

# LaserCon

## LDP Conversion Card for Dragon's Lair & Space Ace

Version 1.2

Design and Firmware by Shaun D. Wood

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**LaserCon** is an adaptor card for the replacement of the original laser disc player installed from the factory to a newer, more reliable player. It is to be installed in an arcade version of Dragon's Lair or Space Ace, which was manufactured by Cinematronics for use in North America.

### **Supported Replacement Players:**

Pioneer - LD-V8000 LD-V4400 LD-V4300D LD-V4200  
LD-V2200 CLD-2600 CLD-2400

The V8000 and V4x00 series are preferred due to their improved search speed performance. The 2000 series is approximately equivalent to the PR-7820. If you are buying a new player, do yourself a favor, and only consider a 4000 or 8000.

### **Parts List**

LaserCon board, Main-board interface ribbon cable, Player interface serial cable, 4 - 1" aluminum risers.

### **Installation Instructions**

#### **1. Configure your new player:**

All players must be configured for proper serial communication as follows:

**Baud Rate: 4800, No Parity, 1 stop bit, Data Length: 8 bits,  
TxD terminator: <CR>.**

#### **LD-V8000:**

Connect the player to a TV or monitor.

Press and hold the "DISPLAY" button while powering-on the player. Press "SCAN FORWARD" to reach Page-5 "RS-232 SWITCH P-5"

Verify: Baud Rate: 4800, No Parity, 1 stop bit, Data Length: 8 bits

To make changes, press "STEP FORWARD" to highlight an item, then press "STEP REVERSE" to change the setting.

Press "SCAN FORWARD" to reach Page-6 "RS-232 SWITCH P-6"

Verify: TxD terminator: <CR>.

## LD-V8000 - Other Settings:

### P-7: Memory Control

(The LD-V8000 player has the ability to hold and “freeze” the last displayed frame of video during a search operation. Thereby eliminating the blackout screen between scene searches. Some people prefer this mode, while others consider it a change from the “original” feel of the game.)

For “Original” blackout searches:

Video Memory Mode: CONTROL DISABLE

Auto Memory: OFF

For “Freeze frame” searches:

Video Memory Mode: CONTROL ENABLE

Auto Memory: ON

\* Press “DISPLAY” to save your settings and exit.

## LD-V4200:

Open the small cover on the front of the player. Set all switches-OFF (up).

## LD-V4400:

Connect the player to a TV or monitor.

Press and hold the “DISPLAY” button while powering-on the player.

Press “SCAN FORWARD” to reach Page-3 “RS-232 SWITCH P-3”

Verify: Baud Rate: 4800, TxD terminator: <CR>.

To make changes, press “STEP FORWARD” to highlight an item, then press “STEP REVERSE” to change the setting.

\* Press “DISPLAY” to save your settings and exit.

## LD-V2200 & CLD-2400:

On the back of the player, set both dip-switches – OFF (up)

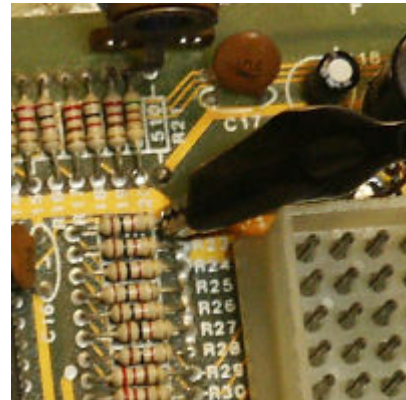
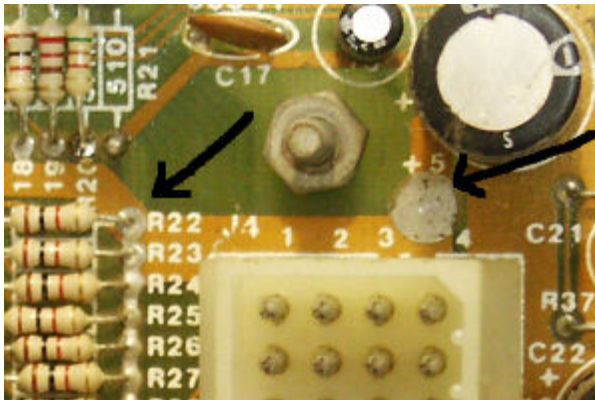
## CLD-2600:

On the back of the player, set dip-switches 1 & 2 – OFF (up)

## 2. Install the LaserCon card:

- a. Remove the original player interface ribbon cable from the main board. (I recommend that you store the cable by rolling it up, board connector pins facing inward, and secure with a rubber band.) Store it away for safekeeping.
- b. Remove the four nuts holding the ROM board in place.
- c. Install the 4 included aluminum risers in place of the nuts.
- d. Install the LaserCon card and secure with the 4 nuts previously removed. (Make sure that the 9-pin connector (CN2) is on the same side as the ROM board's ribbon cable.)
- e. Install the short ribbon cable (provided) from the main board's player connector, to LaserCon's "CN1" (Red stripe up or down it does not matter.)
- f. Attach the alligator lead wire to +5Volts.

You can attach to any point supplying +5V power that you like. Options range from the power supply (pin-9) to the legs of the disc capacitors on the ROM board. My recommendation is to **attach to the leg of R22 and/or R23 on the side closest to the main harness connector**. Another option: Near the main harness connector you will find the +5 test point. Use a soldering iron to install a small piece of solid wire (the center conductor of Coax Cable works well) to the test point, and attach the alligator clip to that. (Ground is supplied through the ribbon cable.)



- g. Install the player into the game cabinet.  
I will leave the means of supplying AC power to your player up to you. You can adapt the original supply wire to your new player, or run the wire separately to outside power. If you need help with this part, feel free to email me.
- h. Connect the supplied serial cable from LaserCon's CN2 and the player's 15-pin connector.  
This is a custom cable. You **cannot** use any other serial cable. If you need to replace the cable for any reason, the pin connections are as follows...

	9-pin Female		15-pin Male	
GND	pin-1	-----	pin-11	GND
TxD	Pin-2	-----	pin-10	RxD
RxD	Pin-3	-----	pin-9	TxD

### 3. Set Dipswitches:

Quick Settings:

1. If your main board is set to control a LD-V1000 player,

On LaserCon, set switch ....    1    2    3    4  
  **OFF ON ON ON** (default for shipping)

2. If your main board is set to control a PR-7820 player,

On LaserCon, set switch ....    1    2    3    4  
  **ON ON ON OFF**

#### More Info:

Early editions of Dragon's Lair came with the Pioneer PR-7820 disc player and what we now refer to as a "Revision A" main board to control it. (Rev-A boards can be identified as having gold colored wire tracings on a green circuit board. Serial numbers are below 6000.) Most of these boards will have ROM versions A, B or C and you do not have to worry about switch B3. But, if the ROMs on your board are versions E, F, F2 or DLE, then you must set switch B3-ON (B3 is printed on the board, '4' will be printed on the switch). **Use Quick setting #2 with this board.**

Later editions of Dragon's Lair and all Space Ace's came with the LD-V1000 disc player and a "Revision-C" main board. (Rev-C boards can be identified as having green colored wire tracings on a green circuit board. Serial numbers are above 6000.) Almost all of these boards are configured to control an LD-V1000 player and switch B3 must be OFF. **Use Quick setting #1 with this board.** However, this board can also be configured to control a PR-7820 player by installing a "W1" jumper wire and setting B3-ON. In this rare case, use Quick setting #2.

#### LaserCon Dip-switch settings (Ver. 5.2 firmware)

Program Space	Switch 1	Switch 2	Switch 3	Switch 4
Euro Space Ace w/'91 ntsc disc	0	0	0	0
Euro Space Ace w/'83 ntsc disc	1	0	0	0
Euro DL/SA 4800 baud	0	1	0	0
Euro DL/SA 9600 baud	1	1	0	0
Space Ace w/'91 disc - V1000	0	0	1	1
M.A.C.H. 3 PR-8210 mode	1	0	1	0
Dragon's Lair / Space Ace LD-V1000 mode	0	1	1	1
Dragon's Lair / Space Ace PR-7820 mode	1	1	1	0

## **Operation**

Power on your machine.

The red LED should light, indicating that the LaserCon board is properly powered.

After a one second delay, the “LDP” LED should light, indicating that LaserCon has established serial communication with the player.

About the time of the second “beep”, the “CPU” LED should light, indicating that LaserCon has received the “PLAY” command from the main board.

The Player should now begin to spin-up and play. The “LDP” LED will go dark, indicating that the player is busy.

During spin-up, before “Play” is achieved, the player cannot accept any new commands. So, if your player starts up slowly, and has not got to “Play” by the third “chime”, then it will miss the initial attract mode start. No problem, it will catch the next command - search and display “Insert coins” (this only occurs in 7820 mode).

Once the game is up and running, all three LEDs should remain lit, with only momentary blinking of the “LDP” LED during searches.  
Enjoy!

## **Disclaimer**

Use at your own risk. By accepting this product, user also accepts all responsibility for the use of this product and releases its manufacturer, Shaun D. Wood, from all possible responsibilities for damages of any kind that the user may incur due to use or misuse of this product.

## **And Finally...**

If you are having any trouble installing your LaserCon card, please contact me immediately via email. I will help you get it working.

LaserCon is an open source project. If you want to write code for other games or players and would like to have copies of the schematics and firmware files, contact me, or visit [www.wood1st.com/lasercon](http://www.wood1st.com/lasercon). Please consider donating your work to be included in future releases of LaserCon.

If you need any help or have any questions, comments, or suggestions, please contact me: [shaun@wood1st.com](mailto:shaun@wood1st.com).