Proceedings of the Institute of Acoustics

UNATTENDED TAPE RECORDINGS FOR ASSESSING NOISE NUISANCE

J F Hinton

Environmental Protection Unit, Birmingham Environmental Services Department

1. INTRODUCTION

Those who deal with the investigation of alleged noise nuisance know only too well that the majority of complaints made by members of the public about noise, concern alleged disturbance which occurs during so-called unsocial hours, and are intermittent and unpredictable in nature. If an 'out of hours' site visit is arranged to assess the problem, the investigating officer often finds that the noise in question is not present or is informed by the complainant that normally the noise levels are considerably higher. In the case of intermittent disturbances the officer may be expected to wait on site for a long period for the disturbance to start, or will be expected to pay several repeat visits in an attempt to witness the alleged nuisance.

Bearing these commonly experienced problems in mind, there is clearly a case for using unattended noise monitoring techniques to permit a comprehensive and cost effective evaluation of many noise complaints. Birmingham Environmental Services Department (B.E.S.D.) have made extensive use of such techniques for more than 20 years.

The purpose of this paper is to review these techniques with particular emphasis on the current use of both analogue and digital tape recorders to investigate alleged domestic noise nuisance.

2. HISTORY OF NOISE MONITORING IN BIRMINGHAM

Purpose built noise monitoring units became available in this country in the early 1970's. The catalyst for this event appears to have been the publication of the Noise Insulation Regulations 1973 which prompted many local authorities to embark on extensive programmes of road traffic noise monitoring. The purpose of these measurements was to identify residential properties which qualified for sound insulation grants. At the time B.E.S.D. purchased five monitoring units which were also used for measuring noise levels over extended periods in connection with planning matters.

It soon became clear that these instruments could be adapted to investigate noise nuisance complainants (Reference 1). The results of a typical investigation are shown in Figure 1. However there were limitations. The chief of these being that the noise was not recorded in an audio format. Therefore subsequent to a monitoring exercise it was impossible to listen to the noise, and with a reasonable degree of certainty, confirm the source of the problem noise. Furthermore it was impossible to carry out frequency analysis which could have been of considerable assistance in subjectively judging the character of the noise for rating purposes and would also have permitted precise source identification.

The aforementioned problems were overcome by adapting tape recorders, mainly Nagra IV SJ's, for automatic unattended monitoring. The limitation on the available recording time on a single reel to reel tape was overcome by employing timers and purpose built sampling units which were developed in-house and have been fully described elsewhere (Reference 2). These samplers and timers are still in use and are particularly helpful in the investigation of industrial, commercial and construction noise problems. An example of the results obtained from a typical monitoring exercise is shown in Figure 2. Evidence of this type has often been used to serve notices and assist in prosecutions.

Since 1987 tape recording techniques have also been used extensively in Birmingham for the investigation of domestic noise complaints. At this juncture it became clear that most local authorities were receiving an ever escalating number of complaints about noise of this nature (Reference 3). Furthermore contemporary research had indicated that more people were bothered by noise from their neighbours than by noise from any other source (Reference 4). Therefore a policy decision was made to target domestic noise complaints in Birmingham.

However, the use of samplers and timers was not considered appropriate for domestic noise monitoring investigations. Firstly the sampling technique could miss important events and secondly in most cases all of the tape, containing a lot of irrelevant information, would require time consuming laboratory analysis. Therefore, it was decided to allow complainants to initiate tape recordings themselves when they were disturbed by their neighbours noise by means of a remote switch. This resulted in the further complication that unscrupulous complainants could make a recording during the normal day and claim it was made at night. The dilemma was overcome by in-house development of time code systems via which date and time information was also recorded whenever a noise recording was initiated. Details of these coders are documented elsewhere (Reference 5). An example of the type of information which can be obtained using these techniques is given in Figure 3.

3. CURRENT PRACTICE IN BIRMINGHAM

Unattended noise monitoring using both environmental noise analysers and tape recorders is still used extensively to investigate and resolve non-domestic noise complaints and to take measurements in connection with planning applications and public entertainment licence matters. However, the vast majority of investigations carried out using tape recorders now concern domestic noise as indicated in Table 1.

TABLE 1

Noise Monitoring Investigations In Response to Complaints 1992

Noise Category	No. of Investigations
Industrial/Commercial	98
Construction/Demolition	3
Entertainment	19
Domestic	338 *
Others	16
	474

* Total number of domestic noise complaints received in 1992 2497

It must be pointed out, that not all domestic noise complaints are referred for noise monitoring. The following procedure is normally followed. Where a noise complaint is made by one household against another, the alleged disturbances are intermittent in nature and if there is no independent evidence to support the complaint then the complainant is asked to keep a log of the disturbances. In addition, a 'friendly' warning letter may be sent to the alleged perpetrator of the nuisance. If the completed log indicates a nuisance may be occurring, attempts are made to obtain the evidence required for formal action using a tape recorder which is installed at the complainants house by a technical officer for a period of 2 to 3 days. Any recordings are subsequently analysed in a laboratory by the Environmental Health Officer who originally requested the investigation and not by the technician who installed and removed the equipment from the complainants dwelling. This procedure has two distinct advantages. Firstly, no internal reports need to be generated. Secondly, the EHO can decide that a nuisance is occurring or a notice has been contravened without necessarily listening to all of the recordings.

Statistics on the outcome of monitoring investigations carried out in 1992 are given in Table 2 and the results of prosecutions are summarised in Table 3.

TABLE 2

Outcome of domestic noise monitoring exercises carried out in 1992

Action Taken	No. of Complaints
Notice served and prosecutions taken	8
Notice served but no prosecution taken	53
Nuisance not substantiated by monitoring evidence. No notice served.	99
No recordings made by the complainant.	58
Offer to monitor declined.	120
	338

TABLE 3

Results of prosecutions initiated in 1992

CASE A	Music Noise - Defendant guilty Fine £250 plus £100 costs
CASE B	Music Noise - Defendant guilty Fine £250 plus £243.75 costs
CASE C	Noise from a dog - Defendant guilty Fine £25 plus £141 costs
CASE D	Music Noise - Defendant guilty Fine £750 (3 offences) plus £465 costs Appeal lodged - commuted to £1000 bind over for 12 months
CASE E	Music Noise - Defendant guilty 12 months conditional discharge plus £116 costs for both defendants
CASE F	Noise from dog - Defendant guilty Fine £1500 (3 offences) plus £299 costs

CASE G	Music Noise - Defendant guilty 12 months conditional discharge plus £252.50 costs
CASE H	Withdrawn after several adjournments. Complainant refused to give evidence.

4. CRITICISM OF THE TAPE RECORDING TECHNIQUES

A number of criticisms have been made concerning the use of tape recorders for investigating noise nuisance.

Criticism 1	The cost of the hardware
Criticism 2	The technical intricacies of date and time coding recordings and providing the remote on/off switch facility.
Criticism 3	A disbelief that the evidence obtained will 'stand up' to scrutiny in court.

Criticisms 1 and 2 have effectively been dealt with by the arrival in the market place of Digital Audio Tape (D.A.T.) Recorders. 'Professional' versions of these machines cost just over £2000 and automatically record time data which can be displayed on analysis. With some minor modifications these recorders can be set-up to be operated from a remote switch. Birmingham have purchased five D.A.T. recorders and eventually intend to replace all analogue tape recorders with these instruments. Furthermore, Bruel and Kjaer UK Limited now market a purpose built noise monitoring system consisting of a D.A.T. recorder which is used in combination with precision noise measurement instrumentation. The system is specifically designed to investigate intermittent noise problems. Once installed on site the instrumentation will continuously measure and store statistical noise level data for the duration of the exercise using a sound level meter incorporating a memory. Meanwhile, the complainant can decide when to start and stop the D.A.T. recorder to obtain information on the actual disturbances when they occur. The latter information can then be listened to/analysed by the investigating officer. A similar system is also being marketed by Industrial Noise and Vibration Centre.

Criticism 3 stems from an understandable worry, particularly amongst some E.H.O.'s, that evidence obtained from tape recording techniques is difficult to substantiate in court. This is not the experience in Birmingham in connection in the domestic noise complaints. Firstly, statistics show that only an extremely small proportion of complaints investigated in this matter result in court proceedings (2.4% in 1992).

Secondly, those complaints which do result in a prosecution, are inevitably the result of severe and protracted disturbances which are supported by substantial corroborative evidence. However, it has become abundantly clear over the years that we have been presenting this type of evidence to courts, that it is essential that all procedures are well documented. For example, officers often faced difficult cross examination on how the tape recorders were set up and calibrated and how the analysis was carried out. Procedure notes have been produced covering these subjects which are now referred to in officers formal statements of evidence. Simply having these documents ready to produce in court, seems to prevent any detailed cross examination on the issues.

Finally, experience has made it clear that a defendant and his legal representatives should be offered the opportunity to listen to the tape recorded evidence prior to any court proceedings. If this is not done, the defence may well request this facility during the court case which can result in an adjournment.

5. DISCUSSION

A recent national survey (Reference 6) has indicated that 22% of people in this country object in some way to noise from their neighbours. Therefore, it is essential that local authorities continue in their attempts to resolve severe problems of this nature. The experience gained in Birmingham is that when the informal techniques that local authorities normally employ at the initial stages of a complaint investigation fail to resolve a problem, then tape recording techniques are an invaluable additional tool. These techniques allow a full and thorough investigation to be carried out, where circumstances warrant it, without having to resort to repeated time consuming and resource sapping out of hours visits.

However, it is clear from Birmingham's statistics for 1992 that the vast majority of domestic noise complaints (91.3%) are resolved by informal action not requiring visits specifically to witness the disturbance, or the use of automatic monitoring.

Furthermore, in those cases where monitoring was carried out, only 28% of these investigations resulted in formal action. Are so many domestic noise complaints resolved by the informal intervention of an E.H.O., or is it that the majority of domestic noise complaints are unfounded or concern disturbance of such a temporary nature and magnitude that no formal action is warranted?

6. CONCLUSIONS

Experience in Birmingham indicates that 'difficult' domestic noise complaints can be 'resolved' by the use of tape recording techniques. Currently up to 13 investigations of this nature are undertaken each week. In the very rare cases which end up in court, evidence obtained in this manner does stand up to scrutiny, provided the calibration, set-up and analysis procedures are properly documented.

The equipment required to carry out tape recordings as described in this paper is now relatively inexpensive. Furthermore, purpose built instruments specifically designed for the investigation of intermittent and unpredictable disturbances are now commercially available.

Finally, the statistical evidence obtained in Birmingham sheds some doubt on the current perceived extent of domestic noise disturbance in the United Kingdom and certainly on the extent of 'actionable' domestic noise nuisance.

Any views or opinions expressed in this paper are those of the author and not necessarily those of Birmingham Environmental Services Department or other officers within the department.

7. REFERENCES

Reference 1 Monitoring of Pollution - Automatic Noise Monitoring and Analysis - A Better Compromise. D Christie - Public Works Congress 1976.

Reference 2 Automatic Noise Monitoring for the Evaluation of Nuisance. J.F. Hinton and A.S. Jellyman. Institute of Acoustics - Developments In Instrumentation and Computation in Acoustics. May 1987.

Reference 3 Environmental Health Officers Association. Environmental Health Report (Annual Publication).

Reference 4 Disturbance Caused By Neighbourhood Noise. W.A. Uttley. Presented At 56th Conference of The National Society For Clean Air 1989.

Reference 5 Investigation Of Domestic Noise. J Hinton. Proceeding Of The Institute of Acoustics Volume 13, Part 8 (1991)

Reference 6 National Survey Of The Effects Of Environmental Noise On People At Home. C.J. Grimwood. Proceedings Of The Institute Of Acoustics Volume 15, Part 8 (1993).

UNATTENDED TAPE RECORDING OF ASSESSING NOISE NUISANCE

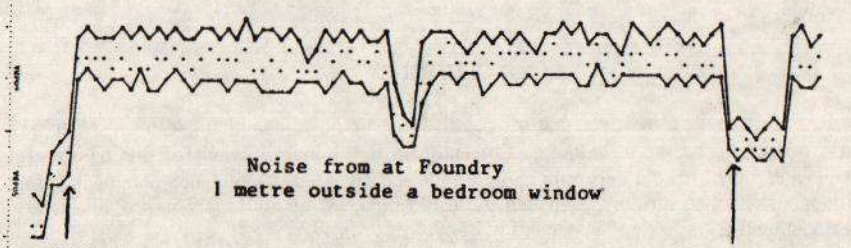

FIGURE 1

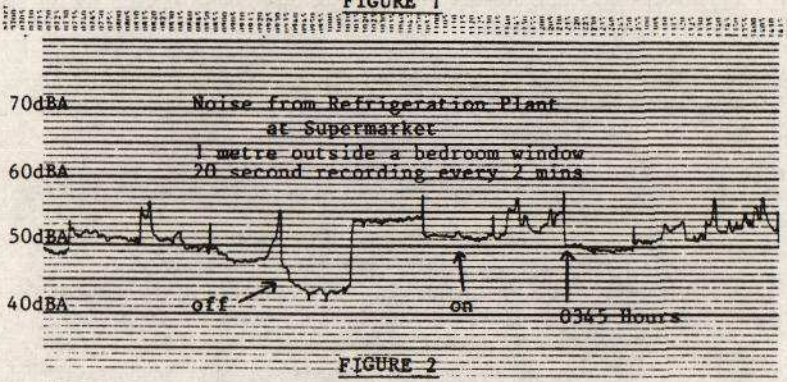

FIGURE 2

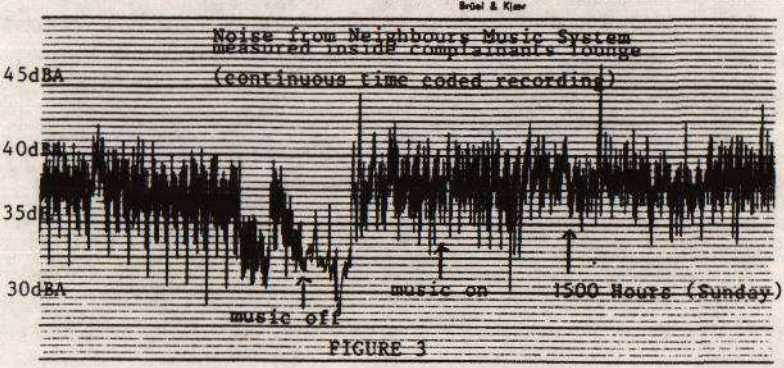

FIGURE 3