

# LaserAce User and Installation Manual

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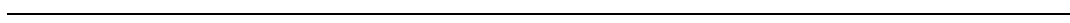
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## Introduction

**T**hankyou for purchasing LaserAce, the Ultimate LaserDisc player Conversion card.

LaserAce can replace the slow, old, faulty or missing LaserDisc Player in your LaserDisc Arcade Game with a more modern and reliable model. LaserAce also has advanced game independent features such as Disc Media and output player Performance Testing, as well as power supply voltage monitoring.

Please take the time to read through this manual to take full advantage of your LaserAce and to ensure trouble free operation.

Retain this manual in an easily accessible location for future reference.

## Parts supplied with LaserAce

1. LaserAce System Board
2. Rubber feet
3. PCM / Trigger Input cable
4. Power Supply Cable
5. Choice of the Output Player Cable
  - a. Pioneer DB25  
For the Pioneer LD-V6000A or LD-V6010A Players
  - b. Pioneer DB15  
For all other Pioneer Players
  - c. Sony DB25  
For all Sony Players
6. Optional Items
  - a. MACH3 boardset type Frame Number Injection (FNI) cable kit
  - b. Cliff Hanger boardset type Frame Number Injection (FNI) cable kit
  - c. Extra Output Player Cables
  - d. Dev+ LCD Display and Interface for advanced test and logging functions

## Key Features

LaserAce retains all setup information when turned off  
LaserAce stores and remembers all configuration and option information, even when turned off, so setting up LaserAce need only be done once per game.

### Communications Hardware and Protocol conversion

LaserAce simulates and processes the propriety communications interface of many old Laser Disc Players to the RS232 standard, which enables a wide range of modern and more advanced players to be used as a replacement.

LaserAce also has an assortment of carefully developed modifications and advancements to the communications process to enhance game play and speed.

LaserAce is very versatile as it has several input connectors, custom I/O ports, and support for a variety of communications protocols. This versatility makes LaserAce expandable and able to be upgraded to increase its functionality.

Most games that use the Pioneer PR-8210 or LD-1100 have a frame number decoder circuit as part of the game board, which decodes the '24-bit Philips Code' on each video frame. The frame number decoder is required for the game to function properly. The Philips code is encoded as a strip of dots and lines at the top (vertical blanking period) of the video image and can sometimes be seen when playing back a LaserDisc.

Unfortunately some LaserDisc Players (all the Sony range, the Pioneer LD-V4300D, and others) corrupt the Philips code in the video signal. Further more, some game boards have frame number decoder circuits that are poorly designed and unreliable. The frame decoder circuit used in the MACH3 board set is a good example of an unreliable decoder circuit, requiring frequent adjustment.

For these reasons LaserAce has a custom Frame Number Injection input and output port which, in conjunction with the FNI Cable Kit for the appropriate game type, intercepts the communications between the game's main CPU board and the game frame number decoder board. LaserAce then reliably communicates the correct frame number directly into the logic circuits of the game board, bypassing the poor frame number decoder circuit and eliminating possible frame number corruption. This results in consistent valid frame number reads and optimum game operation.

### Video Blanking Relay

Games that use the Pioneer PR-8210 and LD-1100 depend on total video signal dropout when the player is spinning-up, or when busy searching. When the video signal returns, the game detects the signal and concludes that the search is done. LaserAce simulates this video dropout, as all the modern players do not dropout the video in these states (except the LD-V8000, software selectable)

### On Screen Display (OSD) Setup

LaserAce has an 80 character display (20 characters x 4 lines) for detailed setup as well as access to Disc Testing and other advanced functions. These features are displayed on the video out signal from the output player, provided the output player features an on screen text display. The features are always available with the Dev+ option installed.

### Disc Media and Player Testing

These features can test a disc and an output player for defects or problems, which may cause your game to misbehave. LaserAce will determine the size of the disc under test, then test every frame of the disc for a valid frame number read. Any failures are logged to the OSD or Dev+ and include display of the most recent nine invalid frame reads as well as a count of the total number of errors encountered during a test.

### Status Log (Dev+)

With the addition of a Dev+, a live display of input and output communications is available for inspection, debugging, or testing.

### Performance Testing (Dev+)

With the addition of a Dev+, LaserAce can perform a variety of performance tests on a replacement player. Test results of similar model players can be compared and used as a guide to determine the player's performance ability.

**Game Board Power Supply monitoring with 5V DC Power Input**  
LaserAce continuously monitors its own +5V dc supply, as well as the Power Input DC Jack voltage and displays the voltage levels on the OSD and Dev+ screens.

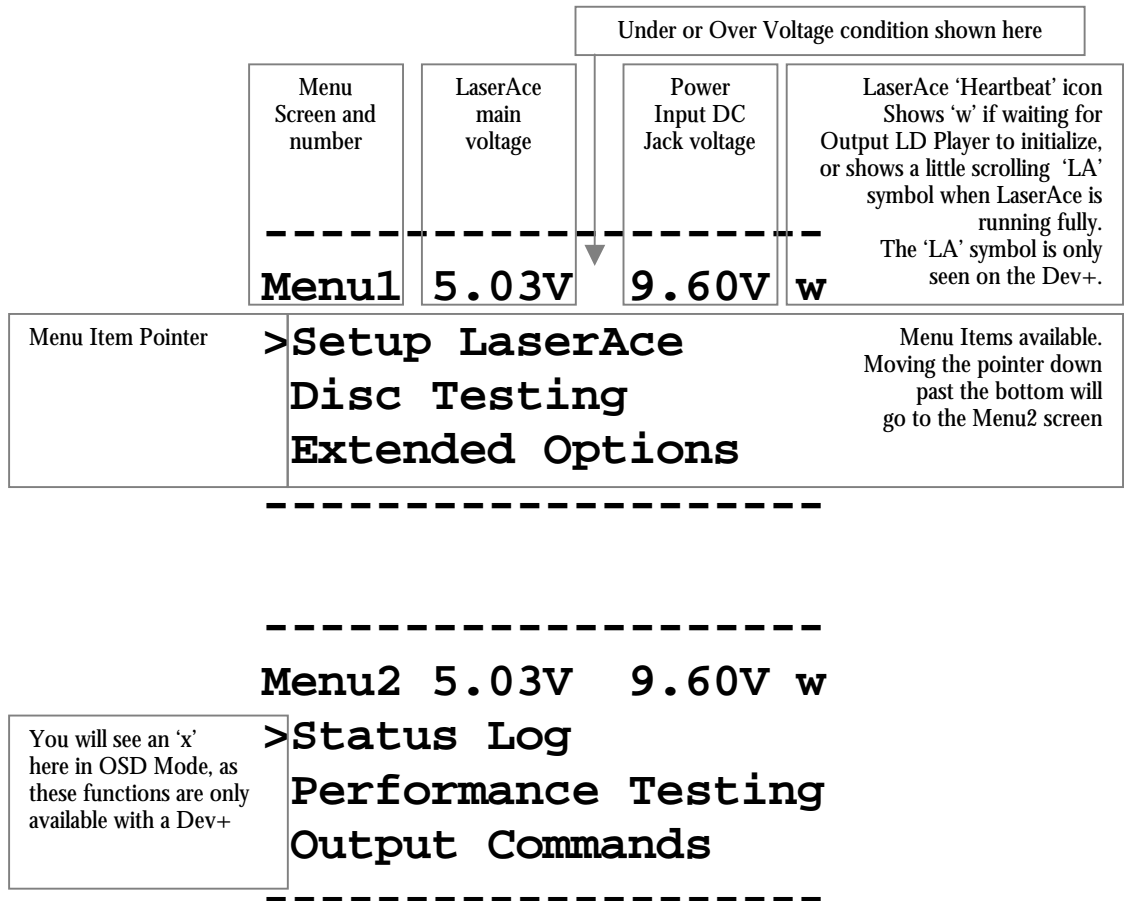
If LaserAce is sourcing its power directly from a game's +5V dc supply then LaserAce is able to monitor the game board's 5V dc supply for under or overvoltage conditions. Any abnormal voltage levels will result in a warning indication from LaserAce, which is retained until the power is turned off or LaserAce is reset.

Refer to section 'Using LaserAce Advanced Features' for more details regarding this and other functions.

# The LaserAce Display

## Main Screens

When using the On Screen Display, or Dev+ unit, screens similar to the ones below will be seen.



Some Output Players only support a limited range of characters so you may see all capitals instead of upper and lower case as well as an '-' as the pointer instead of the '>' arrow.

Only a limited number of Sony Laserdisc players feature an OSD (Refer to the LED Flash Code tables). The OSD capability of these Sony models is very limited. LaserAce will show a scanning display of its menu screens, consisting of 1 line by 20 characters which moves down for each line then restarts. Some patience is required to see the result of any user input when using a Sony player. The button press response is also slower when using the OSD menu compared to Dev+.



## The LaserAce Buttons

This section covers the buttons on the LaserAce board. If you have a Dev+, please see the separate section that covers the Dev+ option.

### Reset Button

Pressing the Reset button 'hard resets' LaserAce, as if it had been powered OFF then ON again.

Resetting LaserAce is recommended after changing any of the settings, and ensures any changes made take effect.

\* Extended options with Dev+ can be modified without the need to reset LaserAce. However, resetting LaserAce is recommended.

### Mode and Enter Buttons

The Mode and Enter buttons have different functions depending on LaserAce's current state: The functions are covered in more detail in the corresponding sections.

**To enter the LED Flash Code Setup Mode**, press and hold down the **MODE** button then momentarily press the **RESET** button. Release the **MODE** button when the LEDs on LaserAce are all flashing.

**MODE** button increments the option being adjusted.

**ENTER** button saves the current option and advances to the next option, or ends the LED Flash Code Setup Mode on saving the last option.

**To enter the OSD Setup Mode**, press and hold down the **MODE** button then press the **ENTER** button – release both buttons.

**MODE** button selects the menu to enter or the option to adjust.

**ENTER** button enters the menu or enters the option selected.

After an option has been entered for adjustment:

**MODE** button increments the entered option's setting.

**ENTER** button saves the option's setting and returns to the menu.

Note: When incrementing the value of a setting holding down the **MODE** button then briefly tapping the **ENTER** button will reverse the adjustment direction. Further presses of the **MODE** button will then decrease the value of the setting.

## The LaserAce LED's

LaserAce has eleven LEDs to display a variety of modes and function status.

### Power LED

This LED is ON whenever LaserAce has power. If you turn LaserAce ON and the Power LED comes on bright then fades away to nothing, LaserAce's over voltage protection circuit has activated. Turn the power to LaserAce OFF then verify the position of the Power Type Switch before continuing.

### Status LED

The Status LED is normally off unless in the Flash Code Setup Mode or if there is a problem. See the Trouble Shooting Section for more information on the Status LED and problems reported.

### Input LD Player LED's

The Input LD Player LEDs show the communications status of the input port on LaserAce.

If there is a communications fault to the Output Player, or LaserAce has not initialized the Output Player, then the Input LED will flash once every second. When there is communication between LaserAce and the game the LED may flash or flicker quite fast, or irregularly flicker as commands are being processed.

LD-V1000/1 Input LED

Active when the Pioneer LD-V1000, LD-V1001, or Badlands LD-V1000/1 Input LD mode is being used.

PR-7820 Input LED

Active when the Pioneer PR-7820 Input LD mode is being used.

Philips 22VP931 Input LED

Active when the Philips 22VP931 Input LD mode is being used.

Hitachi VIP-9500 Input and Serial Port 2 LED

Active when any of the Hitachi Input LD modes or Sony LDP-xxxx Input LD modes is being used.

PR-8210 and LD-1100 Input LED

Active when the Pioneer PR-8210, PR-8210A, LD-1100 Input LD mode is being used

#### PCM LED

Indicates directly to the electrical signal received from the PCM/Trigger Cable.

#### Output Player LED

The Output Player LED shows the communications status of the output port from LaserAce to the replacement player.

While the LED is ON, LaserAce is waiting for acknowledgment from the Output Player. If the LED remains ON for an extended period of time then LaserAce may be waiting for a response from a Player that is faulty, incorrectly configured or not connected.

#### Laser Player RS232 Output LED

Pulses when communications are going out to the Output Player.

#### Frame Number Output LED

##### Frame Number Output LED

LED is ON when the Frame Number Injection output system is in use. In Philips 22VP931 Input LD Player mode, the LED will briefly pulse if the Firefox board has lost communications with LaserAce.

#### Video Blanking LED

##### Video Blanking LED

LED is ON when video through the VIDEO INPUT and VIDEO OUTPUT Jacks is turned OFF (blanked).

#### ISP Program LED

##### ISP Program LED

LED is ON when the In System Programming port is being used to update the firmware in LaserAce.

## Sensible Precautions

Check the orientation of all cables and connections to LaserAce prior to powering it and any hardware connected to it. Failing to do so may cause irreversible damage to LaserAce and/or your game hardware.

LaserAce is designed to be installed inside a video game - when used in a stand-alone situation take care not to damage the circuit board or integrated circuits.

Only use LaserAce as described in this manual. Do not connect or use LaserAce with hardware not covered in this manual. Please consult us prior to using such hardware.

Do not install LaserAce adjacent to high voltage sources, such as monitor chassis or mains power terminal strips.

Do not drop liquids or metallic substances on the LaserAce circuit board.

Do not touch the integrated circuits on the LaserAce circuit board.

Do not place heavy objects on LaserAce or subject it to physical stress.

Do not bend or fasten the LaserAce circuit board to an uneven surface.

Do not subject LaserAce to extremes of temperature or volatile substances.

Do not expose LaserAce to rain or excessive moisture.

Do not attempt to reprogram LaserAce or connect anything to the ISP port.

## Easy Installation - Step-by-Step

Installation instructions for specific games are detailed elsewhere, refer to the relevant sections in this manual. The following is a basic guide for installing LaserAce in your game.

### Procedure Checklist

1. Read '**Sensible Precautions**'
2. Find your game in '**Game Specific Installation Information**' and note the LaserAce settings and any other installation details. Information regarding Power Cable connection for the specific game may also be found in this section.
3. Find your Output Player in '**Installation – LaserDisc Player Setup**' and ensure the player's communications settings have been set correctly.
4. Check that you have all the tools, cable(s) and LaserAce components that you may need for your game. The section '**Installation – Connections**' covers this.
5. Attach the Power Cable or AC Adapter (if used) to a suitable power source. This is covered in '**Connector Descriptions – Power Input and Power Type Switch**'. Game specific power connection locations may also be in '**Game Specific Installation Information**'. Attach the PCM/Trigger Cable if it is required for your game, as well as the Video Blanking system if required.
6. Power-up LaserAce with no other cables connected except for the Power Input Cable; If using the OSD setup then connect the communication cable to the output player and turn on power to it. To setup the input and output modes – see sections:  
' **Installation –Setup of the Output Player**  
**then 'Setting Up LaserAce for the first time with LED Flash Codes'**  
**or 'Setting Up LaserAce for the first time with On Screen Display'**  
**or 'Setting Up LaserAce for the first time with Dev+'**
7. Turn Off LaserAce and the game if also On. Connect all cables to LaserAce.
8. Verify all cables connected to LaserAce for correct connection, giving special attention to the orientation of the Frame Number Injection Kit cables if used.
9. Turn the game On. If everything is connected and configured correctly then your game will start! Otherwise revise the steps in this section or refer to the Troubleshooting/FAQ sections.

## Installation - Connections

Tools or parts you may require for installation

### **Soldering Iron and Solder**

On some games the PCM/Trigger cable, and power cable, may need to be soldered to a connector or location in the game

The PCM/Trigger cable is only required for games which use the Pioneer PR-8210, PR-8210A, LD-1100, and Philips 22VP931 (Firefox).

The Power Cable supplied with LaserAce can be attached to any DC voltage source present in the game or game boards, from 5V to 9V DC. Alternatively an AC Adaptor can be used - refer to section 'Connector Descriptions' below for the Power Type Switch setting.

### **Sidcutters**

Required to strip and prepare LaserAce wires for attachment

### **Mounting screws or spacers**

LaserAce can be installed in a variety of games so the mounting holes on the LaserAce PCB are not intended to suit any particular game. The 4 universal holes on the LaserAce PCB corners can be used for stand-offs or screws. Rubber feet are supplied with LaserAce as standard and can be applied for installing LaserAce on top of the replacement player.

### **BNC Male to RCA Female Adaptor**

If you have a replacement player that has only a BNC video output on it, but your original game has an RCA cable, you can either replace the original cable with a suitable one or get a BNC to RCA adaptor to adapt the player's video output to RCA

Always check the Power Type switch!

**IMPORTANT! Always check the position of the Power Type switch to suit your installation – BEFORE turning the power ON.**

LaserAce is protected against an over-voltage supplied to it. The over-voltage protection consists of an over-voltage clamp and a current limiting Polyfuse.

We have attempted to damage a LaserAce with an over-voltage and not succeeded. However, there is the potential for damage if LaserAce is connected to a sustained high current supply at a voltage greater than 9V DC when the Power Type switch is in the '+5V DC REGULATED FROM GAME' position.

## Connector Descriptions

This section has detailed descriptions of the connectors on LaserAce and the power supply requirements.

### Power Input

The input connector uses a 2.1mm DC Jack - Centre Positive for the '+5Vdc Regulated' position, and jack polarity is unimportant in the 9V DC/AC position. Protection against over-voltage and over-current to LaserAce is by a voltage clamp and an automatically resetting Polyfuse. Brownout protection is also provided.

LaserAce continuously monitors its own +5V dc supply and the Power Input DC jack voltage. Any abnormal voltage levels will result in a warning indication from LaserAce, which is retained until the power is turned off or LaserAce is reset.

Warning indications, as well as the supplied voltage levels, are indicated on the Status LED, the OSD and Dev+ screens.

### Power Type Switch

This switch has two positions. It is very important to ensure that it is set correctly!

#### 1. +5V DC REGULATED FROM GAME

Uses direct 5V DC regulated input from the game. This is a requirement if you are using a Frame Number Injection Kit, as LaserAce must be connected to the game GND and +5V rails to insert the logic signals.

In this mode LaserAce will also directly monitor the game +5V supply voltage and will indicate a warning if the voltage is incorrect (< 4.7V or >5.4V).

LaserAce will not operate correctly below 4.7V DC. If LaserAce does not power-up or respond then verify that the voltage supplied is correct.

#### 2. 9V 400mA+ DC / AC

The input voltage range is 7V to 10V DC/AC (regulated or unregulated DC), which can be sourced from the game or an external AC plug pack.

**Do not exceed 10V DC** - LaserAce will still operate. However, damage may occur due to the greater amount of heat dissipated from its voltage regulator.

Suitable AC/DC plug packs can be found at Radio Shack, Fry's Electronics, and most electronics stores. The ideal specifications are – 9VDC, 400mA or greater, with a centre positive 2.1mm DC Jack. Most types of universal plug packs include a 2.1mm DC jack.

In the USA, possible plug packs are Radio Shack part No. 273-1770, 273-1667, 273-1631. These have not been verified as having the correct DC jack and are given as a guide. Please confirm before purchasing.

Laser Player RS232 Output  
**DB9 Male RS232 Output to the replacement Player.**

Philips 22VP931 Input  
**DB25 Female proprietary parallel high speed I/O port for Philips 22VP931. PCM/Trigger Input is required to be connected to the game board VSYNC signal for the 22VP931 I/O to operate.**

PR-7820 Input  
**Centronics 24 pin Female proprietary parallel I/O port for Pioneer PR-7820**

LD-V1000/1 Input  
**Centronics 24 pin proprietary parallel I/O port for the Pioneer LD-V1000 and LD-V1001/Badlands mode uses the same connector as the PR-7820. LaserAce automatically reconfigures the port I/O to support these laserdisc player interfaces.**

Hitachi VIP-9500 Input  
**DB25 Female RS232 I/O port for Hitachi VIP-9500 series**

PCM and Trigger Input  
**Infrared 'PCM' Input for Pioneer PR-8210, PR-8210A, and LD-1100. Usually used in conjunction with Frame Number Injection. Also used for 22VP931 as LaserAce requires a trigger signal from the game board VSYNC signal to communicate as a 22VP931.**

Frame Number Output  
**24-bit latched and buffered, decoded output of 24-bit Philips frame number code. Used with the Frame Number Input Connector, intercepts the communications between the game main CPU board and the game frame number decoder board. LaserAce then reliably communicates the correct frame number directly into the game's circuits, bypassing the poor frame decoder and eliminating possible frame number corruption.**

Frame Number Input ('From Frame Interface')  
**The game's frame number decoder board cable connects to this socket. This enables pass-through of other logic signals and allows LaserAce to provide the frame number data to the main board via the Frame Number Output Connector.**

Video Blanking Relay System  
**2 RCA Female Video connectors with a disconnect relay and status LED. Games that use the Pioneer PR-8210 and LD-1100 depend on total video signal dropout when the player is spinning-up, or when busy searching. When the video signal returns, the game detects the signal and concludes that the search is done. LaserAce simulates this video dropout, as all the modern laserdisc players do not dropout the video signal in the mentioned circumstances. Although, certain Pioneer models are able to dropout video if setup to do so.**



ISP Program Input

Used to reprogram the Flash Memory 'Firmware' in LaserAce. LaserAce can be updated with extra features, functions, and newer revisions of firmware with this port. Currently we have two locations in Australia, and one in the USA (Sacramento, CA) where LaserAce can be sent for updates.

Mounting LaserAce and connecting cables

Because LaserAce is designed to work with a variety of games it is not possible to make its shape, size and mounting holes suit everything, so we included:

**Rubber feet** for placing LaserAce on a flat surface like on top of a Laserdisc player.

**Mounting holes** in all four corners to enable installation using screws, stand-offs, or feet, to just about any location. If using screws the rubber feet can be used to space LaserAce off the mounting surface by attaching them adjacent to the mounting holes.

Where to put it

Please read the section 'Sensible Precautions'. After careful consideration, choose a location to install LaserAce that is convenient and that best suites your game.

How to route the cables

This is not too much of a problem, so long as the cables are kept away from the monitor, relays, actuators, or any other electrically noisy sources.

Double check your connections and Power Type switch before powering up!

It is important to verify that everything is connected correctly. Once you have finished the installation, take the time to re-check all connections, giving special attention to the orientation of the Frame Number Injection cable, the power cable, and the setting of the power type switch on LaserAce.



**If you have a Frame Number Injection Kit it is essential to ensure the cables and connectors are installed correctly. Installing the DIP20 and strip headers around backwards is very easy to do, so check the cable stripe and pin 1 location carefully. If they are installed backwards they will short the game +5V and GND supply, possibly causing damage to the game power supply, the power cables, and maybe even LaserAce.**

## Installation –Setup of the Output Player

Setting up the Output Player must be done before entry to the OSD Setup can be used; LaserAce must know which player model it is to communicate with.

If you have an Output Player that supports OSD

This includes most Pioneer and some Sony players. If you have an output player that does not feature an OSD then go to the section 'If you have an Output Player that does not support OSD' below.

To continue with OSD Setup, go directly to the section 'Setting up LaserAce for the first time with On Screen Display'

If you have an Output Player that does not support OSD

If you are setting up LaserAce using player that does not feature an OSD then you must use the LED flash code setup or Dev+ for all setup options.

Go to the section 'Setting up LaserAce for the first time with LED Flash Codes'

If you have a Dev+

When using Dev+, all of LaserAce's settings can be configured with out the need of an OSD compatible output player. See section 'Setting Up LaserAce for the first time with Dev+'.

## Setting Up LaserAce for the first time with LED Flash Codes

**To enter LED Flash Code setup, hold down the MODE button and momentarily press the RESET button on LaserAce.**

LaserAce will now flash all of the input and output LED's to verify you have entered the LED Flash Code setup.

Release the **MODE** button. The Laser Player RS232 Output LED will start flashing the code for the current Output Player. The Status LED will continue to flash.

Pressing the **MODE** button increments the Output Player selection number in a forward sequence - (ie. 1-2, 2-3, 3-4, etc.). The Output Player selection number restarts at zero when advanced past the last number.

Pressing the **ENTER** button saves the setting and moves to the next option.

**See the next following pages in this section for the LED Flash Code diagram and setting lookup table.**

LaserAce will now allow you to setup the three main settings:

1. **Output Player.** Inspect the LED Flash code on the 'Laser Player RS232 Output' LED, and **press the MODE button to cycle through to the next player in sequence** until you reach the code for your replacement player. **Press the ENTER button to continue** to Input Player selection when you are done.
2. If desired, all further settings can be done using the OSD setup mode. Refer to section 'Setting Up LaserAce for the first time with On Screen Display'
3. **Input Player.** Inspect the LED Flash code on the appropriate input LED . **Press the MODE button to cycle through to the next input mode in sequence** until you reach the code required for your game. **Press the ENTER button to continue** to the next option when done.
4. **Frame Number Display (for testing).** **Press the MODE button to toggle the 'Video Blanking On' LED ON or OFF.** If it is ON, LaserAce will always have the frame number display from the player turned ON. The default setting is OFF. **Press the ENTER button to finish the LED Flash Code setup.** LaserAce will now flash the LEDs to indicate the completion of the setup. **Press the RESET button to start LaserAce.**
5. If completing the section '**Easy Installation - Step-by-Step**' please return there to **continue.**

## LED Flash Code Diagram

**Note: A zero is one long 'start' flash. When the long flash occurs it is the beginning of the flash code - start counting the following small flashes.**

An example of a 'zero' flash code



An example of a 'seven' flash code



Pattern repeats...

In order to use the flash code tables on the following pages, it will be necessary to know the firmware revision of your LaserAce. If your LaserAce was purchased from us after May 2002 then its firmware will be rev 1.22 or greater.

The firmware revision of your LaserAce can be found in the following places:

- In OSD setup, displayed on screen when on menu pages 1 and 2
- With a Dev+, first screen displayed on the LCD after LaserAce is reset
- Sticker on the underside of LaserAce, if the firmware is revision 1.22 or greater (There is generally no sticker on units earlier than revision 1.22)

**For more detailed information regarding the different Input and Output Player models, please refer to section 'Game Specific Installation Information'.**

## **LED Flash Codes for LaserAce firmware Rev. 1.22 and higher**

### **LED Flash Codes**

0	Custom Input Mode
1	Pioneer PR-8210
2	Pioneer PR-8210A
3	Pioneer LD-1100
4	Pioneer PR-7820
5	Pioneer LD-V1000/1
6	Pioneer LD-V1000Slw
7	Pioneer LD-V1000BdL
8	Hitachi VIP9500SG
9	Hitachi VIP9550
10	Hitachi VIP9600
11	Philips 22VP931
12	Philips 22VP932
13	Sony LDP-xxxx

### **1. Input Player**

### **LED Flash Codes**

0	Custom Output Mode
1	Sony LDP-1000
2	Sony LDP-1200*
3	Sony LDP-1450*
4	Sony LDP-1500
5	Sony LDP-1500P
6	Sony LDP-1550
7	Sony LDP-1550P
8	Sony LDP-1600P
9	Sony LDP-1700AR*
10	Sony LDP-2000
11	Sony LDP-3300P
12	Sony LDP-3600D*
13	Pioneer LD-V2000
14	Pioneer LD-V2200
15	Pioneer LD-V4000
16	Pioneer LD-V4100
17	Pioneer LD-V4200
18	Pioneer LD-V4300D
19	Pioneer LD-V4400
20	Pioneer LD-V5000
21	Pioneer LD-V6000A
22	Pioneer LD-V6010A
23	Pioneer LD-V6200A
24	Pioneer LD-V8000
25	Pioneer CLD-V2300D
26	Pioneer CLD-V2400
27	Pioneer CLD-V2600
28	Pioneer CLD-V2800
29	Pioneer CLD-V5000

### **2. Output Player**

### **LED Flash Codes**

Off	Output Player does not show disc frame number on screen (normal)
On	Output Player shows disc frame number on screen (testing)

### **3. Frame Number Display (for testing)**

\* Only these Sony models support a user OSD and will work with the OSD menu system of LaserAce

## **LED Flash Codes for LaserAce firmware Rev. 1.00 to Rev. 1.21**

### **LED Flash Codes**

0	Custom Input Mode
1	Pioneer PR-8210
2	Pioneer PR-8210A
3	Pioneer LD-1100
4	Pioneer PR-7820
5	Pioneer LD-V1000/1
6	Pioneer LD-V1000Slw
7	Pioneer LD-V1000BdL
8	Hitachi VIP9500SG
9	Hitachi VIP9550
10	Hitachi VIP9600
11	Philips 22VP931
12	Philips 22VP932
13	Sony LDP-xxxx

### **1. Input Player**

### **LED Flash Codes**

0	Custom Output Mode
1	Sony LDP-1000
2	Sony LDP-1450
3	Sony LDP-1500
4	Sony LDP-1500P
5	Sony LDP-1550
6	Sony LDP-1550P
7	Sony LDP-1600P
8	Sony LDP-2000
9	Sony LDP-3300P
10	Sony LDP-3600D
11	Pioneer LD-V2000
12	Pioneer LD-V2200
13	Pioneer LD-V4000
14	Pioneer LD-V4100
15	Pioneer LD-V4200
16	Pioneer LD-V4300D
17	Pioneer LD-V4400
18	Pioneer LD-V5000
19	Pioneer LD-V6000A
20	Pioneer LD-V6010A
21	Pioneer LD-V6200A
22	Pioneer LD-V8000
23	Pioneer CLD-V2300D
24	Pioneer CLD-V2400
25	Pioneer CLD-V2600
26	Pioneer CLD-V2800
27	Pioneer CLD-V5000

### **2. Output Player**

### **LED Flash Codes**

Off	Output Player does not show disc frame number on screen (normal)
On	Output Player shows disc frame number on screen (testing)

### **3. Frame Number Display (for testing)**

\* Only these Sony models support a user OSD and will work with the OSD menu system of LaserAce

## Setting Up LaserAce for the first time with On Screen Display

Complete the section '**Setting Up LaserAce for the first time with LED Flash Codes**' before using the OSD setup. LaserAce needs to know the model of the Output Player connected to it in order to start the OSD setup.

### To enter OSD Setup:

**Momentarily** press the **RESET** button and wait 5 seconds.  
Press **MODE** button and hold down  
Press **ENTER** button (**ENTER** and **MODE** now both pressed)  
Release **ENTER** button  
Release the **MODE** button

**All LaserAce communications will halt, and a menu should appear on the video signal coming out of your Output Player.**

If you do not see this menu, your game may be blanking out the video signal from the player. LaserAce is not able to force the game to display the video from the player. (Refer to section 'Frequently Asked Questions' for more information)

1. When the OSD Menu is displayed on the screen the '>' or '-' pointer, to the left of the menu options, indicates the option currently selected. The pointer will move down to the next option when the **MODE** button is pressed. When the pointer reaches last menu option, it will move back in the opposite direction. When the pointer changes to an 'x' it indicates that the particular option selected is not available to be entered. (Refer to the Dev+ options)
2. Use the **MODE** button to select the option 'Setup LaserAce'.
3. Press the **ENTER** button to enter the option – menu options now displayed are 'Input LD Player' and 'Output LD Player'.
4. Press the **ENTER** button when the 'Input LD Player' option is selected. Selection of the Input LD Player mode is now available.
5. Press the **MODE** button repeatedly\* until the desired Input LD Player mode is selected.

\* If you go past the Input LD Player mode you want to choose, keep pressing the **MODE** button until the last option is selected – the pointer will move backwards through the list.

\* If you want the pointer to move backwards immediately, press and hold the **MODE** button down then tap the **ENTER** button briefly – the adjustment direction will reverse.

6. Once the desired Input LD Player mode is selected, press the **ENTER** button to enter and save it. The OSD will then return to the menu options.
7. Use the **MODE** button to select the option 'Output LD Player', then press the **ENTER** button to enter the option. .
8. Press the **MODE** button repeatedly until the desired Output LD Player mode is selected.
  - \* If you go past the Input LD Player mode you want to choose, keep pressing the **MODE** button until the last option is selected – the pointer will move backwards through the list.
  - \* If you want the pointer to move backwards immediately, press and hold the **MODE** button down then tap the **ENTER** button briefly – the adjustment direction will reverse.
9. Once the desired Output LD Player mode is selected, press the **ENTER** button to enter and save it. The OSD will then return to the menu options.
10. You're done! **Press the RESET button to use LaserAce.**
11. If completing the section '**Easy Installation - Step-by-Step**' please return there to **continue**.



Setting Up LaserAce for the first time with Dev+

**Before using the Dev+, please read the section ‘Using LaserAce Dev+’ to be familiar with Dev+ usage and its buttons.**

Setting up LaserAce with a Dev+ is very easy as all navigation is done with key presses on the Dev+. All menus and options are displayed live on the built in 20x4 Alphanumeric LCD display.

With the Dev+ option, all menu options are available while LaserAce is operating with a game and controlling the Output Player. All option adjustments occur live and can interact with the current operational mode. The OSD Setup mode can also be used with the Dev+ keyboard if desired.

1. Navigate using the **MOVE UP** or **MOVE DOWN** buttons until the ‘>’ pointer is at the ‘Setup LaserAce’ option.
2. Press the **ENTER** button - you will now see two options ‘Input LD Player’ and ‘Output LD Player’.
3. Press the **ENTER** button when the option ‘Input LD Player’ is selected. The Input LD Player mode can now be selected.
4. Use **ADJUST UP** or **DOWN** buttons to select the desired Input LD Player mode. Press the **ENTER** button enter the selection and save it. The previous Menu options will then be displayed.
5. Use the **MOVE DOWN** button to select the ‘Output LD Player’ option. Press the **ENTER** button to enter the selection.
6. Use **ADJUST UP** or **DOWN** buttons to select the desired Output LD Player mode. Press the **ENTER** button enter the selection and save it. The previous Menu options will then be displayed.
7. You’re done! **Press the RESET button to use LaserAce.**
8. If completing the section ‘**Easy Installation - Step-by-Step**’ please return there to **continue.**

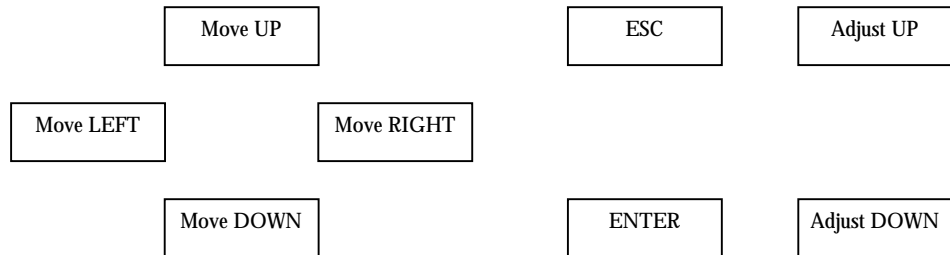
Double check your setup before starting the game

To ensure trouble free installation and operation of LaserAce in your game, please take the time to revise all the steps listed for installation and setup. Verify that everything is connected and setup correctly prior to turning your game and LaserAce on.

## Using LaserAce Dev+

With the Dev+ option, all menu options are available while LaserAce is operating with a game and controlling the Output Player. All option adjustments occur live and can interact with the current operational mode. The OSD Setup mode can also be used with the Dev+ keyboard if desired.

Dev+ has eight buttons on it:



- **Move UP**  
To navigate the menu pointer up
- **Move DOWN**  
To navigate the menu pointer down
- **Move LEFT**  
To navigate the pointer to the right if available
- **Move RIGHT**  
To navigate the pointer to the left if available
- **ESC**  
Cancels any adjustments made or aborts the current function and returns to the previous menu.
- **ENTER**  
Enters a menu or saves a setting.
- **Adjust UP**  
Adjusts a setting up in value.
- **Adjust DOWN**  
Adjusts a setting down in value.

Navigation through the LaserAce menus, and option selections, can be made conveniently with the use of the navigation and control buttons.

## Using LaserAce Advanced Features

### Disc Media and Player Testing

The Disc Media and Player Testing feature tests the ability of a player to read the frame numbers from a disc. Errors in reading frame numbers can be attributed to physical disc media damage (scratches, laser rot), player related problems (dirty optics, miscalibration) or a combination of the two.

**If errors are encountered, the cause may be due to a fault in the player. To confirm if the player is at fault, the disc can be tested in another player. In general, if an error occurs at random areas on a disc, when a disc is retested, the player is likely to be at fault. Consistent errors are generally due to actual faults on a disc.**

**Some LaserDisc Player and disc combinations may report a small number of errors ( 5 or less ) and the disc may still be considered to be 'good'. This usually occurs when a disc has minor surface scratches or defects, and if the player is not performing as it should. If the player was performing properly then the minor scratches may not have resulted in any errors. Try the disc in another player to see if the errors occur in the same areas, if at all.**

After entering the Disc Testing LaserAce will determine the size of the disc then prompt for the testing to commence.

If an error is encountered when determining the disc size, an 'E' will be displayed in the top left corner of the screen to the left of the disc beginning and end frames. A notification screen will then be displayed giving the option to continue with the test regardless. Such errors can occur if the disc has a damaged section right at the end of the disc, or if the player has adjustment problems preventing it from reaching the very start or end of the disc.

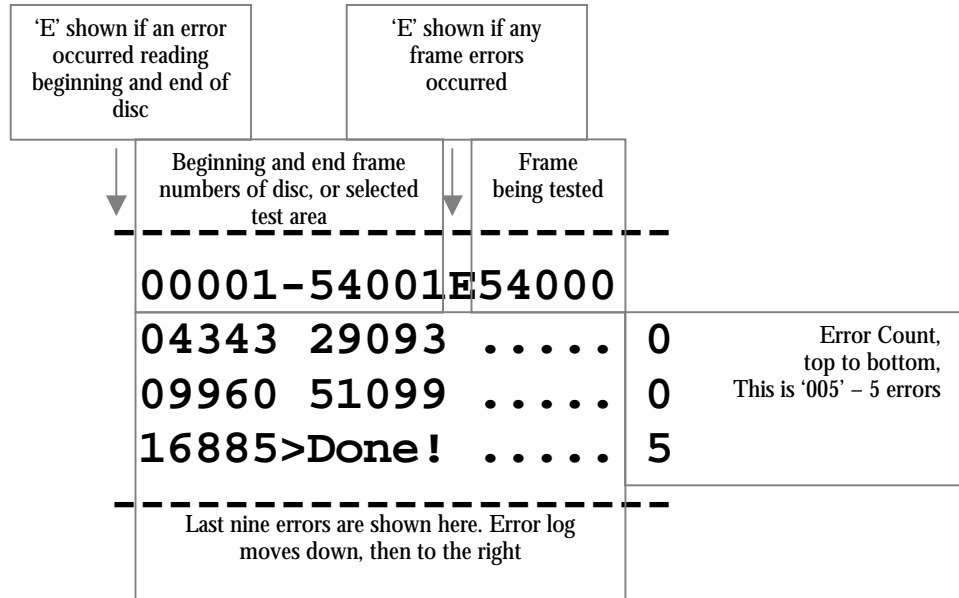
Note: With the Dev+ option, the area of the disc to be tested can be changed before commencing the disc test. By using the UP/DOWN and LEFT/RIGHT buttons the beginning and end frames to test can be changed in 1000 frame increments. This is helpful if testing a known faulty area on a disc or retesting an area after polishing a disc.

**Press the ENTER button when the screen prompts for the disc test to begin.**

If you are using the OSD, LaserAce will now turn on the video, and go to a static display while the test is in progress. LaserAce cannot update the OSD while the test is underway.

With the Dev+ option, LaserAce will display the disc test information as it progresses on the LCD display.

When the test is done, LaserAce will show a screen similar to the one shown below.

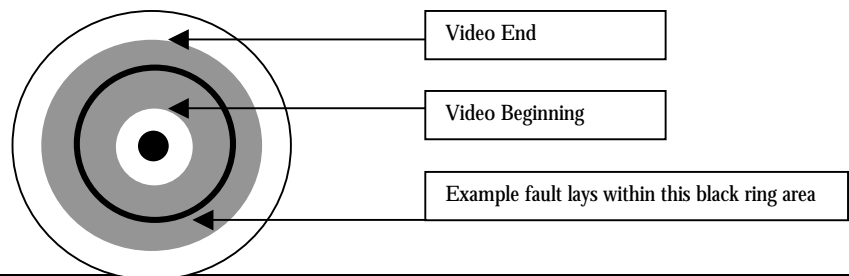


The error number shown is **the last valid frame before the error occurred**

By knowing the frame number location of an error, the physical location of the error on the disc can be approximated

The discs used in LaserDisc games are all in the CAV format - meaning the frame locations on the disc are proportional to the disc diameter. Each track on a disc represents one frame of video. By viewing a disc under light the tracks contained on a disc can be seen. The inner most track is frame 1 and the outer most track represents the end of the disc content.

Eg. If the disc is size is between frames 00001 and 54001 and an error is at frame 29093, the location of the error from frame 1 is 29093 divided by 54001. This is 0.538, so the error is approximately halfway from the beginning of the disc video area, to the end of the disc video area.



## Game Board Power Supply monitoring with 5V DC Power Input

LaserAce continually monitors both the DC input voltage from the Power Input Jack, and its own 5V DC power supply. If the Power Type Switch is set to the '+5V DC REGULATED FROM GAME' position, then both of these voltages will be the same. LaserAce will also display and log any under or over voltage condition of the game's main 5V power supply. This is quite useful as the game's main 5V supply powers nearly all the IC's on the game itself.

If the voltage goes **under 4.70V then LaserAce will consider this an under voltage condition.**

If the voltage goes **over 5.40V then LaserAce will consider this an over voltage condition.**

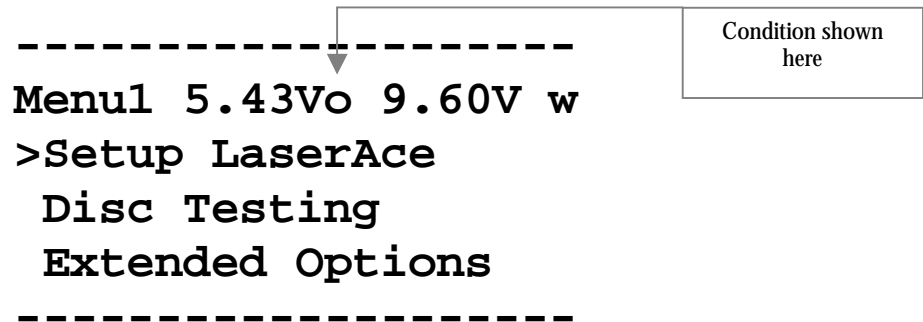
These conditions are stored and displayed by LaserAce as long as it remains powered and is not reset. If the voltage drops below approx 4.65V or above 5.60V, LaserAce will continue to operate as normal, even while displaying the error. If both are tripped, a 'b' will be shown instead.

### **Over Voltage – Above 5.40V**

1. Status LED will flash quickly
2. OSD or Dev+ screen will show an 'o' next to the main voltage reading
3. Above approx 5.7V, LaserAce will trip its internal Polyfuse and shutdown

### **Under Voltage – Below 4.70V**

1. Status LED will flash slowly
2. OSD or Dev+ screen will show an 'o' next to the main voltage reading
3. Below approx 4.65V, LaserAce will go into Reset and not operate



### Status Log (Dev+)

With the addition of Dev+, a live display of input and output communications is available for inspection. All communications between LaserAce and the game, as well as to the output player, are logged and displayed on the Dev+ LCD. The Output Logging option must be turned on to view the outgoing communication to the output player. The current frame number and the input and output buffer pointers are also displayed on the Dev+ LCD.

### Performance Testing (Dev+)

With the addition of a Dev+, LaserAce can perform a variety of search, skip, and propagation delay tests on a player. Test results of similar model players can be compared to measure any performance differences.

### Output Commands (Dev+)

With the addition of a Dev+, LaserAce can output a limited range of control commands to the Output Player for testing and disc location inspection purposes.

Eg.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, Search, Play, Still, Frame, StepFwd, StepRev, 100FSkip

## Installation – Output Player Setup

### Communications requirements

LaserAce communicates to the output player using the RS-232 communications standard. For optimum performance configure your output player to its maximum baud rate.

The following information will allow you to configure your output player to its maximum baud rate. These are the best and default settings of LaserAce. However, you may configure both LaserAce and your output player to a different baud rate if desired, though performance may suffer.

Sony LDP-1000

The factory baud rate setting is 1200. For best results change the baud rate to 9600.

The baud rate jumpers are located on the MP-11 PCB inside the player. Configure the jumpers as follows; otherwise change the **Baud Rate Output** setting on LaserAce to 1200, see the 'Extended Options' section and the setting 'Baud Rate Output'.

Jumper Settings – Baud Rate 9600	
1	OPEN
2	OPEN
3	OPEN
4	CLOSED
5	OPEN
6	OPEN

Sony LDP-1450

DIP Switch Settings – 9600 Baud	
1	DOWN
2	DOWN
3	DOWN
4	UP

DIP Switch Settings – Optional Function	
1	DOWN
2	DOWN
3	DOWN
4	DOWN
5	DOWN
6	DOWN

Sony LDP-1500

DIP Switch Settings – 9600 Baud	
1	DOWN
2	DOWN
3	DOWN
4	UP



Sony LDP-1500P

<b>DIP Switch Settings – 9600 Baud</b>	
1	DOWN
2	DOWN
3	DOWN
4	UP

Sony LDP-1550

<b>DIP Switch Settings – 9600 Baud</b>	
1	DOWN
2	DOWN
3	DOWN
4	UP

Sony LDP-1550P

<b>DIP Switch Settings – 9600 Baud</b>	
1	DOWN
2	DOWN
3	DOWN
4	UP

Sony LDP-1600P

<b>DIP Switch Settings – 9600 Baud</b>	
1	DOWN
2	DOWN
3	DOWN
4	UP

Sony LDP-2000

<b>DIP Switch Settings – 9600 Baud</b>	
1	UP
2	UP
3	UP
4	DOWN

Sony LDP-3300P

**9600 Baud**

**Settings not confirmed.**

Sony LDP-3600D

**9600 Baud**

**Set the rotary switch to Position 4.**

Pioneer LD-V2000

**4800 Baud**

**Requires special RS232 cable - has not been tested**

**Settings not confirmed.**

Pioneer LD-V2200  
**4800 Baud**

**Settings not confirmed.**

Pioneer LD-V4000  
**4800 Baud**

**Settings not confirmed.**

Pioneer LD-V4100  
**4800 Baud**

**Settings not confirmed.**

Pioneer LD-V4200  
**4800 Baud**

**Settings not confirmed.**

Pioneer LD-V4300D

Use the player's On-Screen Function Switches to set the Baud rate.

1. Connect your LD-V4300D to a TV or monitor.
2. Turn the player **OFF** using the power button on the front of the player.
3. Press and hold the **DISPLAY** button on the front panel and turn power **ON**.  
(The On-Screen Display should be displayed on the TV/Monitor)
4. Press the **SCAN FORWARD** button until the RS-232 Switch Page is displayed.
5. Press the **STEP FORWARD** button to highlight the BAUD RATE option.
6. Press the **STEP REVERSE** button to toggle through the various values until 9600 is displayed.
7. Repeat Step 5 and 6 for the following options:

<b>OPTION</b>	<b>SETTING</b>
PARITY	No Parity
STOP BIT	1 Stop Bit
DATA LENGTH	8 Bit
TxD TERMINATOR	<CR>

8. Press the **DISPLAY** button to finish and exit the On-Screen Function Switches.

Note: LaserAce configures the other options so no further changes are necessary.

Pioneer LD-V4400

Use the player's On-Screen Function Switches to set the Baud rate.

1. Connect your LD-V4400 to a TV or monitor.
2. Turn the player **OFF** using the power button on the front of the player.
3. Press and hold the **DISPLAY** button on the front panel and turn power **ON**.  
(The On-Screen Display should be displayed on the TV/Monitor)
4. Press the **SCAN FORWARD** button until the RS-232 Switch Page is displayed.
5. Press the **STEP FORWARD** button to highlight the BAUD RATE option.
6. Press the **STEP REVERSE** button to toggle through the various values until 9600 is displayed.
7. Repeat Step 5 and 6 for the following options:

OPTION	SETTING
PARITY	No Parity
STOP BIT	1 Stop Bit
DATA LENGTH	8 Bit
TxD TERMINATOR	<CR>

8. Press the **DISPLAY** button to finish and exit the On-Screen Function Switches.

Note: LaserAce configures the other options so no further changes are necessary.

Pioneer LD-V5000

**9600 Baud**

Settings not confirmed.

Pioneer LD-V6000A

DIP Switch Settings – Function Selector 1	
1	UP <b>9600 BAUD</b>
2	DOWN
3	UP
4	DOWN
5	DOWN
6	DOWN
7	UP
8	DOWN
9	DOWN
10	DOWN

DIP Switch Settings – Function Selector 2	
1	UP
2	UP
3	UP
4	UP
5	UP
6	UP

Pioneer LD-V6010A

<b>DIP Switch Settings – Function Selector 1</b>	
1	UP <b>9600 BAUD</b>
2	DOWN
3	UP
4	DOWN
5	DOWN
6	DOWN
7	UP
8	DOWN
9	DOWN
10	DOWN

<b>DIP Switch Settings – Function Selector 2</b>	
1	UP
2	UP
3	UP
4	UP
5	UP
6	UP

Pioneer LD-V6200A

<b>DIP Switch Settings – Function Selector 1</b>	
1	UP <b>9600 BAUD</b>
2	DOWN
3	UP
4	DOWN
5	DOWN
6	DOWN
7	UP
8	DOWN
9	DOWN
10	DOWN

<b>DIP Switch Settings – Function Selector 2</b>	
1	UP
2	UP
3	UP
4	UP
5	UP
6	UP

Pioneer LD-V8000

Use the player's On-Screen Function Switches to set the Baud rate.

1. Connect your LD-V8000 to a TV or monitor.
2. Turn the player **OFF** using the power button on the front of the player.
3. Press and hold the **DISPLAY** button on the front panel and turn power **ON**.  
(The On-Screen Display should be displayed on the TV/Monitor)
4. Press the **SCAN FORWARD** button until the RS-232 Switch Page is displayed.
5. Press the **STEP FORWARD** button to highlight the BAUD RATE option.
6. Press the **STEP REVERSE** button to toggle through the various values until 9600 is displayed.
7. Repeat Step 5 and 6 for the following options:

OPTION	SETTING
PARITY	No Parity
STOP BIT	1 Stop Bit
DATA LENGTH	8 Bit
TxD TERMINATOR	<CR>

8. Press the **DISPLAY** button to finish and exit the On-Screen Function Switches

Note: LaserAce configures the other options so no further changes are necessary.

Pioneer CLD-V2300D

DIP Switch Settings – Function Selector		
1	DOWN	AUTOSTART
2	UP	4800 BAUD
3	DOWN	BACKGROUND BLACK
4	UP	Not Used

Pioneer CLD-V2400

DIP Switch Settings – Function Selector		
1	DOWN	AUTOSTART
2	UP	4800 BAUD
3	DOWN	BACKGROUND BLACK
4	UP	Not Used

Pioneer CLD-V2600

DIP Switch Settings – Function Selector		
1	DOWN	AUTOSTART
2	UP	4800 BAUD
3	DOWN	BACKGROUND BLACK
4	UP	Not Used

Pioneer CLD-V2800

DIP Switch Settings – Function Selector		
1	UP	9600 BAUD
2	UP	9600 BAUD
3	DOWN	AUTOSTART
4	DOWN	BACKGROUND BLACK

Pioneer CLD-V5000

<b>DIP Switch Settings – Function Selector</b>		
1	UP	9600 BAUD
2	UP	9600 BAUD
3	UP	REPEAT MODE
4	DOWN	REPEAT MODE
5	DOWN	AUTO START
6	DOWN	BACKGROUND BLACK
7	UP	SEQUENTIAL PLAYBACK
8	UP	NOT USED (MUST BE UP)

## Game Specific Installation Information

### Astron Belt (Hitachi Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
8	Hitachi VIP9500SG
9	Hitachi VIP9550
10	Hitachi VIP9600

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Hitachi VIP-9500 Input and Serial Port 2'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

### Astron Belt (LD-V1000/1 Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
5	Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Badlands

### LED Flash Codes

7

### Input LD Player

Pioneer LD-V1000BdL (Badlands special)

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Bega's Battle

### LED Flash Codes

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### Input LD Player

Sony LDP-xxxx

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Hitachi VIP-9500 Input and Serial Port 2'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required



## Cliff Hanger

### LED Flash Codes

1

### Input LD Player

Pioneer PR-8210

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	Infrared – Disconnect IR Module, and use Cliff Hanger Frame Number Injection Kit, instructions included with kit.
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required unless FNI Kit instructions specify
VIDEO INPUT Jack on LaserAce	Connect to the video cable coming out the rear of the output player
VIDEO OUTPUT Jack on LaserAce	Connect to the game's video cable, the cable that was originally connected to the Laserdisc player.

## Cobra Command (Dedicated / Bega's Battle Conversion)

### LED Flash Codes

13

### Input LD Player

Sony LDP-xxxx

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Hitachi VIP-9500 Input and Serial Port 2'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

Cobra Command (Astron Belt / Galaxy Ranger Conversion  
Hitachi Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
8	Hitachi VIP9500SG
9	Hitachi VIP9550
10	Hitachi VIP9600

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Hitachi VIP-9500 Input and Serial Port 2'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

Cobra Command (Astron Belt / Galaxy Ranger Conversion LD-  
V1000/1 Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
5	Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Cobra Command (MACH3 or Us Vs. Them Conversion)

### LED Flash Codes

1

### Input LD Player

Pioneer PR-8210

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	Infrared Protocol, Unplug Control Cable from original PR-8210 and use MACH3 Frame Number Injection Kit, instructions included with kit.
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required unless FNI Kit instructions specify
VIDEO INPUT Jack on LaserAce	Connect to the video cable coming out the rear of the replacement player
VIDEO OUTPUT Jack on LaserAce	Connect to the game's video cable, the cable that was originally connected to the Laserdisc player.

## Dragon's Lair (PR-7820 Player Type)

### LED Flash Codes

4

### Input LD Player

Pioneer PR-7820

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'PR-7820 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Dragon's Lair (LD-V1000/1 Player Type)

### LED Flash Codes

5  
6

### Input LD Player

Pioneer LD-V1000/1  
Pioneer LD-V1000Slw (Search delay for PR-7820 roms with LD-V1000 set)

The LD-V1000Slw 'Slow' player is designed to emulate the delay that games originally designed for the PR-7820, but then updated to the LD-V1000 expect from the player. Early Dragon's Lair ROMS and boards are an example of this.

Depending on which revision of Dragon's Lair ROMS you have, and if they are Enhanced ROMS or not, you may prefer to choose LD-V1000Slw mode if you find that scenes are running into the next one briefly before the search to the next scene happens.

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Firefox

### LED Flash Codes

11

### Input LD Player

Philips 22VP931

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Philips 22VP931 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	<p>Solder brown PCM/Trigger wire to Firefox NTSC/Demodulator board edge connector pin 'J'. The NTSC Demodulator board is the one that has the BNC Video connector on it, and is the smaller of the two edge connectors that go to the Firefox board set.</p> <p>Looking at the NTSC/Demodulator board itself, on the parts side, it is the 5<sup>th</sup> pin in on the parts side, starting with the pin closest to the BNC Video connector.</p> <p>The brown wire is reading the VSYNC signal present at pin 'J' of the NTSC/Demodulator board.</p>

## Galaxy Ranger (Hitachi Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
8	Hitachi VIP9500SG
9	Hitachi VIP9550
10	Hitachi VIP9600

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'Hitachi VIP-9500 Input and Serial Port 2'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Galaxy Ranger (LD-V1000/1 Player Type)

<b>LED Flash Codes</b>	<b>Input LD Player</b>
5	Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Goal To Go (Cliff Hanger Conversion)

### LED Flash Codes

1

### Input LD Player

Pioneer PR-8210

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	Infrared – Disconnect IR Module, and use Cliff Hanger Frame Number Injection Kit, instructions included with kit.
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required unless FNI Kit instructions specify
VIDEO INPUT Jack on LaserAce	Connect to the video cable coming out the rear of the replacement player
VIDEO OUTPUT Jack on LaserAce	Connect to the game's video cable, the cable that was originally connected to the Laserdisc player.

## MACH3

### LED Flash Codes

1

### Input LD Player

Pioneer PR-8210

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	Infrared Protocol, Unplug Control Cable from original PR-8210 and use MACH3 Frame Number Injection Kit, instructions included with kit.
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required unless FNI Kit instructions specify
VIDEO INPUT Jack on LaserAce	Connect to the video cable coming out the rear of the replacement player
VIDEO OUTPUT Jack on LaserAce	Connect to the game's video cable, the cable that was originally connected to the Laserdisc player.



Space Ace '83 (Dragon's Lair Conversion PR-7820 Player Type)

**LED Flash Codes**

4

**Input LD Player**

Pioneer PR-7820

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'PR-7820 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Space Ace '83 (Dragon's Lair Conversion LD-V1000/1 Player Type)

### LED Flash Codes

5  
6

### Input LD Player

Pioneer LD-V1000/1  
Pioneer LD-V1000Slw (Search delay for PR-7820 roms with LD-V1000 set)

The LD-V1000Slw 'Slow' player is designed to emulate the delay that games originally designed for the PR-7820, but then updated to the LD-V1000 expect from the player. Early Space Ace ROMS and boards are an example of this.

Depending on which revision of Space Ace ROMS you have, and if they are Enhanced ROMS or not, you may prefer to choose LD-V1000Slw mode if you find that scenes are running into the next one briefly before the search to the next scene happens.

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Star Blazer

**LED Flash Codes**

5

**Input LD Player**

Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output LD Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Super Don Quix-ote

**LED Flash Codes**

5

**Input LD Player**

Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Thayer's Quest (LD-V1000/1 Player Type)

**LED Flash Codes**

5

**Input LD Player**

Pioneer LD-V1000/1

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'LD-V1000/1 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Thayer's Quest (PR-7820 Player Type)

**LED Flash Codes**

4

**Input LD Player**

Pioneer PR-7820

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	To 'PR-7820 Input'
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required

## Us Vs. Them (MACH3 Conversion)

### LED Flash Codes

1

### Input LD Player

Pioneer PR-8210

<b>Connections:</b>	
Game power source or AC Adapter	To 'Power Input' on LaserAce, and set 'Power Type Switch' to suit
Game LD Cable	Infrared Protocol, Unplug Control Cable from original PR-8210 and use MACH3 Frame Number Injection Kit, instructions included with kit.
'Laser Player RS232 Output' on LaserAce	To Output Player of choice, with cable supplied with LaserAce
PCM/Trigger Cable	Not required unless FNI Kit instructions specify
VIDEO INPUT Jack on LaserAce	Connect to the video cable coming out the rear of the replacement player
VIDEO OUTPUT Jack on LaserAce	Connect to the game's video cable, the cable that was originally connected to the Laserdisc player.

## Extended Options

How to enter Extended Options Setup and adjust values using the On Screen Display

### To enter OSD Setup:

**Momentarily** press the **RESET** button and wait 3 seconds  
Press and **hold** down the **MODE** button then **press** the **ENTER** button  
**Release** both **MODE** and **ENTER** buttons

**All LaserAce communications will halt, and a menu should appear on the video signal coming out of your Output Player.**

If you do not see this menu, your game may be blanking out the video signal from the player. LaserAce is not able to force the game to display the video from the player. (Refer to section 'Frequently Asked Questions' for more information)

1. When the OSD Menu is displayed on the screen the '>' or '-' pointer, to the left of the menu options, indicates the option currently selected. The pointer will move down to the next option when the **MODE** button is pressed. When the pointer reaches last menu option, it will move back in the opposite direction. When the pointer changes to an 'x' it indicates that the particular option selected is not available to be entered. (Refer to the Dev+ options)
2. Use the **MODE** button to select the option 'Extended Options'
3. **Press** the **ENTER** button to enter the option – displayed are the Extended Options that can be adjusted. Press the **MODE** button repeatedly until the desired option is selected.
4. Press the **ENTER** button to enter the selected option for adjustment.
5. By **pressing** the **MODE** button, the value of the setting will increment. **Press** the **ENTER** button to enter and save the adjustment. The extended options menu will be displayed.

\* If you go past the Input LD Player mode you want to choose, keep pressing the **MODE** button until the last option is selected – the pointer will move backwards through the list.

\* If you want the pointer to move backwards immediately, press and hold the **MODE** button down then tap the **ENTER** button briefly – the adjustment direction will reverse.

6. After completing all adjustments press the **RESET** button to finish.

How to enter Extended Options Setup and adjust values using Dev+

**Before using the Dev+, please read the section 'Using LaserAce Dev+' to be familiar with Dev+ usage and its buttons.**

Making adjustments with a Dev+ is very easy as all navigation is done with key presses on the Dev+. All menus and options are displayed live on the built in 20x4 Alphanumeric LCD display.

1. Navigate using the **MOVE UP** or **MOVE DOWN** buttons until the '>' pointer is at the 'Extended Options' option.
2. **Press the ENTER button** to enter the option – the Extended Options that can be adjusted will be displayed.
3. Use **ADJUST UP** or **DOWN** buttons to select the desired option to adjust.
4. **Press the ENTER button** to enter the option – displayed are the Extended Options that can be adjusted.
5. Use **ADJUST UP** or **DOWN** buttons to adjust the value.
6. **Press the ENTER button** to save and enter the option – display will return to the extended options.
7. Repeat steps 3 to 6 if any other changes are desired.
8. When done **press the RESET** button, unless interrupting the current operating mode is not desired.

## Extended Option descriptions

**The following options are automatically configured by the current Input and Output Player models - adjustment is not generally required.**

Some options may be adjusted for better performance. However, incorrect adjustment may cause unexpected behavior from LaserAce. The options are restored each time the Input or Output Player model is changed.

- |                               |   |
|-------------------------------|---|
| <b>1) Input LD Player</b>     | Input LD Player model for LaserAce. This mode depends on the game that LaserAce is used with.   |
| <b>2) Output LD Player</b>    | Output Player model for LaserAce. This mode depends on the player that is used with LaserAce.   |
| <b>3) Pre-SearchDelayTime</b> | Only relevant to LD-V1000Slw Input LD Player. It is the amount of fields delayed before a search is executed. Value in VSync Cycles (16.67mS). Used in conjunction with Option 9. The LD-V1000Slw 'Slow' player uses these settings to emulate the delay that games originally designed for the PR-7820, but then updated to the LD-V1000 expect from the player. |
| <b>4) Input Mode(no adj)</b>  | Do not Adjust. Used for development and debugging.  |
| <b>5) Output Mode(no adj)</b> | Do not Adjust. Used for development and debugging.  |
| <b>6) Baud Rate Input</b>     | Baud Rate setting for Hitachi VIP9500 Serial Port.  |
| <b>7) Baud Rate Output</b>    | Baud Rate setting for Output Player RS232 Output Port.  |
| <b>8) Frame Skip Emulate</b>  | Simulation of Relative Search Commands. Required for LaserDisc players that do not support Relative Search Commands. Automatically controlled by the Output Player model.   |



<b>9) Pre-SearchDelayOn</b>	Only relevant to LD-V1000Slw Input LD Player model. Used in conjunction with Option 3. The LD-V1000Slw 'Slow' player uses these settings to emulate the delay that games originally designed for the PR-7820, but then updated to the LD-V1000 expect from the player.
<b>10) Frame Skip Blanking</b>	Turns off the Video during Relative Searches (over-rides video squelch settings). Feature is dependant on the Output Player model
<b>11) Frame Number Read</b>	Enables accurate Frame Synchronization. Controlled automatically depending on the Input and Output Player models.
<b>12) Frame Number Write</b>	Enables/Disables the current frame number to be available from the Frame Number Injection output port.
<b>13) Video Blank MinTime</b>	Minimum time for the Video Blanking Relay to turn off the video signal during a Search. Applicable in PR-8210, PR-8210A, LD-1100, and Custom Input LD Player models.
<b>14) LD-V8000 Video Mem</b>	Enables/Disables Digital Video Memory. Only applicable to the Pioneer LD-V8000 LaserDisc player. If On, the LD-V8000 will hold a still picture on screen of the LaserDisc video while a search or skip is in progress If Off, the LD-V8000 will show a black screen when a search or skip is in progress.
<b>15) First Search Delay</b>	Delay in mS prior to the execution of a Search Command. Applicable in PR-8210, PR-8210A, LD-1100, and Custom Input LD Player models.
<b>16) PlayStarted Timeout</b>	Timeout value for the Output Player to "Spin-up" in mS. If timed out, LaserAce will stop converting and attempt to reinitialize the Output Player
<b>17) Search/Scan Timeout</b>	Timeout value for Search and Scan commands in mS. If timed out, LaserAce will stop converting and attempt to reinitialize the Output Player
<b>18) Ack Timeout</b>	Timeout value for "Ack" from the Output Player in mS. If timed out, LaserAce will stop converting and attempt to reinitialize the Output Player
<b>19) Frame Timeout</b>	Timeout value for receiving frame number from the Output Player in mS. If timed out, LaserAce will stop converting and attempt to reinitialize the Output Player
<b>20) Output Logging</b>	Enable/Disable output command logging in the Status Log screen (Dev+). Should be turned off for normal use.

<b>21) Audio Out Mono</b>	Applicable to the Output Player.
<b>22) Exercise Player</b>	Enables faster searches from “spin-up”. Feature only beneficial to certain Output Player models.
<b>23) IR Input Rpt Filter</b>	Enables/Disables the IR input repeat filter. Applicable in PR-8210, PR-8210A, LD-1100, and Custom Input LD Player models.
<b>24) No Audio Squelching</b>	Enables/Disables Audio Squelching during a search, skip or still. Only available on Output Player models supporting this feature.
<b>25) No Video Squelching</b>	Enables/Disables Video Squelching during a search, skip or still.. Only available on Output Player models supporting this feature
<b>26) LDP Show Frame Num</b>	Enables/Disables the current frame number display on the Output Player model. Off by default. Can be turned On if during testing or gameplay you wish to see the disc frame numbers on the game monitor
<b>27) Frame Num Tweak 1</b>	Frame number offset adjustable 1.
<b>28) Frame Num Tweak 2</b>	Frame number offset adjustable 2.

## How to reset all the settings back to defaults

All options are restored to their default values when the input and output modes are changed. To restore all options to their default values the Input LD Player and Output Player models must be changed.

To restore all Option settings to default, the following must be done.

1. Change Input LD Player model then return it to the previous/desired Input LD Player model.
2. Change Output LD Player model then return it to the previous/desired Output LD Player model.
3. The extended options ‘Output Logging’ and ‘LDP Show Frame Number’ are exceptions and need to be changed manually, if desired. If they have not been changed, or their current setting is okay, then no change is necessary.

## Frequently Asked Questions

My Pioneer LaserDisc player has many setup options; do I need to make any changes?

No. LaserAce automatically configures all of the relevant user parameters and register settings in the laserdisc player when it initializes it on power-up/reset. Many of the laserdisc player's specific features and options are available through the Extended Options in LaserAce. The only options that will need to be verified or defined are those relating to the communications settings (see section 'Installation – Laserdisc Player Setup').

My Laserdisc player has many DIP switches on the back; do I need to make any changes?

Yes. See section 'Installation – Laserdisc Player Setup'.

After entering the OSD setup, the video from the output player turns off and I cannot see the OSD menu. Is LaserAce turning the video off?

No. When entering the OSD Setup mode LaserAce stops communicating to the game. Some games turn the LaserDisc generated video off when communication is lost to the laserdisc player (LaserAce in this case).

If the laserdisc video turns off when starting OSD Setup mode, try entering the game's self test mode first. Go to the video tests where a frame from the disc is displayed. If the laserdisc video still turns off then it may be necessary to force the game's video switching control signal to enable the video to be displayed (please contact us for more information for your specific game).

Alternatively, the video signal from the output player can be routed to the game's monitor by another means or even to a different monitor or television.

## Troubleshooting

Status LED flashes.

The following is only applicable if LaserAce is not in the Flash Code Setup Mode. The Status LED will flash if there is a problem detected by LaserAce.

If the Status LED is constantly flashing fast then it is indicating that the voltage supplied to LaserAce is too high and that the over voltage protection is activated. If LaserAce is powered by the +5V supply in your game (voltage select switch on LaserAce set to +5V Regulated from game position) then the power supply in the game needs to be turned down so the +5V voltage is at an acceptable level. Reset LaserAce after lowering the power supply voltage and recheck the Status LED. If LaserAce is not being powered by the +5V supply in your game then the voltage select switch on LaserAce is in the wrong position!! Switch it to the 9V AC/DC position.

If the Status LED is constantly flashing slowly then it is indicating that the voltage supplied to LaserAce is too low. If LaserAce is powered by the +5V supply in your game (voltage select switch on LaserAce set to +5V Regulated from game) then the power supply in the game needs to be turned up so the +5V voltage is at an acceptable level. Reset LaserAce after raising the power supply voltage and recheck the Status LED. If LaserAce is not being powered by the +5V supply in your game then the power pack or voltage source is inadequate for LaserAce; replace power pack or source a higher supply voltage for LaserAce.

If the Status LED is flashing a code then count the flashes and see below. A flash code consists of a long pause (LED off) then one long flash followed by a number of flashes depending on the error. Eg. A long flash followed by three flashes would count as three flashes or error code 3.

**Error Code 3 (3 flashes):** Wrong output player connected to LaserAce. Check the output player setting in LaserAce and make sure it corresponds to the player model connected.

**Error Code 4 (4 flashes):** Output player does not support OSD mode. If your player does support OSD then check the output player setting in LaserAce and make sure it corresponds to the player model connected.

**Error Code 5 (5 flashes):** Please contact us.

Output Player LED turns ON and LaserAce appears to do nothing for a long time. Status LED may also stay ON.

The following is not relevant to LaserAce's with firmware versions 1.23 or greater (shipped after 18/5/02). Check the output player setting in LaserAce and make sure it corresponds to the player connected to it. LaserAce's with older firmware may wait forever for correct player communications if the player connected to it is different to what has been setup. Eg. If LaserAce is setup for a Pioneer CLD-V2400 and the player connect to it is really a Sony LDP-2000.

Power LED is ON but LaserAce does not respond – Unable to enter LED Flash Code set-up mode.

LaserAce requires a minimum of 4.75Vdc to its components to operate reliably. Ensure the Power Type switch is set in the correct position (see section 'Installation – Connections'). Ensure the voltage supply to LaserAce is adequate.

It is best to check the voltage while the power supply is fully loaded (game boards, monitor, etc switched on) as the power supply may give a false high reading with little load on it

If the correct voltage to LaserAce is confirmed, press and hold the MODE button then momentarily press the RESET button. The LED Flash Code Entry should start (all LEDs flashing). If LaserAce does not respond, then turn the power to LaserAce off then turn it back on after 10 seconds and try again. If the problem persists, contact us for more information.

Power LED comes on but then fades out, LaserAce does not operate

If you turn on LaserAce, and the Power LED comes on bright, then fades away to nothing, LaserAce has tripped its internal Polyfuse and protection circuit, and the voltage input and Power Type Switch should be immediately inspected. (see section 'Installation - Connections').

Unable to turn on Digital Video Memory on the LD-V8000 LaserDisc player.

Ensure the output player model is set to LD-V8000. Reset LaserAce after turning the digital video memory option ON in the extended options.

Game does not start. Input Mode LED flashes slowly and the output LED flashes every 10 seconds on LaserAce.  
(Indicates LaserAce is unable to communicate successfully to the output player)

Check the following:

- Output player mode is set correctly in LaserAce?
- Is there a disc inside the laserdisc player and is the player turned on?
- Is the proper (supplied) cable connected to the output player?
- Is the baud rate setting on the player set correctly?

See section 'Installation – LaserDisc Player Setup'

Game does not work properly or as expected.

Check the following:

- LaserAce is functioning and the LEDs are operating as expected
- An inspection of all connections, cables, and voltages are good
- The output player and disc are in good operating condition.
- LaserAce Disc Testing passes with no or very few disc errors.
- Switch the game to 'test mode' and perform any diagnostics that may indicate any hardware faults – if the game permits.

If you suspect that your game may be faulty, you can contact fellow collectors at <http://www.d-l-p.com/community/board/> Post a detailed description of your game, disc, player, installation, and the nature of your game's problem. We both frequent the message board, along with many regulars, so someone should be able to assist you in some way.

We are also happy to help with the installation of LaserAce or diagnosing game faults, please contact us for further assistance also if you require. [\*\*enquiries@laserarcade.com\*\*](mailto:enquiries@laserarcade.com).

## Glossary

mS	Milliseconds
FNI	Frame Number Injection
OSD	On Screen Display
Player	Laserdisc or similar output player

## Contacting Us

We can be reached via email at:

[enquiries@laserarcade.com](mailto:enquiries@laserarcade.com)

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# NOTES