

RS-232 IMPLEMENTATION OVERVIEW

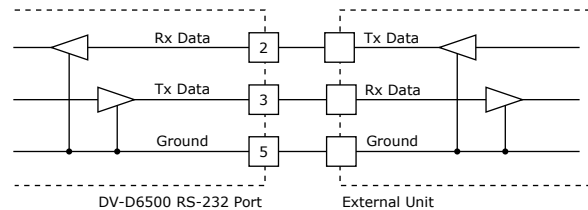
TASCAM's DV-D6500 has an RS-232C port, capable of receiving commands and sending status information. The commands cover all transport functions, menu functions and power on/standby. Return status includes timer readouts, type of disc, and transport status. Additional commands are available to enable/disable the DV-D6500 front panel or IR controls, if desired.



- Power On/Standby & Disc Tray Open/Close
- Transport Control (Including Slow Motion)
- Menu Navigation Functions
- Power & Tray Status
- Disc Format (or No Disc) Status
- Transport Status
- Timer Read (Track/Disc, Progress/Remain)
- Front Panel & IR Enable/Disable

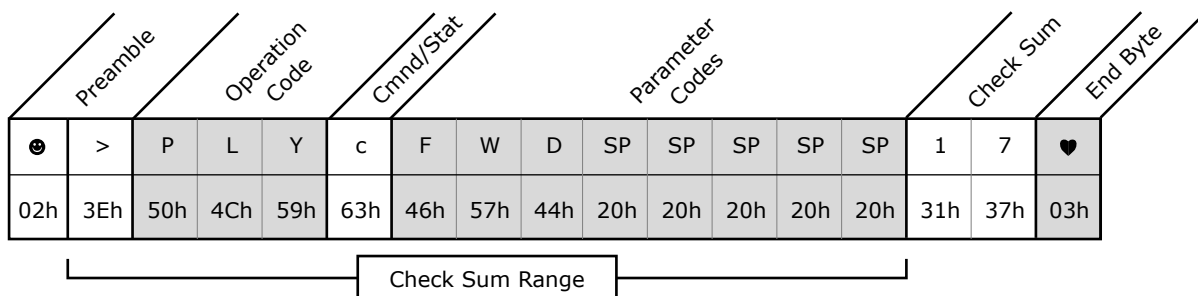
RS-232 Pin Assignment & Protocol Specification:

Connector:	Male DB9	Data Transmission Speed:	9600 bps
Pin 2:	Rx Data	Command Spacing:	>25msec
Pin 3:	Tx Data	Character Length:	8 bit
Pin 5:	Ground	Parity Bit:	None
		Stop Bit:	1 bit
		Transfer Bit:	LSBit Fast



COMMAND STRUCTURE & BEHAVIOR

Core Command Structure: Example with PLAY Command



Preamble - All command strings for the DV-D6500 begin with the start byte "02h" and header byte "3Eh".

Operation Code - Each command has a 3 byte operation code, which are listed in the following pages. The operation code for play is simply PLY (upper case letters).

Command/Status Byte - This section determines whether the command is telling the DV-D6500 to do something, or asking it's status. A lower case "c" (63h) indicates a command; a lower case "s" (53h) indicates status request.

Parameter Codes - 8 bytes are reserved for parameters on the command/status request. When the status information does not fill up all 8 bytes (most don't), the extra slots are filled with spaces (20h). In the example, FWD indicates playing forward at normal (1x) speed.

Check Sum - The check sum is calculated from the ">" in the Preamble to the end of the Parameter Codes. The last two digits of the hexadecimal addition are shown as ASCII in the Check Sum Area. In this example, we add:

$$3E+50+4C+59+63+46+57+44+20+20+20+20+20=317$$

The last two digits, "17" are displayed as ASCII in the Check Sum.

End Byte - This marks the end of the string with "03h".

COMMAND TABLE OF CONTENTS

Transport Functions:

PLY - Play/Pause/Slow/Scan Command 3
 STP - Stop Command 3
 SKP - Next/Previous Chapter/Track 3
 MED - Open/Close Tray 5
 POW - Power On/Off..... 5

Menu Navigation

MNU - Menu Calls 6
 NAV - Menu Navigation (Cursors, Enter, etc)..... 6

Status Information Commands:

MOD - Disc Type and Transport Status..... 7
 DSC - Disc Type 8
 SPD - Play Speed (Video Discs) 9
 INF - Counter Information Status..... 10

Advanced Functions:

PSW - Front Panel Control Enable/Disable 12
 IRD - InfraRed Control Enable/Disable 12
 SET - Establish Default Settings..... 12
 INI - Initialize Machine 12

SUGGESTIONS ON REMOTE CONTROL CODES

The DV-D6500 RS-232 commands work virtually identical to the IR remote behavior. For instance, when the machine is in pause, pressing pause again increments to the next frame. Or, when scanning forward, pressing scan forward again will increase the speed of the scan. So, the transport and menu buttons can be hard coded to their commands.

The only exception to that is the number buttons. The DV-D6500 does not cue up numbers for you. You'll need to build a routine that gathers the 1's and 10's digits for a CD, and even a 100's digit for DVD. The alternative is to hard code the first 20 (or so) tracks of a CD; that will work fine in most situations.

SUGGESTIONS ON STATUS INFORMATION CYCLE

There are many ways to design your information scanning sequence; this is just a basic example to help you become familiar with the commands on the DV-D6500.

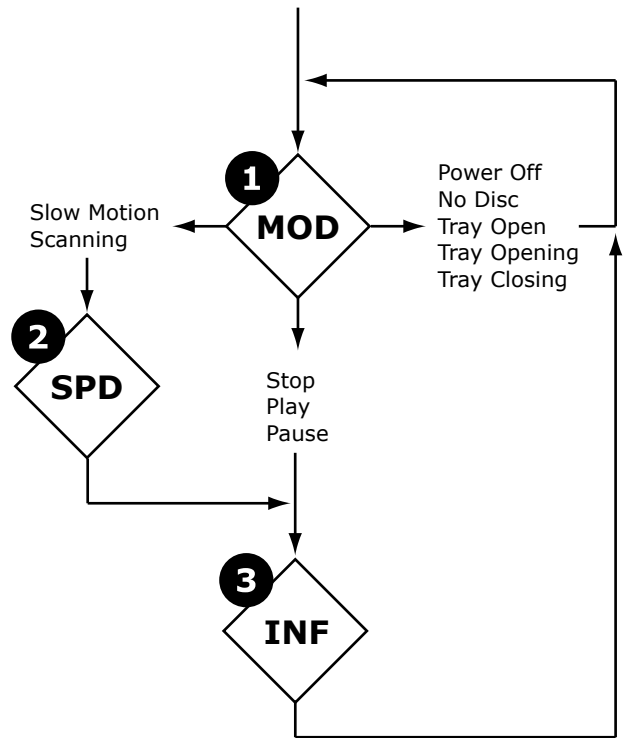
Step 1 - The MOD Command will tell you if a disc is in the tray, and what type of disc it is. (eg - DVD Video, Audio CD, Video CD, etc.) It will also give you basic information about what the transport is doing. If the DVD player indicates that there is no disc in the machine, or that it's off, you don't need to scan anything else. Just check the machine again later on. (Perhaps a 2 second cycle.)

Step 2 - The SPD command is totally optional. If the machine is searching or in slow motion, the command will return the speed of slow motion, or the speed and direction of the search.

Step 3 - If you wish to query the timer and track/chapter data on the disc, you can do with the INF command. You will need to know the type of disc returned from the MOD command, since the INF command will change depending on the type of timer and type of media.

The most common approach of CD and DVD players is to show total disc time and chapter/track numbers on the disc when the transport is stopped. When the machine is playing, show the current track/chapter number and time. When planning cycle times, keep in mind that track/chapter and time are requested in separate commands, so you'll use the INF command twice.

You'll want to scan the counter each second or on a cycle that will add up to a second in length to ensure a smooth



counter on your display. For instance, if a cycle of 400msec is used, then the counter display will show a jerky second increment at 800 msec, and 1200 msec. However, if a one second, 500msec, or 250msec interval is used, then the second counter will update each second.

CORE TRANSPORT COMMANDS

These commands are all pretty straight forward, acting as they do in the included RC-6500J IR remote. There are a few notes on useful repeated commands:

If pause is sent when the machine is in pause, the DV-D6500 will advance one video frame. If several pause commands are issued in quick succession, the DV-D6500 will engage slow motion. (This double function only applies to video discs.)

Fast Forward and Fast Backward scan the disc. Repeated pushes increments the speed from 2x, 5x, 20x, and 60x.

The "Previous Track/Chapter" command will not likely be used in normal touch screen commands; "Return to Beginning of Current Track/Chapter" is the more common operation. If it's in the middle of a track, it will return to the beginning of the track. If it's at the beginning of a track, it will go to the previous track.

Play	☺ >	P	L	Y	c	F	W	D	SP	SP	SP	SP	SP	SP	1	7	♥
	02h 3Eh	50h 4Ch	59h 63h	46h 57h	44h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	31h 37h	03h	
Stop	☺ >	S	T	P	c	SP	SP	SP	SP	SP	SP	SP	SP	SP	9	8	♥
	02h 3Eh	53h 54h	50h 63h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	39h 38h	03h	
Pause - Pause when paused advances frame, rapid succession is slow motion.	☺ >	P	L	Y	c	P	A	U	SP	SP	SP	SP	SP	SP	1	C	♥
	02h 3Eh	50h 4Ch	59h 63h	50h 41h	55h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	31h 43h	03h	
Fast Forward - Repeated commands increases FFWD speed from 2x to 20x	☺ >	P	L	Y	c	F	F	F	SP	SP	SP	SP	SP	SP	0	8	♥
	02h 3Eh	50h 4Ch	59h 63h	46h 46h	46h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	30h 38h	03h	
Fast Backward - Repeated commands increases REW speed from 2x to 20x	☺ >	P	L	Y	c	F	F	B	SP	SP	SP	SP	SP	SP	0	4	♥
	02h 3Eh	50h 4Ch	59h 63h	46h 46h	42h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	30h 34h	03h	
Return to Beginning of Current Track/Chapter	☺ >	S	K	P	c	S	SP	SP	SP	SP	SP	SP	SP	SP	C	2	♥
	02h 3Eh	53h 4Bh	50h 63h	53h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	43h 32h	03h	
Next Track/Chapter	☺ >	S	K	P	c	N	SP	SP	SP	SP	SP	SP	SP	SP	B	D	♥
	02h 3Eh	53h 4Bh	50h 63h	4Eh 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	42h 44h	03h	
Previous Track/Chapter	☺ >	S	K	P	c	P	SP	SP	SP	SP	SP	SP	SP	SP	B	F	♥
	02h 3Eh	53h 4Bh	50h 63h	50h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	42h 46h	03h	
Slow Motion	☺ >	P	L	Y	c	S	L	W	SP	SP	SP	SP	SP	SP	2	C	♥
	02h 3Eh	50h 4Ch	59h 63h	53h 4Ch	57h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	32h 43h	03h	

GO TO SPECIFIC TRACK/CHAPTER NUMBER

Below, you can see the pattern for going to a specific track or chapter number. The only thing that changes is the track number (shown in ASCII text), and the checksum.

To use a 10-key on a touch screen, you'll want to build a routine that collects the numbers of the track that will output the direct track number at the end. Then, the system will need to derive a checksum for the command, and put it all together.

If your control system cannot calculate the hexadecimal checksum, you may want to hard-code the first twenty (or so) tracks. You can place buttons to access them on your touch panel directly. We've shown the codes for up to the first 30 tracks on this and the next page.

Note that this command uses a capital "G" (47h) in the parameter codes before the track/chapter number.

		TRACK/CHAPTER #										CHECK SUM				
Go To Track/Chapter 1	☺ >	S	K	P	c	G	0	0	1	SP	SP	SP	SP	E	7	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 31h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 37h	03h	
Go To Track/Chapter 2	☺ >	S	K	P	c	G	0	0	2	SP	SP	SP	SP	E	8	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 32h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 38h	03h	
Go To Track/Chapter 3	☺ >	S	K	P	c	G	0	0	3	SP	SP	SP	SP	E	9	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 33h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 39h	03h	
Go To Track/Chapter 4	☺ >	S	K	P	c	G	0	0	4	SP	SP	SP	SP	E	A	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 34h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 41h	03h	
Go To Track/Chapter 5	☺ >	S	K	P	c	G	0	0	5	SP	SP	SP	SP	E	B	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 35h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 42h	03h	
Go To Track/Chapter 6	☺ >	S	K	P	c	G	0	0	6	SP	SP	SP	SP	E	C	♥
	02h 3Eh	53h 4Bh	50h 63h	47h 30h	30h 36h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	20h 20h	45h 43h	03h	

GO TO SPECIFIC TRACK/CHAPTER NUMBER (CONT)

Go To Track/Chapter 7	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	0 30h	7 37h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	D 44h	♥ 03h
Go To Track/Chapter 8	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	0 30h	8 38h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	E 45h	♥ 03h
Go To Track/Chapter 9	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	0 30h	9 39h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	F 46h	♥ 03h
Go To Track/Chapter 10	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	0 30h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	7 37h	♥ 03h
Go To Track/Chapter 11	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	1 31h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	8 38h	♥ 03h
Go To Track/Chapter 12	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	2 32h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	9 39h	♥ 03h
Go To Track/Chapter 13	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	3 33h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	A 41h	♥ 03h
Go To Track/Chapter 14	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	4 34h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	B 42h	♥ 03h
Go To Track/Chapter 15	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	5 35h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	C 43h	♥ 03h
Go To Track/Chapter 16	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	6 36h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	D 44h	♥ 03h
Go To Track/Chapter 17	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	7 37h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	E 45h	♥ 03h
Go To Track/Chapter 18	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	8 38h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	F 46h	♥ 03h
Go To Track/Chapter 19	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	1 31h	9 39h	SP 20h	SP 20h	SP 20h	SP 20h	F 46h	0 30h	♥ 03h
Go To Track/Chapter 20	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	0 30h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	8 38h	♥ 03h
Go To Track/Chapter 21	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	1 31h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	9 39h	♥ 03h
Go To Track/Chapter 22	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	2 32h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	A 41h	♥ 03h
Go To Track/Chapter 23	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	3 33h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	B 42h	♥ 03h
Go To Track/Chapter 24	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	4 34h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	C 43h	♥ 03h
Go To Track/Chapter 25	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	5 35h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	D 44h	♥ 03h
Go To Track/Chapter 26	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	6 36h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	E 45h	♥ 03h
Go To Track/Chapter 27	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	7 37h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	F 46h	♥ 03h
Go To Track/Chapter 28	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	8 38h	SP 20h	SP 20h	SP 20h	SP 20h	F 46h	0 30h	♥ 03h
Go To Track/Chapter 29	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	2 32h	9 39h	SP 20h	SP 20h	SP 20h	SP 20h	F 46h	1 31h	♥ 03h
Go To Track/Chapter 30	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	G 47h	0 30h	3 33h	0 30h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	9 39h	♥ 03h

GO TO SPECIFIC TITLE NUMBER

For DVDs that have multiple titles in it, you can access each one directly using this command. (Most of the time, you'll probably just navigate to it through menus, though.)

This command is similar in structure to the command for locating to a specific track or chapter, but this uses a lower case "g" (67h) in the parameter code.

		TITLE #										CHECK SUM				
Go To Title 1	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	g 67h	0 30h	0 30h	1 31h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	7 37h	♥ 03h
Go To Title 2	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	g 67h	0 30h	0 30h	2 32h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	8 38h	♥ 03h
Go To Title 3	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	g 67h	0 30h	0 30h	3 33h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	9 39h	♥ 03h
Go To Title 4	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	g 67h	0 30h	0 30h	4 34h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	A 41h	♥ 03h
Go To Title 5	☺ > 02h 3Eh	S 53h	K 4Bh	P 50h	c 63h	g 67h	0 30h	0 30h	5 35h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	B 42h	♥ 03h

OPEN/CLOSE DISC TRAY

This command toggles between open and close tray. There are not separate, discreet commands for each direction. If you wish to determine whether the tray

is open or closed before issuing this command, use the "MOD" status request. It will let you know if the tray is open, closed, opening, or closing.

Open/Close Disc Tray	☺ > 02h 3Eh	M 4Dh	E 45h	D 44h	c 63h	E 45h	J 4Ah	C 43h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	9 39h	♥ 03h
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POWER ON/STANDBY

There are separate commands for power on and standby mode. The DV-D6500 will respond to the "MOD" command when it is off.

Power On	☺ > 02h 3Eh	P 50h	O 4Fh	W 57h	c 63h	O 4Fh	N 4Eh	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	F 46h	4 34h	♥ 03h
Power Standby	☺ > 02h 3Eh	P 50h	O 4Fh	W 57h	c 63h	O 4Fh	F 46h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	C 43h	♥ 03h

MENU CALL COMMAND

The MNU command can recall either the "title" or "root" menus on a DVD. Keep in mind when you are testing this that DVDs can lock this function out in some parts of the

disc. This is common for things like the "FBI Warning" at the beginning of a disc. Some discs also force the viewing of ads at the beginning of the disc.

		TITLE #											CHECK SUM				
Title Menu	☺ > 02h 3Eh	M 4Dh	N 4Eh	U 55h	c 63h	T 54h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	C 43h	5 35h	♥ 03h
Root Menu	☺ > 02h 3Eh	M 4Dh	N 4Eh	U 55h	c 63h	R 52h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	C 43h	3 33h	♥ 03h	

MENU NAVIGATION KEYS

These are the standard navigation keys, and they work just like the commands from the remote.

Cursor Left	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	L 4Ch	F 46h	T 54h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	C 43h	♥ 03h
Cursor Right	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	R 52h	I 49h	T 54h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	1 31h	5 35h	♥ 03h
Cursor Up	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	U 55h	P 50h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	E 45h	B 42h	♥ 03h
Cursor Down	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	D 44h	W 57h	N 4Eh	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	F 46h	♥ 03h
Enter/Select	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	E 45h	N 4Eh	T 54h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	D 44h	♥ 03h
Return	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	R 52h	T 54h	N 4Eh	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	1 31h	A 41h	♥ 03h
PBC Call (Video CD Function)	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	P 50h	B 42h	C 43h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	F 46h	B 42h	♥ 03h
Previous	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	P 50h	R 52h	E 45h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	0 30h	D 44h	♥ 03h
Next	☺ > 02h 3Eh	N 4Eh	A 41h	V 56h	c 63h	N 4Eh	X 58h	T 54h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	2 32h	0 30h	♥ 03h

"MOD" STATUS REQUEST

The MOD status request is a good first step in querying the DV-D6500. From it, you can tell:

- 1) If the DV-D6500 is on or off
- 2) If on, you can know if the tray is open, closed, opening or closing
- 3) If the tray is closed, you'll know what type of disc is inserted, and what the machine is doing.

When you consider the responses from the machine, you should think of it in this order. You'll notice that there is no response that says the machine is on, or that the tray is closed. If you get information on the type of disc and what the transport is doing, then you know the player is turned on, and the tray is closed.

MOD Status Request	☺	>	M	O	D	c	SP	SP	SP	SP	SP	SP	SP	SP	SP	8	1	♥
	02h	3Eh	4Dh	4Fh	44h	63h	20h	20h	20h	20h	20h	20h	20h	20h	20h	38h	31h	03h

RESPONSES TO "MOD" REQUEST

							TRANSPORT STATUS		DISC FORMAT									
Video DVD in Play <i>(Reply to "mod")</i>	☺	>	M	O	D	s	:	4	SP	SP	SP	SP	SP	SP	SP	B	F	♥
	02h	3Eh	4Dh	4Fh	44h	73h	3Ah	34h	20h	20h	20h	20h	20h	20h	20h	42h	46h	03h

The reply to the MOD status request will offer two main parameter bytes, offering both transport status and disc format. The available codes are listed in the charts at right.

For more information on the speed of slow motion, issue the SPD command in the next section to determine the speed.

As always, remember that the check sum at the end will change, with the various combinations of codes.

TRANSPORT STATUS BYTE CODES

ASCII	Hex	Meaning
SP	20h	Power Off
1	31h	No Disc In Tray
2	32h	Tray Open
3	33h	Tray Opening
4	34h	Tray Closing
5	35h	Reading Disc
6	36h	DVD Menus
7	37h	Stop
9	39h	Search
:	3Ah	Play
;	3Bh	Pause
<	3Ch	Still Playing
=	3Dh	Scan
>	3Eh	Slow Motion

DISC FORMAT BYTE CODES

ASCII	Hex	Meaning
0	30h	No Disc
1	31h	Unknown Format
4	34h	DVD Video
5	35h	Super Video CD
6	36h	Video CD
7	37h	Audio CD
9	39h	MP3/JPEG Disc

"DSC" STATUS REQUEST

The DSC request will simply return the type of disc in the DV-D6500. The same information can also be obtained in the MOD request.

DSC Status Request	☺	>	D	S	C	c	SP	SP	SP	SP	SP	SP	SP	SP	SP	7	B	♥
	02h	3Eh	44h	53h	43h	63h	20h	20h	20h	20h	20h	20h	20h	20h	20h	37h	42h	03h

RESPONSES TO "DSC" REQUEST

Video DVD <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	V	i	d	SP	SP	SP	SP	SP	SP	4	E	♥
	02h	3Eh	44h	53h	43h	73h	56h	69h	64h	20h	20h	20h	20h	20h	20h	34h	45h	03h
Audio CD <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	C	D	A	SP	SP	SP	SP	SP	SP	F	3	♥
	02h	3Eh	44h	53h	43h	73h	43h	44h	41h	20h	20h	20h	20h	20h	20h	46h	33h	03h
Video CD <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	V	C	D	SP	SP	SP	SP	SP	SP	0	8	♥
	02h	3Eh	44h	53h	43h	73h	56h	43h	44h	20h	20h	20h	20h	20h	20h	30h	38h	03h
S-Video CD <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	S	V	C	SP	SP	SP	SP	SP	SP	1	7	♥
	02h	3Eh	44h	53h	43h	73h	53h	56h	43h	20h	20h	20h	20h	20h	20h	31h	37h	03h
MP3/JPEG <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	F	I	L	SP	SP	SP	SP	SP	SP	0	6	♥
	02h	3Eh	44h	53h	43h	73h	46h	49h	4Ch	20h	20h	20h	20h	20h	20h	30h	36h	03h
None <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	U	N	K	SP	SP	SP	SP	SP	SP	1	9	♥
	02h	3Eh	44h	53h	43h	73h	55h	4Eh	4Bh	20h	20h	20h	20h	20h	20h	31h	39h	03h
Unknown <i>(Reply to DSC Request)</i>	☺	>	D	S	C	s	N	O	N	SP	SP	SP	SP	SP	SP	1	6	♥
	02h	3Eh	44h	53h	43h	73h	4Eh	4Fh	4Eh	20h	20h	20h	20h	20h	20h	31h	36h	03h

"SPD" STATUS REQUEST

The SPD status request will return the playback speed of the DV-D6500. For instance, if the MOD request replied that the DV-D6500 is in search or slow motion mode, the SPD command can be used to determine more information on that mode, if desired.

As an added convenience, the SPD will also tell you if the DVD player is in pause, play, or stop. This is helpful, in case the status of the DVD player changed in the time between the MOD and SPD requests.

SPD Status Request	☺	>	S	P	D	c	SP	SP	SP	SP	SP	SP	SP	SP	8	8	♥
	02h	3Eh	53h	50h	44h	63h	20h	20h	20h	20h	20h	20h	20h	20h	38h	38h	03h

RESPONSES TO "SPD" REQUEST

Stop Status (Reply to "spd")	☺	>	S	P	D	s	S	SP	SP	SP	SP	SP	SP	SP	C	B	♥
	02h	3Eh	53h	50h	44h	73h	53h	20h	20h	20h	20h	20h	20h	20h	43h	42h	03h
Pause Status	☺	>	S	P	D	s	P	SP	SP	SP	SP	SP	SP	SP	C	8	♥
	02h	3Eh	53h	50h	44h	73h	50h	20h	20h	20h	20h	20h	20h	20h	43h	38h	03h
Play (Normal 1x) Status	☺	>	S	P	D	s	N	SP	SP	SP	SP	SP	SP	SP	C	6	♥
	02h	3Eh	53h	50h	44h	73h	4Eh	20h	20h	20h	20h	20h	20h	20h	43h	36h	03h
Scan Forward 2x Status	☺	>	S	P	D	s	F	0	2	x	SP	SP	SP	SP	3	8	♥
	02h	3Eh	53h	50h	44h	73h	46h	30h	32h	78h	20h	20h	20h	20h	33h	38h	03h
Scan Forward 5x Status	☺	>	S	P	D	s	F	0	5	x	SP	SP	SP	SP	3	B	♥
	02h	3Eh	53h	50h	44h	73h	46h	30h	35h	78h	20h	20h	20h	20h	33h	42h	03h
Scan Forward 10x Status	☺	>	S	P	D	s	F	1	0	x	SP	SP	SP	SP	3	7	♥
	02h	3Eh	53h	50h	44h	73h	46h	31h	30h	78h	20h	20h	20h	20h	33h	37h	03h
Scan Forward 20x Status	☺	>	S	P	D	s	F	2	0	x	SP	SP	SP	SP	3	8	♥
	02h	3Eh	53h	50h	44h	73h	46h	32h	30h	78h	20h	20h	20h	20h	33h	38h	03h
Scan Forward 60x Status	☺	>	S	P	D	s	F	6	0	x	SP	SP	SP	SP	3	C	♥
	02h	3Eh	53h	50h	44h	73h	46h	36h	30h	78h	20h	20h	20h	20h	33h	43h	03h
Scan Backward 2x Status	☺	>	S	P	D	s	B	0	2	x	SP	SP	SP	SP	3	4	♥
	02h	3Eh	53h	50h	44h	73h	42h	30h	32h	78h	20h	20h	20h	20h	33h	34h	03h
Scan Backward 5x Status	☺	>	S	P	D	s	B	0	5	x	SP	SP	SP	SP	3	7	♥
	02h	3Eh	53h	50h	44h	73h	42h	30h	35h	78h	20h	20h	20h	20h	33h	37h	03h
Scan Backward 10x Status	☺	>	S	P	D	s	B	1	0	x	SP	SP	SP	SP	3	3	♥
	02h	3Eh	53h	50h	44h	73h	42h	31h	30h	78h	20h	20h	20h	20h	33h	33h	03h
Scan Backward 20x Status	☺	>	S	P	D	s	B	2	0	x	SP	SP	SP	SP	3	4	♥
	02h	3Eh	53h	50h	44h	73h	42h	32h	30h	78h	20h	20h	20h	20h	33h	34h	03h
Scan Backward 60x Status	☺	>	S	P	D	s	B	6	0	x	SP	SP	SP	SP	3	8	♥
	02h	3Eh	53h	50h	44h	73h	42h	36h	30h	78h	20h	20h	20h	20h	33h	38h	03h
Slow Motion 1/2 Status	☺	>	S	P	D	s	F	/	0	2	SP	SP	SP	SP	E	F	♥
	02h	3Eh	53h	50h	44h	73h	46h	2Fh	30h	32h	20h	20h	20h	20h	45h	46h	03h
Slow Motion 1/4 Status	☺	>	S	P	D	s	F	/	0	4	SP	SP	SP	SP	F	1	♥
	02h	3Eh	53h	50h	44h	73h	46h	2Fh	30h	34h	20h	20h	20h	20h	46h	31h	03h
Slow Motion 1/8 Status	☺	>	S	P	D	s	F	/	0	8	SP	SP	SP	SP	F	5	♥
	02h	3Eh	53h	50h	44h	73h	46h	2Fh	30h	38h	20h	20h	20h	20h	46h	35h	03h
Slow Motion 1/16 Status	☺	>	S	P	D	s	F	/	1	6	SP	SP	SP	SP	F	4	♥
	02h	3Eh	53h	50h	44h	73h	46h	2Fh	31h	36h	20h	20h	20h	20h	46h	34h	03h
Slow Motion 1/32 Status	☺	>	S	P	D	s	F	/	3	2	SP	SP	SP	SP	F	2	♥
	02h	3Eh	53h	50h	44h	73h	46h	2Fh	33h	32h	20h	20h	20h	20h	46h	32h	03h

"INF" STATUS REQUESTS & RESPONSES - Structure for Audio and Video CDs

The INF commands offer requests for different types of information on the disc. CDs and DVDs work differently, so the commands and replies are different for each. This section deals with information on a CD; for information on the DVD, please check the next section.

The DV-D6500 offers the following information on CDs:

- 1) First and Last Track (Useful for total tracks on disc)
- 2) Total Playing Time of Disc
- 3) Current Track & Index Numbers
- 4) Elapsed Time of Current Track
- 5) Elapsed Time of Entire Disc
- 6) Start time of a Specific Track

Please note that the first parameter byte (following the "c" or "s" command/status byte) is lowercase on CD status information. These are upper case for DVD information.

CD players will traditionally show the total tracks and total playing time of a disc (items 1 & 2) when the machine is stopped.

If the machine is playing, the display usually shows current track number and elapsed time of track (items 3 & 4).

Items 5 & 6 are sometimes offered as an optional viewing modes, though they are not commonly used.

You can use items 5 & 6 together to calculate the remaining time in a track. For instance, if the machine is playing track 6, then you could calculate the time remaining by subtracting the elapsed time of disc from the start time of track 7.

First and Last Track Request	☺	>	I	N	F	c	n	SP	SP	SP	SP	SP	SP	SP	C	C	♥
	02h	3Eh	49h	4Eh	46h	63h	6Eh	20h	20h	20h	20h	20h	20h	20h	43h	43h	03h
First and Last Track Response <i>(Shows tracks 01 and 23)</i>	☺	>	I	N	F	s	n	0	1	2	3	SP	SP	SP	2	2	♥
	02h	3Eh	49h	4Eh	46h	73h	6Eh	30h	31h	32h	33h	20h	20h	20h	32h	32h	03h
								First Trk		Last Trk							
Total Playing Time of Disc Request	☺	>	I	N	F	c	t	SP	SP	SP	SP	SP	SP	SP	D	2	♥
	02h	3Eh	49h	4Eh	46h	63h	74h	20h	20h	20h	20h	20h	20h	20h	44h	32h	03h
Total Playing Time Response <i>(Shows 72min, 48sec, 13fr)</i>	☺	>	I	N	F	s	t	7	2	4	8	1	3	SP	5	B	♥
	02h	3Eh	49h	4Eh	46h	73h	74h	37h	32h	34h	38h	31h	33h	20h	35h	42h	03h
								Minutes		Seconds		Frames					
Current Track and Index Request	☺	>	I	N	F	c	i	SP	SP	SP	SP	SP	SP	SP	C	7	♥
	02h	3Eh	49h	4Eh	46h	63h	69h	20h	20h	20h	20h	20h	20h	20h	43h	37h	03h
Current Track and Index Response <i>(Shows track 23, index 01)</i>	☺	>	I	N	F	s	i	2	3	0	1	SP	SP	SP	1	D	♥
	02h	3Eh	49h	4Eh	46h	73h	69h	32h	33h	30h	31h	20h	20h	20h	31h	44h	03h
								Track		Index							
Elapsed Time, Current Track Request	☺	>	I	N	F	c	p	SP	SP	SP	SP	SP	SP	SP	C	E	♥
	02h	3Eh	49h	4Eh	46h	63h	70h	20h	20h	20h	20h	20h	20h	20h	43h	45h	03h
Elapsed Time, Curr Trk Response <i>(Shows 03min, 12sec, 13fr)</i>	☺	>	I	N	F	s	p	0	3	1	2	1	3	SP	4	8	♥
	02h	3Eh	49h	4Eh	46h	73h	70h	30h	33h	31h	32h	31h	33h	20h	34h	38h	03h
								Minutes		Seconds		Frames					
Elapsed Time, Entire Disc Request	☺	>	I	N	F	c	t	SP	SP	SP	SP	SP	SP	SP	D	2	♥
	02h	3Eh	49h	4Eh	46h	63h	74h	20h	20h	20h	20h	20h	20h	20h	44h	32h	03h
Elapsed Time, Entire Disc Response <i>(Shows 42min, 35sec, 16fr)</i>	☺	>	I	N	F	s	t	4	2	3	5	1	6	SP	5	7	♥
	02h	3Eh	49h	4Eh	46h	73h	74h	34h	32h	33h	35h	31h	36h	20h	35h	37h	03h
								Minutes		Seconds		Frames					
Start Time of Track Request	☺	>	I	N	F	c	s	SP	SP	SP	SP	SP	SP	SP	D	1	♥
	02h	3Eh	49h	4Eh	46h	63h	73h	20h	20h	20h	20h	20h	20h	20h	44h	31h	03h
Start Time of Track Response <i>(Shows 42min, 35sec, 16fr)</i>	☺	>	I	N	F	s	s	4	2	3	5	1	6	SP	5	6	♥
	02h	3Eh	49h	4Eh	46h	73h	73h	34h	32h	33h	35h	31h	36h	20h	35h	36h	03h
								Minutes		Seconds		Frames					

"INF" STATUS REQUESTS & RESPONSES - Structure for Video DVDs

The INF commands offer requests for different types of information on the disc. CDs and DVDs work differently, so the commands and replies are different for each. This section deals with information on a DVD; for information on the CD, please check the previous section.

The DV-D6500 offers the following information on DVDs:

- 1) Total Number of Titles
- 2) Total Number of Chapters in Current Title
- 3) Total Time of Current Title
- 4) Elapsed Time of Current Title
- 5) Current Title and Chapter Numbers

Please note that the first parameter byte (following the "c" or "s" command/status byte) is upper case on DVD status information. These are lower case for CD information.

DVD players will traditionally show the current title number, total number of chapters in current title, and total time of the current title (items 1-3) when the machine is stopped.

If the machine is playing, the display usually shows the current title, current chapter, and elapsed time (items 4 & 5).

Total Number of Titles Request	☺	>	I	N	F	c	L	SP	SP	SP	SP	SP	SP	SP	SP	A	A	♥
	02h	3Eh	49h	4Eh	46h	63h	4Ch	20h	20h	20h	20h	20h	20h	20h	20h	41h	41h	03h
Total Number of Titles Response <i>(Shows 2 Titles)</i>	☺	>	I	N	F	s	L	0	2	SP	SP	SP	SP	SP	SP	D	C	♥
	02h	3Eh	49h	4Eh	46h	73h	4Ch	30h	32h	20h	20h	20h	20h	20h	20h	44h	43h	03h
								# of Titles										
Total Chapters In Title Request	☺	>	I	N	F	c	U	SP	SP	SP	SP	SP	SP	SP	SP	B	3	♥
	02h	3Eh	49h	4Eh	46h	63h	55h	20h	20h	20h	20h	20h	20h	20h	20h	42h	33h	03h
Total Chapters In Title Response <i>(Shows 24 Chapters)</i>	☺	>	I	N	F	s	U	0	2	4	SP	SP	SP	SP	SP	F	9	♥
	02h	3Eh	49h	4Eh	46h	73h	55h	30h	32h	34h	20h	20h	20h	20h	20h	46h	39h	03h
								# of Chapters										
Total Time of Current Title Request	☺	>	I	N	F	c	Y	SP	SP	SP	SP	SP	SP	SP	SP	B	7	♥
	02h	3Eh	49h	4Eh	46h	63h	59h	20h	20h	20h	20h	20h	20h	20h	20h	42h	37h	03h
Total Time of Current Title Response <i>(Shows 1hr, 23min, 45sec)</i>	☺	>	I	N	F	s	Y	1	2	3	4	5	SP	SP	2	6	♥	
	02h	3Eh	49h	4Eh	46h	73h	59h	31h	32h	33h	34h	35h	20h	20h	32h	36h	03h	
								HR		MIN		SEC						
Elapsed Time, Current Title Request	☺	>	I	N	F	c	M	SP	SP	SP	SP	SP	SP	SP	SP	A	B	♥
	02h	3Eh	49h	4Eh	46h	63h	4Dh	20h	20h	20h	20h	20h	20h	20h	20h	41h	42h	03h
Elapsed Time, Curr Title Response <i>(Shows 1hr, 15min, 23sec)</i>	☺	>	I	N	F	s	M	1	1	5	2	3	SP	SP	1	8	♥	
	02h	3Eh	49h	4Eh	46h	73h	4Dh	31h	31h	35h	32h	33h	20h	20h	31h	38h	03h	
								HR		MIN		SEC						
Current Title & Chapter Request	☺	>	I	N	F	c	H	SP	SP	SP	SP	SP	SP	SP	SP	A	6	♥
	02h	3Eh	49h	4Eh	46h	63h	48h	20h	20h	20h	20h	20h	20h	20h	20h	41h	36h	03h
Current Title & Chapter Response <i>(Shows Title 1, Chapter 23)</i>	☺	>	I	N	F	s	H	0	1	0	2	3	SP	SP	0	C	♥	
	02h	3Eh	49h	4Eh	46h	73h	48h	30h	31h	30h	32h	33h	20h	20h	30h	43h	03h	
								Title		Chapter								

FRONT PANEL & IR PERMISSIONS

The DV-D6500 uses the PSW and IRD commands to disable the front panel or IR controls for automated installations. These settings will remain in tact until the either the power

disconnected from the player, or until these commands are used to turn the control back on. The INI command can also be used to reset the controls to its default (on).

Disable Front Panel Control	☺ > 02h 3Eh	P 50h	S 53h	W 57h	c 63h	D 44h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	B 42h	F 46h	♥ 03h
Enable Front Panel Control	☺ > 02h 3Eh	P 50h	S 53h	W 57h	c 63h	A 41h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	B 42h	C 43h	♥ 03h
Disable IR Remote Control	☺ > 02h 3Eh	I 49h	R 52h	D 44h	c 63h	D 44h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	A 41h	4 34h	♥ 03h
Enable IR Remote Control	☺ > 02h 3Eh	I 49h	R 52h	D 44h	c 63h	A 41h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	A 41h	1 31h	♥ 03h

INITIALIZING THE DV-D6500

The initial settings of the DV-D6500 can be set, then recalled by using the SET and INI commands. The SET command should only be used directly after the player is turned on.

The INI command will initialize the system, and return the machine to the settings last built by the SET command. The no other commands should be sent for at least 500msec while the RS-232 routine is initializing.

Capture Default Settings	☺ > 02h 3Eh	S 53h	E 45h	T 54h	c 63h	0 30h	0 30h	8 38h	e 65h	SP 20h	SP 20h	0 30h	8 38h	8 38h	D 44h	♥ 03h
Initialize RS-232 Control	☺ > 02h 3Eh	I 49h	N 4Eh	I 49h	c 63h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	SP 20h	8 38h	1 31h	♥ 03h