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NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

A Study of a new Problem for the Nineties, Inaudibility Rejected as a Valid Criterion and an Objective Alternative Proposed and Monitored.

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1. INTRODUCTION

Contrary to popular belief Acid House Raves do not involve any acid and are not held in private houses. The term Acid House refers to a particular type of music which has emerged from the Chicago House music scene in the USA during the late 1980s, which, along with New York street Rap, forms the basis of the music played at these events. They are usually held outdoors, often under huge marquees, or may be held in a large warehouse or arena. Often other attractions such as fair ground rides and side shows are included in the activity. An unfortunate reputation has been inherited from large scale unlicensed events staged on unauthorised sites where alcohol and drug abuse has become a major problem.

More recently a number of responsible entrepreneurs have emerged in this field and as a result, properly organised, licensed Pay Parties (as they are officially termed) are taking place on suitable sites up and down the Country, often with the full co-operation of the Police, local authority Licensing Committees and Environmental Health Departments, etc. Such is the momentum that a Joint Police Pay Party Intelligence Unit has been set up, based at Atherstone, Warwickshire, under the guiding hand of Detective Chief Inspector Burrell, to co-ordinate a policing policy for this type of event and to provide guidance to local Police forces suddenly finding themselves confronted with this situation.

Surprisingly perhaps, the Police policy is a positive one, taking the view that it is much better to find ways of permitting these events to take place under formally licensed conditions where proper controls can be exercised, rather than being driven underground. Usually such events are alcohol free and drug free in so far as this can be realistically controlled, with patrons being searched for drink and drugs upon entry to the event. Many are large scale events attracting up to 10,000 patrons, usually starting at around 2100hrs and running right through the night until about 0600hrs the following morning, thus posing a particular problem in terms of noise control.

This paper will present some typical audience exposure levels and music spectra, discuss some of the environmental issues arising, identify the need for a new criterion to address this emerging problem and illustrate the application of one such proposal.

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

2. THE MUSIC, LEVELS AND SPECTRA

The primary attraction is the music itself, which supported by an elaborate light show and laser projection system, is itself sufficient to put patrons on an all-time high, without the need for alcohol and drugs. In essence it comprises a monotonous pounding bass throb, with a simple rhythmic structure not unlike that of an African tribal war dance, to which patrons heave, stamp and contort themselves into a sweated frenzy, blowing horns and whistles until crimson faced with the effort. As in the war dance situation, where tribesmen were exhorted to attain still higher levels of ecstasy by the chantings of the Witchdocter, here it is the MC and his "platform posse" who chant incantations over and above the music. Names such as Rhythm Doctor, Evil O, Da Posse, MC Hardcore General, MC Kinky, Captain Fantasy, along with event banners like Raindance, Indian Summer, The Gathering of the Tribes, Fantasy FM, will, I am sure, serve to set the scene.

Interestingly, and contrary to popular belief, volume levels from the music itself, when measured on a conventional A-weighted SPLM, are not particularly high: 96dB - 103dB LA10 would be a realistic range over four recent events. Fig. 1 shows a typical 1/3rd octave spectra measured inside a large marquee with some 5000 patrons dancing. Note the 30dB plus exceedance of the 50Hz, 63Hz and 80Hz 1/3rd octave bands above the mid-band average level. Fig. #2 shows another 1/3rd octave spectrum, this time with an MC voiceover bringing up the midband level and increasing the A-weighted SPL appreciably. These relatively high levels of low frequency energy are inherent in the recording process - they are not the result of the replay system equalisation curve or of the loudspeaker characteristics.

3. COMMUNITY NOISE IMPACT

Most such events take place either in marquees or in lightweight buildings such as warehouses, sports halls or indoor arenas, where the Mass Law dictates that sound transmission loss through the cladding will be at its lowest value over the very frequency bands where the highest attenuation is needed. Fig. #3 shows a typical noise transmission plot through a lightweight steel framed building with profiled steel sheet cladding and Fig. #4 a family of such plots taken on four sides of a large marquee.

In each case the upper curve is the internal stimulus and the lower the residual external level. Although in these examples the stimulus is ordinary pop music, not Rap or House, and therefore does not reflect the LF energy levels, they nevertheless serve to illustrate the order of attenuation to be expected of such enclosures and are useful in predicting likely propagation from the site. Both illustrate the low level of attenuation provided

at these very low frequency bands, whilst Fig. #4 shows that contrary to popular belief, useful levels of midband attenuation can be provided by a good quality marquee in association with appropriate orientation of the loudspeaker system, and that this should not disregarded in assessing a noise control programme. Again, this data is taken from our own file records.

Clearly however, from an environmental viewpoint, such events should not be sited in close proximity to residential areas. Having regard to the numbers of attendees involved it is not uncommon to find disused airfields, farmland, derelict industrial sites and isolated warehouses, large barns and sports arenas being used for such events. But even this level of isolation does not altogether solve the problem and on one site in rural Leicestershire for example, identifiable music could be heard 8 miles away at 0130hrs due to an unexpected change in wind direction.

One useful trick is to use a combination of loudspeaker directionality and screening to protect a particular noise sensitive area, but because of the effects of wind direction and strength over larger distances, it is necessary to leave the decision regarding orientation of the site until the last minute - and even then one can be caught out. Fig. #5 shows the combined effect of the marquee walls in combination with two large juggernaut trailers - used to carry the sound and lighting systems but pressed into service as a makeshift but effective noise screen to solve a last minute problem.

4. NOISE CRITERIA

Clearly, there is a limit to the practicable means by which noise propagation can be controlled and even on remote sites, there will always be a very real risk of noise nuisance. Turning the volume down below a certain pre-requisite level is not a valid solution as it leads to intense dissatisfaction amongst patrons, to unrest and risk of public disorder in an event of this scale. Some environmental noise impact is therefore inevitable.

The nature of the residual noise from these events is the dull thud of the LF beat, the MC voiceovers and often the blowing of horns and whistles can also be heard. Also, in the case of events which include fairground attractions, the uncontrolled music and public address systems which accompany the larger rides are another identifiable source. Given that these events are usually sited some distance away from residential areas the propagation is largely dependent upon climatic conditions, usually coming in waves carried by the wind to the extent that one minute the event noise might be inaudible and the next quite unacceptable, thus making accurate prediction an almost impossible task.

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

The quantification of what constitutes nuisance in terms of entertainment noise has long been a bone of contention. It has lead on the one hand to the realistic levels of tolerance shown by the GLC in arriving at their well known control criteria in respect of pop concerts at Wembley, Crystal Palace, Reading and elsewhere on the one hand and to the invocation of the Edinburgh inaudibility criteria on the other.

The GLC Experience

In the case of the GLC Code of Practice (1), determination of nuisance has been based on the difference between event noise and background noise, both measured in terms of 15 minute LAeq. Originally 10dB above background was permitted until 2000hrs, reducing to 6dB until 2300hrs and no increase thereafter (2). It seems likely that this would originally have been based on BS4142:1975 (3) applying the intermittency correction only after 2000hrs. Over a ten year period this criterion was relaxed to 12dB exceedance up to 2300hrs (4) as experience in the management of such events was gained and more data became available. The draft of the new Noise Council Code of Practice (5) suggests a 20dB exceedance where only one event per year is staged at the same site, reducing to 10dB for 2 - 12 events with more than 12 events being treated as a permanent site. In a still more recent draft, the HSE Guidance on Health, Safety and Welfare at Pop Concerts (6) the single event exceedance criterion is stretched out to 25dB; for 2 - 12 events 15dB and for 12 events or more to 5dB - although in this latter instance the comparison is on the basis of event LAeq vs background LA90.

At every stage of the development of the GLC CoP, each relaxing of the exceedance criterion was supported by data in which the relationship between the exceedance criteria, frequency of events and numbers of complaints received was carefully analysed. I am not however convinced that the single event exceedances of the current round of draft proposals enjoy any such pedigree, but I guess time will tell.

One of the more crucial elements of the GLC approach was the introduction of an active noise monitoring and event control procedure, without which even the very best of criteria will be without effect and which must therefore be seen as an integral part of any proposals which might be considered.

The Concept of Inaudibility

Throughout its evolution the GLC criterion has always stated that there should be no exceedance of background after 2300hrs and this concept has been continued into the two new draft CoPs. As stated by Griffiths & Kamath (4):-

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

"After 2300hrs it is reasonable to assume that a guideline to preserve sleep is required...it is recommended that a more stringent standard of inaudibility be maintained for open air concerts. This effectively defines the finishing time."

Because the inaudibility criterion "effectively defines the finishing time" there is no published complaints data to support or contradict the 2300hrs deadline and nothing to suggest whether there is any scope for relaxation of this criterion too.

The concept of inaudibility was born in Edinburgh for a particular reason. With the advent of virtual 24 hour licensing under the Licensing (Scotland) Act 1976 and with 54% of Edinburgh public houses situated directly under residential premises (7) problems with entertainment noise were inevitable. Therefore, since 1984, the Act has made provision for the enactment of bye-laws to enable the problem to be controlled. This has been used in Edinburgh to impose a condition that any music shall be inaudible within the nearest noise sensitive premises.

To anyone with any knowledge of Edinburgh, were hundreds of tenements are squeezed into monolithic blocks with shops or other commercial premises on the ground floor and a pub on the corner, there will be a degree of logic in this approach. Imagine living immediately over, next door to or directly opposite the pub with uncontrolled live rock music or loud juke boxes playing all night long, 7 days a week, 52 weeks of the year, doubtless with the windows and doors left wide open in the summer months! Clearly Draconian measures were needed to deal with this problem and in the absence of an effective objective criterion, (8) inaudibility was adopted.

The adoption of a subjective criterion as a legislative instrument understandably caused some concern amongst the acoustics profession and two conferences were organised by the Institute of Acoustics to air the subject, the first in Edinburgh itself in April 1988 (9) followed by Reading in March 1989 (10). Whilst the Edinburgh Environmental Health Officers were able to hold their own ground for their particular circumstances, the contributed papers and the talk over lunch conveyed much concern.

Fig. #6 illustrates the problem the inaudibility criterion seeks to address, where the lower curve shows a 1/3rd octave analysis of the background noise and the upper the superimposed bass beat from music. The broadband SPL was 42dB(A) with and without the music present and therefore the disturbing noise could be said to be incapable of measurement using a conventional A-weighted SPLM. The bass beat shown in the upper plot was however audible by listening and therefore would contravene an inaudibility order - but it would be surprising if any reasonable person would consider it as nuisance at any time of day.

However, as is stated by Somerville (7) in his paper to the Reading meeting, inaudibility is not intended, and in Edinburgh is not applied, to Occasional Licenses for "one-off" or irregular events and states:-

"...inaudibility as a criterion is therefore only used in certain specific circumstances the context of which has been shown to be valid."

If it were applied to occasional events, the internationally renowned Edinburgh Royal Tattoo and the Edinburgh Festival - both of which go on into the early hours of the morning - would not take place, this position being highlighted by the decision of Lord Scott in the case of Webster vs The Lord Advocate, in the Scottish Court of Session, 1983, in which the complainant had applied to have the Tattoo moved to another part of the City on nuisance grounds:-

"...I have been unable to conclude that the disturbance of the pursuer's home life and interference with her comfort arising from that source are of such a degree as to be characterised as nuisance..."

5. THE CASE FOR A NEW CRITERIA FOR OCCASIONAL ALL-NIGHT EVENTS

The established use of inaudibility in Edinburgh - albeit in an altogether different context - coupled with the untested late night proviso of the GLC CoP, has unfortunately provided an all too convenient "soft option" for a number of local authorities in dealing with the noise issues arising from these newly emerging all-night Pay Party events and a number of Section 80 Abatement Notices have already been issued in which inaudibility is stated as the compliance requirement. Had the GLC adopted that attitude in the 1970s when large scale open air pop concerts were as revolutionary as an all-night Acid House Rave is in the 1990s, there would be no open air concerts and the world would be a poorer place as a result. As is stated in paragraphs 457 thru 459 of the Wilson Report to Parliament (11):-

"Noise which is Occasional but Predictable

457: This group...covers noise produced by events which occur infrequently, but predictably, at particular places....Their common features are that their noise is part of, or an inevitable accompaniment to, the amusement and pleasure they provide to the people who attend them, or participate in them. They are relatively infrequent and last for a limited time....Many, perhaps most of them, take place out of doors.

458: ...These activities are not subject to controls under the...planning legislation as they involve only the temporary use of land and little or no works. We do not think that further control should be sought in this direction.

459: We do not think that the nuisance provisions of common law...are likely to be effective....Neither, in our view, is total prohibition the right answer as this would not hold a reasonable balance between the liberty of those people who enjoy the noisy activity and those who are disturbed by the noise."

Neither, it is suggested, does the application of inaudibility, out of context of its original intentions, hold a reasonable balance. This would, in effect, amount to the total prohibition which Lord Wilson found unacceptable. Nowhere in English law is the statutory right to immunity from noise conveyed and in no Standards is this condition recognised as desirable, let alone enforceable. Both Wilson (11) and the DoE Circular 10/73 (12) recognise that a similar order of noise intrusion will exist outside and inside a dwelling, the latter stating that the standard applies with windows shut. BS4142 does not, and never has, recognised inaudibility, and it is to be hoped it never will.

Clearly, a new criterion which reflects the spirit of Wilson, which is fair and reasonable to both interests and which takes proper account of the time of day, is needed.

6. A PROPOSAL

Just as BS4142 probably provided the basis for the first attempts in the evolution of the GLC CoP (1) so it has again. BS4142:1990 has kept pace with current thinking in that background noise is now measured in terms of LA90 instead of the earlier LAeq. I have no argument with that.

BS4142:1990 retains the 10dB exceedance criteria of its predecessors and the concept that when the intruding noise is tonal or is sufficiently irregular to attract attention, it should be unfavourably weighted by 5dB. By application to music it is my view that at 5dB LAeq above the LA90 background, in the early hours of the morning, a significant number of people would be disturbed. But what if we were to substitute LA10 for LAeq in determining the Rating Level? LA10 is highly effective in the measurement of what is probably the most common intrusion - road traffic noise - and a growing number of those involved in noise assessment work are of the view that LA10 agrees well with the subjective impression of noise intrusion in situations where the noise is not continuous in character - especially when applied to music.

Effectively therefore, the proposed criterion is that complaints are to be expected when the event LA10 exceeds the background LA90 by more than 5dB and the following trial applications show the results of the initial attempts to validate the proposal.

7. TEST SITE #1 - MELTON AIRFIELD

The first test case was the event previously referred to in rural Leicestershire. The site was a disused wartime airfield some two miles due south of Melton Mowbray, 1½ miles from the nearest occupied residential premises, which, because it lies in a hollow, is largely screened from the nearest villages and from Melton Mowbray itself. Fig. #7 shows a location map with the primary monitoring points marked.

The local authority had cited 35dB(A) external to any residential dwelling as the criterion, believing that to be the likely background noise level over the belt of countryside likely to be affected. In other words, they intended that event noise should not exceed the background level, which would would therefore rise by 3dB. This does not therefore amount to inaudibility.

At 0030hrs the Melton EHO team made a tour of the neighbouring villages and reported back that all was well. At 0130hrs our own surveillance team discovered a problem on the outskirts of Melton Mowbray itself and recorded music levels of 48dB LA10 as against an LA90 background of 42dB - ie 1dB above our trial criteria. Bass beat and MC voiceovers were audible, coming in waves on the wind. Fig. #8 shows the 1/3rd octave RTA which clearly shows the nature of the exceedance. Although no complaint had been received we returned to the event site to discover that the volume levels inside the marquee had crept up to 100dB LA10, that the wind was rising and changing in direction. Meanwhile complaints had started to come in, one from a village some 8 miles to the south east - which would be well down wind had the prevailing wind not veered around during the night. The volume level was reduced to 95dB LA10 using dynamics compression rather than the volume control and the level re-checked at the problem location. The LA90 had remained at 42dB but the LA10 had reduced to 45dB, at which level it was considered unlikely to provoke complaint, and indeed it did not. Fig. #9 shows the new relationship in terms of the 1/3rd octave RTA.

Throughout the night the entire 8 mile radius was patrolled. Downwind of the site there was absolutely nothing audible, whilst for eight miles east and south the bass beat and MC voiceovers could be heard on the wind, but was controlled to stay within the proposed 5dB LA10/LA90 exceedance criteria. On one tour of duty, creeping around the back of a tiny village in the dead of night, a resident came to his door in his nightshirt to ask what was my

business skulking around at 3 o'clock in the morning. Upon explaining my errand, it turned out it was he who had complained earlier. He seemed pleased that we had the event under control and stated that whilst he was very much disturbed earlier, "it must have been turned down at about half past one - now it is fine, no problem at all." The measurement was 43dB LA10 and the background 40dB LA90. This was certainly not "inaudible" but clearly was not considered nuisance by the resident, even at 3.00AM and in the wake of having already complained.

Thus it was concluded that although the local authority condition of licence had been breached for virtually the entire duration of the event, application of the new criterion had provided a realistic balance between the numbers of complaints received and the maintenance of the necessary volume levels inside the marquee, despite an unexpected and unfavourable change in wind conditions. The following table records the principal results of the monitoring exercise:-

Time	Location	Ref	LA10	LA90	Comment
0130hrs	Kirby Lane	1	48dB	42dB	Definite nuisance
0210hrs	Kirby Lane	1	45dB	42dB	Audible but OK
0220hrs	Kirby Lane	2	43dB	40dB	Audible but OK
0230hrs	Burton Lazzars	3	43dB	40dB	Audible but OK
0245hrs	Little Dalby	4	44dB	40dB	Audible but OK
0255hrs	Little Dalby	5	43dB	40dB	Audible but OK
0305hrs	Pickwell	6	43dB	40dB	Audible but OK
0315hrs	Somerby	7	-	40dB	Virt. inaudible
0320hrs	Borough	8	42dB	40dB	LF only, OK
0322hrs	Melton Lane	9	45dB	40dB	Borderline
0325hrs	Moscow Lodge	10	-	40dB	Inaudible
0335hrs	Great Dalby	11	-	40dB	Inaudible
0340hrs	Red Lodge	12	-	40dB	Inaudible
0355hrs	Kirby Lane	13	46dB	40dB	Borderline
0400hrs	Edendale Rd	14	44dB	40dB	Audible but OK
0405hrs	Kirby Lane	1	44dB	42dB	Audible but OK

Event Levels: LAmax: 119dB(A); LA10: 102.0dB; LAeq: 101.3dB.
Complaints: 7 in total. 3 Melton Mowbray outskirts; 1 Burton Lazzars, 1 Somerby, 2 Pickwell.
Note: The virtually constant background levels are due to constant wind noise from trees and hedgerows.

8. TEST SITE #2 - JENKINS LANE E6

A highly successful series of all-night parties have been staged in the London Borough of Newham, set amidst derelict industrial wasteland close to the Docklands and the City Airport. Because the earlier events are reported to have given rise to noise nuisance complaints the London Boroughs of Barking & Dagenham and

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

Greenwich have both seen fit to issue Section 80 Abatement Notices citing inaudibility as the criterion. Two events on this site have been used to test the proposed new criterion and a third is used as a point of reference.

A plan of the area is shown in Fig. 10. To the north the site is screened by the elevated section of the main A13 Tilbury arterial road and to the west by a large waste transfer/incinerator facility. To the east there is a small industrial estate with a sewage treatment works and Barking Creek beyond, whilst to the south lies waste land, a gas works, and parts of the old London Docklands with the River Thames beyond. The nearest residential accommodation is the Gascoigne Estate. This high-rise development lies within the London Borough of Barking and Dagenham and is some 800m due north-east of the site. Because of the elevated location, the upper floors are the only dwellings to have line-of-sight into the site. The prevailing wind is from the south-west, thus carrying any noise up onto Gascoigne where the problem would be compounded by facade reflections off the expansive frontages to the tower blocks themselves, thus forming something of a noise corridor effect.

An event was staged on August 03/04. Although control measures were in place these were operated in response to complaints received at the site, the proposed criterion was not tested and no monitoring was carried out by our own team until 0500hrs. Typical event levels were 98dB LA10 towards the stage falling to 91/2dB LA10 towards the rear of the big top. A total of 4 complaints were received at the site office, three from the Gascoigne Estate (Barking & Dagenham) and one from Thamesmead (Greenwich) some 4 miles distant. No complaints were received from Newham itself. Only two complaints, both from the Gascoigne Estate were subsequently officially notified by the the local authority and on both occasions the visiting EHOs were unable to verify nuisance. These were amongst the four complaints received at the site. Each time a complaint was received the big top volume level was checked and volume adjusted if considered necessary.

A tour of the Gascoigne Estate was made at between 0500hrs and 0530hrs. Background levels were typically 42dB LA90 and event noise just audible, mainly LF and the occasional MC voiceover carried on the wind. Typical LA10 values were 44dB/46dB and would certainly not be considered nuisance. Clearly therefore, music must have been audible during the event but it seems unlikely that the propsed criterion would have been exceeded.

In confirmation of the two complaints formally investigated Barking & Dagenham stated that no further noise from the site was recorded after 0300hrs and noted their officer's satisfaction with the level of co-operation received during the night.

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

The next event at this site took place on September 14/15 but due to some last minute technical difficulties the noise control arrangements were not in place. Also, monitoring was only carried out up to 0230hrs with the following results:-

Time	Location	Ref	LA10	LA90	Comment
0125hrs	Dovehouse Mead	1	62dB	51dB	Nuisance
0126hrs	Dovehouse Mead	1	58dB	54dB	Audible but OK
0127hrs	Dovehouse Mead	1	58dB	52dB	Borderline
0128hrs	Dovehouse Mead	1	61dB	57dB	Audible but OK
0134hrs	Dovehouse Mead	1	62dB	55dB	Nuisance
0135hrs	Dovehouse Mead	1	64dB	55dB	Nuisance
0138hrs	The Coverdales	2	66dB	53dB	Nuisance
0139hrs	The Coverdales	2	57dB	53dB	MC audible, OK
0140hrs	The Coverdales	2	69dB	56dB	Nuisance
0150hrs	St Annes Road	3	63dB	50dB	Nuisance
0151hrs	St Annes Road	3	66dB	57dB	Nuisance
0152hrs	St Annes Road	3	67dB	52dB	Nuisance
0154hrs	St Annes Road	3	64dB	52dB	Traffic Noise
0155hrs	St Annes Road	3	63dB	53dB	Traffic noise
0156hrs	St Annes Road	3	67dB	50dB	Traffic noise
0200hrs	St Annes Road	3	56dB	50dB	Lull, LF & MC audible but OK

Event Levels: LAmax: 115dB(A); LA10: 103.0dB; LAeq: 100.5dB.
Complaints: 9 in total advised. No details provided.
Note: Nuisance assessment = LF and MC voiceovers clearly audible and carried on the wind. Volume level reduced immediately upon return to site at 0220hrs

During this event the new criterion was tested for the first time by a third party - consultants engaged by the London Borough of Barking & Dagenham to assist in monitoring the event. Although the results have not been released the consultants have expressed the view that they are satisfied that the criterion is suitable as the basis for determination of nuisance.

The third event at this site took place on November 02/03 and was monitored entirely by a third party, being an experienced noise control officer from another authority having considerable experience in entertainment noise control. There was however a new development here in that two smaller marquees had been erected, each with their own music amplification system and at one point the three sources merged into a single cacophonic noise, cancelling out the distinguishable LF beat from the main system. Under these conditions the normal characteristics of this type of music change such that the LAeq and LA10 values move closer together and the noise approaches a continuous charaterer where LAeq would not be out of place as the unit of measurement.

Also at this time, windspeed had increased to an estimated 15m/sec. thus making meaningful measurement a difficult matter. All the results obtained after 2400 hours are affected by these two considerations, but notwithstanding these problems, the observer was of the opinion that the criterion does provide a means of determining nuisance which is applicable to an all-night event. Unfortunately however the event was closed down at 0230hrs due to risk of the big top collapsing in the high winds, thus precluding a through the night study.

Time	Location	Ref	LA10	LA90	Comment
2210hrs	Dovehouse Mead	1	64dB	58dB	Audible but OK
2225hrs	Boundary Road	4	65dB	60dB	Audible but OK
2400hrs	Dovehouse Mead	1	61dB	57dB	Borderline *
0005hrs	Dovehouse Mead	1	62dB	56dB	Nuisance *
0030hrs	Dovehouse Mead	1	60dB	57dB	Borderline *
0035hrs	Dovehouse Mead	1	62dB	58dB	Nuisance *
0040hrs	The Shaftburys	5	64dB	57dB	Nuisance *

Event Levels: 93dB LAeq (2150hrs) rising to 99dB LAeq (2250hrs), reduced to 92dB LAeq at 2255hrs. However 102dB LAeq measured in secondary marquee at 2315hrs and 98dB LAeq in the third marquee at 2325hrs.

Complaints: None to site, 4 subsequently advised, no details.

Note: Asterisked assessments relate to combined noise level from all three marquees and high windspeed.

9. SUMMARY AND CONCLUSIONS

The problem associated with the control of entertainment noise at all-night events has been discussed and some typical event data provided. The use of the GLC Pop Concert CoP and the application of the Scottish Inaudibility criterion in this situation has been considered and the view taken that inaudibility fails to reflect the degree of reasonableness which is an essential component at English law, when applied to an occasional event.

In an attempt to find a solution an alternative criterion has been developed and tested and in the context of the tests carried out, has been found to provide encouraging co-relation to subjective assessment of nuisance and actual complaints received. Further and more widespread evaluation is however necessary before any formulative conclusions can be reached.

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

References:-

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(5) "Code of Practice for Environmental Noise Control at Open Air Pop Concerts", The Noise Council, London, 1991 - draft document for comment.

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NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

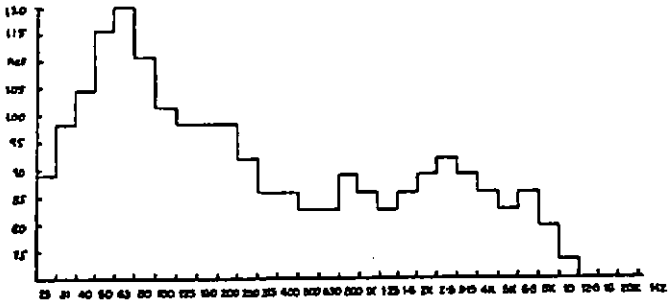

Fig 1

Fig 2

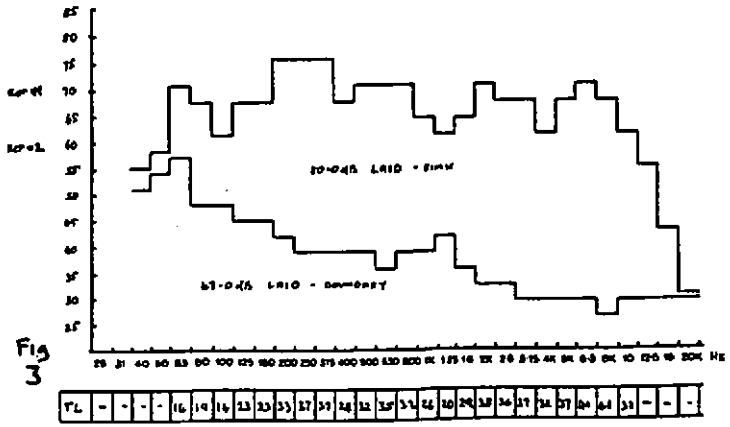

Fig 3

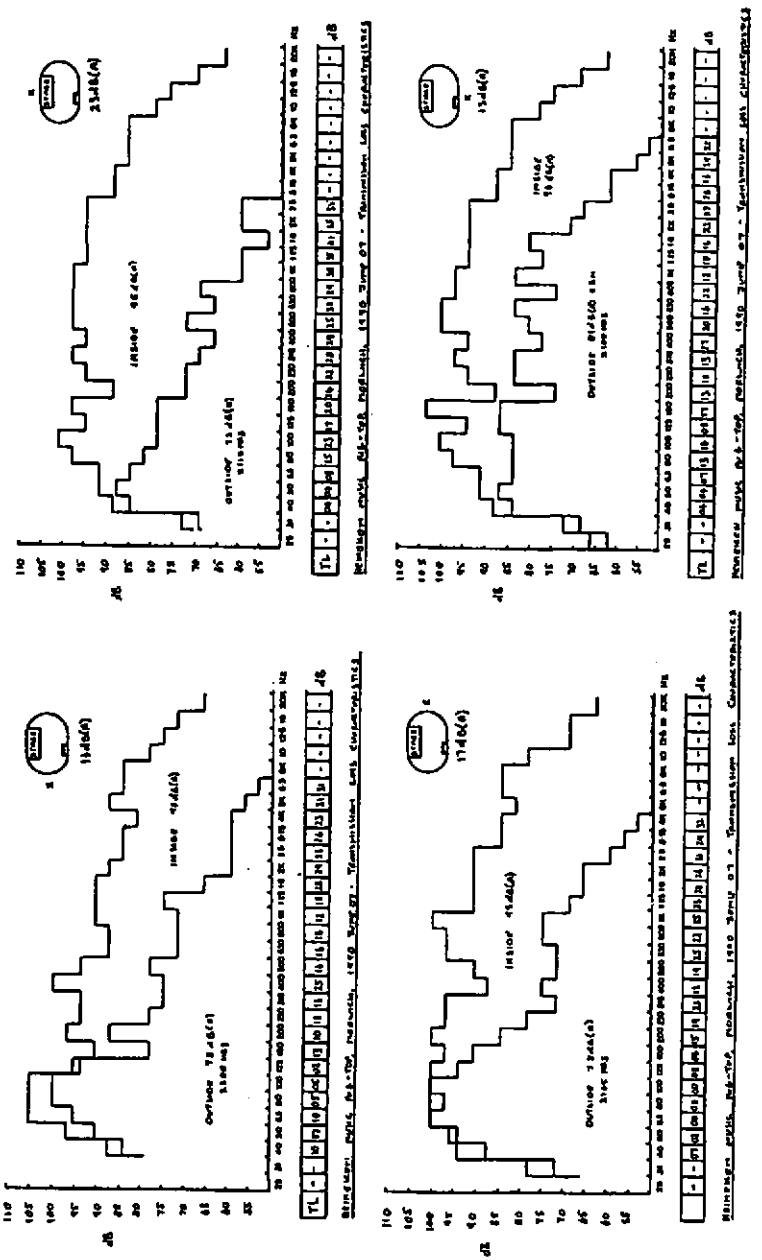

Fig 4

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

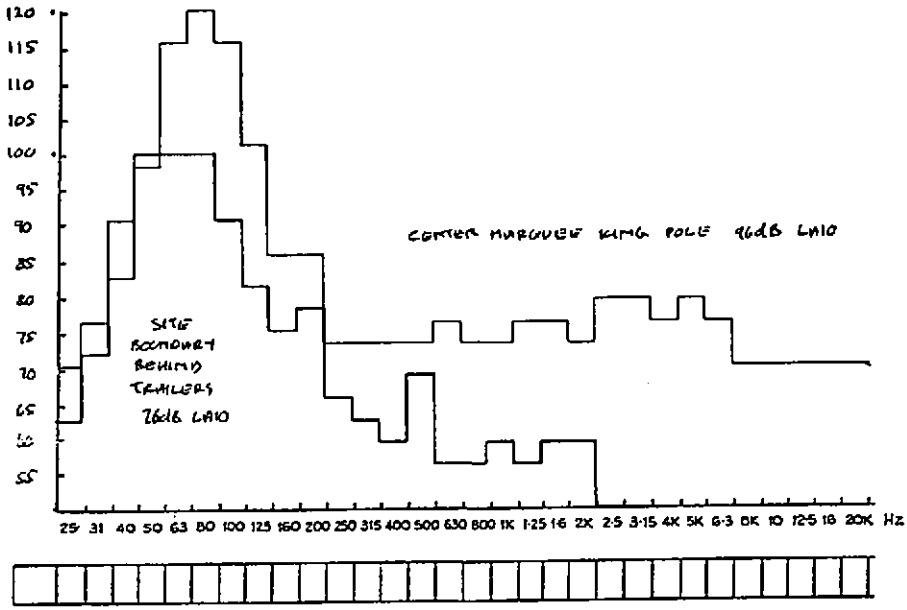

Fig 5

Data: MARQUEE SPECTRA VS TRAILER/TENT SCREENING Date: 21/08/89 Ref: CP6502
Client: RAMONICA PROMOTIONS Location: NORTON AIRFIELD
Ref Lvl: 110/90 dB Sens: 3 dB SPL: 96/76 dB Wtg: A Resp: SLW Sig: TD

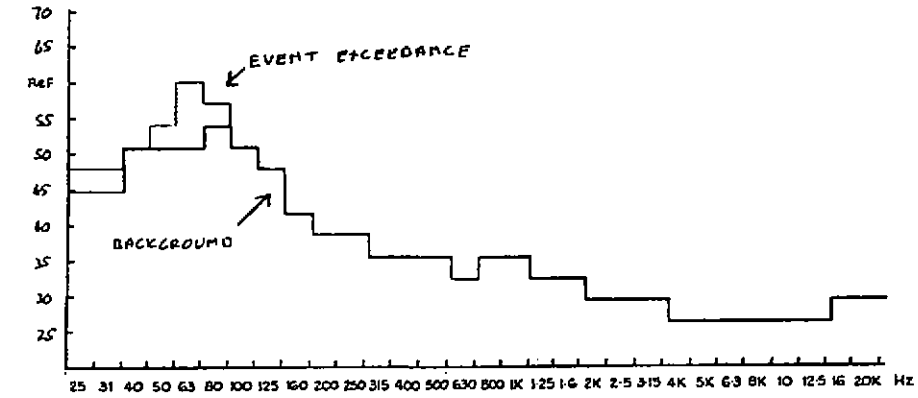

Fig 6

Data: REMOVAL MUSIC VS BACKGROUND - OSBORNES Date: 21/08/89 Ref: CP63
Client: RAMONICA PROMOTIONS Location: DOVEHOUSE MEAD, GASCOIGNE ESTATE
Ref Lvl: 60 dB Sens: 3 dB SPL: 42 dB Wtg: A Resp: SLW Sig: TD

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

Fig 7

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

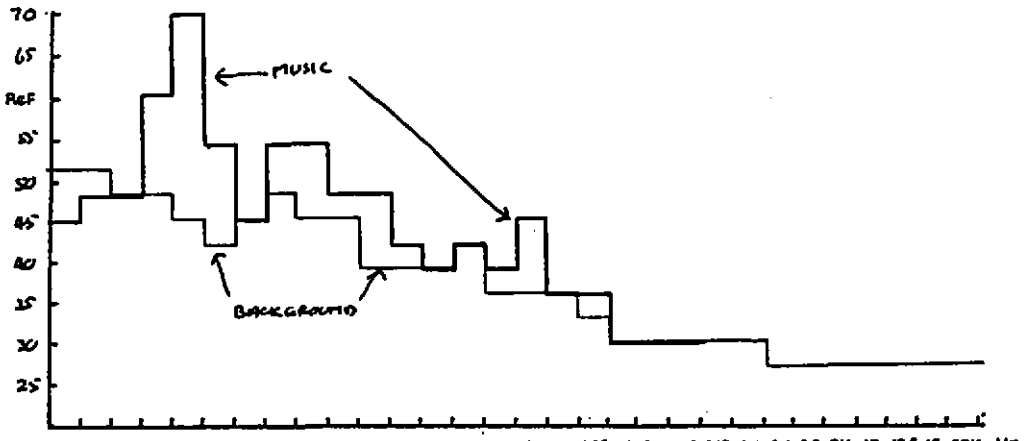

Fig 8 Data: MUSIC EXCEEDANCE OF BACKGROUND, 0130HRS Date: 21/02/09 Ref: CF6302
Client: PANDANCE PROMOTIONS Location: HEAVY LIMIT TERRACED ROW
Ref Lvl: 60 dB Sens: 3 dB SPL: 63/63 dB Wtg: A Resp: SCW Sig: ☑

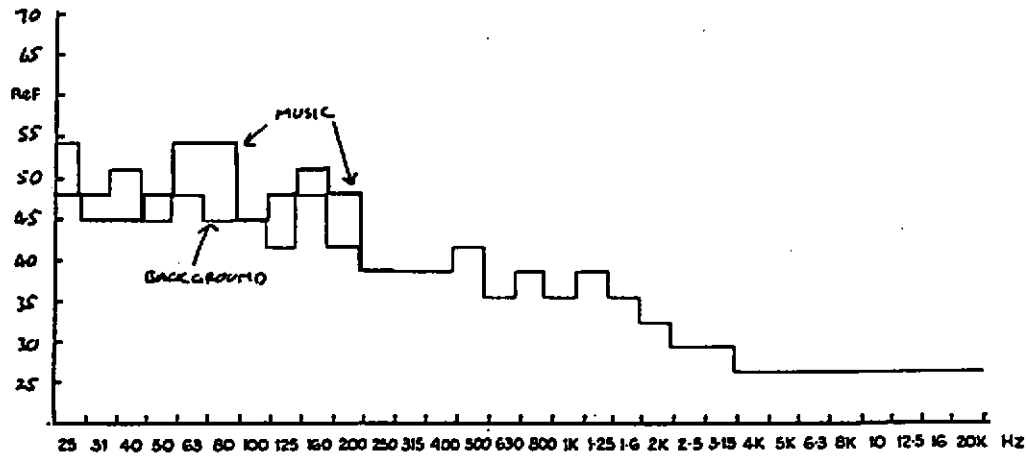

Fig 9 Data: MUSIC EXCEEDANCE OF BACKGROUND, 0210HRS Date: 21/02/09 Ref: CF6302
Client: PANDANCE PROMOTIONS Location: HEAVY LIMIT TERRACED ROW
Ref Lvl: 60 dB Sens: 3 dB SPL: 45 dB Wtg: A Resp: SCW Sig: ☑

NOISE CONTROL AT ALL-NIGHT ACID HOUSE RAVES

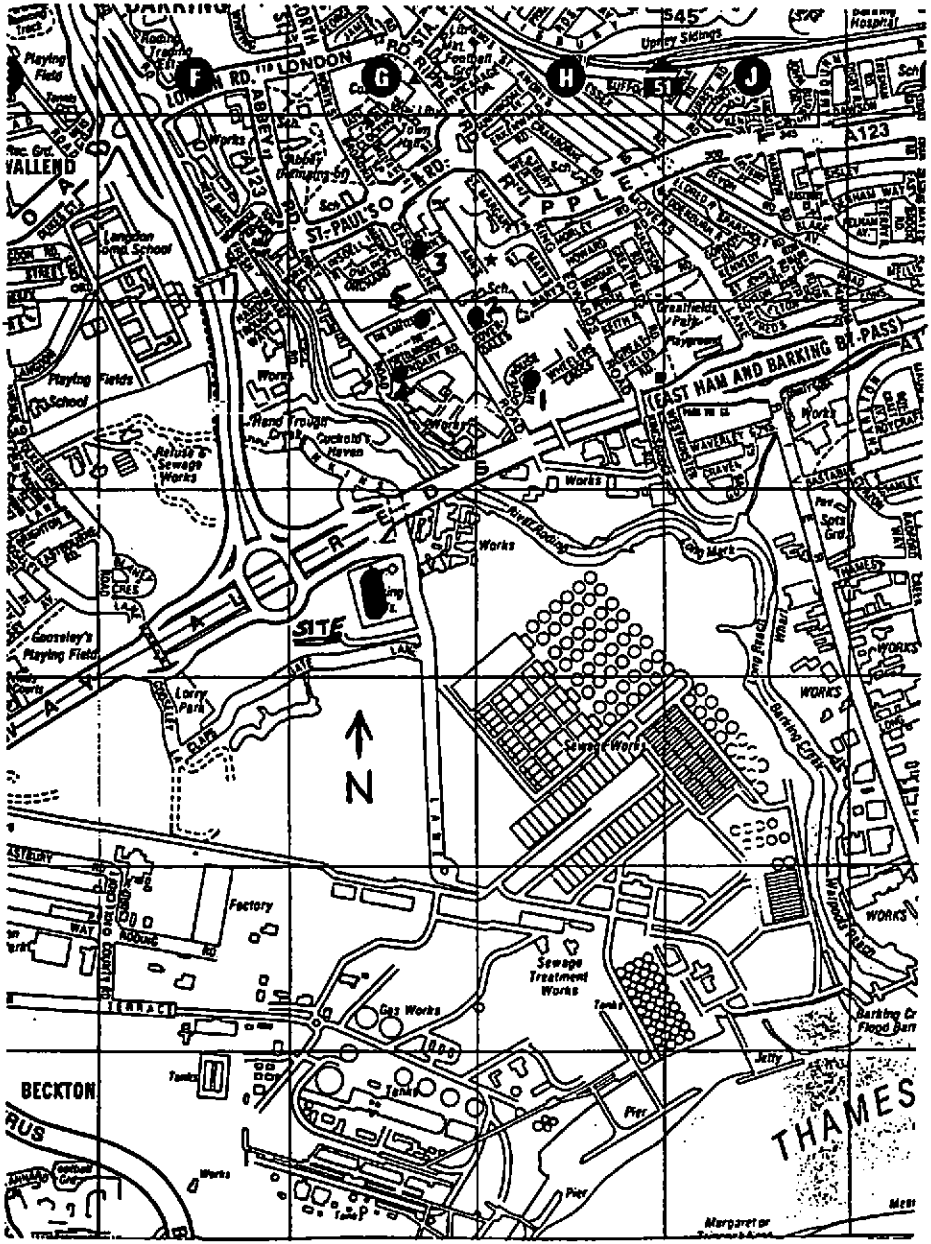

Fig 10