

Quiet Nightclubs.

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Almost by definition a quiet night-club is a contradiction in terms. When I refer to a quiet night-club I mean one in which the Noise at Work Regulations are satisfied.

The industry has recognised for some time the difficulty of compliance with the Noise at Work Regulations. The British Entertainment and Discotheque Association Ltd (BEDA) produced guidelines for compliance which have not been universally welcomed in all clubs. The means of compliance is described as:-'Given that the wearing of ear muffs and similar methods of hearing protection is not a feasible proposition in the majority of clubs, and certainly inappropriate to DJ's and artistes, the compliance policy is geared towards reducing the actual noise levels in the workplace and reducing the amount of time spent in a noisy area.'

Reducing noise levels by turning the volume down is fraught with problems and is frequently resisted. Controlling exposure by staff rotation whilst fine in theory assumes that a quiet area can be found in the venue and that staff have sufficient skill levels to be moved around from activity to activity.

Strange as it may seem it is local Environmental Health Officers rather than the Health and Safety Executive who are responsible for policing the industry. Whilst EHOs are not as cohesively organised as the HSE on a national scale, there has been a marked rise in interest in enforcement of the Noise at Work Regulations in night-clubs across the country.

In order to illustrate the problem I will describe a typical case history of a venue in the south east of the country. This particular club in common with many modern venues actually has two clubs in one building. Club 1 caters for the younger age group of eighteen to twenty four, whilst Club 2 is for the over twenty four's. The first club is located on the ground floor with a mezzanine floor overlooking the dance floor. The second club is at first floor level. Club 1 has four bars and Club 2 only one.

In 1997 we carried out a full occupational noise survey in the venue, a process fraught with unique problems. In our experience, it is always advisable to carry spare wind shields for your microphone as they provide the clientele with considerable amusement if purloined. Having survived, Table 1 shows the results of the survey.

Club 1	LEP,d
Cashier	69.6
Cloak Room	69.6
Diner	85.8
Bar 1	93.7
DJ	98.6
Bar 2	90.3
Bar 3	95.5
Glass Collector, ground floor	96.3
Bar4	93.2
Glass Collector, bar 4	95.2
Club 2	LEP,d
Glass Collector, bar 5	98.1
Bar 5	95.9
DJ	99.8
Doormen between the two clubs	86.5
Cashier	76.6
Cloakroom	95.3

Table 1.

The exposures measured are based on measurements over the entire evening because in all clubs the sound levels rise and do not reach their maximum until after 23.30hrs. Most of the exposures measured were significantly greater than the second action level of 90 dB(A), LEP,d. These numbers tell an alarming story which needed some serious consideration.

The venue has some added problems all of which are exacerbated by lack of space. Figure 1 shows that Bar 5 is only two paces from the dance floor. This proximity of bars to the dance floors was common to all five bars. Even worse, the cloakroom for Club 2 was equally close to the dance floor. The concept of a 'quiet area' would be impossible to realise in such a small venue.



Figure 1.

The two clubs, whilst physically quite small, had virtually no acoustic absorption in them apart from people and had mid frequency reverberation times of about one second. The effect of this

was to produce high reverberant sound pressure levels and little apparent attenuation with distance. A by-product was that the music system did not sound particularly good which is a feature common to many night-clubs.

An ideal opportunity presented itself for introducing noise reduction measures in the form a complete re-fit. Periodically all clubs refurbish their internal finishes and decor which takes considerable wear and tear in normal or perhaps abnormal usage. In this case we were almost given a free hand to introduce as much noise control as the refurbishment budget would permit.

Figure 2 shows the ground floor layout of Club 1 and it must be remembered that there is a mezzanine floor above Bars 1 and 2 on which Bar 4 is located directly above Bar 2.

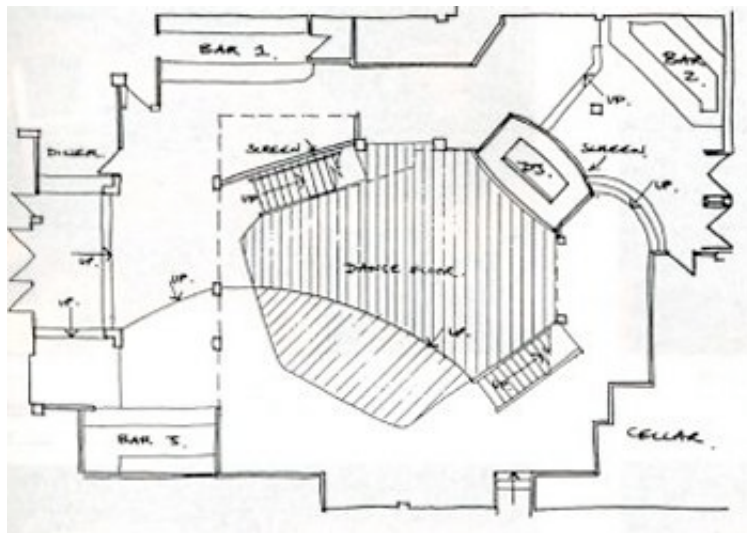


Figure 2. Club 1, Floor plan.

Figure 3 shows the revised layout for Club 2.

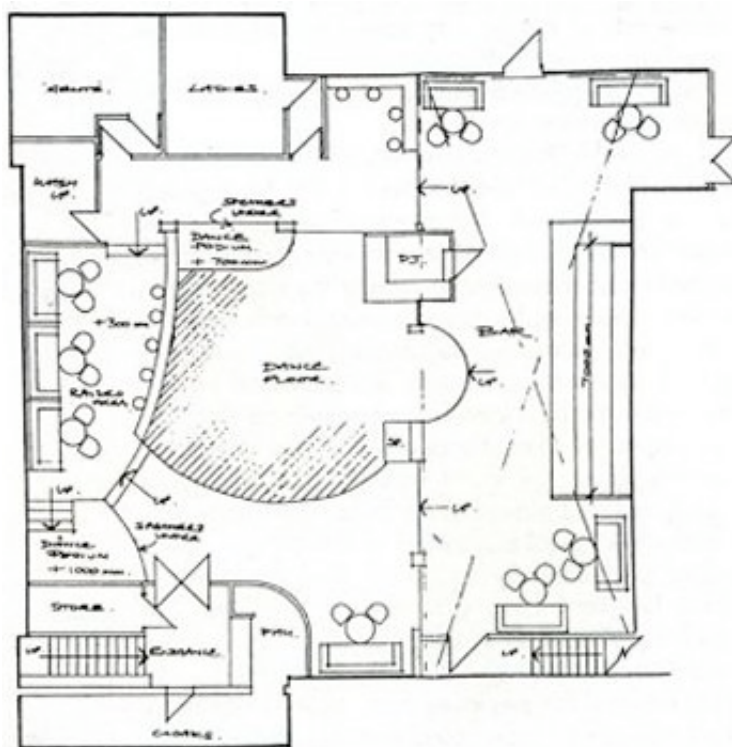


Figure 3. Club 2, Floor plan.

In Club 2 several key elements were introduced:- The cloakroom was moved together with the

paydesk to directly next to the entrance and it is separated from the dance floor by a wall. The bar was moved from the position now occupied by the raised seating area to the opposite wall increasing the distance between the bar and the dance floor.

All the loud speakers were orientated to point away from the new bar. The entire ceiling area was faced with acoustically absorbent material. Figure 4 shows the black coloured acoustic ceiling tiles over the raised seating area.



Figure 4.

As much of the wall areas as practical were also covered with acoustic absorbent faced with a purple cloth. This can be seen to the right of Figure 4.



Figure 5.

Figure 5 shows a view of the bar from the raised seating area. The bass bins in the column are mounted on vibration isolation mounts and are direct radiators. The vibration isolation mounts prevent the low frequency energy entering the structure which can produce unpleasant buzzes and rattles in fixtures and fittings.



Figure 6.

Figure 6 shows that the absorbent ceiling extends right underneath the bar and the bar opening is kept to the minimum commensurate with operational requirements.

In Club 1 the same treatments were applied with a few additional measures:- The wall areas which were out of reach of the clientele were finished with a sprayed acoustic absorber. Some wall areas and ceilings under the bars were finished with mineral wool behind galvanised perforated sheet steel. This is an unusual finish but just happened to meet with the approval of the interior designer.

A large glass screen was introduced in front of Bar 1 at the side of the stairs to screen the bar from the dance floor. The DJ console was built as an acoustic screen to provide some screening to Bar 2. Figure 7 shows the DJ console which totally obscures the bar behind. Bar 4 can also be seen in this photograph on the mezzanine.



Figure 7.

The sound system was based on downward facing loudspeakers with very narrow directivity patterns. These can be seen at the top of Figure 5. The basic idea is to direct the sound only onto the dance floor with as little overspill as possible. Figure 8 shows the schematic of the control system. As with Club 1 the bass bins were mounted on vibration isolation mounts in dummy cabinets at dance floor level.

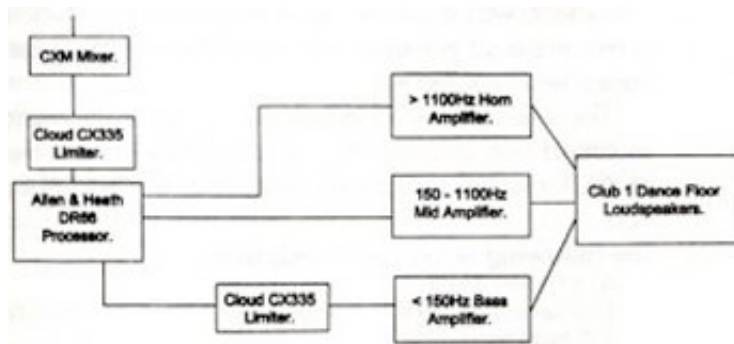


Figure 8. Club 1. Sound System Schematic.

We carefully set up the sound systems using the type of music preferred and played in the clubs. The system was set to produce a typical music level of 103 dB(A) Leq on the dance floor and carefully equalised. The result was a very loud but very crisp and clear sound. Subjectively the DJ's felt it sounded much louder than it actually was and this was due to the much reduced reverberation time of about 0.3 seconds at mid frequency.

We resurveyed the employee noise exposure after the club had re-opened and the results are shown in Table 2.

Club 1	LEP,d
Cashier	72.1
Cloak Room	72.1
Diner	86.3
Bar 1	86.6
DJ	98.2
Bar 2	89.0
Bar 3	88.4
Glass Collector, ground floor	96.8
Bar4	89.1
Glass Collector, bar 4	94.5
Club 2	LEP,d
Glass Collector, bar 5	97.0
Bar 5	86.9
DJ	97.3
Doormen between the two clubs	86.5
Cashier	77.5
Cloakroom	73.7

Table 2.

The only employees who now have exposures above the second action level are the glass collectors and the DJs. The glass collectors are perfectly able to wear hearing protection in the form of ear plugs since their job does not involve communication.

The DJs are their own worst enemies in that their high exposure comes from the 'monitor' loudspeaker which they insist on using as a private discotheque at excessive levels. Given the proximity of the DJs to the dance floor these monitor loudspeakers are totally unnecessary. Unfortunately DJs are temperamental 'artists' and refused to perform without their beloved monitors.

From the clientele point of view the sound system is very good and they do not have to scream at the bar staff in order to get a drink. The level on the dance floor was 103 dB(A) Leq which reduced to 89dB(A) Leq behind Bar 3.

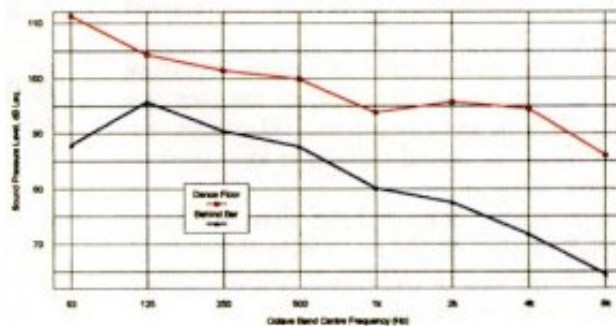


Figure 9. Spectra on the dance floor and behind the bar.

This is shown in octave bands in Figure 9. In physically larger venues the same techniques are even more effective and easier to implement. These basic measures can be designed into new night-clubs and retrofitted to virtually any club undergoing a refurbishment.