310 jacks. Repeatedly pressing this key cycles between the Live and History mode.



In Live mode (the Live LED is illuminated), a transient error (such as a frame bit error or a bipolar violation) causes its associated LED to illuminate for about a second.

If there are continuous errors, the LED stays illuminated constantly. Visual detection of a single error might slip by if you are not looking at the LED when the error occurs. However, all error information is continuously accumulated by the Error Monitor. If you miss the LED indication, the error occurrence is maintained in the error counters.

In History mode (the History LED is illuminated and flashing), any error detected causes the associated LED to illuminate and remain illuminated, even if the error condition has ceased. This prevents you from missing an error because you did not see it indicated by the LED blink (as with Live mode). When you place the 375A in Live mode, the LEDs are cleared.

NOTE Both sides of the inputs are simultaneously affected by the LED History mode key.

Supervision signaling states are also stored in History mode. If a signaling bit ever changes to a 1, its LED is illuminated until you leave History mode. Because a 1 indicates off-hook for most signaling types, History mode indicates whether a trunk has been used. This can be very useful in detecting unused trunks (a trunk that is never seized has no signaling LEDs illuminated).

Framing LEDs

Each set of inputs has a set of four, green LEDs that indicate framing and line coding.

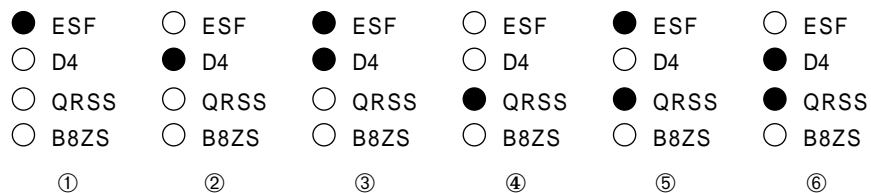


Figure 3-1 Example Framing LEDs

- ESF illuminates when ESF framing is detected (Bellcore TR-TSY-000194 and AT&T 54016). ①
- D4 illuminates when standard superframe is detected (AT&T 43801). D1D channel sequence decoding is available in D4 (see Section VI). ②

- ESF and D4 are both illuminated when D4 framing with data link is detected (SLC-96® or similar). D1D channel sequence decoding is available in SLC-96® (see Section VI). ③
- QRSS illuminates when the standard quasi-random signal sequence on the received line (when Option 375A-02 is installed) is detected. The ESF and D4 LEDs indicate the presence of framing, if any:
 - Only QRSS is illuminated when unframed QRSS is detected. ④
 - ESF and QRSS are both illuminated when ESF framed QRSS is detected. ⑤
 - D4 and QRSS are both illuminated when D4 framed QRSS is detected. ⑥

Once QRSS is detected and synchronized to, to take it out of QRSS reception mode, you must use the reset command or cycle the power of the unit. Even if a loss of carrier occurs, you will remain in QRSS reception mode. This condition is imposed because QRSS uses different error information to calculate error statistics. See Section 6.2 for information on error statistics, and Section 6.3 for the Reset command. See Section 6.4.1 to disable automatic detections of QRSS.

B8ZS illuminates when a valid bipolar violation sequence that corresponds to B8ZS line coding is received (per CB 144). B8ZS line code reception can be forced on, forced off, or automatically detected. See Section 6.4.1 for information on the B8ZS automatic detection option and how to configure it.

Because the B8ZS LED indicates the presence of at least one valid B8ZS sequence, it may occasionally not act as expected.

- If there is a very high bipolar violation rate on the line, the B8ZS LED might occasionally illuminate even though no B8ZS coding is being used because some random groups of BPVs might look like the B8ZS sequence. This condition can be noted when the red BPV LED is continually illuminated while the B8ZS LED flashes.
- If all channels on the span are idle or have traffic that has a high 1s density, the B8ZS LED might not illuminate even though B8ZS coding is used on the line. This could occur when no sequences of eight consecutive zeros ever appear, so the B8ZS code word is never sent.

Error and Alarm LEDs

Each set of inputs has a set of six red and two yellow LEDs that indicate errors and alarms.

- | | |
|------------------------------|---------------------------------|
| <input type="radio"/> No Sig | <input type="radio"/> Zeros |
| <input type="radio"/> No Frm | <input type="radio"/> Bit Error |
| <input type="radio"/> FE/CRC | <input type="radio"/> Rmt Alm |
| <input type="radio"/> BPV | <input type="radio"/> All 1s |

No Sig illuminates when there is no carrier present on the line.

No Frm illuminates when the 375A is unable to auto-frame to the signal. Any active framing LEDs are extinguished if No Frm is on.

FE/CRC illuminates when there has been a frame error (in all framing types) or a CRC error (in ESF only).

BPV illuminates when there has been a bipolar violation.

Zeros illuminates when there has been greater than fifteen consecutive zeros on the line with AMI line coding, or greater than seven zeros with B8ZS line coding.

NOTE On some older units, the Zeros LED was labeled “>15 0s”.

Bit Error illuminates when the 375A-02, QRSS, option installed and the unit detects a bit logic error in the QRSS pattern. If Bit Error is on and the QRSS LED is off, a loss of QRSS sync is being detected.

Rmt Alm illuminates when the 375A is receiving remote, or yellow, alarm.

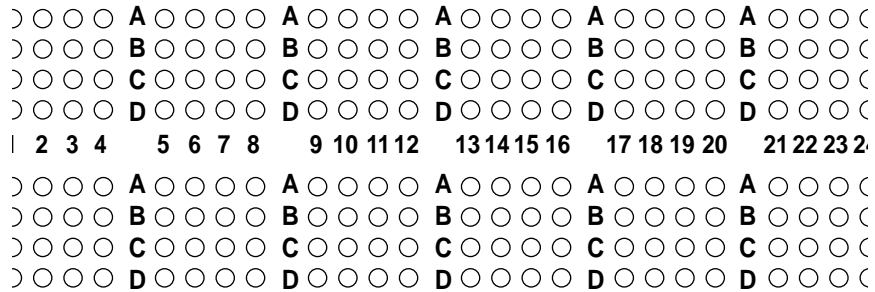
- In D4 framing, remote alarm is denoted when bit 2 of all 24 channels being set to 0.
- In ESF, remote alarm is sent via a special code in the facility data link.

Remote alarm indicates the remote terminal has lost carrier from the near terminal.

All 1s, or blue alarm, illuminates when an unframed all-1s signal is being received. All 1s alarm is typically sent by multiplexers when they detect downstream signal failure.

Signaling LEDs

Within the Signaling Bit Monitor, there is one bank of LEDs for each direction of the span. Each bank contains green LEDs indicating the states of the A, B, C, and D (supervision) bits for all 24 channels.

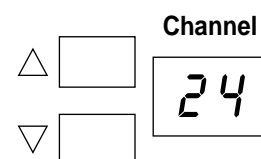


An LED illuminates to indicate that the corresponding signaling bit is set to a 1 (off-hook in most signaling types). In D4 and SLC-96[®] framing, the C and D LEDs remain off. In QRSS reception mode, all signaling LEDs remain off.

The Audio Channel Monitor area selects the audio of any channel from either one or both directions of the span. The signaling bit and channel data for the selected channel are displayed simultaneously for both directions.

Channel Selection

To select a channel, use the Up and Down arrow keys to the left of the red channel number display. Each press of an arrow key increments or decrements the channel number once. The channel “wraps” around (from 24 to 1 or 1 to 24) at the end of the sequence. To change the channel number continuously, press and hold one of the arrow keys.

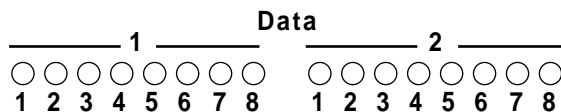
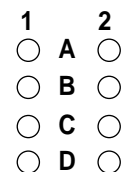


Channel Information

The Signaling and Data LEDs display the signaling bits and the received data respectively for both directions of the selected channel. The signaling bit LEDs operate identically to their counterparts in the Signaling Bit Monitor section of the unit (see Signaling LEDs on page 16).

For the Data LEDs, bit 1 is the bit sent first on that channel (the Most Significant Bit [MSB]) and bit 8 is the bit sent last (the Least Significant Bit [LSB]).

Signaling



Channel Audio Selection

Pressing the Monitor key chooses the selected channel's audio source. The audio is sent to both the speaker and the VF Out jack.

Monitor

Input 1

Input 2



Table 4-1 show how the Input 1 and Input 2 LEDs indicate the monitored direction.

Table 4-1 How Input LEDs show direction monitored

Input LEDs	Direction Monitored
Both off	No output
Input 1	Audio out from selected channel on input 1
Input 2	Audio out from selected channel on input 2
Both on	Audio out from selected channel on both inputs

The VF Out is a 310 jack that provides a 600 Ohm, 0 dBm, TLP output. Its level is not affected by the volume control position.

The Error Monitor provides an in-depth analysis and report of span conditions. It provides access to the system-wide configuration menu. The Error Monitor also serves as a gateway to the printer and computer remote functions discussed in Section VII.

System Structure

The 13 keys surrounding the 24-character alphanumeric display and their associated operations can be divided into four groups:

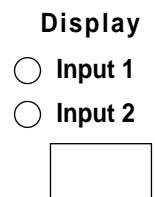
- Selection and movement keys
- Error and analysis keys
- Information modifier keys
- System configuration keys

Selection and Movement Keys

There are four keys that you use to move to different menu items and select specific actions—the Display Input key, the Up arrow, the Down arrow, and the Enter key.

Display Input Key

The Error Monitor display provides information on one DS1 data stream at a time. The Display input key, with two LEDs, selects which data will be shown. The Input 1 LED refers to the DS1 data stream on the 310 jacks (or rear panel wirewrap connections) labeled 1. The Input 2 LED refers to the DS1 data stream on the 310 jacks (or rear panel wirewrap connections) labeled 2. Regardless of which stream is being displayed, line conditions are continuously being collected on both streams.



Up & Down Arrow Keys

The Up and Down arrow keys (Ⓜ in Figure 5-1) are used to scroll through different counts, statistics, and menu items, or to change the value of an item. The flashing Up and Down arrow character in the display indicates that the text to the immediate right can be changed.

For instance, after pressing the Slips key, a count of frame slips is displayed. By pressing the Up arrow key, a count of bit slips is displayed. Pressing the Down arrow key returns the frame slip count.

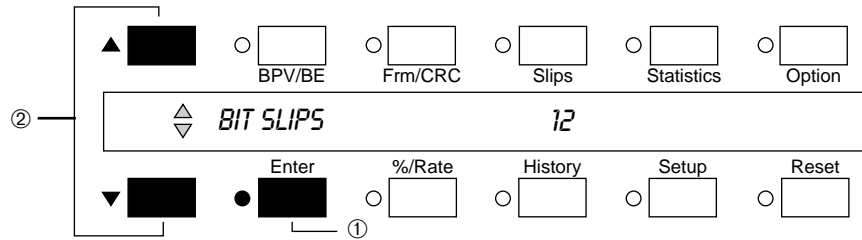


Figure 5-1 Error Monitor area of the front panel showing arrow and Enter keys

Enter

The Enter key (① in Figure 5-1) operates while inside the History, Setup, Print, and Option menus. The Enter key enters or confirms the action that is displayed. The exact usage is discussed with those menu items in which it is used.

Error and Analysis Keys

There are three error keys and one analysis key. The error keys are BPV/BE, Frm/CRC, and Slips; the analysis key is Statistics. Each key corresponds to a list of menu items. When a key is pressed, the list of menu items is accessible. Using the Up and Down arrow keys, you can scroll through the list of menu items. As described at the end of Section 3.4, each of the error and analysis menus uses the “sticky position” feature. To quickly get to the top menu item in a list, press the desired error or analysis key twice.

BPV/BE Key

Pressing the BPV/BE key (① in Figure 5-2) twice displays the count of *BPVS* (bipolar violations). The Up and Down arrow keys toggle between *BPVS* and *BITERRORS*. If you are not receiving QRSS, and you toggle to *BITERRORS*, the display reads *BITERRORSN/A*.

Frm/CRC Key

Pressing the Frm/CRC key (② in Figure 5-2) twice displays the number of *FRAMEERRORS*. The Up and Down arrows scroll between *FRAMEERRORS*, *CRCs*, and *FRAMELOSSES*. CRC errors are only valid in ESF framing type; the display reads *CRCN/A* when in D4 framing.

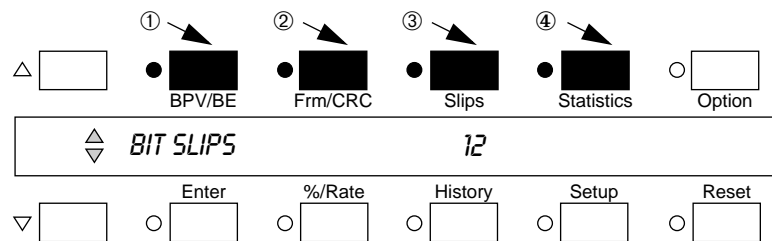


Figure 5-2 Error Monitor area of the front panel showing error and analysis keys

Slips Key

Pressing the Slips key (③ in Figure 5-2) twice displays *FRAME SLIPS*. The Up and Down arrows toggle between *FRAME SLIPS* and *BIT SLIPS*. If you are not receiving carrier on both inputs, the display reads *FRAME SLIPSN/A* or *BIT SLIPSN/A* as appropriate. See Appendix A for more details on slips.

Bit Slips

Slips are only available when two DS1 data streams are being monitored. Bit slips measure the difference in received clocks between the two data streams.

For example, if the clock frequency of stream one was slightly higher than the frequency of stream two, the Bit Slip count would increase. This indicates that there are more clock pulses on span one than there are on span two.

The bit slip count can be positive or negative, depending on whether the frequency on span one is higher or lower than the clock on span two.

It is normal for the display to alternate between two consecutive numbers, especially if there is some jitter on the line. Even with the two span clocks perfectly locked to each other, the display might alternate between zero or one bit slip.

Frame Slips

The frame slip counter increments every 193 bit slips, indicating that one more or one less frame has been sent on one span than on the other. Regardless of the direction of the bit slips, the frame slip count is always positive.

Statistics Key

Pressing the Statistics key (Ⓞ in Figure 5-2) twice takes you to the top of the statistics display. All statistics are calculated on live traffic errors, except in block History mode. When in block History mode, the statistics are calculated on the error information contained in the selected 15-minute block. Block History mode is discussed in Section 6.3.

In D4 or SLC-96[®] framing, frame errors and BPVS are used as the basis for error statistic calculations. In ESF framing CRCS, frame errors and BPVS are used as the basis for error statistic calculations. In QRSS reception mode, bit errors and BPVS are used as the basis for error statistic calculations. All calculations comply with CCITT Recommendation G.821. The following error statistics can be displayed, using the Up and Down arrow keys to scroll among them.

- EFS (Error Free Seconds)—the number of available seconds in which no errors occurred.
- ES (Errored Seconds)—the number of available seconds in which at least one error occurred.
- SES (Severely Errored Seconds)

In D4 or SLC-96[®] framing, this is the number of seconds with

- more than 12 frame bit errors, or
- more than 1544 bipolar violations (10-3 error rate), or
- no received carrier

In ESF, this is the number of seconds with more than 12 frame bit errors, or more than 320 CRC errors, or more than 1544 bipolar violations (10-3 error rate), or with no received carrier.

In QRSS reception mode, this is the number of seconds

- with more than 1544 bit (logical) errors (10-3 error rate), or
- in which a loss of QRSS sync occurs, or
- with no received carrier
- FS (Failed Seconds)—start accumulating after 10 consecutive severely errored seconds; stop accumulating after 10 consecutive non-severely errored seconds.

FS does not include the 10 consecutive severely errored seconds that determined the initial failed second criteria.

- AVS (Available Seconds)—accumulate while 10 consecutive severely errored seconds have not occurred; stop accumulating during unavailable seconds.

- UVS (Unavailable Seconds)—start accumulating after 10 consecutive severely errored seconds; stop accumulating after 10 consecutive non-severely errored seconds.
UVS does include the 10 consecutive severely errored seconds that determined the start of unavailable seconds.
- NO CARRIER (seconds)—the number of seconds in which there has been no PCM signal received.
- NO QRSS SYNC (seconds)—the number of seconds QRSS sync has been lost since first synchronization. If you are not receiving QRSS, the number of seconds will say *N/A*.
- ELAPSED TIME (seconds)—the number of seconds since the error counters have been cleared.

In %/Rate mode, the *ELAPSED TIME* is displayed in *HOURS:MINUTES:SECONDS* format.

The available and unavailable second counters might seem to function strangely if you are not aware of their interaction. For example, if you are watching the UVS counter when the span becomes unavailable, it will suddenly increment by 10 seconds because the last 10 seconds are added to the unavailable time. Similarly, when the span becomes available again, the UVS counter decrements by 10 seconds because those seconds that had been counted are declared available.

Information Modifier Keys

There are three modifier keys below the display—%/Rate, History, and Reset. These keys change the display format or data source of the error counter being shown. These keys affect the data representation of both inputs' data streams.

%/Rate Key

The %/Rate key (① in Figure 5-3) changes

- an error count display, such as *BPVS*, into an error rate display
- a statistics display, such as *EF5*, into a percent of the total seconds indicated in the elapsed time counter

The %/Rate LED illuminates when in this mode, and stay illuminated until you press %/Rate to return to the normal display. The LED is not illuminated when you go from a valid menu, such as *BPV/BE*, to one where a rate or percent calculation has no meaning, such as *Option*. In this case, the %/Rate LED illuminates when you return to a valid menu.

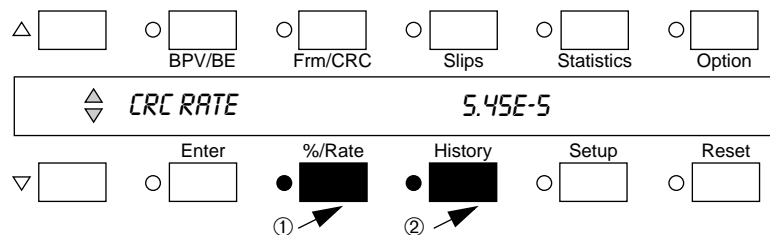


Figure 5-3 Error Monitor area of the front panel showing information modifier keys

History Key

The 375A error information and statistics are based on the total accumulated number of errors since the unit was last reset or powered up. History mode allows you to access the error information accumulated over the last 24 hours in small, manageable units.

The 375A keeps the 24-hour history of its error counters in 97, fifteen-minute blocks. The first 96 blocks are called completed blocks. The data in a completed block is static and represents

only the errors accumulated during its 15-minute interval. The 97th block is the one still accumulating data and is labeled *CURRENT*. If you monitor errors on a line for more than 24 hours, the oldest block will be rolled off the end every time a current block is finished and added to the queue.

For example, at the end of a 15-minute period, the *CURRENT* block becomes block #96, block #96 becomes block #95..., block #2 becomes block #1, and block #1 is lost.

The 15-minute blocks are matched to the system's time-of-day clock. This allows data to be updated on the hour, at quarter-past the hour, at half-past the hour and at 45 minutes past the hour. The data in the first accumulated block will not hold a full 15-minute period unless you start logging errors at one of these four times. Once a quarter-hour boundary is reached on the time-of-day clock, the first block is stored as a partial block. All following blocks will be a full 15 minutes long and will be stored on quarter-hour boundaries.

Press the History (Ⓜ in Figure 5-3) key to view the error counters for any of the blocks in the last 24 hours. The History LED begins to blink and the Enter LED illuminates. The display contains a block number along with its starting time. For example: *VIEW BLK#: 1 13:45:00*

Using the Up and Down arrow keys, you can cycle through the available history blocks. Pressing the Enter or History key selects the block with the displayed start time. If you decide not to enter History mode, press one of the other menu keys to abort the selected operation. For example, pressing the Slips key instead of the Enter key aborts the history block selection process and place you in the frame slips display.

When in History mode, all the keys on the 375A act as before. In this mode, however, there are differences in the error information and calculations you call up when selecting a key in the error monitor. The information you receive is based on the static data from the 15-minute block you selected when you entered History mode, as opposed to the total data used in the live mode.

The Current block in the History mode is a special case. Unlike the other 96 blocks of history data, the current block is still accumulating its data. Thus, when viewing the Current block, the counters increment as appropriate for the display measurements. The ability to show data and statistics over the present 15-minute period allows you to perceive changes in line conditions that might not reflect quickly in the totals' counters. This is especially true if the totals' counters (non-History mode data and statistics) are very large.

To exit History mode, press the History key. The History LED goes out and the data for accumulating totals is displayed. To select a different block from within History mode, press the History key twice and select the new block.

Reset Key

The Reset key clears all of the counters and history blocks, and forces a re-frame and re-sync. It also turns off any error or signaling LEDs that have been illuminated by the Live/History key in the Signaling Bit Monitor.

When you press the Reset key, you must confirm or cancel the action. *RESET* is displayed with flashing arrows next to *NO*. Pressing the Enter key or any other menu key aborts the reset operation. To continue with the reset operation, use the Up and Down arrows to scroll the display until *YES* is shown. Press Enter, and the system will reset.

NOTE Reset is the only way to exit QRSS reception mode once QRSS sync has been detected.

System Configuration Keys

There are two system configuration keys on the 375A for optional functions and system setup—Option and Setup. The status of items accessed via the Setup key is retained through periods when no power is applied to the unit. The status of items accessed via the Option key is not retained when the unit is powered down.

Option Key

When you press the Option key twice, the beginning of a list of nine option menu items is displayed. Use the Up and Down arrow keys to access all option menu items. Pressing the Enter key selects the currently displayed item. Pressing the Option key again returns to the beginning of the option menu. Figure A-1 on page 47 provides a quick reference for the structure of the Option key.

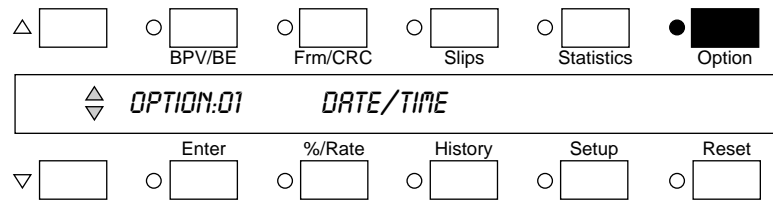


Figure 5-4 Error Monitor area of the front panel showing Option key

Option 1: Date/Time

This option displays the current day, date, and time. For example, *FRI 02-15-95 15:33:22*.

Option 2: Timer

This option accesses four timer event control choices. A timer event is an action specified to occur at a certain time. For example, resetting the error counters and statistics at 02:30 AM would allow you to accumulate data on early morning activity, starting at that time. If you get to work at 7:30 a.m., for example, you would see five hours of data accumulated starting at the exact time you specified. Events such as this can be handled through the timer option.

After selecting the timer option, use the Up and Down arrow keys to scroll among the four timer event control choices. When you arrive at the control choice you want to use, press the Enter key. The flashing arrows move to the right in the display, along side the current time. (The Enter key bounces the flashing arrows between selecting control choices and selecting event start times.) Use the Up and Down arrow keys to set the time to when you want the timer event to occur.

Press the Option key to exit this option and activate the timer event controller. The timer event displayed as you exit this option item is the currently active event. If you do not want an active timer event, use the Enter key to bounce the flashing arrows to the left of the display. Scroll the event control choices until the display reads *NO TIMEREVENT --:--*.

There are four timer event control choices to choose from.

- *NO TIMEREVENT --:--*—disables all timer events.
- *STOP COUNTERS* (hours):(minutes)—enables the stop timer event to execute at the specified time. At the specified time, all the error counters and statistical timers stop incrementing.

The contents of the display flash between the current display contents and the word *STOPPED*. At this point you can operate the unit to examine error counters, statistics, history blocks, and to print items, but no new data is accumulated on the DS1 line.

To exit this condition reset the error counters using the Reset key.

- *RESET COUNTERS* (hours):(minutes)—enables the reset timer event to execute at the specified time. Until the specified time occurs, the unit operates normally. At the specified time, all error counters and statistical timers are reset. The unit also restarts its auto-framing circuitry to hunt the framing mode. This is the same as using the Reset key at the set time.
 - *LED LIVE/HIST* (hours):(minutes)—enables the SBM Live/History key timer event to execute at the specified time. Until the specified time occurs, the unit operates normally. At the specified time, the state of the SBM Live/History key (and its associated LED) toggles. This is the same as pushing the Live/History key at the set time.
- ➡ Only one of these four types of timer events can be the active event. The active event type will be the type displayed when you exit the option by hitting the Option key.

Option 3: Version

This option displays the version number of the software installed in your system. The QRSS and SDR annunciators are also displayed if you have purchased those options. An example display is: *VERSION: 2.05 SDR QRSS*

Option 4: B8ZS Detect

This option gives you control of the automatic B8ZS detection circuit's interaction with the excess Zeros detector and alarm reporting for each input stream. The configuration of each data streams, simultaneously or independently, can be set to one of three modes—B8ZS line coding forced *ON*, B8ZS line coding forced *OFF*, or B8ZS line coding *AUTO* detect. These three choices tell the system what to expect on the line concerning B8ZS.

If *B8ZS = OFF* the system is forced to assume B8ZS line codes are not used in this data stream. An excess Zeros alarm activates if more than 15 consecutive Zeros are counted. If *PRINT ALARMS = YES* in the serial port setup menu and a B8ZS code is detected, the printed message will say: *(TIME)(DAY)(DATE)INPUT(#):B8ZS DETECTED*.

If *B8ZS = ON* the system is forced to assume B8ZS line codes are used in this data stream. An excess Zeros alarm activates if more than seven consecutive Zeros are counted. If *PRINT ALARMS = YES* in the serial port setup menu and a B8ZS code is detected, nothing is printed to indicate the detection.

If *B8ZS = AUTO* the system determines whether B8ZS line codes are used in this data stream. Initially, the system assumes that no B8ZS line coding is used (i.e., AMI only). If five consecutive seconds occur during which at least one B8ZS code in each second is detected, the system then assumes B8ZS line coding is in use from that point on.

During the period of AMI only, an excess Zeros alarm activates if more than 15 consecutive Zeros are counted. Once the switch to B8ZS has occurred, an excess Zeros alarm activates if more than seven consecutive Zeros are counted. If *PRINT ALARMS = YES* in the serial port setup menu, a B8ZS code is detected, and the unit is still in AMI coding, the printed message reads: *(TIME)(DAY)(DATE)INPUT(#):B8ZS DETECTED IN AMI CODING*. This continues until the above criteria are met to assume B8ZS coding is supposed to be on the line. Once the criteria are met, the printed message reads: *(TIME)(DAY)(DATE)INPUT(#):SWITCH TO B8ZS*. When further B8ZS codes are detected, nothing is printed.

The B8ZS detection circuit constantly scans the input data stream for BPVs whose appearance match the B8ZS code word. For each code word detected the B8ZS indicator LED will illuminate regardless of the state of this option item.

To set up this option:

- 1 Select option six by using the Enter key.

A display appears similar to this: *BOTHBBZS: AUTO*. The flashing arrows are to the left of the display.

The Up and Down arrow keys scroll through the choice of inputs to be affected by the setting to the right of the display. The choices are *BOTH*, *INPUT #1*, and *INPUT #2*.

The Enter key bounces the flashing arrows to the left of the mode choices. The choices are *AUTO*, *ON*, and *OFF* as described above.

- 2 Press the Enter key to bounce the flashing arrows between selecting inputs affected and selecting detection mode.
- 3 After you set up the inputs and their detection modes, press the Option key to exit this option item and activate your selections.

Option 5: QRSS Detect

This option controls the automatic QRSS detection circuitry in the system, if you have the QRSS test receiver option installed (Option 375A-02). You can set both data streams, together or each independently, to allow automatic detection of and synchronization to the QRSS signal pattern. You can also disable this automatic detection ability.

When automatic detection is enabled (*QRSS = AUTO*), the system must receive 128 consecutive bits of the QRSS data pattern with no bit errors to declare the 375A in QRSS sync. When automatic detection is disabled (*QRSS = OFF*), the system never attempts to enter the QRSS reception mode.

To set up this option:

- 1 Selecting option five with the Enter key.

A display appears similar to this: *BOTHQRSS: AUTO*. The flashing arrows are to the left of the display.

The Up and Down arrow keys scroll through the choice of inputs to be affected by the setting to the right of the display. The choices are *BOTH*, *INPUT #1*, and *INPUT #2*.

The Enter key bounces the flashing arrows to the left of the mode choices. The choices are *AUTO* and *OFF* as described above.

- 2 Press the Enter key to bounce the flashing arrows between selecting inputs affected and selecting detection mode.
- 3 After you set up the inputs and their detection modes, press the Option key to exit this option item and activate your selections.

Option 6: Reframe

This option forces the unit to engage its automatic framing circuitry. You must select what to reframe in the display. The initial display reads *RE-FRAME:BOTH*. The flashing arrows are to the left of *BOTH*.

- To reframe both inputs to their DS1 data streams, press the Enter key.
- Otherwise, use the Up and Down arrow keys to select *INPUT #1* or *INPUT #2*.
- Press the Enter key to reframe the selected inputs.

The display shows *FORCINGREFRAME(S)...* To escape the reframe menu, press any other menu key, such as BPV/BE, instead of the Enter key. The error counters are not altered by forcing the unit to reframe.

An example of when you might use this option follows.

If you are monitoring a test line with a SLC-96® datalink, the 375A will detect and frame to D4 with SLC-96®. If you then switch to D4 framing alone and no Loss Of Signal (or LOS) occurred, the 375A could not detect the loss of the data link. This is due to the definition of the SLC-96® data link being embedded in the D4 framing. Forcing the reframe would cause the unit to find the D4 framing alone in use.

NOTE The chance of a live span ever changing framing types with no LOS occurring is very small.

NOTE This option does not change mode if it is in QRSS receiver mode. To do so, you must use the Reset operation. If you select this option while in QRSS, the display will read *REFRAME:N/A IN QRSS*.

Option 7: Test LEDs

This option enters the diagnostic mode. Although the display is in a forced mode of operation, the error monitor is still accumulating errors in the background. When in this mode, the ACM Data LEDs are not illuminated. The ACM Channel number display is forced to 8.8. The Error Monitor alphanumeric display is forced to 24 blocks of all pixels on (a block is five pixels wide and seven pixels high). The remaining LEDs on the 375A are illuminated. The speaker beeps loudly. To exit this mode, press any key.

Option 8: Lock KeyBD

This option disables the buttons on the front panel. This option is useful to protect against inadvertent or unauthorized manipulations of the unit by others, especially at remote control sites. The front panel buttons on the unit are locked out of operation, but all remote control operations are unaffected as well as any automatic report printing or timer operations that were enabled prior to selecting this option item.

To set up this option:

- 1 Select option eight with the Enter key.

A display appears similar to this: *LOCK KEYBOARD? NO*. The flashing arrows are in the right center of the display next to the *YES/NO* choice.

The Up/Down arrow keys toggle the choice between *YES* and *NO*.

- 2 Press the Enter key when your choice is displayed.

If you choose *NO*, the display returns to the top of the option item list and the system responds as always to user keystrokes.

If you choose *YES*, the display returns to the top of the option item list, but pressing any key causes the speaker to beep and the following message appears briefly on the display: *KEYBOARD IS LOCKED*.

- 3 To unlock the keyboard from the front panel, press and hold the Option key until the speaker beeps four times.

To unlock the keyboard under remote control, send the "O" command four times in a row.

As the keyboard becomes unlocked, the display reads: *KEYBOARD IS UNLOCKED*.

Option 9: Start SDR

This option places the unit in the 24-channel Dual Direction Supervision Detail Recorder mode (if the 374A-03 option is installed). In this mode the 375A accumulates all the supervision signaling bits for all 24 channels on both inputs on 20 millisecond boundaries. It then packs the bits into a serial data package and transmits it out the Serial I/O connector. A computer attached to the serial connector of the unit receives these data packages and reassembles them into a visual format for the users inspection. See the SDR manual for complete details on the computer operation when this option is active.

To set up this option:

- 1 Select option nine with the Enter key.

A display appears similar to this: *ARE YOU SURE? NO*. The flashing arrows are in the right center of the display next to the *YES/NO* choice.

The Up/Down arrow keys toggle the choice between *YES* and *NO*.

- 2 Press the Enter key when your choice is displayed.

If you choose *NO*, the display returns to the top of the option item list and the system responds as always to user keystrokes.

If you choose *YES*, the display reads: *SDR RUNNING 1: 2: .* The stopwatch icons in the center of the display will have a small sweeping second hand to indicate the serial packages are being transmitted. The channel number display and all the LEDs on the unit will be off except the Reset key LED.

- 3 To exit the bit dump option press the Reset key.

The unit resets and returns to normal operation.

When this option is engaged, the serial port on the 375A is automatically set to the following configuration:

Computer Mode, 38400 Baud (BPS), 8 Data, 1 Stop, No parity.

When you exit this option, the serial port is reconfigured to the setup that was selected before this option was engaged.

Setup

When you press the Setup key, the Setup LED begins flashing.

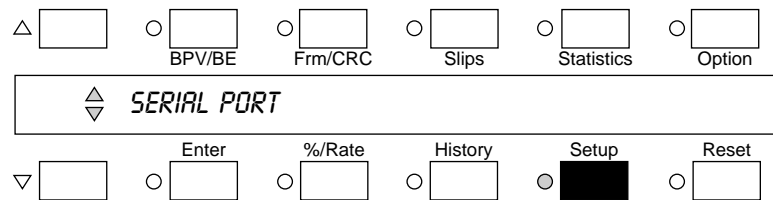


Figure 5-5 Error Monitor area of the front panel showing Setup key

The display will show the beginning of the following list of configurable items:

- *SERIAL PORT*
- *KEYBOARD AUTO REPEAT*
- *TIME/DATE*
- *SELECT PRINTED ERRORS*
- *SET CHANNEL SEQUENCE*
- *DISPLAY BRIGHTNESS*

Scroll through these items by using the Up and Down arrows. Pressing the Enter key selects the submenu of the displayed item so you can configure it. After setting up the submenu parameters of concern, pressing the Setup key again exits the Setup menu.

Figure A-1 on page 47 provides a quick reference of the structure of the Option key.

The flashing arrows on the alphanumeric display are useful for visualizing where you are in the Setup menu structure. When located at the far left of the display, the Up and Down arrow keys scroll through the six main Setup menu items. After a main menu item is selected, the arrows scroll through the list of submenus corresponding to the parent menu.

After you scroll to the desired submenu choice, pressing Enter selects the value for that item so you can edit it. The blinking cursor moves from the left-most position to a central position on the display. The Up and Down arrow keys now scroll through a list of available values. Pressing the Enter key, sets the value of the submenu item to the displayed value and moves the flashing arrows to the far left again, allowing you to choose and edit another submenu item.

Serial Port

The serial port setup submenus consist of a list of serial port parameters. Scroll through the parameters by using the Up and Down arrow keys. Press the Enter key to select a parameter to modify its value. Table 5-1 describes the submenus and their possible values.

Table 5-1 Serial Port submenu descriptions

Submenu	Values
Description	
Mode	COMPUTER, PRINTER, NONE
configures the serial port (Serial I/O connector) base operation mode Use COMPUTER if the unit will be connected to a computer that will provide remote control instructions. Use PRINTER if a serial printer, such as Sage Instruments P/N 9400-0001-02, will be attached to the serial port. Use NONE if nothing will be attached to the serial port. In COMPUTER mode, the DTR value is not available in the HANDSHAKE submenu describe below.	
Baud	38400, 19200, 9600, 4800, 1200, 600, 300
configures the serial transfer speed in bits per second Set this value to match the value selected on the serial device on the other end of the cable.	
Data	8 BITS, 7 BITS
configures the serial data word size Set this value to match the value selected on the serial device on the other end of the cable.	
Stop	1 BIT, 2 BITS
configures the number of stop bits Set this value to match the value selected on the serial device on the other end of the cable.	
Parity	NONE, EVEN, ODD
configures the type of parity Set this value to match the value selected on the serial device on the other end of the cable.	
Handshake	XON/XOFF, NONE, RTS/CTS, DTR

Table 5-1 Serial Port submenu descriptions (Continued)

Submenu	Values
Description	
<p>configures the type of low level transfer handshake</p> <p>Set this value to match the value selected on the serial device on the other end of the cable.</p> <p>In COMPUTER mode, the DTR value is not available in the MODE submenu describe above.</p>	
Lines per Page	1–200
<p>sets the page length of the serial device that will be receiving printed reports.</p> <p>A page could be a standard printer page, in which case you would use a value of 66. A page could also be a standard computer screen that is attached to a computer that talks to the 375A, in which case you would use a value of 25.</p>	
Print Blocks	YES, NO
<p>controls the automatic printing of error information blocks</p> <p>The system accumulates error and statistics information for 15-minute intervals and stores this data as a history block (see Section 6.3).</p> <p>If YES is selected and the serial port is in PRINTER mode, the data is printed to the serial printer as it is stored to the history block. You can then maintain a continuous log of span status information in a hard copy automatically.</p> <p>If the serial port is in COMPUTER mode, a bell character (^G) is sent instead. This causes the computer's speaker to beep to alert you that information is pending. The information is sent when the computer requests it via the W command.</p> <p>Section VII discusses remote computer operations.</p> <p>If NO is selected, automatic block printing is disabled.</p>	
Print Alarms	YES, NO
<p>controls the automatic printing of received alarm conditions as they occur.</p> <p>The alarm and error conditions of concern are any event that would light an alarm or error LED in the Signaling Bit Monitor (see Section 4.2).</p> <p>If YES is selected and the serial port is in PRINTER mode, the data is printed to the serial printer as the error or alarm LED is lit on the 375A. If the serial port is in COMPUTER mode, a bell character (^G) is sent instead. This beeps causes the computer's speaker to beep to alert you that information is pending. The information is sent when the computer requests it via the W command.</p> <p>Section VII discusses remote computer operations.</p> <p>If NO is selected, automatic alarm printing is disabled.</p>	

The error and alarm conditions are prioritized when printed. A higher priority item will print instead of a lower priority item if more than one item occurs simultaneously. For example, a loss of carrier (PCM signal) would also cause a loss of QRSS sync. Printing a loss of QRSS sync is meaningless, however, in view of carrier being lost. Thus, only the loss of carrier error is printed. The following is the priority list of error and alarm messages that *PRINT ALARMS* uses.

- No Carrier Alarm
- No QRSS Sync

- Unframed All 1s (Blue alarm)
- Frame Loss
- Remote Alarm (Yellow Alarm)
- Excess Zeros
- Framing Error
- CRC Error
- BPV Error
- Frame Slip
- Bit Error (Logic Error)
- B8ZS code detected in AMI
- Switching to B8ZS from AMI

Keyboard Auto Repeat

To select the Keyboard Auto Repeat Setup menu, press the Enter key while *KEYBOARD AUTO REPEAT* is displayed. This menu consists of two submenus, *KEYDOWNDELAY* and *REPEAT SPEED*, which can be selected with the arrow keys. Table 5-2 describes the menus and submenus and their possible values.

Table 5-2 Keyboard Auto Repeat menu and submenu descriptions

Submenu	Values
Description	
Key down delay	SHORT, MEDIUM, LONG
<p>configures how long you must hold down a key before the auto repeat function engages</p> <p>This function emulates pressing the same key over and over again. Only certain keys, such as the Up and Down arrows, will auto repeat if held down long enough. The value you set in this option is the length of time you must hold down a key before auto repeat engages.</p> <p>If SHORT is selected, the delay is less than one second. If MEDIUM is selected, the delay is less than two seconds. If LONG is selected, the delay is less than three seconds.</p>	
Repeat speed	FAST, MEDIUM, SLOW
<p>configures how quickly a key is repeated when the auto repeat function engages</p> <p>If FAST is selected, a key is repeated every 1/10th of a second. If MEDIUM is selected, a key is repeated every 3/10ths of a second. If SLOW is selected, a key is repeated every 7/10ths of a second.</p>	

Time/Date

To select the system time and date setup menu, press the Enter key while *TIME/DATE* is displayed. This menu consists of seven submenus, which can be selected with the arrow keys. Table 5-3 describes the menus and submenus and their possible values.

Table 5-3 Time/Date submenu descriptions

Submenu	Values
Description	
Month	01–12
configures the current month Month 01 is January, month 02 is February, ... month 12 is December.	
Day	01–31
configures the current day of the month After the value is set, the clock in the 375A updates the day to match the length of each month. (e.g., April has 30 days, May has 31 days)	
Year	00–99
configures the current year in a two-digit format A value of 91 indicates 1991, and a value of 00 indicates the year 2000.	
Hour	00–23
configures the current hour of the day in a 24-hour format Noon is 12 and midnight is 00.	
Minute	00–59
configure the current minute of the hour	
Second	00–59
configure the current second of the minute	
Weekday	MON, TUE, WED, THU, FRI, SAT, SUN
configures the current day of the week	

Select Printed Errors

To customize your printed 15-minute block reports, press the Enter key while *SELECT PRINTED ERRORS* is displayed. This setup affects only reports that are printed by pressing the Print key and selecting the appropriate item to print (see Section VII). This setup does not affect the 15-minute block reports that are printed automatically if you have selected *YES* to the *PRINT BLOCKS* submenu of the serial port setup.

This menu consists of 16 submenus, which can be selected with the arrow keys.

Each submenu calls out a different item type; *BPVS*, *CRCS*, etc., and has a *YES* or *NO* toggle. If you want the information for the item to be printed in your selected report, set its value to *YES*. Otherwise, set it to *NO*. This is useful if you are only looking for certain types of information and do not wish to be flooded with span monitoring data.

For example, if *QRSS* is being sent on a test line, you can customize the reports to show only *BIT ERRORS* and *QRSS SYNC* information.

The following is a list of the submenus (with additional information where necessary).

- BPVS—bipolar violations
- CRC ERRORS—CRC error information in ESF or frame error information in D4
- FRAME ERRORS
- FRAME LOSSES
- FRAME SLIPS
- BIT SLIPS
- NO CARRIER
- AVS—available seconds
- UVS—unavailable seconds
- EFS—error free seconds
- ES—errored seconds
- SES—severely errored seconds
- FS—failed seconds
- ELAPSED—the amount of time elapsed since testing began
- BIT ERRORS
- NO QRSS SYNC—the amount of time that QRSS sync is lost

Set Channel Sequence

To choose the channel sequence decoding to use if a SLC-96® or D4 framing is detected, press the Enter key while *SET CHANNEL SEQUENCE* is displayed. The *SET CHANNEL SEQUENCE* menu consists of one submenu—*CHANNEL SEQUENCE*. The values are *03/04* and *010*.

Display Brightness

To choose the relative brightness of the display, press the Enter key while *DISPLAY BRIGHTNESS* is displayed. The *DISPLAY BRIGHTNESS* menu consists of one submenu—*CHANGES BRIGHTNESS*. The values are *1–7*. Scroll through the values by using the Up and Down arrow keys. 1 is dimmest; 7 is brightest.

The 375A has a nine-pin, female, D-shell serial I/O port on the front panel. You can connect the 375A to a printer for printing error counters and system setups. You can also connect the 375A to a computer so the unit can be operated remotely. Remote operation allows the data from the 375A error counters to be logged into a computer data base.

Setting Up

To use the printer or computer remote mode, the serial port must be set-up for the type of device that will be used. You can do this using the Setup key (see Section VI).

If you are connecting to a Sage Instruments P/N 9400-0001-02 serial printer, use the following data to configure the serial port to printer mode.

- 9600 bps
- even parity
- 7 data bits
- one stop bit
- DTR handshaking

If you are connecting to a computer serial port, use the fastest baud rate your computer can reliably support. A typical setup for computer mode is:

- 38400 bps
- no parity
- one stop bit
- XON/XOFF handshaking

Printing

Pressing the Print key places the 375A into print function. This function contains six print menu items—*TOTAL COUNTERS*, *ERRORED BLOCKS*, *SINGLE BLOCKS*, *RANGE OF BLOCKS*, *BLOCK TOTALS*, *PRINT CONFIGURATION*—some of which contain submenus. Each menu item is discussed in detail in the following sections.

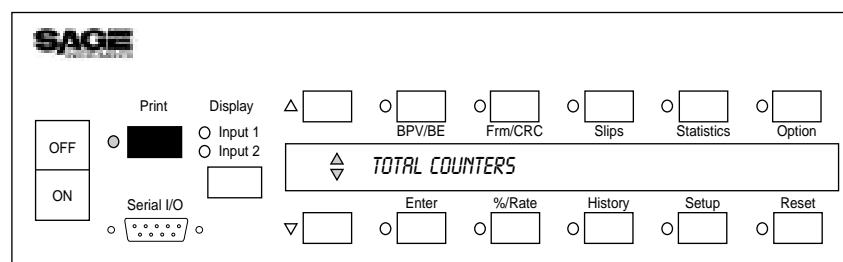


Figure 6-1 Error Monitor area of the front panel showing Print key

To view the desired menu item, use the Up and Down arrow keys to scroll through the choices. To select a menu item, press the Enter key.

To exit the print function without printing anything, press the Print key again. This exits the print function regardless of the number of submenus you are in.

To cancel a print job once printing has started, press the Print key. You must confirm the cancellation at a *CANCEL?* prompt. Use the Up and Down arrow keys to scroll the *YES/NO* toggle to *YES*, and press the Enter key.

The 375A has a built-in print buffer that queues the print data before it is sent to the printer. The display flashes *PRINTING...* for a brief period while the data is moved to the buffer.

While the print data is being moved to the buffer, you cannot use these keys; BPV/BE, Frm/CRC, Slips, Statistics, Options, %/Rate, History, and Setup. All other keys operate normally. Error counts and statistics are updated in the background during printing. This ensures no error events or span information is lost during printing.

Total Counters Menu

The *TOTAL COUNTERS* menu item prints the error totals with their rate calculations and error statistics. Totals are the values accumulated since the unit was last reset or turned on. There is one submenu to this menu—*PRINT*. The *PRINT* submenu determines which error information to print—*ALL* or *SELECTED*.

If *ALL* is chosen, the complete error block information is printed (see Figure 6-2).

```

TUE 05-21-91 11:59:51
—TOTAL COUNTERS—
FROM: TUE 05-22-91 11:06:18 TO: TUE 05-21-91 11:59:51

```

	INPUT#1		INPUT#2	
BPVS	1	1.04E-9	1	1.04E-9
CRC5	0	0.00E-6	0	0.00E-6
FRAMEERRORS	0	0.00E-6	0	0.00E-6
FRAMELOSSES	0	0.00E1	0	0.00E1
FRAME SLIPS	0	0.00E1	0	0.00E1
BIT SLIPS	0	0.00E0/HR	0	0.00E0/HR
NO CARRIER	0	0.00%	0	0.00%
AVS	4339	100.00%	4339	100.00%
UVS	0	0.00%	0	0.00%
EFS	4338	99.95%	4338	99.95%
ES	2	.04%	2	.04%
SES	0	0.00%	0	0.00%
FS	0	0.00%	0	0.00%
ELAPSED	4341	01:12:21	4341	01:12:21
BITERRORS	4	5.96E-10	4	5.96E-10
NO QRSS SYNC	0	0.00%	0	0.00%

Figure 6-2 Sample print out when Print All is selected

If *SELECTED* is chosen, only the error information that has been selected in the *SELECT PRINTED ERRORS* menu of the Setup function (see Setup on page 28) is printed (see Figure 6-3).

```

TUE 05-21-91 11:59:51
—TOTAL COUNTERS—
FROM:  TUE  05-22-91  11:06:18  TO:  TUE  05-21-91  11:59:51

```

	INPUT#1		INPUT#2	
<i>BPVS</i>	1	1.04E-9	1	1.04E-9
<i>AVS</i>	4339	100.00%	4339	100.00%
<i>UVS</i>	0	0.00%	0	0.00%
<i>EFS</i>	4338	99.95%	4338	99.95%
<i>ES</i>	2	.04%	2	.04%
<i>SES</i>	0	0.00%	0	0.00%
<i>FS</i>	0	0.00%	0	0.00%
<i>BITERRORS</i>	4	5.96E-10	4	5.96E-10
<i>NOQRSS SYNC</i>	0	0.00%	0	0.00%

Figure 6-3 Sample print out when Print Selected is selected

The header contains the following information:

- day, date, and time the report was printed
- the report title
- the time from which the data started accumulating
- time to which the data was accumulated

The columns of the body of the report are (from left to right):

- the type of error statistic
- the results for input one as a count
- the results for input one as a percent
- the results for input two as a count
- the results for input two as a percent

Errored Blocks Menu

This menu item prints the error totals with their rate calculations and error statistics only for the completed blocks that contain errors in the past 24 hours. If a block was accumulated and no errors were recorded during that time period, it is not considered an errored block. A block is considered errored only if some type of error (BPV, CRC, ...) is recorded during that block's accumulation. If no blocks have been accumulated, the speaker beeps and the display flashes *NO ERRORED BLOCKS*.

There is one submenu to this menu—*PRINT*. The *PRINT* submenu determines which error information associated with an errored block is printed—*ALL* or *SELECTED*. If *ALL* is chosen, the complete error block information is printed. If *SELECTED* is chosen, only the error information that has been selected in the *SELECT PRINTED ERRORS* menu of the Setup function (see Setup on page 28) is printed (see Figure 6-4).

```

TUE 05-21-91 1:59:51
—ERRORED BLOCK—
BLOCK#: 6          STARTED:  TUE  05-21-91  12:15:00

```

	INPUT #1		INPUT #2	
BPVS	25	1.79E-8	25	1.79E-8
CRC5	31	1.03E-4	31	1.03E-4
FRAME ERRORS	0	0.00E-5	0	0.00E-5
FRAME LOSSES	0	0.00E1	0	0.00E1
FRAME SLIPS	0	0.00E1	0	0.00E1
BIT SLIPS	0	0.00E1/HR	0	0.00E1/HR
NO CARRIER	0	0.00%	0	0.00%
AVS	900	100.00%	900	100.00%
UVS	0	0.00%	0	0.00%
EFS	899	98.77%	899	98.77%
ES	11	1.22%	11	1.22%
SES	0	0.00%	0	0.00%
FS	0	0.00%	0	0.00%
ELAPSED	900	01:15:00	900	01:15:00
BIT ERRORS	43	3.09E-8	43	3.09E-8
NO QRSS SYNC	0	0.00%	0	0.00%

Figure 6-4 Sample Errored Blocks print out

The header contains the following information:

- the day, date, and time the report was printed
- the report title
- the block number as related to its position in the history blocks
- the time from which the data contained in the block started accumulating

All errored block printed reports span a 15-minute time span, so no ending time is printed.

The body is the same as that for the total counters report.

Single Block Menu

This menu item prints the error totals with their rate calculations and error statistics for one block only. There are two submenus to this menu—*PRINT CURRENT* and *PRINT*.

PRINT CURRENT determines which block's information is printed. The values are *CURRENT*, *PRINT BLOCK#:1*, *PRINT BLOCK#:2*, ..., *PRINT BLOCK#:96*. Selecting *CURRENT* prints the information for the currently accumulating block. Selecting one of *BLOCK#:1-BLOCK#:96* prints that block.

When selecting the block to be printed, notice the right hand portion of the display. It shows the start time of the block currently shown in the center of the display. The time format is hours:minutes:seconds, 24-hour format (e.g., 16:45:32). The word *PRINT* on the far left of the display differentiates this submenu from the History mode block-select submenu, which looks similar.

PRINT determines which error information associated with the block is printed. The values are *ALL* and *SELECTED*. If *ALL* is chosen, the complete error block information is printed. If *SELECTED* is chosen, only the error information that has been selected in the *SELECT PRINTED ERRORS* menu of the Setup function (see Setup on page 28) is printed (see Figure 6-5).

```
TUE 05-21-91 1:59:51
BLOCK#: 9          STARTED:  TUE  05-21-91  13:00:00
```

	INPUT #1		INPUT #2	
BPVS	0	0.00E-9	0	0.00E-9
CRC5	0	0.00E-5	0	0.00E-5
FRAMEERRORS	0	0.00E-5	0	0.00E-5
FRAMELOSSES	0	0.00E1	0	0.00E1
FRAME SLIPS	0	0.00E1	0	0.00E1
BIT SLIPS	0	0.00E1/HR	0	0.00E1/HR
NO CARRIER	0	0.00%	0	0.00%
AVS	900	100.00%	900	100.00%
UVS	0	0.00%	0	0.00%
EFS	900	100.00%	900	100.00%
ES	0	0.00%	0	0.00%
SES	0	0.00%	0	0.00%
FS	0	0.00%	0	0.00%
ELAPSED	900	00:15:00	900	00:15:00
BITERRORS	0	0.00E-9	0	0.00E-9
NO QRSS SYNC	0	0.00%	0	0.00%

Figure 6-5 Sample Single Blocks print out

The header and columns of the body of this report are the same as the errored blocks report, except that there is no report title. There is no report title because it is an on-demand print.

The body is the same as that for the errored blocks report.

Range of Blocks Menu

This menu item prints the error totals with their rate calculations and error statistics for any number of blocks. There are three submenus to this menu—*FROM*, *TO*, and *PRINT*.

Selection *FROM* determines the starting block number whose information is printed. The values are *CURRENT*, *BLK#:1*, *BLK#:2*, ..., *BLK#:96*. Selecting *CURRENT* starts printing from the information for the currently accumulating block. Selecting one of *BLK#:1-BLK#:96* starts printing from that block. Note the right-hand portion of the display when selecting the block to

be printed. It shows the start time of the block currently shown in the center of the display. The time format is in hours:minutes:seconds, 24-hour format (e.g., 16:45:32).

Selecting *TO* determines the ending block number whose information is printed. The values are *CURRENT*, *BLK#:1*, *BLK#:2*, ..., *BLK#:96*. Selecting *CURRENT* print from the starting block number chosen above, to the information for the currently accumulating block. The *CURRENT* block is considered to be the last block in the chain. Selecting one of *BLK#:1–BLK#:96* ends the printing with that block. Note the right-hand portion of the display when selecting the block to be printed. It shows the start time of the block currently shown in the center of the display. The time format is in hours:minutes:seconds, 24-hour format (e.g., 16:45:32).

Selecting *PRINT* determines which error information associated with the block is printed. The values are *ALL* and *SELECTED*. If *ALL* is chosen, the complete error block information is printed. If *SELECTED* is chosen, only the error information in the *SELECT PRINTED ERRORS* menu of the Setup function (see Setup on page 28) is printed.

Figure 6-6 and Figure 6-7 show a printed report for a range of blocks from block six to block eight. The print *SELECTED* submenu item was chosen to yield the abbreviated list of error statistics.

TUE 05-21-91 1:59:51				
BLOCK#: 6	STARTED:	TUE 05-21-91	12:15:00	
	INPUT #1		INPUT #2	
BPVS	25	1.79E-8	25	1.79E-8
CRCS	31	1.03E-4	31	1.03E-4
FRAMEERRORS	0	0.00E-5	0	0.00E-5
AVS	900	100.00%	900	100.00%
UVS	0	0.00%	0	0.00%
EFS	900	100.00%	900	100.00%
ES	11	1.22%	11	1.22%
BITERRORS	43	3.09E-8	43	3.09E-8
NO QRSS SYNC	0	0.00%	0	0.00%

TUE 05-21-91 14:26:47				
BLOCK#: 7	STARTED:	TUE 05-21-91	12:30:00	
	INPUT #1		INPUT #2	
BPVS	0	0.00E-9	0	0.00E-9
CRCS	0	0.00E-9	0	0.00E-9
FRAMEERRORS	0	0.00E-5	0	0.00E-5
AVS	900	100.00%	900	100.00%
UVS	0	0.00%	0	0.00%
EFS	900	100.00%	900	100.00%
ES	0	0.00%	0	0.00%
BITERRORS	0	0.00E-9	0	0.00E-9
NO QRSS SYNC	0	0.00%	0	0.00%

Figure 6-6 Sample Range of Blocks print out, page 1

TUE 05-21-91 14:26:47

BLOCK#: 7 STARTED: TUE 05-21-91 12:30:00

	INPUT #1		INPUT #2	
BPVS	0	0.00E-9	0	0.00E-9
CRCS	0	0.00E-9	0	0.00E-9
FRAMEERRORS	0	0.00E-5	0	0.00E-5
AVS	900	100.00%	900	100.00%
UVS	0	0.00%	0	0.00%
EFS	900	100.00%	900	100.00%
ES	0	0.00%	0	0.00%
BITERRORS	0	0.00E-9	0	0.00E-9
NOQRSS SYNC	0	0.00%	0	0.00%

TUE 05-21-91 14:26:55

—BLOCK TOTALS—

FROM BLOCK#: 6 TUE 05-21-91 12:15:00 TO BLOCK#: 8 TUE 05-21-91 12:45:00

	INPUT #1		INPUT #2	
BPVS	25	1.79E-8	25	1.79E-8
CRCS	31	1.03E-4	31	1.03E-4
FRAMEERRORS	0	0.00E-5	0	0.00E-5
AVS	2700	100.00%	2700	100.00%
UVS	0	0.00%	0	0.00%
EFS	2700	100.00%	2700	100.00%
ES	0	0.00%	0	0.00%
BITERRORS	0	0.00E-9	0	0.00E-9
NOQRSS SYNC	0	0.00%	0	0.00%

Figure 6-7 Sample Range of Blocks print out, page 2

The individual block information reports are of the same format as the print single block reports. In addition, a final *BLOCK TOTALS* report is printed for the range of blocks selected.

The header contains the following information:

- day, date, and time the report was printed
- the report title
- block number and block start time from which the data contained in the block started accumulating
- the block number and block start time to which the data was accumulated through

The body is the same as that for the single blocks report.

Block Totals Menu

This menu item prints the error totals of the accessible blocks. This report is different from the Total Counters menu item. The block totals printed are based on the history blocks that are available for viewing, while the total counters printed are based on the totals accumulated since the 375A was last reset. As the unit calculates the totals over each history block, the display shows *TOTALING BLOCKS: XX*, where *XX* is the block count. If no blocks have been accumulated, the speaker beeps when this item is selected.

There is one submenu to this menu, *PRINT*, that determines which error information associated with the block totals is printed. The values are *ALL* and *SELECTED*. If *ALL* is chosen, the full set of error information is printed. If *SELECTED* is chosen, only the error information in the *SELECTPRINTEDERRORS* menu of the Setup function (see Setup on page 28) is printed (see Figure 6-8).

```
TUE 05-21-91 14:27:46
—BLOCK TOTALS—
FROM BLOCK#: 1 TUE 05-22-98 11:06:18 TO BLOCK#: 15 TUE 05-22-98 14:30:18
```

	INPUT#1		INPUT#2	
BPVS	25	2.46E-9	25	2.46E-9
CRC5	31	1.41E-5	31	1.41E-5
FRAMEERRORS	0	0.00E-6	0	0.00E-6
FRAMELOSSES	0	0.00E1	0	0.00E1
FRAMESLIPS	0	0.00E1	0	0.00E1
BITSLIPS	0	0.00E1/HR	0	0.00E1/HR
NO CARRIER	0	0.00%	0	0.00%
AVS	13122	100.00%	13122	100.00%
UVS	0	0.00%	0	0.00%
EFS	13111	.00%	13111	.00%
ES	11	.00%	11	.00%
SES	0	0.00%	0	0.00%
FS	0	0.00%	0	0.00%
ELAPSED	13122	100.00%	13122	100.00%
BITERRORS	43	4.24E-9	43	4.24E-9
NO QRSS SYNC	0	0.00%	0	0.00%

Figure 6-8 Sample Block Totals print out

The header contains the following information:

- day, date, and time the report was printed
- the report title
- the block number and block start time from which the data contained in the block started accumulating
- the block number and block start time to which the data was accumulated through

The body is the same as that for the range of blocks report.

Print Configuration Menu

This menu item prints the current system configuration of the 375A. These are the items you configure when you use the Setup and Option keys. The current state of the system's monitoring functions is also reported (e.g., whether History mode is selected, what the framing type of the DS1 data streams is, what the active channel is). Figure 6-9 shows an example print out.

```

—375A CONFIGURATION—
16:16:11 TUE 04-17-98 VERSION: 2.05 SDR QRSS
BRIDGED
CHANNEL: 20
LED HISTORY: OFF
ERROR MONITOR INPUT: SPAN 1

MODE:          COMPUTER
BAUD:          38400 DATA: 8 BITS   STOP: 1BIT
PARITY:        NONE  HANDSHAKE: NONE LINES PER PAGE: 66
PRINT BLOCKS:  NO    PRINT ALARMS: NO

04/SLC-96 CHANNEL SEQUENCE: 03/04
INPUT#1 B8ZS:  AUTO
INPUT#2 B8ZS:  AUTO
INPUT#1 QRSS DETECT: AUTO
INPUT#2 QRSS DETECT: AUTO
BRIGHTNESS: 5
REPEAT SPEED: FAST  KEY DOWN DELAY: SHORT
KEYBOARD IS UNLOCKED

```

Figure 6-9 Sample Print Configuration print out

Computer Remote Control

The 375A can be operated remotely by a computer via the serial I/O connector on the front panel. To control the 375 remotely, a simple set of ASCII characters are mapped to front panel keys and computer control specific commands. The front panel is still completely functional when being controlled remotely unless the front panel is disabled via *OPTION: 8* (see Option 8: Lock KeyBD on page 27).

NOTE To use the 375A computer remote capabilities, be certain that the serial mode is set to *COMPUTER* and the serial line parameters match those used by your computer.

Computer remote control mode is designed as a method of accessing the functions of the 375A from a remote location. Although it is not a true terminal emulation, you can use it as such on a limited basis.

This mode is geared to interfacing the 375A with a general computer control language. You could create such a language yourself. It would need to provide the user a clear and concise environment to access the 375A. The user should be insulated from having to work at the low level of the single letter ASCII command characters that the remote control mode understands.

However, you do not need to create this language yourself. Sage Instruments has a working, tested, and available computer control language called STARMAC[®]. It is a macro language tailored to the specific needs of the Sage Instruments test equipment product line. It is currently sold as an option to the 930A product line, but all the functions are available to interface with the 375A. If you already use STARMAC, everything you know about the

language remains the same in relation to the 375A. If you are not familiar with STARMAC and would like more information, contact Sage Instruments.

If you want to use the computer remote control mode as a limited terminal emulator or wish to devise your own serial script language (using a commercial telecom package such as PROCOMM® or CROSSTALK®), the computer control commands are provided below.

NOTE (CR) denotes a carriage return from the computer. All characters are case sensitive. The W command exists because in computer mode, the 375A sends an ASCII bell (^G) character when block data or error information is ready to be transmitted. This occurs when *PRINT ALARMS* or *PRINT BLOCKS* are set to *YES* in the serial port setup Menus.

Table 6-1 Error monitor commands for remote operation

Character	Description
?	displays help screen of computer control commands
%	equivalent to the %/Rate key
(CR)	equivalent to the Enter key
B	equivalent to the BPV/BE key
D	equivalent to the error monitor Down arrow key
E	equivalent to the Display Input key
f	displays the monitoring status
F	equivalent to the Frm/CRC key
H	equivalent to the History key
O	equivalent to the Option key
P	equivalent to the Print key
R	equivalent to the Reset key
s	equivalent to the Slips key
S	equivalent to the Statistics key
t	equivalent to the Setup key
U	equivalent to the error monitor Up arrow key
W	displays any errors or blocks queued for transmission
X	echos the contents of the display

Table 6-2 Audio monitor commands for remote operation

Character	Description
A	equivalent to the audio monitor Input key
c	equivalent to the audio monitor channel Down arrow key
C	equivalent to the audio monitor channel Up arrow key

Table 6-3 Signaling bit monitor commands for remote operation

Character	Description
.	displays current signaling bits status of both DS1 inputs
L	equivalent to the Live/History key
T	equivalent to the Bridge/Terminate key

Figure 6-10 shows an example of the output of the “.” command.

```

UNIT#1 [1-24]                UNIT#1 [1-24]
A: 1100 0000 0001 0000 1110 0000    1000 0010 0001 0000 1100 0111
B: 1100 0000 0001 0000 1110 0000    1000 0010 0001 0000 1100 0111
C: 0000 0000 0000 0000 0000 0000    1000 0010 0001 0000 1100 0111
D: 0000 0000 0000 0000 0000 0000    1000 0010 0001 0000 1100 0111

```

Figure 6-10 Sample print out of the “.” command

Figure 6-11 shows an example of the output of the “f” command.

```

INPUT#1 FRAMING: ESF
INPUT#2 FRAMING: D4

AUDIO INPUT: IN#2 CHANNEL: 3 SUPERVISION: 1=1111 2=1100
D4/SLC-96 CHANNEL SEQUENCE: D3/D4

INPUT IMPEDANCE: DSX/MON LED DISPLAY: LIVE MODE

```

Figure 6-11 Sample print out of the “f” command

The monitoring status is broken into three sections.

- The first section describes the framing type detected on each input.
- The second section describes the current status of the Audio Monitor section.
- The third section describes the state of the two switches in the Signaling Bit Monitor section.

Figure A-1 Option key setup

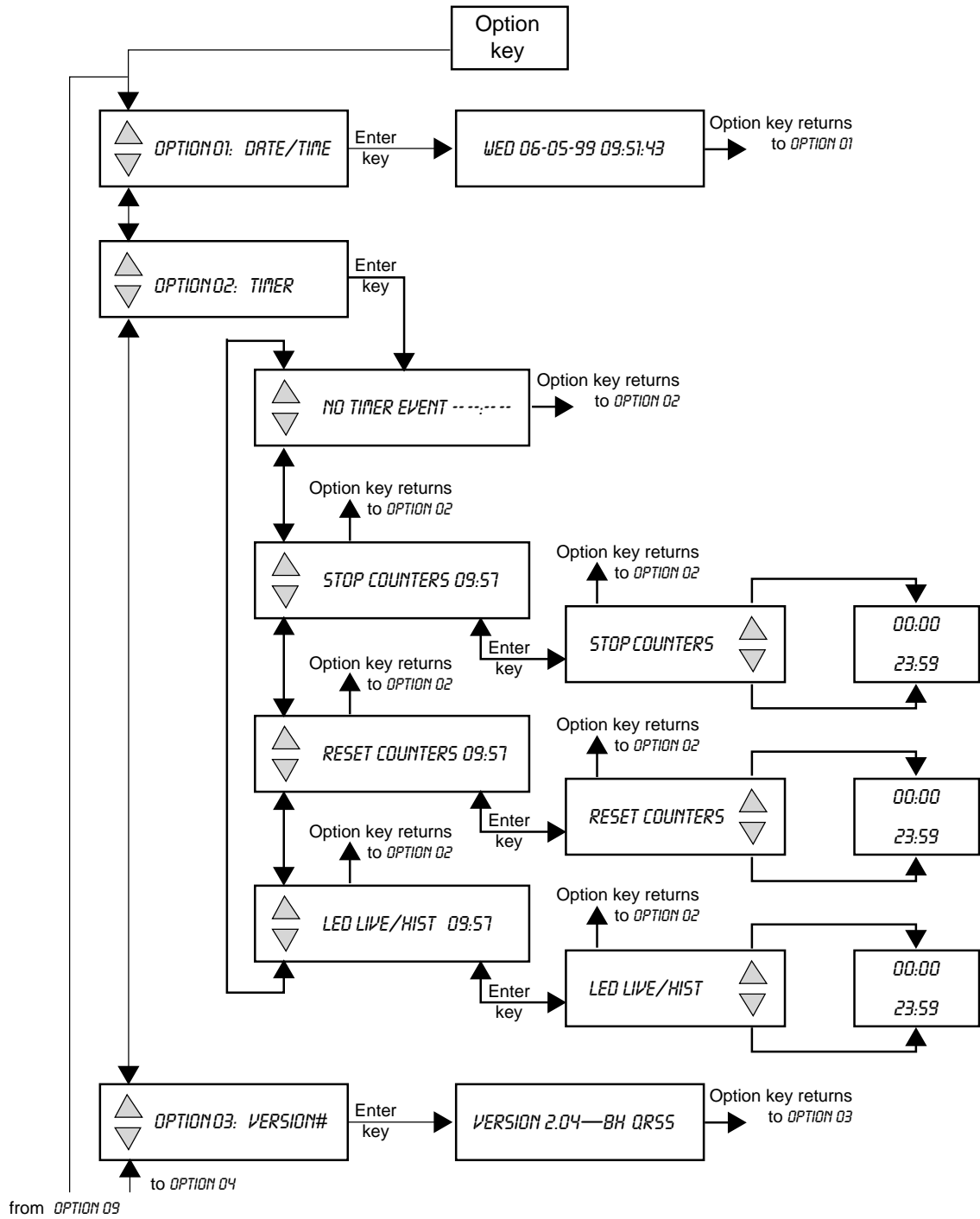


Figure A-1: Option Key Setup (cont'd)

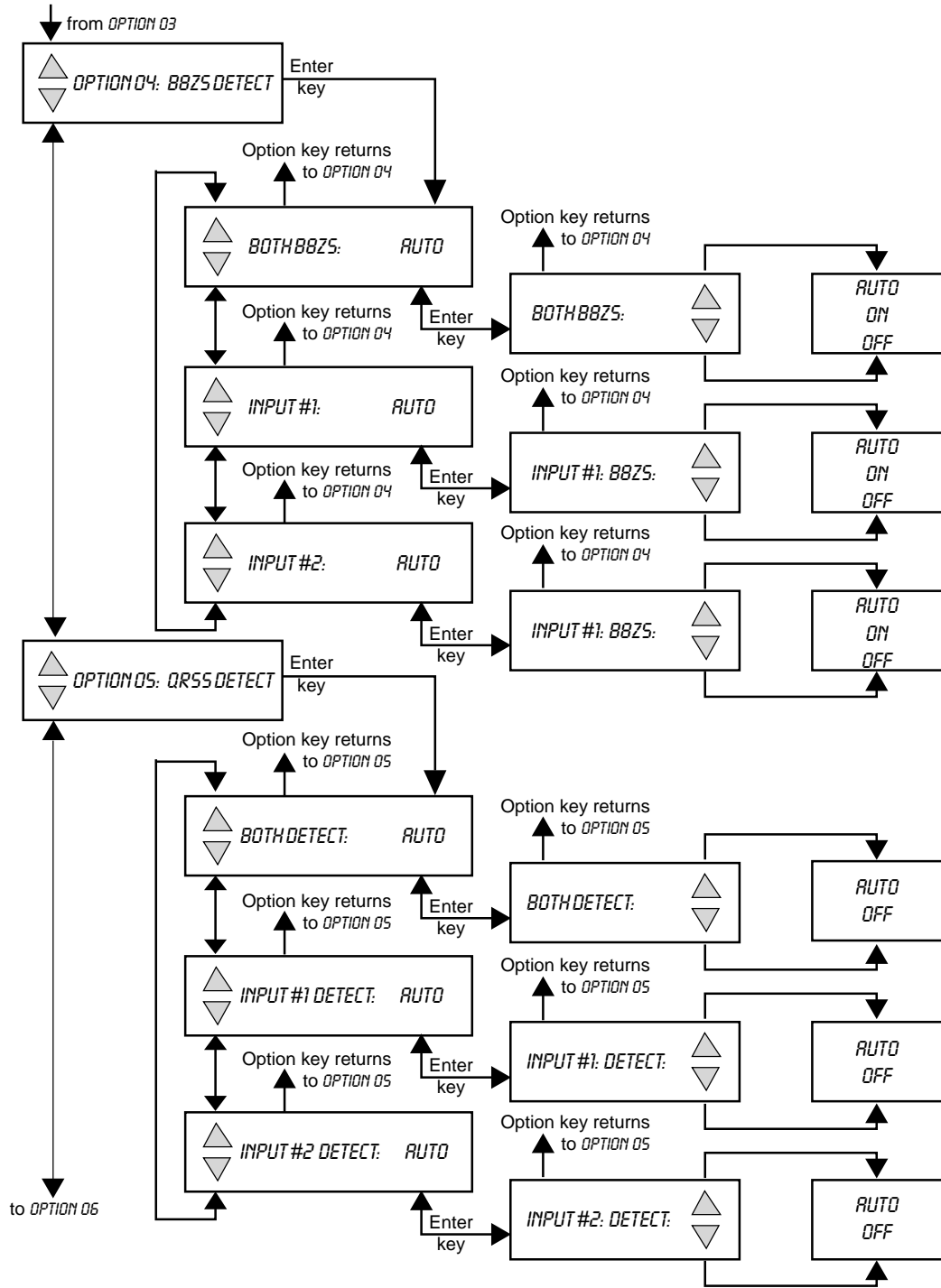


Figure A-1: Option Key Setup (cont'd)

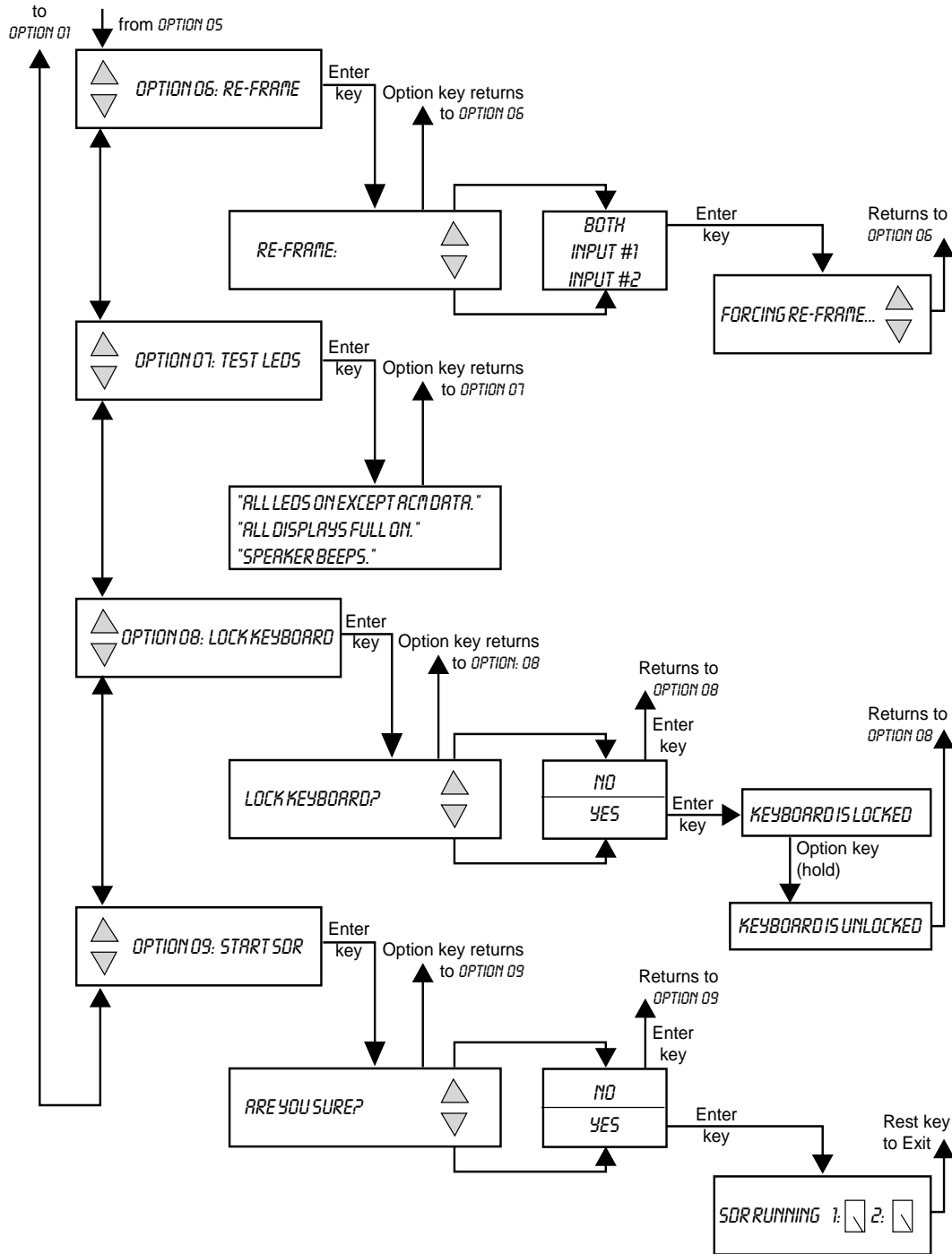


Figure A-2 Setup procedure

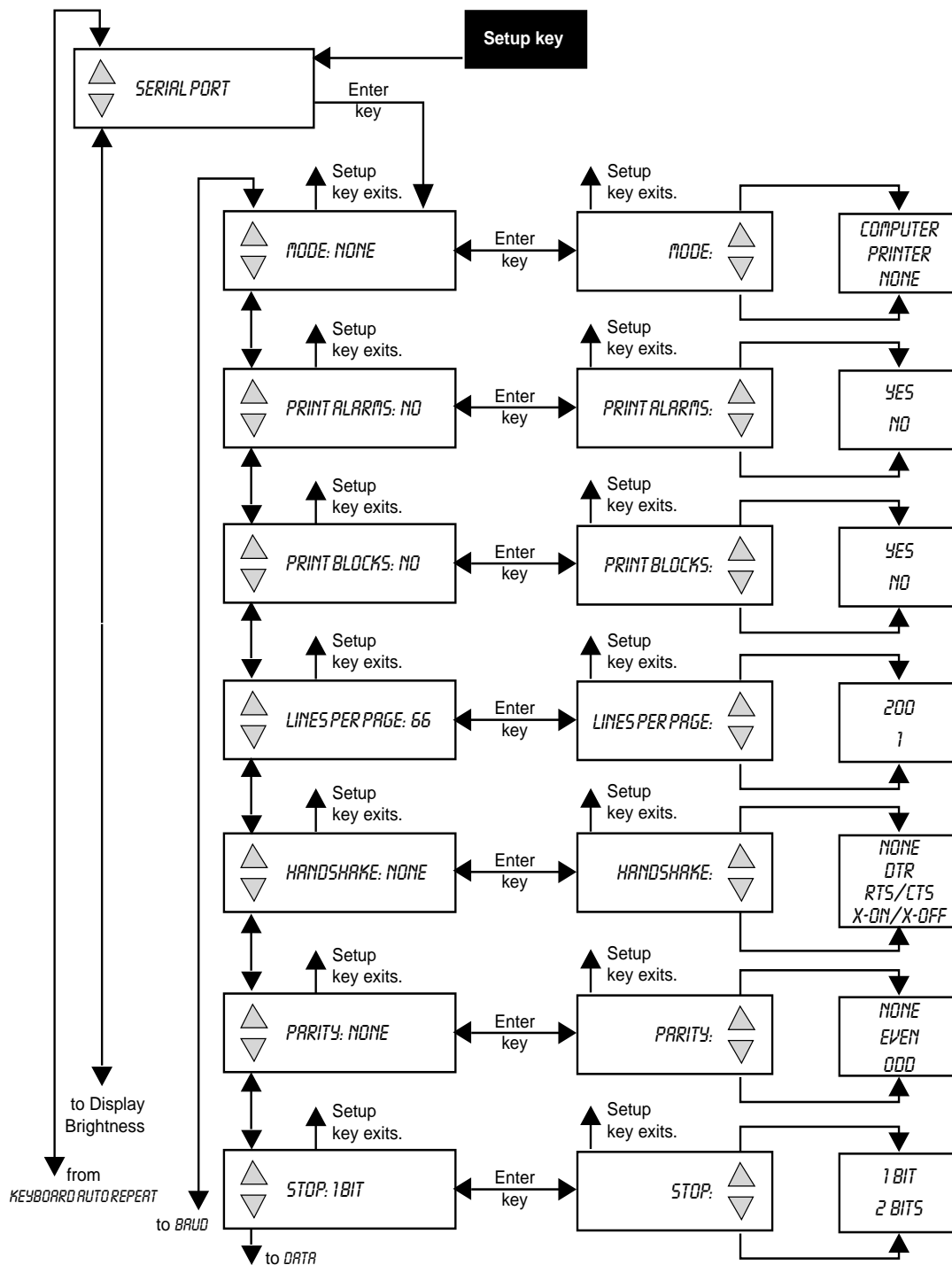


Figure A-2: Setup Procedure (cont'd)

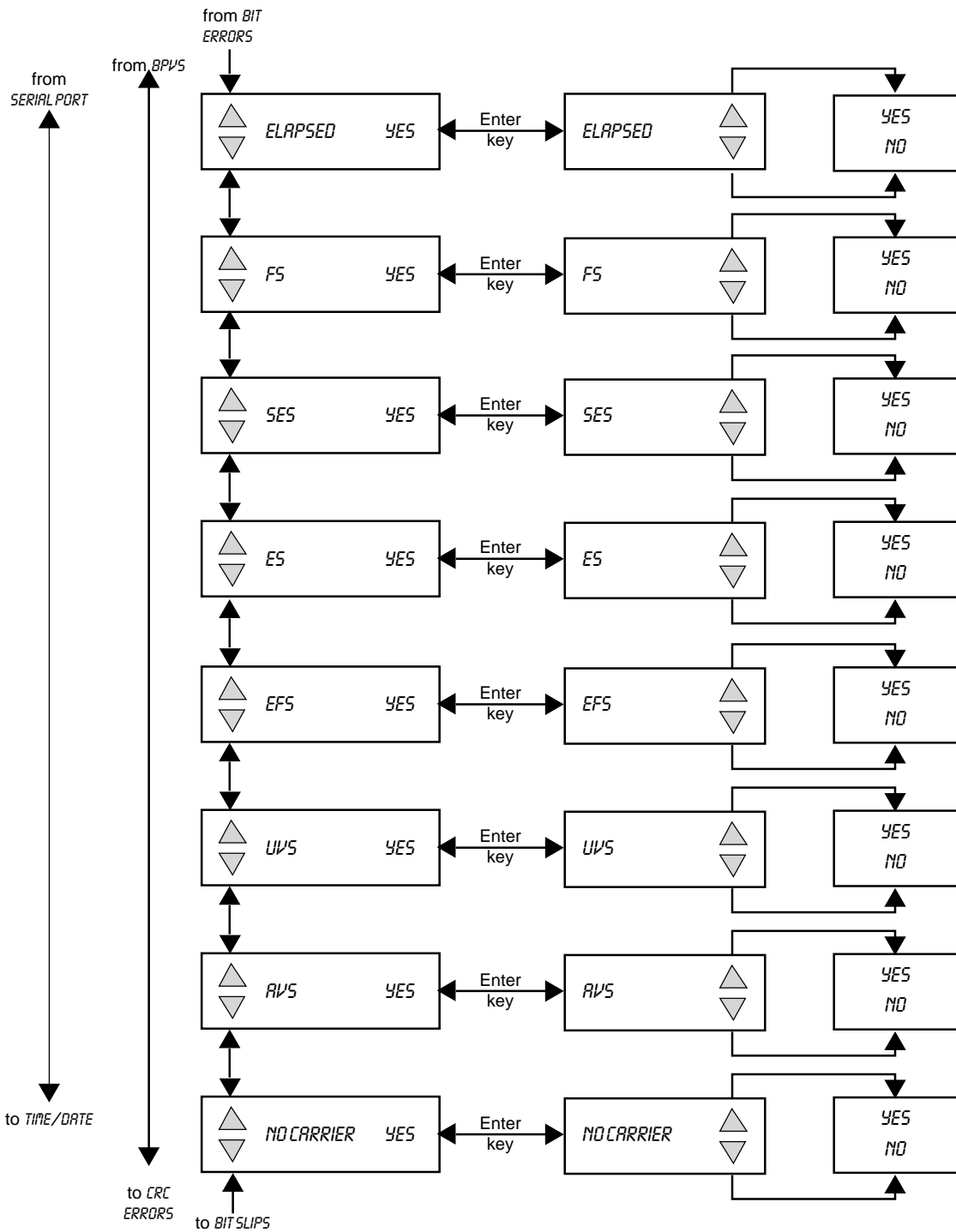


Figure A-2: Setup Procedure (cont'd)

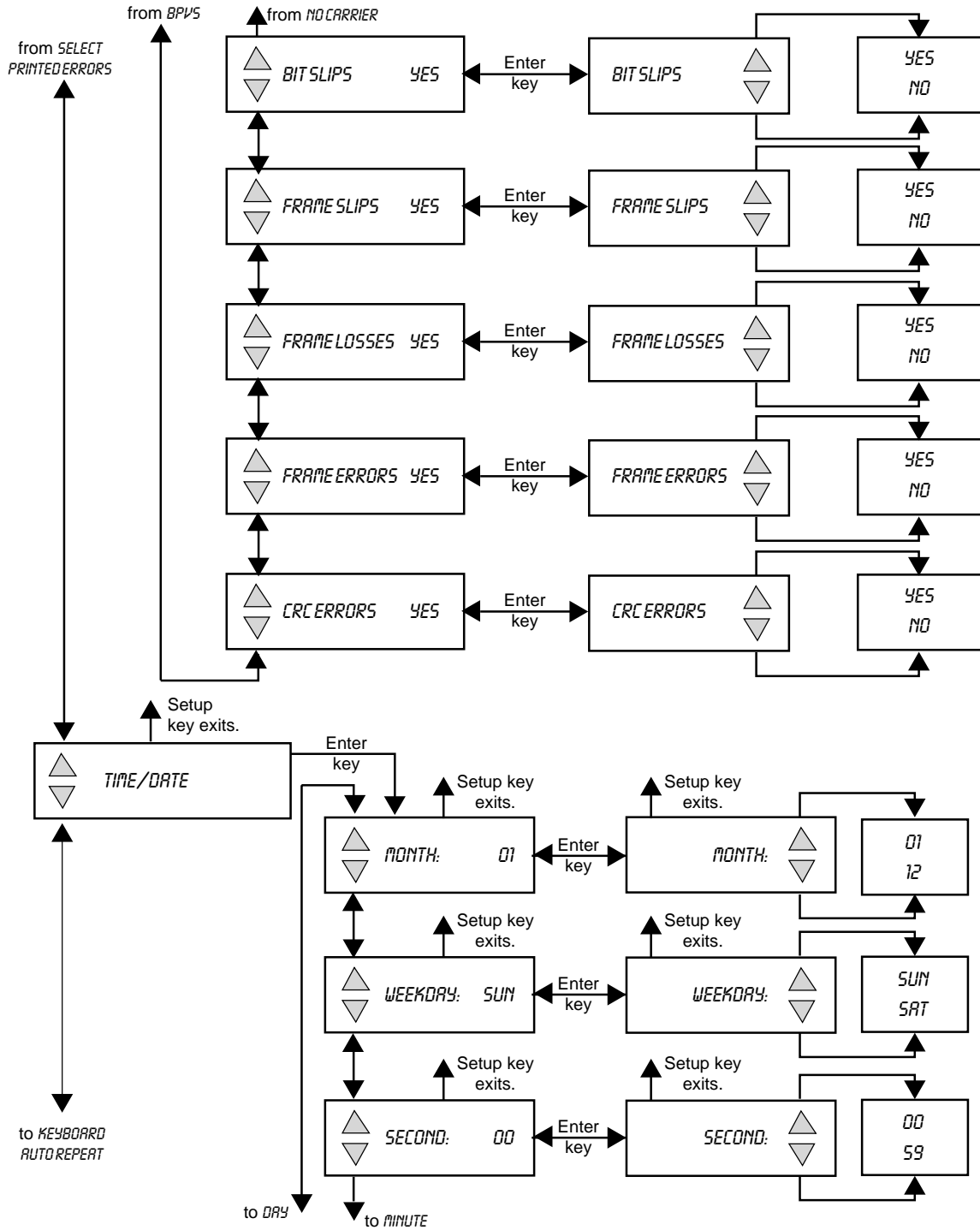


Figure A-2: Setup Procedure (cont'd)

