Industrial Streams

Standard Mpeg

⁕ Email Alerts   ⁕ Events   ⁕ Contact Us

SEARCH [   ] ⬛

| Home | About | Products | Sales | Support | Contact |

MPEG Headers Quick Reference

MPEG Headers Quick Reference

This is a quick reference to the various headers and streams found in MPEG/DVD. For a complete description you should get a copy of ISO/IEC 13818.

The header

Every stream or table begins with a 32-bit start code, codes 00 through B8 are video stream start codes (fully defined in 13818-2), and codes B9-FF are stream-id's

byte 0	byte 1	byte 2	byte 3
0000 0000 0000 0000 0000 0001 Start code prefix			Stream ID

Start code	used for
0x00	Picture
0x01 - 0xAF	slice
0xB0	reserved
0xB1	reserved
0xB2	user data
0xB3	Sequence header
0xB4	sequence error
0xB5	extension
0xB6	reserved
0xB7	sequence end
0xB8	Group of Pictures

Stream ID	used for
0xB9	Program end (terminates a program stream)
0xBA	Pack header
0xBB	System Header
0xBC	Program Stream Map
0xBD	Private stream 1
0xBE	Padding stream
0xBF	Private stream 2
0xC0 - 0xDF	MPEG-1 or MPEG-2 audio stream
0xE0 - 0xEF	MPEG-1 or MPEG-2 video stream
0xF0	ECM Stream
0xF1	EMM Stream
0xF2	ITU-T Rec. H.222.0	ISO/IEC 13818-1 Annex A or ISO/IEC 13818-6_DSMCC_stream
0xF3	ISO/IEC_13522_stream
0xF4	ITU-T Rec. H.222.1 type A
0xF5	ITU-T Rec. H.222.1 type B
0xF6	ITU-T Rec. H.222.1 type C
0xF7	ITU-T Rec. H.222.1 type D
0xF8	ITU-T Rec. H.222.1 type E
0xF9	ancillary_stream
0xFA - 0xFE	reserved
0xFF	Program Stream Directory

Picture header (0100)
Variable length.

byte 4	byte 5	byte 6	byte 7
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
temperal sequence number	frame type 1=I, 2=P 3=B, 4=D	VBV delay	---

additional fields appended beginning at byte 7 bit 2:
If frame type = 2 (P) or 3 (B) the following 4 bits are appended to the header:

3	2	1	0
full_pel_forward_vector	forward_f_code		

This field is used by MPEG-1 only, for MPEG-2 it should be set to 0 1 1 1

If frame type = 3 (B) the following 4 bits are appended to the header:

3	2	1	0
full_pel_backward_vector	backward_f_code		

This field is used by MPEG-1 only, for MPEG-2 it should be set to 0 1 1 1

additionally if the next bit is "1" (extra_bit_picture) it is followed by 8 bits of "extra" data (discarded by decoders). This continues until a "0" bit is encountered.

Sequence header (01B3)

Variable length.

byte 4	byte 5	byte 6	byte 7
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
horizontal size	vertical size	aspect ratio	frame rate

byte 8	byte 9	byte 10	byte 11			
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3	2	1	0
bit rate			1 VBV buffer size	constrained parameters flag	load intra quantiser matrix	(load non-intra quantiser matrix)

If either load quantiser matrix flag is =1, it is immediately followed by the 64 byte table (moving the "load non-intra quantiser matrix" flag, in the case of "load intra quantiser matrix")

Code	Aspect Ratio	Frame Rate
0	forbidden	forbidden
1	1:1	24000/1001 (23.976)
2	4:3	24
3	16:9	25
4	2.21:1(not used in DVD)	30000/1001 (29.97)
5	reserved	30
6	reserved	50
7	reserved	60000/1001 (59.94)
8	reserved	60
9	reserved	reserved
:		
15	reserved	reserved

extension header (01B5)

There are a variety of extensions, denoted by the first 4 bits.

Sequence_Extension

Fixed length.

byte 4		byte 5					byte 6				byte 7	byte 8	byte 9			
7 6 5 4	3 2 1 0	7 6 5 4	3	2	1	0	7	6	5	4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7	6	5	4 3 2 1 0
0001	profile and level		progressive_sequence	chroma_format		horizontal size extension	vertical size extension		bit rate extension			1 vbv buffer size extension	low delay	frame rate extension n	frame rate extension d	

Sequence_Display_Extension

Variable length.

byte 4			byte 5	byte 6	byte 7
7 6 5 4	3 2 1	0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
0010	video format	color description flag **=0**	(not present)		
		=1	color primaries	transfer characteristics	matrix coefficients

byte 5 byte 8	byte 6 byte 9	byte 7 byte 10	byte 8 byte 11
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
display horizontal size	**1** display vertical size		**0 0 0**

Picture_Coding_Extension

Variable length.

byte 4					byte 5								byte 6							
7 6 5 4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
1000	f_code[0][0] (forward horizontal)				f_code[0][1] (forward vertical)				f_code[1][0] (backward horizontal)				f_code[1][1] (backward vertical)				intra_DC_precision		picture_structure	

byte 7							
7	6	5	4	3	2	1	0
Top_Field_First	frame_pred_frame_dct	concealment_motion_vectors	q_scale_type	intra_vlc_format	alternate_scan	Repeat_First_Field	chroma_420_type

byte 8						byte 9	byte 10
7	6	5 4 3 2	1	0		7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
progressive_frame	composite_display **=0**	**0 0 0 0 0 0**				(not present)	
	=1	v_axis	field_sequence	sub_carrier	burst_amplitude	sub_carrier_phase	**0 0**

Group Of Pictures (GOP) (01B8)

Fixed length, contains 3 flags and the time stamp for the first frame.

byte 4		byte 5	byte 6	byte 7			
7	6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7	6	5	4 3 2 1 0
drop frame flag	hour (0-23)	minute (0-59) **1**	second (0-59) frame (0-59)	closed GOP	broken GOP	**0 0 0 0 0**	