



# **B&K Components Device Interface Protocol (BKC-DIP) Product Specific Appendices**

For use with Six Zone Video Switcher

HD-6 T- Router

Version 2.00.05

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# Revision History

## **Version 2.00.05**

1. Add Front Panel commands 0x12 and 0x16 – Restore Memory and Backup Memory.
2. Remove 0x0D - Restore User Preference Memory

## **Version 2.00.04**

1. Reinstated the re-initialize BKC-DIP Command (FF,X,8;).
2. Added greater detail descriptions for current preset parameters 02-source input, and 04-video input in operation with regard to using the HD6 as a 15x6 stand alone video switcher.
3. Added BKC-DIP IR command listing for In10 – In15.
4. Revised system parameters 09-0E and 28-2D to include descriptions relating to using the HD6 as a 15x6 video switcher.
5. Defined executive Bootloader Command (FF,X,B;), Clear Flash Block Command (FF,X,C=xx;) and TFTP Client Load Command: (FF, X, D;) as commands valid only via an ethernet connection.

## **Version 2.00.03**

1. Fix note\* on Appendix A Preset Parameter Notes.

## **Version 2.00.02**

1. Add Parameters 46, 47, 48, 51, and 52 to unit info.

## **Version 2.00.01**

1. Add preset parameter 0C (allows dedicated Zone A-F as Input 10 – Input 15 and allows RBG to be selected independently for use with composite/s-video/component input) on Appendix A Preset Parameter Notes (only for use HD6 flash ver. 306 and higher).

## **Version 2.00.00**

1. The Initial Release of this document, which is referred to as BKC-DIP V2.00.00 documentation.

# Introduction

## Overview

The following is a supplement to B&K Components Device Interface Protocol (BKC-DIP) Protocol Document. This document contains the specific BKC-DIP implementation details for B&K Components' HD-6 products.

## Document Conventions

**All numbers are assumed to be hexadecimal**. Hexadecimal (or Hex for short) characters range from 0 to F.

For example:

The number 19 is the hexadecimal number 19 which is  $(1 \times 16^1) + (9 \times 16^0)$  or 25 decimal. Similarly, EA is the hexadecimal number EA which is  $(14 \times 16^1) + (10 \times 16^0)$  or 234 decimal. For clarity, some descriptions regarding numbers may use the *xxh* notation to remind the reader that the number is implicitly hexadecimal where *xx* are the hexadecimal characters 0 - F. Thus the previous examples would be 19h and EAh respectively, the "h" indicating hexadecimal.

Maximum values appearing in double quotes indicate that the parameter is an ASCII string.

For example:

"D" for the Z1 Title maximum value indicates that the title is a string with a maximum length of 0Dh (13 decimal) characters.

*Italics* indicate a non-literal string.

For example:

(00,G, P00, 0;*cs16*)

*cs16* indicates the calculated checksum and does NOT literally appear in the data stream.

Important concepts are denoted by **NOTE**:

## Appendix A, Preset Parameters

(0,G,P1=FF,02;cs16) Example of Get Z1 current source input

(0,S,P1=FF,04=8;cs16) Example of Set Z1 current video input to 8

(0,S,P1=FF,04=B;cs16) Example of Set Z1 current video input to In11 (Dedicated B)

(0,S,P1=FF,04=8,OC=1;cs16) Example of Set Z1 current video input to 8 and Red RCA as composite input

(0,S,P1=FF,04=7,OC=4;cs16) Example of Set Z1 current video input to 7 and Blue (C) and Green (Y) RCA as S-Video input

(0,S,P1=FF,04=6,OC=0;cs16) Example of Set Z1 current video input to 6 becomes plug and play

Parameter Identifier (in hex)	Description	Parameter Max Values (in hex)	Formatting Notes
02	Source Input	B	Note 1*
04	Video Input	9	Note 2*
0C	Video Input Format	4	Note 3*

### Appendix A Preset Parameter Notes

(NOTE: hex values denoted by xxh convention)

Note 1: 0h = FM Tuner, 1h = AM Tuner, 2h = Dedicated, 3h = In1, 4h = In2, 5h = In3, 6h = In4, 7h = In5, 8h = In6, 9h = In7,

**\* Below is only for use in stand alone HD6 operation**

Ah = In8, Bh = In9, Ch = In10, Dh = In11, Eh = In12, Fh = In13, 10h = In14, 11h = In15

\* FM Tuner and AM Tuner do not have video sources, so selecting either as a video source will NOT change the current video source (i.e. the video source will remain on the currently selected video source).

\* Source Input controls both Audio and Video Inputs simultaneously, keeping them synchronized.

Note 2: 0h = Dedicated, 1h = In1, 2h = In2, 3h = In3, 4h = In4, 5h = In5, 6h = In6, 7h = In7, 8h = In8, 9h = In9,

**\* Below is only for use in stand alone HD6 operation**

Ah = In10, Bh = In11, Ch = In12, Dh = In13, Eh = In14, Fh = In15

**\*: For use in stand alone HD6 only** (must not link to a CT series receiver since it only supports 9 + 6 dedicated inputs) Dedicated Zone A-F become Input 10 - Input 15 (the parameter max values is 0F)

Note 3: 0h = Plug and Play, 1h = Red, 2h = Blue, 3h = Green, 4h = S-Video, 5h = Component

## Appendix B, System Parameters

(0,G,S,1F;cs16) Example of Get Input 1 Video setting  
 (0,S,S,20=1;cs16) Example of Set Input 2 Video to Yes

Parameter Identifier (in hex)	Description	Parameter Max Values (in hex)	Formatting Notes
00	Input 1 Title	"5"	
01	Input 2 Title	"5"	
02	Input 3 Title	"5"	
03	Input 4 Title	"5"	
04	Input 5 Title	"5"	
05	Input 6 Title	"5"	
06	Input 7 Title	"5"	
07	Input 8 Title	"5"	
08	Input 9 Title	"5"	
09	Zone A IN (In10) Dedicated Title	"5"	
0A	Zone B IN (In11) Dedicated Title	"5"	
0B	Zone C IN (In12) Dedicated Title	"5"	
0C	Zone D IN (In13) Dedicated Title	"5"	
0D	Zone E IN (In14) Dedicated Title	"5"	
0E	Zone F IN (In15) Dedicated Title	"5"	
1F	Input 1 Video	1	Note 1
20	Input 2 Video	1	Note 1
21	Input 3 Video	1	Note 1
22	Input 4 Video	1	Note 1
23	Input 5 Video	1	Note 1
24	Input 6 Video	1	Note 1
25	Input 7 Video	1	Note 1
26	Input 8 Video	1	Note 1
27	Input 9 Video	1	Note 1
28	Zone A IN (In10) Dedicated Video	1	Note 1
29	Zone B IN (In11) Dedicated Video	1	Note 1
2A	Zone C IN (In12) Dedicated Video	1	Note 1
2B	Zone D IN (In13) Dedicated Video	1	Note 1
2C	Zone E IN (In14) Dedicated Video	1	Note 1
2D	Zone F IN (In15) Dedicated Video	1	Note 1
64	Group a Code Set ID	80	Note 2
65	Group b Code Set ID	80	Note 2
66	Group c Code Set ID	80	Note 2
67	Group d Code Set ID	80	Note 2
68	Group e Code Set ID	80	Note 2
69	Group f Code Set ID	80	Note 2
6A	Group g Code Set ID	80	Note 2
6B	Group h Code Set ID	80	Note 2
6C	Group i Code Set ID	80	Note 2
6D	Group j Code Set ID	80	Note 2
6E	Group k Code Set ID	80	Note 2
6F	Group l Code Set ID	80	Note 2
70	Group m Code Set ID	80	Note 2
71	Group n Code Set ID	80	Note 2
72	Group o Code Set ID	80	Note 2
73	Group p Code Set ID	80	Note 2
74	Group q Code Set ID	80	Note 2

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75	Group r Code Set ID	80	Note 2
AA	RS-232 Baud Rate	8	Note 4
AB	Serial <b>(RS-232 and Ethernet)</b> Receive ID	7F	Note 5
AC	Serial <b>(RS-232 and Ethernet)</b> Transmit ID	7F	Note 5
AD	RS-232 Echo Enabled	1	Note 3
AE	Serial Feedback <b>(RS-232 and Ethernet)</b>	3	Note 8
AF	RS-232 V2.0 Enabled	1	Note 3
C9	Rear Panel Remote Setting	1	Note 7
E8	Auto BKC-DIP Set IR Generate Enable	1	Note 3
EA	Auto BKC-DIP Set IR Transmit ID	80	Note 6

## Appendix B System Parameter Notes

(0,G,S,1F;cs16) Example of Get Input 1 Video setting

(0,S,S,20=1;cs16) Example of Set Input 2 Video to Yes

(NOTE: hex values denoted by xxh convention)

Note 1: 0h = No, 1h = Yes

**\*Note:** Front display commands do not apply to a HD-6.

Note 2: 0h = Group Disabled, 1h = Zone ID of 1, ... 80h = Zone ID of 128

Note 3: 0h = Normal, 1h = Disabled

**\*Note:** Front panel commands do not apply to a HD-6.

Note 4: 0h = 1200  
 1h = 2400  
 2h = 9600  
 3h = 14400  
 4h = 19200  
 5h = 28800  
 6h = 38400  
 7h = 57600  
 8h = 115200

Note 5: Valid IDs are 00h to 7Fh. Receive IDs must be unique (to avoid ambiguity)

Note 6: 00h to 7Fh map directly to Transmit IDs 00h to 7Fh. 80h maps to the Global Transmit ID FFh.

Note 7: 0h = Off, 1h = On

Note 8: 0h = Disabled, 1h = Update, 2 = Reply, 3 = Both (Update and Reply).

## RS-232 Feedback Selection set to Reply

### Continuous Parameter Feedback

Setting the RS-232 Feedback Selection to "Reply" allows the HD-6 to automatically generate BKC-DIP Reply messages for changes to Source Input and Video Input.

Below is an example of how the RS-232 Feedback Selection Reply may be used as Source Input Feedback from the HD-6 for use with an external controller.

#### Step 1)

First, set the HD-6 system parameter AE = 2, RS-232 Feedback Selection set to Reply.

Next, initiate a Source Input change by one of the following methods:

B&K code set 11 (Logical Zone 11) Source Up  
B&K code set 11 (Logical Zone 11) Source Down  
Direct IR Source selection of Logical Zone 11

The HD-6 will automatically generate the following BKC-DIP Reply message command:

(0,R,P0B=FF,2=3;) Logical Zone 11 current Preset Parameter Source Input is set to 2 hex or In 1.

**Step 2)**

The external control device should be set to Poll for any BKC-DIP Reply messages and parse out the specific logical zone and current Preset Parameter value of interest, in this case the current Preset Parameter Source Input value for Zone 11.

**Step 3)**

The external controller should use the HD-6 Zone 11 current Preset Parameter Source Input "02" hex to update its GUI or status in an appropriate fashion.

## RS-232 Feedback Selection set to Update

BKC-DIP messages "Update", "Get" and "Reply" commands are necessary for feedback. All current preset parameters for all logical zones in the HD-6 are available at anytime. Typically, an external controller will use the Update message generated in response to a received B&K IR code-set, to formulate a BKC-DIP Get command. The returned BKC-DIP Reply message data may be used to extract the desired current Preset Parameter(s) and value(s) for use with updating its display requirements.

Below is an example of how the RS-232 Feedback Selection Update may be used to allow Source Input Feedback from the HD-6 for use with an external controller.

**Step 1)**

First, set the HD-6 System Parameter AE = 1, RS-232 Feedback Selection set to Update.

Next, initiate a Source Input (to select In 1 ) change by using an IR remote control set to B&K code set 11 (Logical Zone 11) and pressing the In 1 button.

The HD-6 will generate the following BKC-DIP Update message command:

(0,U,I,0B=A0;) Update from Zone 11 via an IR message.

**Step 2)**

The external control device should be set to Poll for any BKC-DIP Update messages and parse out the specific BKC-DIP message of interest, in this case a Zone 11, Input 1 0B=A0 "U,I,0B=A0".

**Step 3)**

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The external controller should generate a HD-6 Get command for the specific current Preset Parameter of interest, in this case the current Preset Parameter Source Input value. The command would look like the following BKC-DIP Get message:

```
(0,G,P0B=FF,2;) Get Zone 11 Source Input setting.
```

**Step 4)**

Once the HD-6 receives the above Get message it will generate a Reply message with the requested parameter, in this case the Reply for the current Preset Parameter Source Input value for Zone 11. The command would look like the following BKC-DIP Reply message command:

```
(0,R,P0B=FF,2=03;) Zone 11 current Source Input value is set to 03 hex or In 1.
```

**Step 5)**

The external controller may then use the HD-6 Zone 11 current Preset Parameter Source Input value of "03" hex to update its GUI or status in an appropriate fashion.

In addition to RS-232 Feedback Selections of Update and Reply, Disable and Both (Update and Reply) allow further versatility to set the best interface for the HD-6 to an external controller.

## **Appendix C Tuner Station Parameters**

Tuner stations are not supported in the HD-6.

## **Appendix D Realtime Status Parameter**

Real-time Status Parameters are not currently supported in the HD-6.

## Appendix E Unit Parameters

(0,G,F4,0;cs16) Example of Get Unit Name  
 (0,G,F4,1;cs16) Example of Get Version  
 (0,G,F4,C;cs16) Example of Get Active BKC-DIP Version

Parameter Identifier (in hex)	Description	Notes
00	Unit name	Note 1
01	Version	Note 2
02	Zone Description	Note 3
0C	Active BKC-DIP Version	Note 4
0D	Software Time Stamp	Note 5
10	Serial Number	Note 6
11	Highest BKC-DIP Version Available	Note 7
12	Active Logical Zone Numbers	Note 8
13	Number of Inputs	Note 9
14	Number of Zones	Note 10
15	Number of Dedicated Inputs	Note 11
1E	Receive ID	Note 12
1F	Transmit ID	Note 12
20	Input Bitmap LSB	Note 13
21	Input Bitmap MSB	Note 13
22	Output Bitmap LSB	Note 14
23	Output Bitmap MSB	Note 14
24	Dedicated Input Bitmap LSB	Note 15
25	Dedicated Input Bitmap MSB	Note 15
29	Group Code Set List	Note 16
2C	Video Input Detect Bitmap LSB	Note 17
2D	Video Input Detect Bitmap MSB	Note 17
40	MAC Address	Note 18
41	IP Address	Note 19**
42	Subnet Mask	Note 19**
43	Gateway	Note 19**
44	Host Name	Note 20**
45	Domain / Workgroup	Note 20**
46	Primary DNS	Note 19**
47	Secondary DNS	Note 19**
48	Use DHCP	Note 22**
51	TFTP Server IP Address	Note 19**
52	TFTP Server File Name	Note 21**

\*\* Read/Write Unit Info Parameters.

(0,S,F4,48=1;) Example of Set to use DHCP

## Appendix E, Unit Info Parameter Notes

- Note 1: String indicating Name  
Note 2: String indicating software version  
Note 3: String indicating Zone capabilities  
Note 4: String describing currently active BKC-DIP version.  
This may not necessarily be the most sophisticated (highest) version of BKC-DIP the device can support, but the unit can be forced to communicate using older more restrictive forms of BKC-DIP for backwards compatibility.  
Note 5: String indicating date/time which software was compiled  
Note 6: String containing Unit's Serial Number  
Note 7: String indicating highest BKC-DIP version unit can support.  
This can be different than the currently active BKC-DIP version, as the unit can be forced to communicate using older more restrictive forms of BKC-DIP for backwards compatibility.  
Note 8: String containing list of all active Logical Zone Numbers in the unit. Each logical zone is delimited by white space, and the values are in hexadecimal.

For example:

"0 1 2 3 4 5 6 7"

indicates that there are 8 Logical zones, 0-7 currently present in the unit.

As another example

"0 3 6 9 C 1D"

indicates that there are 6 Logical zones (0h, 3h, 6h, 9h, Ch, and 1Dh) currently present in the unit.

- Note 9: Number of Inputs (including AM and FM if any tuners present)  
Note 10: Number of Hardware Zones  
Note 11: Number of Dedicated Inputs  
Note 12: Current Serial (RS-232 and Ethernet) Receive/Transmit ID, shadows System setting  
Note 13: Bitmaps indicating which inputs are valid with the current hardware configuration. If the bit is set (i.e. 1) that particular input is valid.

LSB/MSB Word	Bit	Input Represented
LSB	0	FM (when linked to a CT Series unit)
LSB	1	AM (when linked to a CT Series unit)
LSB	2	Zone Dedicated IN
LSB	3	In 1
LSB	4	In 2
LSB	5	In 3
LSB	6	In 4
LSB	7	In 5
MSB	0	In 6
MSB	1	In 7
MSB	2	In 8
MSB	3	In 9

For example, a fully loaded HD6 should have the following return values:

20=FF Indicates FM, AM, Zone Dedicated IN, In 1-5

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valid  
21=F            Indicates In 6-9 valid

Note 14: Bitmaps indicating which outputs are valid with the current hardware configuration. If the bit is set (i.e. 1) that particular output is valid. Note an HD6 currently only supports 6 video zones.

LSB/MSB Word	Bit	Output Represented
LSB	0	Zone A
LSB	1	Zone B
LSB	2	Zone C
LSB	3	Zone D
LSB	4	Zone E
LSB	5	Zone F
LSB	6	unused
LSB	7	unused

For example, a fully loaded HD6 would have the following return values:

22=3F            Indicates Zones A-F valid  
23=0            Always 0

**NOTE:** The MSB currently is always 0 as there is a maximum of 6 possible Zone outputs in the HD6 unit. This parameter is provided in the protocol for future expandability should there be more than 8 Zone outputs.

Note 15: In the current HD6 unit there is a Dedicated Zone input associated with each Zone Output. Thus, these values are the same as the Output Bitmap parameters. They are provided in the protocol for future expandability should there be a difference between Zone Dedicated inputs and Zone Outputs.

Note 16: String containing list of all Group Code Sets (Zone IDs) in the unit. Each Code Set (Zone ID) is delimited by white space, and the values are in hexadecimal.

For example:

"0 B C D E F 10 0 0 0 0 0 0 0 0 0 0"

indicates that there are 17 Groups with Code Sets (Zone IDs):

Group	Code Set (Zone ID)
0	0h
a	3h
b	4h
c	Bh
d	Ch
e	Dh
f	Eh
g	10h
h	0h
i	0h
j	0h
k	0h
l	0h
m	0h
n	0h
o	0h
p	0h
q	0h
r	0h

Note 17: Bitmaps indicating the current Video Input Detect status for all valid video inputs in the current hardware configuration. If the bit is set (i.e. 1) that particular input is valid.

LSB/MSB Word	Bit	Video Input Represented
LSB	0	Dedicated IN A
LSB	1	Dedicated IN B
LSB	2	Dedicated IN C
LSB	3	Dedicated IN D
LSB	4	Dedicated IN E
LSB	5	Dedicated IN F
LSB	6	In 1
LSB	7	In 2
MSB	0	In 3
MSB	1	In 4
MSB	2	In 5
MSB	3	In 6
MSB	4	In 7
MSB	5	In 8
MSB	6	In 9

For example, the HD6 would have the following return values:

Video Input Detect  
2C=FF Indicates video detected on Dedicated Zone  
Inputs A thru F and Inputs 1 thru 9  
2D=1F Indicates video detected on Dedicated Zone  
Inputs A thru F and Inputs 1, 2, and 3.

Note 18: Unit's MAC Address

Format is xx:xx:xx:xx:xx:xx

Note 19: IP Address / Subnet Mask / Gateway / DNS format

Format as xxx.xxx.xxx.xxx

Unit IP is obtained from DHCP

Unit Subnet Mask is obtained from DHCP

Gateway IP Address is obtained from DHCP

Primary DNS (DHCP Option 6)

Secondary DNS (DHCP Option 6)

TFTP Server IP (DHCP Option 150 (default option 54))\*

\* Assigned by an external PC application and is only to be used with the flashloader utility.

Note 20: String containing Domain Name

Domain Name (DHCP Option 15)

Note 21: String containing TFTP File Name \*

\* Assigned by an external PC application and is only to be used with the flashloader utility.

Note 22: 0h = Off (use static IP address), 1h = On (get IP from DHCP)

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## Appendix F IR Commands

(0,S,I,1=A0;cs16)  
(0,S,I,4=5A;cs16)

Example of Set Zone 1 to Input 1  
Example of Set Zone 4 to use its  
dedicated zone input

IR Command (in hex)	IR Description
14	ALL B&K POWER OFF
15	ALL B&K POWER ON
40	POWER ON
45	POWER (TOGGLE)
4C	2
52	INPUT 6
5A	ZONE_DIRECT_INPUT
5C	8
5E	VIDEO SOURCE -
5F	VIDEO SOURCE +
60	INPUT 3
65	SOURCE -
66	SOURCE +
6C	5
76	INPUT 9
7C	0
80	POWER OFF
8C	1
90	INPUT 2
9C	7
A0	INPUT 1
AC	4
B0	INPUT 4
CC	3
D0	INPUT 7
DC	9
E0	INPUT 8
E9	INPUT 10
EA	INPUT 11
EB	INPUT 12
ED	INPUT 13
EE	INPUT 14
EF	INPUT 15
EC	6
F0	INPUT 5
FC	ZONE

## Appendix G, Front Panel Commands

(0,S,F,1=1;cs16) Example of Set Zone 1 FP Sleep  
(0,S,F,1=7;cs16) Example of Set Zone 1 Source

Identifier (in hex)	Front Panel Button/Switch	Function
01	SLEEP	Unit Sleep Toggle
07	SOURCE	Increment Source
09	ZONE	Increment Zone
0E	CHORD 2: SLEEP + UP + ZONE	Factory Reset Unit
12	CHORD 1: SLEEP + DOWN + SOURCE	Restore User Memory
16	CHORD 1: SLEEP + DOWN + SAVE	Backup User Memory

## Appendix H, Valid ASCII Display Characters

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

0123456789 -+/?='

**NOTE:** Due to the lack of an OSD, ASCII Display Characters do not apply to an HD-6.

## Appendix I, Special Display Characters

Character (in hex)	Description
0B	blank space
64	no tick symbol (long dash)
65	left 1/4 tick symbol
66	left middle 1/4 tick symbol
67	right middle 1/4 tick symbol
68	right 1/4 tick symbol
72	1/6 of solid vertical bar
73	2/6 of solid vertical bar
74	3/6 of solid vertical bar
75	4/6 of solid vertical bar
76	5/6 of solid vertical bar
77	6/6 of solid vertical bar
6E	satellite symbol
79	G clef symbol
7A	right facing arrow
7B	left facing arrow
7C	upward facing arrow
7D	downward facing arrow
7E	key symbol
71	heart symbol

**NOTE:** Due to the lack of an OSD, Special Display Characters do not apply to an HD-6.

## Appendix J, ASCII Table

Decimal	Hex	ASCII	Decimal	Hex	ASCII
0	0	xx	64	40	@
1	1	xx	65	41	A
2	2	xx	66	42	B
3	3	xx	67	43	C
4	4	xx	68	44	D
5	5	xx	69	45	E
6	6	xx	70	46	F
7	7	xx	71	47	G
8	8	xx	72	48	H
9	9	xx	73	49	I
10	A	xx	74	4A	J
11	B	xx	75	4B	K
12	C	xx	76	4C	L
13	D	xx	77	4D	M
14	E	xx	78	4E	N
15	F	xx	79	4F	O
16	10	xx	80	50	P
17	11	xx	81	51	Q
18	12	xx	82	52	R
19	13	xx	83	53	S
20	14	xx	84	54	T
21	15	xx	85	55	U
22	16	xx	86	56	V
23	17	xx	87	57	W
24	18	xx	88	58	X
25	19	xx	89	59	Y
26	1A	xx	90	5A	Z
27	1B	xx	91	5B	[
28	1C	xx	92	5C	\
29	1D	xx	93	5D	]
30	1E	xx	94	5E	^
31	1F	xx	95	5F	_
32	20		96	60	`
33	21	!	97	61	a
34	22	"	98	62	b
35	23	#	99	63	c
36	24	\$	100	64	d
37	25	%	101	65	e
38	26	&	102	66	f
39	27	'	103	67	g
40	28	(	104	68	h
41	29	)	105	69	i
42	2A	*	106	6A	j
43	2B	+	107	6B	k
44	2C	,	108	6C	l
45	2D	-	109	6D	m
46	2E	.	110	6E	n
47	2F	/	111	6F	o
48	30	0	112	70	p
49	31	1	113	71	q
50	32	2	114	72	r
51	33	3	115	73	s
52	34	4	116	74	t
53	35	5	117	75	u
54	36	6	118	76	v
55	37	7	119	77	w
56	38	8	120	78	x
57	39	9	121	79	y
58	3A	:	122	7A	z
59	3B	;	123	7B	{
60	3C	<	124	7C	
61	3D	=	125	7D	}
62	3E	>	126	7E	~
63	3F	?	127	7F	xx

**NOTE:** xx indicates non printable character

## **Appendix K, LED Mapping**

**NOTE:** Due to the lack of front panel electronics, LEDs commands do not apply to a HD-6.

## Appendix L, X (executive) Commands

The following is a list of the supported Executive commands and details regarding their usage:

### **Power State Command: (receiveID, X, 2, z=onOff, cs16)**

Zone *z*'s power state may be controlled using this command. The *onOff* parameter may take on the values of 1 or 0 for “on” or “off (Sleep)” respectively.

(00, X, 2, 1=1;cs16)	Turn Z1 power on (unit not in Sleep)
(00, X, 2, 2=0;cs16)	Turn Z2 power off (unit in Sleep)

**NOTE:** A Power State Command “on” is referred to as a “Warm Boot”.

### **Cold Boot Command: (receiveID, X, 6; cs16)**

This forces the unit to do a “Cold Boot”, which is the same sequence of events that occur when the unit is turned on from the power on/off switch. This differs from a “Warm Boot” (Power State Command with On/Off state of 1) in that all of the unit’s hardware is re-initialized.

**NOTE:** After issuing a Cold Boot command, the unit’s communication port is reinitialized. Communication will have to be re-established. The unit cannot receive BKC-DIP commands until the Update Unit “BKC-DIP ACTIVE” reply has been transmitted by the unit (see Update Command below for further details).

### **Factory Reset Command: (receiveID, X, 7; cs16)**

This command executes the factory-reset sequence in the unit. The factory reset returns the state of the unit to its original factory settings.

**WARNING!:** Issuing a Factory Reset Command will destroy all user modified data in the unit (preset, system settings, etc.).

**NOTE:** After issuing a Factory Reset command, the unit’s communication port is reinitialized. Communication will have to be re-established. The unit cannot receive BKC-DIP commands until the Update Unit “BKC-DIP ACTIVE” reply has been transmitted by the unit (refer to the Update Command in the **BKC-DIP Specification** for further details).

### **Reinitialize BKC-DIP State Command: (receiveID, X, 8; cs16)**

There are certain parameters and settings that are only available via BKC-DIP. On cold boot, these states are reset. It may be desirable to reset these states without performing a cold boot. The Reinitialize BKC-DIP State does the following:

1. Exits Override mode (setting Active to False), resets the acknowledge timeout to 0, and resets all other override parameters to their corresponding System Settings (i.e. the Override Baud Rate is reset to the System Baud Rate)
2. Disables all Realtime events
3. Restores Audio/Video linked on all zones
4. Resets all RS232 control out states for all inputs to off

**NOTE:** This command does not reset the state of the BKC-DIP parser.

### **Color Bar Video Test Command: (receiveID, X, 9, z=onOff; cs16)**

This command puts a NTSC video color bar test signal out the designated zone video outputs. The *onOff* parameter may take on the values of 1 or 0 for “on” or “off (Sleep)” respectively.

### **Initiate Bootloader Command: (receiveID, X, B; cs16)**

This command initiates a flashloader mode to allow flash B&K firmware updates via TFTP. The “initiate flashloader command” will disconnect all active telnet connections and will start the B&K flashloader application. Once the unit is in the flashloader mode, the unit will start a new telnet connection after the DHCP is assigned. After the telnet connection is reestablished, TFTP Flash Load can be started with “TFTP Client Load Command: (receiveID, X, D; cs16)”.

**This executive command is used only on bootloader, and only valid when transmitted via an Ethernet connection.**

### **Clear Flash Block Command: (receiveID, X, C=xx; cs16)**

This command initiates an erase of flash memory starting at the specified flash block. Example (FF,X, C=41;) Clears the 64k flash block starting at 0x410000.

**This executive command is used only on bootloader, and only valid when transmitted via an Ethernet connection.**

### **TFTP Client Load Command: (receiveID, X, D; cs16)**

This command initiates a TFTP client with the server name and information set under Unit Info Parameters 51 and 52 (see Appendix E Unit Parameters). The TFTP client load will load a new “Flash Upgrade” file.

Status responds with a error log (see Appendix M, Error Logs) parameter 0A = 0 or 1. 0 = bad and 1 = good.

**This executive command is used only on bootloader, and only valid when transmitted via an Ethernet connection.**

**WARNING!:** Issuing a TFTP Client Load Command will destroy all user modified data in the unit (preset, system settings, etc.).

### **Unsupported Executive Commands**

The following Executive Commands are **not** supported by the HD-6:

Recall Preset Command Command: (receiveID, X, 0, z=nn; cs16)

Save Preset Command Command: (receiveID, X, 1, z=nn, autoNameMode; cs16)

Noise Generator State Command: (receiveID, X, 3, noiseState; cs16)

Noise Steering Command: (receiveID, X, 4, speakerIndex=onOff, ... speakerIndex=onOff; cs16)

Noise Increment Command: (receiveID, X, 5; cs16)

Mute State Command: (receiveID, X, A, z=muteState; cs16)

## Appendix M, Error Logs

(0,G,E,0;cs16)

Example of Get Primary Preset Errors

(0,S,E,0=0;cs16)

Example of Set Primary Preset Errors

Identifier (in hex)	Description	Note
02	Primary System Error Log	Note 1
03	Secondary System Error Log	Note 1
04	Primary Preserved Error Log	Note 2
05	Secondary Preserved Error Log	Note 2
06	Serial Number Error Log	Note 3
07	Signature Error Log	Note 4
08	Non Volatile Write Error Log	Note 5
09	Block Memory Erase Error Log	Note 6
0A	Flash Memory Load Error Log	Note 7
0B	Undefined Command Error Log	Note 8

### Appendix M, Error Logs Parameter Notes

General Note 1: If error is detected in the primary memory, the error is logged as a primary error, then the settings are recovered from the secondary (backup) settings. If the secondary settings are corrupted, the error is logged as a secondary error, and the settings are forced to their default value.

General Note 2: Error Logs are not reset by factory reset. To clear error logs, the value of 0 must explicitly be written to each identifier via a BKC-DIP set (S), command.

Note 1: Indicates data corruption in System primary/secondary settings.

Note 2: Indicates data corruption in Preserved primary/secondary settings.

Note 3: Indicates data corruption of one of the redundant serial number entries.

Note 4: Indicates data corruption of one of the redundant signature entries.

Note 5: Indicates general low level write error to non-volatile memory device.

Note 6: Indicates data corruption during flash block erase command.

Example (FF,R,E,09=0;) Block successfully erased.

Example (FF,R,E,09=41;) Error erasing flash block 41.

This executive command is used only on bootloader

Note 7: Indicates data corruption during the flash block load command.

Example (FF,R,E,0A=00;) Flash memory successfully loaded.

Example (FF,R,E,0A=42;) Error loading flash block 42.

This executive command is used only on bootloader

Note 8: Indicates an undefined command sent during flash memory load.

Example (FF,R,E,0B=01;) Error undefined command.

This executive command is used only on bootloader

## Appendix N, Zone Specific Parameters

(0,G,Z1,03;cs16) Example of Get Video input power on setting  
 (0,S,Z0,04=6;cs16) Example of Set Video input power on preference

Parameter Identifier (in hex)	Description	Parameter Max Values (in hex)	Formatting Notes
00	Title	"B"	
03	Video Input Power On Setting	1	Note 1
04	Video Input Power On Preference	9	Note 2
22	Left (Stereo) Hardware Group Mask	3F	Note 3
23	Right Hardware Group Mask	3F	Note 3
24	Zone Power State	1	Note 4

### Appendix N, Zone Specific Parameter Notes

(0,G,Z1,03;cs16) Example of Get Video input power on setting  
 (0,S,Z0,04=6;cs16) Example of Set Video input power on preference

Note 1: 0h = Last Used  
 1h = Preferred Value

Note 2: 0h = Dedicated  
 1h = In1  
 2h = In2  
 3h = In3  
 4h = In4  
 5h = In5  
 6h = In6  
 7h = In7  
 8h = In8  
 9h = In9

Note 3: Bitmaps indicating which hardware zone outputs are associated with the Group which has this Zone (code set). If the bit is set (i.e. 1) that particular hardware zone output is valid.

Bit	Output Represented
0	Zone A
1	Zone B
2	Zone C
3	Zone D
4	Zone E
5	Zone F
6	unused
7	unused

**NOTE:** If hardware zone is configured in Stereo Mode, the appropriate bits of the Right Group Mask are ignored, and the Left Group Mask bits determine the grouping for both the Left and Right sides of the hardware zone.

Note 4: 0h = power off, 1h = power on

## **Appendix O, Macro Parameters**

Macro Parameters are not supported in the HD-6.

## Appendix P, Override Parameters

(0,G,0,0;cs16) Example of Get Override Active state  
(0,S,0,4=1;cs16) Example of Set Echo Enabled

Parameter Identifier (in hex)	Description	Default Values (in hex)	Parameter Max Values (in hex)	Formatting Notes
00	Override Active	0	1	Note 1
01	RS-232 Baud Rate	2	8	Note 2
02	BKC-DIP Receive ID	00	7F	Note 3
03	BKC-DIP Transmit ID	00	7F	Note 3
04	BKC-DIP Echo Enabled	0	1	Note 1
05	BKC-DIP Feedback Selection	0	3	Note 4
08	RS-232 V2.0 Enabled	0	1	Note 1
0B	Auto BKC-DIP Set IR Generate Enable	0	1	Note 4
0C	Auto BKC-DIP Set IR Mask	3F	3F	Note 7
0D	Auto BKC-DIP Set IR TX ID	80	80	Note 6
FF	Override Timeout	0	FF	Note 5

### Appendix P, Override Parameters Notes

(0,G,0,0;cs16) Example of Get Override Active state  
(0,S,0,4=1;cs16) Example of Set Echo Enabled

- Note 1: 0h = No, 1h = Yes \*(Front Panel commands do not apply to a HD-6)
- Note 2: 0h = 1200, 1h = 2400, 2h = 9600, 3h = 14400, 4h = 19200, 5h = 28800, 6h = 38400, 7h = 57600, 8h = 115200
- Note 3: Valid IDs are 00h to 7Fh. Receive IDs must be unique (to avoid ambiguity)
- Note 4: 0h = Disabled, 1h = Update, 2h = Reply, 3h = Both
- Note 5: 0h = No timeout, 1h = 0.1 second timeout ... FFh = 25.5 second timeout
- Note 6: 00h to 7Fh map directly to Transmit IDs 00h to 7Fh. 80h maps to the Global Transmit ID FFh.
- Note 7: Bitmap indicating which Hardware Zones (Zones A, B, C, D, E or F) to allow RS-232 data to be output. If the bit is set, the data will be output.

Zone A 01h  
Zone B 02h

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Zone C 04h  
Zone D 08h  
Zone E 10h  
Zone F 20h

Thus an output mask of 2Bh would allow serial port data to be output on Zone A, Zone B, Zone D and Zone F, but NOT on Zone C and Zone E.

**NOTE:** The serial port data is always transmitted out the “primary” serial port connection, i.e. the RJ45 connector. An output mask of 00h will mask all data to the Hardware Zone outputs, but the data will still be transmitted to the primary serial port.

## Appendix Q, Status Messages

(0,U,S,0="BKC-DIP ACTIVE";05FE) Example Status Message

Message Number	Message	Indication
0	( <i>receiveID</i> ,U,S,0="BKC-DIP ACTIVE"; <i>cs16</i> )	BKC-DIP interface is active an the Device is ready to accept BKC-DIP commands
4	( <i>receiveID</i> ,U,S,4="za zb ... zn"; <i>cs16</i> )	String containing current Logical Zones in system, delimited by whitespace. For example default HD-6 zones: (0,U,S,4="0 B C D E F 10";)
5	( <i>receiveID</i> ,U,S,5="Pz=nn"; <i>cs16</i> )	Logical Zone <i>z</i> Preset <i>nn</i> updated, where <i>z</i> can range from 0h – 80h, and <i>nn</i> 0h – FEh
5	( <i>receiveID</i> ,U,S,5="S"; <i>cs16</i> )	System parameters updated