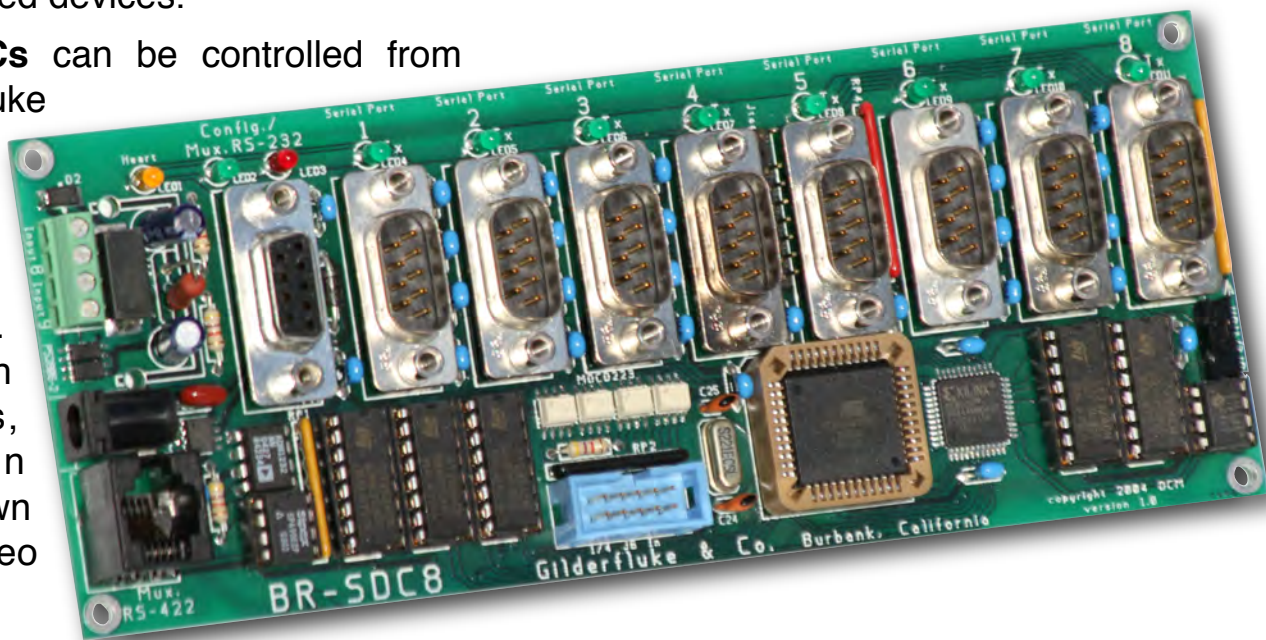# Gilderfluke
& Co.
ROBOTICS & SOUND SYSTEMS

Br-SDC8 & Br-SDC/09

Serial Device Controllers v4.nn

The **Br-SDC** is a complete, stand-alone Serial Output Controller. It is used whenever you need to control any device that needs to be fed strings of RS-232 serial data (optionally RS-422) in response to a switch closure input. It has been preprogrammed to work with many LaserDisk and DVD players, but can be used with any RS-232 controlled device.

The **Br-SDC8** expands the single port **Br-SDC/09**, by adding eight multiplexed RS-232 output ports. It also has two dedicated input ports, one of which is RS-232, and the other is RS-422, so the **Br-SDC8** can double as a level converter allowing RS-422 devices to talk to RS-232 controlled devices.

The **Br-SDCs** can be controlled from any of Gilderfluke & Co.'s Show Control Systems, PLCs or any other control systems. Just attach some buttons, and you can make your own interactive video kiosk.

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A note about this manual:

This manual covers the specifics of the **Br-SDC**. To configure the **Br-SDC** you will need a simple serial terminal program. We provide one called GilderTerm for free with our software.

GilderTerm can be downloaded from our web site at:

http://www.gilderfluke.com

Br-SDC Overview

The **Br-SDCs** are configured using the RS-232 serial port of any PC compatible computer. The only software you need on your PC is a simple 'terminal' program. Typical of these is HyperTerm. We recommend GilderTerm, which is available free from Gilderfluke & Co..

Once a configuration is completed, serial strings are sent from the **Br-SDC** through its standard RS-232 serial port to whatever it is controlling. Typically, the **Br-SDC** is attached right on the back of the controlled device.

Features of the Br-SDC/09, Br-SDC/422 or Br-SDC8 include:

- Fifteen different serial strings of up to 127 characters each.
- Unplug it from the device it normally controls and plug it into the serial port on a PC to configure.
- 'Write Protect' switch protects against accidental configuration changes. Configurations should last about forty years.
- Ten optoisolated inputs to synchronize **Br-SDCs** with pushbuttons, real-time events and other control systems. Two of the inputs use screw terminals. The other eight use a standard 1/4-J6 connector.
- Different actions can take place on the opening and closing edges of any input.
- The **Br-SDC** can send a different string, or play a different show when it has completed any string.
- Strings can include 'delays' of one frame to over nine hours.
- It can send a different string, or play a different show if any string gets an incorrect serial response from the device it is controlling.
- Built in software to control Pioneer LaserDisk and DVD players, or Sony LaserDisk players.
- Supports both CAV (thirty minute) and CLV (one hour) LaserDisks.
- Available with DE-09 female or DB-15 male (for Pioneer LaserDisks and DVDs).
- The **Br-SDC** runs on anything from 9-24 VDC. It includes a small 9 VDC 'wallwart' power supply. It can even be run from batteries.
- **Br-SDCs** are often mounted by their connectors or by Velcro on their backs.

Typically mounted right on whatever it is controlling.

Features exclusive to the Br-SDC8 include:

- Adds eight downstream RS-232 serial ports for controlling multiple devices.
- 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) upstream ports.
- Strings can be sent to one or more of the serial outputs simultaneously.
- Responses to serial strings can be received from the controlled devices one at a time.
- Can be used as a multiplexer to route serial data to and from a single serial data source to one or more outputs simultaneously. Which serial outputs are selected can be done using simple 'AT+++' commands as part of the strings you send it, or using the switch closure inputs.

Br-SDC LEDs, Switches and Connections:

There are only a small number of LEDs, connections and single configuration switch on each **Br-SDC**.

Status LEDs:

On the Br-SDC/09, Br-SDC/422:

1) Green 'Heart' LED. This is used so you can see that the **Br-SDC** is alive. If this LED doesn't flash at least once per second, you should power down the **Br-SDC** and check the power supply and connections to the **Br-SDC**. When in configuration mode, the **Br-SDC's** 'heart' LED will flash at a far faster rate than normal.

2) Red LED attached to the serial data input line on the **Br-SDC**. Any time the **Br-SDC** receives something through its serial port, you will see this LED flash.

3) Yellow LED attached to the serial data transmission line on the **Br-SDC**. Any time the **Br-SDC** sends out something through its serial port, you will see this LED flash.

On the Br-SDC8:

1) Yellow 'Heart' LED. This is used so you can see that the **Br-SDC8** is alive. If this LED doesn't flash at least once per second, you should power down the **Br-SDC8** and check the power supply and connections to the **Br-SDC**.When in configuration mode, the **Br-SDC's** 'heart' LED will flash at a far faster than the normal 'Running' rate.

2) Green LED attached to the serial data input on the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports. Any time the **Br-SDC8** receives something through this serial port, you will see this LED flash. You will see this during configuration, or when operating in any of the multiplexer modes.

3) Red LED attached to the serial data output on the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports. Any time the **Br-SDC8** sends something out through this serial port, you will see this LED flash. You will see this during configuration, or when operating in any of the multiplexer modes, when serial data received through one of the multiplexed serial ports 1-8 (male DE-09) is routed to the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports.

4) Green LED attached to the serial data output on the **Br-SDC8's** multiplexed serial ports 1-8 (male DE-09). Any time the **Br-SDC8** sends out something through one

or more of these serial ports, you will see the adjacent LED flash.

'Configure/Run' Switch:

This switch must be in the 'Disabled' position for the **Br-SDC** to receive and send strings normally. When this switch is in the 'Disabled' position, there is no possible way for a **Br-SDC** to alter its memory and the **Br-SDC** operates normally, receiving characters and sending strings in response to inputs.

With the switch in the 'Configure' position, the serial port is forced to 9600 baud, and is put into 'configuration' mode. The **Br-SDC's** built-in menu is displayed on a computer attached to the female DE-09 serial port1 and configuration reads and writes can take place normally.

When in configuration mode, the **Br-SDC's** 'heart' LED will flash at a far faster than the normal 'Running' rate.

With the switch in the 'Disabled' position, the **Br-SDC** should retain its configurations for at least forty years. The serial port is returned to the baud rate selected during setup, and the **Br-SDC** returns to 'normal' operation.

Serial Ports:

There are several different options available on the **Br-SDCs** for RS-232 or RS-422 Serial port connectors:

a) **DE-09 Nine Position Female:**

On the **Br-SDC/09**, this connection is used for both configuration and sending strings to the devices the **Br-SDC/09** controls. When connecting the **Br-SDC/09** to your controlled device, this may require a cable that flips pins #2 and #3.

On the eight port **Br-SDC8**, this female connection is used for configuration, and for attaching the **Br-SDC8** to the your PC, PLC, or other source of serial data. The RS-232 serial port is paralleled with the RS-244 serial port. You can use either port interchangeably, but not at the same time. The eight male DE-09 connectors are used to attach the devices that receive the strings that the **Br-SDC8** generates or reroutes.

A nine pin male to nine pin female serial cable with 'straight through' wiring is used to connect the **Br-SDC** to your PC or PLC. The pins that the **Br-SDC** uses are:

---

[1] The computer must be running a terminal program, such as GilderTerm, HyperTerm or others.

POSITION	WIRE #	SIGNAL NAME:
TOP-LEFT	1	n/c
	2	RS-232 Tx from **Br-SDC**
	3	RS-232 Rx to **Br-SDC**
	4	n/c
TOP-RIGHT	5	Ground
BOTTOM-LEFT	6	n/c
	7	n/c
	8	n/c
BOTTOM-RIGHT	9	n/c

b) **RS-422 (female Rj-12):**

The single port **Br-SDC/422** replaces the RS-232 port with a RS244 serial port.

On the eight port **Br-SDC8**, the RS-232 serial port is paralleled with the RS-244 serial port. You can use either port interchangeably, but not at the same time.

The serial data signals from the **Br-SDC** are brought out on a six position RJ-12 (six position, six conductor modular telephone style connector) on the card cage. Facing the end of the cable with the release latch upwards, its pin out is as follows:

POSITION	WIRE #	COLOR	SIGNAL NAME:
LEFT	1	white	Signal Ground
	2	black	- Serial data out from **Br-SDC**
	3	red	+ Serial data out from **Br-SDC**
	4	green	- Serial data in to card
	5	yellow	+ Serial data in to card
RIGHT	6	blue	Signal Ground

c) **DE-09 Nine Position Male:**

On the eight port **Br-SDC8**, these eight male connections are used to attach the devices that receive the strings that the **Br-SDC8** generates or reroutes.

A nine pin male to nine pin female serial cable with 'straight through' wiring should be used to connect the **Br-SDC** to your controlled devices. The pins that the **Br-SDC** uses are:

POSITION	WIRE #	SIGNAL NAME:
TOP-RIGHT	1	n/c
	2	RS-232 Rx to **Br-SDC8**
	3	RS-232 Tx from **Br-SDC8**
	4	n/c
TOP-LEFT	5	Ground
BOTTOM-RIGHT	6	n/c
	7	n/c
	8	n/c
BOTTOM-LEFT	9	n/c

1/4-J6 Input:

This connector has eight optically isolated inputs. It requires an external power source. It is compatible with the digital outputs from any Gilderfluke & Company Show Control Systems.

```
(Brown) PIN #1  ◄──────────────   GROUND
  (red) PIN #2  ◄──●  ●──────●   DATA BIT 7
(orange) PIN #3  ◄──●  ●──────●   DATA BIT 5
(yellow) PIN #4  ◄──●  ●──────●   DATA BIT 6
 (green) PIN #5  ◄──●  ●──────●   DATA BIT 4
  (blue) PIN #6  ◄──●  ●──────●   DATA BIT 3
(violet) PIN #7  ◄──●  ●──────●   DATA BIT 2
  (grey) PIN #8  ◄──●  ●──────●   DATA BIT 1
 (white) PIN #9  ◄──●  ●──────●   DATA BIT 0
 (black) PIN #10 ◄──┤├┤├──────   + 5 to 24 VDC SUPPLY
                     +
```
External Power
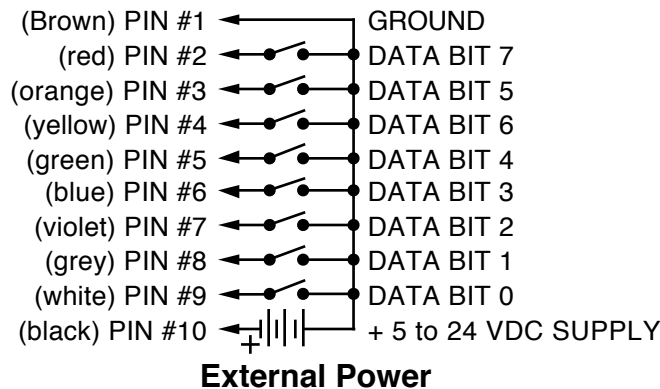
Any event can be triggered on either the 'closing' or 'opening' edge of any input. A 'closing' is when you ground an input. An 'opening' is when that grounding is removed. The inputs can be triggered on any voltage from 9 to 24 VDC. If you don't have an external source of power for these two inputs, you can 'steal' some juice from the **Br-SDC's** power supply.

'8' & '9' Inputs:

These are two optically isolated digital inputs. Unlike the 1/4-J6 inputs, these can be wired to switch either side of the photo diode:

terminal #1
terminal #2   DATA BIT 8

terminal #3
terminal #4   DATA BIT 9

External Power
(+ 5-24 VDC supply)
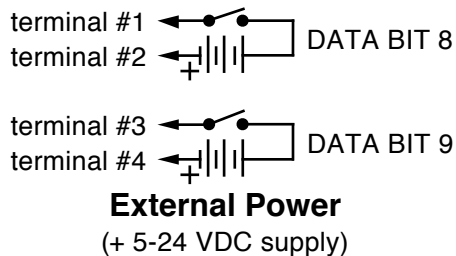
Versions of the **Br-SDC** 2.0 or later use a bipolar optoisolator on inputs 8 and 9. This means that you can ignore the polarity markings shown in the above illustrations on all versions of the **Br-SDC** 2.0 and later.

Any event can be triggered on either the 'closing' or 'opening' edge of either input. A 'closing' is when you apply a voltage to an input. An 'opening' is when that voltage is removed. The inputs can be triggered on any voltage from 5 to 24 VDC. If you don't have an external source of power for these two inputs, you can 'steal' some juice from the **Br-SDC**'s power supply.

Power Supply:

(5.5 mm O.D. / 2.1 mm I.D. power jack)

The **Br-SDC** can be run from any supply voltage from 9-24 VDC.

The outer ring is used for the ground, and the middle pin is used for the positive connection. This input is protected from reverse polarity connections. An idle **Br-SDC** draws only about twenty-five milliamperes. It can run for days on just a single nine volt battery.

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Br-SDC Software Configuration

The **Br-SDC** can be accessed through the serial port from any computer running just about any modem or terminal program. We provide a free terminal program called GilderTerm that makes working with GilderGear through the serial port a little easier. The computer you are using doesn't even need to have any PC•MACs software installed on it.

Most Gilderfluke & Co. products can be controlled through their RS-232 or RS-422 Serial ports. The **Br-SDC** has a single RS-232 (**Br-SDC/09**) or RS-422 (**Br-SDC/422**) serial port on it.

An RS-232 serial port typically controls a single device with a serial RS-232 port on it.

With an RS-422 serial port, many different cards and devices can be attached to the same RS-422 serial lines to form an RS-422 'multi Drop' network. Commands can be addressed to a single card on the network, or all the cards simultaneously.

If you don't have access to GilderTerm, typical modem programs you can use are Terminal.exe (which came with Windows 3.1) and HyperTerm.exe (which comes with later versions of Windows).

GilderTerm is available free from Gilderfluke & Co. for use with all of our products. It can be downloaded from our web page, and is included on all of our CD-ROMs. GilderTerm has been optimized for use with all Gilderfluke & Company equipment. All the commands are built in, and it will even let you use your mouse to select commands by clicking on the menus.

If you are using GilderTerm, all the settings are fixed at the appropriate settings. All you will need to do is select the appropriate 'COM' port. To talk to the **Br-SDC**, just configure your terminal program for 9600 baud, no parity, eight data bits, one stop bit and no flow control handshaking.

Computers don't normally come with serial ports on them anymore. Instead, you use a USB-to-Serial (USB-RS232/422 or C-USB-RS232) adapter, BlueTooth-to-Serial (Bt-Rs232Rx and Bt-USBTx), Ethernet-to-Serial (Modem-Internet) adapter, or WiFi-to-Serial (Modem-Wi-Fly) adapter. For the **Br-SDC** you will need one that provides the more common RS-232. These are available from a number of different sources, including Gilderfluke & Company. Our part number is USB-RS232/422 for the USB-to-Serial adapter that provides both RS-232 and RS-422 connections, or the simpler RS-232-only adapter is the C-USB-RS232.

If you have hooked up the **Br-SDC** to your computer and it still doesn't seem to respond to the keyboard, the first thing to check is that you are attached to the right serial port. The easiest way to do this is to disconnect the **Br-SDC** and short between the Tx

data out and Rx data in pins on your USB-to-Serial converter. For an RS-232 port, this means temporarily shorting pins #2 and #3 together. On the C-USB-RS232, the pinout is as follows:

POSITION	WIRE #	SIGNAL NAME:
TOP-LEFT	1	n/c
	2	RS-232 Rx to C-USB-RS232
	3	RS-232 Tx from C-USB-RS232
	4	n/c
TOP-RIGHT	5	Ground
BOTTOM-LEFT	6	n/c
	7	n/c
	8	n/c
BOTTOM-RIGHT	9	n/c

While still running the modem program, anything you type should be shown on the screen while these jumpers are in place, while nothing will appear when you remove them. If your computer passes this test, then you are using the right serial port and the problem is most likely the baud rate setting or in your wiring to the **Br-SDC**. If you get characters on the screen even with the jumpers removed from the serial port, it means:

a) You need to set the 'echo' mode to 'none' or 'full duplex' and try this test again, or…

b) You are talking to a different serial port than the one you actually want.

3) String Setup: This screen is used to set up which characters are sent and received in each string.

Entering Configuration Mode:

To enter the configuration mode you need to move the 'Configure/Run' Switch to the 'configure' position. The 'heart' LED will begin flashing at about four times per second, instead of the usual twice per second. The **Br-SDC** will then send out its menu through the main serial port. If you have a computer attached and running a terminal program

set to the default 9600 baud, N, 8, 1, you will see the menu displayed on your computer's screen. There are two configuration screens in the **Br-SDC**:

1) Trigger Setup Screen: On this screen, you set which input sends out which string.

2) String Setup: This screen is used to set up which characters are sent and received in each string.

To redraw any screen at any time, just press the <ESC>ape key or <SPACE> bar.

All numeric values are entered in Decimal (0-9) or HEXadecimal (0-9, A-F) numbers. Each number consist of one or more ASCII characters followed by a <RETURN> (<ENTER> on some keyboards). If more characters have been entered before the <RETURN> than are allowed, then the characters already entered will scroll to the left to make room for the new entries. Once a command has been invoked, characters can be erased one-by-one by using the <DELETE> key (<BACKSPACE> on some keyboards). An entire entry can be erased by hitting the <ESC>ape key. A command can be canceled altogether by hitting the <RETURN> key (<ENTER> on some keyboards) or <ESC>ape key after all the characters have been erased or before any have been entered.

Once you have configured a **Br-SDC**, you can 'lock' the configuration by moving the 'Configure/Run' Switch to the 'run' position. This should protect your configuration from anything short of a lightning hit. The 'Heart' LED will slow to the normal running rate, and you can test your strings by triggering them through the 0-9 switch closure inputs. Configuration changes can be re-enabled at any time by moving the switch back to the 'Configure' position.

If you want to keep a hard copy printout of the current configuration of the **Br-SDC**, you should use the <ESC>ape key to redraw the screen while 'saving to file' in the modem program running on your computer. This file can be printed out at any time, or spliced into the documentation package for your project.

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Br-SDC Input Setup Menu

The Trigger Setup menu will appear as follows (**Br-SDC/09** shown):

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13 (c) 2014 DCM -
a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) string, f) 30 FPS, 9) mode
Input 2 close:1) string, 2) delay,  3) dvd start/end, 4) @end, 5) @fail, 6) kopy
g) 0 c:
h) 0 0:
i) 1 c:
j) 1 0:
K) 2 c: STRING-3 | DELAY-123,456 | DVD-123,456 / END-654,321 | @END-4 | @FAIL-5
l) 2 0:
m) 3 c:
n) 3 0:
o) 4 c:
p) 4 0:
q) 5 c:
r) 5 0:
s) 6 c:
t) 6 0:
u) 7 c:
v) 7 0:
w) 8 c:
x) 8 0:
y) 9 c:
z) 9 0:
                          Enter Command-
```

This screen is used to set what happens on each of the ten switch closure inputs. Different actions can be chosen for the opening or closing edge of each input. The options are:

1) Which of the fifteen possible strings (0=none, 1-F) will be sent on this input/ edge.

2) If a 'Delay' marker ('TIMER') is found in the string, how long (in 30 FPS or 25 FPS frames) the delay will be.

3) If a DVD 'Search' marker ('SERCH') is found in the string, then what frame number on the DVD will be searched for.

4) String to send at end of this string, if it completes successfully.

5) String to send at end of this string, if it encounters an error while sending this string.

Several commands are shown at the top of the screen. Below this are the actions that will take place one each of the ten optically isolated inputs. Each of these inputs has both a 'closing' edge (shown by a 'c') and opening edge (shown by an 'o') action. If

the input is currently closed, the small 'c' will be printed as an upper case 'C'. This allows you to see if the external connections to the **Br-SDC** are working properly. The screen will not be updated until it redraws. You can force the screen to redraw by hitting the <space bar> or <ESC>ape keys.

In most cases, strings used in the **Br-SDC** first search for a specific 'LDP Start' frame number on the LaserDisk/DVD. As soon as it finds this frame, the next characters in the string tell it to start the player 'playing'. At this point, you can either start a timer or start polling the LaserDisk/DVD for the end frame of the show. When the timer times out or the LaserDisk/DVD end frame is found, then the next characters in the string tell the LaserDisk/DVD to stop (or 'still'). If all of this has completed successfully, then the **Br-SDC** will play whatever show/string has been set for the '@end'. If there is a failure anywhere in the string, then the '@fail' show/string will be played.

If you want to tell the **Br-SDC** to send out a string on power-up, then all you need to do is set the action you want to happen on any unused 'opening' input. When power is applied to the **Br-SDC**, it will see that this input has 'just opened', and send the string you have requested.

To loop a single string, all you need to do is tell any show to use the same string as it does when it starts as the string to play '@end'. It will then play this same string over again each time it finishes. If you have an initialization that needs to be done to a serial device before the first loop of the day, you can use a string that initializes the device as the 'normal' triggered string, and then use the string that 'plays' the serial device as the string '@end'. It will play the 'normal' string once, and then loop the '@end' string for the rest of the day.

If you are synchronizing multiple LaserDisk/DVD players, you will probably want to use a single input (wired in parallel on all of the **Br-SDCs**) to tell all of the LaserDisk/DVD players to their respective start frames. A second input, wired in parallel to all of the **Br-SDCs**, then is used to simultaneously tell all of the players to start 'playing'. You can then either start a timer or start polling the LaserDisk/DVD for the end frame of the show. When the timer times out or the LaserDisk/DVD end frame is found, then the next characters in the frame tell the LaserDisk/DVD to stop (or 'still').

If the **Br-SDC** has been set for binary mode, then the screen will appear as follows:

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13 (c) 2014 DCM -
a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) string, f) 30 FPS, 9) mode
Input 0 close:1) string, 2) delay,  3) dvd start/end, 4) @end, 5) @fail, 6) kopy
G) 0 c: STRING-3 | DELAY-123,456 | DVD-123,456 / END-654,321 | @END-4 | @FAIL-5
h) 0 0:

Binary mode: 00000000b / 00h / __0




w) 8 c:
x) 8 0:
y) 9 c:
z) 9 0:
                         Enter Command-
```

The inputs for individual inputs 1 though 7 have disappeared from the screen. Any 1/4-J6 input change that does not equal zero is considered to be a 'closing' action, and the string set for 'bit 0 closing', will take place. Any change in the 1/-J6 inputs which results in a 'zero' value will be treated as an 'opening' edge, and the actions set for 'bit 0 closing', will take place. The current status of the 1/4-J6 input is displayed one the menu each time the screen is redrawn.

When a **Br-SDC8** is in mode0, the entire string menu and all but four commands on the Input Setup menu are disabled, and the trigger menu is drawn with instructions for the multiplexer mode:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.11 (c) 2014 DCM -

b) 9600 baud,  c) clear to default, d) save configuration thru serial, 9) mode 0



Serial Multiplexer (Mode 0) selected:

no strings or shows are available

use J6 bits 0, 1, 2 and 3 of J6 or AT+++ commands to select multiplexer channels

00000000b / 00h / __0








                              Enter Command-
```

a) LaserDisk/DVD Player type:

This command is used to select which type of LaserDisk/DVD is going to be used with the **Br-SDC**. Supported types are Pioneer or Sony. For each of these, you can also select whether it will be using a standard CAV (thirty minutes maximum length) disk, or an extended CLV (60 minutes maximum length) disk. DVDs all use frame references, and numbers from 1 to 9,999,999 are valid (assuming there are that many frames recorded on your disk!).

CAV disks use frame number references between one and 54,000 frames. CLV disks use time references between 0:00:00.01 and 9:59:59.29. The display on this screen will be modified to show the appropriate numbering system for the LaserDisk/DVD selected.

You can switch back and forth between CAV and CLV disk formats to review the frame numbers you have entered either in 'frames' or 'time' formats.

If using a Pioneer DVD-V7200, DVD-V7400 (or their PAL equivalents DVD-V7100 or DVD-V7300), you should set the **Br-SDC** for 'Pioneer CAV' mode.

b) Baud Rate:

This command toggles among the eight supported baud rates:

1) 1200 baud

2) 2400 baud
3) 4800 baud
4) 9600 baud (default)
5) 19,200 baud
6) 38,400 baud
7) 57,600 baud
8) 115,200 baud

No matter the baud rate chosen, configuration will always take place at 9600 baud. The **Br-SDC** will only switch to another baud rate upon exiting configuration.

c)   Clear Configuration Memory:

This command is used to reload the default configurations into the **Br-SDC**. Default configuration loads a sequence into bit 0 closing edge that will access frame 1000 of a Pioneer CAV LaserDisk/DVD player, play until frame 2000, delay for 500 frames, and then repeat.

Six default strings are loaded in the **Br-SDC**. These are the most commonly used strings. They can be used as-is, modified, or deleted altogether, depending on your application:

1) For Pioneer LaserDisk and DVD players. This string is used to loop a single video sequence, with a delay between each iteration of the loop. It tells a Pioneer LaserDisk/DVD player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.
   c) Stop when it is found.
   d) Delay for the amount of time entered in the 'show length'.

Note that because of the length of this string, it will not show in its entirety on an eighty column wide display. You will need to scroll the screen to the right or use a screen setting that is wider than eighty columns.

2) For Pioneer LaserDisk and DVD players. This string will tell a Pioneer LaserDisk/ DVD player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.

3) For Pioneer LaserDisk and DVD players. This string will tell a Pioneer LaserDisk/ DVD player go to:

       a) Go to still mode.

4) For Sony LaserDisk players. This string is used to loop a single video sequence, with a delay between each iteration of the loop. This string will tell a Sony LaserDisk player to:

       a) Search for a frame number.
       b) Start the Player playing once it is found.
       c) Search for an ending frame number.
       d) Stop when it is found.
       e) Delay for the amount of time entered in the 'show length'.

5) For Sony LaserDisk players. This string will tell a Sony LaserDisk player to:

       a) Search for a frame number.
       b) Start the Player playing once it is found.
       c) Search for an ending frame number.

6) For Sony LaserDisk players. This string will tell a Sony LaserDisk player go to:

       a) Go to still mode.

d)   Save Configuration:

This command allows you to save a **Br-SDC** to the disk of your PC for archival purposes, or to copy it into another **Br-SDC**. To use this command:

1) Press the 'd' key. This will bring up an explanation of what you need to do:

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13 (c) 2014 DCM -




    Set your computer to save a stream of text to a file. The file should be 4095
      bytes long. To reload this card, just send this file back to this screen.

                              Hit any key when ready.

          Stop saving text and hit any key when the data has finished.











                        hit <ESC>ape key to cancel-
```

2) Set your modem program to receive a string of text. Give the file a name of your choosing. Hit 'start' to begin saving text.

3) Hit any key to start the download.

4) When the download has completed, the **Br-SDC** will give an extra line feed and stop sending any more data.

5) Stop your computer from saving any more text.

6) Hit any key to redraw the **Br-SDC** menu.

To send a configuration file to a **Br-SDC**, all you need to do is 'Send a Text file' from your modem program. Select a previously saved configuration and the **Br-SDC** will do the rest. After the configuration has been sent, the **Br-SDC** will check to see if the data arrived OK.

e)   Edit Strings:

This toggles you between the menu where serial strings are edited, and the menu where the trigger inputs' actions are configured.

f)   Frame Rate:

The standard frame rate is always thirty Frames Per Second in the parts of the world that use NTSC video standards. In places where PAL video standards prevail, the standard frame rate is twenty-five Frames Per Second. This command allows you to select which frame rate will be used by the **Br-SDC**.

Since delay times, LaserDisk and DVD player commands are all based on the frame rate, changing this setting will affect all of these. A delay of 500 frames is 16.6 seconds at thirty FPS. It changes to 20 seconds if the frame tare is lowered to twenty-five FPS.

9)   Mode:

The 1/4-J6 input on a **Br-SDC/09** or **Br-SDC/422** can be switched between two modes of operation. In the first of these, each of the eight inputs on the 1/4-J6 are used individually to trigger strings on either the opening or closing edges of each input. In the 'Binary' mode, the eight inputs are grouped together to form a binary value, which can then be sent as part of a serial string. Any 1/4-J6 input change that does not equal zero is considered to be a 'closing' action, and the string set for 'bit 0 closing', will take place. Any change in the 1/4-J6 inputs which results in a 'zero' value will be treated as an 'opening' edge, and the actions set for 'bit 0 closing', will take place.

When set for 'Binary' mode, a binary coded keypad (like the **KP-200**) can be attached to the 1/4-J6 input. A string set to be sent on the bit 0 closing edge will have the binary value of the 1/4-J6 input inserted into it. This can be set to send a 'show request' and 'play' command to a **Sd-50**, **Br-Brain4**, **Sd-25**, **Sd-10**, **Br-miniBrick8** or other controller.

On the **Br-SDC8s**, there are five modes of operation available, instead of the two on the **Br-SDC/09** or **Br-SDC/422**. The number of the mode is displayed on the menu next to the 'mode' command:

1) **Mode 0:** This is the 'multiplexer' mode. Instead of sending strings in response to the inputs, it simply routes the serial to/from on the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports to one or more of the eight multiplexed male DE-09 plugs.

   When a **Br-SDC8** is in mode0, the string menu is disabled, and the trigger menu is drawn with all but four commands disabled, with instructions for the multiplexer mode displayed:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.11 (c) 2014 DCM -

b) 9600 baud,  c) clear to default, d) save configuration thru serial, 9) mode 0



Serial Multiplexer (Mode 0) selected:

no strings or shows are available

use J6 bits 0, 1, 2 and 3 of J6 or AT+++ commands to select multiplexer channels

00000000b / 00h / __0







                           Enter Command-
```

Which ports are used are selected in one of two ways:

1) ATT+++ commands: Nine 'special' strings will be intercepted by the **Br-SDC8**, and not passed through to the outputs. When it receives one of these special strings, instead of passing the string through to the currently selected male DE-09 plug(s), the **Br-SDC8** will use it to select a different port for sending and receiving serial data.

String Sent	Multiplexer Selected
AT+++0 <CR>	Tx = ALL, Rx = #1
AT+++1 <CR>	Tx = #1, Rx = #1
AT+++2 <CR>	Tx = #2, Rx = #2
AT+++3 <CR>	Tx = #3, Rx = #3
AT+++4 <CR>	Tx = #4, Rx = #4
AT+++5 <CR>	Tx = #5, Rx = #5

String Sent	Multiplexer Selected
AT+++6 <CR>	Tx = #6, Rx = #6
AT+++7 <CR>	Tx = #7, Rx = #7
AT+++8 <CR>	Tx = #8, Rx = #8

If more numbers (1-8) are received before the <CR> (0x0D), then you can choose to route data to more than one of the multiplexed ports a the same time. The first valid number between 1 and 8 sets the port that will be used of receiving serial data and routing to the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports.

As an example, to send serial data out ports 3, 5, and 7, and listen to port 5 for any serial data which is returned, you would send the string: 'AT+++537 <CR>'

2) ¼-J6 input bits 0, 1, 2 and 3: A binary pattern of bits presented on these four input pins will select which multiplexer output is to be used:

Binary Number	Bit3 Pin #6 (+8)	Bit2 Pin #7 (+4)	Bit1 Pin #8 (+2)	Bit0 Pin #9 (+1)	Multiplexer Selected
0	Off	Off	Off	Off	Tx = ALL, Rx = #1
1	Off	Off	Off	On	Tx = #1, Rx = #1
2	Off	Off	On	Off	Tx = #2, Rx = #2
3	Off	Off	On	On	Tx = #3, Rx = #3
4	Off	On	Off	Off	Tx = #4, Rx = #4
5	Off	On	Off	On	Tx = #5, Rx = #5
6	Off	On	On	Off	Tx = #6, Rx = #6
7	Off	On	On	On	Tx = #7, Rx = #7
8	On	Off	Off	Off	Tx = #8, Rx = #8

This mode is often used with a PLC or other controller, where GPIOs are available for making the binary selections.

Note that when using the binary inputs, it is not possible to transmit through more than one multiplexer output at one time, unless you want to transmit to all of them simultaneously.

You don't want to switch between multiplexers in the middle of a message. Make sure that the last serial message has completed transmission before you change the selected multiplexer.

2) **Mode 1:** This mode of operation is combination of mode 0 and mode 2. Strings can be triggered by the optically isolated inputs as with mode 2, but the multi-plexed serial ports to sue for the strings can be selected either using the 'AT+++' commands of mode 0, or the commands embedded in the strings that are to sent from the internal memory of the **Br-SDC8**. The **Br-SDC8** does not hear any of the data returned through the multiplexed serial ports, as these are passed through to the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (fe-male Rj-12) ports. As with mode 2, mode 1 has the option of a 'binary mode' as described above for the **Br-SDC/09** and **Br-SDC/422**.

3) **Mode 2:** This mode is the closest in operation to the single port **Br-SDC/09** and **Br-SDC/422** as described above. The only addition to the menus you will see is the addition of the commands to select the multiplexed serial port on the string menu:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.13 (c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode2
h) edit string 1, i) edit entry __1, s) value to Send,  g) value to Get, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
0) Rx from one and Tx to all,         1-8) Select serial port for both Rx and Tx

        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
STRING1 |_MX0_|SERCH|_00H_|_'T'_|_52H_|('R')|(00H)|LDEND|_'R'_|_00H_|_F3H_|(12H)
string2 |_mx0_|serch|_0Dh_|_'u'_|_1Ah_|(16h)|(0Dh)|LdEnd|_end_|
string3 |_mx0_|_0Dh_|_0Dh_|_83h_|(02h)|(D0h)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
stringF |
                        Enter Command-
```

As with mode 2, mode 1 has the option of a 'binary mode' as described above for the **Br-SDC/09** and **Br-SDC/422**.

g) through z)
Edit Input Actions:

These commands are used to select and modify the twenty 'shows' that play when the level of an input changes. When you have selected an input/edge, this line will be displayed in UPPER CASE to make it easier to see. You can set:

1) 'String' that will be sent on this closure:

A string can be up to one hundred characters long, and can include commands to:

a) Search for a specific frame on many LaserDisk/DVD players when a 'serch' marker is found in the string being sent.
b) Delay until a specific frame of a LaserDisk/DVD player has been played when a 'LdEnd' marker is found in the string which is being sent.
c) Delay until a certain amount of time has passed when a 'delay' marker is found in the string being sent.
d) Get a specific character, or any character through the serial port. These can be entered as either HEXadecimal or ASCII text characters.

Valid string numbers are 1 through 9, A through F. A entry of '0' tells the **Br-SDC** to not send any string on this input/edge. This disables this entire input/edge, and the settings for that input/edge will no longer be displayed on the menu until it is changed to a non-zero value.

2) Delay Timer Length:

This is the length that the internal timer will run for when a 'Start Timer' ('delay') command is found in the string that is being sent. The string will be paused until this amount of time (in frames) has passed. The string will then continue with the next character in the string.

Valid range of inputs for this timer are one frame to 99,999 frames. This translate into a potential time delay of over nine hours.

3)   LaserDisk/DVD Start frame:

This is the frame number that the **Br-SDC** will search for when a special 'LaserSearch' ('serch') command is found in the string that is being sent. The string will be paused until the LaserDisk/DVD has completed the search command. The string will then continue with the next character in the string. The 'serch' command will typically be followed by the commands to tell the LaserDisk/DVD to begin playing.

On CAV LaserDisks, the range of valid frame numbers is one to 54,000. Values of zero will be ignored. Larger values will just confuse the LaserDisk/DVD player.

On CLV LaserDisks, the range of valid frame numbers is 0:00:00.01 to 0:59:59:29 (1 to 108,000 frames). LaserDisks are pressed with an 'hour' programmed into them, typically hour '0' or hour '1'. You will need to add a value equal to one hour worth of frames if your disk was encoded to use hour '1' [2]. Frame values of zero are also not allowed, and will not be sent.

LaserDisk/DVD End Frame:

This is the frame number that the **Br-SDC** will poll the LaserDisk/DVD player for when it encounters a 'LaserDisk End' ('LdEnd') command in the string being sent. The string will be paused until the LaserDisk/DVD has passed this frame. The string will then continue with the next entry.

DVD players respond slowly to any request for frame numbers. The **Br-SDC** has code which specifically delays re-polling a LaserDisk/DVD player until it has finished getting the last frame's frame number.

If the **Br-SDC** does not hear from the LaserDisk/DVD Player for a full second, it will try resending the query command.

On CAV LaserDisks, the range of valid frame numbers is one to 54,000. Frame values of zero will never be found. Larger values will just confuse the LaserDisk/ DVD player.

On CLV LaserDisks, the range of valid frame numbers is 0:00:00.01 to 0:59:59:29 (one to 108,000 frames). The **Br-SDC** ignores the 'hour' when searching for the end of a show. Frame values of zero will never be found. Larger values will just confuse things.

---

[2]   108,000 if operating at thirty FPS, 90,000 if operating at twenty-five FPS.

4) String/Show to play at End:

This allows you to request that a specific show or string will be played at the successful completion of the string that is being sent. This allows you to jump to another show, or just send a different string when the main sequence has completed successfully. Valid input range for this setting is 0 (if no string or show is selected), 1 through 9, A through F (for strings to send), and 'g' through 'z' (for different shows to play).

5) String/Show to play on Failure:

This allows you to request that a specific show or string will be played at the unsuccessful completion of the string that is being sent. String failures are when you request that a specific character be returned by the device being controlled, and a different character comes back. This allows you to jump to another show, or just send a different string when the main sequence has completed failed. Valid input range for this setting is 0 (if no string or show is selected), 1 through 9, A through F (for strings to send), and 'g' through 'z' (for different shows to play).

6) Kopy:

This command asks you for the number of another input. When you enter it, the entire contents of the requested line is copied to the currently selected line.

Br-SDC String Menu

Strings are the ASCII commands which you can tell the **Br-SDC** send. They are used primarily for turning on and off video displays and projectors. They can also be used with any other piece of show equipment that needs a serial input. Pressing the 'e' command brings up the following screen (the default strings on a **Br-SDC/09** are shown):

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13+(c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end


        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

If the binary mode of operation has been selected, then the menu will add the commands to embed the value on the trigger inputs into the strings as a binary, Hexadecimal or BCD values:

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13+(c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
n) send eight bit binary, o) send two character HEX, p) send three character BCD

        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

If this is a **Br-SDC8**, the commands to select the multiplexed serial port have been added to the menu:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.13 (c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
0) Rx from one and Tx to all,        1-8) Select serial port for both Rx and Tx

        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

If the **Br-SDC8** is also in a binary mode, then both the commands to embed the markers into the strings to send a binary, Hexadecimal or BCD values and the commands to select the multiplexed serial port have been added to the menu:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.13 (c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
n) 8 bit binary, o) two character HEX,  p) three character BCD, 0-8) Select Mux.


        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

On the String Setup menu, there are fifteen strings, numbered 1 through 9 and A through F. Each string can hold up to one hundred characters (you will need to expand your screen view beyond eighty columns or scroll to the right to see strings longer than twelve characters). Characters are entered into the strings directly as HEXadecimal values using the 'value to send' and 'value to get' commands. Any value between 00h to FFh can be sent or received. As an example:

To send a letter "a", you enter the HEXadecimal value of 61h.

Values can also be entered as ascii characters by using the 'Tx Text' and 'Rx Text' commands. This allows you to just 'type' whatever characters need to go into your string. Characters entered as ascii text will appear on the screen between single quotes. Values to 'get' are also surrounded by parenthesis.

a) LaserDisk/DVD Player type:

This command is used to select which type of LaserDisk/DVD is going to be used with the **Br-SDC**. Supported types are Pioneer or Sony. For each of these, you can also

select whether it will be using a standard CAV (thirty minutes maximum length) disk, or an extended CLV (60 minutes maximum length) disk. DVDs all use frame references, and numbers from 1 to 9,999,999 are valid (assuming there are that many frames recorded on your disk!).

CAV disks use frame number references between one and 54,000 frames. CLV disks use time references between 0:00:00.01 and 9:59:59.29. The display on this screen will be modified to show the appropriate numbering system for the LaserDisk/DVD selected.

You can switch back and forth between CAV and CLV disk formats to review the frame numbers you have entered either in 'frames' or 'time' formats.

If using a Pioneer DVD-V7200, DVD-V7400 (or their PAL equivalents DVD-V7100 or DVD-V7300), you should set the **Br-SDC** for 'Pioneer CAV' mode.

b)   Baud Rate:

This command toggles among the eight supported baud rates:

1) 1200 baud
2) 2400 baud
3) 4800 baud
4) 9600 baud (default)
5) 19,200 baud
6) 38,400 baud
7) 57,600 baud
8) 115,200 baud

No matter the baud rate chosen, configuration will always take place at 9600 baud. The **Br-SDC** will only switch to another baud rate upon exiting configuration.

c)   Clear Configuration Memory:

This command is used to reload the default configurations into the **Br-SDC**. Default configuration loads a sequence into bit 0 closing edge that will access frame 1000 of a Pioneer CAV LaserDisk/DVD player, play until frame 2000, delay for 500 frames, and then repeat.

Six default strings are loaded in the **Br-SDC**. These are the most commonly used strings. They can be used as-is, modified, or deleted altogether, depending on your application:

1) For Pioneer LaserDisk and DVD players. This string is used to loop a single video sequence, with a delay between each iteration of the loop. It tells a Pioneer

LaserDisk/DVD player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.
   c) Stop when it is found.
   d) Delay for the amount of time entered in the 'show length'.

Note that because of the length of this string, it will not show in its entirety on an eighty column wide display. You will need to scroll the screen to the right or use a screen setting that is wider than eighty columns.

2) For Pioneer LaserDisk and DVD players. This string will tell a Pioneer LaserDisk/ DVD player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.

3) For Pioneer LaserDisk and DVD players. This string will tell a Pioneer LaserDisk/ DVD player go to:

   a) Go to still mode.

4) For Sony LaserDisk players. This string is used to loop a single video sequence, with a delay between each iteration of the loop. This string will tell a Sony LaserDisk player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.
   d) Stop when it is found.
   e) Delay for the amount of time entered in the 'show length'.

5) For Sony LaserDisk players. This string will tell a Sony LaserDisk player to:

   a) Search for a frame number.
   b) Start the Player playing once it is found.
   c) Search for an ending frame number.

6) For Sony LaserDisk players. This string will tell a Sony LaserDisk player go to:

   a) Go to still mode.

d)   Save Configuration:

This command allows you to save a **Br-SDC** to the disk of your PC for archival pur- poses, or to copy it into another **Br-SDC**. To use this command:

1) Press the 'd' key. This will bring up an explanation of what you need to do:

```
- Gilderfluke & Co. - Br-SDC Serial Device Controller - ver. 2.13 (c) 2014 DCM -




     Set your computer to save a stream of text to a file. The file should be 4095
       bytes long. To reload this card, just send this file back to this screen.

                            Hit any key when ready.

            Stop saving text and hit any key when the data has finished.









                          hit <ESC>ape key to cancel-
```

2) Set your modem program to receive a string of text. Give the file a name of your choosing. Hit 'start' to begin saving text.

3) Hit any key to start the download.

4) When the download has completed, the **Br-SDC** will give an extra line feed and stop sending any more data.

5) Stop your computer from saving any more text.

6) Hit any key to redraw the **Br-SDC** menu.

To send a configuration file to a **Br-SDC**, all you need to do is 'Send a Text file' from your modem program. Select a previously saved configuration and the **Br-SDC** will do the rest. After the configuration has been sent, the **Br-SDC** will check to see if the data arrived OK.

e) Edit Strings:

This toggles you between the menu where serial strings are edited, and the menu where the trigger inputs' actions are configured.

f) Frame Rate:

The standard frame rate is always thirty Frames Per Second in the parts of the world that use NTSC video standards. In places where PAL video standards prevail, the standard frame rate is twenty-five Frames Per Second. This command allows you to select which frame rate will be used by the **Br-SDC**.

Since delay times, LaserDisk and DVD player commands are all based on the frame rate, changing this setting will affect all of these. A delay of 500 frames is 16.6 seconds at thirty FPS. It changes to 20 seconds if the frame tare is lowered to twenty-five FPS.

9) Mode:

The 1/4-J6 input on a **Br-SDC/09** or **Br-SDC/422** can be switched between two modes of operation. In the first of these, each of the eight inputs on the 1/4-J6 are used individually to trigger strings on either the opening or closing edges of each input. In the 'Binary' mode, the eight inputs are grouped together to form a binary value, which can then be sent as part of a serial string. Any 1/4-J6 input change that does not equal zero is considered to be a 'closing' action, and the string set for 'bit 0 closing', will take place. Any change in the 1/4-J6 inputs which results in a 'zero' value will be treated as an 'opening' edge, and the actions set for 'bit 0 closing', will take place.

When set for 'Binary' mode, a binary coded keypad (like the KP-100 or KP-200) can be attached to the 1/4-J6 input. A string set to be sent on the bit 0 closing edge will have the binary value of the 1/4-J6 input inserted into it. This can be set to send a 'show request' and 'play' command to a **Sd-50**, **Br-Brain4**, **Sd-25**, **Sd-10**, **Br-miniBrick8** or other controller.

On the **Br-SDC8s**, there are five modes of operation available, instead of the two on the **Br-SDC/09** or **Br-SDC/422**. The number of the mode is displayed on the menu next to the 'mode' command:

1) **Mode 0:** This is the 'multiplexer' mode. Instead of sending strings in response to the inputs, it simply routes the serial to/from on the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports to one or more of the eight multiplexed male DE-09 plugs.

When a **Br-SDC8** is in mode0, the string menu is disabled, and the trigger menu is drawn with all but four commands disabled, with instructions for the multiplexer mode:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.11 (c) 2014 DCM -

b) 9600 baud,  c) clear to default, d) save configuration thru serial, 9) mode 0



Serial Multiplexer (Mode 0) selected:

no strings or shows are available

use J6 bits 0, 1, 2 and 3 of J6 or AT+++ commands to select multiplexer channels

00000000b / 00h / __0









                            Enter Command-
```

Which ports are used are selected in one of three ways:

1) ATT+++ commands: Nine 'special' strings will be intercepted by the **Br-SDC8**, and not passed through to the outputs. When it receives one of these special strings, instead of passing the string through to the currently selected male DE-09 plug(s), the **Br-SDC8** will use it to select a different port for sending and receiving serial data.

String Sent	Multiplexer Selected
AT+++0 <CR>	Tx = ALL, Rx = #1
AT+++1 <CR>	Tx = #1, Rx = #1
AT+++2 <CR>	Tx = #2, Rx = #2
AT+++3 <CR>	Tx = #3, Rx = #3

String Sent	Multiplexer Selected
AT+++4 <CR>	Tx = #4, Rx = #4
AT+++5 <CR>	Tx = #5, Rx = #5
AT+++6 <CR>	Tx = #6, Rx = #6
AT+++7 <CR>	Tx = #7, Rx = #7
AT+++8 <CR>	Tx = #8, Rx = #8

If more numbers (1-8) are received before the <CR> (0x0D), then you can choose to route data to more than one of the multiplexed ports a the same time. The first valid number between 1 and 8 sets the port that will be used of receiving serial data and routing to the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (female Rj-12) ports.

As an example, to send serial data out ports 3, 5, and 7, and listen to port 5 for any serial data which is returned, you would send the string: 'AT+++537 <CR>'

2) ¼-J6 input bits 0, 1, 2 and 3: A binary pattern of bits presented on these four input pins will select which multiplexer output is to be used:

Binary Number	Bit3 Pin #6 (+8)	Bit2 Pin #7 (+4)	Bit1 Pin #8 (+2)	Bit0 Pin #9 (+1)	Multiplexer Selected
0	Off	Off	Off	Off	Tx = ALL, Rx = #1
1	Off	Off	Off	On	Tx = #1, Rx = #1
2	Off	Off	On	Off	Tx = #2, Rx = #2
3	Off	Off	On	On	Tx = #3, Rx = #3
4	Off	On	Off	Off	Tx = #4, Rx = #4
5	Off	On	Off	On	Tx = #5, Rx = #5
6	Off	On	On	Off	Tx = #6, Rx = #6
7	Off	On	On	On	Tx = #7, Rx = #7

Binary Number	Bit3 Pin #6 (+8)	Bit2 Pin #7 (+4)	Bit1 Pin #8 (+2)	Bit0 Pin #9 (+1)	Multiplexer Selected
8	On	Off	Off	Off	Tx = #8, Rx = #8

This mode is often used with a PLC or other controller, where GPIOs are available for making the binary selections.

Note that when using the binary inputs, it is not possible to transmit through more than one multiplexer output at one time, unless you want to transmit to all of them simultaneously.

You don't want to switch between multiplexers in the middle of a message. Make sure that the last serial message has completed transmission before you change the selected multiplexer.

3) (Available in mode #1 ONLY) Commands can be embedded into the strings that select the following:

String Entry	Multiplexer Selected
Mux0	Tx = ALL, Rx = #1
Mux1	Tx = #1, Rx = #1
Mux2	Tx = #2, Rx = #2
Mux3	Tx = #3, Rx = #3
Mux4	Tx = #4, Rx = #4
Mux5	Tx = #5, Rx = #5
Mux6	Tx = #6, Rx = #6
Mux7	Tx = #7, Rx = #7
Mux8	Tx = #8, Rx = #8

Note that when using the binary inputs, it is not possible to transmit through more than one multiplexer output at one time, unless you want to transmit to all of them simultaneously.

2) **Mode 1:** This mode of operation is combination of mode 0 and mode 2. Strings

can be triggered by the optically isolated inputs as with mode 2, but the multi-plexed serial ports to use for the strings can be selected either using the 'AT+++' commands of mode 0, or the commands embedded in the strings that are to sent from the internal memory of the **Br-SDC8**. The **Br-SDC8** does not hear any of the data returned through the multiplexed serial ports, as these are passed through to the **Br-SDC8's** 'Config./Mux. RS-232 port' (female DE-09) or 'Mux./RS-422' (fe-male Rj-12) ports. All of the commands to 'Rx' a character are not displayed if in mode 1. As with mode 2, mode 1 has the option of a 'binary mode' as described above for the **Br-SDC/09** and **Br-SDC/422**.

3) **Mode 2:** This mode is the closest in operation to the single port **Br-SDC/09** and **Br-SDC/422** as described above. The only addition to the menus you will see is the addition of the commands to select the multiplexed serial port on the string menu:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.13 (c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
0) Rx from one and Tx to all,        1-8) Select serial port for both Rx and Tx

        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

As with mode 2, mode 1 has the option of a 'binary mode' as described for the **Br-SDC/09** and **Br-SDC/422**. This will add the commands to set 'binary, hex or BCD values to be embedded in the strings:

```
- Gilderfluke & Co. - Br-SDC8 Multiport Serial Controller - v2.13 (c) 2014 DCM -

a) Pioneer CAV, b) 9600 baud,  c) clear, d) save, e) shows,  f) 30 FPS, 9) mode
h) edit string F, i) edit entry__1, s) Tx value, g) Rx value, u) Rx any, k) kopy
j) Tx Text, q) Rx text, l) dvd search, m) dvd End, T) start Timer, x) string end
n) 8 bit binary, o) two character HEX,  p) three character BCD, 0-8) Select Mux.


        |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|__10_|__11_|__12_
string1 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_'S'_|_'T'_|_0Dh_|('R')|(0Dh)
string2 |serch|_'P'_|_'L'_|_0Dh_|('R')|(0Dh)|LdEnd|_end_|
string3 |_'S'_|_'T'_|_0Dh_|('R')|(0Dh)|_end_|
string4 |
string5 |
string6 |
string7 |
string8 |
string9 |
stringA |
stringB |
stringC |
stringD |
stringE |
STRINGF |
                        Enter Command-
```

Several 'special characters' can be embedded into these strings. These are:

• LaserSearch (displayed as 'serch')

• LaserDisk/DVD End (displayed as 'LdEnd'):

• Start Timer (displayed as 'timer'):

• Get anything (displayed as '__?__'):

• End Of String (displayed as '_end_'):

• Eight Bit Binary value (displayed as '_BIN_'):

• Two character HEX value (displayed as '_HEX_'):

• Three character BCD value (displayed as '_BCD_'):

h)   Edit String n:

This is used to select the string to edit. The number of the currently selected string (1-9, A-F) is displayed. The **Br-SDC** will ask you for the string number to edit (1-9, A-F). The selected string is printed in UPPER case letter to make it a little easier to see.

i)   Edit Entry nn:

This command displays the entry within the selected string (1-99) that will be changed by the next string altering command (value to get, value to send, etc.). When a new string is selected, this is reset back to the first entry in the selected string. Each time you make an entry in a string, this value is automatically incremented to the next entry. If you make a mistake in a string, you can use this command to go back a few entries and make your corrections.

s)   Tx Value:

This adds an entry in the selected string (shown by 'h) Edit String n') at the entry (shown by 'i Edit Entry nn'). The **Br-SDC** will ask you for a Hexadecimal value (00-FF), which will be sent out as part of the string. This will be displayed on this menu as a hexadecimal value. You can make multiple entries, which will be added to consecutive entries in the selected string. Enter an <Escape> when you are finished making entries.

g)   Rx Value:

(Command <u>NOT</u> available if in Mode 1) This adds an entry in the selected string (shown by 'h) Edit String n') at the entry (shown by 'i Edit Entry nn'). The **Br-SDC** will ask you for a Hexadecimal value (00-FF). This will be displayed on this menu as a (hexadecimal value). The parenthesis show that this is a character that the **Br-SDC** will pause until it is received. If a different character is received, this will generate an 'error'. A different string can be triggered if there is an error in a string. You can make multiple entries, which will be added to consecutive entries in the selected string. Enter an <Escape> when you are finished making entries.

h)   Kopy:

This command asks you for the number of another string. When you enter it, the entire contents of the requested string is copied to the currently selected string.

j)   Tx Text:

This command is an alternative way to enter data to send as ASCII text (instead of entering characters as hexadecimal values, as done in the 's) Send a Value' command). You simply type the ascii text to send. This will add a 'text' entry in the selected string (shown by 'h) Edit String n') at the entry (shown by 'i Edit Entry nn'). This will be displayed on this menu as an ascii text character, within a single pair of quotes. You can

make multiple entries, which will be added to consecutive entries in the selected string. Enter an <Escape> when you are finished making entries.

q) Rx Text:

(Command <u>NOT</u> available if in Mode 1) This command is an alternative way to enter data to get as ASCII text (instead of entering characters as hexadecimal values, as done in the 'g) Value to Get' command). You simply type the ascii text to send. This adds an entry in the selected string (shown by 'h) Edit String n') at the entry (shown by 'i Edit Entry nn'). This will be displayed on this menu an ascii text character, within a pair of single quotes, within a single pair of parenthesis. The parenthesis show that this is a character that the **Br-SDC** will pause until it is received. If a different character is received, this will generate an 'error'. A different string can be triggered if there is an error in a string. You can make multiple entries, which will be added to consecutive entries in the selected string. Enter an <Escape> when you are finished making entries

l) LaserDisc/DVD Search (displayed as 'serch'):

This tells the **Br-SDC** to search for the 'LDP' frame number entered for the input/ edge on the input setup menu. The **Br-SDC** will use the commands that are appropriate for the type of LaserDisk/DVD that has been selected. If it finds the drawer open, spindle stopped, or anything else amiss on the LaserDisk/DVD, it will try to correct the condition before continuing with the search.

When the search has completed, the **Br-SDC** will then continue with the next character in the string. Often these are the commands to tell the LaserDisk/DVD to start 'playing'.

If you are using a CAV disk, the maximum frame number you can enter is 54,000. Any value larger than this is invalid, and will probably upset the LaserDisk/DVD. Frame values of zero are also not allowed, and will not be sent.

If you are using a CLV disk, the range of valid frame numbers is 0:00:00.01 to 0:59:59:29 (1 to 108,000 frames). LaserDisk/DVDs are pressed with an 'hour' programmed into them, typically hour '0' or hour '1'. You will need to add a value equal to one hour worth of frames if your disk was encoded to use hour '1' 3. Frame values of zero are not allowed, and will not be sent.

---

3   108,000 if operating at thirty FPS, 90,000 if operating at twenty-five FPS.

m) LaserDisk/DVD End (displayed as 'LdEnd'):

This command tells the **Br-SDC** to go into a mode where it polls the attached LaserDisk/DVD for the 'LDP End' frame that has been entered for the show that is playing. If the **Br-SDC** doesn't get a response from the LaserDisk/DVD within a second, it will try to query it again.

Once the 'end frame' (or any value larger than the 'LDP end frame') has been found, the **Br-SDC** will then continue with the next character in the string.

t) Start Timer (displayed as 'timer'):

You can set a 'length' for each of the shows. This command will start an internal timer in the **Br-SDC** running for the number of frames that has been set for the show 'length'. Valid range of frames for this timer are one frame to 99,999 frames. This translates into a potential time delay of over nine hours.

Once the delay time has passed, the **Br-SDC** will then continue with the next character in the string.

u) Rx Anything (displayed as '__?__'):

(Command <u>NOT</u> available if in Mode 1) There are times when you need to get a character from the serially controlled device, but really just don't care what it is that is returned. The string will be paused until any character is received. The string will then continue with the next character.

v) End Of String (displayed as '_end_'):

This is used to mark the end of any string. When inserted into any string, the remainder of the string will not be displayed or sent. You can use this command to truncate a string that is now longer than you need.

n) Eight Bit Binary value (displayed as '_BIN_'):

(Binary Mode only) This is used insert the binary value on the 1/4-J6 input into any string. This is sent as a single 8 bit byte. The value can be anything from 0x00 to 0xFF.

o) Two character HEX value (displayed as '_HEX_'):

(Binary Mode only) This is used insert the HEXadecimal value on the 1/4-J6 input into any string. This is sent as two 8 bit ascii bytes (0-9, A-F).

If you are building a string to use with another piece of Gilderfluke equipment, this will probably be the way you will want to send it a binary value from the 1/4-J6 port. A typical string to select and loop a show looks like this:

|_2Ah_|_HEX_|_22h_|_end_|

The first character is the '*' (2Ah) that is used for the 'global show select' command. The two digit HEXadecimal value from the 1/4-J6 is sent next (shown by the '_HEX_'). The 'global loop' command '"' (22h) is sent to start the selected show looping.

p)   Three character BCD value (displayed as '_BCD_'):

(Binary Mode only) This is used insert the Binary Coded Decimal (BCD) value on the 1/4-J6 input into any string. This is sent as three 8 bit ascii bytes (0-9). Three characters are always sent, so it is led by '0's if the value is less than 100. Two zeros lead values of '9' and below.

o)   Transmit to ALL, Receive from #1:
1)   Transmit to #1, Receive from #1:
2)   Transmit to #2, Receive from #2:
3)   Transmit to #3, Receive from #3:
4)   Transmit to #4, Receive from #4:
5)   Transmit to #5, Receive from #5:
6)   Transmit to #6, Receive from #6:
7)   Transmit to #7, Receive from #7:
8)   Transmit to #8, Receive from #8:

(Available in mode #1 ONLY) Commands can be embedded into the strings that select the following:

String Entry	Multiplexer Selected
Mux0	Tx = ALL, Rx = #1
Mux1	Tx = #1, Rx = #1
Mux2	Tx = #2, Rx = #2
Mux3	Tx = #3, Rx = #3

String Entry	Multiplexer Selected
Mux4	Tx = #4, Rx = #4
Mux5	Tx = #5, Rx = #5
Mux6	Tx = #6, Rx = #6
Mux7	Tx = #7, Rx = #7
Mux8	Tx = #8, Rx = #8

Note that when using the embedded 'Mux' commands, it is not possible to transmit through more than one multiplexer output at one time, unless you want to transmit to all of them simultaneously (Mux0).

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Pioneer LaserDisk/DVD Commands

The Pioneer LaserDisk and DVD players all share a common command format. A full description of the commands can be found in the technical publications available from Pioneer Communications of America. They can be reached at (408) 988-1702. You can also download their manuals from their web site.

LaserDisks used with the **Br-SDC** can be recorded in either the CAV or CLV format disks. CLV disks can hold up to one hour per side. Not all players will support the commands needed for using CLV disks. The player must be able to position the disk to a frame (and pause on that frame if it is to be used in a multiple LaserDisk/DVD installation).

The LaserDisk/DVD player must be configured for 9600 baud, eight bit data, and one stop bit (2400 or 4800 baud can also work in some applications). On the LD-V8000, you also must set the 'TxD Terminator' to '<C/R>'. Other data rates can be used, but lower baud rates can't get the data across fast enough for the **Br-SDC** while a show is running. Whatever the data rate used, you must set the **Br-SDC** and LaserDisk/DVD player to the same baud rate. Connections are made as follows:

The DB-15 female connector on a Pioneer LaserDisc/DVD player are:

POSITION	WIRE #	SIGNAL NAME:
TOP-RIGHT	1	Ground
	2	RS-232 Rx to **Br-SDC**
	3	RS-232 Tx from **Br-SDC**
	4	n/c
	5	n/c
	6	n/c
	7	n/c
TOP-LEFT	8	n/c
BOTTOM-RIGHT	9	n/c
	10	n/c
	11	n/c

POSITION	WIRE #	SIGNAL NAME:
	12	n/c
	13	n/c
	14	n/c
BOTTOM-LEFT	15	n/c

Pioneer LaserDisk/DVD DB-15 Female

The ground connections to pins #11 and #15 may need to be disconnected when used with Pioneer DVD players. The usage of these pins are different from those of their LaserDisk counterparts.

In general, you send a command to a Pioneer LaserDisk/DVD player as two ASCII characters (with occasional variables), followed by a <carriage return> character (0Dh). The LaserDisk/DVD player will then respond when it has completed the task with an upper case 'R' followed by a <carriage return> character (0Dh). A number of different commands can be stacked together and then followed by a single <carriage return> character (0Dh) to get them all rolling. The LaserDisk/DVD player will go through all of these commands in the order they were entered and then return an 'R' followed by a <carriage return> character (0Dh) when it has finished the last command. This can save a lot of string space if you are sending complicated strings to the LaserDisk/DVD player.

The majority of commands which you might need to use are all pretty simple two or three character ones. The one complicated 'search' command is handled transparently to you when you insert a LaserSearch character in the string being sent to the LaserDisk/DVD player (the **Br-SDC** must first be told it is running a Pioneer player). This string only performs a search for the starting frame of the show on the LaserDisk/DVD player. For this reason it is normally followed by a 'PL' (play) command in the same string.

A typical start string for a LaserDisk/DVD show is:

LaserSearch 'P' 'L' <CR> ('R') (<CR>) end-o-string

Translated into HEX ASCII, this string would be displayed on the String Setup Menu as:

serch 50h 4Ch 0Dh (52h) (0Dh)

Notice that after the LaserSearch command we have to then tell the LaserDisk/DVD to start playing, and that this command is followed by one <carriage return> character to

be sent out. Following this we tell the **Br-SDC** to wait until it gets first an 'R', and then a <CR> back from the LaserDisk/DVD player.

A typical end string for a LaserDisk/DVD show is:

'S' 'T' <CR> ('R') (<CR>) end-o-string

Translated into HEX ASCII, this string would be displayed on the String Setup Menu as:

53h 54h 0Dh (52h) (0Dh)

The format of this string is pretty much like that of the startup string, except that there is no need to send the LaserSearch string as was done at the beginning of the show, and the 'PL' command has been replaced by a 'ST' (still frame) command for the LaserDisk/DVD player. This freezes the image to whatever the last image on the video disk was. Other commands are available for blanking out the video, ejecting the disk, or a variety of other things. You can even build up a string which will tell the LaserDisk/ DVD player to search for another frame on the disk and freeze or start playing from that frame. If no command is given to the LaserDisk/DVD player at the end of a LaserDisk/ DVD show, then the player will continue playing along until the end of the disk is reached or another command is received.

As an example of how you combine more than a single LaserDisk/DVD command in the same string, we will now show a sample of a string which sends two commands at the same time to the LaserDisk/DVD player.

A typical combined start string for a LaserDisk/DVD show is:

LaserSearch 'P 'L' 1 'K' 'P' <CR> ('R') (<CR>) end-o-string

Translated into HEX ASCII, this string would be displayed on the String Setup Menu as:

serch 50h 4Ch 30h 4Bh 4Ch 0Dh (52h) (0Dh)

This string is just like the start string shown above, except that it sends a command to disable the front panel keypad on the LaserDisk/DVD player after it sends the command to start the show playing, but before it sends the <carriage return> that tells the LaserDisk/DVD player to start acting upon all the commands it has just received.

The following is a partial listing of the commands supported by Pioneer LaserDisk and DVD players. It is by no means a complete list of all of the commands available to you, but includes those common commands which you may actually need. Remember that you only need to send the <carriage return> (0Dh) (shown as the last character of all the commands) only if you aren't following the current command with any other

command. The <carriage return> tells the LaserDisk/DVD player to start working on all of the commands it has received since the last <carriage return> was received.

Please note that in many ways a LaserDisk/DVD player isn't very bright. If you send it a command to do something that is already done, it will return an error message. As an example, if you ask it to close the door and the door is already closed, it will return an error message 'E04 <CR>' instead of the 'R <CR>' you are expecting.

COMMAND	MNEMONIC	1st	2nd	3rd	4th	RESPONSE	2ND
OPEN DOOR	**OP**	**4Fh**	**50h**	**0Dh**		**52h**	**0Dh**

Stops the player if it is running and opens the door.

REJECT	**RJ**	**52h**	**4Ah**	**0Dh**		**52h**	**0Dh**

Stops the player motor if it is running.

PLAY	**PL**	**50h**	**4Ch**	**0Dh**		**52h**	**0Dh**

Starts the LaserDisk/DVD playing from the current position on the disk.

PAUSE	**PA**	**50h**	**41h**	**0Dh**		**52h**	**0Dh**

Stops the LaserDisk/DVD player and a blue (or black) screen appears.

STILL	**ST**	**53h**	**54h**	**0Dh**		**52h**	**0Dh**

Freezes the output of the LaserDisk/DVD player at the current frame.

STEP FORWARD	**SF**	**53h**	**46h**	**0Dh**		**52h**	**0Dh**

Steps the current video frame forward by one frame.

STEP BACKWARDS	**SB**	**53h**	**42h**	**0Dh**		**52h**	**0Dh**

Steps the current video frame backwards by one frame

VIDEO CONTROL0	**VD**	**30h**	**56h**	**44h**	**0Dh**	**52h**	**0Dh**

Turns off the video output.

VIDEO CONTROL1	**VD**	**31h**	**56h**	**44h**	**0Dh**	**52h**	**0Dh**

Turns on the video output (default condition).

CLOSE DOOR	**CO**	**43h**	**4Fh**	**0Dh**		**52h**	**0Dh**

Closes the player's door if it was open.

KEY LOCK	**0KL**	**30h**	**4Bh**	**4Ch**	**0Dh**	**52h**	**0Dh**

Enables the buttons on the front panel of the LaserDisk/DVD player.

KEY LOCK	**1KL**	**31h**	**4Bh**	**4Ch**	**0Dh**	**52h**	**0Dh**

Disables the buttons on the front panel of the LaserDisk/DVD player.

BEEP CONTROL	**0BP**	**30h**	**42h**	**50h**	**0Dh**	**52h**	**0Dh**

Mix a 100 millisecond long 880 Hz beep into the audio channel at 6%.

BEEP CONTROL	**1BP**	**31h**	**42h**	**50h**	**0Dh**	**52h**	**0Dh**

Mix a 100 millisecond long 880 Hz beep into the audio channel at 10%.

BEEP CONTROL	**2BP**	**32h**	**42h**	**50h**	**0Dh**	**52h**	**0Dh**

Mix a 100 millisecond long 880 Hz beep into the audio channel at 20%.

BEEP CONTROL	**3BP**	**33h**	**42h**	**50h**	**0Dh**	**52h**	**0Dh**

Mix a 100 millisecond long 880 Hz beep into the audio channel at 40%.

feel the blankness

Sony LaserDisk Commands

The Sony LaserDisk players all share a more or less common command format. A full description of the commands can be found in the technical publications available from Sony or your Sony dealer. You should confirm the usage of these commands for the specific player you are using.

LaserDisks used with the **Br-SDC** can be recorded in either CAV or CLV format. CLV disks can hold up to one hour per side. Not all players will support the commands needed for using CLV disks. The player must be able to position the disk to a frame (and pause on that frame if it is to be used in a multiple LaserDisk installation). Many Sony players can only position to a 'chapter' when playing CLV disks. They can not be used with CLV disks.

The LaserDisk player must be configured for 9600 baud, eight bit data, and one stop bit (2400 or 4800 baud can also work in some applications). Other data rates can be used, but lower baud rates can't get the data across fast enough for the **Br-SDC** while a show is running. Whatever the data rate used, you must set the **Br-SDC** and LaserDisk player to the same baud rate. Connections are made as follows:

The DB-15 female connector on a Pioneer LaserDisc/DVD player are:

POSITION	WIRE #	SIGNAL NAME:
TOP-RIGHT	1	n/c
	2	RS-232 Rx to **Br-SDC**
	3	RS-232 Tx from **Br-SDC**
	4	RTS (connect to CTS pin 5)
	5	CTS (connect to RTS pin 4)
	6	DSR (connect to DTR pin 20)
	7	ground
	8	n/c
	9	n/c
	10	n/c
	11	n/c

POSITION	WIRE #	SIGNAL NAME:
	12	n/c
TOP-LEFT	13	n/c
BOTTOM-RIGHT	14	n/c
	15	n/c
	16	n/c
	17	n/c
	18	n/c
	19	n/c
	20	DTR (connect to DSR pin 6)
	21	n/c
	22	n/c
	23	n/c
	24	n/c
BOTTOM-LEFT	25	n/c

Sony LaserDisk/DVD DB-25 Female

In general, you send a command to the LaserDisk player as a single ASCII character. The LaserDisk player will then respond that it has received the command with a 'ACK' (0Ah). When it has completed the task it will sometimes respond with a 'COMPLETION CODE' (01h, usually). Each command must be transmitted one at a time, after which you must wait for a return code(s) before you can send any additional commands.

The majority of commands which you might need to use are all pretty simple ones. The one complicated 'search' command is handled transparently to you when you insert a LaserSearch character in the string being sent to the LaserDisk player (the **Br-SDC** must have been told it is running a Sony player). This string only performs a search for the starting frame of the show on the LaserDisk player. For this reason it is normally followed by a 'F-PLAY' (3Ah) command in the same string.

A typical start string for a LaserDisk would be displayed on the String Setup Menu as:

serch 3Ah (0Ah)

Notice that after the LaserSearch command we have to then tell the LaserDisk to start playing, and that we tell the **Br-SDC** to wait until it gets an 'ACK' (0Ah) back from the LaserDisk player so we know that the command has been accepted.

A typical end string for a Sony LaserDisk show is:

STILL <ACK> end-o-string

Translated into HEX ASCII, this string would be displayed on the String Setup Menu as:

4Fh (0Ah)

The format of this string is pretty much like that of the startup string, except that there is no need to send the LaserSearch string as was done at the beginning of the show, and the 'F-Play' command has been replaced by a 'Still' command for the LaserDisk player. This freezes the image to whatever the last image on the video disk was. Other commands are available for blanking out the video, ejecting the disk, or a variety of other things. You can even build up a string which will tell the LaserDisk player to search for another frame on the disk and freeze or start playing from that frame. If no command is given to the LaserDisk player at the end of a LaserDisk show, then the player will continue playing along until the end of the disk is reached or another command is received.

The following is a partial listing of the commands supported by Sony LaserDisk players. It is by no means a complete list of all of the commands available to you, but includes those common commands which you may actually need. Not all Sony players support this full range of commands or respond in the same way to the commands sent to them. These particular commands are from a LDP-1500's manual, and so may not be applicable to all Sony players. The values shown are what you would actually enter into the strings.

COMMAND	HEX CHARACTER SENT	POSITIVE RESPONSE

AUDIO MUTE ON [4]   24h   (0Ah)
> Stops the audio output from the player.

AUDIO MUTE OFF [3]   25h   (0Ah)
> Enables the audio output from the player.

CH-1 ON   46h   (0Ah)
> Turns on audio output from channel one to 'Left' audio output connector.

CH-1 OFF   47h   (0Ah)
> Turns off audio output from channel one audio. channel two audio will go to both outputs if it is still enabled.

CH-2 ON   48h   (0Ah)
> Turns on audio output from channel two to 'Right' audio output connector.

CH-2 OFF   49h   (0Ah)
> Turns off audio output from channel two audio. Channel one audio will go to both outputs if it is still enabled.

CLEAR ALL   56h
> Stops any ongoing command and puts player into STILL mode.

EJECT 3   2Ah   (0Ah) (03h)
> Opens the disk compartment. Returns (0Ah) immediately, (03h) when task is completed.

EJECT ENABLE [3]   74h   (0Ah)
> Enables the 'Eject' button on the front of the LaserDisk player.

EJECT DISABLE [3]   75h   (0Ah)
> Disables the 'Eject' button on the front of the LaserDisk player.

F-PLAY   3Ah   (0Ah)
> Puts the player in normal play mode.

F-STEP and STILL [3]   2Bh   (0Ah)
> Steps the LaserDisk forward by one frame and display still frame.

R-STEP and STILL [3]   2Ch   (0Ah)
> Steps the LaserDisk backwards by one frame and display still frame.

FRAME # MODE   55h   (0Ah)
> Sets the player to 'frame' mode. This is the only mode which will work with the **Br-SDC**.

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[4] Command not available on all Sony models

MOTOR ON   **62h**   **(0Ah) (0Ah)**

Turns the motor on if it is stopped. Returns the first (0Ah) immediately, and the second after the motor is up to speed. Returns one NAK if the motor was already on.

MOTOR OFF   **63h**   **(0Ah) (8Ah)**

Turns the motor off if it is running. Returns the first (0Ah) immediately, and the second after the motor has wound down. Returns one NAK if the motor was already off.

NAK   **(0Bh)**

Code returned when the player doesn't like the command, as in the above two examples.

STILL   **4Fh**   **(0Ah)**

Sets the player to display a frozen picture.

STOP   **3Fh**   **(0Ah)**

Stops all video and audio output.

VIDEO OFF [2]   **26h**   **(0Ah)**

Turns off video output.

VIDEO ON [2]   **27h**   **(0Ah)**

Turns on video output.

HEXadecimal to Decimal to Percentage

The following chart shows decimal, HEXadecimal, and a few percentage equivalents to aid you when you need to convert between numbering bases:

decimal	HEX	ASCII	%	decimal	HEX	ASCII	%	decimal	HEX	ASCII	%	decimal	HEX	ASCII	%
00	00	null	0	64	40	@	25%	128	80	(null)	50%	192	C0	(@)	75%
1	01	soh/^A		65	41	A		129	81	(soh)		193	C1	(A)	
2	02	stx/^B		66	42	B		130	82	(stx)		194	C2	(B)	
3	03	etx/^C		67	43	C		131	83	(etx/)		195	C3	(C)	
4	04	eot/^D		68	44	D		132	84	(eot)		196	C4	(D)	
5	05	eng/^E		69	45	E		133	85	(eng)		197	C5	(E)	
6	06	ack/^F		70	46	F		134	86	(ack)		198	C6	(F)	
7	07	bell/^G		71	47	G		135	87	(bell)		199	C7	(G)	
8	08	bs/^H		72	48	H		136	88	(bs)		200	C8	(H)	
9	09	ht/^I		73	49	I		137	89	(ht)		201	C9	(I)	
10	0A	lf/^J		74	4A	J		138	8A	(lf)		202	CA	(J)	
11	0B	vt/^K		75	4B	K		139	8B	(vt)		203	CB	(K)	
12	0C	ff/^L		76	4C	L		140	8C	(ff)		204	CC	(L)	
13	0D	cr/^M		77	4D	M		141	8D	(cr)		205	CD	(M)	
14	0E	so/^N		78	4E	N		142	8E	(so)		206	CE	(N)	
15	0F	si/^O		79	4F	O		143	8F	(si)		207	CF	(O)	
16	10	dle/^P		80	50	P		144	90	(dls)		208	D0	(P)	
17	11	dc1/^Q		81	51	Q		145	91	(dc1)		209	D1	(Q)	
18	12	dc2/^R		82	52	R		146	92	(dc2)		210	D2	(R)	
19	13	dc3/^S		83	53	S		147	93	(dc3)		211	D3	(S)	
20	14	dc4/^T		84	54	T		148	94	(dc4)		212	D4	(T)	
21	15	nak/^U		85	55	U		149	95	(nak)		213	D5	(U)	
22	16	syn/^V		86	56	V		150	96	(syn)		214	D6	(V)	
23	17	etb/^W		87	57	W		151	97	(etb)		215	D7	(W)	
24	18	can/^X		88	58	X		152	98	(can)		216	D8	(X)	
25	19	em/^Y		89	59	Y		153	99	(em)		217	D9	(Y)	
26	1A	sub/^Z		90	5A	Z		154	9A	(sub)		218	DA	(Z)	
27	1B	ESC		91	5B	[		155	9B	(ESC)		219	DB	([)	
28	1C	FS		92	5C	\		156	9C	(FS)		220	DC	(\)	
29	1D	GS		93	5D	]		157	9D	(GS)		221	DD	(])	
30	1E	RS		94	5E	^		158	9E	(RS)		222	DE	(^)	
31	1F	VS		95	5F	_		159	9F	(VS)		223	DF	(_)	
32	20	SP	12.5%	96	60	`	37.5%	160	A0	(SP)	62.5%	224	E0	(`)	87.5%
33	21	!		97	61	a		161	A1	(!)		225	E1	(a)	
34	22	"		98	62	b		162	A2	(")		226	E2	(b)	
35	23	#		99	63	c		163	A3	(#)		227	E3	(c)	
36	24	$		100	64	d		164	A4	($)		228	E4	(d)	
37	25	%		101	65	e		165	A5	(%)		229	E5	(e)	
38	26	&		102	66	f		166	A6	(&)		230	E6	(f)	
39	27	'		103	67	g		167	A7	(')		231	E7	(g)	
40	28	(		104	68	h		168	A8	(()		232	E8	(h)	
41	29	)		105	69	i		169	A9	())		233	E9	(i)	
42	2A	*		106	6A	j		170	AA	(*)		234	EA	(j)	
43	2B	+		107	6B	k		171	AB	(+)		235	EB	(k)	
44	2C	'		108	6C	l		172	AC	(')		236	EC	(l)	
45	2D	-		109	6D	m		173	AD	(-)		237	ED	(m)	
46	2E	•		110	6E	n		174	AE	(•)		238	EE	(n)	
47	2F	/		111	6F	o		175	AF	(/)		239	EF	(o)	
48	30	0		112	70	p		176	B0	(0)		240	F0	(p)	
49	31	1		113	71	q		177	B1	(1)		241	F1	(q)	
50	32	2		114	72	r		178	B2	(2)		242	F2	(r)	
51	33	3		115	73	s		179	B3	(3)		243	F3	(s)	
52	34	4		116	74	t		180	B4	(4)		244	F4	(t)	
53	35	5		117	75	u		181	B5	(5)		245	F5	(u)	
54	36	6		118	76	v		182	B6	(6)		246	F6	(v)	
55	37	7		119	77	w		183	B7	(7)		247	F7	(w)	
56	38	8		120	78	x		184	B8	(8)		248	F8	(x)	
57	39	9		121	79	y		185	B9	(9)		249	F9	(y)	
58	3A	:		122	7A	z		186	BA	(:)		250	FA	(z)	
59	3B	;		123	7B			187	BB	(;)		251	FB	( )	
60	3C	<		124	7C			188	BC	(<)		252	FC	( )	
61	3D	=		125	7D	l		189	BD	(=)		253	FD	(l)	
62	3E	>		126	7E	~		190	BE	(>)		254	FE	(~)	
63	3F	?		127	7F	del		191	BF	(/)		255	FF	(del)	100%