

AAC Audio ES Viewer User's Guide

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1. Overview

AAC Audio ES Viewer application provides a visual representation of the structure of Advanced Audio Coding (AAC) audio elementary stream (ISO/IEC 13818-7), MPEG-2 (ISO/IEC 13818-7) and HE AAC audio streams. The AAC audio frames sequence can be investigated along with the most common parameters of each audio frame in the application's list view. Detailed AAC audio frame headers information is available in the application's tree view. Hexadecimal representation of the AAC audio elementary stream file is available in the Hex View module. Along with the presentation capabilities, the AAC Audio ES Viewer Pro can perform AAC stream validation. The Pro version also supports import from multiplexed MP4, MPEG-2 Program Stream and MPEG-2 Transport Stream media files.

<u>File T</u> ools <u>H</u> elp									
Offset	Length	ID	Layer	Sampling Rate	Profile	Channel Configuration	-	<pre>4 adts_frame()</pre>	
0x00000000000000000	367	0	0	48000 Hz	1	2 - LF RF		<pre>4 adts_fixed_header()</pre>	: 0x0FFF (12 bits)
0x000000000000016F	392	0	0	48000 Hz	1	2 - LF RF		- TD	: 0 (1 bit)
0x0000000000002F7	422	0	0	48000 Hz	1	2 - LF RF		laver	: 0 (1 Dit) : 0 (2 bits)
0x000000000000049D	411	0	0	48000 Hz	1	2 - LF RF		protection absent	: 1 (1 bit)
0x0000000000000638	392	0	0	48000 Hz	1	2 - LF RF		profile	: 1 [Low Complexity profile (LC)] (2 bits
0x00000000000007C0	356	0	0	48000 Hz	1	2 - LF RF		- sampling frequency index	: 3 [48000 Hz] (4 bits)
0x0000000000000924	432	0	0	48000 Hz	1	2 - LF RF		-private bit	: 0 (1 bit)
0x000000000000000000000000000000000000	387	0	0	48000 Hz	1	2 - LF RF		channel configuration	: 2 [2 - LF RF] (3 bits)
0x000000000000000000000000000000000000	421	0	0	48000 Hz	1	2 - LF RF		- original/copy	: 0 (1 bit)
0x000000000000DFC	414	0	0	48000 Hz	1	2 - LF RF		home	: 0 (1 bit)
0x000000000000F9A	414	0	0	48000 Hz	1	2 - LF BF		<pre>4 adts_variable_header()</pre>	
0x0000000000001138	465	0	0	48000 Hz	1	2 - LF RF		- copyright_identification_bit	: 0 (1 bit)
0x0000000000001309	410	0	0	48000 Hz	1	2 - LF RF		copyright_identification_start	: 0 (1 bit)
0x00000000000014A3	470	0	0	48000 Hz	1	2 - LF BF		- frame_length	: 367 (13 bits)
0x0000000000001679	395	0	0	48000 Hz	1	2 - LF BF		-adts_buffer_fullness	: 7 (11 bits)
0x000000000001804	422	0	0	48000 Hz	1	2 · LF BF		number_of_raw_data_blocks_in_frame	: 0 (2 bits)
0x00000000000194A	402	0	0	48000 Hz	1	2 - LE BE		adts_error_check()	
		-	1				*	raw_data_block()	
Hex View									
0x000000000000000						03 BC 07 B7		!\Юяш.ј.	
0x000000000000000								01n"y9.3=	
0x000000000000000								ия.[і'	
0x00000000000000								.@.D.aX2.	
0x000000000000000000000000000000000000						BF FC 9F 67		e\$±.8ĭь.g MD%.SDh	
0x000000000000000000000000000000000000								щие.sDn .U\&Ms±.B	
0x000000000000000000000000000000000000								/Ricsl-Sp	
0x000000000000000000000000000000000000								B!ibH	
0x000000000000000000000000000000000000						D9 3E 09 33		.u I>.3	

AAC Audio ES Viewer solution is useful for detailed Advanced Audio Coding (AAC) elementary streams investigation, error detection and validation.



1.1 General Features

- Visual representation of Advanced Audio Coding (AAC) audio elementary stream
- ADTS frames list view representation
- ADTS frames tree view representation
- ADTS fixed header tree view representation
- ADTS variable header tree view representation
- Hex data representation of the file
- Automatic hex positioning of the selected audio frame
- Hex data editing of the selected AAC audio frame
- Stream Frame Graph presentation
- ADTS AAC audio elementary stream validation available in AAC Audio ES Viewer Pro
- AAC audio elementary stream loading from MP4 container available in AAC Audio ES Viewer Pro
- AAC audio elementary stream loading from MPEG-2 Program
 Stream available in AAC Audio ES Viewer Pro
- AAC audio elementary stream loading from MPEG-2 Transport
 Stream available in AAC Audio ES Viewer Pro

1.2 Supported Structures

- AAC audio elementary stream ADTS sequence
- ADTS fixed header
- ADTS variable header

2. Installation

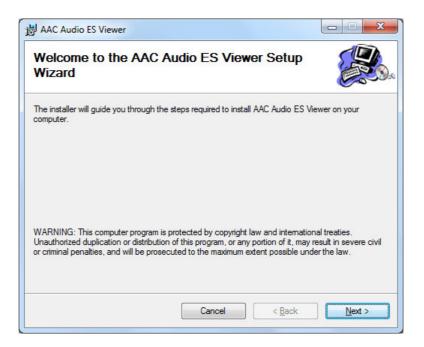
2.1 Installing AAC Audio ES Viewer



Before installing the **AAC Audio ES Viewer** solution, make sure that any previous version of the product has been uninstalled refer 2.2.

The installation package of **AAC Audio ES Viewer** is distributed in msi file. After downloading the file from the official Jongbel Media Solutions web site – <u>www.jongbel.com</u>, execute the installation by starting the msi file.

First a Welcome dialog pops up. Click "Next" in order to proceed.



After this a License Agreement dialog pops up. Read the agreement carefully, select "I Agree" if you agree all the terms and click "Next" to proceed.





The next window shown specifies the installation product location and user access to the product. Change the destination product folder and user access if needed and click "Next" to proceed.

AAC Audio ES Viewer	
Select Installation Folder	
The installer will install AAC Audio ES Viewer to the following folder.	
To install in this folder, click "Next". To install to a different folder, enter it below	w or click "Browse".
Folder:	
C:\Program Files (x86)\Jongbel Media Solutions\AAC Audio ES Viewe	Browse
,	Disk Cost
Install AAC Audio ES Viewer for yourself, or for anyone who uses this compu	iter:
© Everyone	
Just me	
Cancel < <u>B</u> ack	<u>N</u> ext >

The next dialog is a confirmation dialog. Confirm by clicking "Next" in order to start the installation procedure.



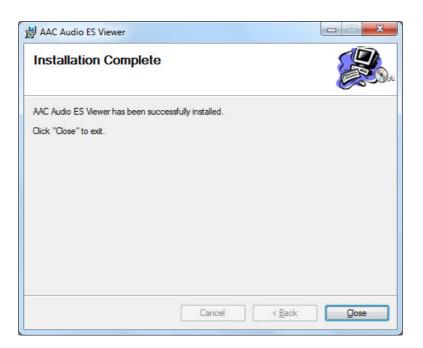
湯 AAC Audio ES Viewer	
Confirm Installation	E .
The installer is ready to install AAC Audio ES Viewer on your computer. Click "Next" to start the installation.	
Cancel < <u>B</u> ack	<u>N</u> ext >

While the product is being installed an "Installing" window shows the installation progress. Wait until the product is being installed.

AAC Audio ES Viewer	
Installing AAC Audio ES Viewer	
AAC Audio ES Viewer is being installed.	
Please wait	
Cancel	Back Next >

At the end an "Installation Complete" dialog pops up, which denotes the successful AAC Audio ES Viewer installation. Click "Close" to finalize the process.





2.2 Uninstalling AAC Audio ES Viewer

The application can be removed opening the Control Panel – Programs and Features. Select the **AAC Audio ES Viewer** application and click Uninstall.

3. Functions

The following functions are available from the application **File** menu.

Open – Opens a file open dialog box for selecting media file for loading. AAC Audio ES Viewer supports AAC ADTS sequence audio elementary streams, MP4 multiplexed AAC audio streams, MPEG-2 Program Stream multiplexed AAC audio streams and MPEG-2 Transport Stream multiplexed AAC audio streams. Demultiplex and import of AAC audio streams from multiplexed media files is available only in AAC Audio ES Viewer Pro. In case of multiplexed media file loading Extract Elementary Stream dialog opens.



Prog ID	Stream ID	Stream Type
0	0	AAC audio
0	1	AVC/H.264 video
Output File	name	
C:\Temp	AC_Stream_0	000.aac

The dialog lists all elementary streams in the selected multiplexed media file with its internal program ID information, stream ID information and elementary stream type. "Output File Name" denotes the output folder and file name which will be used as a destination for the elementary stream demultiplexing. "Demultiplex and Load" button performs the elementary stream extraction and loading into the AAC Audio ES Viewer Pro.

Close – Closes the opened file and clears the tree and hex views.

Exit – Closes the application.

The following functions are available from the application **Tools** menu.

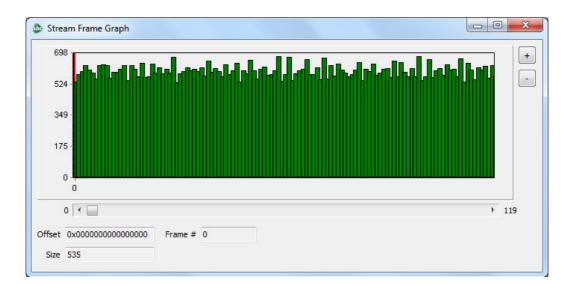
Hex Edit Selected Frame – Opens a Hex Exit dialog box for byte hex manipulating the binary data of the selected ADTS AAC audio frame from the list view.



	00	01	02	03	04	05	06	07	08	09	OA	0B	oc	OD	0E	OF		1
0x0000000000000000	FF	F1	4C	80	2D	AO	00	21	5C	DF	43	87	B7	DC	AF	BF	ясL!\ЯС. ·ЫЇї	
x0000000000000000000000000000000000000	32	5D	DC	AC	CA	04	FA	37	49	27	D3	FA	CD	F3	95	48	2]Ъ¬К.ъ7І'УъНу.Н	
0x0000000000000020	OF	61	38	01	49	FO	AE	2E	4F	91	F2	7C	9B	08	9B	F6	.а8.Ір⊚.О.т ц	
x0000000000000030	94	E9	1A	F9	FA	50	84	7D	55	26	4F	20	82	7C	AB	6A	.й.щъР.}U&O . «ј	
0x000000000000040	48	5A	52	7D	27	C9	64	FF	38	50	08	F5	DF	8E	24	3F	HZR}'Йdя8Р.жЯ.\$?	
0x0000000000000050	09	3F	6C	СВ	71	CF	97	A4	7E	83	7E	09	49	F8	FF	90	.?1ИqП.¤~.~.Ішя.	
0x000000000000060	92	FD	17	77	52	10	BF	AO	10	E6	9C	68	8F	0B	E4	E4	.э.wR.ï .ж.hдд	
0x0000000000000070	70	В9	F2	1B	1E	DA	43	09	oc	8E	43	C1	44	68	48	25	p№TЪCCEDhH%	
0x00000000000080	C9	2E	D6	5A	22	1C	9F	86	90	DD	6B	08	ES	31	24	6F	Й.ЦZ"Эk.e1\$o	
0x0000000000000000x0	D6	E7	42	F2	E8	D6	в0	57	10	DE	EC	48	69	F3	E4	32	ЦзВтиЦ°W.ЮмНіуд2	
0x000000000000000x0	F9	12	18	BC	31	1B	F6	48	D4	AO	46	6C	A2	32	23	00	щj1.цНФ Flў2#.	

By double-clicking on the byte cell, the form will enter into byte editing mode, making it possible to change the value of the selected byte cell. The byte cells with values different from the values of the original file are marked in red. **Save Changes** button will save the altered bytes to the original file. **Cancel** button will exit the form, without altering the original file.

Stream Frame Graph – Shows the Stream Frame Graph form. The form shows the loaded AAC audio elementary stream frames into a graph.





At the center of the form is placed the chart, where all the frames from the loaded audio elementary stream are located with their sizes. The scroll box below the chart can control the current samples stream position. The "Offset" specifies the frame offset in bytes, from the beginning of the file. The "Size" specifies the sample size in bytes. The "Frame" specifies the frame number in the stream. It is possible to zoom-in and to zoom-out the samples chart with the "+" and "-" buttons on the right side of the chart.

Validation – Performs validation and verification of the ADTS AAC audio elementary stream. The function opens the media validation dialog from where the validation process can be started.

eport				Validation Modules	
*	Module	Type	Message	AAC Audio Validato	r
	AAC Audio Validator	Info	[101] Start validation at 10:51:22 03.06.2012		
	AAC Audio Validator	Info	[102] Loading File: C:\Sound.aac		
	AAC Audio Validator	Info	[401] Audio Profile : Low Complexity Profile		
	AAC Audio Validator	Info	[402] Audio Frequency : 48000Hz		
	AAC Audio Validator	Info	[403] Audio Channels Configuration : 2 - LF RF		
	AAC Audio Validator	Info	[506] Audio Parsed Frames Count : 1440	Validation Module S	ettings
	AAC Audio Validator	Info	[501] Audio Decoded Frames Count : 1440	Validation Reports	
	AAC Audio Validator	Info	[502] Audio Corrupted Frames Count : 0	Infos	11
	AAC Audio Validator	Info	[507] Audio Total Frames With Errors Count : 0	INTOS	11
0	AAC Audio Validator	Info	[103] Unloading File.	Warnings	0
1	AAC Audio Validator	Info	[108] Finish validation at 10:51:23 03.06.2012		
				Errors	0
			Progress: 100.00%Done.		

Once the Media Validation dialog is opened, the validation process can be started by pressing the "Start Validation" button. During the validation, the process can be stopped by pressing the "Stop Validation" button. The validation Report table contains four columns. The first column is the index of the validation report starting from 1. The second column denotes the validation module name. At this point AAC Audio ES Viewer supports only "AAC Audio Validator" module. The third column denotes each report type, which can be "Info" for informational report, "Warning" for warning report and "Error" for error report. The fourth column contains the Validation ID and the report message. The button "Save Report" saves the current report into a XML validation report file. The XML validation Reports" box represents the information about the total informational, warning and error reports in the current validation.



The button "Validation Module Settings" opens the validation module settings dialog.

Load Timeout	15000	🔿 ms
Unload Timeout	15000	😁 ms
10	10-2	12 13

From the validation module settings dialog it is possible to control the loading and unloading timeout.

Load Timeout denotes the timeout, in milliseconds, for the media file loading process.

Unload Timeout denotes the timeout, in milliseconds, for the media file unloading process.

The advances settings are also accessible from this dialog by pressing the "Advanced" button.



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ID Name	Туре	Enabled	Description	Validation	
101 Start validation information	Info	Yes	Start validation information	ID	101
102 Loading file information	Info	Yes	Loading file information		
103 Unloading file information	Info	Yes	Unloading file information	Name	Start validation informa
104 Loading timeout	Error	Yes	Loading timeout	Name	
105 Unloading timeout	Error	Yes	Unloading timeout	Dentet	Info
106 Play timeout	Error	Yes	Play timeout	Report Type	
107 Stop timeout	Error	Yes	Stop timeout		[
108 Finish validation information	Info	Yes	Finish validation information	Enabled	Yes
201 Corrupted Audio Frames	Error	Yes	Corrupted Audio Frames		-
204 Changing Protection	Warning	Yes	Changing Protection	Description	Start validation informa
206 Changing Audio Profile	Warning	Yes	Changing Audio Profile		
208 Changing Audio Frequency	Warning	Yes	Changing Audio Frequency		
209 Valid Audio Channels Configuration	Warning	Yes	Valid Audio Channels Configuration		
210 Changing Audio Channels Configuration	Warning	Yes	Changing Audio Channels Configuration		
211 Changing Copyright Bit	Warning	Yes	Changing Copyright Bit		
212 Changing Home Bit	Warning	Yes	Changing Home Bit		
213 Junk At The End Of File Bytes	Warning	Yes	Junk At The End Of File Bytes		
214 Junk Bytes	Warning	Yes	Junk Bytes		
401 Audio Profile	Info	Yes	Audio Profile		
402 Audio Frequency	Info	Yes	Audio Frequency		
403 Audio Channels Configuration	Info	Yes	Audio Channels Configuration		
501 Audio Decoded Frames Count Information	Info	Yes	Audio Decoded Frames Count Information		
502 Audio Corrupted Frames Count Information	Info	Yes	Audio Corrupted Frames Count Information		
503 AAC Stream Index To Validate Information	Info	Yes	AAC Stream Index To Validate Information		
504 AAC Program ID To Validate Information	Info	Yes	AAC Program ID To Validate Information		
505 AAC Stream ID To Validate Information	Info	Yes	AAC Stream ID To Validate Information		
506 Audio Parsed Frames Count Information	Info	Yes	Audio Found Frames Count Information		
507 Audio Total Frames With Errors Count Information	Info	Yes	Audio Total Frames With Errors Count Information		

From the Validation Settings dialog it is possible to control all validation procedures. All validation procedures can be Disabled/Enabled and the report type of some can be switched to "Info", "Warning" or "Error" depending on each custom workflow. The validation customization allows easy integration of the product in every workflow.

For more information about the validation checks go to Chapter 4.

The following functions are available from the application **Help** menu.

Registration – Opens the product registration form. This function is available only in the full licensed version of the product.

Check For Updates – Enables/Disables automatic check for updates.

About – Opens the About dialog box of the product.



4. Validation

AAC Audio ES Viewer Pro can perform validation of the ADTS AAC audio elementary stream. Incorrect header structure can be detected by this validation module. The supported AAC streams are AAC elementary streams with ADTS headers according to the ISO/IEC 13818-7 specification.

The following validation checks are available for this module:

ID: 101
Name: 'Start validation information'
Type: Info
Description: Reports information on file validation start.

ID: 102Name: 'Loading file information'Type: InfoDescription: Reports information on file load.

ID: 103
Name: 'Unloading file information'
Type: Info
Description: Reports information on file unload.

ID: 104
Name: 'Loading timeout'
Type: Error
Description: Reports load timeout if the loading time is greater than the maximum loading time specified in the main property page of the validation module.

ID: 105Name : 'Unloading timeout'Type : Error



Description : Reports unload timeout if the unloading time is greater than the maximum unloading time specified in the main property page of the validation module.

ID: 106
Name: 'Play timeout'
Type: Error
Description: Reports validation start timeout.

ID: 107
Name: 'Stop timeout'
Type: Error
Description: Reports validation stop timeout.

ID: 108
Name: 'Finish validation information'
Type: Info
Description: Reports information on file validation finish.

ID: 201
Name: 'Corrupted Audio Frame Number'
Type: Error
Description: Reports each corrupted AAC audio frame number.

ID: 204
Name : 'Changing Protection'
Type : Warning
Description : Reports changing Protection Absent bit value throughout the AAC audio elementary stream.

ID: 206
Name : 'Changing Audio Profile'
Type : Warning
Description : Reports changing Profile value throughout the AAC audio elementary stream.



ID: 208

Name : 'Changing Audio Frequency'

Type : Warning

Description : Reports changing Audio Frequency value throughout the AAC audio elementary stream.

ID: 209
Name: 'Valid Audio Channels Configuration'
Type: Error
Description: Reports invalid audio Channels Configuration value.

ID: 210

Name : 'Changing Audio Channels Configuration'

Type : Warning

Description : Reports changing audio Channel Configuration value throughout the AAC audio elementary stream.

ID: 211

Name : 'Changing Copyright Bit'

Type : Warning

Description : Reports changing Copyright bit value throughout the AAC audio elementary stream.

ID: 212
Name: 'Changing Home Bit'
Type: Warning
Description: Reports changing Home bit value throughout the AAC audio elementary stream.

ID: 213
Name: 'Junk At The End Of File Bytes'
Type: Warning
Description: Reports junk data block at the end of the AAC audio elementary stream. The report includes the size of the junk data block.



ID: 214
Name: 'Junk Bytes'
Type: Warning
Description: Reports Junk data block in the AAC audio elementary stream.

ID: 401 Name : 'Audio Profile' Type : Info Description : Reports the audio Profile value of the AAC audio elementary stream.

ID: 402
Name : 'Audio Frequency'
Type : Info
Description : Reports the audio Frequency value of the AAC audio elementary stream.

ID: 403

Name : 'Audio Channels Configuration'

Type : Info

Description : Reports the audio Channel Configuration value of the AAC audio elementary stream.

ID: 501
Name: 'Audio Decoded Frames Count Information'
Type: Info
Description: Reports the count of the successfully decoded AAC audio

frames.

ID: 502
Name : 'Audio Corrupted Frames Count Information'
Type : Info
Description : Reports the count of the corrupted AAC audio frames.



ID : 503

Name : 'AAC Stream Index To Validate Information'

Type : Info

Description : Reports the stream index of the AAC audio elementary stream, which is being validated in case of multiplexed media file.

ID: 504

Name : 'AAC Program ID To Validate Information'

Type : Info

Description : Reports the program ID of the AAC audio elementary stream, which is being validated in case of multiplexed media file.

ID: 505

Name : 'AAC Stream ID To Validate Information'

Type : Info

Description : Reports the stream ID of the AAC audio elementary stream, which is being validated in case of multiplexed media file.

ID: 506

Name : 'Audio Parsed Frames Count Information'

Type : Info

Description : Reports the count of the parsed AAC audio frames in the elementary stream.

ID: 507
Name: 'Audio Total Frames With Errors Count Information'
Type: Info
Description: Reports the count of the total frames with errors.

ID: 508
Name: 'Demo Restrictions Information'
Type: Info
Description: Reports the 30 seconds limitation in case of trial mode of the validation module.



ID: 509
Name: 'Average Bitrate Information'
Type: Info
Description: Reports the average bitrate of the audio stream.

ID: 510
Name: 'Minimum bitrate Information'
Type: Info
Description: Reports the minimum bitrate of the audio stream.

ID: 511
Name : 'Maximum bitrate Information'
Type : Info
Description : Reports the maximum bitrate of the audio stream.

ID: 512
Name: 'Average Framesize Information'
Type: Info
Description: Reports the average audio frame size.

ID: 513
Name: 'Minimum Framesize Information'
Type: Info
Description: Reports the minimum audio frame size.

ID: 514
Name: 'Maximum Framesize Information'
Type: Info
Description: Reports the maximum audio frame size.

ID: 515
Name : 'File Duration Information'
Type : Info
Description : Reports the file duration.



ID: 516
Name: 'Initial ADTS Frame Information'
Type: Info
Description: Reports the initial AAC ADTS frame information.



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