

Sound Limiting Equipment Installation Report

Background

An environmental noise survey and noise assessment impact was undertaken by Hoare Lea on behalf of Diecast, Manchester on 8th March 2024 to assess the level of noise emissions from amplified music. Details of the measurements and assessment of noise emission to the nearby sensitive premises were provided in a separate document supplied by Hoare Lea to Diecast Ltd.

The document provided internal noise limits to apply to both Leno Ex Machina and the Beerhall.

Industry recognised and council approved sound limiting equipment was installed into both Leno and the Beerhall and were set to the limits described in the implementation section. Descriptions of this equipment can be found in Appendix 1.

Implementation

All measurements were undertaken using 10Eazy sound level monitoring equipment, which complies with international standards ANSI/IEC61672. The maximum allowed dB value over an average of time - referred to as an "Leq limit" – was measured as 'C' weighted, and averaged over 5 minutes, to comply with the levels set out in the Hoare Lea report

The Table below details the single centre octave band limit levels and the corresponding single figure dB(A) and dB(C) values taken from Table 4 of the Hoare Lea report.

The Formula Sound limiters have been set to align with the single figure L_{Ceq,5min} of 93dB(C) and 91dB(C) for the pre and post 23:00 situations.

	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	dB(A)	dB(C)
12.00-23.00	84	81	84	88	88	79	80	85	92	93
23.00-01.00	81	78	80	84	84	72	75	84	88	91

Leno

For reference, a monitoring test was run at a position on the rear fence of the courtyard (as shown in Appendix 3 Figures 01 & 02). This was to measure the ambient background noise prior to running the Leno system at full volume. This test was run for a full half hour between 10:20 am and 10:50 am. A monitoring test was then run with the system in Leno running at full volume with pink noise as the source material. This test was run between 10:51 am and 11:21am. (Results are shown in Appendix 2 Figure 01). It should be noted that during these periods, there was a lot of work activity and deliveries

occurring, normal to the operation of the venue. The results show that there was little variation in noise levels with the system running or not running.

The sound limiting equipment has been installed in the signal chain between the input sources and the AHM matrix mixer and before the Amplifiers. As the volume control is dependent on the input volume and the amplifiers are set to maximum, the sound level from the system will be no more than the maximum set on the Automatic volume controller units.

A Formula Sound AVC-4 was fitted, which can limit 2 separate stereo input sources, between the input sources (DJ feed and background music source) and the audio matrix mixer. This matrix unit distributes the audio signal to the crossovers and amplifiers and controls the volume level of the signal sent to the speaker amplifiers. All amplifiers were set to maximum volume levels. The audio matrix mixer, which is controlled by a dedicated app interface, has controls for the volume of individual areas of speakers. The maximum levels are set in the custom control editor software, which can only be changed with administrator access, which is password protected. Staff do not have access to the administrator login details.

The AVC-4 has two thresholds, set via a key switch (Appendix 3 Figure 6) mounted to the side of the amplifier rack. The limit thresholds were set with the 10Eazy monitoring system placed in the Lighting Control point which is situated on the inside wall of Leno that adjoins the courtyard.

Level 1 was set to 93dB LCeq, 5min (12.00-23.00)

Level 2 was set to 91dB LCeq, 5min (23.00-01.00)

All rear setting controls have been fitted with tamperproof labels to ensure the limiter cannot be adjusted without evidence. (Appendix 3 Figures 3, 4 & 5)

An AVC-2D was also installed to control the signal sent from the audio matrix amplifier to the Beerhall (For events where the same source is required across both venues).

Beerhall

An AVC-2D with External reference mic has been installed in the signal chain of the audio system between the Mixing desk and the amplifiers. As the amplifiers are set to maximum, the sound level from the system will be no more than the maximum set on the Automatic Volume Controller.

The limit thresholds were set with the 10Eazy monitoring system placed in front of the bar (Appendix 3 Figure 10) and have been set to 93dB LCeq, 5min.

All connections have been labelled with tamperproof stickers to ensure that the limiter cannot be bypassed without evidence. (Appendix 3 Figures 7, 8 & 9)

Appendix 1: Equipment specifications

Formula Sound AVC 2D:

The AVC 2D controls the sound level of a system to a set maximum, if the incoming signal is below the set threshold the AVC 2D has no effect. If the average programme level exceeds the set threshold the AVC 2D will reduce its gain to hold the output level at the set maximum. The gain is reduced slowly so as not to affect the dynamics of the music. Once the set threshold is reached any increases of the input level (volume) is offset by reducing the gain. In mode 3 a microphone is used to monitor the actual sound level so turning up amplifiers will not increase the sound level.

The AVC 2D has no external controls - just a display and indicator LED's to inform the operator of the status of the unit.

All adjustments are made through holes on the rear of the unit to prevent accidental changes.

The AVC 2D operates as a stereo unit that controls volume level based on the microphone input, which measures actual sound pressure level in the venue.

In mode 3 a microphone is used to monitor the actual sound level so turning up amplifiers will not increase the sound level.

Formula Sound AVC-4:

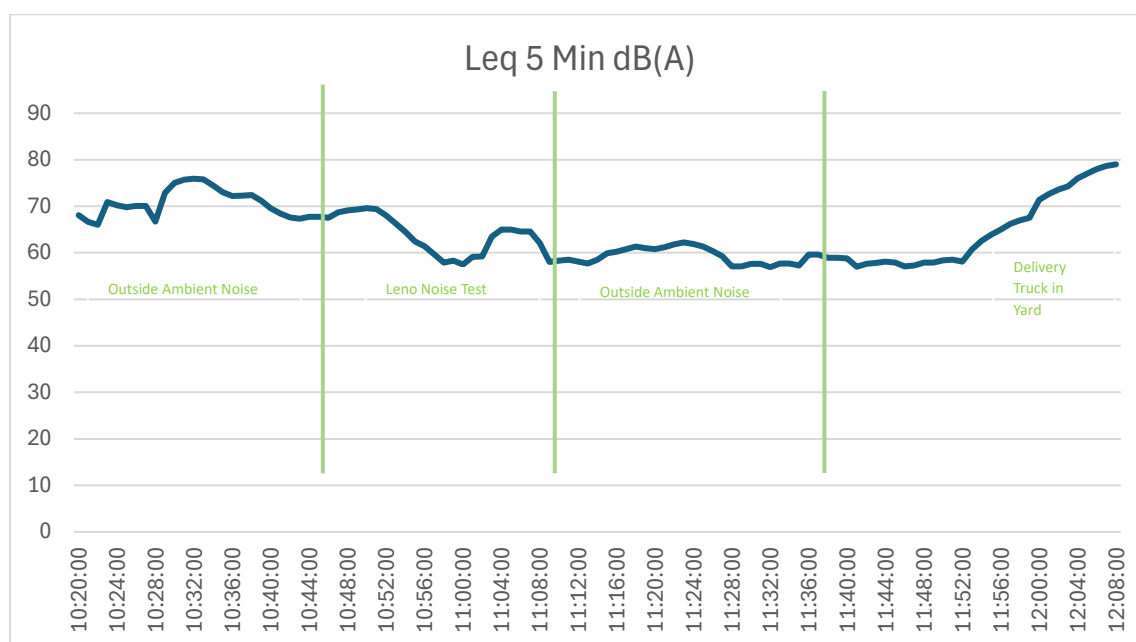
The AVC-4 is an analogue, stereo automatic volume controller, which controls the level of 2 stereo channels to a maximum set level (each stereo channel is set independently and may have different levels).

The AVC-4 has no external controls - just indicator LED's to inform the operator of the status of the unit.

All adjustments are made through holes on the rear of the unit to prevent accidental changes.

Appendix 2: External Level Monitoring

For reference, a monitoring test was run at a position on the rear fence (Appendix 3 Fig 1 & 2). This was to measure the ambient background noise prior to running the Leno system at full volume. Results are shown in the figure below.



Appendix 3: Reference Photos

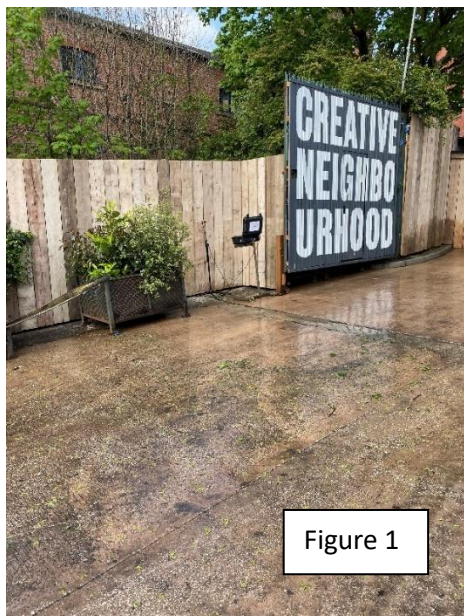


Figure 1



Figure 2

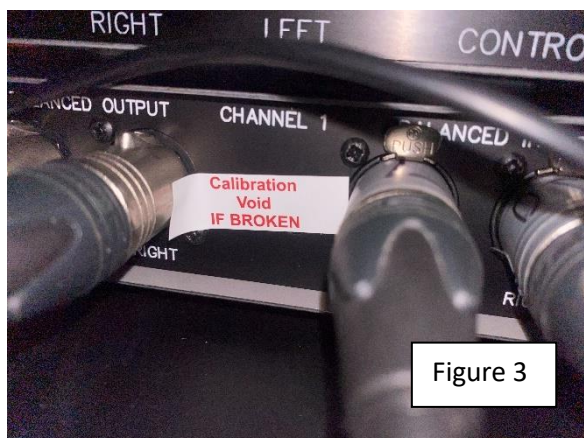


Figure 3



Figure 4

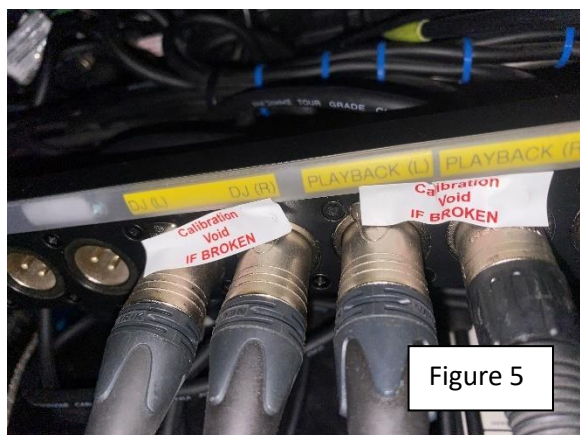


Figure 5

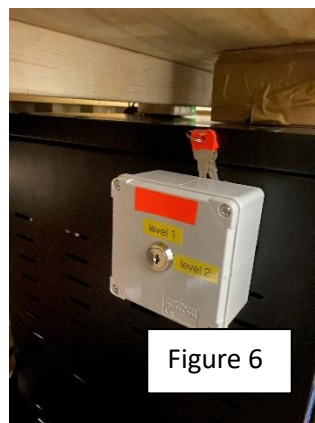


Figure 6

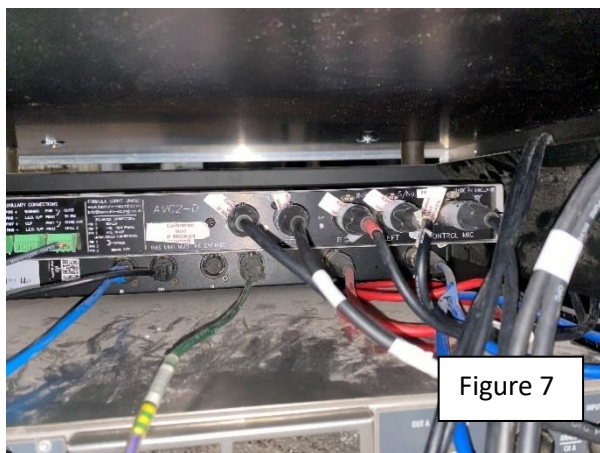


Figure 7

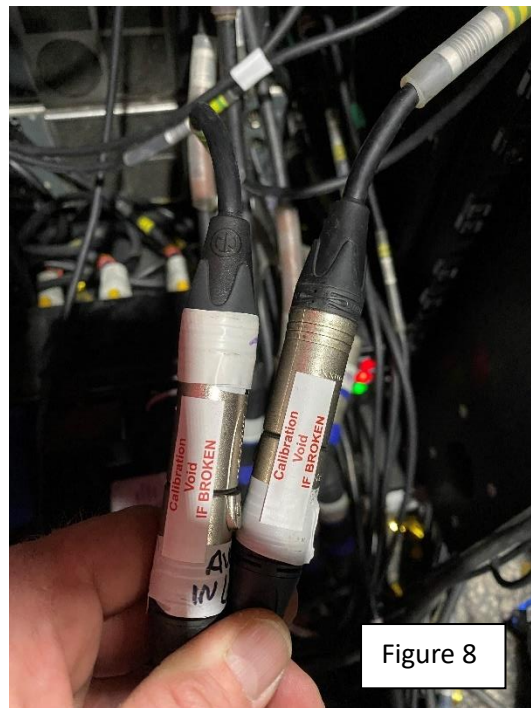


Figure 8

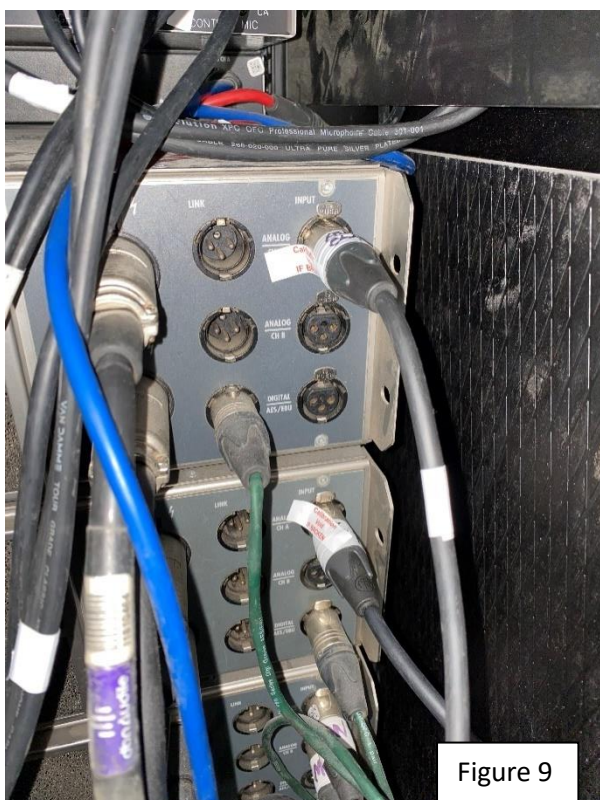


Figure 9

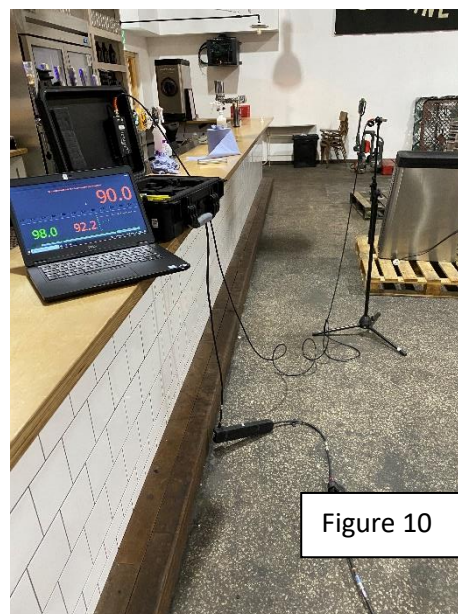
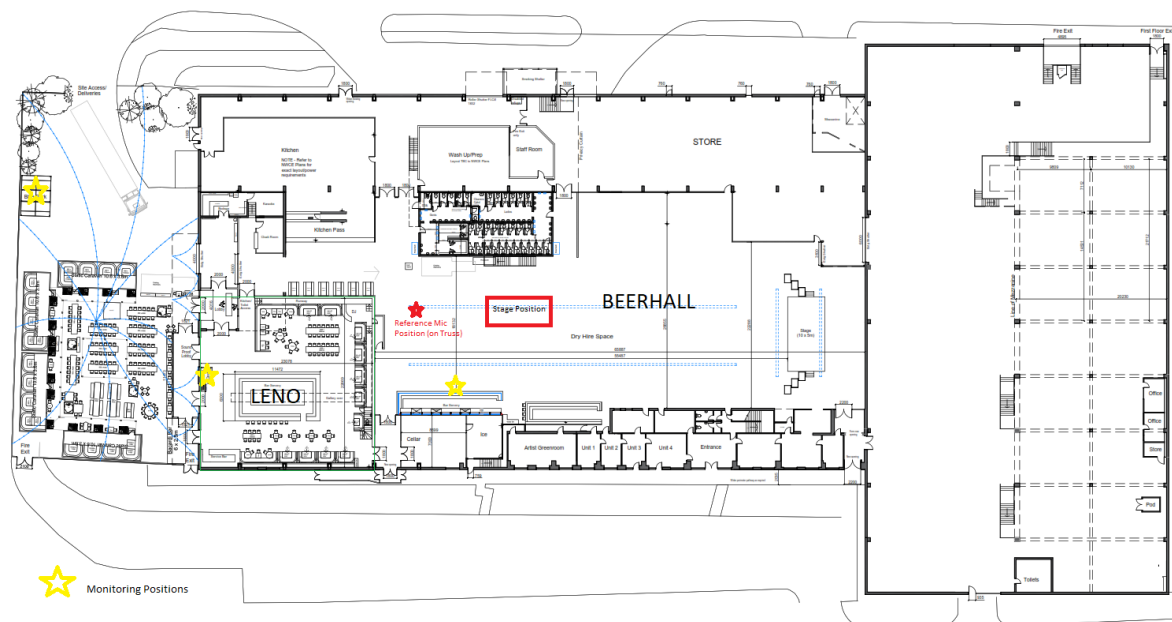


Figure 10

Appendix 4

Site Map



Monitoring positions used during limiter setting of Leno and the Beerhall, and the position of the external level monitoring (Appendix 2)