57 – 59 High Street, Sevenoaks
TN13 1JF
Noise Impact Assessment

MONO ACOUSTICS LIMITED

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N17 9QU

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Report 0909TN13			
Issue	**Date**	**Prepared by**	
1 (Initial Report)	30 August 2021	Umut Yurdakul	AMIOA
2 (Revised)	09 September 2021	Umut Yurdakul	AMIOA

Umut Yurdakul AMIOA, is an associate member of The Institute of Acoustics and has achieved the IOA diploma and Noise Control. Umut Yurdakul has 3 years experience working in acoustics.

Mono Acoustics Limited established in 2020 and providing noise consultancy services to hospitality and entertainment industry.

Registered in England
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1.0 INTRODUCTION

The management have applied a licence variation to increase current operation hours from 00:00 to 01:30 Thursday and Sunday, and to 02:30 Friday and Saturday. The management are concerned over the possibility of noise nuisance and have therefore commissioned a professional noise survey report to investigate and reducing the potential noise breakout.

1.1 Site Description

The premises is located at number 57 – 59 on the west side of High Street. To the north is main road then commercial shops with offices above. The area is mixed commercial and residential with many shops and restaurants. However, main source of noise is dominated by road traffic.

2.0 ENVIRONMENTAL NOISE SURVEY

Following guidelines are considered to assess music noise from proposed activities.

2.1 Institute of Acoustics Good Practice Guide on the Control of Noise from Pubs and Clubs]

There are no British Standards relating to the assessment of noise from amplified music regard to planning control for entertainment places. However, Institute of Acoustics published a guide that provides guidance for the assessment and control of noise affecting noise sensitive properties.

2.2 The World Health Organisation Guidelines for Community Noise

The World Health Organisation (WHO) Guidelines for Community Noise defines noise annoyance as "the capacity of noise to induce annoyance depends upon its characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time". The critical effects of noise are sleep disturbance, annoyance, and speech interference in dwellings. The guidelines suggests that a music noise limit of 45 dBA is sufficient to ensure that restful sleep is not disturbed.

2.3 Noise Break-out Assessment

The purpose of the assessment is to determine the impact of noise from the operation of the proposed activities at the nearest noise sensitive receptors. The assessment looks specifically at the worst affected dwellings close to the proposed development. Mono Acoustics has visited the

site for investigation purposes to carry out an environmental noise survey and establish existing background noise levels at a location representative of the nearest noise sensitive receptors on 16 August 2021. Then a sound propagation test has been caried out on 17 August 2021. The measured background noise levels have then been compared against predicted noise level of the proposed activities.

There are no British Standards relating to the assessment of noise from amplified music regard to planning control for entertainment places. However, Institute of Acoustics published a guide that provides guidance for the assessment and control of noise affecting noise sensitive properties. However, noise levels in $L_{Aeq,5min}$ and $L_{Ceq,5min}$ emanating from the application site shall not increase noticeably 1 metre from any façade of noise sensitive premises. Local authorities will consider measured sound levels against following 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

- NOEL – No Observed Effect Level
- LOAEL – Low Observed Effect Level
- SOAEL – Significant Observed Effect Level

2.4 Methodology

In order to establish a representative background and ambient noise levels, the environmental noise survey was undertaken at a measurement location at the rear garden of the premises near the residents. The survey was undertaken between 16 August 2021 at 14:33 and 17 August 2021 at 11:18 hours. The survey covers the most sensitive period of times in which the entertainment activities taking place when background noise levels would be expected to be lower.

The sound level meter was positioned at 3.5m above from ground and at least 1m from the resident' windows. The monitoring positions are considered representative of background noise levels at the nearest identified noise sensitive properties and shown in Appendix B.

The sound system was set up with music playing at typical sound level for usual evening operations, around 90 dB L_{Aeq} and relatively 98 dB L_{Ceq}. The choice of recorded music contained

variety of instruments, especially bass and vocals to simulate live music and DJ scenarios. Measurement locations were chosen as below:

- Location A – in the restaurant, 3m away from the loudspeakers,
- Location B – in the back garden area, 1m away from the door,
- Location C – in the car park, 30m away from the venue, near residents to west,
- Location D –car park entrance, 20m away from the venue, near residents to south,
- Location E – main entrance (high street), 1m away from front door.

2.5 Measurement Equipment

The measurement equipment illustrated in Table 1 was used during the survey, all equipment complies with BS EN 61672-1, Class 1 and BS EN 60942, Class 1.

Name	Serial Number	Last Calibrated	Certificate No
NTI XL2 Acoustic Analyser	A2A-17797-E0	29 July 2020	UK-20-038
M2230 Measurement Microphone	8561	29 July 2020	UK-20-038
NTI Precision Calibrator	17147	28 July 2020	44040-17147-CAL200

Table 1 – Equipment

2.6 Weather Conditions

Weather conditions throughout the entire noise survey period were noted to be warm (between 10 - 12 degrees Celsius), dry but partially (%80) cloudy with occasional drizzle during the measurement period, and a light wind (<5metres per second) from south-west. These conditions were maintained throughout most of the survey period and are considered reasonable for undertaking environmental noise measurements.

3.0 RESULTS

3.1 Background Noise Levels

Figure 2 shows the statistical analysis of the results of 21 hours period to determine a background sound level. For this distribution of the data an $L_{A90,15mins}$ of 50 dB was considered representative and in this instance was also the most commonly occurring value.

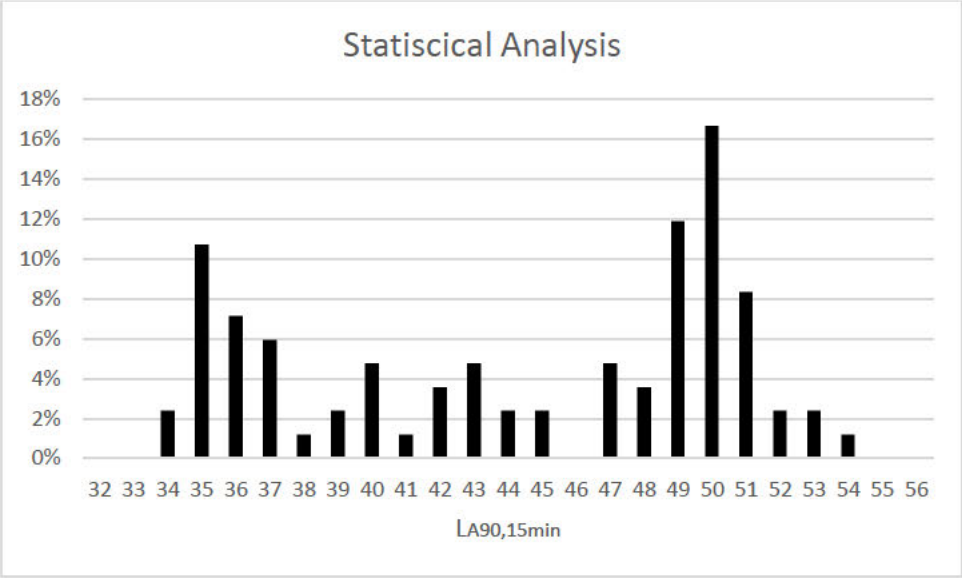


Figure 2 – Background Noise Levels

However, during the end of proposed hours, the lowest background noise level was 35 dBA.

3.2 Music levels inside the venue and other locations

The sound level meter was set in octave band logging mode at 1-minute intervals gave a result in terms of music sound level in $L_{Aeq,1min}$ and $L_{Ceq,1min}$. Total number of five consecutive measurements were taken and averaged at each locations A, B, C D and E respectively. Results are shown in Table 2 below.

Location	dB $L_{Aeq,5min}$	dB $L_{Ceq,5min}$	Subjective Assessment	Notes
A	90	98	Highly Perceptible	Music on
B	64	76	Just Perceptible	Music on
B	47	64	Ambient Noise	Music off
C	44	60	Inaudible	Music on
C	48	62	Ambient Noise	Music off
D	53	67	Inaudible	Music on
D	51	66	Ambient Noise	Music off
E	69	78	Insignificant	Music on
E	70	79	Ambient Noise	Music off

Table 2 – Summary of results

4.0 NOISE IMPACT ASSESSMENT

4.1 Music Levels

Music level was significantly reduced from 90 dB to 64 dB L_{Aeq} from inside (Location A) to garden area (Location B). This indicates that double glazed door performs a reduction of 26 dBA. Since sound levels attenuated over distance, music sound levels will be attenuated by 26 dBA and 30 dBA at Location C and D, respectively.

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 30 dB(A) as being suitable internal resting/sleeping conditions.

According to BS8233:2014, a typical building façade with a partially open window offers a minimum of 15 dB attenuation. It can therefore be predicted that noise emissions from the premises would be expected to meet recommendations for internal noise, even with neighbouring windows partially open, assuming mitigation requirements as per Section 5 are met.

5.0 NOISE CONTROL MEASURES

The music noise issues with the venue have been investigated and discussed for potential noise breakout. To be able to play the music at a reasonable volume, some soundproofing improvements to reduce the potential noise breakout are recommended and detailed below.
To reduce the potential for complaints from loud music will only be achieved by implementing all the recommendations made in this report. Good detailing and workmanship are essential to get the best acoustic performance. The management were made aware that some improvements will be needed to minimise the potential for noise disturbance and operate at the desired music sound levels without complaints.

5.1 Automatic Volume Control Unit (Sound Limiter)

The use of a sound limiter on the main sound system is an effective control measure to prevent excessive sound levels and possibility of complaints from nearby residents exists from music noise breakout in a venue. The sound limiters also serve a practical and safe way of controlling and limiting the exposure of high sound levels to staff working in the venue.

The device should be set accurately and calibrated by an acoustic consultant. A calibration certificate will be issued. Details of the volume control unit given in Appendix E.

5.2 Double Glazing

The rear garden area should be enclosed with double-glazed construction and all the doors kept closed during the late nigh operations. The management have already agreed to install double glazing windows (see Appendix E). Acoustic performance of the proposed system is predicted to give a reduction of about 18 dBA. Calculations shown in Appendix D.

5.3 Good Management

Notices should be installed asking customers to not shout and respect the neighbours and to keep their voices as low as possible. Business management should also be aware of rules such as opening and closing times.

6.0 CONCLUSION

The restaurant has been investigated for music noise levels and potential noise problems. A sound propagation test was undertaken, and sound levels have been monitored under typical operating conditions at various locations. Noise reduction measures has been proposed to reduce the potential noise situation. A list of recommendations has been made. Improvements are needed to provide soundproofing to enable the venue to operate without complaints at the desired music levels. Calculations has shown that proposed activities will not have an adverse impact when the noise control measures are completed. A final sound test should be performed to ensure full compliance with all the local authority noise criteria conditions.

APENDIX A

Glossary of Acoustic terms

- **Decibel, dB:** A unit of logarithmic ratio between a sound pressure and a known reference pressure.

- **dB(A):** A weighted dB. A-weighting is an electronic frequency weighting network which attempts to build the human response to different frequencies into the reading indicated by a sound level meter, so that it will relate to this loudness of the noise.

- **dB(C):** The C-weighting is the 'flattest' of the weightings and so dB(C) is sometimes used as and an approximation to the un-weighted sound pressure level, and the difference between dB(A) and dB(C) is used as an indication of low frequency content of a noise.

- **Background sound level, $L_{A90,t}$:** A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of given time interval T measured using time waiting F and quoted the nearest whole number of decibels.

- $L_{Aeq,T}$: is equivalent continues A-weighted sound pressure level. Value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval has the same mean-squared sound pressure as a sound that varies with time.

- $L_{Ceq,T}$: Value of the C-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval has the same mean-squared sound pressure as a sound that varies with time.

APENDIX B

Pictures - Measurement positions

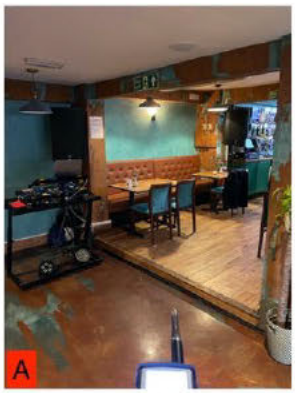


Figure 3 – Measurement Locations

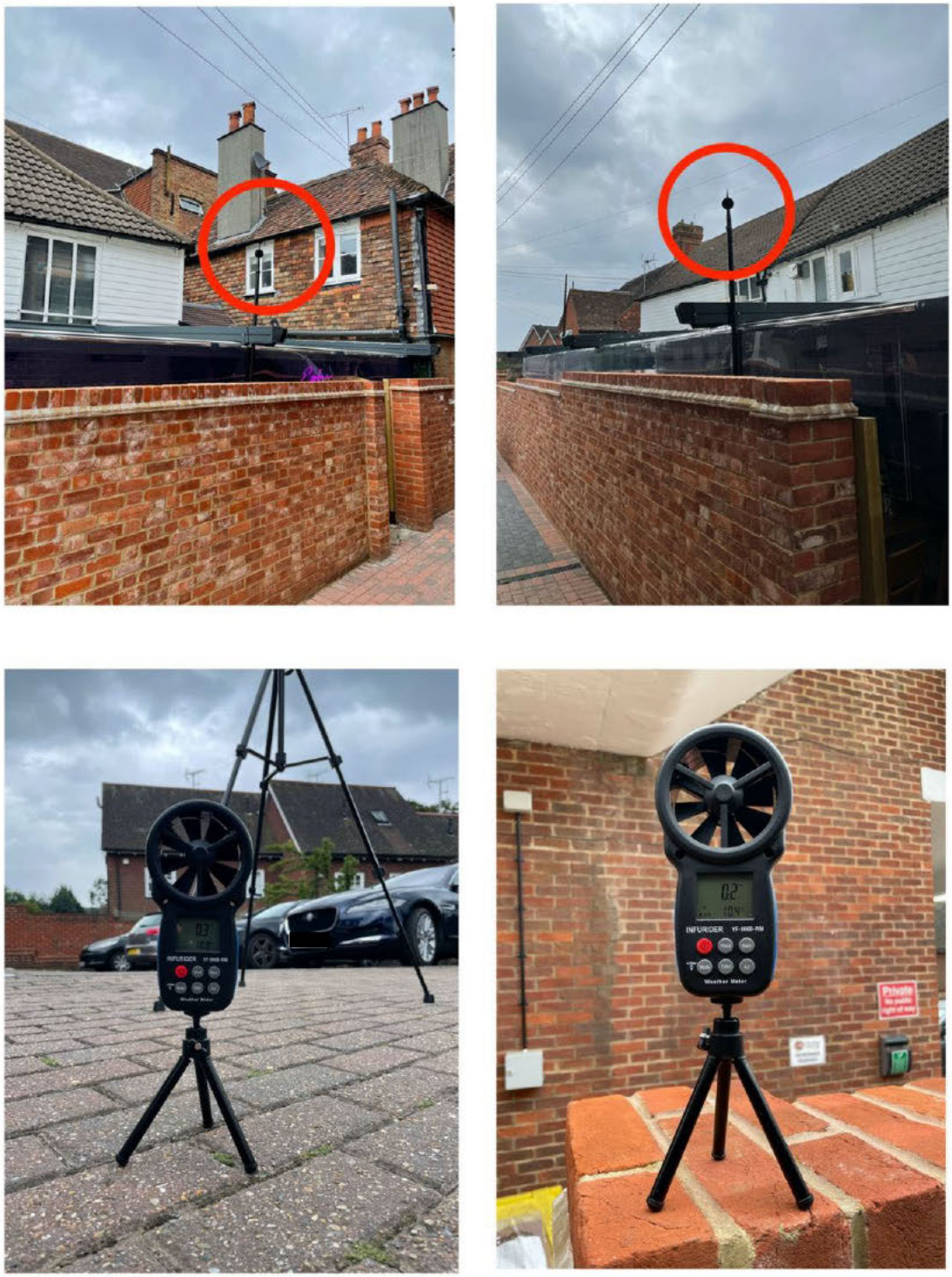


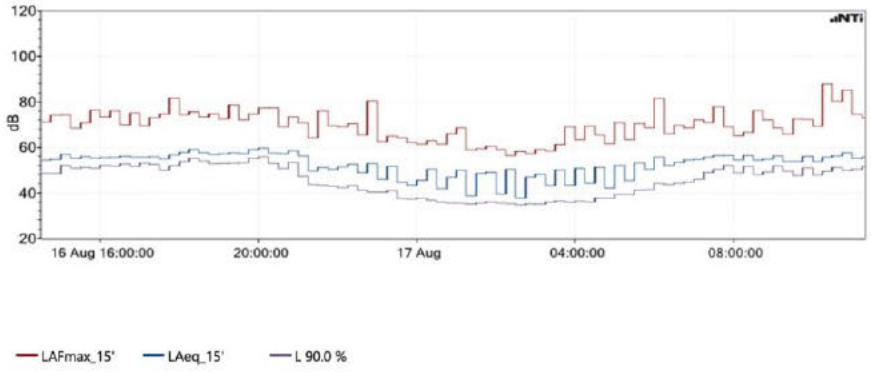
Figure 4 – Background Measurement Locations and weather conditions

APPENDIX C

Measurement Data

Background Sound Levels

Start: 2021-08-16 14:33:42
End: 2021-08-17 11:18:44



Results

Type	Start	Duration	LAFmax [dB]	LAeq [dB]	L 90.0 % [dB]
Recorded	**2021-08-16 14:33:42**	**20:45:02**	**87.9**	**54.4**	
Project Result		**20:45:02**	**87.9**	**54.4**	**36.9**

Audit Intervals

Type	Start	Duration	LAFmax [dB]	LAeq [dB]	L 90.0 % [dB]
15'	2021-08-16 14:30:00	00:11:18	71.1	54.4	48.6
15'	2021-08-16 14:45:00	00:15:00	74.1	54.8	48.6
15'	2021-08-16 15:00:00	00:15:00	74.3	56.8	52.1
15'	2021-08-16 15:15:00	00:15:00	68.4	55.1	50.9
15'	2021-08-16 15:30:00	00:15:00	70.8	55.8	51.2
15'	2021-08-16 15:45:00	00:15:00	76.4	55.3	50.9
15'	2021-08-16 16:00:00	00:15:00	73.3	55.6	52.0
15'	2021-08-16 16:15:00	00:15:00	76.1	55.7	51.8
15'	2021-08-16 16:30:00	00:15:00	70.0	56.1	52.7
15'	2021-08-16 16:45:00	00:15:00	75.0	55.7	51.7
15'	2021-08-16 17:00:00	00:15:00	69.6	55.7	53.1
15'	2021-08-16 17:15:00	00:15:00	73.1	55.8	52.4
15'	2021-08-16 17:30:00	00:15:00	74.6	54.9	49.9
15'	2021-08-16 17:45:00	00:15:00	81.7	56.7	51.9
15'	2021-08-16 18:00:00	00:15:00	74.4	57.9	53.7
15'	2021-08-16 18:15:00	00:15:00	75.6	59.1	55.2
15'	2021-08-16 18:30:00	00:15:00	73.3	57.6	54.0
15'	2021-08-16 18:45:00	00:15:00	74.7	56.9	52.8
15'	2021-08-16 19:00:00	00:15:00	72.5	57.2	53.0
15'	2021-08-16 19:15:00	00:15:00	78.7	57.5	53.1
15'	2021-08-16 19:30:00	00:15:00	72.1	57.2	53.2
15'	2021-08-16 19:45:00	00:15:00	74.7	59.0	55.1
15'	2021-08-16 20:00:00	00:15:00	77.2	59.6	55.8
15'	2021-08-16 20:15:00	00:15:00	77.3	57.5	52.9
15'	2021-08-16 20:30:00	00:15:00	69.0	57.2	50.6
15'	2021-08-16 20:45:00	00:15:00	73.3	58.4	53.3
15'	2021-08-16 21:00:00	00:15:00	70.7	56.2	47.3
15'	2021-08-16 21:15:00	00:15:00	64.2	49.6	43.6
15'	2021-08-16 21:30:00	00:15:00	76.0	51.1	43.3
15'	2021-08-16 21:45:00	00:15:00	69.6	50.3	43.0
15'	2021-08-16 22:00:00	00:15:00	69.1	51.4	42.3
15'	2021-08-16 22:15:00	00:15:00	70.4	52.6	43.2
15'	2021-08-16 22:30:00	00:15:00	65.4	48.9	41.2
15'	2021-08-16 22:45:00	00:15:00	80.4	52.8	40.4

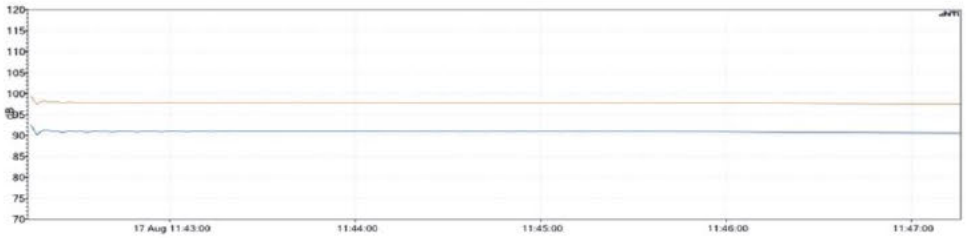
15'	2021-08-16 23:00:00	00:15:00	62.5	45.9	40.4
15'	2021-08-16 23:15:00	00:15:00	64.9	51.7	41.0
15'	2021-08-16 23:30:00	00:15:00	64.3	44.7	37.5
15'	2021-08-16 23:45:00	00:15:00	62.0	43.4	37.3
15'	2021-08-17 00:00:00	00:15:00	61.4	45.5	37.6
15'	2021-08-17 00:15:00	00:15:00	62.9	50.5	36.7
15'	2021-08-17 00:30:00	00:15:00	61.4	41.8	35.9
15'	2021-08-17 00:45:00	00:15:00	66.0	47.0	35.6
15'	2021-08-17 01:00:00	00:15:00	68.5	50.0	35.4
15'	2021-08-17 01:15:00	00:15:00	58.9	38.7	35.0
15'	2021-08-17 01:30:00	00:15:00	59.3	48.7	35.6
15'	2021-08-17 01:45:00	00:15:00	60.5	49.1	36.1
15'	2021-08-17 02:00:00	00:15:00	59.0	39.6	35.5
15'	2021-08-17 02:15:00	00:15:00	56.4	50.3	35.3
15'	2021-08-17 02:30:00	00:15:00	58.2	37.7	34.8
15'	2021-08-17 02:45:00	00:15:00	57.2	47.0	35.2
15'	2021-08-17 03:00:00	00:15:00	59.1	48.2	35.0
15'	2021-08-17 03:15:00	00:15:00	58.4	43.2	36.0
15'	2021-08-17 03:30:00	00:15:00	61.2	50.1	36.4
15'	2021-08-17 03:45:00	00:15:00	69.1	43.3	36.0
15'	2021-08-17 04:00:00	00:15:00	63.3	50.7	36.3
15'	2021-08-17 04:15:00	00:15:00	69.3	44.2	36.1
15'	2021-08-17 04:30:00	00:15:00	65.4	51.2	37.7
15'	2021-08-17 04:45:00	00:15:00	61.5	42.1	37.7
15'	2021-08-17 05:00:00	00:15:00	70.7	52.0	39.3
15'	2021-08-17 05:15:00	00:15:00	63.3	45.4	39.3
15'	2021-08-17 05:30:00	00:15:00	70.5	53.2	41.3
15'	2021-08-17 05:45:00	00:15:00	68.7	50.4	41.4
15'	2021-08-17 06:00:00	00:15:00	81.5	55.7	44.1
15'	2021-08-17 06:15:00	00:15:00	66.1	52.0	43.6
15'	2021-08-17 06:30:00	00:15:00	69.7	53.5	44.3
15'	2021-08-17 06:45:00	00:15:00	68.5	54.5	44.8
15'	2021-08-17 07:00:00	00:15:00	72.1	54.8	45.9
15'	2021-08-17 07:15:00	00:15:00	70.9	55.7	48.9
15'	2021-08-17 07:30:00	00:15:00	77.9	56.4	50.4
15'	2021-08-17 07:45:00	00:15:00	69.1	56.5	52.0
15'	2021-08-17 08:00:00	00:15:00	65.1	54.5	48.8
15'	2021-08-17 08:15:00	00:15:00	66.6	56.3	51.6
15'	2021-08-17 08:30:00	00:15:00	76.2	54.4	48.0
15'	2021-08-17 08:45:00	00:15:00	72.0	54.9	49.2
15'	2021-08-17 09:00:00	00:15:00	68.5	56.2	51.9
15'	2021-08-17 09:15:00	00:15:00	65.8	53.9	49.6
15'	2021-08-17 09:30:00	00:15:00	72.4	53.9	47.6

15'	2021-08-17 09:45:00	00:15:00	72.3	56.1	51.0
15'	2021-08-17 10:00:00	00:15:00	69.3	53.9	47.9
15'	2021-08-17 10:15:00	00:15:00	87.9	55.7	49.5
15'	2021-08-17 10:30:00	00:15:00	80.2	56.2	51.1
15'	2021-08-17 10:45:00	00:15:00	85.2	57.6	49.9
15'	2021-08-17 11:00:00	00:15:00	74.5	55.0	50.3
15'	2021-08-17 11:15:00	00:03:44	73.0	55.7	51.7

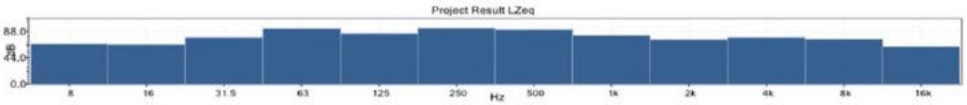
Music sound levels

Location A

Start: 2021-08-17 11:42:14
End: 2021-08-17 11:47:16



LAeq LCeq

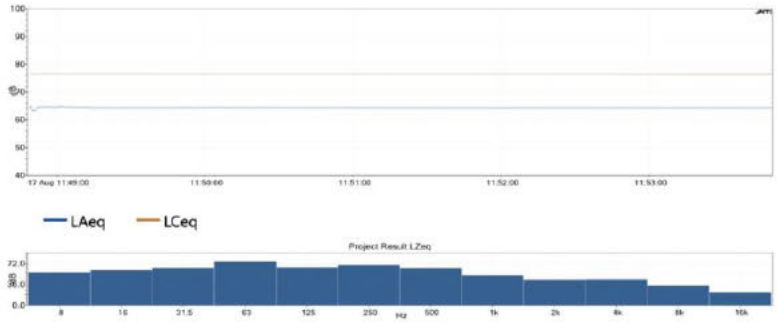


Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 11:42:14**	**00:05:02**	**90.6**	**97.5**
Project Result		00:05:02	90.6	97.5

Location B (music on)

Start: 2021-08-17 11:48:48
End: 2021-08-17 11:53:50

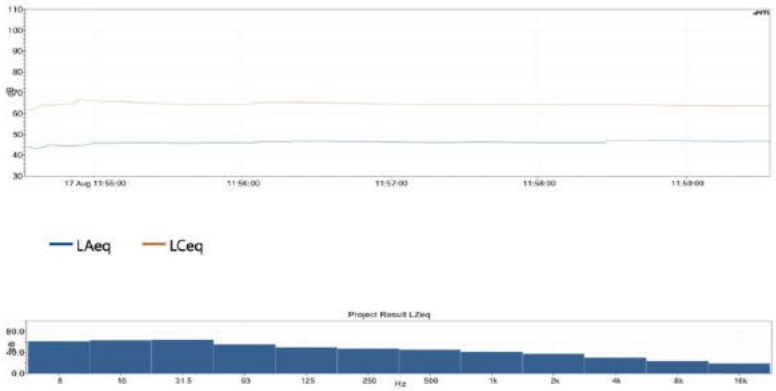


Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 11:48:48**	**00:05:02**	**64.2**	**76.3**
Project Result		00:05:02	64.2	76.3

Location B (music off)

Start: 2021-08-17 11:54:32
End: 2021-08-17 11:59:34

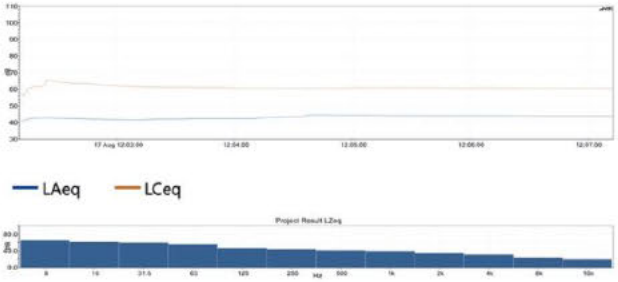


Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 11:54:32**	**00:05:02**	**46.7**	**63.6**
Project Result		00:05:02	46.7	63.6

Location C (music on)

Start: 2021-08-17 12:02:10
End: 2021-08-17 12:07:13

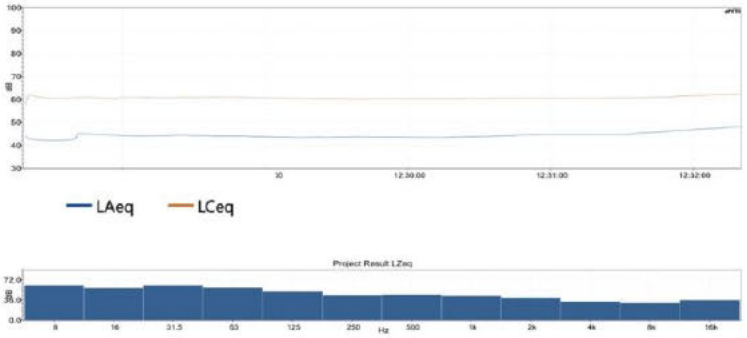


Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:02:10**	**00:05:03**	**43.8**	**60.4**
Project Result		00:05:03	43.8	60.4

Location C (music off)

Start: 2021-08-17 12:27:18
End: 2021-08-17 12:32:20



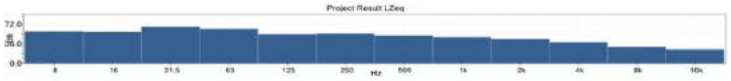
Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:27:18**	**00:05:02**	**48.1**	**62.3**
Project Result		00:05:02	48.1	62.3

Location D (music on)

Start: 2021-08-17 12:09:20
End: 2021-08-17 12:14:22

LAeq LCeq

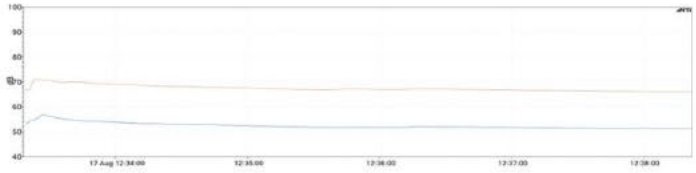


Results

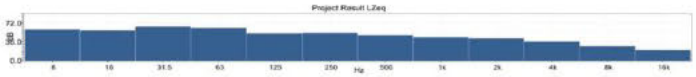
Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:09:20**	**00:05:02**	**53.3**	**67.3**
Project Result		**00:05:02**	**53.3**	**67.3**

Location D (music off)

Start: 2021-08-17 12:33:18
End: 2021-08-17 12:38:22



LAeq LCeq

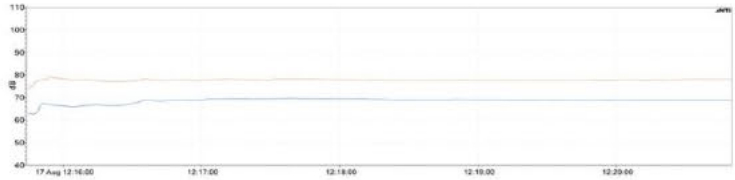


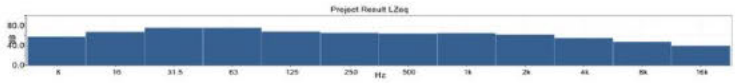
Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:33:18**	**00:05:04**	**51.3**	**66.2**
Project Result		**00:05:04**	**51.3**	**66.2**

Location E (music on)

Start: 2021-08-17 12:15:44
End: 2021-08-17 12:20:50



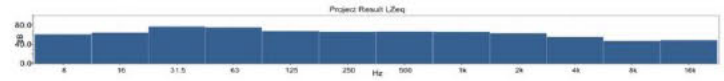


Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:15:44**	**00:05:06**	**68.8**	**78.1**
Project Result		**00:05:06**	**68.8**	**78.1**

Location E (music off)

Start: 2021-08-17 12:21:32
End: 2021-08-17 12:26:34



Results

Type	Start	Duration	LAeq [dB]	LCeq [dB]
Recorded	**2021-08-17 12:21:32**	**00:05:02**	**70.0**	**78.8**
Project Result		**00:05:02**	**70.0**	**78.8**

APPENDIX D

Calculation of composite Sound Reduction Index (*R*)

The transmission coefficient, *t*, is the ratio of the sound energy transmitted across a boundary to the sound energy incident. It can be determined from sound reduction index, R, value using;

$$t_i = 1/10^{R_{i/10}}$$

Then area weighted average *t* values can be used to determine total effective sound reduction index.

Element	R Value (dB)	t value	Area	Area x t
Double glazing	27	0.001995262	30.83	0.06151394
Canopy (roof)	15	0.031622777	33.26	1.05177355
Door	27	0.001995262	4.39	0.0087592

Total	68.48	1.12204669
	tavge	0.01638503
	Ravge	18 dB

***Representative R values in dB determined from: Ian Sharland, *"Woods Practical Guide to Noise Control,"* 5th ed., Colchester, 1988, p. 194.**

Finally, sound propagation to a distance given by following:

Calculation the sound level transmitted thorough structure:

$$L_{out} = L_{in} - R - 6$$
$$= 64 - 18 - 6$$
$$= 40\ dB$$

To calculate the sound power level of the element:

$$L_w = L_{out} + 10logS$$
$$= 40 + 10log(1)$$
$$= 40\ dB$$

To calculate the sound level at resident's window:

$$L_r = L_w - 20\log(r) - 11 + D$$
$$= 40 - 20log(3) - 11 + 3$$
$$= \mathbf{22\ dB}$$

where *S* is total open area, *r* is the distance to the reception point and *D* is the directivity index.

***D is +3 dB assumed against one plane.**

***r is 3 m (nearest resident's windows)**

***S is assumed 1 m^2 opening area for air circulation**

APPENDIX E

Manufacturers Data

AVC 2D
AUTOMATIC VOLUME CONTROL

Analogue signal processing
Digital control

With all the features of the AVC2 plus a number of enhancements the AVC 2D gives full control of music levels without compromising the audio quality.

The AVC 2D has three operating modes. The first is stereo, the second is two mono channels and the third is stereo with control microphone.

The LCD displays shows the status and all the information required is clearly visible for installer and operator. There is an LED to show if the input is clipping.

The AVC 2D automatically adjusts the volume once a preset threshold has been reached to keep the audio level within that required.

When attenuating the audio signal the distortion from the AVC 2D is less than 0.01% so the quality of the audio is not compromised.

The audio signal processing is entirely analogue, control of the audio level is digital using a PIC controller. This combination gives the best control of audio levels and retains the sound quality.

In stereo mode; two thresholds can be set; so for example one level could be for daytime and the second for night.

In mode 3 with control microphone connected the sound level is controlled based on the actual SPL so changes to equipment after the AVC 2D are compensated for.

A fourth mode to be added later will monitor the level of ambient sound, and for example adjust the paging level up if noise is high.

The factory setting will not instantly react to individual peaks or dips but responds to average programme level (this is a good thing). The attack and decay is adjustable.

The factory setting gives smooth operation that is almost imperceptible as the level is automatically adjusted, with minimal effect on your sytems audio quality.

A security panel on the back protects against unauthorised adjustment.

FORMULA SOUND

www.formula-sound.co.uk

AVC2-D SPECIFICATIONS

Frequency response	20Hz - 20kHz	+/- 0.5dB	
Distortion (THD and noise) freq 1kHz	O/P@ any level 0 to +22dBu	Attenuation @ any level 0 to -90dB	 < 0.01% (typically 0.005%)
Noise measured 20Hz-20kHz	Equiv. input noise	< -90dBu	

INPUTS Electronically balanced, connect pins 1 & 3 to screen pin 2 hot for unbalanced use

XLR Connectors	Pin 1 screen Pin 3 -Ve Non Phase Pin 2 +Ve Phase
Input impedance	Balanced 20K ohms Unbalanced 10K ohms
Maximum input level	+22dBu
Clip indicator	Indicates @ +20dBu

OUTPUTS Electronically balanced, connect pins 1 & 3 to screen pin 2 hot for unbalanced use

XLR Connectors	Pin 1 screen Pin 3 -Ve Non Phase Pin 2 +Ve Phase
Source impedance	100 ohms
Minimum load impedance	600 ohms
Operating Threshold Range	Average level +10 dBu -20dBu
Operating Modes 3	
Mode 1	Stereo operation. (A & B channels are controlled together)
Mode 2	2 x Mono operation. (A & B Channels are controlled independently)
Mode 3	Stereo operation with control taken from an optional microphone which will measure & control actual sound pressure level (SPL) in the venue.

AUX CONNECTIONS	1 & 2 Open to Mute	3 & 4 Coms (future development)
	5 & 6 Warning LED	7 & 8 Clip LED
	9 & 10 close to DIM - 20dB	11 & 12 Close to select level 2
MICROPHONE CONTROL INPUT	XLR Connector Lo Z Balanced input (15V Phantom internal selection)	
DISPLAY	2 X 20 Segment Liquid Crystal Display (LCD) Backlight & Contrast are internally adjustable 1 Green LED Power indicator	 1 Red LED Input Clip indicator

POWER
220-240 V AC 110 -120V AC Operation Internal selection I.E.C. Mains connector

Mains Fuse 220V operation 250mA slow blow. 110V operation 500mA slow blow

FINISH
Front and Rear panels - Black anodised aluminium with silver notation
Case black plastic-coated steel.

DIMENSIONS
19" Rack mounting 1RU
Width 482mm (19") Depth 200mm (7.9") Height 44mm (1.75")

FORMULA SOUND Ltd
Unit 23 Stadium Business Centre
North End Road
Wembley
Middlesex; UK
HA9 0AT
TEL 0208 900 0947 (+44 208 900 0947) FAX 0208 903 8657 (+44 208 903 8657)
Email: info@formula-sound.co.uk www.formula-sound.co.uk

Double-glazed construction details

NANOSAFE
care and protect

3.b MATERIALS & SPECS

Technical specs, material information of the automatic guillotine glass system are as mentioned in the attached annex1 of "PERGOLA AND GUILLOTINE GLASS CONSTRUCTION TECH GUIDE".

3.c SERVICES AND GUARANTEE

3.c.1 Production, shipment of the goods to the Client's premises
3.c.2 Installaton and assembly
3.c.3 Consultancy sevices for production, logistics and assembly
3.c.4 2 years installation guarantee, 3 years product guarantee for the guillotine glass system

3. PRICING

Client and Supplier agree on a budget of [redacted] **in total** ([redacted]).

- Includes :
  - Automatic guillotine glass system (double glazed / (4mm+12mm+4mm)
  - Fix body parts
  - 2 manual doors
  - Main body construction and fix parts
  - Shipment, assembly & installation
  - Consultancy for production, logistics, assembly & installation
- Excludes :
  - Any flooring or decking needed for the area
  - Energy and gas lines/pipes
  - Installation of the gas pipes to the gas heaters and / or electric lines
  - Any demolition at site before the assembly

4. TIMINGS

20 working days for the production, 10-12 days for delivery, 2-3 days for assembly (may differ +/-2 working days depending on the weather conditions).

NANOSAFE LTD.
17 Green Lanes, LONDON, N16 9BS (R)
M: 07445 695 886