

# AMP

ADVANCED MEDIA PROTOCOL

Specification



→ VERSION 2.15

MARCH 2010

*the most watched worldwide*

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## Revision Status

Version Number	Revision Date	Description
1.7	01/04	New cover and copyright pages.
1.8	04/04	Added IANA port number.
1.9	07/04	Updated the following commands to support parallel transfers - <i>Extended Transfer ID</i> - Transfer ID Status Request - Abort Transfer
1.91	08/16	Made a small change in Extended Transfer ID command.
1.92	11/26/04	Updates to transfer ID Status Request to support return on abort/error state.
1.93	6/15/05	Added List First Folder and List Next Folder commands.
1.94	6/30/05	Added GetThumbnail command.
1.95	9/27/05	Added following commands 01.06 Set Drop Frame A4.15 Set Record Duration A2.1B Set Aspect Ratio AX.1A Get Aspect Ratio Updated following commands AA.13 <i>Clip Data Request</i> . Added file size to Option 'C', Added new Video Formats AX.1C Renamed and updated Contiguous Storage Request command. Now command is named Total/Available Storage. It has more functions added.
1.96	11/7/05	Updates to incorporate improvements suggested by Bryan Hunt
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2.05	1/31/2007	Added User Data Request Spec Updates
2.06	05/02/2007	Added New and Updated K2 ver. 3.2 commands. (Set Mark In, Set Mark Out, Set Widescreen Mode, Set Loop Playback Mode,

		Get Aspect Ratio Conversion Override , and Set Aspect Ratio Conversion Override)
2.09	05/06/2008	Added Audio Tagging commands to the spec.
2.10	05/08/2008	Clarified ID Changed List command, Current Time Sense command, and Audio Gain commands.
2.11	05/07/2009	Added information to the Device Type Request and Set Ganging commands.
2.12	8/20/2009	Added information about the new commands for setting and getting AFD values. Fixed/clarified the table of values returned by the Device Type Request command. Corrected typos in the chart showing return data for the IDs Changed List command.
2.13	12/21/2009	Updated AA.13 Clip Data Request to support DV100 and AVCI compression types. Removed obsolete "Get All Folders" command from spec. Updated introduction section to include information on longer clip names allowed on Summit. Corrected send data format in table for AX.34 Set Ganging Information. Clarified some commands requiring two arbitrary data bytes to be sent (A2.14, 42.14, 42.15, A2.04, A2.05).
2.14	3/25/2010	Removed mention of the (unsupported) optional bitrate parameter from Total Available Storage Request.
2.15	3/26/2010	Added (21.62) Set Mute Mode command.

# TABLE OF CONTENTS

1	Introduction.....	7
1.1.1	New AMP Commands .....	7
1.1.2	Extended Odetics Commands .....	10
2	How to read this specification.....	12
3	Communication Protocol .....	12
3.1	Error Acknowledgment.....	12
3.2	Command Timing .....	13
3.3	“In Preset” and “Preview In Preset” Transition .....	13
3.4	Data Bytes Maximum length .....	13
3.5	UTF-8.....	13
3.6	(10.01) ACK .....	13
3.7	(11.12) NAK .....	13
4	Command and status format.....	14
4.1	Standard command format.....	14
4.2	Command format variable-length clip and machine names .....	15
4.3	Status Data .....	16
4.3.1	Status byte 0.....	16
4.3.2	Status byte 1 .....	17
4.3.3	Status byte 2.....	17
4.3.4	Status byte 3.....	18
4.3.5	Status byte 4.....	19
4.3.6	Status byte 9.....	19
4.3.7	Status byte A .....	20
4.3.8	Status byte D .....	21
5	Command descriptions.....	22
5.1	Definitions.....	22
5.2	Device management.....	23
5.2.1	(01.06) Set Drop Frame Mode .....	23
5.2.2	(00.0C) Local Disable .....	23
5.2.3	(0X.1D) Local Enable .....	24
5.2.4	(00.11) Device Type Request .....	25
5.2.5	(20.04) Standby Off .....	25
5.2.6	(20.05) Standby On .....	26
5.2.7	(20.60) EE Off .....	26
5.2.8	(20.61) EE On .....	26
5.2.9	(21.62) Set Mute Mode .....	27
5.2.10	(A8.20) Set Device ID .....	28
5.2.11	(A0.21) Device ID Request.....	28
5.2.12	(A0.2C) Device Name Request.....	29
5.3	Transport controls .....	29
5.3.1	(2X.00) Stop.....	29
5.3.2	(2X.01) Play .....	30
5.3.3	(2X.02) Record .....	31
5.3.4	(20.0F) Eject .....	32

5.3.5	(20.10) Fast Forward.....	32
5.3.6	(2X.11) Jog Forward.....	33
5.3.7	(2X.12) Variable Forward.....	34
5.3.8	(2X.13) Shuttle Forward.....	34
5.3.9	(20.20) Rewind.....	35
5.3.10	(2X.21) Jog Reverse.....	35
5.3.11	(2X.22) Variable Reverse.....	36
5.3.12	(2X.23) Shuttle Reverse.....	37
5.3.13	(2X.31) Cue Up With Data.....	37
5.3.14	(20.52) Tension Release.....	38
5.3.15	(44.05) User Bits Preset.....	39
5.3.16	(40.20) In Reset.....	39
5.3.17	(41.36) Timecode Mode Preset.....	40
5.3.18	(40.40) Auto Mode Off.....	40
5.3.19	(40.41) Auto Mode On.....	41
5.3.20	(41.42) Set Loop Playback Mode.....	42
5.3.21	(41.43) Set Widescreen Mode.....	43
5.3.22	(41.44) Set Stop Mode.....	43
5.3.23	(40.45) Get Stop Mode.....	45
5.3.24	(60.0B) State Change Latency Request.....	46
5.3.25	(61.0C) Current Time Sense.....	46
5.3.26	(61.20) Status Sense.....	48
5.3.27	(AX.02) Record Cue Up With Data.....	49
5.4	Managing clips on the timeline.....	51
5.4.1	(4X.14) In Preset.....	51
5.4.2	(4X.15) Out Preset.....	54
5.4.3	(4F.16) Append Preset.....	56
5.4.4	(4X.21) Out Reset.....	57
5.4.5	(A0.06) Preview In Reset.....	57
5.4.6	(AX.07) Preview Out Reset.....	58
5.4.7	(44.31) Pre-roll.....	58
5.4.8	(AX.04) Preview In Preset.....	59
5.4.9	(AX.05) Preview Out Preset.....	62
5.4.1	(AF.0A) Append Preview Preset.....	63
5.4.2	(A1.32) Set Ganging.....	64
5.4.3	(A0.33) Get Ganging.....	65
5.4.4	(AX.34) Set Ganging Information.....	66
5.4.5	(A0.35) Get Ganging Information.....	67
5.4.6	(AX.11) Erase Segment.....	68
5.4.7	(A0.16) ID Loaded Request.....	69
5.4.8	(AX.01) Auto Skip.....	69
5.5	Managing stored clips.....	71
5.5.1	(A0.26) ID Count Request.....	71
5.5.2	(AX.14) List First ID.....	72
5.5.3	(AX.15) List Next ID.....	72
5.5.4	(AX.18) ID Status Request.....	74

5.5.5	(A2.0E) Set Working Folder Request .....	75
5.5.6	(A0.0F) Get Working Folder Request .....	76
5.5.7	(A0.12) IDs Changed List Request .....	76
5.5.8	(AX.10) Erase ID .....	78
5.5.9	(A0.2A) List First Folder .....	79
5.5.10	(A0.2B) List Next Folder .....	79
5.5.11	(AX.1C) Total /Available Storage Request .....	80
5.5.12	(A4.1D) Set Record Duration .....	82
5.5.13	(A2.31) Create Folder .....	82
5.5.14	(A2.28) Rename Folder .....	83
5.5.15	(A2.29) Delete Folder .....	84
5.5.16	(A2.25) ID Start Time Request .....	84
5.5.17	(A2.17) ID Duration Request .....	85
5.5.18	(AE.30) Replace Edit .....	86
5.5.19	(AX.2D) Stripe Timecode .....	87
5.5.20	(AX.2E) Set Mark In .....	88
5.5.21	(AX.2F) Set Mark Out .....	89
5.5.22	(AX.1A) Get Aspect Ratio Conversion Override .....	91
5.5.23	(A2.1B) Set Aspect Ratio Conversion Override .....	92
5.5.24	(AE.1E) Set Audio Gain .....	94
5.5.25	(AA.1F) Get Audio Gain .....	95
5.5.26	(C0.28) Abort Transfer ID .....	95
5.5.27	(C1.27) Transfer ID Status Request .....	96
5.5.28	(C2.26) Transfer ID .....	97
5.5.29	(C2.25) Extended Transfer ID .....	98
5.5.30	(C2.29) Network Delete .....	100
5.5.31	(AX.19) New Copy .....	101
5.5.32	(AX.22) Get Audio Track Labels .....	102
5.5.33	(AX.23) Set Audio Track Labels .....	103
5.5.34	(A0.36) Get Audio Input Tags .....	104
5.5.35	(AA.37) Set Audio Input Tags .....	105
5.5.36	(A0.38) Get Audio Output Tags .....	105
5.5.37	(AA.39) Set Audio Output Tags .....	106
5.5.38	(A2.3A) Get AFD Setting .....	107
5.5.39	(A2.3B) Set AFD Setting .....	108
5.6	Clip data information .....	109
5.6.1	(AA.08) Set Clip Data .....	109
5.6.2	(AA.13) Clip Data Request .....	111
5.6.3	(A2.09) Get Thumbnail .....	115
6	Ethernet Access .....	116
6.1	TCP API Interface .....	116
7	Index .....	119

# 1 Introduction

This document contains a description of the list of commands specified in the *Video Disk Recorder – Command and Control Specification* document of the Odetics Broadcast Corporation, along with a list of new and extended commands added by Thomson Grass Valley to the Odetics command set. We are calling this new extended protocol AMP – Advanced Media Protocol.

*Note:* As part of this extension, all commands are now available via Ethernet or RS-422 serial ports. Ethernet definition is provided TCP. Refer to Ethernet Access on page 116 for more Ethernet access information.

The new commands support variable length clip names, with allowable lengths up to 64K bytes. In such commands, the conventional byte count nibble is ignored and the first two data bytes sent contain the actual byte count. Thus, in these commands, data length can go up to 64K bytes, where the data bytes include all the bytes between the command code byte and the checksum byte.

Profile and K2 systems support clip names up to 32 chars, which limits the allowable clip name length that can be sent using these commands to 32 chars. Also, the maximum data bytes that can be sent are restricted to 256 bytes.

On the K2 Summit, longer clip and bin names are now permitted (refer to the document “K2 AppCenter User Manual” for details). When using long names with multi-byte character sets or certain AMP commands which can return multiple IDs in a single reply (commands 42.14, 42.15, A2.04, A2.05) it is possible for a reply packet to exceed 256 bytes.

This specification provides a complete listing of the proposed AMP command set, including new, extended, and unchanged commands. The following table lists the new and extended commands that are described in this specification.

1.1.1 New AMP Commands		
<b>Local Disable</b>	00.0C	Disable local control.
<b>Local Enable</b>	0X.1D	Allows for both local and remote control.
<b>EE Off</b>	20.60	This helps the operator to define the nature of the output on the screen when a clip has/has not been loaded on a channel.  If a screen is selected with <b>EE On</b> and no clip loaded, signals produced from other equipment will be allowed to simply pass through the VDR. To prevent this, the operator could set <b>EE Off</b> .  In order to display the clip that is loaded instead of EE, the operator could issue <b>EE Off</b> .  The operator could issue <b>EE On</b> to prevent the last frame of the previously loaded clip from being displayed, when a clip has not yet been loaded on a channel or when it has already been ejected
<b>EE On</b>	20.61	

1.1.1 New AMP Commands		
		from the channel.
<b>Timecode Mode Preset</b>	41.36	This command is used to set the timecode mode to be selected for subsequent <b>Play, Stop, Record, In Preset, Out Preset, Record Cue Up, Cue Up With Data, Preview In Preset, Preview Out Preset</b> and <b>Erase Segment</b> commands. The timecode modes that could be set include – Timer, LTC and VITC
<b>State Change Latency Request</b>	60.0B	This command requests the number of fields in advance of a desired state change that a controller must issue a command before it takes effect at the output.  This helps in performing ‘frame accurate’ operations such as <b>Play, Record, Stop</b> etc.
<b>Erase Segment</b>	A8.11	This command can be used to retain material between the specified timecode positions in the currently loaded ID. All timecode positions between the SOM and the specified starting timecode position and between ending timecode position and EOM, inclusive, will be erased and de-allocated.
<b>Device Name Request</b>	A0.2C	This command has been added to get the name of a VDR like Profile XP.
<b>Extended Transfer ID</b> <b>Transfer ID</b> <b>Transfer ID Status Request</b> <b>Abort Transfer ID</b> <b>Network Delete</b>	C2.25 C2.26 C1.27 C0.28 C2.29	These commands have been added to enable fibre channel transfer of clips.  Video files identified by the ID can be copied between the local disk system machine and a remote disk system machine using the <b>Transfer ID</b> command.  The <b>Transfer ID Status Request</b> command gives the status of the current transfer request being processed by the videodisk recorder. The various states of the transfer may be "queued," "building," "to try state," "currently in progress," or "completed." Information such as number of bytes transferred or number of fields transferred can be obtained.  The <b>Abort Transfer ID</b> will cause the disk system machine to abort the transfer request being processed by the videodisk recorder.  <b>Network Delete</b> will cause a clip on a destination system to be deleted.  AMP has a mode that does not consume a channel for these commands.
<b>Set Working Folder Request</b>  <b>Get Working Folder Request</b>	A2.0E  A0.0F	Currently, all commands issued by the controller refer to the default working folder, which cannot be changed. This forces the user to maintain all the files in one single default folder.  These commands allow the user to change the default working folder to any desired folder. Once the working folder has been changed, all further commands issued by the controller refer to this new working folder. This gives the user the ability to organize the files in different meaningful folders.



1.1.1 New AMP Commands		
<b>List First Folder</b> <b>List Next Folder</b> <b>Create Folder</b> <b>Rename Folder</b> <b>Delete Folder</b>	A0.2A A0.2B A3.11 A2.28 A2.29	These are folder management commands. They help the user view the existing folders, create, rename and delete folders and hence organize files in different logical folders.
<b>IDs Changed List Request</b> <b>IDs Changed List</b>	A0.12  82.13	This command helps the user obtain information about the list of clips that have changed and the nature of the change.  Clips that are added/deleted/modified after a certain reference point will be reported. The reference point may be when the VDR was first started, or when the <b>IDs changed list request</b> was last processed.
<b>Set Clip Data</b> <b>Clip Data Request</b> <b>Clip Data</b>	AC.16 AX.17 8C.17	These commands allow the user to maintain and retrieve clip related metadata on/from the VDR.
<b>New Copy</b>	AX.19	This command allows the user to create either a copy of a clip or a sub-clip of the original clip.
<b>ID Count Request</b> <b>ID Count</b>	A0.26 82.26	This command returns the total number of clips that are available in the current working folder.
<b>Pre-roll</b>	44.31	This command will affect the timing in which the <b>Play</b> , <b>Record</b> , and <b>Auto Skip</b> commands are executed. Please note that scheduled <b>Play</b> and scheduled <b>Record</b> commands are not affected by this command.
<b>Total/Available Storage Request</b>	AX.1C	This command is used to request the total storage capacity of the video server, or to request the space remaining on a video server in Extended Time Format or in regular timecode format.
<b>Set Record Duration</b>	A4.1D	This command sets the length of a recording and can be sent prior to or during recording.
<b>Get Thumbnail</b>	A2.09	This command returns a thumbnail of the clip requested.

1.1.2 Extended Odetics Commands		
<b>Play</b>	2X.01	<p>These motion commands have been extended to carry a 4 byte timecode data along with it.</p> <p>This allows one to schedule a <b>Play</b>, <b>Record</b> or <b>Stop</b> to occur at a defined timecode, which means that the operator need not be physically present in front of the controller to send these commands at the time when it needs to happen.</p> <p>This addition provides better accuracy in 'frame accurate' situations.</p>
<b>Record</b>	2X.02	
<b>Stop</b>	2X.00	
<b>Jog Forward</b>	2X.11	<p>This command was extended to take a 4 byte field count as a parameter, which causes the current timecode position to be moved by the number of fields specified.</p> <p>In VTR transport control usage, jog refers to turning the jog knob, resulting in the tape being moved forward or backwards by a number of frames. If you stop turning the jog knob, the VTR will stop where it is. This behavior was carried to the jog commands, with the parameter in the command specifying the number of fields to move forward/backward.</p>
<b>Jog Reverse</b>	2X.21	
<b>Record Cue Up With Data</b>	AX.02	<p>These commands have been extended to take the ID or device name as an extended variable length file name.</p> <p>Extended Format for clip/device names allows controllers to take advantage of long clip/device names supported in most VDRs, e.g. Profile XP supports 32 byte clip names. Also, in the future there is scope for allowing fully-qualified clip names to be sent as part of the protocol.</p>
<b>Current ID</b>	A0.16	
<b>List First ID</b>	AX.14	
<b>List Next ID</b>	AX.15	
<b>ID Start Time Request</b>	A2.25	
<b>ID Duration Request</b>	A2.17	
<b>ID Status Request</b>	AX.18	
<b>Erase ID</b>	AX.10	
<b>Current Time Sense</b>	61.0C	<p>This command has been extended to include the following:</p> <p>If bit 6 is set, then a four-byte current LTC timecode from the LTC source will also be returned.</p> <p>If bit 7 is set, then a four-byte current VITC timecode from the VITC source will also be returned.</p>
<b>In Preset</b>	4X.14	<p>These commands have been extended to take the ID name as an extended variable length file name. In addition, they have been extended to be able to cue up a list of clips to the timeline instead of a single clip. This allows the user to automatically create a playlist using the AMP command.</p> <p>Black may be inserted into the timeline by loading a pseudo clip ID named &lt;BLACK&gt;. By default, when this ID is loaded without timecode, it will be added to the timeline for 1 frame. The timecode associated with the <b>In Preset</b> command will determine the duration for the clip. If an <b>Out Preset</b> command is then sent, it will then manipulate this clip as any other clip.</p>
<b>Out Preset</b>	4X.15	
<b>Preview In Preset</b>	AX.04	
<b>Preview Out Preset</b>	AX.05	

1.1.2 Extended Odetics Commands		
<b>In Reset</b>	40.20	These clips have been extended to operate on a sequence of clips that have been cued onto the timeline instead of a single clip..
<b>Out Reset</b>	4X.21	
<b>Preview In Reset</b>	A0.06	
<b>Preview Out Reset</b>	AX.07	
<b>Auto Skip</b>	AX.01	Has been extended to skip a set number of clips or skip to the head of the <b>Preview In Preset</b> list

## 2 How to read this specification

The following command example illustrates how commands are documented in this specification.

Example:

**Command sent**  
5.2.3 (0X.1D) Local Enable ← **Command mnemonic**

**Location in document** →

**Command Sent**

**0X.1D Local Enable**

Command Type 0  
Byte count 0 – Local bit set high. Local+Remote bit set low  
2 – Extended command uses Send Data 1 & 2 to set Local and Local+Remote  
Command Code 1D  
Send Data 1 1 byte data to set state of local + remote  
Send Data 2 1 byte data to set state of local

**Command breakdown**

**Command block format**

CMD TYPE	BC	CMD CODE	CS
0	0	1 D	
1 byte		1 byte	1 byte

CMD TYPE	BC	CMD CODE	ACTUAL BYTE COUNT	LOCAL + REMOTE	LOCAL	CS
0	2	1 D				
1 byte		1 byte	2 byte	1 byte	1 byte	1 byte

**Returns**  
ACK ← **Return value**

**Comments**

If the controlled device receives this command, without any data bytes (00.1D) then the status byte 0, bit 0 (local) is set high and bit 1 of status byte 0 (Local+Remote) is un-affected. Control panel operations are possible and remote operations should be disabled.

If the controlled device receives the extended version of this command (02.1D) then Send Data 1 (Local+Remote) will set the status byte, 0 bit 1 to value contained in Send Data 1 (1, or 0). Send Data 2 (local) will set the status byte 0, bit 0 to the specified value in Send data 2 (1, 0). Using this method, the controlling device will be able to allow all combinations of remote and local control on the controlled device.

**Describes data byte options and helpful information relating to this command. General and server-specific information is found here.**

## 3 Communication Protocol

### 3.1 Error Acknowledgment

In case an error in communication is detected or an unknown command is received, the server shall return NAK + Error Data

## 3.2 Command Timing

- The minimum timing between commands is one frame.
- Controlling device shall wait for a response from current command before sending the next command.
- Controlling device will detect a timeout condition if it receives no reply within 100msec of sending a command.
- Response timing from controller shall not be greater than 10msec for immediate commands.

## 3.3 “In Preset” and “Preview In Preset” Transition

Clips in “Preview In Preset” will be moved to “In Preset” position after all the current clips in “In Preset” have played. At this time the status byte 9 bit 0 and bit 1 will be set to low.

## 3.4 Data Bytes Maximum length

The maximum number of data bytes accepted by the controller at one time is 65535 bytes.

## 3.5 UTF-8

Character encoding for strings follows the UTF-8 spec.

UTF-8 stands for **Unicode Transformation Format-8**. It is an octet (8-bit) lossless encoding of Unicode characters.

UTF-8 encodes each Unicode character as a variable number of 1 to 6 octets, where the number of octets depends on the integer value assigned to the Unicode character. It is an efficient encoding of Unicode documents that use US-ASCII characters because it represents each character in the range U+0000 through U+007F as a single octet.

<http://www.utf-8.com>

## 3.6 (10.01) ACK

This response is returned to acknowledge a command that requires no data to be returned.

## 3.7 (11.12) NAK

This response is returned in response to an immediate communications error resulting from a command. One byte of data will be returned with this response indicating the error or errors that occurred. This byte of data is a bit field with the following format:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Time Out	Framing Error	Overrun Error	Parity Error		Checksum Error		Undefined Command

<b>bit 7: Time Out</b>	This bit is high when a communications time-out error has occurred; otherwise it is low.
<b>bit 6: Framing Error</b>	This bit is high when a communications framing error has occurred; otherwise it is low.
<b>bit 5: Overrun Error</b>	This bit is high when a communications overrun error has occurred; otherwise it is low.
<b>bit 4: Parity Error</b>	This bit is high when a communications parity error has occurred; otherwise it is low.
<b>bit 2: Checksum Error</b>	This bit is high when a communications checksum error has occurred; otherwise it is low.
<b>bit 0: Undefined Command</b>	This bit is high when an undefined command error has occurred; otherwise it is low.

## 4 Command and status format

### 4.1 Standard command format

CMD-1+BC	CMD-2	DATA-1	DATA-2	DATA-N	CHECKSUM
----------	-------	--------	--------	--------	----------

byte 0	Most significant nibble is command type or function and least significant nibble is byte count (=n), which is the number of bytes between the command code byte and the checksum.
byte 1	Command code byte
byte n + 2	This is the checksum, which is calculated as the least significant 8 bits of the sum of the values of the function category and data count byte through the last data byte.

Between the Command Code byte and the checksum are ‘n’ data bytes. For instance, to cue a clip named 1 onto the timeline the byte stream to be sent is, 48143120202020202020 where

CMD-1+BC	CMD-2	DATA-1	DATA-2	DATA-3	DATA-4	DATA-5	DATA-6	DATA-7	DATA-8	CHECKSUM
4 + 8	14	31	20	20	20	20	20	20	20	

## 4.2 Command format variable-length clip and machine names

CMD-1+BC	CMD-2	Actual BC	Actual BC	DATA-1	DATA-2	DATA-N	CHECKSUM
----------	-------	-----------	-----------	--------	--------	--------	----------

**byte 0** Most significant nibble is command type or function and least significant nibble is byte count. Here byte count will have bit ‘1’ (2<sup>1</sup>) set high to indicate different command format.

**byte 1** Command code byte

**byte 2 & 3** These contain the actual byte count (=n). It is the number of bytes present between itself and the checksum.

**byte n + 4** This is the checksum, which is calculated as the least significant 8 bits of the sum of all the values.

Between the byte count bytes and the checksum are ‘n’ data bytes. For instance, to cue a clip named 1 on to the timeline, the byte stream that needs to be sent is,

4A140003000131

CMD-1+BC	CMD-2	Actual BC	Actual BC	DATA-1	DATA-2	DATA-3	CHECKSUM
4 + A	14	00	03	00	01	31	

The response time for commands with the above format will depend on the length of the command. Response and may be more than 10 ms for very long commands.

### 4.3 Status Data

The status data response (7X.20) is returned for the Status Sense command (61.20). The number and sequence of data bytes returned will depend on the value of the data byte sent with the request. Sending 0F will return all the status bytes. Applicable status bytes are shown below, with each field required of a video disk recorder implementation listed and described. These status bytes have the following format:

AMP Status Data Chart								
Status Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Busy		Cassette Out		General Error	Hard Error	Remote + local	Local
1	Standby On	Tension Release	Stop	Eject	Rewind	Fast Forward	Record	Play
2	Servo Lock		Shuttle	Jog	Variable Play	Direction	Still	Cue Complete
3	Auto Mode	Source Missing	Jog Reject	Folder Deletion Failed	Invalid Folder name	Specified Folder Exists	Out Preset	In Preset
4		EE On	Loop Playback Mode	Mute			Event schedule failed	Preroll
9	Overwrite Clip name	Out Preset Failed	Clips Dropped	Metadata not Found	Disk Overflow	Folder Not Found	Preview Out Preset	Preview In Preset
A	Movie Delete Failed	Transfer ID Abort Failed	Transfer ID Failed	Movie Delete Complete	Transfer ID Abort Complete	Transfer ID Complete	Timecode Not Found	ID Not Found
D	Tape Top	Tape End	LTC	Timer	VITC	Drop Frame	Widescreen Mode	Time Of Day

#### 4.3.1 Status byte 0

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Busy		Cassette Out		General Error	Hard Error	Remote + local	Local

##### bit 7: Busy

This bit is high if the video disk recorder cannot accept motion commands or other commands requiring time consuming processing, and low if those commands can be accepted. Note that status commands and other sensing commands must always be processed, even if this bit is set high.

##### bit 5: Cassette Out

This bit is always low.



**bit 3: General Error** This bit is set high to indicate any general error in the processing of a command.

**bit 2: Hard Error** This bit is high if a hardware error or other unrecoverable error is encountered, low if no such error has occurred.

**bit 1: Remote+Local** This bit is high if both remote control and local control are enabled, and is low for remote control only. Default to 0.

**bit 0: Local** This bit is high if local control is enabled and low if not. Default is 0.

#### 4.3.2 Status byte 1

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Standby On	Tension Release	Stop	Eject	Rewind	Fast Forward	Record	Play

**bit 7: Standby On** This bit is always high.

**bit 6: Tension Release** This bit is always low.

**bit 5: Stop** This bit is high when in stop mode, low for other modes.

**bit 4: Eject** This bit is always low.

**bit 3: Rewind** This bit is high when in rewind mode, low for other modes.

**bit 2: Fast Forward** This bit is high when in fast forward mode, low for other modes.

**bit 1: Record .** This bit is high when in record mode, low for other modes.

**bit 0: Play** This bit is high when in play or record mode, low for other modes.

#### 4.3.3 Status byte 2

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Servo Lock		Shuttle	Jog	Variable Play	Direction	Still	Cue Complete

**bit 7: Servo Lock** This bit is high when a play or record mode is active and low for other modes, such as when the output is not genlocked to the reference. While servo lock probably has no meaning for a video disk recorder, this status bit is provided in order to maintain compatibility with existing video cassette recorder implementations.

**bit 5: Shuttle .** This bit is high when in shuttle mode, low for other modes.

- bit 4: Jog** This bit is high when in jog mode, low for other modes.
- bit 3: Variable Play** This bit is high when in variable play mode, low for other modes.
- bit 2: Direction** This bit is low when timecode is increasing (“moving” forward), high when timecode is decreasing (“moving” in reverse).
- bit 1: Still** This bit is high when timecode is not changing (stopped, still, zero speed shuttle, jog, or variable play, etc.).
- bit 0: Cue Complete** This bit is set high at the completion of a **Cue Up With Data, Record Cue Up With Data, or In Preset** command. It is set low on initialization, as well as any time the current timecode position changes due to a motion command, etc.

#### 4.3.4 Status byte 3

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Auto Mode	Source Missing	Jog Reject	Folder Deletion Failed	Invalid Folder name	Specified Folder Exists	Out Preset	In Preset

- bit 7: Auto Mode** This bit is set high when auto mode is enabled, low when auto mode is disabled.
- bit 6: Source Missing** This bit is set high when the source file specified in **New Copy** does not exist.
- bit 5: Jog Reject**
- bit 4: Folder Deletion Failed** This bit is set high to indicate that the operation to delete folder failed.
- bit 3: Invalid Folder name** This bit is set high to indicate “Invalid Folder name.”
- bit 2: Specified Folder exists** This bit is set high to indicate “Specified Folder exists.”
- bit 1: Out Preset** This bit is set high if the auto mode Out Preset contains a valid timecode position. It is set low when a clip is ejected from the timeline.
- bit 0: In Preset** This bit is set high if the auto mode In Preset references a valid ID and contains a valid timecode position. It is set low when a clip is ejected from the timeline.

#### 4.3.5 Status byte 4

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	EE On	Loop Playback Mode	Mute			Event schedule failed	Pre-roll

##### bit 6: EE On

This bit is set high if EE is turned on.

##### bit 5: Loop Playback Mode

This bit is set high to indicate whether the channel's loop playback mode is enabled.

##### bit 4: Mute

This bit is set high to indicate whether the channel's mute playback mode is enabled.

##### bit 1: Event Schedule Failed

This bit is set high if a **Play**, **Stop**, or **Record** command was sent and the event failed to be scheduled.

##### bit 0: Pre-roll

This bit is set high while cueing (following the issuing of a **Record/Play Cue** command or **In Preset** command), and is set low high at completion.

#### 4.3.6 Status byte 9

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Overwrite Clip name	Out Preset Failed	Clips Dropped	Metadata not Found	Disk Overflow	Folder Not Found	Preview Out Preset	Preview In Preset

##### bit 7: Overwrite Clip Name

This bit is set high to indicate 'Cannot Overwrite an Existing Clip,' if a clip with the specified name is already present on the disk.

##### bit 6: Out Preset Failed

This bit is set high if clips have not been cued on to the timeline by a **Preview In Preset / In Preset** previously.

##### bit 5: Clips Dropped

This bit is set high if the number of changed clips overflows and the details of some clips whose details have been dropped.

##### bit 4: Metadata Not Found

This bit is set high to indicate that the requested metadata is not found in the database.

##### bit 3: Disk Overflow

This bit is set high to indicate disk overflow in case the server is unable to write clip data information to the database.

##### bit 2: Folder Not Found

This bit is set high if the specified folder is not found on the disk

#### **bit 1: Preview**

##### **Out Preset**

This bit is set high if the auto mode Preview Out Preset contains a valid timecode position. Otherwise, it is set low. The auto mode Preview Presets will become invalid, and this bit will be set low, when the auto mode Preview Presets are shifted to the auto mode Presets as part of the auto Play processing. During this transition, the Preview Preset status bit values are transferred to the respective preset status bits. This will be the means by which a controlling device can determine when it can set new values for the auto mode preview presets.

##### **bit 0: Preview In Preset**

This bit is set high if the auto mode Preview In Preset references a valid ID and contains a valid timecode position. Otherwise, it is set low. The auto mode Preview Presets will become invalid, and this bit will be set low, when the auto mode Preview Presets are shifted to the auto mode Presets as part of the auto Play processing. During this transition the Preview Preset status bit values are transferred to the respective preset status bits. This will be the means by which a controlling device can determine when it can set new values for the auto mode Preview Presets.

#### **4.3.7 Status byte A**

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Movie Delete Failed	Transfer ID Abort Failed	Transfer ID Failed	Movie Delete Complete	Transfer ID Abort Complete	Transfer ID Complete	Timecode Not Found	ID Not Found

**bit 7: Network Delete Failed** This bit is set high if the command AX.29 **Delete File From** terminated with an error.

**bit 6: Transfer ID Abort Failed** This bit is set high if the command AX.289 **Abort Transfer ID** terminated with an error.

**bit 5: Transfer ID Failed** This bit is set high if the command AX.26 **Transfer ID** terminated with an error.

**bit 4: Network Delete Complete** This bit is set low when the command AX.29 **Delete File From** is received. It is set high when the delete is complete.

**bit 3: Transfer ID Abort Complete** This bit is set low when the AX.28 **Abort Transfer ID** command is received. It is set high when the abort is complete.

**bit 2: Transfer ID Complete** This bit is set low when the AX.26 **Transfer ID** command is received. It is set high when the network transfer is complete.

**bit 1: Timecode Not Found** This bit is set high when the timecode searched for is not found.

**bit 0: ID Not Found** This bit is set high if the ID specified is not found while processing commands A8.22 **ID Duration Request**, AC.23 **Timecode Position Request**, A8.25 **ID Start Time Request**, AX.26 **Transfer ID**.

#### 4.3.8 Status byte D

*Note: Although the status bits described for this status byte are not defined in the Sony Betacam/Betacam SP Protocol, they are defined in subsequent documents such as the Sony DVR-10/DVR-C10 Protocol.*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Tape Top	Tape End	LTC	Timer	VITC	DF	Widescreen Mode	Time Of Day

**bit 7: Tape Top** This bit is set high when the current timecode position has reached its minimum value and can not decrease (“move” in reverse). Once set, this bit will be cleared (set low) by any movement command (**Play**, **Rewind**, etc.), and will continue to be set low as long as the current timecode position can decrease (“move” in reverse).

**bit 6: Tape End** This bit is set high when the current timecode position has reached its maximum value and can not increase (“move” forward). Once set, this bit will be cleared (set low) by any movement command (**Play**, **Rewind**, etc.), and will continue to be set low as long as the current timecode position can increase (“move”

forward). This bit is also used during recording to indicate to the controlling device that there is no more available storage in the video disk recorder.

<b>bit 5: LTC</b>	This bit is set high if the current timecode mode is LTC
<b>bit 4: Timer</b>	This bit is set high if the current timecode mode is Timer
<b>bit 3: VITC</b>	This bit is set high if the current timecode mode is VITC
<b>bit 2: DF</b>	This bit is set high to indicate whether the channels drop frame mode is enabled.
<b>bit 1: Widescreen Mode</b>	This bit is set high to indicate whether the channels widescreen mode is enabled.
<b>bit 0: Time Of Day</b>	This bit is set high if the current timecode mode is Time Of Day. (Supported on K2 Server.)

## 5 Command descriptions

### 5.1 Definitions

<b>Name Format</b>	An 8 byte ASCII name representing the file name of the clip. If timecode and name are together, the timecode precedes the name in the data stream. If the name length is less than 8 bytes, then the extra bytes following the name are padded with blanks (0x20).
<b>Extended Name Format</b>	A variable length ASCII name preceded by a two-byte value containing the name length. If timecode and name are together, the timecode precedes the name in the data stream.
<b>Timecode Format</b>	Timecode is represented in four BCD bits representing the hours (hh), minutes (mm), seconds (ss), and frames (ff) of a clip. The ordering of the bytes is: ff ss mm hh with frames sent first in the byte stream.
<b>Format for Multi-Byte Numbers Sent</b>	MSB is sent first in the stream.

## 5.2 Device management

### 5.2.1 (01.06) Set Drop Frame Mode

#### Command Sent

##### 01.06 Set Drop Frame Mode

Command Type      0  
Byte count          1  
Command Code      06

Send Data 1          1 byte data to set Drop Frame on/off

CMD TYPE	BC	CMD CODE		Send Data 1	CS
0	1	0	6		
1 byte		1 byte		1 byte	1 byte

#### Returns

ACK

#### Comments

When the videodisk recorder receives this command, it will set the drop frame mode to true/false. If the Send Data =1, then the channel's default drop frame mode is set to true. If Send Data = 0, then channel's default drop frame mode is set to false. This value is ignored if the channel's video timing is not NTSC.

Status byte 'D' bit '2' will hold the drop frame setting for the current session.

### 5.2.2 (00.0C) Local Disable

#### Command Sent

##### 00.0C Local Disable

Command Type      0  
Byte count          0  
Command Code      0C

#### Returns

ACK

#### Comments

If the controlled device receives this command, all operations on its control panel except REMOTE/LOCAL selection will be disabled. Status byte 0, bit 0 (Local Enabled bit) is set to 0.

Only remote control operations are possible. Status byte 0, bit 1 (Local + Remote bit) is set low to indicate that the controlled device will process commands only from the remote controller.

### 5.2.3 (0X.1D) Local Enable

#### Command Sent

##### 0X.1D Local Enable

Command Type        0  
Byte count            0 – Local bit set high. Local+Remote bit set low  
                             2 – Extended command uses Send Data 1 & 2 to set Local and Local+Remote  
Command Code        1D  
Send Data 1           1 byte data to set state of local + remote  
Send Data 2           1 byte data to set state of local

CMD TYPE	BC	CMD CODE		CS
0	0	1	D	
1 byte		1 byte		1 byte

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LOCAL + REMOTE	LOCAL	CS
0	2	1	D				
1 byte		1 byte		2 byte	1 byte	1 byte	1 byte

#### Returns

ACK

#### Comments

If the controlled device receives this command with byte count equal to '0,' (00.1D), then the status byte 0, bit 0 (local) is set high and bit 1 of status byte 0 (Local+Remote) is un-affected. Control panel operations are possible and remote operations should be disabled.

If the controlled device receives the extended version of this command in which byte count equals 2 (02.1D), then Send Data 1 (Local+Remote) will set the status byte,0 bit 1 to value contained in Send Data 1 (1, or 0). Send Data 2 (local) will set the status byte 0, bit 0 to the specified value in Send data 2 (1, 0). Using this method, the controlling device will be able to allow all combinations of remote and local control on the controlled device.



### 5.2.4 (00.11) Device Type Request

#### Command Sent

##### 00.11 Device Type Request

Command Type      0  
Byte count        0  
Command Code     11

#### Returns

##### 12.11 Device Type

Command Type      1  
Byte count        2  
Command Code     11  
Return Data 1     1-byte category of device  
Return Data 2     1-byte model number

#### Comments

This command requests the model identifier of the video disk recorder. The video disk recorder will respond with a Device Type response (12.11).

Two bytes of data will be returned with the response. The first byte is generally used as a category of device, and the second byte is generally used as a model number for the device. Although not officially specified, some video cassette recorder implementations use the least significant bit of the category byte of the device type to indicate if the device is configured for NTSC (bit low) or PAL (bit high). Video disk recorder manufacturers must assign a unique number for their category and models, and should be careful to avoid conflicting with existing device types.

Device Type Models	Category	Model
Profile	0xD8	0x00
M122A (Analog M-Series), K2 (versions before 3.3)	0xD8	0x01
M122 (M-Series)	0xD8	0x02
K2-SD (version 3.3 and greater)	0xD8	0x03
K2-HD (version 3.3 and greater)	0xD8	0x04
K2-Summit	0xD8	0x05

### 5.2.5 (20.04) Standby Off

#### Command Sent

##### 20.04 Standby Off

Command Type      2

Byte count	0
Command Code	04

#### **Returns**

ACK

#### **Comments**

This command has no effect in a video disk recorder, and the video disk recorder will always respond with an ACK response (10.01).

### 5.2.6 (20.05) Standby On

#### **Command Sent**

##### **20.05 Standby On**

Command Type	2
Byte count	0
Command Code	05

#### **Returns**

ACK

#### **Comments**

This command has no effect in a video disk recorder, and the video disk recorder will always respond with an ACK response (10.01).

### 5.2.7 (20.60) EE Off

#### **Command Sent**

##### **20.60 EE Off**

Command Type	2
Byte count	0
Command Code	60

#### **Returns**

ACK

#### **Comments**

This command will request the video disk recorder to turn EE mode off. The disk recorder will send back an ACK reply. Status byte 4, bit 6 is set to 0 to indicate EE turned off. In this mode, the output shown will be the active timeline's current position.

### 5.2.8 (20.61) EE On

#### **Command Sent**

### 20.61 EE On

Command Type        2  
Byte count            0  
Command Code        61

#### Returns

ACK

#### Comments

This command will request the video disk recorder to turn on EE mode. The disk recorder will send back an ACK reply. Status byte 4, bit 6 is set to 1 to indicate EE turned on. In this mode, when no clips are playing or recording, the channel's live video input is directly connected to the output.

### 5.2.9 (21.62) Set Mute Mode

#### Command Sent

#### 21.62 Set Mute Playback Mode

Command Type        2  
Byte count            1  
Command Code        62

Send Data 1            1 byte data to set Mute Mode On/Off

CMD TYPE	BC	CMD CODE		MUTE MODE	CS
2	1	6	2		
1 byte		1 byte		1 byte	1 byte

#### Returns

ACK

#### Comments

This command was introduced in the K2-Summit server, version 7.2.

When the video disk recorder receives this command, it will set the mute playback mode to true/false. If Send Data 1 = 1, then the channel's mute mode is set to true. If Send Data 1 = 0, then the channel's mute mode is set to false. The value is ignored if the channel is not a player. Status byte '4' bit '4' will hold the mute mode setting for the current channel.

If the video disk recorder does not support mute mode, the command will return ACK but the mute mode status will not be set high.

#### 5.2.10 (A8.20) Set Device ID

##### Command Sent

###### A8.20 Set Device ID

Command Type	A
Byte count	8
Command Code	20
Send Data 1	8 byte Device ID

##### Returns

ACK

##### Comments

This command will set the device ID to the device ID specified.

#### 5.2.11 (A0.21) Device ID Request

##### Command Sent

###### A0.21 Device ID Request

Command Type	A
Byte count	0
Command Code	21

##### Returns

###### 88.21 Device ID

Command Type	8
Byte count	8
Command Code	21
Return Data	8 byte device ID

##### Comments

This command will request the device ID of the video disk recorder, returned using the device ID response (88.21).

Eight bytes of data will be returned corresponding to the device ID previously set using the set device ID command (A8.20). If no device ID has been previously set, the video disk recorder will return eight null bytes with a value of 0 for the device ID.

### 5.2.12 (A0.2C) Device Name Request

#### Command Sent

##### A0.2C Device Name Request

Command Type	A
Byte count	0
Command Code	2C

#### Returns

##### 82.2C Device Name

Command Type	8
Byte count	2 – Indicates variable length data follows
Command Code	2C
Send Data 1	2-byte number of data bytes to follow
Send Data 2	1 byte device name length (n)
Send Data 3	n byte device name (up to 32 bytes)

#### Comments

When the video disk recorder receives this command, it will send back its name as reply in the format specified above.

## 5.3 Transport controls

The following commands implement typical tape transport operations.

### 5.3.1 (2X.00) Stop

#### Command Sent

##### 2X.00 Stop

Command Type	2
Byte count	0 or 4
Command Code	00
Send Data 1	4 byte time data (timecode format <sup>5.1</sup> (ffssmmhh)) (Optional)

#### Returns

ACK

#### Comments

This command places the video disk recorder in the stop mode, and any “motion” command such as **Play**, **Fast Forward**, **Record**, etc., will stop. This command will abort any current auto play or record process, but will not reset the auto mode presets and preview presets.

When a **Stop** command is issued, the stop status (status byte 1, bit 5) will be set high. In addition, the rewind status (status byte 1, bit 3), fast forward status (status byte 1, bit 2), record status (status byte 1, bit 1), play status (status byte 1, bit 0), shuttle status (status byte 2, bit 5), jog status (status byte 2, bit 4), and variable play status (status byte 2, bit 3) will all be set low.

This command can be sent with 0 or 4 bytes of Data. If zero bytes of data are received, then the **Stop** will stop the current “motion” in progress on the next frame.

If 4 bytes of data are received, then the **Stop** will occur a frame after the timecode value specified is reached on the timecode generator in the disk recorder. The timecode generator could be of type LTC, VITC or Timer, based on the current timecode mode set. The Event Schedule Failed status bit (status byte 4, bit 1) will be set if the driver was not able to schedule the **Stop**. The status bits described earlier will be set when the **Stop** actually takes effect.

If any **Play**, **Stop** or **Record** command without a timecode is sent after this command, then the event associated with this command will be cancelled. This command will also be cancelled if a **Rewind** or **Fast Forward** command is sent.

If a timecode is provided with this command, it should be sent at least four frames prior to the specified timecode.

### 5.3.2 (2X.01) Play

#### Command Sent

##### 2X.01 Play

Command Type	2
Byte count	0 or 4
Command Code	01
Send Data 1	4 byte time (Timecode Format <sup>5.1</sup> (ffssmmhh)) (Optional)

#### Returns

ACK

#### Comments

This command places the video disk recorder in the play mode, and playback will begin. Playback begins from the current timecode position on the currently loaded ID. The timecode position will increase and new video material will be output until playback is stopped.

If auto mode is enabled, the **Play** command will initiate the auto play processing described under the **Auto Mode On** command (40.41).

There should be a fixed latency in number of frames from the time this command is issued, after a **Play Cue** or **In Preset** is issued, until the video disk recorder begins playback. This allows the controlling device to ‘frame accurately’ play material.

When a **Play** command is issued, the stop status (status byte 1, bit 5) will be set low, and the play status (status byte 1, bit 0) and servo lock status (status byte 2, bit 7) will be set high.

This command can be sent with 0 or 4 bytes of Data. If zero bytes of data are received, then the Play will begin a frame after the command is received.

If 4 bytes of data are received, then the Play will begin a frame after the time on the timecode generator on the disk recorder reaches the specified time. The timecode generator used will depend on the timer mode set. The Event Schedule Failed status bit (status byte 4, bit 1) will get set if the disk recorder was not able to schedule the **Play**. The status bits described earlier will get set when the **Play** actually begins. If any other shuttle command is sent after this command, then this command will be cancelled.

If any **Play**, **Stop** or **Record** command without a timecode is sent after this command, then the event associated with this command will get cancelled. This command will also get cancelled if a **Rewind** or **Fast Forward** command is sent.

If a timecode is provided with this command, it should be sent at least four frames prior to the specified timecode.

### 5.3.3 (2X.02) Record

#### Command Sent

##### 2X.02 Record

Command Type	2
Byte count	0 or 4
Command Code	02
Send Data 1	4 byte time (Timecode Format <sup>5.1</sup> (ffssmmhh)) (Optional)

#### Returns

ACK

#### Comments

This command places the video disk recorder in the record mode, and recording will begin. Recording begins from the current timecode position on the currently loaded ID, and the timecode position will increase and new video material will be recorded until recording is stopped.

If auto mode is enabled, the **Record** command will initiate the auto record processing described under the **Auto Mode On** command (40.41).

There should be a fixed latency in number of frames from the time this command is issued, after a **Record Cue** is issued, until the video disk recorder actually starts recording, so that the controlling device can 'frame accurately' synchronize the source material.

When a **Record** command is issued, the stop status (status byte 1, bit 5) will be set low, and the record status (status byte 1, bit 1), play status (status byte 1, bit 0) and servo lock status (status byte 2, bit 7) will be set high.

This command can be sent with 0 or 4 bytes of data. If zero bytes of data are received, then the **Record** will begin a frame after the command is received.

If 4 bytes of data are received, then the **Record** will begin a frame after the time in the timecode generator in the disk recorder reached the specified timecode. The timecode generator could be of type LTC, VITC or timer based on the current timecode mode set. The Event Schedule Failed status bit (status byte 4, bit 1) will get set if the driver was not able to schedule the **Record**. The status bits described earlier will be set when the **Record** actually begins.

If any **Play**, **Stop** or **Record** command without a timecode is sent after this command, then the event associated with this command will be cancelled. This command will also be cancelled if a **Rewind** or **Fast Forward** command is sent.

If a timecode is provided with this command, it should be sent at least four frames prior to the specified timecode.

#### 5.3.4 (20.0F) Eject

##### Command Sent

###### 20.0F Eject

Command Type	2
Byte count	0
Command Code	0F

##### Returns

ACK

##### Comments

This command places the video disk recorder in an idle mode where any "motion" command such as **Play**, **Fast Forward**, **Record**, etc., shall be aborted, and the currently loaded clip, if any, is unloaded. All Preview Presets shall be cleared and all preset status bits are cleared. Auto mode will remain in its current state.

If an encoder receives this command, the recording in progress shall be cleanly stopped. The clip is not deleted from the cache. When an Eject command is issued, the stop status (status byte 1, bit 5) will be set high, and the rewind status (status byte 1, bit 3), fast forward status (status byte 1, bit 2), record status (status byte 1, bit 1), play status (status byte 1, bit 0), shuttle status (status byte 2, bit 5), jog status (status byte 2, bit 4), and variable play status (status byte 2, bit 3) shall be all set low. Status byte 0, bit 7, busy bit is set high to indicate the system is busy until the Eject process is complete.

The video disk recorder will respond with an ACK response (10.01)

#### 5.3.5 (20.10) Fast Forward

##### Command Sent



## 20.10 Fast Forward

Command Type	2
Byte count	0
Command Code	10

### Returns

ACK

### Comments

This command will cause the current timecode position to increase at the maximum speed. The video output will be updated as frequently as possible.

When a fast forward command is issued, the stop status (status byte 1, bit 5) and direction status (status byte 2, bit 2) will be set low, and the fast forward status (status byte 1, bit 2) will be set high.

The video disk recorder will respond with an ACK response (10.01)

## 5.3.6 (2X.11) Jog Forward

### Command Sent

#### 2X.11 Jog Forward

Command Type	2
Byte count	1 – One rate parameter sent 2 – Two rate parameters sent 4 – Number of fields sent
Command Code	11
Send Data	1-byte rate parameter 1
Send Data	1-byte rate parameter 2 (Optional)
Send Data	4-byte field count sent

### Returns

ACK

### Comments

This command can be sent with rate parameters. In this case, it will cause the current timecode position to increase at the specified speed. The data provided for this command is variable.

If one byte of data is specified as the rate parameter,  $N$ , the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter,  $N_1$  and  $N_2$ , the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{10^{(N_1+1/32-2)} - 10^{(N_1/32-2)}\}$  times the normal play speed. The video output will be updated as frequently as possible.

This command can be sent with a 4-byte field count. In this case, the current position is moved forward by the number of fields specified.

When this command is issued, the stop status (status byte 1, bit 5) and direction status (status byte 2, bit 2) will be set low, and the jog status (status byte 2, bit 4) will be set high.

### 5.3.7 (2X.12) Variable Forward

#### Command Sent

##### 2X.12 Variable Forward

Command Type	2
Byte count	1 or 2
Command Code	12
Send Data 1	1-byte rate parameter 1
Send Data 2	1-byte rate parameter 2 (Optional)

#### Returns

ACK

#### Comments

This command will cause the current timecode position to increase at the specified speed. The data provided for this command is variable.

If one byte of data is specified as the rate parameter,  $N$ , the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter,  $N_1$  and  $N_2$ , the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{10^{(N_1+1/32-2)} - 10^{(N_1/32-2)}\}$  times the normal play speed. The video output will be updated as frequently as possible.

When this command is issued, the stop status (status byte 1, bit 5) and direction status (status byte 2, bit 2) will be set low, and the variable play status (status byte 2, bit 3) will be set high.

### 5.3.8 (2X.13) Shuttle Forward

#### Command Sent

##### 2X.13 Shuttle Forward

Command Type	2
Byte count	1 or 2
Command Code	13
Send Data 1	1-byte rate parameter 1
Send Data 2	1-byte rate parameter 2 (Optional)

#### Returns

ACK

#### Comments

This command will cause the current timecode position to increase at the specified speed. The data provided for this command is variable.

If one byte of data is specified as the rate parameter, N, the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter, N<sub>1</sub> and N<sub>2</sub>, the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{10^{(N_1+1/32-2)} - 10^{(N_1/32-2)}\}$  times the normal play speed. The video output will be updated as frequently as possible.

When this command is issued, the stop status (status byte 1, bit 5) and direction status (status byte 2, bit 2) will be set low, and the shuttle status (status byte 2, bit 5) will be set high.

#### 5.3.9 (20.20) Rewind

##### Command Sent

###### 20.20 Rewind

Command Type	2
Byte count	0
Command Code	20

##### Returns

ACK

#### Comments

This command will cause the current timecode position to decrease at the maximum speed. The data provided for this command is variable.

When a rewind command is issued, the stop status (status byte 1, bit 5) will be set low, and the rewind status (status byte 1, bit 3) and direction status (status byte 2, bit 2) will be set high.

#### 5.3.10 (2X.21) Jog Reverse

##### Command Sent

###### 2X.21 Jog Reverse

Command Type	2
Byte count	1 – One rate parameter sent 2 – Two rate parameters sent 4 – Number of fields sent
Command Code	21
Send Data	1-byte rate parameter 1

Send Data	1-byte rate parameter 2 (Optional)
Send Data	4-byte field count sent

### Returns

ACK

### Comments

This command can be sent with rate parameters. In this case, it will cause the current timecode position to decrease at the specified speed.

If one byte of data is specified as the rate parameter, N, the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter, N1 and N2, the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{10^{(N_1+1/32-2)} - 10^{(N_1/32-2)}\}$  times the normal play speed. The video output will be updated as frequently as possible.

This command can be sent with a 4-byte field count. In this case, the current position is moved backward by the number of fields specified.

When one of these commands is issued, the stop status (status byte 1, bit 5) will be set low, and the jog status (status byte 2, bit 4) and direction status (status byte 2, bit 2) will be set high.

## 5.3.11 (2X.22) Variable Reverse

### Command Sent

#### 2X.22 Variable Reverse

Command Type	2
Byte count	1 or 2
Command Code	22
Send Data 1	1-byte rate parameter 1
Send Data 2	1-byte rate parameter 2 (Optional)

### Returns

ACK

### Comments

These commands will cause the current timecode position to decrease at the specified speed. This command can be issued with either one or two parameters.

If one byte of data is specified as the rate parameter, N, the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter, N1 and N2, the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{10^{(N_1+1/32-2)} - 10^{(N_1/32-2)}\}$  times the normal play speed. The video output will be updated as frequently as possible.

When one of these commands is issued, the stop status (status byte 1, bit 5) will be set low, and the variable play status (status byte 2, bit 3) and direction status (status byte 2, bit 2) will be set high.

### 5.3.12 (2X.23) Shuttle Reverse

#### Command Sent

##### 2X.23 Shuttle Reverse

Command Type	2
Byte count	1 or 2
Command Code	23
Send Data 1	1-byte rate parameter 1
Send Data 2	1-byte rate parameter 2 (Optional)

#### Returns

ACK

#### Comments

These commands will cause the current timecode position to decrease at the specified speed. This command can be issued with either one or two parameters.

If one byte of data is specified as the rate parameter, N, the speed is defined as  $10^{(N/32-2)}$  times the normal play speed.

If two bytes of data are specified as the rate parameter, N1 and N2, the speed is defined as  $10^{(N_1/32-2)} + N_2 / 256 \{ 10^{(N_1+1/32-2)} - 10^{(N_1/32-2)} \}$  times the normal play speed. The video output will be updated as frequently as possible.

When one of these commands is issued, the stop status (status byte 1, bit 5) will be set low, and the shuttle status (status byte 2, bit 5) and direction status (status byte 2, bit 2) will be set high.

### 5.3.13 (2X.31) Cue Up With Data

#### Command Sent

##### 2X.31 Cue Up With Data

Command Type	2
Command Code	31
Byte count	0, 4, 8, C
Send Data 1	4-byte timecode (Timecode Format <sup>5.1</sup> (ffssmmhh)) (Optional)
Send Data 2	clip name in Name Format <sup>5.1</sup> (Optional)

#### Returns

ACK

## Comments

This command can be used prior to playback to load the currently active ID for the channel and/or set the current timecode position within the currently loaded ID. This command will also set the ID and/or the timecode position for the auto mode In Preset as described by the **In Preset** command (4X.14). The data provided for this command is variable.

When a **Cue Up With Data** command is accepted and an ACK response is received by the controlling device, the Pre-roll status (status byte 4, bit 0) will be set high, and the cue complete status (status byte 2, bit 0) will be set low. When the cue command has successfully completed, the Pre-roll status (status byte 4, bit 0) will be set low, and the cue complete status (status byte 2, bit 0) will be set high. If the cue command does not successfully complete, the Pre-roll status (status byte 4, bit 0) and cue complete status (status byte 2, bit 0) will be set low.

This command can be issued with no parameters. If byte count is zero, the current timecode position will be set to the first field of video, and the currently loaded ID will be used.

This command can be issued with a single timecode position parameter. If byte count is four, the current timecode position will be set to the specified timecode position within the currently loaded ID.

This command can be issued with a single ID parameter. If byte count is eight, the ID corresponding to the specified ID will be loaded, and the current timecode position will be set to the first field of video. If the ID specified does not currently exist in the video disk recorder, the cue command will not successfully complete.

This command can be issued with two parameters indicating the timecode position and ID. If byte count is twelve, the first four bytes correspond to the timecode position and the next eight bytes correspond to the ID. When this command is issued, the ID corresponding to the specified ID will be loaded, and the current timecode position will be set to the specified timecode position. If the ID specified does not currently exist in the video disk recorder, the cue command will not successfully complete.

Black may be inserted into the timeline by loading a pseudo clip ID named **<BLACK>**. By default, when this ID is loaded without timecode, it will be added to the timeline for 1 frame. The timecode associated with the **In Preset** command will be used for the duration for the clip. If an **Out Preset** command is then sent, it will manipulate this pseudo clip same as it would any other clip.

Note: To cue up a clip with an extended clip name, please see the **In Preset** command (4X.14).

### 5.3.14 (20.52) Tension Release

#### Command Sent

##### 20.52 Tension Release

Command Type	2
Byte count	0

Command Code      52

**Returns**

ACK

**Comments**

This command has no effect in a video disk recorder, and the video disk recorder will always respond with an ACK response (10.01).

**5.3.15 (44.05) User Bits Preset**

**Command Sent**

**44.05 User Bits Preset**

Command Type	4
Byte count	4
Command Code	05
Send Data 1	4-byte user bit value

**Returns**

ACK

**Comments**

This command will set the current user bit preset values to the values of the specified 4 bytes.

**5.3.16 (40.20) In Reset**

**Command Sent**

**40.20 In Reset**

Command Type	4
Byte count	0
Command Code	20

**Returns**

ACK

**Comments**

This command will clear the ID for the auto mode In Preset to an undefined ID, and will clear the timecode position for the auto mode In Preset to 00:00:00:00, thereby making the **In Preset** invalid.

When an **In Reset** command is issued and the **In Preset** becomes invalid, the In Preset status (status byte 3, bit 0) will be set low.

### 5.3.17 (41.36) Timecode Mode Preset

#### Command Sent

##### 41.36 Timecode Mode Preset

Command Type	4
Byte count	1
Command Code	36
Send Data	0 – Select LTC mode 1 – Select Timer mode 2 – Select VITC mode 3 – Select Time Of Day mode

#### Returns

ACK

#### Comments

This command is used to select the timecode mode to be selected for subsequent **Auto Skip, Play, Stop, Record, In Preset, Out Preset, Record Cue Up With Data, Cue Up With Data, Preview In Preset, Preview Out Preset, Erase Segment, and ID Start Time Request** commands. The mode is set to Timer by default when the AMP driver starts up on the Video Disk Recorder.

On the K2 Server, the Time Of Day option is supported. This Time of Day setting sets the AMP channel to the Time of Day configuration defined in the System Configuration dialog on the K2 Client.

Status byte 'D' bits 5, 4, 3, or 0 are set high based on the current timecode mode.

### 5.3.18 (40.40) Auto Mode Off

#### Command Sent

##### 40.40 Auto Mode Off

Command Type	4
Byte count	0
Command Code	40

#### Returns

ACK

#### Comments



This command will disable auto play of video segments that was enabled with the Auto Mode On command (40.41).

When this command is issued and auto mode is disabled, the auto mode status (status byte 3, bit 7) will be set low.

### 5.3.19 (40.41) Auto Mode On

#### Command Sent

##### 40.41 Auto Mode On

Command Type	4
Byte count	0
Command Code	41

#### Returns

ACK

#### Comments

This command will enable auto play of video segments as defined by the auto mode ID and in and Out Preset values. Auto mode is the mechanism by which advanced cueing information can be provided to the video disk recorder, thereby allowing continuous playback of video material.

When this command is issued and auto mode becomes enabled, the auto mode status (status byte 3, bit 7) will be set high. The In and Out Preset values, as well as the In Preview and Out Preset values will be cleared, and the In Preset status (status byte 3, bit 0), Out Preset status (status byte 3, bit 1), Preview In Preset status (status byte 9, bit 0), and Preview Out Preset status (status byte 9, bit 1) will be set low.

When auto mode is enabled and a **Play** command (20.01) is issued, the video disk recorder will begin playing the ID specified by the **In Preset** command and will play to the auto mode Out Preset position.

After an **In Preset** command has completed processing, there should be a fixed latency in the number of frames from the time the **Play** command is issued until the video disk recorder actually starts playback, so that the controlling device can frame accurately synchronize the source material.

When the Out Preset has been reached, and if auto mode is still enabled, the video disk recorder will examine the auto mode Preview In Preset (set by the **Preview In Preset** command, AX.04). If it is valid, the ID and the In and Out Preset values will be shifted from the auto mode Preview Preset to the auto mode Preset, and the video disk recorder will once again load the ID specified by the ID for the auto mode Preset, and output video material from the auto mode In Preset to the auto mode Out Preset. At this point a new set of **Preview In Preset**, **Preview Out Preset** commands can be sent. When the ending timecode position has been reached, and if auto mode is still enabled, the video disk recorder will repeat the process until either no more **Preview In/Out Preset** commands are sent, or any

other command that would cause video output to stop is issued (such as a **Stop** command, 20.00, etc.), or any error occurs that would prevent auto play from continuing.

The auto mode Out Preset and the auto mode Preview In and Preview Out Preset may be changed at any time up to their use during the auto play process.

A **Stop** command (20.00) will immediately abort a current auto play process, but will not reset the auto mode Presets or Preview Presets. An **Auto Skip** command (A0.01) will abort the current auto play or record segment only, and will cause processing to proceed as if the Out Preset had been reached, as described above.

### 5.3.20 (41.42) Set Loop Playback Mode

#### Command Sent

##### 41.42 Set Loop Playback Mode

Command Type        4  
 Byte count            1  
 Command Code        42

Send Data 1            1 byte data to set Loop Mode On/Off

CMD TYPE	BC	CMD CODE		LOOP MODE	CS
4	1	4	2		
1 byte		1 byte		1 byte	1 byte

#### Returns

ACK

#### Comments

This command was introduced in the K2 server, version 3.2.

When the video disk recorder receives this command, it will set the loop playback mode to true/false. If Send Data 1 = 1, then the channel's loop mode is set to true. If Send Data 1 = 0, then the channel's loop mode is set to false. The value is ignored if the channel is not a player. Status byte '4' bit '5' will hold the loop mode setting for the current channel.

If the video disk recorder does not support loop mode, the command will return ACK but the loop mode status will not be set high.

### 5.3.21 (41.43) Set Widescreen Mode

#### Command Sent

##### 41.43 Set Widescreen Mode

Command Type        4  
Byte count            1  
Command Code        43

Send Data 1            1 byte data to set Widescreen Mode On/Off

CMD TYPE	BC	CMD CODE		WIDESCREEN MODE	CS
4	1	4	3		
1 byte		1 byte		1 byte	1 byte

#### Returns

ACK

#### Comments

This command was introduced in the K2 server, version 3.2.

When the video disk recorder receives this command, it will set the widescreen record mode to true/false. If Send Data 1 = 0x01, then the record channel's widescreen mode will be enabled. If Send Data 1 = 0x00, then the record channel's widescreen mode will be disabled. Status byte 'D' bit '1' will hold the widescreen mode setting for the current session.

If the video disk recorder does not support widescreen mode, the command will return ACK but the widescreen mode status will not be set high.

### 5.3.22 (41.44) Set Stop Mode

#### Command Sent

##### 41.44 Set Stop Mode

Command Type        4  
Byte count            1  
Command Code        44

STOP MODE            0 – Off  
                          1 – Freeze On Last Frame

- 2 – Freeze On Next Clip
- 3 – Show Black
- 4 – Show EE

CMD TYPE	BC	CMD CODE		STOP MODE	CS
4	1	4	4		
1 byte		1 byte		1 byte	1 byte

## Returns

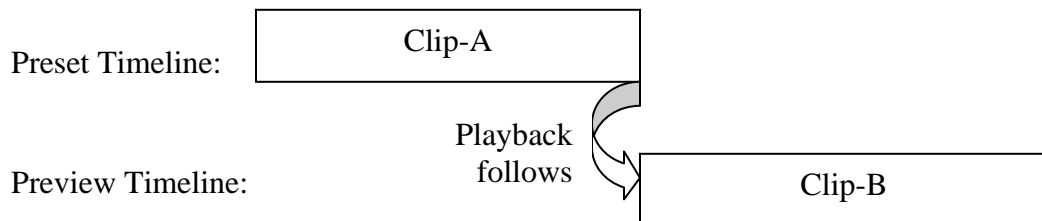
ACK

## Comments

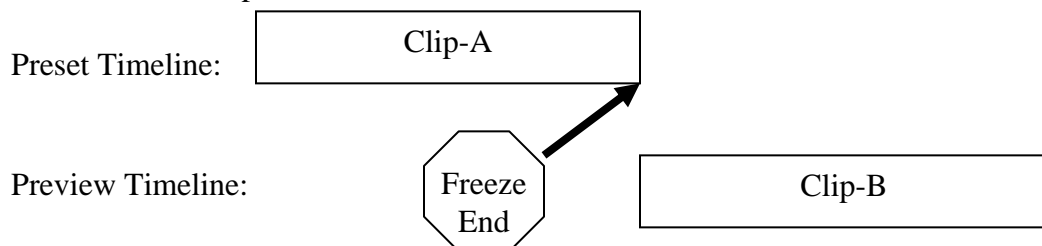
This command was introduced in the K2 server, version 3.2.

When the video disk recorder receives this command, it will set the stop mode to the specified mode. The stop mode must be sent at least 10 frames before reaching an end limit. Upon stopping at the end of the preset timeline, sending the Play command will cause playback to resume on the preview timeline.

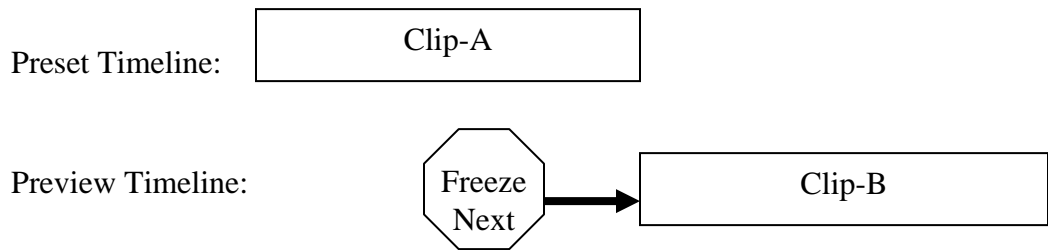
- 0 – Off:** This is the default stop mode state. When stop mode is off and playout reaches the end of the preset timeline, the preview timeline is activated and played.



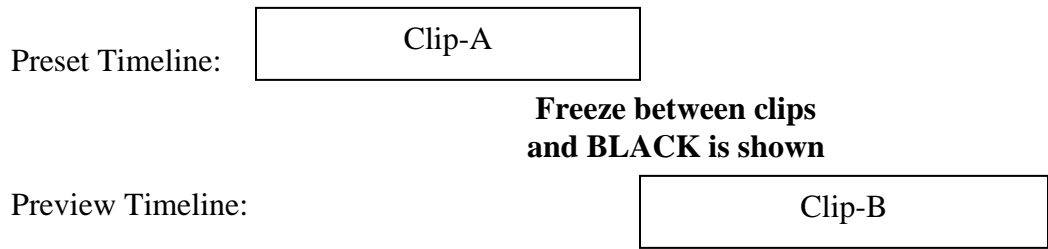
- 1 – Freeze On Last Frame:** Pause playback at the end of the preset timeline and freeze on the last picture.



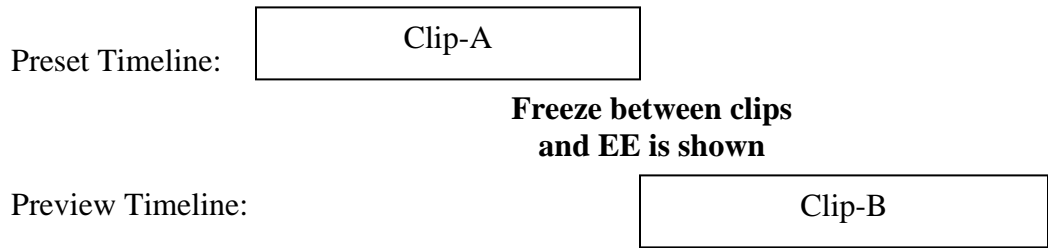
- 2 – Freeze On Next Clip:** Pause playback on the first frame of the preview timeline (if applicable).



**3 – Show Black:** Pause playback at the end of the preset timeline and show black.



**4 – Show EE:** Pause playback at the end of the preset timeline and show EE (if applicable).



### 5.3.23 (40.45) Get Stop Mode

#### Command Sent

#### 40.45 Get Stop Mode

Command Type      4  
 Byte count        0  
 Command Code     45

CMD TYPE	BC	CMD CODE		CS
4	0	4	5	
1 byte		1 byte		1 byte

#### Returns

#### 81.45 Return Stop Mode

Command Type 8  
 Byte count 1  
 Command Code 45

STOP MODE 0 – Off  
 1 – Freeze On Last Frame  
 2 – Freeze On Next Clip  
 3 – Show Black  
 4 – Show EE

CMD TYPE	BC	CMD CODE		STOP MODE	CS
8	1	4	5		
1 byte		1 byte		1 bytes	1 byte

### Comments

This command was introduced in the K2 server, version 3.2. For descriptions of the modes, please see (41.44) Set Stop Mode. This command returns the current stop mode for the channels timeline.

## 5.3.24 (60.0B) State Change Latency Request

### Command Sent

#### 60.0B State Change Latency Request

Command Type 6  
 Byte count 0  
 Command Code 0B

### Returns

#### 71.0B State Change Latency

Command Type 7  
 Byte count 1  
 Command Code 0B  
 Return Data 1-byte number of fields

### Comments

This command requests the number of fields in advance of a desired state change that a command must be issued before it takes effect at the output. The return value is the requested value for this video disk recorder.

## 5.3.25 (61.0C) Current Time Sense

### Command Sent

### 61.0C Current Time Sense

Command Type        6  
Byte count            1  
Command Code        0C  
Send Data 1           1-byte data with format as shown in table below

VITC time from source	LTC Time From Source	VITC User Bits	LTC User Bits	Windows Time	Timer1	VITC Time from timecode track	LTC Time from timecode track
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### Returns

#### 7X.0Y Time and/or User Bits Data

Command Type        7  
Byte count            4 or 8  
Command Code        04 or 05  
Return Data           As specified in following table. The values listed in the following table are the only data byte values supported.

	Supported Data Byte Values and Responses
Data byte Value	Expected Response
01	74.04 LTC Time Data with the LTC timecode.
02	If VITC is implemented, 74.06 VITC Time Data with the VITC timecode. If VITC is not implemented, 70.0D Request Time Data Missing.
03	74.04 LTC Time Data with the LTC timecode.
04	74.04 Time Data with the Timer1 timecode.
10	74.05 LTC User Bits Data with the LTC user bits.
20	If VITC is implemented, 74.07 VITC User Bits Data with the VITC user bits. If VITC is not implemented, 70.0D Request Time Data Missing.
30	74.05 LTC User Bits Data with the LTC user bits.
11	78.04 LTC Time and User Bits Data with the LTC timecode and user bits, respectively.
22	If VITC is implemented, 78.06 VITC Time and User Bits Data with the VITC timecode and user bits, respectively. If VITC is not implemented, 70.0D Request Time Data Missing.
33	78.04 LTC Time and User Bits Data with the LTC timecode and user bits, respectively.
08	74.0A Windows time with 4 byte timecode
40	74.0B LTC time from source with 4 byte timecode
80	74.0C VITC time from source with 4 byte timecode

### Comments

This command requests the current timecode position and/or user bit values for the current timecode position. One byte of data is provided that specifies the desired information.

A **Current Time Sense** command may be issued that requests either timecode only, user bits only, or both timecode and user bits. The source for the requested data may be specified as either linear timecode (LTC), vertical interval timecode (VITC), or both, which indicates that the information will be derived from the source with the “most confidence.”

It is assumed that there are two timecode tracks. The first one is always reported as LTC regardless of the input to it and the second is always reported as VITC.

It is assumed that LTC data will always be available for video disk recorders, and will be returned if the source is specified as LTC only. If VITC data is implemented, it will be returned if the source is specified as VITC only. If VITC data is not implemented, an error will be returned if the source is specified as VITC only. If the source for data is specified as both, the video disk recorder will select the source in which it has the “most confidence,” which for most situations will be the LTC data.

This command has been extended to include the following:

- If bit 3 is set, a four-byte current Windows timecode from Windows time source will be returned.
- If bit 6 is set, a four-byte current LTC timecode from the LTC source will also be returned.
- If bit 7 is set, a four-byte current VITC timecode from the VITC source will also be returned.

All timecodes are returned in the Timecode Format<sup>5.1</sup> (ffssmmhh).

### 5.3.26 (61.20) Status Sense

#### Command Sent

##### 61.20 Status Sense

Command Type	6
Byte count	1
Command Code	20
Send Data	1 byte value

#### Returns

##### 7X.20 Status Sense

Command Type	7
Byte count	1 to F
Command Code	20
Return Data	status bytes

#### Comments



This command requests current status from the video disk recorder. One byte of data is provided, with the most significant nibble specifying the first data byte to be returned, and the least significant nibble specifying the number of data bytes to return. Refer to Status Data Section 4.3 for a description of the contents of each status byte. If the data byte is 0F, all status bytes are returned.

### 5.3.27 (AX.02) Record Cue Up With Data

#### Command Sent

##### AX.02 Record Cue Up With Data

Command Type	A
Command Code	02
Byte count	0 – Current clip is positioned to start of material (SOM) for record 4 – Current clip is positioned to specified timecode for record 8 – Clip (Name Format <sup>5.1</sup> ) specified by data is loaded to SOM for record C – Clip (Name Format <sup>5.1</sup> ) specified by data is loaded to specified timecode for record A – Clip (Extended Format <sup>5.1</sup> ) specified by data is loaded to SOM for record E - Clip (Extended Format <sup>5.1</sup> ) specified by data is loaded to specified timecode for record
Send Data 1	4-byte timecode (Timecode Format <sup>5.1</sup> (ffssmmhh)) (Optional)
Send Data 2	2-byte clip name length (Present only if Extended Format <sup>5.1</sup> is used for clip name)
Send Data 3	clip name

In the case of extended commands the command format is as depicted below, where X can take values A or E.

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	TIMECODE	CLIPNAME LENGTH	CLIPNAME	CS
A	X	0	2					
1 byte		1 byte		2 byte	4 byte	2 byte		1 byte

#### Returns

ACK

#### Comments

This command must be used prior to recording to load or create the ID for the channel, and set the current timecode position within that ID. The data provided for this command is variable.

When a **Record Cue Up With Data** command is accepted and an ACK response is received by the controlling device, the Pre-roll status (status byte 4, bit 0) will be set high, and the cue complete status (status byte 2, bit 0) will be set low.

When the **Record Cue Up With Data** command has successfully completed, the Pre-roll status (status byte 4, bit 0) will be set low, and the cue complete status (status byte 2, bit 0) will be set high. If the **Record Cue** command does not successfully complete, the Pre-roll status (status byte 4, bit 0) and cue complete status (status byte 2, bit 0) will be set low and stop status (status byte 1, bit 5) will be set high.

The duration for a recording can be defined by either using the **Out Preset**, **Set Record Duration**, or the **Stop** command. After a **Record Cue Up With Data** command is issued, a **Record** command could follow which would start an “open ended” recording which would be completed by the reception of a **Stop** command. Or, an **Out Preset** could be set followed by a **Record** command. Using the **Out Preset** mechanism, the video disk recorder can calculate the duration based on the **Record Cue Up With Data** and **Out Preset** values. When doing open ended recordings, it is important to remember to send an **Out Point Reset** command to clear any previously set Out points.

This command can be issued with no parameters. If byte count is zero, the current timecode position will be set to 00:00:00:00, and the currently loaded ID will be used.

This command can be issued with a single timecode position parameter. If byte count is four, the current timecode position will be set to the specified timecode position within the currently loaded ID, and subsequent timecode values increase linearly. The timecode mode supported is always Timer.

This command can be issued with a single ID parameter. If byte count is eight, the ID corresponding to the specified ID will be loaded, and the current timecode position will be set to 00:00:00:00. If the ID specified does not currently exist in the video disk recorder, the specified ID will be created and loaded.

This command can be issued with two parameters indicating the timecode position and ID. If byte count is twelve, the first four bytes correspond to the timecode position and the next eight bytes correspond to the ID. When this command is issued, the ID corresponding to the specified ID will be loaded, the current timecode position will be set to the specified timecode position and subsequent timecode values increase linearly. The timecode mode supported is always Timer. If the ID specified does not currently exist in the video disk recorder, the specified ID will be created and loaded.

The Clip ID name could be sent in the Extended Format<sup>5.1</sup>. In this case, the byte count sent will have the second bit set high. So, if byte count is A, then it means that a Clip ID name in Extended Format has been sent. If byte count is E, it means that timecode has been sent along with a clip ID name in Extended Format. The

third and fourth bytes sent in the stream will have the actual number of data bytes sent.

The clip name specified in Send Data 3 may contain a full rooted path; otherwise it is assumed that the clip which is requested for **Record Cue Up With Data** exists in the current working directory.

## 5.4 Managing clips on the timeline

The following commands attach clips to the timeline. Extended and new commands allow a list of clips to be attached to the timeline, then cued and played in sequence.

### 5.4.1 (4X.14) In Preset

#### Command Sent

##### 4X.14 In Preset

- Command Type 4
- Command Code 14
- Byte count
  - 0 – Current clip is positioned to start of material (SOM)
  - 4 – Current clip is positioned to specified timecode
  - 2 – Return all clips loaded in the preset position with their respective In points
  - 8 – Clip (Name Format<sup>5.1</sup>) specified by data is loaded to SOM
  - C – Clip (Name Format<sup>5.1</sup>) specified by data is loaded to specified timecode
  - A – Clips (Extended Format<sup>5.1</sup>) specified by data is loaded to SOM
  - E - Clips (Extended Format<sup>5.1</sup>) specified by data is loaded to specified timecode

*With byte count equal to 'A'*

Send Data 1 2-byte clip name length (present only if Extended Format<sup>5.1</sup> is used for the clip name sent)

Send Data 2 clip name

#### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	CLIPNAME	LENGTH	CLIPNAME	CS
4	A	1	4						
1 byte		1 byte		2 byte	2 byte		2 byte		1 byte

The least significant nibble of the first byte ‘A’ indicates that the clip name specified is in Extended Format<sup>5.1</sup>. The listener gets the 2 byte actual byte count, then reads the 2 byte clip name length and then reads that number of bytes to obtain the 7 clip name. It keeps reading the length and clip name until the actual byte count is reached. This way multiple clips can be cued to the timeline.

*With byte count equal to ‘E’*

Send Data 1                      1 byte  
    A – Clip (Extended Format<sup>5.1</sup>) specified by data is loaded to SOM  
    E - Clip (Extended Format<sup>5.1</sup>) specified by data is loaded to specified timecode

Send Data 2                      2-byte clip name length (present only if Extended Format<sup>5.1</sup> is used for clip name sent)

Send Data 3                      4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh)) (optional)

Send Data 4                      clip name

*Note: In order to load a series of clips byte count (BC) can be ‘A’ or ‘E’ only. If BC is equal to ‘8’ or ‘C,’ only a single clip will be loaded. This has been done to maintain the original functionality of the commands. The **In Preset** command looks in the working directory for clips that have been cued.*

## Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	TYPE	CLIPNAME LENGTH	CLIPNAME	TYPE	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
4	E	1	4		A			E				
1 byte		1 byte		2 byte	1 byte	2 byte		1 byte	2 byte	4 byte		1 byte

The least significant nibble of the first byte ‘E’ indicates that the clip name specified is in Extended Format<sup>5.1</sup>. The server gets the 2 byte actual byte count, then reads the next 1 byte which indicates whether the timecode is specified with the clip. If this byte is ‘A,’ it cues up the specified clip to SOM; if it is ‘E’ it cues up the clip to the specified timecode. The server keeps reading the bytes until the actual byte count is reached.

Status byte 0, bit 7, busy bit is set high to indicate the system is busy when a sequence of clips is being cued onto the timeline. This is cleared once the cueing process is complete.

## Returns

ACK

With byte count equal to '2'

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
8	2	1	4								
1 byte		1 byte		2 byte	2 byte	4 byte		2 byte	4 byte		1 byte

## Comments

This command will set the ID and/or the timecode position for the auto mode In Preset. The data provided for this command is variable.

When an **In Preset** command is issued, the VDR cues to this position. While this cue operation is in progress, the Pre-roll status bit is set high (see status byte 4 description), and cleared when the decoder is finished cueing the material. When cueing is finished and all channel information is updated, the Cue Complete (status byte 2, bit 0) and In Preset bits (status byte 3, bit 0) are set high. If the position is not found, the VDR clears the Pre-roll bit, Cue Complete, In Preset and Out Preset status (status byte 3, bit 1) bits. It also sets the stop status bit high. This will indicate that the position was not found.

*Note: There is an implied order for Preset and Preview In and Out points. It is **In Preset** followed by **Out Preset** then **Preview In Preset** followed by **Preview Out Preset**.*

This command can be issued with no parameters. If byte count is zero, the timecode position for the auto mode In Preset will be set to the first field of video within the currently loaded ID.

This command can be issued with a single timecode position parameter. If byte count is four, the timecode position for the auto mode In Preset will be set to the specified timecode position within the currently loaded ID. An optional byte can be sent before the timecode to indicate whether timecode type is in VITC or LTC format. In this case, byte count will be 5. The default timecode format is Timer format.

This command can be issued with a single ID parameter. If byte count is eight, the ID for the auto mode In Preset will be set to the specified ID, and the timecode position for the auto mode In Preset will be set to the first field of video. If the ID specified does not currently exist in the video disk recorder, the auto mode In Preset will become invalid for subsequent auto play operations.

This command can be issued with two parameters indicating the timecode position and ID. If byte count is twelve, the first four bytes correspond to the timecode position and the next eight bytes correspond to the ID. When this command is issued, the ID for the auto mode In Preset will be set to the specified ID, and the timecode position for the auto mode In Preset will be set to the specified timecode position. If the ID specified does not currently exist in the video disk recorder, the auto mode In Preset will become invalid for subsequent auto play.

The clip ID name can be sent in the Extended Format<sup>5.1</sup>. In this case, the byte count sent will have the second bit set high. So, if byte count is A, then it means that a Clip ID name in Extended Format has been sent. If byte count is E, it means that timecode has been sent along with the variable length clip ID name. The third and fourth bytes sent in the stream will have the actual number of data bytes sent.

Black may be inserted into the timeline by loading a pseudo clip ID named **<BLACK>**. By default when this ID is loaded without timecode, it will be added to the timeline for 1 frame. The timecode associated with the **In Preset** command will be used for the duration for the clip.

This command can be issued with a byte count of 2, which will return all clips loaded to the preset timeline along with their respective in points. Note that when this variation of the command is used, the protocol requires two arbitrary data bytes to be sent (ie, 42.14.00.00) even though no actual arguments are needed by the command.

Use the (A0.16) ID Loaded Request to request the name of the currently playing clip among all of the clips cued.

## 5.4.2 (4X.15) Out Preset

### Command Sent

#### (4X.15) Out Preset

Command Type      4  
 Byte count      0 or 4 or E  
                          2 – Return all clips loaded in the preset position with their respective Out points  
 Command Code      15

*With byte count equal to '4'*

Send Data 1    4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh)) to which the Out point is set

*With byte count equal to 'E'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	TYPE	CLIPNAME LENGTH	CLIPNAME	TYPE	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
4	E	1	5		A			E				
1 byte		1 byte		2 byte	1 byte	2 byte		1 byte	2 byte	4 byte		1 byte

Send Data 1    1 byte Type

A – The Out point of the clip specified in Extended Format<sup>5.1</sup> is set to EOM

E – The Out Point of the clip specified in Extended Format<sup>5.1</sup> is set to the specified timecode

Send Data 2 2-byte clip name length (present only if Extended Format<sup>5.1</sup> is used for clip name sent)

Send Data 3 4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh)) (optional) to which the Out point is set.

Send Data 4 Clip name

## Returns

ACK

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
8	2	1	5								
1 byte		1 byte		2 byte	2 byte	4 byte		2 byte	4 byte		1 byte

Status byte 9, bit 6 will be set high to indicate 'Out Preset Failed' for certain clips if such clips have not been cued onto the timeline by a **Preview In Preset / In Preset** previously.

## Comments

This command will set the timecode position for the auto mode Out Preset. If the auto mode In Preset is not valid, the Out Preset will be lost when a valid **In Preset** is sent, because it will clear the Out Preset. But auto play will not be able to function until a valid **In Preset** has been set. The ID associated with the auto mode presets can only be set by an **In Preset** command (4X.14). The Out Preset may be set at any time during auto play processing to dynamically change the Out Preset. The data provided for this command is variable.

This command is also used to set the length of a recording. If a **Record Cue Up With Data** has been sent, then this command will determine the out point of the recording. Once recording has started, the Out Preset cannot be changed.

When an **Out Preset** command is issued and the **Out Preset** is set and valid, the Out Preset status (status byte 3, bit 1) will be set high.

*Note: There is an implied order for Preset and Preview In and Out points. It is **In Preset** followed by **Out Preset** then **Preview In Preset** followed by **Preview Out Preset**.*

This command can be issued with no parameters. If zero bytes of data are specified, the timecode position for the auto mode Out Preset will be set to the highest recorded timecode position of the ID currently specified for the auto mode In Preset.

This command can be issued with a single timecode position parameter. If four bytes of data are specified, the timecode position for the auto mode Out Preset

will be set to the specified timecode position within the ID specified for the auto mode In Preset. The timecode type will depend on the current timer mode set.

This command can be issued with a byte count of 2, which will return all clips loaded to the preset timeline along with their respective out points. Note that when this variation of the command is used, the protocol requires two arbitrary data bytes to be sent (ie, 42.15.00.00) even though no actual arguments are needed by the command.

When multiple clips are cued on the Preset timeline, the outpoints can be changed by providing the entire list of clips and there respective Out Preset times.

Alternatively, you can change the Out Preset of the currently playing clip, with multiple clips cued, without providing the entire list of clips. To do this, provide the current clip name and new Out Preset time. If the clip name matches the currently playing clip, we will edit the clips Out Preset time.

#### 5.4.3 (4F.16) Append Preset

##### Command Sent

##### (4F.16) Append Preset

Command Type	4
Byte count	F - Clip (Extended Format <sup>5.1</sup> ) specified by data is loaded to specified timecode and out point is set to specified timecode.
Command Code	16
Send Data 2	2-byte clip name length (present only if Extended Format <sup>5.1</sup> is used for clip name sent)
Send Data 3	4-byte in point timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))
Send Data 3	4-byte out point timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))

##### Comments

This command will append the given clip to the end of the current preset timeline. The preset timeline is the current timeline in use by the player.

While this cue operation is in progress, the Pre-roll status bit is set high (see status byte 4 description). When cueing is finished, and the material is found, the Pre-roll bit is cleared while Cue Complete and In Preset bits (status byte 3, bit 0) are set high. If the in point position is not found, the start of material will be used. If the out point position is not found, the end of material will be used. If the clip itself is not found, ID Not Found status byte (Byte A Bit 0) will be set to high to indicate the failure.



#### 5.4.4 (4X.21) Out Reset

##### Command Sent

###### 4X.21 Out Reset

Command Type        4  
Byte count            0 or 2  
Command Code        21

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	CLIPNAME	CLIPNAME LENGTH	CLIPNAME	CS
4	2	2	1						
1 byte		1 byte		2 byte	2 byte		2 byte		1 byte

##### Returns

ACK

##### Comments

This command will clear the timecode position for the auto mode Out Preset to 00:00:00:00.

When an **Out Reset** command is issued and the **Out Preset** is cleared, the Out Preset status (status byte 3, bit 1) will be set low. When the byte count is equal to '2', the listener reads the 2 byte actual byte count, then reads the 2 byte clip name length, and then reads that many number of bytes to obtain the clip name. It keeps reading the length and clip name until the actual byte count is reached. This way the timecode position for the auto mode Preset can be set to multiple clips specified in the **Out Reset** command.

#### 5.4.5 (A0.06) Preview In Reset

##### Command Sent

###### A0.06 Preview In Reset

Command Type        A  
Byte count            0  
Command Code        06

##### Returns

ACK

##### Comments

This command will clear the ID for the auto mode Preview In Preset to an undefined ID, and will clear the timecode position for the auto mode Preview In Preset to 00:00:00:00, thereby making the **Preview In Preset** invalid.

When a **Preview In Reset** command is issued and the **Preview In Preset** becomes invalid, the Preview In Preset status (status byte 9, bit 0) will be set low.

#### 5.4.6 (AX.07) Preview Out Reset

##### Command Sent

##### A0.07 Preview Out Reset

Command Type        A  
 Byte count            0 or 2  
 Command Code        07

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	CLIPNAME	CLIPNAME LENGTH	CLIPNAME	CS
A	2	0	7						
1 byte		1 byte		2 byte	2 byte		2 byte		1 byte

##### Returns

ACK

##### Comments

This command will clear the timecode position for the auto mode Preview Out Preset to 00:00:00:00.

When a **Preview Out Reset** command is issued and the **Preview Out Preset** is cleared, the Preview Out Preset status (status byte 9, bit 1) will be set low.

When a **Preview In Reset** command is issued and the **Preview In Preset** becomes invalid, the Preview In Preset status (status byte 9, bit 0) will be set low.

When the byte count is equal to '2,' the listener reads the 2 byte actual byte count, then reads the 2 byte clip name length and then reads that number of bytes to obtain the clip name. It keeps reading the length and clip name until the actual byte count is reached. This way the timecode position can reset for multiple clips specified in the **Preview Out Preset** command.

#### 5.4.7 (44.31) Pre-roll

##### Command Sent

##### 44.31 Pre-roll

Command Type        4

Byte count 4  
 Command Code 31  
 Send Data 1 4-byte number of frames in timecode format

CMD TYPE	BC	CMD CODE		TIMECODE	CS
4	4	3	1		
1 byte		1 byte		4 bytes	1 byte

## Returns

ACK

## Comments

This command will affect the timing in which the **Play, Record, Stop** and **Auto Skip** commands are executed. Please note that scheduled **Play** and scheduled **Record** commands are not affected by this command.

Send Data 1 specifies the Pre-roll time in number of frames by which **Play, Record, Stop** and **Auto Skip** should be delayed after receiving the respective command.

### 5.4.8 (AX.04) Preview In Preset

#### Command Sent

##### AX.04 Preview In Preset

Command Type A  
 Command Code 04  
 Byte count 0 – Current clip is positioned to start of material (SOM)  
 2 – Return all clips loaded in the preview position with their respective In points  
 4 – Current clip is positioned to specified timecode  
 8 – Clip (Name Format<sup>5.1</sup>) specified by data is loaded to SOM  
 C – Clip (Name Format<sup>5.1</sup>) specified by data is loaded to specified timecode  
 A – Clips (Extended Format<sup>5.1</sup>) specified by data is loaded to SOM  
 E - Clips (Extended Format<sup>5.1</sup>) specified by data is loaded to specified timecode

*With byte count equal to 'A'*

Send Data 1                      2-byte clip name length (present only if Extended Format<sup>5.1</sup>  
is used for clip name sent)

Send Data 2                      clip name

### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	CLIPNAME	CLIPNAME LENGTH	CLIPNAME	CS
A	A	0	4						
1 byte		1 byte		2 byte	2 byte		2 byte		1 byte

The least significant nibble of the first byte ‘A’ indicates that the clip name specified is in Extended Format. The listener gets the 2 byte actual byte count, then reads the 2 byte clip name length and then reads that number of bytes to obtain the clip name. It keeps reading the length and clip name until the actual byte count is reached. This way multiple clips can be cued to the timeline.

If the clip itself is not found, ID Not Found status byte (Byte A Bit 0) will be set to high to indicate the failure.

*With byte count equal to ‘E’*

Send Data 1                      1 byte type  
A – Clip (Extended Format<sup>5.1</sup>) specified by data is loaded to SOM  
E - Clip (Extended Format<sup>5.1</sup>) specified by data is loaded to specified timecode

Send Data 2                      2-byte clip name length (present only if Extended Format<sup>5.1</sup>  
is used for clip name sent)

Send Data 3                      4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))  
(optional) to which the In Point is set

Send Data 4                      Clip name

*Note: In order to load a series of clips, byte count (BC) can be ‘A’ or ‘E’ only. If BC is equal to ‘8’ or ‘C,’ only a single clip will be loaded. This has been done to maintain the original functionality of the commands. The **Preview In Preset** command looks in the working directory for clips that have been cued.*

### Command Structure

CMD TYPE	BC	CMD CODE	ACTUAL BYTE COUNT	TYPE	CLIPNAME LENGTH	CLIPNAME	TYPE	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
----------	----	----------	-------------------	------	-----------------	----------	------	-----------------	----------	----------	----

A	E	0	4		A			E				
1 byte		1 byte		2 byte	1 byte	2 byte		1 byte	2 byte	4 byte		1 byte

The least significant nibble of the first byte 'E' indicates that the clip name specified is in Extended Format. The listener gets the 2 byte actual byte count, then reads the next one byte which indicates whether the timecode is specified with the clip or not. If this byte is 'A,' it cues up the specified clip to SOM while if it is 'E' it cues up the clip to the specified timecode. The listener keeps reading the bytes until the actual byte count is reached.

Status byte 0, bit 7, busy bit is set high to indicate the system is busy when a sequence of clips is being cued onto the timeline. This will be cleared once the cueing process is complete.

Status byte 9 bit 0 is set high if the auto mode Preview In Preset contains a valid timecode position. Otherwise, it is set low. The auto mode Preview Presets will become invalid, and this bit will be set low, when the auto mode Preview Presets are shifted to the auto mode presets as part of the auto play processing. During this transition, the preview preset status bit values are transferred to the respective preset status bits. This will be the means by which a controlling device can determine when it can set new values for the auto mode Preview Presets.

If the clip itself is not found, ID Not Found status byte (Byte A Bit 0) will be set to high to indicate the failure.

## Returns

ACK

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
8	2	0	4								
1 byte		1 byte		2 byte	2 byte	4 byte		2 byte	4 byte		1 byte

## Comments

Black may be inserted into the timeline by loading a pseudo clip ID named <**BLACK**>. By default when this ID is loaded without timecode, it will be added to the timeline for one frame. The timecode associated with the Preview **In Preset** command will determine the duration of the clip. If a Preview **Out Preset** command is then sent, it will then manipulate this clip as any other clip.

If Status Byte 3 Bit 0 is low, byte counts 0x0a and 0x0e will be applied to the Preset context rather than the Preview Context because the implied order of cueing is In\Out Preset followed by Preview In\Out Preset.

This command can be issued with a byte count of 2, which will return all clips loaded to the preview timeline along with their respective in points. Note that when this variation of the command is used, the protocol requires two arbitrary data bytes to be sent (ie, A2.04.00.00) even though no actual arguments are needed by the command.

#### 5.4.9 (AX.05) Preview Out Preset

##### Command Sent

##### AX.05 Preview Out Preset

Command Type        A  
 Byte count            0 or 4 or E  
                           2 – Return all clips loaded in the Preview position  
                           with their respective Out Points  
 Command Code        05

*With byte count equal to ‘4’*

Send Data 1            4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh)) to which  
                           the Out Point is set.

*With byte count equal to ‘E’*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	TYPE	CLIPNAME LENGTH	CLIPNAME	TYPE	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
A	E	0	5		A			E				
1 byte		1 byte		2 byte	1 byte	2 byte		1 byte	2 byte	4 byte		1 byte

Send Data 1            1 byte type  
                           A – The Out Point of the clip specified in Extended  
                           Format<sup>5.1</sup> is set to EOM  
                           E – The Out Point of the clip specified in Extended  
                           Format<sup>5.1</sup> is set to the specified timecode  
 Send Data 2            2-byte clip name length (present only if Extended Format<sup>5.1</sup>  
                           is used for clip name sent)  
 Send Data 3            4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))  
 (optional)  
 Send Data 4            clip name

##### Returns

ACK

Status byte 9, bit 6 will be set high to indicate ‘Preview Out Preset Failed’ for certain clips if such clips have not previously been cued onto the timeline by a **Preview In Preset / In Preset** command.

*With byte count equal to ‘2’*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CLIPNAME LENGTH	TIMECODE	CLIPNAME	CS
8	2	0	5								
1 byte		1 byte		2 byte	2 byte	4 byte		2 byte	4 byte		1 byte

## Comments

Status byte 9, bit 1 is set high if the auto mode Preview Out Preset contains a valid timecode position. Otherwise, it is set low. The auto mode Preview Presets will become invalid, and this bit will be set low when the auto mode Preview Presets are shifted to the auto mode Presets as part of the auto play processing. During this transition, the preview preset status bit values are transferred to the respective preset status bits. This is the means by which a controlling device determines when it can set new values for the auto mode Preview Presets.

If Status Byte 9 Bit 0 is low, and Status Byte 3, Bit 0 is high, byte counts 0x04 and 0x0e will be applied to the Preset context rather than the Preview Context because the implied order of cueing is In\Out Preset followed by Preview In\Out Preset.

This command can be issued with a byte count of 2, which will return all clips loaded to the preview timeline along with their respective out points. Note that when this variation of the command is used, the protocol requires two arbitrary data bytes to be sent (ie, A2.05.00.00) even though no actual arguments are needed by the command.

### 5.4.1 (AF.0A) Append Preview Preset

#### Command Sent

##### (AF.0A) Append Preview Preset

Command Type	A
Byte count	F - Clip (Extended Format <sup>5.1</sup> ) specified by data is loaded to specified timecode and out point is set to specified timecode.
Command Code	0A
Send Data 2	2-byte clip name length (present only if Extended Format <sup>5.1</sup> is used for clip name sent)
Send Data 3	4-byte in point timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))
Send Data 3	4-byte out point timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))

## Comments

This command will append the given clip to the end of the current preview timeline.

While this cue operation is in progress, the Pre-roll status bit is set high (see status byte 4 description). When cueing is finished, and the material is found, the Pre-roll bit is cleared. If the in point position is not found, the start of material will be used. If the out point position is not found, the end of material will be used. This will indicate that the out position was not found. If the clip itself is not found, ID Not Found status byte (Byte A Bit 0) will be set to high to indicate the failure.

### 5.4.2 (A1.32) Set Ganging

#### Command Sent

##### (A1.32) Set Ganging

Command Type        A  
Byte count            1  
Command Code        32  
Send Data 1           1-Byte Gang Number

CMD TYPE	BC	CMD CODE		Send Data 1	CS
A	1	3	2		
1 byte		1 byte		1 byte	1 byte

#### Returns

ACK

## Comments

This command was introduced in the K2 server, version 3.2.

This command will gang two or more channels together. To gang channels, you must assign the same gang number to two or more channels.

Send Data 1	Description
0	Not ganged
1	Assigned to gang #1
2	Assigned to gang #2

A new Instant Ganging mode has been implemented in K2-Summit and K2 3.3 code bases. In this mode, you can tell a channel to gang with another channel just like in the description above, except that it does not reconfigure the K2, which takes considerable time. The K2 AppCenter GUI will not show that it is ganged, but the standard ganged commands will work in a ganged manner. Use this mode



if you often need to switch in and out of ganging modes. If you enable ganging for long periods of time, use the standard ganging mode. Instant Ganging only applies when you send commands to the channel of which the gang mask was set. Sending commands to other channels will not result in a ganged command.

For Instant Ganging mode, Send Data 1 becomes a bit-mask. The bits indicated which channels will be grouped into the instant gang. Some examples:

Send Data 1	Description
0	Not ganged
3	Channels 1 and 2 ganged.
5	Channels 1 and 3 ganged.
85	Channels 1 and 3 ganged with transport controls only.

Also, by setting the highest bit (0x80) when the gang mask (Send Data 1) is sent, only transport commands will be ganged. Cue commands will be exempt.

### 5.4.3 (A0.33) Get Ganging

#### Command Sent

##### (A0.33) Get Ganging

Command Type      A  
 Byte count        0  
 Command Code      33

#### Returns

##### 81.33

Command Type      8  
 Byte count        1  
 Command Type      33  
 Return Data 1      1 byte Gang Number

CMD TYPE	BC	CMD CODE		Return Data 1	CS
8	1	3	3		
1 byte		1 byte		1 byte	1 byte

#### Comments

This command was introduced in the K2 server, version 3.2.  
 This command will return the gang number for the channel.

#### 5.4.4 (AX.34) Set Ganging Information

##### Command Sent

##### (AX.34) Set Ganging Information

Command Type	A
Byte count	0 – Each Channel Loads Clips Independently 2 – Send Data 1 and Send Data 2 are sent. Channels are combined under a single controller (lowest numbered channel). Use this option to record and play clips with more than one video track.
Command Code	34
Send Data 1	1-Byte Video Consolidation Information 0 – Only record video from the first channel in the gang configuration. 1 – Record video from all channels in the gang configuration.
Send Data 2	1-Byte Audio Consolidation Information 0 – Only record audio from the first channel in the gang configuration. 1 – Record audio from all channels in the gang configuration.

*With byte count equal to '0'*

CMD TYPE	BC	CMD CODE		CS
A	0	3	4	
1 byte		1 byte		1 byte

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	Send Data 1	Send Data 2	CS
A	2	3	4				
1 byte		1 byte		2 bytes	1 byte	1 byte	1 byte

##### Returns

ACK

##### Comments

This command was introduced in the K2 server, version 3.2.

This command provides ganging configuration information for the server. It can be sent to a channel or channel-less connection.

#### 5.4.5 (A0.35) Get Ganging Information

##### Command Sent

##### (A0.35) Get Ganging Information

Command Type      A  
Byte count          0  
Command Code      35

##### Returns

##### 80.35

Command Type      8  
Byte count          0  
Command Type      35

Each channel is configured to load clips independently.

CMD TYPE	BC	CMD CODE		CS
8	0	3	5	
1 byte		1 byte		1 byte

##### 82.35

Command Type      8  
Byte count          2  
Command Type      35  
Return Data 1      1-Byte Video Consolidation Information  
                             0 – Only record video from the first channel in the gang configuration.  
                             1 – Record video from all channels in the gang configuration.  
 Return Data 2      1-Byte Audio Consolidation Information  
                             0 – Only record audio from the first channel in the gang configuration.  
                             1 – Record audio from all channels in the gang configuration.

Channels are combined under a single controller (lowest numbered channel).

CMD TYPE	BC	CMD CODE	Return Data 1	Return Data 2	CS
----------	----	----------	---------------	---------------	----

8	2	3	5			
1 byte		1 byte		1 byte	1 byte	1 byte

## Comments

This command was introduced in the K2 server, version 3.2.

This command will return the gang information for the channel. It can be sent to a channel or channel-less connection.

### 5.4.6 (AX.11) Erase Segment

#### Command Sent

##### AX.11 Erase Segment

Command Type	A
Byte count	8 – Send Data 1 and Send Data 2 are sent. A – Send Data 1 and Send Data 2 are sent along with Clip Name in Extended Format is sent Send Data 3.
Command Code	11
Send Data 1	Starting timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))
Send Data 2	Ending timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))
Send Data 3	Clip name in Extended Format <sup>5.1</sup>

#### Returns

ACK

#### Comments

This command is used to retain material between the specified timecode positions in the currently loaded ID (BC equal to '8') or the ID provided (BC = 'A'). Eight data bytes are specified, with the first four bytes corresponding to the starting timecode position and the second four bytes corresponding to the ending timecode position. All timecode positions between the specified starting and ending timecode positions, inclusive, will be retained. All timecode positions between the SOM and the specified starting timecode and between ending timecode and EOM, both inclusive, will be erased and de-allocated. The specified starting and ending timecodes are considered offsets from the SOM of the clip.

When Byte Count 'A' is provided, an extended clip name is required. This allows for the use of this command when the clip is not currently loaded into the timeline and also allows the use of this command from a channel-less connection.

Status Byte 0 Bit 7 will be set until the completion of this command.

*With byte count equal to 'A'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	STARTING TIMECODE	ENDING TIMECODE	CLIP NAME LEN	CLIP NAME	CS
A	A	1	1						
1 byte		1 byte		2 bytes	4 bytes	4 bytes	2 bytes		1 byte

Note that this command does not erase material when multiple clips refer to the same media.

#### 5.4.7 (A0.16) ID Loaded Request

##### Command Sent

##### A0.16 ID Loaded Request

Command Type        A  
Byte count            0  
Command Code        16

##### Returns

##### 8X.16 ID Loaded

Command Type        8  
Byte count            0 – No Clip Loaded  
                             2 – Name (Extended Format<sup>5.1</sup>) of loaded clip returned  
Command Code        16  
Return Data 1        2-byte number of data bytes to follow  
Return Data 2        Clip name in Extended Format<sup>5.1</sup> (if clip is loaded)

##### Comments

This command will request the name of the currently loaded clip from the video disk recorder. If two clips were loaded using the **In Preset** and the **Preview In Preset** commands, then the name of the clip loaded with the **In Preset** command is returned.

If there is a clip loaded, then 82.16 will be sent as reply. This will contain a clip ID name in Extended Format<sup>5.1</sup> as return data.

If there is no clip loaded, then 80.16 will be sent with no data members as reply.

#### 5.4.8 (AX.01) Auto Skip

##### Command Sent

##### (AX.01) Auto Skip

Command Type        A

Byte count                0, 1, or 4  
Command Code            01

*With byte count equal to '1'*

CMD TYPE	BC	CMD CODE		NUMBER OF CLIPS TO BE SKIPPED	CS
A	1	0	1		
1 byte		1 byte		1 byte	1 byte

*With byte count equal to '4'*

CMD TYPE	BC	CMD CODE		Timecode to Skip At	CS
A	1	0	1		
1 byte		1 byte		4 bytes	1 byte

## Returns

ACK

## Comments

This command immediately aborts auto play of the current video segment specified by the current auto mode preset, and performs the processing associated with the end of the current auto mode preset ([see 40.41, Auto Mode On](#)).

With byte count equal to '0,' the play head is moved to the end of the In Preset list and starts pointing to the beginning of the auto mode Preview In Preset list. The first frame of the first preview clip in the list will be displayed.

With byte count equal to '1,' the play head is moved by the number of clips specified in the Auto Skip command including the current one.

With byte count equal to '4', a four byte timecode is provided. This timecode is to be in Timecode Format<sup>5.1</sup> (ffssmmhh). When the specified timecode is reached, the play head is moved to the end of the In Preset list and starts pointing to the beginning of the auto mode Preview In Preset list. The first frame of the first preview clip in the list will be displayed.

For instance, if clips 1 to 4 have been cued on the timeline by auto mode **In Preset** command, the number of clips to be skipped as specified in the **Auto Skip** command is 3 and the currently playing clip is clip 1, the play of clip 1 is aborted and the play head is moved to clip 4 skipping clips 1,2 and 3. The first frame of clip 4 is displayed.

If a Pre-roll value has been set, auto play of the current clip continues for the Pre-roll number of frames before auto skip is affected.

Note that Pre-roll is supported in **Auto Skip** only when the current mode is Play / Stop / Idle / Play Cue.

Note that BC 0x01 is not supported on the K2 server.

## 5.5 Managing stored clips

Two new commands, **Set Working Folder Request** and **Get Working Folder Request**, have been added. The user needs to first set the working directory using this command before issuing any other commands. All commands that are issued operate on the currently specified directory. If this is not set, the factory default directory is used.

Other related commands that have been defined are:

**Get All Folders**

**Create Folder**

**Rename Folder**

**Delete Folder**

### 5.5.1 (A0.26) ID Count Request

#### Command Sent

##### (A0.26) ID Count Request

Command Type      A  
Byte count          0  
Command Code      26

CMD TYPE	BC	CMD CODE		CS
A	0	2	6	
1 byte		1 byte		1 byte

#### Returns

##### (82.26) ID Count

Command Type      8  
Byte count          2  
Command Code      26

Send Data 1          Number of IDs

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	NUM OF IDS	CS
8	2	2	6			
1 byte		1 byte		2 byte	2 byte	1 byte

### 5.5.2 (AX.14) List First ID

#### Command Sent

##### AX.14 List First ID

Command Type	A
Byte count	0 – Clip name in Name Format <sup>5.1</sup> requested 2- Clip name in Extended Format <sup>5.1</sup> requested
Command Code	14

#### Returns

##### 8X.14 ID Listing

Command Type	8
Byte count	0 – No clips present 8 – Clip name in Name Format <sup>5.1</sup> returned A – Clip name in Extended Format <sup>5.1</sup> returned
Command Type	14
Return Data 1	2-byte number of data bytes to follow (only if clip name in Extended Format <sup>5.1</sup> returned)
Return Data 2	2 byte clip name length
Return Data 3	clip name (if at least one clip is present)

#### Comments

This command will request the first ID in sorted order that currently exists in the video disk recorder's storage, returned using the **ID Listing Response** (8X.14). This command will then advance the current listing position to the second ID in sorted order, so that a subsequent **List Next ID** command will return the second ID.

If no IDs exist, 80.14 is returned. If at least one ID is present, then the reply will depend on the clip name type that is requested. 88.14 is sent filled with eight bytes of clip name if the clip name in Name Format<sup>5.1</sup> is requested (A0.14). 8A.14 is sent back containing the clip name in Extended Format<sup>5.1</sup> if the clip name in Extended Format<sup>5.1</sup> is requested (A2.14).

Note that when the A2.14 variation of the command is used, the protocol requires two arbitrary data bytes to be sent (ie, A2.14.00.00) even though no actual arguments are needed by the command.

### 5.5.3 (AX.15) List Next ID

#### Command Sent

##### AX.15 List Next ID

Command Type	A
Byte count	0 – A single clip with name in Name Format <sup>5.1</sup> requested



1 – Defined number of clips in Extended Format<sup>5.1</sup>  
requested

Command Code 15

Send Data 1 1 byte number of clips to be returned in ID Listing response

*With byte count equal to '1'*

CMD TYPE	BC	CMD CODE		NUMBER OF CLIPS TO BE RETURNED	CS
A	1	1	5		
1 byte		1 byte		1 byte	1 byte

## Returns

### 8X.14 ID Listing

Command Type 8

Byte count 0 – No more clips present  
8 – Single clip in Name Format<sup>5.1</sup> returned as data  
A – Single or multiple clips in Extended Format<sup>5.1</sup> returned as data

Command Type 14

Return Data 1 2-byte number of data bytes to follow (only if clip name is returned in Extended Format<sup>5.1</sup>.)

Return Data 2 2 byte clip name length

Return Data 3 clip name (if at least one more clip present)

*With byte count equal to 'A'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	CLIP NAME LEN	CLIP NAME	CS
8	A	1	4						
1 byte		1 byte		2 bytes	2 bytes				1 byte

## Comments

This command will request, in sorted order, the next set of IDs that currently exist in the video disk recorder's storage. These IDs are returned using the **ID Listing Response** (8X.14). This command will then advance the current listing position to the next ID after the sent list, in sorted order, so that a subsequent **List Next ID** command will return the next set of IDs.

If no more IDs exist, 80.14 is returned. If at least one more ID is present, then the reply will depend on the byte count sent in the request. If the A0.15 request was sent, 88.14 is returned containing an eight byte clip name. If A1.15 request was

sent, then 8A.14 is returned filled with names of the requested number of clips in Extended Format<sup>5.1</sup>.

The number of IDs returned in the response depends on the number of clips requested in the **List Next ID** request. If the number of clips available on the disk is less than the number of clips requested, only the available number of clips will be returned in the **ID Listing Response**.

#### 5.5.4 (AX.18) ID Status Request

##### Command Sent

###### AX.18 ID Status Request

Command Type	A
Command Code	18
Byte count	8 - Clip name in Name Format <sup>5.1</sup> sent A - Clip name in Extended Format <sup>5.1</sup> sent
Send Data 1	2-byte number of data bytes to follow (only if clip name with Extended Format <sup>5.1</sup> is sent)
Send Data 2	Clip Name (see comment below)

##### Returns

###### 81.18 ID Status

Command Type	8
Byte count	1
Command Type	18
Return Data 1	1 byte status data

##### Comments

This command will request the status of the specified ID, returned using the ID status response (81.18). If byte count is sent as 8, then it indicates that an 8-byte Clip ID name is sent. If byte count is sent as A, then it indicates that variable length Clip ID name is sent.

The clip name specified in Send Data 2 may contain a full rooted path; otherwise it is assumed that the clip whose status is being requested exists in the current working directory.

A single byte of data is returned, indicating the status of the specified ID. Additional ID status fields may be defined as required by the video disk recorder implementation. This byte of data is a bit field with the following format:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
				Loaded on Another Channel	Ready For Playback	ID Loaded	ID In Storage

**bit 3: Loaded on Another Channel** This bit is set high if the ID is loaded on another channel. If the clip is loaded on another channel, opening it would result in read only access.

**bit 2: Ready For Playback** This bit is set high once enough of the ID has been recorded or transferred into the system to allow playback. See specific system specifications for further Ready For Playback specifications.

**bit 1: ID Loaded** This bit is set high if the ID is loaded for the channel which issued the ID status command; otherwise, it is set low.

**bit 0: ID In Storage** This bit is set high if the ID currently exists in the video disk recorder's storage; otherwise, it is set low.

### 5.5.5 (A2.0E) Set Working Folder Request

#### Command Sent

#### (A2.0E) Set Working Folder Request

Command Type        A  
Byte count            2 – Indicates folder name in Extended Format<sup>5.1</sup>  
Command Code        0E

Send Data 1            2-byte folder name length  
Send Data 2            Absolute folder name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	FOLDER NAME	CS
A	2	0	E				
1 byte		1 byte		2 bytes	2 bytes		1 byte

#### Returns

#### ACK

On Success:            ACK. Also status byte 0, bit 7, busy bit is set high to indicate that the videodisk recorder is busy. This bit will be cleared once the clip cache is reinitialized.

On Failure:            Status byte 9, bit 2 is set high to indicate 'Folder Not Found,' in case the specified folder is not found on the disk.

Status byte 3, bit 3 is set high to indicate ‘Invalid folder name’ if the folder name has invalid characters.

### 5.5.6 (A0.0F) Get Working Folder Request

#### Command Sent

##### (A0.0F) Get Working Folder Request

Command Type A

Byte count 0

Command Code 0F

CMD TYPE	BC	CMD CODE		CS
A	0	0	F	
1 byte		1 byte		1 byte

#### Returns

##### 82.0F Working Folder

Command Type 8

Byte count 2 – Indicates folder name in Extended Format<sup>5.1</sup>

Command Code 0F

Send Data 1 2-byte folder name length

Send Data 2 Absolute folder name path in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	FOLDER NAME	CS
8	2	0	F				
1 byte		1 byte		2 bytes	2 bytes		1 byte

### 5.5.7 (A0.12) IDs Changed List Request

#### Command Sent

##### (A0.12) IDs Changed List Request

Command Type A

Byte count 0

Command Code 12

#### Command Structure

CMD TYPE	BC	CMD CODE		CS
A	0	1	2	
1 byte		1 byte		1 byte

#### Returns

### 82.13 IDs Changed List

Command Type	8
Byte count	2 – Indicates clip name in Extended Format <sup>5.1</sup>
Command Code	13
Send Data 1	2-byte volume name length
Send Data 2	Volume name in Extended Format <sup>5.1</sup>
Send Data 3	2-byte folder name length
Send Data 4	Absolute folder name path in Extended Format <sup>5.1</sup>
Send Data 5	1-byte number of clips that changed in that folder
Send Data 6	2-byte change type. The structure of Send Data 4 is shown in the diagram below.
Send Data 7	2-byte clip name length
Send Data 8	Clip name in Extended Format <sup>5.1</sup>

### Command Structure

CMD TYPE	BC	CMD CODE	ACTUAL BYTE COUNT	VOLUME NAME LENGTH	VOLUME NAME	FOLDER NAME LENGTH	FOLDER NAME	# CLIPS CHANGED	CHANGE TYPE	CLIP NAME LENGTH	CLIP NAME	CS
8	2	1 3										
byte		1 byte	2 bytes	2 bytes		2 bytes		1 byte	2 bytes	2 bytes		1 byte

### Send Data 4

									Ren	Meta data	Folder	Mark Out	Mark In	Del	Add
1 byte								1 byte							

### Comments

**NOTE:** Clips that are added/deleted/modified after a certain reference point will be reported. The reference point may be when the system was first started or when the **IDs Changed List Request** was last processed. In the current implementation, only added and deleted clips are reported. The maximum limit on the number of clips that will be returned per command is 100. Also, this command looks for changed clips in all folders.

Drive name and folder name are sent, followed by the list of all clips that changed in that folder. This is then followed by a second drive and folder name and the list all the clips that changed in this folder. Note that the drive name and folder name will be specified only once for all clips that changed in a particular folder.

As shown above in the Send Data 4 chart, bit 0 byte 2 of Send Data 4, will be set high to indicate that the clip has been added. Bit 1 is set high to indicate that the clip has been deleted, and so on.

Details of the clips, up to the maximum limit of 100 per command, will be returned to the controller. If the number of changed clips overflows this limit, status byte 9, bit 5 will be set high to indicate that details of some clips were dropped.

**NOTE:** *To avoid losing changes, we recommend that the controller poll for the changed IDs at short time intervals.*

### 5.5.8 (AX.10) Erase ID

#### Command Sent

##### AX.10 Erase ID

Command Type	A
Byte count	0 – No Data sent 8 – Clip Name (Name Format <sup>5.1</sup> ) to erase sent A – Clip Name (Extended Format <sup>5.1</sup> ) to erase sent
Command Code	10
Send Data 1	2-byte number of data bytes to follow (sent only if clip name with Extended Format <sup>5.1</sup> is also sent)
Send Data 2	clip name (optional—see comment below)

#### Returns

ACK

#### Comments

This command is used to erase and delete either a specified ID or all existing IDs from the video disk recorder's storage. All timecode positions for a deleted ID will be erased and de-allocated. Note that the default ID cannot be deleted. An attempt to delete the default ID will have no effect. The data provided for this command is variable.

This command can be issued with no parameters. If byte count is zero, all existing IDs (with the exception of the default ID) will be erased and deleted from the video disk recorder's storage.

Deleting many IDs may prevent the video disk recorder from processing further commands for some period of time. If this is the case, the busy status (status byte 0, bit 7) will be set high until the video disk recorder can once again process commands. Status byte A, bit 4 (Movie Delete Complete) will be set once the delete is complete. Status byte A, bit 7 (Movie Delete Failed) will be set if the delete failed. The Network Delete Complete status bit will be reset when another delete command is received.

This command can be issued with a single ID parameter. If byte count is 8, then an 8 byte ID is sent as data. In this case, the specified ID will be erased and

deleted from the video disk recorder's storage. If the specified ID does not currently exist in the video disk recorder's storage, or if the default ID is specified, the **Erase ID** command will have no effect.

The Clip ID name can be sent in the Extended Format<sup>5.1</sup>. In this case, the byte count sent will have the second bit set high. So, if byte count is A, a clip ID name in Extended Format has been sent. The third and fourth bytes sent in the stream will have the actual number of data bytes sent.

The clip name specified in Send Data 2 may contain a full rooted path; otherwise, the clip to be erased will be picked from the current working directory.

### 5.5.9 (A0.2A) List First Folder

#### Command Sent

##### A0.2A List First Folder

Command Type	A
Byte count	0
Command Code	2A

#### Returns

##### 8X.2A Folder List

Command Type	8
Byte count	2 – If at least one folder present 0 – If no folders present
Command Type	2A
Return Data 1	2-byte number of data bytes to follow (if at least one folder is present)
Return Data 2	2 byte folder name length (if at least one folder is present)
Return Data 3	Folder name (if at least one folder is present)

#### Comments

This command will request the name of the first folder that currently exists in the video disk recorder's storage. This command will then advance the current listing position to the second folder, so that a subsequent **List Next Folder** command will return the next set of folders starting from the second folder.

In no folders exist, 80.2A is returned. If at least one folder is present, 82.2A is returned with the folder name in Extended Name Format.

### 5.5.10 (A0.2B) List Next Folder

#### Command Sent

### A0.2B List Next Folder

Command Type      A  
Byte count          0  
Command Code      2B

### Returns

#### 8X.2B Folder List

Command Type      8  
Byte count          0 – No more folders present  
                         2 – One or more folders in Extended Format<sup>5.1</sup> returned as data  
  
Command Type      2B  
Return Data 1      2-byte number of data bytes to follow (if at least one more folder is present)  
Return Data 2      2 byte folder name length (if at least one more folder is present)  
Return Data 3      Folder name (if at least one more folder is present)

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	FOLDER NAME LEN	FOLDER NAME	FOLDER NAME LEN	FOLDER NAME	CS
8	2	2	B						
1 byte		1 byte		2 bytes	2 bytes				1 byte

### Comments

This command will request the next set of folders that currently exists in the video disk recorder's storage, and will return this information in an ID listing response (82.2A). This command will then advance the current listing position to the next folder after the sent list, so that a subsequent **List Next Folder** command will return the next set of folder names.

If no more folders exist, 80.2A is returned. If at least one more folder is present, then 82.2A is sent back filled with as many folder names as can fit in the 255 byte return data stream. The folder names are returned in the Extended Format.

### 5.5.11 (AX.1C) Total /Available Storage Request

#### Command Sent

#### (AX.1C) Total /Available Storage Request

Command Type      A  
Byte count          0 – Request for longest contiguous storage  
                         1 – Extension  
  
Command Code      1C  
Send Data 1      Sent if byte count=1. Can be one of following:  
                         0 – Request for free space in Mbytes



- 1 – Request for total capacity in Mbytes
- 2 – Request for available free space in new format

## Returns

If A0.1C was sent,

### 84.1C Storage Data

Command Type	8
Byte count	4
Command Type	1C
Return Data 1	4 byte data (Timecode Format <sup>5.1</sup> (ffssmmhh)) (if A0.1C was sent)

-OR-

If A1.1C was sent,

### 88.1C Storage Data

Command Type	8
Byte count	8
Command Type	1C
Return Data 1	8 byte capacity in MB (If A11C00/A11C01 was sent)

-OR-

If A1.1C 02 was sent,

8 byte data (hhhhhhhhhhmmssff)

## Comments

This command can be used to request the total storage capacity of the video server. For this request, the byte count and Send Data should both be 1. Eight bytes of return data will contain the total storage capacity of the server in Mbytes.

This command can also be used to request the free space in Mbytes remaining on the video server. For this request, the byte count should be 1 and send data should be 0. Eight bytes of return data will contain the remaining free space in Mbytes.

This command can also be used to request the space (in the Extended Time Format) remaining on the video server. For this request, the byte count should be 1 and send data should be 2. Eight bytes of return data will contain the remaining free space in the new timecode format. Five bytes will hold the hour information and the remaining three bytes will hold the minute, second and frame information. The ordering of the bytes is: hh hh hh hh hh mm ss ff, with frames sent first in the byte stream. The values are in hexadecimal rather than BCD format. The space remaining is calculated based on the settings of the channel acquired.

The command can also be used to request the amount of available storage in the video disk recorder in regular timecode format. Four bytes of data will be returned

expressed in hours, minutes, seconds, and frames. The storage time is calculated based on settings of the acquired channel. The available storage time is formatted similar to the 4 byte BCD format for timecode positions, but the hours digits will be permitted to reach 99 hours. If the available storage time exceeds 99:59:59:00, the video disk recorder should return 99:59:59:00.

#### 5.5.12 (A4.1D) Set Record Duration

##### Command Sent

##### (A4.1D) Set Record Duration

Command Type      A  
Byte count          4  
Command Code      1D

Send Data 1          4-byte timecode (Timecode Format<sup>5.1</sup> (ffssmmhh)) to represent record duration to set

##### Returns

ACK

##### Comments

This command can be used to set the length of a recording. A clip should have been loaded previously through a **Record Cue Up With Data** command. This command can also be sent when a recording is in progress.

Status byte 9, bit 6 will be set high to indicate 'Out Preset Failed' if the command has failed for some reason. The command could fail if no clip was loaded for record on the timeline. It could also fail if an incorrect duration is sent (e.g. duration is less than current length already recorded).

#### 5.5.13 (A2.31) Create Folder

##### Command Sent

##### (A2.31) Create Folder

Command Type      A  
Byte count          2 – Indicates folder name in Extended Format<sup>5.1</sup>  
Command Code      31

Send Data 1          2-byte folder length

Send Data 2          Absolute folder name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	FOLDER NAME	CS
A	2	3	1				
1 byte		1 byte		2 bytes	2 bytes		1 byte

## Returns

On Success: ACK  
On Failure: Status byte 3, bit 2 is set high to indicate ‘Specified Folder already exists,’ or status byte 3, bit 3 is set high to indicate ‘Invalid Folder Name.’

## Comments

Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command.

### 5.5.14 (A2.28) Rename Folder

#### Command Sent

##### (A2.28) Rename Folder

Command Type A  
Byte count 2 – Indicates folder name in Extended Format<sup>5.1</sup>  
Command Code 28

Send Data 1 2-byte folder length  
Send Data 2 Current absolute folder name in Extended Format<sup>5.1</sup>  
Send Data 3 2-byte folder length  
Send Data 4 New absolute folder name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	CURRENT FOLDER NAME	LENGTH	NEW FOLDER NAME	CS
A	2	2	8						
1 byte		1 byte		2 bytes	2 bytes				1 byte

## Returns

On Success: ACK  
On Failure: Status byte 3, bit 2 is set high to indicate ‘Specified Folder Already Exists,’ or status byte 3, bit 3 is set high to indicate “Invalid Folder Name.” Status byte 3, bit 6 is set high to indicate ‘Specified Folder Does Not Exist.’

## Comments

The current folder will be assumed if no path information is available in Send Data 2. If path information is only available in Send Data 2 and not in Send Data 4, then the rename will take effect on the folder path specified in Send Data 2. Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command.

### 5.5.15 (A2.29) Delete Folder

#### Command Sent

##### (A2.29) Delete Folder

Command Type        A  
Byte count            2 – Indicates folder name in Extended Format<sup>5.1</sup>  
Command Code        29

Send Data 1           2-byte folder length  
Send Data 2           Current absolute folder name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	FOLDER NAME	CS
A	2	2	9				
1 byte		1 byte		2 bytes	2 bytes		1 byte

#### Returns

On Success:            ACK  
On Failure:            Status byte 3, bit 3 is set high to indicate, ‘Invalid Folder Name,’ or status byte 3, bit 4 is set high to indicate ‘Folder Deletion Failed.’

#### Comments

Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command.

### 5.5.16 (A2.25) ID Start Time Request

#### Command Sent

##### A2.25 ID Start Time Request

Command Type        A  
Byte count            2 – To indicate clip name in Extended Format<sup>5.1</sup> sent  
Command Code        25  
Send Data 1           2-byte number of data bytes to follow  
Send Data 2           Clip name in Extended Format<sup>5.1</sup>

#### Returns

##### 84.25 ID Start Time

Command Type        8  
Byte count            0 – If clip not found  
                            4 – If clip found

Command Code	25
Return Data 1	4-byte timecode in Timecode Format <sup>5.1</sup> (ffssmmhh) if clip is found

### Comments

This command will request the start timecode of a clip from the Video Disk Recorder. Send Data 1 is the number of data bytes to follow. Send Data 2 is the clip name in Extended Format<sup>5.1</sup>.

If the ID is found, then 84.25 will be sent as reply. This will contain the 4-byte timecode in Timecode Format<sup>5.1</sup>. This is the timecode value in the first field of the first timecode track of clip.

If the ID is not found, then 80.25 will be sent as reply. Status byte A, bit 0 (ID Not Found) will also be set.

The clip name specified in Send Data 2 may contain a full rooted path; otherwise it is assumed that the clip whose start time is being requested exists in the current working directory.

## 5.5.17 (A2.17) ID Duration Request

### Command Sent

#### A2.17 ID Duration Request

Command Type	A
Byte count	2 – Indicates clip name in Extended Format <sup>5.1</sup> sent
Command Code	17
Send Data 1	2-byte number of data bytes to follow (1+ n)
Send Data 2	Clip name in Extended Format <sup>5.1</sup>

### Returns

#### 84.17 ID Duration

Command Type	8
Byte count	4 – If clip found 0 – If clip not found
Command Code	17
Return Data 1	4 byte length data Timecode Format <sup>5.1</sup> (ffssmmhh)

### Comments

This command requests the duration or length of a clip from the Video Disk Recorder. Send Data 1 is the number of data bytes to follow. Send Data 2 is clip name in Extended Format<sup>5.1</sup>.

If the ID is found, 84.17 is sent as reply. This will contain the 4-byte length of the clip in BCD Format<sup>5.1</sup>. The first byte in the return data will have the frame count,

second byte will have the seconds count, third byte will have the minute count and the fourth byte will have the hour count.

If the ID is not found, then 80.17 will be sent as reply. Status byte A, bit 0 (ID Not Found) will also be set.

The clip name specified in Send Data 2 may contain a full rooted path; otherwise it is assumed that the clip whose duration is being requested exists in the current working directory.

#### 5.5.18 (AE.30) Replace Edit

##### Command Sent

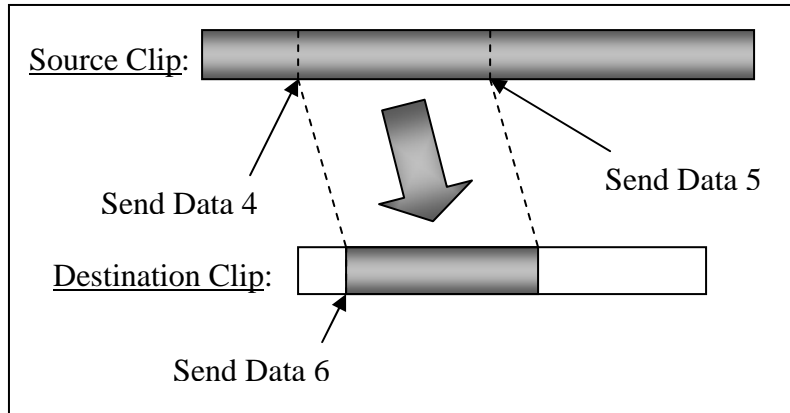
##### (AE.30) Replace Edit

Command Type	A
Byte count	E - Clip (Extended Format <sup>5.1</sup> ) specified by data is loaded to specified timecode
Command Code	30
Send Data 1	1 byte track mapping value. 0x00 – All tracks 0x01 – Video Tracks 0x02 – Audio Tracks
Send Data 2	2-byte source clip name length
Send Data 3	source clip name (Extended Format <sup>5.1</sup> )
Send Data 4	4 byte in point in Timecode Format <sup>5.1</sup> (ffssmmhh)
Send Data 5	4 byte out point in Timecode Format <sup>5.1</sup> (ffssmmhh)
Send Data 6	4 byte destination insert point, zero based from start of material in Timecode Format <sup>5.1</sup> (ffssmmhh)
Send Data 7	2 byte destination clip name length (optional)
Send Data 8	destination clip name (Extended Format <sup>5.1</sup> ) (optional)

##### Comments

This command was introduced in the K2 server, version 3.2.

This command will replace a portion of one clip with a portion of another clip. Using the track mapping value, it can replace all the tracks in the clip, replace only the video tracks in the clip, or replace only the audio tracks in the clip.



Replace a portion of a clip with black by using the virtual clip “<BLACK>” as the source clip. Wipe out just the audio by using the “<BLACK>” clip as the source material and the audio tracks mapping value.

Send Data 7 and 8 may be omitted if the clip is cued on a timeline on the channel in which the command is received. In this case, the edit will only occur against the cued material and will not affect the original clip in any manner.

Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set. This command is also supported by the channel-less AMP listener. If the command fails, Status Byte 0 bit 3, “General Error”, will be set.

### 5.5.19 (AX.2D) Stripe Timecode

#### Command Sent

##### AX.2D Stripe Timecode

Command Type	A
Byte count	4 – Starting timecode is sent in Send Data 1. A – Starting timecode is sent in Send Data 1 along with the clip name in Extended Format, sent Send Data 2.
Command Code	2D
Send Data 1	Starting timecode (Timecode Format <sup>5.1</sup> (ffssmmhh))
Send Data 2	Clip name in Extended Format <sup>5.1</sup>

#### Returns

ACK

#### Comments

This command is used to reinitialize the timecode track of the specified clip beginning with the timecode specified in Send Data 1 of the currently loaded ID (BC equal to ‘4’) or the ID provided (BC equal to ‘A’).

When Byte Count 'A' is provided, an extended clip name is required. This allows for the use of this command when the clip is not currently loaded into the timeline and also allows the use of this command from a channel-less connection. Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set. If the stripe fails, Status Byte 0 bit 3, “General Error”, will be set.

*With byte count equal to '4'*

CMD TYPE	BC	CMD CODE		STARTING TIMECODE	CS
A	4	2	D		
1 byte		1 byte		4 bytes	1 byte

*With byte count equal to 'A'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	STARTING TIMECODE	CLIP NAME LEN	CLIP NAME	CS
A	A	2	D					
1 byte		1 byte		2 bytes	4 bytes	2 bytes		1 byte

## 5.5.20 (AX.2E) Set Mark In

### Command Sent

#### AX.2E Set Mark In

Command Type      A

Byte count          0 – Currently loaded clip’s mark in is set to start of material (SOM).  
                              4 – Currently loaded clip’s mark in is set to specified timecode.  
                              A – Set mark in to start of material (SOM) for clip name provided in Extended Format.  
                              E – Set mark in to specified timecode for clip name provided in Extended Format.

Command Code      2E

### Returns

ACK

### Comments

This command was introduced in the K2 server, version 3.2.  
 This command is used to set the mark in point of the specified clip.



Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set. If the Set Mark In command fails, Status Byte 0 bit 3, “General Error”, will be set.

*With byte count equal to ‘0’*

CMD TYPE	BC	CMD CODE		CS
A	0	2	E	
1 byte		1 byte		1 byte

*With byte count equal to ‘4’*

Send Data 1                      Mark in timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))

CMD TYPE	BC	CMD CODE		MARK IN TIMECODE	CS
A	4	2	E		
1 byte		1 byte		4 bytes	1 byte

*With byte count equal to ‘A’*

Send Data 1                      2-byte clip name length.

Send Data 2                      Clip name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	CS
A	A	2	E				
1 byte		1 byte		2 bytes	2 bytes		1 byte

*With byte count equal to ‘E’*

Send Data 1                      Mark in timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))

Send Data 2                      2-byte clip name length.

Send Data 3                      Clip name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	MARK IN TIMECODE	CLIP NAME LEN	CLIP NAME	CS
A	E	2	E					
1 byte		1 byte		2 bytes	4 bytes	2 bytes		1 byte

## 5.5.21 (AX.2F) Set Mark Out

### Command Sent

## AX.2F Set Mark Out

Command Type	A
Byte count	0 – Currently loaded clip’s mark out is set to end of material (EOM). 4 – Currently loaded clip’s mark out is set to specified timecode. A – Set mark out to end of material (EOM) for clip name provided in Extended Format. E – Set mark out to specified timecode for clip name provided in Extended Format.
Command Code	2F

### Returns

ACK

### Comments

This command was introduced in the K2 server, version 3.2.

This command is used to set the mark out point of the specified clip. Please note that the mark out is exclusive; therefore the timecode specified is the position after the last frame to be used.

Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set. If the Set Mark Out command fails, Status Byte 0 bit 3, “General Error”, will be set.

*With byte count equal to ‘0’*

CMD TYPE	BC	CMD CODE		CS
A	0	2	F	
1 byte		1 byte		1 byte

*With byte count equal to ‘4’*

Send Data 1            Mark out timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))

CMD TYPE	BC	CMD CODE		MARK OUT TIMECODE	CS
A	4	2	F		
1 byte		1 byte		4 bytes	1 byte

*With byte count equal to ‘A’*

Send Data 1            2-byte clip name length.

Send Data 2            Clip name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	CS
A	A	2	F				
1 byte		1 byte		2 bytes	2 bytes		1 byte

*With byte count equal to 'E'*

Send Data 1            Mark out timecode (Timecode Format<sup>5.1</sup> (ffssmmhh))

Send Data 2            2-byte clip name length.

Send Data 3            Clip name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	MARK OUT TIMECODE	CLIP NAME LEN	CLIP NAME	CS
A	E	2	F					
1 byte		1 byte		2 bytes	4 bytes	2 bytes		1 byte

## 5.5.22 (AX.1A) Get Aspect Ratio Conversion Override

### Command Sent

#### AX.1A Get Aspect Ratio Conversion Override

Command Type        A

Byte count            2 or 0

Command Code        1A

Send Data 1            2-byte clip name length (optional)

Send Data 2            clip name (optional)

### Command Structure

If A0.1A sent,

CMD TYPE	BC	CMD CODE		CS
A	0	1	A	
1 byte		1 byte		1 byte

If A2.1A sent,

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	CLIP NAME	CS
A	2	1	A				
1 byte		1 byte		2 byte	2 bytes		1 byte

### Returns

#### 81.1A Aspect Ratio Conversion Override Setting

Command Type        8

Byte count 1  
 Command Code 1  
 Return Data 1 0 – Bars (Upconversion)  
 1 – Half Bar (Upconversion)  
 2 – Crop (Upconversion)  
 3 – Stretch (Upconversion)  
 4 – Bars (Downconversion)  
 5 – Half Bar (Downconversion)  
 6 – Crop (Downconversion)  
 7 – Stretch (Downconversion)  
 8 – Default to channel setting (K2 server, version 3.2 and above)

CMD TYPE	BC	CMD CODE		Conversion Type	CS
8	1	1	A		
1 byte		1 byte		1 byte	1 byte

## Comments

This command can be sent to get the current aspect ratio conversion setting for the current channel or for a particular clip. If the clip name is sent with the command, the setting for the clip is returned. Otherwise the setting for a channel is returned.

### 5.5.23 (A2.1B) Set Aspect Ratio Conversion Override

#### Command Sent

#### A2.1B Set Aspect Ratio Conversion Override

Command Type A  
 Byte count 2  
 Command Code 1B  
 Send Data 1 0 – Bars (Upconversion)  
 1 – Half Bar (Upconversion)  
 2 – Crop (Upconversion)  
 3 – Stretch (Upconversion)  
 4 – Bars (Downconversion)  
 5 – Half Bar (Downconversion)  
 6 – Crop (Downconversion)  
 7 – Stretch (Downconversion)  
 8 – Default to channel setting. (K2 server, version 3.2 and above)

Send Data 2                      2-byte clip name length (Optional)  
Send Data 3                      clip name (Optional)

### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CONVERSION TYPE	LENGTH	CLIP NAME	CS
A	2	1	B					
1 byte		1 byte		2 byte	1 byte	2 bytes		1 byte

### Returns

ACK

### Comments

This command can be sent to set the aspect ratio conversion for a particular clip.  
The following table explains the various aspect ratio conversion settings that can be sent.

AMP Code	Description	Profile term	Turbo term	K2 term
0	The 4:3 aspect ratio is maintained, centered on the screen, with black bars filling the left and right portions of the 16:9 display.	Pillarbox	Bars	Bar
1	The picture aspect ratio is maintained, but the image is slightly enlarged. The top and bottom of the image are slightly cropped, and thin black bars fill the left and right portions of the 16:9 display.	Half Pillarbox	Bars & Crop	Half Bar
2	The picture aspect ratio is maintained, but the image is enlarged so that it horizontally fills the HD display. The top and bottom of the 4:3 SD image are cropped to fit in the 16:9 display.	Zoom	Crop	Crop
3	The picture aspect ratio is distorted. The image fills the screen vertically without cropping, and is stretched horizontally to fill the 16:9 display. This conversion up-converts Full Height Anamorphic (FHA) 16:9SD material.	Stretch to Fit	Not supported	Stretch
4	The 16:9 aspect ratio is maintained centered on the screen, with black bars filling the top and bottom portions of the 4:3 display.	Letterbox	Bars	Bar
5	The picture aspect ratio is maintained, but the image is slightly enlarged. The left and right sides of the image are slightly cropped, and thin black bars fill the top and bottom portions of the 4:3 display.	Half Letterbox	Bars & Crop	Half Bar
6	The picture aspect ratio is maintained, but the image is enlarged so that it vertically fills the SD display. The left and right sides of the 16:9 HD image are cropped to fit in the 4:3 SD display	Crop	Crop	Crop
7	The picture aspect ratio is distorted. The image fills the screen horizontally without cropping, and is stretched vertically to fill the 4:3 display. This conversion	Compress	Not supported	Stretch

AMP Code	Description	Profile term	Turbo term	K2 term
	generates Full Height Anamorphic (FHA) 16:9 SD material.			
8	The aspect ratio override will be removed and the clip will adopt the default aspect ratio setting of the channel it plays out.	Not supported	Not supported	Channel Default

#### 5.5.24 (AE.1E) Set Audio Gain

##### Command Sent

##### A2.1E Set Audio Gain

Command Type        A  
 Byte count            E  
 Command Code        1E  
 Send Data 1           4-byte audio gain  
 Send Data 2           2-byte clip name length  
 Send Data 3           clip name

##### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AUDIO GAIN	LENGTH	CLIP NAME	CS
A	E	1	E					
1 byte		1 byte		2 byte	4 bytes	2 bytes		1 byte

##### Returns

ACK

##### Comments

This command was introduced in the K2 server, version 3.2.

This command can be sent to set the audio gain for a particular clip. The audio gain will be applied to all audio tracks on the specified clip. A clip only gets a single audio gain adjustment. The 4 byte audio gain value is a 4 byte float number that represents a gain value between -40.00 and +20.00 dBu. The format of the floating point value used in this command follows the standard IEEE floating point format for representing a 32-bit (single precision) value.

The gain adjustment is applied as a clip property, so as the clip is ejected, transferred, or the system is restarted, the property will persist. The property can be applied prior to loading the clip on the timeline and the command is also supported by the channel-less AMP listener. When the clip is played back alone or as part of a clip sequence, the audio gain is adjusted in real time.

Status Byte 0 Bit 7, “Busy”, will be set until the completion of this command.

### 5.5.25 (AA.1F) Get Audio Gain

#### Command Sent

##### A1.1F Get Audio Gain

Command Type        A  
Byte count            A  
Command Code        1F  
Send Data 2           2-byte clip name length  
Send Data 3           clip name

#### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	LENGTH	CLIP NAME	CS
A	A	1	F				
1 byte		1 byte		2 byte	2 bytes		1 byte

#### Returns

CMD TYPE	BC	CMD CODE		AUDIO GAIN	CS
8	4	1	F		
1 byte		1 byte		4 bytes	1 byte

#### Comments

This command was introduced in the K2 server, version 3.2.

This command can be sent to retrieve the audio gain for a particular clip. The gain is returned in the command response as a 4 byte value. The 4 byte audio gain value is a 4 byte float number that represents a gain value between -40.00 and +20.00 dBU. The format of the floating point value used in this command follows the standard IEEE floating point format for representing a 32-bit (single precision) value. This command is also supported by the channel-less AMP listener. For more details regarding audio gain, please see the (AC.1E) Set Audio Gain command.

### 5.5.26 (C0.28) Abort Transfer ID

#### Command Sent

##### C0.28 Abort Transfer ID

Command Type        C

Byte count	0 or 2
Command Code	28
Send Data 1	2-bytes destination location length (optional)
Send Data 2	Dest path (hostname/volume/dir/ID) (optional)

### Returns

ACK

### Comments

Send Data 1 and Send Data 2 will fully qualify the transfer that needs to be aborted.

This command will cause the disk system machine to abort the requested transfer being processed by the video disk recorder.

Status byte A, bit 3 (Abort Transfer ID Complete) will be set once the **Abort** is complete. This bit will be reset when an **Abort Transfer ID** command is received. Status byte A, bit 6 (Abort Transfer ID Failed) will be set if the abort fails.

## 5.5.27 (C1.27) Transfer ID Status Request

### Command Sent

#### C1.27 Transfer ID Status Request

Command Type	C
Byte count	1 or 2
Command Code	27
Send Data 1	1 byte data 0 for state request 1 for percent complete 2 for number of bytes transferred 3 for number of fields transferred
Send Data 2	2-bytes destination location length (optional)
Send Data 3	Dest path (hostname/volume/dir/ID) (optional)

### Returns

#### DX.27 Transfer ID Status

Command Type	D
Byte count	1 – If Send Data 1 was 0 or 1 8 – If Send Data 1 was 2 or 3 0 – If no transfer is currently in progress



Command Code	27
Return Data 1	<p>If Send Data 1 was 0, then</p> <p>1-byte state info</p> <p>0 for queued / building state</p> <p>2 for error</p> <p>1 for currently in progress</p> <p>3 for completed</p> <p>4 for aborted</p> <p>If Send Data 1 was 1, then</p> <p>1-byte value between 0 and 100</p> <p>If Send Data 1 was 2, then</p> <p>8 bytes data containing number of bytes transferred</p> <p>If Send Data 1 was 3, then</p> <p>8 bytes<sup>5.1</sup> data containing number of fields transferred</p>

### Comments

This command will cause the disk system machine to get the status of the requested transfer being processed by the videodisk recorder.

Send Data 1 is the type of status info requested.

Send Data 2 and Send Data 3 will fully qualify the transfer whose status is requested.

The return data will depend on the kind of status requested. If the information pertaining to the clip is not found, D0.27 is returned with no data in it.

### 5.5.28 (C2.26) Transfer ID

This form of the command is provided for backwards compatibility. For finer control on transfer files and file conversion, please refer to the newer form of the Extended Transfer ID command C2.25.

### Command Sent

#### C2.26 Transfer ID

Command Type	C
Byte count	2 – Indicates data in Extended Format <sup>5.1</sup> sent
Command Code	26
Send Data 1	2-byte number of data bytes to follow
Send Data 2	1 byte direction of transfer.
	0 – Transfer from local to remote machine
	1 – Transfer from remote to local machine
Send Data 3	clip name (Extended Format <sup>5.1</sup> )

Send Data 4	1 byte remote machine name length (n2)
Send Data 5	'n2' bytes remote machine name (up to 32 bytes)

## Returns

### D1.26 Transfer Started

Command Type	D
Byte count	1
Command Code	26
Send Data 1	1 byte value
	0 – Accepted Request
	1 – Could not accept request because another transfer is in progress

## Comments

This command will cause the video file identified by the ID to be copied between the local disk system machine and a remote disk system machine.

Send Data 1 is the number of data bytes to follow; Send Data 2 is the direction of transfer. Send Data 3 is the clip name in Extended Format<sup>5.1</sup>. Send Data 4 is the remote machine name length. Send Data 5 is the remote machine name.

Status byte A, bit 0 (ID Not Found) will be set if the ID was not found. Status byte A, bit 2 (Transfer ID Complete) will be set once the copy is complete. Status byte A, bit 5 (Transfer ID Failed) will be set if the copy failed for some reason. The Transfer ID Complete status bit will be reset when a **Transfer ID** command is received. The video disk recorder will only accept one transfer request at a time.

D1.26 is returned as reply. Return Data 1 is sent as 0 if transfer request was accepted. Return Data 1 is sent as 1 if another transfer is already being processed.

In Profile systems, all information related to the transfer request will be logged in the local disk machine in the file FcNet\_<channelName>.000 where <channelName> is the name of the channel being controlled.

## 5.5.29 (C2.25) Extended Transfer ID

### Command Sent

#### C2.25 Extended Transfer ID

Command Type	C
Byte count	2 – Indicates data in Extended Format <sup>5.1</sup> sent
Command Code	25
Send Data 1	1 byte source transfer type
	0 - GXF
	1 – Avi file

2 - Vibrint  
 3 - Profile  
 4 – MXF  
 5 – MPEG  
 6 – MOV  
 Send Data 2      2-bytes source location length  
 Send Data 3      Src path data (hostname/volume/dir/ID)  
 Send Data 4      4-bytes Mark-In timecode  
 Send Data 5      4-bytes Mark-Out timecode  
 Send Data 6      1 byte destination transfer type  
                      0 - GXF  
                      1 – Avi file  
                      2 - Vibrint  
                      3 - Profile  
                      4 – MXF  
                      5 – MPEG  
                      6 – MOV  
 Send Data 7      2-bytes destination location length  
 Send Data 8      Destination path data (hostname/volume/dir/ID)

Cmd Type	BC	Cmd Code	Actual byte count	Src xfr type	Src locn length	Src path	Mark In TC	Mark Out TC	Dest xfr type	Dest locn length	Dest path	CS
C	2	25										
1 byte		1 byte	2 bytes	1 byte	2 bytes		4 bytes	4 bytes	1 byte	2 bytes		1 byte

## Returns

### D1.25 Transfer Started

Command Type      D  
 Byte count          1  
 Command Code      25  
 Send Data 1        1 byte value  
                      0 – Accepted Request  
                      2 – Unsupported Option

## Comments

This command will cause the file identified by the ID to be copied or converted between the source device and a destination device. Source and destination device may be the same.

Send Data 3 and Send Data 8 may contain only the ID. In this case, the ID is taken or placed in the current active directory.

Send Data 4 and Send Data 5 – Timecode – The timecode value for both Mark-In and Mark-Out must be set to FFFFFFFF to transfer the complete clip (ID).

When an **Extended Transfer ID** is issued, the status of the transfer can be obtained only by issuing the **Transfer ID Status Request**.

D1.25 is returned as reply. Return Data 1 is sent as 0 if transfer request was accepted. Return Data 1 is sent as 2 if the option is unsupported.

### 5.5.30 (C2.29) Network Delete

#### Command Sent

##### C2.29 Network Delete

Command Type	C
Byte count	2 – Indicates clip name in Extended Format <sup>5.1</sup> sent
Command Code	29
Send Data 1	2-byte number of data bytes to follow
Send Data 2	Clip name (Extended Format <sup>5.1</sup> )
Send Data 3	1 byte machine name length (n2)
Send Data 4	‘n2’ bytes machine name (up to 32 bytes)

#### Returns

##### D1.29 Delete Started

Command Type	D
Byte count	1
Command Code	29
Send Data 1	1 byte value 0 – Accepted Request 1 – Could not accept request since another delete is in progress

#### Comments

This command will cause the disk system to delete the video file identified by the ID from the destination disk system machine.

This command can be used on systems where multiple videodisks and/or archive systems may be linked together on a network where files are to be transferred between them. Send Data 1 is the number of data bytes to follow; Send Data 2 is the clip name in Extended Format<sup>5.1</sup>. Send Data 3 is the machine name length and Send Data 4 is the machine name.

Status byte A, bit 4 (Movie Delete Complete) will be set once the delete is complete. Status byte A, bit 7 (Movie Delete Failed) will be set if the delete failed. The Network Delete Complete status bit will be reset when another delete command is received. The video disk recorder will accept only one Delete request at a time.

D1.29 is sent as reply. Return Data 1 is zero if the request was accepted. Return Data 1 is 1 if another Network Delete operation is already in progress.

On Profiles, all information related to the transfer request will be logged in the local disk machine in the file FcNet\_<channelName>.000 where <channelName> is the name of the channel being controlled.

### 5.5.31 (AX.19) New Copy

The **New Copy** command creates a sub-clip from the original clip.

Both Shallow and Deep copy will eventually be supported by this command, though initially only Shallow Copy will be supported.

#### Command Sent

##### (AX.19) New Copy

Command Type	A
Byte count	A no marks or E with marks
Command Code	19
Send Data 1	Type of Copy When Data 1 equals 'S' – Shallow Copy When Data 1 equals 'D' – Deep Copy When Data 1 equals 'M' - Move
Send Data 2	2-byte clip name length
Send Data 3	Original clip name (see comment below)
Send Data 4	4-byte Mark-In (Optional)
Send Data 5	4-byte Mark-Out (Optional)
Send Data 6	2-byte clip name length
Send Data 7	New clip name (see comment below)

Status byte 0, bit 7 (busy bit) is set high to indicate that the server is busy while New Copy is happening. Once the Copy is complete, the busy bit is cleared.

## Command structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	COPY TYPE	LENGTH	ORIGINAL CLIP NAME	MARK IN	Mark Out	LENGTH	NEW CLIP NAME	CS
A	A	1	9		S							
1 byte		1 byte		2 byte	1 byte	2 byte		4 byte	4 byte	2 byte		1 byte

## Returns

On Success	ACK
On Failure	<p>Byte 9, bit 7 is set high to indicate ‘Cannot Overwrite An Existing Clip,’ if a clip with the specified “New clip” name is present on the disk.</p> <p>Status byte 9, bit 3 is set high to indicate ‘Disk Overflow’ in case there is not enough disk space to create the new clip.</p> <p>Status byte 3, bit 6 is set high to indicate the source file specified in the <b>New Copy</b> does not exist.</p>

## Comments

Send Data 4 (Mark-In) and Send Data 5 (Mark-Out) are considered offsets from the SOM of the clip.

Send Data 3 and Send Data 7 may contain a full rooted path; otherwise the source and destination clips will be chosen from the working directory.

### 5.5.32 (AX.22) Get Audio Track Labels

#### Command Sent

##### AX.22 Get Audio Track Labels

Command Type	A
Byte count	2 – No Data sent A – Clip Name (Extended Format <sup>5.1</sup> ) sent
Command Code	22
Send Data 1	2-byte number of data bytes to follow (sent only if clip name with Extended Format <sup>5.1</sup> is also sent)
Send Data 2	clip name (optional—see comment below)

## Returns

##### 8X.22 Audio Track Label List

Command Type	8
--------------	---

Byte count                      A – If at least one label is present  
    0 – If no labels are present

Command Type                22

Return Data 1                1-byte audio track index number, zero based (if at least one label is present)

Return Data 2                2-byte label name length (if at least one label is present)

Return Data 3                label name (if at least one folder is present)

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	INDEX	LABEL LEN	LABEL NAME	...	CS
8	A	2	2						
1 byte		1 byte		2 bytes	1 byte	2 bytes			1 byte

## Comments

This command is used to retrieve all the audio track labels from a particular clip. This command can be issued with no parameters. If byte count is zero the audio track labels from the currently loaded clip will be returned. If the byte count is A, the audio track labels from the clip name provided will be returned. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set.

If multiple audio track labels exist, return data 1, 2, and 3 will be repeated in the response until all labels are returned.

## 5.5.33 (AX.23) Set Audio Track Labels

### Command Sent

#### AX.23 Set Audio Track Labels

Command Type                A

Byte count                    2 – Currently loaded clips label is set.  
    A – Clip name (Extended Format<sup>5.1</sup>) sent to set labels.

Command Code                23

### Returns

ACK

### Comments

This command is used to set the audio track labels for a particular clip. This command can be issued with no parameters. If byte count is zero the audio track labels from the currently loaded clip will be set. If the byte count is A, the audio track labels from the clip name provided will be set. If the clip specified is not found, Status Byte A bit 0, “ID Not Found”, will be set.

If multiple audio track labels are to be set, repeat the Audio Track Index, Label Length, and Label fields.

*With byte count equal to '2'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AUDIO TRACK INDEX	LABEL LENGTH	LABEL	...	CS
A	2	2	3						
1 byte		1 byte		2 bytes	1 byte	2 bytes			1 byte

*With byte count equal to 'A'*

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	AUDIO TRACK INDEX	LABEL LENGTH	LABEL	...	CS
A	A	2	3								
1 byte		1 byte		2 bytes	2 bytes		1 byte	2 bytes			1 byte

### 5.5.34 (A0.36) Get Audio Input Tags

#### Command Sent

##### A0.36 Get Audio Input Tags

Command Type        A  
Byte count            2  
Command Code        36

#### Returns

##### 8X.36 Audio Input Tag List

Command Type        8  
Byte count            A – If at least one tag is present  
                             0 – If no tag are present  
Command Type        36  
Return Data 1        1-byte audio input number, zero based.  
Return Data 2        2-byte tag length  
Return Data 3        Tag name

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	INPUT NUMBER	TAG LEN	TAG NAME	...	CS
8	2	3	6						
1 byte		1 byte		2 bytes	1 byte	2 bytes			1 byte



## Comments

This command is used to retrieve all the audio input tags from a particular record channel.

If multiple audio inputs exist, return data 1, 2, and 3 will be repeated in the response until all tags are returned.

### 5.5.35 (AA.37) Set Audio Input Tags

#### Command Sent

##### AA.37 Set Audio Input Tags

Command Type        A  
Byte count            A  
Command Code        37  
Send Data 1           1-byte audio input number, zero based  
Send Data 2           2-byte tag length  
Send Data 3           Tag name

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AUDIO INPUT NUMBER	TAG LENGTH	TAG	...	CS
A	A	3	7						
1 byte		1 byte		2 bytes	1 byte	2 bytes			1 byte

## Returns

ACK

## Comments

This command sets the audio input tags from a particular record channel. If multiple audio input tags are to be set, you can repeat the Audio Input Number, Tag Length, and Tag.

### 5.5.36 (A0.38) Get Audio Output Tags

#### Command Sent

##### A0.38 Get Audio Output Tags

Command Type        A  
Byte count            2  
Command Code        38

## Returns

### 8X.38 Audio Output Tag List

Command Type	8
Byte count	A – If at least one tag is present 0 – If no tags are present
Command Type	38
Return Data 1	1-byte audio output number, zero based.
Return Data 2	2-byte tag length
Return Data 3	Tag name
Return Data 4	2-byte secondary tag length
Return Data 5	Secondary tag name
Return Data 6	1-byte play silence 0x01 = true.

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AUDIO OUTPUT NUMBER	TAG LEN	TAG NAME	SECONDARY TAG LEN	SECONDARY TAG	PLAY SILENCE	...	CS
8	2	3	8									
1 byte		1 byte		2 bytes	1 byte	2 bytes		2 bytes				1 byte

## Comments

This command is used to retrieve all the audio output tags from a particular play channel.

If multiple audio outputs exist, return data 1 thru 6 will be repeated in the response until all tags are returned.

## 5.5.37 (AA.39) Set Audio Output Tags

### Command Sent

#### AA.39 Set Audio Output Tags

Command Type	A
Byte count	A
Command Code	39
Send Data 1	1-byte audio output number, zero based
Send Data 2	2-byte tag length
Send Data 3	Tag name
Send Data 4	2-byte secondary tag length
Send Data 5	Secondary tag name
Send Data 6	1-byte play silence 0x01 = true.

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AUDIO OUTPUT NUMBER	TAG LEN	TAG NAME	SECONDARY TAG LEN	SECONDARY TAG	PLAY SILENCE	...	CS
A	A	3	9									
1 byte		1 byte		2 bytes	1 byte	2 bytes		2 bytes		1 byte		1 byte

## Returns

ACK

## Comments

This command sets the audio output tags from a particular play channel. If multiple audio output tags are to be set, you can repeat Send Data 1 thru 6.

## 5.5.38 (A2.3A) Get AFD Setting

### Supported On

- K2 (version 3.3 and newer)
- Summit (all versions)

### Command Sent

#### A2.3A Get AFD Setting

Command Type A

Byte count 2 – To indicate clip name in Extended Format<sup>5.1</sup> sent

Command Code 3A

Send Data 1 2-byte number of data bytes to follow

Send Data 2 Clip name in Extended Format<sup>5.1</sup>

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LENGTH	CLIP NAME	CS
A	2	3	A				
1 byte		1 byte		2 byte	2 bytes		1 byte

## Returns

#### 82.3A AFD Setting

Command Type 8

Byte count 2

Command Code 3A

Return Data 1            AFD Code  
Return Data 2            Widescreen setting:  
                                 0 = 4:3  
                                 1 = Widescreen

CMD TYPE	BC	CMD CODE		AFD SETTING	WIDESCREEN SETTING	CS
8	2	3	A			
1 byte		1 byte		1 byte	1 byte	1 byte

### 5.5.39 (A2.3B) Set AFD Setting

#### Supported On

- K2 (version 3.3 and newer)
- Summit (all versions)

#### Command Sent

##### A2.3B Set AFD Setting

Command Type        A  
Byte count            2 – To indicate clip name in Extended Format<sup>5.1</sup> sent  
Command Code        3B  
Send Data 1           2-byte number of data bytes to follow  
Send Data 2           AFD Setting  
Send Data 3           Widescreen setting:  
                                 0 = 4:3  
                                 1 = Widescreen  
Send Data 4           Clip name in Extended Format<sup>5.1</sup>

#### Command Structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	AFD SETTING	WIDESCREEN SETTING	CLIP NAME LENGTH	CLIP NAME	CS
A	2	3	B						
1 byte		1 byte		2 byte	1 byte	1 byte	2 bytes		1 byte

#### Returns

ACK

## 5.6 Clip data information

Clips can have associated metadata or user data. The following commands provide the ability to read and write clip metadata from/to the video server database.

### 5.6.1 (AA.08) Set Clip Data

#### Command Sent

##### (AA.08) Set Clip Data

Command Type      A  
 Byte count        A  
 Command Code     08

Send Data 1        2-byte clip name length  
 Send Data 2        Clip name in Extended Format<sup>5.1</sup>  
 Send Data 3        1-byte user data name length  
 Send Data 4        User data name  
 Send Data 5        2-byte user data value length  
 Send Data 6        User data value  
 Send Data 7        1-byte Creator Length (optional)  
 Send Data 8        Name of the creator (optional)  
 Send Data 9        1-byte class name length (optional)  
 Send Data 10       Class name (optional)  
 Send Data 11       1-byte data type length (optional)  
 Send Data 12       data type name (optional)

#### Command structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	USER DATA NAME LEN	USER DATA NAME	USER DATA VAL LEN	USER DATA VAL	CREA NAME LEN	CREA NAME	CLASS NAME LEN	CLASS NAME	DATA TYPE LEN	DATA TYPE	CS
A	A	0	8														
1 byte		1 byte		2 byte	2 byte		1 byte		2 byte		1 byte		1 byte		1 byte		1 byte

#### Comments

User data name is a string that identifies the extension, such as description, talents, producer, etc. The creator name refers to the name of the creator of this extension and defaults to “Thomson”. Extensions can be organized under different groups referred to as a class. Examples of possible class values are “user

data,” “Metadata,” and “thumbnail.” If this value is not supplied, it defaults to “user data.”

User data types are

- BINARY
- BYTE (1 byte)
- SHORT (2 bytes)
- INT (4 bytes)
- FLOAT (4 bytes)
- DOUBLE (8 bytes)
- BOOL (1 byte)
- DATE (4 bytes)
- STRING

The default user data type is BINARY.

The clip name specified in Send Data 2 may contain a full rooted path; otherwise it is assumed that the clip whose start time is being requested exists in the current working directory.

If an optional parameter is sent, all prior optional parameters must be sent as well although, a byte count of zero can be used to essentially skip an option. If the option is not provided, the default values are applied.

On the K2 server, if the class “Metadata” is provided, the user data will be visible from AppCenter’s Clip Properties page.

## Returns

### 8A.08 Clip Data

Command Type	8
Byte count	A
Command Code	08

Return Data 1	2-bytes Extension ID length
Return Data 2	Extension identifier

For every user data that is to be stored in its database, the video server generates an extension identifier and returns it in the Clip Data response. The controller can supply this later in order to query for very specific user data.

On failure, status byte 9, bit 3 is set high to indicate disk overflow in case the server is unable to write clip data information to the database.

If a clip does not exist, 80.08 will be returned.

## 5.6.2 (AA.13) Clip Data Request

### Command Sent

#### (AA.13) Clip Data Request

Command Type        A

Byte count            A        Extended command

Command Code        13

Send Data 1           1 byte

C – Only clip name is specified. Attributes related to the clip are returned.

E – Clip name and extension search parameters are specified. User data that match the search criteria is returned.

Send Data 2           2-byte clip name length

Send Data 3           Clip name

The clip name specified in Send Data 3 may contain a full rooted path; otherwise, it is assumed that the clip whose start time is being requested exists in the current working directory.

*With Send Data 1 equal to 'C' (0x43)*

### Command structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	SEARCH OPTION	CLIP NAME LENGTH	CLIP NAME	CS
A	A	1	3		C			
1 byte		1 byte		2 byte	1 byte	2 bytes		1 byte

### Returns

#### 8A.13 Clip Data

Command Type        8

Byte count            A

Command Code	13
Return Data 1	8-bytes Creation Date (Windows FILETIME structure)
Return Data 2	8-bytes Modify Date (Windows FILETIME structure)
Return Data 3	4-bytes duration (timecode)
Return Data 4	1-byte Compression Type – <b>0</b> MPEG1, <b>1</b> MPEG2, <b>2</b> D10, <b>3</b> DV25, <b>4</b> DV50, <b>5</b> DVCAM, <b>6</b> MPEG2HD, <b>7</b> DV100, <b>8</b> AVCI
Return Data 5	1-byte Video Format – <b>0</b> NTSC_525, <b>1</b> PAL_625, <b>2</b> 720_59_94p, <b>3</b> 720_60p, <b>4</b> 1080_23_98i, <b>5</b> 1080_24i, <b>6</b> 1080_25_1to1i, <b>7</b> 1080_29_97_1to1i, <b>8</b> 1080_30_1to1i, <b>9</b> 1080_25_2to1i, <b>10</b> 1080_29_97_2to1i, <b>11</b> 1080_30_2to1i, <b>12</b> 1035_30_2To1 <b>13</b> 1035_29_97_2To1 <b>14</b> 720_50_1To1p <b>15</b> 525_59_94_1To1p <b>16</b> 525_60_1To1p <b>17</b> 525_29_97_1To1p <b>18</b> 525_30_1To1p <b>19</b> 625_50_1To1p <b>20</b> 625_25_1To1p <b>21</b> 720_29_97_1To1p <b>22</b> 720_30_1To1p <b>23</b> 720_25_1To1p <b>24</b> 1440x1080_29_97_2To1 <b>25</b> 1440x1080_30_2To1 <b>26</b> 1440x1080_25_2To1 <b>27</b> Xga_59_94_1To1 <b>28</b> Xga_50_1To1 <b>29</b> Wxga_59_94_1To1 <b>30</b> Wxga_50_1To1 <b>31</b> Wsxga_59_94_1To1 <b>32</b> Wsxga_50_1To1
Return Data 6	1-byte Number of Video Tracks
Return Data 7	1-byte Number of Audio Tracks
Return Data 8	1-byte Number of Ancillary Data Tracks
Return Data 9	1-byte Number of Timecode Tracks
Return Data 10	4-bytes status bytes – <b>bit 0</b> ready to play, <b>bit 1</b> Under Construction, <b>bit 2</b> read only, <b>bit 3</b> locked, <b>bit 4</b> Drop Frame
Return Data 11	2-bytes Thumbnail extension ID length (on thumbnail supported servers)
Return Data 12	Thumbnail extension ID (on thumbnail supported servers)
Return Data 13	8-bytes file size in MB (on thumbnail supported servers)

CMD TYPE	BC	CMD CODE	ACTUAL BYTE COUNT	Creation Date	Modify Date	Duration	Compression Type	Video Format	#Video Tracks	#Audio Tracks	#Anc data Tracks	# TC Tracks	Status	Thumbnail Extn ID len	Thumbnail Extn ID	File Size	CS
8	A	1 3															
1-byte		1-byte	2-byte	8-byte	8-byte	4-byte	1-byte	1-byte	1-byte	1-byte	1 byte	1-byte	4-bytes	2-byte		8-byte	1-byte

On Failure: 80.13 is returned to indicate failure.



Status byte A, bit 0 is set high to indicate 'ID Not Found' if the specified clip is not found on disk.  
 Status byte 9, bit 4 is set high to indicate 'Metadata Not Found' if any requested metadata item is not found in the database.

*With Send Data 1 equal to 'E'*

Send Data 2            2-byte clip name length  
 Send Data 3            Clip name

*Optional*

Send Data 4            1-byte User Data Name length  
 Send Data 5            User Data Name Value  
 Send Data 6            1-byte Creator length  
 Send Data 7            Creator Value  
 Send Data 8            1-byte Class length  
 Send Data 9            Class Value

## Command structure

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	SEARCH OPTION	CLIP NAME LEN	CLIP NAME	USER DATA NAME LEN	USER DATA NAME VALUE	CREATOR LEN	CREATOR VALUE	CLASS LEN	CLASS VALUE	CS
A	A	1	3		E									
1 byte		1 byte		2 byte	1 byte	2byte		1 byte		1byte		1 byte		1 byte

## Returns


### 8A.13Clip Data


Command Type        8  
 Byte count            A  
 Command Code        13

Return Data 1        2-bytes number of data bytes to follow

Return Data 2	1-byte User Data Name length
Return Data 3	User Data Name value
Return Data 4	1-byte Creator length
Return Data 5	Creator value
Return Data 6	1-byte Class length
Return Data 7	Class value
Return Data 8	1-byte Type length
Return Data 9	Type value
Return Data 10	2-bytes User Data Value length
Return Data 11	User Data Value value
.	.
.	.
.	.
Return Data n-9	1-byte User Data Name length
Return Data n-8	User Data Name value
Return Data n-7	1-byte Creator length
Return Data n-6	Creator value
Return Data n-5	1-byte Class length
Return Data n-4	Class value
Return Data n-3	1-byte Type length
Return Data n-2	Type value
Return Data n-1	2-bytes User Data Value length
Return Data n	User Data Value value

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	USER DATA NAME LEN	USER DATA NAME VALUE	CREATOR LEN	CREATOR VALUE	CLASS LEN	CLASS VALUE	TYPE LEN	TYPE VALUE	USER DATA VALUE LEN	USER DATA VALUE VALUE	.....		CS
8	A	1	3												.....		
1 byte		1 byte		2 byte	1 byte		1 byte		1 byte		1 byte		2 byte		.....		1 byte




..... Nth Block

## Comments

If an optional parameter is sent, all prior parameters, optional or not, must also be sent to ensure proper communication. However, in the K2 implementation, you may send a null optional value by specifying a byte count of 0x00. This allows for multiple search combinations.

### 5.6.3 (A2.09) Get Thumbnail

#### Command Sent

##### A2.09 Get Thumbnail

Command Type        A  
Byte count            2  
Command Code        09  
Send Data 1           2-byte clip name length  
Send Data 2           Clip name in Extended Format<sup>5.1</sup>  
Send Data 3           2-byte frame number (optional)

Without frame info (i.e. byte count = clip name length + 2)

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME
A	2	0	9			
1 byte		1 byte		2 byte	2 byte	

With frame info (i.e. byte count = clip name length + 4)

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	CLIP NAME LEN	CLIP NAME	Frame #
A	2	0	9				
1 byte		1 byte		2 byte	2 byte		2 byte

#### Returns

If thumbnail present/generated for clip,

##### 82.09 Thumbnail Data

Command Type        8  
Byte count            2  
Command Type        09  
Return Data 1        2-byte actual data count  
Return Data 2        1-byte Frame format  
                          0 – jpeg  
                          1 - bmp  
Return Data 3        2-byte thumbnail size  
Return Data 4        Thumbnail data

CMD TYPE	BC	CMD CODE		ACTUAL BYTE COUNT	FRAME FORMAT	THUMBNAIL LENGTH	THUMBNAIL
8	2	0	9				
1 byte		1 byte		2 bytes	1-byte	2-byte	

If thumbnail does not exist and could not be created,

#### 80.09 Thumbnail Data

Command Type 8

Byte count 0

Command Type 09

#### Comments

This command requires the clip name for the desired thumbnail. If the optional frame number is not specified, the default thumbnail is returned, or else a thumbnail for the desired frame is generated and returned. The format of the thumbnail is also returned.

In the event that the thumbnail does not exist and cannot be generated, 80.09 is returned.

## 6 Ethernet Access

Ethernet access is possible using the socket interface to the AMP server.

The AMP socket interface uses IANA assigned to port number 3811 for both TCP and UDP.

### 6.1 TCP API Interface

AMP assigned **IANA** port number is **3811** for both TCP and UDP.

Function Calls to make	Description
WORD VersionRequested = MAKEWORD(1,1); WSADATA wsaData; WSAStartup(&VersionRequested, &wsaData);	Initialize the Windows Socket libraries
SOCKET m_sockfd = socket(AF_INET, SOCK_STREAM, 0)	Create a Socket Descriptor
hostent *hostdata; hostdata = gethostbyname("keystone3");	Create hostent structure
sockaddr_in dest;  // the address of the destination computer	Create sockaddr_in structure and fill up the data

Function Calls to make	Description
<pre> dest.sin_family = AF_INET;  dest.sin_port = htons(3811);  dest.sin_addr = *((struct in_addr *)hostdata-&gt; h_addr);  memset(&amp;(dest.sin_zero), '\0', 8);  // zero the rest of the struct </pre>	
<pre> connect(m_sockfd, (struct sockaddr *)&amp;dest, sizeof(dest)); </pre>	Connect to Ethernet Server
<pre> send(m_sockfd, sendBuffer, numToSend, 0);  Recv = recv(m_sockfd, recvBuffer, numToRecv, 0); </pre>	<p>General command for sending messages through TCP.</p> <p><i>sendBuffer</i> is pointer to char buffer containing data to send. <i>NumToSend</i> is the number of bytes to send.</p> <p>General command for receiving data from the socket.</p> <p><i>recvBuffer</i> is pointer to char data received containing data to send. <i>NumToRecv</i> is the number bytes to receive. <i>Recv</i> is the number of bytes received. This call should be made in a loop until <i>Recv</i> = <i>numToReceive</i>.</p>
<pre> switch(mode) { case TCP_RS422_CHN: // 1 sprintf(sendBuffer, "CRAT%.4d%.d%.2d%s%.2d%s\n", strlen(portRS422) + strlen(channelName)+ 5, mode, strlen(portRS422), portRS422, strlen(channelName), channelName); break;  case TCP_CHN: // 2 sprintf(sendBuffer, "CRAT%.4d%.d%.2d%s\n", strlen(channelName)+ 3, mode, strlen(channelName), channelName); break;  case TCP_RS422_CHL: //3 sprintf(sendBuffer, "CRAT%.4d%.d%.2d%s\n", strlen(portRS422) + 3, mode, strlen(portRS422), portRS422); break;  default: //4 i.e. TCP_CHL </pre>	<p>Create and send CRAT command to connect to AMP Server.</p> <p>Receive reply, which could be 1001 (ACK) or 1111 (NAK) or 2222 (ERR).</p> <p><b>The same command can be sent for reacquiring a channel. Replace 'CRAT' with 'REQ' in the sendBuffer.</b></p>

Function Calls to make	Description
<pre>sprintf(sendBuffer,"CRAT0001%d\n", TCP_CHL); }  send(m_sockfd, sendBuffer, strlen(sendBuffer), 0);  Recv = recv(m_sockfd, recvBuffer, numToRecv, 0);</pre>	
<pre>sprintf(sendBuffer, "CMDS%.4d", cmdLen * 2); memcpy(sendBuffer + 8, AMPCommandInBCD,cmdlength); strcat(sendBuffer, "\n");  unsigned int numSent = _sockIF-&gt;Send(sendBuffer, numToSend);  Recv = recv(m_sockfd, recvBuffer, numToRecv, 0);</pre>	<p>Send AMP command through socket IF to AMP Server. Prefix with 'CMDS' hdr and add '\n' separator.</p> <p>Receive AMP reply.</p>
<pre>char sendBuffer[12] = "STOP0000\n"; char recvBuffer[12]; _sockIF-&gt;Send(sendBuffer, strlen(sendBuffer));  memset(recvBuffer, 0, 12); Recv = recv(m_sockfd, recvBuffer, numToRecv, 0);</pre>	<p>Disconnect from AMP Server by sending the <b>StopAMP</b> command</p> <p>Receive reply, which could be 1001 (ACK) or 1111 (NAK) or 2222 (ERR).</p>
<pre>closesocket(m_sockfd)</pre>	<p>Close socket connection at client end.</p>

## 7 Index

- 00.0C Local Disable, 23
- 00.11 Device Type Request, 25
- 00.1D Local Enable, 24
- 01.06 Set Drop Frame Mode, 23
- 12.11 Device Type, 25
- 20.04 Standby Off, 25
- 20.05 Standby On, 26
- 20.0F Eject, 32
- 20.10 Fast Forward, 32
- 20.20 Rewind, 35
- 20.52 Tension Release, 38
- 20.60 EE Off, 26
- 20.61 EE On, 26
- 2X.00 Stop, 29
- 2X.01 Play, 30
- 2X.02 Record, 31
- 2X.11 Jog Forward, 33
- 2X.12 Variable Forward, 34
- 2X.13 Shuttle Forward, 34
- 2X.21 Jog Reverse, 35
- 2X.22 Variable Reverse, 36
- 2X.23 Shuttle Reverse, 37
- 2X.31 Cue Up With Data, 37
- 40.20 In Reset, 39
- 40.40 Auto Mode Off, 27, 40, 42, 43, 45
- 40.41 Auto Mode On, 41
- 41.36 Timecode Mode Preset, 40
- 44.05 User Bits Preset, 39
- 44.31 Pre-roll, 58
- 4X.14 In Preset, 51
- 4X.15 Out Preset, 54, 56, 63, 64, 65, 66, 67, 86
- 4X.21 Out Reset, 9, 57
- 60.0B State Change Latency Request, 46
- 61.0C Current Time Sense, 46
- 61.20 Status Sense, 48
- 71.0B State Change Latency, 46
- 7X.04 LTC Time and User Bits Data, 47
- 7X.20 Status Sense, 48
- 80.09 Thumbnail Data, 116
- 81.18 ID Status, 65, 67, 74
- 81.1A Aspect Ratio Conversion Setting, 91, 107
- 82.09 Thumbnail Data, 115
- 82.09 Working Folder, 45, 76
- 82.13 IDs Changed List, 77
- 82.26 ID Count, 71
- 82.2C Device Name, 29
- 84.17 ID Duration, 85
- 84.1C Storage Data, 81
- 84.25 ID Start Time, 84
- 88.1C Storage Data, 81
- 88.21 Device ID, 28
- 8A.13 Clip Data, 111, 113
- 8A.16 Clip Data, 110
- 8X.14 ID Listing, 72, 73
- 8X.16 ID Loaded, 69
- 8X.2A Folder List, 79, 102, 104, 106
- 8X.2B Folder List, 80
- A0.06 Preview In Reset, 57
- A0.0F Get Working Folder Request, 76
- A0.12 IDs Changed List Request, 76
- A0.16 ID Loaded Request, 69
- A0.21 Device ID Request, 28
- A0.26 ID Count Request, 71
- A0.2A List First Folder, 79
- A0.2B List Next Folder, 79
- A0.2C Device Name Request, 29
- A2.09 Get Thumbnail, 115
- A2.0E Set Working Folder Request, 75
- A2.17 ID Duration Request, 85
- A2.1B Set Aspect Ratio Conversion, 92, 94, 95
- A2.25 ID Start Time Request, 84
- A2.26 Create Folder, 82
- A2.28 Rename Folder, 83
- A2.29 Delete Folder, 84
- A3.11 Create Folder, 82
- A4.1D Set Record Duration, 82
- A8.11 Erase Segment, 68, 87, 88, 89
- A8.20 Set Device ID, 28
- AA.13 Clip Data Request, 111
- AA.16 Set Clip Data, 109
- ACK, 13
- AX.01 Auto Skip, 69
- AX.02 Record Cue Up With Data, 49
- AX.04 Preview In Preset, 59
- AX.05 Preview Out Preset, 62

- AX.07 Preview Out Reset, 58
- AX.10 Erase ID, 78, 102, 103, 104, 105, 106
- AX.14 List First ID, 72
- AX.15 List Next ID, 72
- AX.18 ID Status Request, 74
- AX.19 New Copy, 101
- AX.1A Get Aspect Ratio Conversion, 91
- AX.1C Total /Available Storage Request, 80
- AX.1C Total/Availible Storage Request, 80
- C0.28 Abort Transfer ID, 95
- C1.27 Transfer ID Status Request, 96
- C2.25 Extended Transfer ID, 98
- C2.26 Transfer ID, 97
- C2.29 Network Delete, 100
- Clips
  - data information, 109
  - managing on timeline, 51
  - managing stored, 71
- Command and status format, 14
  - standard, 14
  - variable length names, 15
- Command timing, 13
  - minimum timing, 13
  - response time, 13
  - timeout condition, 13
- Commands
  - extended, 10
  - new, 7
- Commands (by title)
  - Abort Transfer ID, 95
  - Auto Mode Off, 39
  - Auto Mode On, 41
  - Auto Skip, 69
  - Clip Data, 110
  - Clip Data Request, 111
  - Count Request, 71
  - Create Folder, 82
  - Cue Up With Data, 37
  - Current Time Sense, 46
  - Delete Folder, 84
  - Device ID Request, 28
  - Device Name, 29
  - Device Name Request, 29

- Device Type Request, 25
- EE Off, 26
- EE On, 26
- Eject, 32
- Erase ID, 78, 102, 103, 104, 105, 106
- Erase Segment, 68, 87, 88, 89
- Extended Transfer ID, 98
- Fast Forward, 32
- Folder List, 80
- Get Aspect Ratio Conversion, 91
- Get Thumbnail, 115
- Get Working Folder Request, 76
- ID Duration Request, 85
- ID Loaded Request, 69
- ID Start Time Request, 84
- IDs Changed List Request, 76
- In Reset, 39
- Jog Forward, 33
- Jog Reverse, 35
- List First Folder, 79
- List First ID, 72
- List Next Folder, 79
- List Next ID, 72
- Local Disable, 23
- Local Enable, 24
- Network Delete, 100
- New Copy, 101
- Our Reset, 57
- Out Preset, 54, 56, 63, 64, 65, 66, 67, 86
- Play, 30
- Pre-roll, 58
- Preview In Preset, 59
- Preview Out Preset, 62
- Preview Out Reset, 58
- Record, 31
- Record Cue Up With Data, 49
- Rename folder, 83
- Rewind, 35
- Set Aspect Ration Covernion, 92, 94, 95
- Set Clip Data, 109
- Set Device ID, 28
- Set Drop Frame Mode, 23
- Set Record Duration, 82
- Set Working Folder Request, 75



- Shuttle Forward, 34
- Shuttle Reverse, 37
- Standby Off, 25
- Standby On, 26
- State Change Latency Request, 46
- Status Request, 74
- Status Sense, 48
- Stop, 29
- Tension Release, 38
- Timecode Mode Preset, 40
- Total/Available Storage Request, 80
- Transfer ID, 97
- Transfer ID Status Request, 96
- User Bits Preset, 39
- Variable Forward, 34, 36
- Communication Protocol, 12
- Copy
  - shallow and deep, 101
- D1.26 Transfer Started, 98, 99
- D1.29 Delete Started, 100
- Data Bytes
  - max. length, 13
- Definitions
  - Extended Name Format, 22
  - Format for Multi-byte, 22
  - Name Format, 22
  - Numbers Sent, 22
  - Timecode Format, 22
- Device management, 23
- DX.27 Transfer ID Status, 96
- Encoding
  - UTF-8, 13
- Error acknowledgement, 12
- Ethernet
  - access with sockets, 116
  - IANA port number, 116
- In/Out Preset, 13
- Introduction, 7
- NAK, 13
- Returns
  - ACK, 13
  - Aspect Ratio Conversion Setting, 91, 107
  - Clip Data, 111
  - Delete Started, 100
  - Duration, 85
  - First Folder, 79, 102, 104, 106
  - ID Count, 71
  - ID Listing, 72, 73
  - ID Loaded, 69
  - ID Status, 65, 67, 74
  - IDs Changed List, 77
  - LTC Time and User Bits Data, 47
  - NAK, 13
  - NAK+ Error Data, 13
  - Start Time, 84
  - Storage Data, 81
  - Thumbnail data, 116
  - Thumbnail Data, 115
  - Transfer ID Status, 96
  - Transfer Started, 98, 99
  - Working Folder, 45, 76
- Status data, 16
- Timeline
  - managing clips, 51
- Timeout condition, 13
- Transport controls, 29
- UTF-8, 13