

Post Broadcast Audio Suite, Reliable and Precise;

- \checkmark **AUDIO & GPI DELAY SYSTEMs**
- **MIC SKIMMERs**
- \checkmark **AUDIO LOGGERs**
- SILENCE DETECTORs \checkmark
- **MP3 STREAMER & EXTRACTORs** \checkmark
- Available in 4, 6 & 8 channels





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AudioFile – many products in one and as solid as software gets.



KLZ AudioFileTM consists of three primary programs: Server, Player and Monitor. At the heart of the system is the AudioFile ServerTM, a *multi-channel audio recording engine* packaged to run on a dedicated PC or "IP Appliance". The AudioFile ServerTM provides very reliable long-term recording of numerous audio sources and includes: *silence detection, precise playback delay, MP3 Streaming, Remote Access* (web server) on all sources. A variety of audio players and a serial General Purpose Interface (GPI) make AudioFileTM ideal for many radio applications.

- *Audio Logger* Audio archive for general archives or for licensing and liability purposes.
- Precise Audio + GPI Delay for re-broadcasts or time zone shifting with "local insertions".
- *Mic. Skimming* (I/O box required) for talent quality / air-checks or monitoring events.
- *IP/MP3 Listening* hear Stations' content, *Past or Present* via KLZ Web-Server and MP3 Streming (MP3 Licensing; Thomson and Fraunhofer). Web Links for simple browser access to time specific recording and live content are accommodated in a uniquely simple fashion.

Options will grow but include those of the KLZ VideoLogger and PodCast creation as well as:

- WebPortal for sales staff a simple means of reviewing contract obligations for immediate results. Quickly access ads that have run for your clients or show examples of past ads to draw in new prospects... at their office.
- Traffic Log & Audio Log data integration secure access by web browser for database searching. For example, a simple search could list all "Ford" ads run on a selection of stations over a certain time period. Click on one of the entries in the results list for audible verification.



<u>Note:</u> KLZ Innovations' long history of producing 24/7 media recording and editing products suggests the best way for our software to run endlessly is to install it on a reliable computer (and keep people off of it). By packaging the Player and Monitor programs as "clients" with a lower priority, the AudioFile[™] Server's primary functions cannot be affected by common users.

AudioFile™ Server

AudioFileTM Server continuously records multiple audio sources, which can be played independently at a specific delay. All audio is recorded in linear PCM format at 48kHz sampling and automatically archived as MP3 audio. When equipped with an I/O interface, delays can also be applied to GPIs to accommodate automatic local insertions or alternate program material.

AudioFileTM in standard configuration permits delays of 1 second to 4 ½ hours. Delayed output is also 48kHz linear audio. The delay system can be setup in combinations of mono and stereo with each source having a unique delay period. Provided the server is adequately synchronized to a reliable source, delay accuracies better than 10ms can be expected for the audio and approximately 30ms for GPIs.

In addition to audio recording and precise delays, the server includes:

- Silence detection on each channel.
- MP3 Encoder for audio logging and file extraction.
- Multi-rate MP3 Streaming.
- KLZ Web Server Technology.

KLZ has also developed a simple protocol for accessing AudioFile[™] Server to facilitate unique requirements, web link utilities and third party developments. This protocol is available at <u>www.AudioFile.KLZ.com</u> or by calling KLZ Support at 800-334-9640.

AudioFile™

AudioFileTM Player works in three modes; Monitor, Skim and Archive (logger). The Player can be installed on any computer(s) with LAN, WAN, or Internet access to the server. Multiple players can be opened simultaneously without affecting the recorder or the time delayed playback. These key functions are understood to be of highest priority. The Player and Monitor operate at a lower priority. If too many users access an AudioFile Server concurrently, they may hear audio dropouts due to bandwidth limitations. These dropouts are not part of the audio being recorded or delayed audio playback.

Users first connect to the logger, open one player or more, and then:

- Listen to the incoming streams in near real-time;
- Preview/play segments of the archived audio;
- Extract selective portions of the audio archive as MP3 files.

AudioFile™ Monitor

AudioFile[™] Monitor serves to continually report the system status. Visual cues & alerts display any concerns with any AudioFile or its connected audio sources.

Setting Up Precise Time Delays

AudioFileTM Server can delay audio inputs by different intervals on multiple audio outputs. A broadcaster might use KLZ AudioFileTM to re-broadcast shows at later times or to air at appropriate times in multiple time zones. To facilitate local insertions, the same time delays can be applied to GPI's using an optional KLZ I/O box. The serial I/O interface has 4 optically coupled inputs and 8 relay outputs.

As a Precise Audio Time Delay, the audio out is 48kHz linear PCM and can be in combinations of mono and stereo being output on one or more audio devices. A standard system accommodates delays of one-second to 4½ hours however custom delays to meet almost any circumstances are possible.

The setup program allows you to set the precise delay you wish to apply to a channel or pair of channels (stereo). Delay accuracy is maintained even across multiple sound cards/devices. The "precision" or deviation from actual (live time + delay interval) remains within eight milliseconds provided the server has adequate time sync. GPI delay is not as precise as audio delay for a number of reasons. Devise latencies may further contribute to lag but GPI delay accuracies will be maintained within 30ms by pre-firing relays for known minimum latency.

Once settings are made for Channels 1 & 2, click on the next tab and continue with configuration of other channels. With configuration complete and the various audio sources connected to audio inputs on the sound card(s), ensure you have adequate sound levels on each source. Use the sound card mixer of the installed sound device or the KLZ Monitor program to view and adjust audio levels of the incoming channel(s).

Channels are configured in pairs, either stereo or dual mono. See the Channel 3 & 4 tab for adjusting the next channel pair or audio device. Restart the KLZAudioLogger service for configuration changes to take effect.

Config Audio Logger	<u>></u>
Channels 1 & 2 Channels 3 & 4 Channels 5 & 6 Chan	nels 7 & 8
[Logger Mode] OFF STEREO DUAL MONO [Record Device] Image: Constraint of the second	Channels 1 & 2 Display Name: CKLZ AudioFile - stereo 1 [Delayed Playback] (hours) (min) (sec) Playback Delay: 0 (min) (sec) Playback Delay: 0 (min) (sec) [Archive Settings] Enable Archiving: Archive Maximum File Duration: 1.0 Hour Days To Archive: 3 (min)
Alarms 😵 GPI Delays	Save 🗙 Cancel

KLZ I/O Interfaces - GPI Delays, Alarms and Mic. Skimming



I/O BOX SPECIFICATIONS

RELAY OUTPUTS	
Number of relays	8
Туре	Form C. SPDT
Contact Capacity - Resistive Load	15A 24VDC
	15A 120VAC
	10A 240 VAC
Inductive Load	5A 24VDC
	5A 120VAC
	5A 240VAC
Max. Allowable Voltage	AC 240V
	DC 110V
Max. Allowable Current	15A
Max. Allowable Power Force	1800VAC/250W
Min. Applicable Load	5VDC 10mA
Relay Life - Mechanical	10 million operations
Electrical/Load dependent	100,000 operations
Operating Time	10m sec max.

ISOLATED INPUTS

Number of inputs	4
Туре	Polarized, opto-isolated
	(Not TTL/CMOS compatible)
Voltage	5-24VDC
Isolation (min)	2500V peak
	1775V RMS (1 sec.)

KLZ AudioFile[™] Player Program



The AudioFileTM Player provides people access to the server and it's resources. The player operates in three modes: Monitor, Skim & Archive (logger). Listen to incoming sources, browse archives, and extract MP3 files with the AudioFileTM player program from virtually anywhere. This program connects to an AudioFileTM Server by TCP/IP by LAN, WAN or Internet connection.

Navigating The Toolbar



The toolbar along the top of the interface contains tool buttons for common tasks such as; connecting to an AudioFileTM Server, opening players and adjusting the Time-Line scale (zoom). Notice that additional menus appear as different Player types are opened. For example, while monitoring, a "compression factor" lets the user choose the MP3 bit rate. Higher bit rates offer higher quality whereas lower bit-rates are best for Internet access or remote streaming.

KLZ AudioFil	e [connected to 127.0.0. Markers Time Zoom Win	1] dow			
Ø Q					
mineral					
U:UU Mon 2	/2:40:00 Mon 22:50:00	Mon 23:00:00 Mon 23	:10:00 Mon 23:20:00 Mon	23:30:00 Mon 23:40:00 Mon	23:50:00 Mon
□	idioFile - stereo 1	🚱 cKLZ AudioFile - steree	o 1		
	March Mar 20 to 26 	Position: Mon, Ma Status: Stopped In Point: [none]	ar 20 2006 5:21:36 pm I		
		Out Point: [none]			
		Duration:			
		Playback Device: Windows	: Default	+10.5 db	
		0 🔄 🖬 🖬			
Screen	after New Pla	aver opened			
				Play Live (mo	onitor)
	In-Point & Ou	t-Point Markers:			
	Preview, Go to <archive &="" sl<="" th=""><th>o, Set, Extract, etc. kim Mode Players></th><th></th><th>Play Archive (audio le</th><th>og)</th></archive>	o, Set, Extract, etc. kim Mode Players>		Play Archive (audio le	og)

KLZ AudioFile [connected to 12	7.0.0.1]	
Logger Player Markers Time Zoom	Window	
8:40:00 Mon 19:20:00 Mon	20:00:00 - Mon 20:40:00 - Mon 21:20:00 - Mon 22:00:00 - Mon 22:40:00 - Mon 23:20:00 -	Mon
CKLZ AudioFile - stereo 1	CKLZ AudioFile - stereo 1	
March March Mar 20 to 26 Solution March March March March March March March 20 · Mon March Mar	Position: Tue, Mar 21 2006 11:58:43 am Status: Monitoring from: Tue, Mar 21 2006 11:56:11 am In Point: [none] Out Point: [none] Duration: Playback Device: Windows Default () () () () () () () () () () () () () (
Archive date ranges received.		11.
	Stop - (all player modes) Playback	Volume

Using the Player Program

To begin, open the					
Player program and click	KLZ AudioFile [connected t	o 10.0.0.103:5501]			
on the " <u>Connect</u> " button.	cogger Time Zoom Window				
In the dialogue that appears, select the AudioFile system of interest. Enter its machine		01:00:00	01:30:00	02:00:00	02:30:00 03:00:0
name or I.P. address if not					
previously connected.					
The Address will be			Logor	To KI Z-AudioFile Forus	
retained by the dialog.	Connect to the A	udioFile	Ber	ote File Server Address:	
There are two passwords defined in the configuration dialog; one for Administrator(s), another for general user access. In reality, only the password is required for general users. We	Server by IP add - Administrator User Name and - All other users use a generic pa	ress; s require Password. s typically ssword only.	Iten Iten Iten Serv Iten Iten Iten Iten Iten Iten Iten Iten	ore the Server Address. 0.0.103:5501 ver Description: r Name: nin sword: sword:	▼ ✓ ↓ Logon ★ Cancel

encourage users to enter their name here... (and it may be handy if this were logged in the future?)

In applications such as audio logging, technical staff is often called upon for audio log copy. With AudioFile, PDs, managers, traffic and sales people can all access and take copy without interrupting engineering staff, nor raising their concern.

Near Real Time Audio Monitoring

To monitor an incoming audio channel live, select a channel in the tree along the left, open a New Player, and select the "Monitor" button (the speaker button). The player will start a near real-time playback of the selected channel. The audio heard is an MP3 stream being encoded on the fly by the AudioFile Server.

While monitoring, you can choose other sources by simply clicking on other channel names in the navigation tree. The player automatically switches to the desired source. As well, you may open additional players and monitor multiple stations at once.



Note: We call the feature "Near Real-Time Monitoring" because the audio heard is being played after recording to disk, MP3 encoding and streaming to your PC at the selected bit rate. The delay is typically less than a few seconds depending on the IP connection being used.

(I.E. directly over a LAN, over a Corporate WAN, VPN, Internet, etc)

Playing Archived Audio (audio logger)

To play a specific station log, click on the channel of interest in the Navigation Tree. Opening an audio player by; using the "New Player" button at the top of the screen, right-click in the tree area and select "New Player", open a new player from the Logger menu. Press "Play" to start the audio playback from the start of the selected day/date. Click on any position within The TimeLine to hear that channel at that time.

Clicking anywhere within the time-bar re-cues the audio player to the newly selected time. Use the zoom controls or "zoom menu" to make it easier to locate a very specific moment. At the highest zoom level, easily locate a time down to the second.

To extract a specific portion of an audio log, In-Point and Out-Point markers must be set. In either order; click your mouse at the point in the Time-Bar where your segment will start and click "Set In-Point", then do the same at the time where your selection should end and click on "Set Out-Point". Press Play to hear the selection, or Extract to save the selection as an MP3 file.



Navigating The Time-Line – Locating Specific Times

The timeline across the top of the screen is used to navigate within an Archive or "audio-log". Active audio recording is shown as a solid green bar. Gaps or interruptions in the green bar indicate there was no audio being recorded on the selected channel for that period. In most cases, the green bar should always be continuous.



Use the Time-Line Slider to quickly navigate to any time you wish. The Zoom In / Zoom Out buttons in the toolbar adjust the TimeLine's scale as desired, down to 1sec. resolution. Click at any point in the timeline and press play to hear what was recorded at that time.

If the player has been left running a long time, the playback position may be "off screen". To quickly re-position the timeline to see where the cursor resides, simply click the "Find Cursor" button in the toolbar. The timeline with adjust to the current playback position with cursor visible.

Channel / Archive Tree - Navigating in AudioFile Player



The Channel / Archive tree makes it very easy for users to find the desired audio segments. Clicking on the channel name enables monitoring, expanding to dates that resemble the folder system found in many computer applications.

Navigate the Archive Tree by either:

- Clicking on the icon to expand (show) the folder view with sub-folders, or the icon to collapse (hide) the folder view. (speed hint; use keyboard arrow keys)
- 2. Double-clicking the folder title to expand/collapse the folders as desired.



Note: The Channel / Archive Tree only displays days that contain captured audio. If a day is not present for a specific channel, no audio was captured for that channel on that day.

Extracting Audio as MP3 Files

To save a portion of an archive as an MP3 file, set In and Out-point markers and click the "Extract" button on the player. The "Extract Options" dialogue will open.

Change settings in the dialogue as desired for your extracted file(s):

- □ In the "Extract To" entry field, enter a folder name or browse [...] to the folder where you will save the extracted file(s).
- □ Check all sub-folders to be included when the system creates the storage folder.
- □ In the "Channel" entry field, designate the reference name of the folder for the extracted files to be kept in. By default, the channel name is inserted here. You may accept or modify this as desired.
- Set the "Maximum File Duration" to the largest size clip size you wish the files to be.

When audio to be extracted exceeds the maximum duration, the program creates multiple sequential clips as required. *Note:* Maximum File Duration is 4 hrs.

 "Overlap Split Files" adds a portion of the previous file for audible verification of the integrity where files are split. *Note:* Overlap maximum is 30 seconds.

Start Time:	Tue, Jan 31 2006 12:32:24 am
End Time:	Tue, Jan 31 2006 3:20:06 am
Time Span:	0 days 02:47:42
Actual Duration:	0 days 02:47:42
Record Sessions:	1
Files To Create:	3
Required Space	160,997,791
Disk Space:	13,447,061,504
xtract To: c3temp	channel name to extract path
Extract To: C:Xtemp Append folder with Append folder with Append folder with Append folder with	channel name to extract path 4 digit year to extract path month name to extract path day name to extract path
Extract To: C:\temp Append folder with Append folder with Append folder with Append folder with Channel: KLZ - am	channel name to extract path 4 digit year to extract path month name to extract path day name to extract path
Extract To: C:\temp Append folder with Append folder with Append folder with Append folder with Channel: KLZ - am Maximum File Duratio	channel name to extract path 4 digit year to extract path month name to extract path day name to extract path an: 60 : minutes
Extract To: c:\temp Append folder with Append folder with Append folder with Append folder with Append folder with Channel: KLZ - am Maximum File Duratio Overlap Split File	channel name to extract path 4 digit year to extract path month name to extract path day name to extract path on: 60

By default, extraction creates 64kbs MP3 files in a folder appended into subfolders resembling the navigation tree in AudioFile. Sub-folders including; channel, date/time stamp, sequential order ID, and the file name you entered in the previous dialogue will result if all "append" options are selected.

The extracted clips can be played using any device capable of playing MP3 files. With software such as Windows Media Player®, simply drag all extracted files onto the play-list. The naming convention of the extracted files can be used to easily list the flies in correct order.

QUICK EXTRACTION:

Set In and Out markers. Click Extract button. Choose a target folder. Press Extract.

Monitoring AudioFileTM

KLZ AudioFile[™] includes a system status monitor that can be run on computers with a connection to the AudioFile Server. The Status Monitor provides up-to-date visual indicators for each audio source and the AudioFile functions applied to that source.

The state of all channels can be visible at all times and displayed in any of three views (modes):

- Small so the program can be sized to share the screen with other applications (Green dot = good)
- Icon View so users can view at a glance what is happening with all aspects of each audio source. (see right).
- Report View a detailed view where the source icons are displayed with actual readings and status of each audio source. (See below)

Visual indicators depict the state of each channel for Record, Archive, and Delay. Functions may have the following states:

- Stopped The default state for an unused feature.
- Active Feature is working and a source available.
- No Audio The source is not connected or has not provided sufficient audio level to surpass the silence detect threshold.
- Waiting System is waiting for a process to complete.
- Error A non-specific error has occurred which is not covered by the standard icons. See the event log for more error details.





Green indicators mean all is okay. A channel indicator will turn RED if a software fault is detected including prolonged silence on a channel.

🕼 KLZ Aud	dioFile Monitor										
Monitor V	liew										
Channel •	Small	State	Record 1	ime	Rec Level	Silence Level	Delay Level	Delay State	Delay Time	Archive State	Archiver Time
🔘 1 : KL	Icons		12:12:05	i pm	-23.1, -19.4	-10.9, -10.9	-11.5, -11.4	Active	12:11:05 pm	Stopped	
🔘 3 : Kl	Report	ŀ	12:12:05	j pm	-23.1, -19.4	-9.7, -10.4	-11.3, -12.7	Active	12:11:35 pm	Stopped	
	Refresh Rate 🔸	• Very	Fast								
	ShowDelays	Fast			_						
Audio	Kec	Norn	nal		Rec Time			Arc State		Arc Ti	me
Connectio	on Server status do	Slow					L	ast Error			

AudioFile Monitor "Report View" with View menu visible. Up to 64 sources can be monitored in this view.

Approved Playback Devices

KLZ AudioFile[™] can operate using a variety of audio cards, including multiple sound cards or devices installed in the AudioFile server. The following cards have been tried and tested in a variety of combinations;

On-Board Sound Devices

The embedded audio devices of modern day motherboards are all capable of handling the demands of a small, two-channel AudioFile server.

Consumer Sound Cards -Creative Labs and others

We have found that common consumer grade products such as the SoundBlaster and Audigy work well and can be added for additional channels. A variety of audio cards can be used to accommodate multiple channels of good audio quality at very low cost.

M-Audio Delta-44 and Delta-1010

M-Audio offers cards with 4 channels and 8 channels of in/out and are ideal for creating a cost effective, multi-channel AudioFile Server. The cards come with a PCI interface, which then connects to a breakout box or cable with appropriate connectors. Each Delta-44 has 4 inputs that could be used as all mono, two stereo, or one stereo and two mono. The Delta-1010 has 8 inputs.



Note: For those of you looking for a tidy solution, the Delta-1010 with rack-mount breakout box (pictured above right) offers exceptional value.

Audio Science ASI-6044

This professional audio card has 8 channels of in and out, true balanced audio, and XLR connectors. For best audio quality, particularly when using AudioFileTM for time delayed broadcasting, the Audio Science asi6044 makes an excellent choice.



Credits

Various technologies have been used in the making of this program. The following is a list of acknowledgements to the respective companies/organizations.

MPEG Layer-3 audio coding technology licensed from Fraunhofer IIS and Thomson.



Fraunhofer _{Institut} Integrierte Schaltungen

http://www.iis.fraunhofer.de/amm/

LAME MP3 Encoder by Open Source Developers



MPG123 Library courtesy of MPG3Dev.org



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