



# **BCD *DVD-C7* DVD Player with BCD C7 Controller**

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## BCD DVD-C7 with BCD C7 Controller

### Introduction

Welcome to the BCD DVD-C7 DVD Player with the BCD C7 Controller!

This document will show you how to connect, configure, operate, and if required, reprogram the BCD DVD-C7 equipped with the BCD C7 controller.

#### About BCD Associates, Inc.

BCD has manufactured controller systems for video since 1980. BCD is known for *frame-accurate* time code control of video tape machines for computer-controlled interactive applications. In fact the first two interactive videodiscs produced by Sony were developed using BCD interactive systems. (Remember the big, 12" Videodiscs? Also called Laserdiscs?)

### What is a BCD C7?

The BCD C7 is an RS-232 interface that mimics most of the commands found on the hand-held remote control. All BCD Commands are 4-characters like PLAY and STOP. Units may be "daisy-chained" together to operate multiple units simultaneously from a single serial port:

DECK 1; PLAY makes deck # 1 play.  
DECK 2; STOP makes deck # 2 stop.

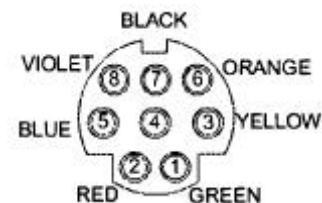
### Components

- 1 BCD C7 Controller installed in the BCD DVD-C7
- 1 "Button" cable w/8-Pin DIN Connector
- 1 Serial Cable (9-pin to 1/8" mini-stereo)
- 1 1/8" mini-plug (shorted) to activate programming mode
- 1 3.5" Floppy Disc

### Button Hookup

Plug the round 8-Pin Din plug into the rear of the machine.  
Connect your buttons to the appropriate conductors of the cable.  
NOTE: The single Ground (GND) conductor is shared by all 'buttons.

We worked hard to make the C7 easy to connect to your buttons. Here is the diagram of the 8-Pin DIN connector.



Below is the connection chart for Buttons & Cables:

Button # (Cmd)	DIN Pin #	Cable Color	Function
1 (BT01)	1	Green	STUP (Up)
2 (BT02)	2	Red	STDN (Down)
3 (BT03)	3	Yellow	STLF (Left)
4 (BT04)	4	White	STRT (Right)
5 (BT05)	5	Blue	ENTR (Enter)
6 (BT06)	6	Orange	PREV (Previous)
7 (BT07)	7	Black	NEXT (Next)
8	8	Violet	Ground

## RS-232 Hookup

You need to do this *only* if :

- You want to use commands different from those that are pre-programmed.
- You need to update the controller with a new program.
- Plug the 9-pin end of the RS-232 cable into a serial port of your computer.
- Plug the mini-plug marked “RS-232” into the jack on the rear of the deck marked “RS-232”.
- The extra mini-plug labeled “Program” activates an internal programming switch for updating the C7 firmware. It is physically attached to the RS-232 cable so it won’t get lost, but is not electrically connected.

## Computer Communication Setup

The BCD C7 communication configuration process is not difficult, but it is a bit of a hassle. Fortunately, you only have to do it once...unless you change to a different Make/Model DVD machine or you wish to re-assign the functions of the buttons.

You should know how to:

- Operate a computer
- Find the computer’s RS-232 Serial Port (9-Pin)
- Operate a “Terminal Communications Program” like Windows *HyperTerm*, *Telix*, *Procomm*, or BCD’s *BCDComm* for DOS, or something like *Kermit* for Unix/Linux.

If you ever need to install completely new firmware, you must also know how to install the FlashMagic software for Windows. FlashMagic is available for free download from Embedded Systems Academy [www.esacademy.com](http://www.esacademy.com)

## Computer Communication

The *Host Serial Cable* has 9-pin (DB-9) female connector on one end and a 1/8" mini-stereo plug on the other end. Plug the 9-Pin end into your RS-232 Serial Port (Com1 or Com2), and plug the mini-plug connector into rear jack marked "RS-232".

## Communications Parameters

The C7 controller is set up for

38,400 Baud

1 Start Bit

8 Data Bits

1 Stop Bit

No Parity

No Handshaking/Flow Control

An AutoBaud firmware version is available if required.

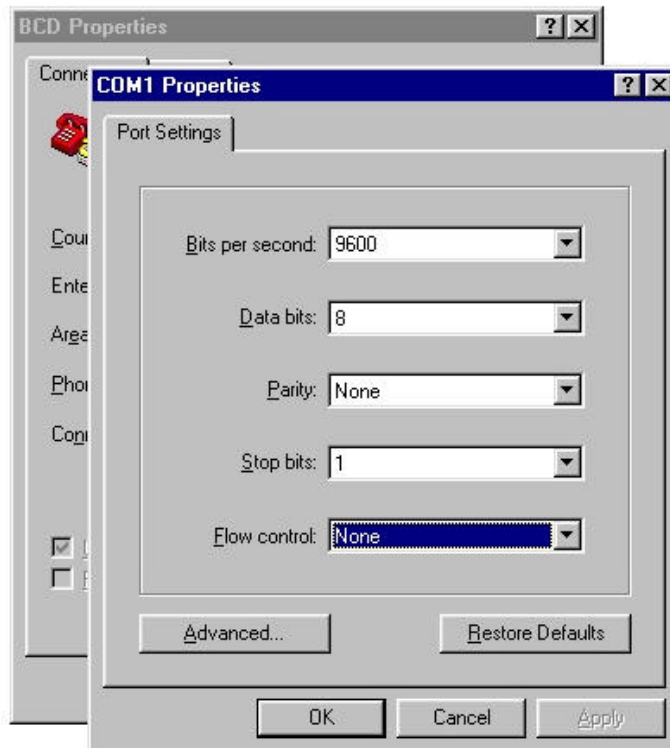
## Windows HyperTerm Settings

Cancel the *New Connection Window*.

Click on the *File* menu and choose *Properties*.

Choose *Direct to Com1* or *Direct to Com2*.

Click *Configure*.



Set the "Bits per second" window to be 38400).

**Be certain that "Flow Control" is set to *None*.**

## BCDComm Settings

BCDComm is an MS-DOS program that we use all the time because it provides very fast, direct communication with BCD controllers. It is configured with a text file called BCD.PRM.

For 38.4K Baud, the BCD.PRM file should be

```
mode = com1:38400,n,8,1
```

Note that the line is lower case and there are *spaces* on both sides of the “=” equal sign. Change “com1” to be “com2” if you are using Serial Comm Port #2.

## Talking to the Deck

Be certain that you are hooked up and your communications parameters are correct. On your computer keyboard hit the ENTER key several times. You should see a series of BCD Prompt Characters (>) like this:

```
>  
>  
>
```

If you do not see this, something is wrong: terminal program parameters, the cable, the computer serial port, or the Controller (unlikely).

## BCD Command Syntax

All BCD Commands are 4-characters long, terminated by a Carriage Return/Linefeed. In a terminal program, the Carriage Return/Linefeed is the same as the Enter key.

The first command you should type is VERS. This is short for VERSion, and it will display the version of the firmware that is in your controller. Something like:

```
BCD BCD C7 Control System Copyright 1986-2002  
C20331 Sunday March 31 2002 10:56am
```

The important part is the Version Number – in this case C20331. Write this down, and it’s also a good idea to tape it on the back of the deck.

When you see the VERSion, you know that the Controller is working and that communications are ok.

In this manual, when we issue a command like PLAY, it is assumed that we mean PLAY<CR>, or PLAY followed by the Enter key.

Most commands are **not** cAsE-sEnsitive.  
(The exception is the LABL command)  
Spaces do not matter.

You can issue several commands on the same line, with commands separated by a semicolon (;) like this:

PLAY ; TIME 100 ; STOP

This causes the unit to play for about 10 seconds, then stop. (Each unit of TIME is about 0.1 second.)

### **The Save Command**

Some parameters are variable and SAVE-able. These include DEBG and RDLY. Typing or issuing the SAVE command will program all appropriate variables into the non-volatile Flash-ROM.

### **Commands**

All BCD Commands are 4-characters, terminated by a Carriage Return & Line Feed <CR><LF>. Some commands may have a parameter, like a number. Most commands are case insensitive and may be typed in UPPER or lower case letters because the controller converts all commands to upper case. The full list of commands keeps growing, See the latest at [www.bcdusa.com/commands](http://www.bcdusa.com/commands).

Here are some of the most popular commands

#### **POWR**

POWR toggles the power ON.or OFF

#### **BAUD**

Displays or Sets the communications Baud rate. BAUD with no parameter will display the current Baud rate as 38400, 19200, 9600, 4800 or 2400.

BAUD 9600 will :

- set the new Baud rate to 9600
- save the new Baud rate in Flash Rom
- send what appears to be garbage to your computer.

YOU must change your terminal program's Baud rate to match the new setting. Set DEBG 1 before doing this to get some help.

#### **PLAY**

Plays the highlighted title

#### **STOP**

Stops PLAY, RECS, FFWD, REWD

#### **FFWD**

Fast scan forward

#### **REWD**

Fast Scan reverse

#### **STUP**

Up Arrow Key

#### **STDN**

Down Arrow Key

**STLF**

Left Arrow Key

**STRT**

Right Arrow Key

**GDLY**

How long must a 'button' be held before action happens. The default is 100, but you can go up to 255. This avoids "Button Bounce" of the button contacts and avoids inadvertent multiple presses.

**HELP**

HELP lists ALL of the commands embedded in the controller. Some of the commands may not apply to your DVD-C7 deck. If in doubt you can try it (it won't hurt), or check [www.bcdusa.com/commands](http://www.bcdusa.com/commands) or email [support@bcdusa.com](mailto:support@bcdusa.com).

## Reprogramming - Complete

In the event that features are added or (perish the thought) bugs or errors are detected in the C7 firmware, you can easily update the controller firmware.

You will need:

- A BCD Hex File
- *FlashMagic* from Embedded Systems Academy – [www.esacademy.com](http://www.esacademy.com)
- The 1/8" BCD Programming Plug, or something similar.

New hex files are available by email or at BCD's website [www.bcdusa.com/updates](http://www.bcdusa.com/updates).

*FlashMagic* is a Windows program for programming the type of Philips microcontroller used in the C7 controller.

- After downloading *FlashMagic* from [www.esacademy.com](http://www.esacademy.com), install it in a Windows computer.
- Run *FlashMagic*
- Configure the program by setting set the COM Port of the program to be the same as the serial port used to control the DVD Player.
- Insert the BCD Programming Plug into the jack on the rear of the machine called Program.
- UN-PLUG the BCD DVD-C7 and wait about 5 seconds.
- PLUG IN the BCD DVD-C7
- Click the Browse button on the FlashMagic Screen to select the BCD <filename>.hex file
- Click the Flashmagic Start button to begin programming.
- The program will briefly display "Finished" when programming is complete.
- UN-PLUG the BCD DVD-C7
- Remove the Programming Plug
- PLUG-IN the BCD DVD-C7 machine.

Now you're ready to go.

If, for some reason, programming fails, just do the procedure again. The microprocessor in the C7 has its own Boot ROM, and we do not believe that you can harm the system by mis-programming even if someone disconnects the computer from power or for any other reason.

***Questions? Commands you want?***

Contact BCD Associates, Inc. <http://www.bcdusa.com> or via email [support@bcdusa.com](mailto:support@bcdusa.com).  
or 800-223-6734 (800-BCD-MPEG)

Thank You!