

EVIDENTIARY TAPE RECORDINGS - THEIR MANAGEMENT AND CONTROL

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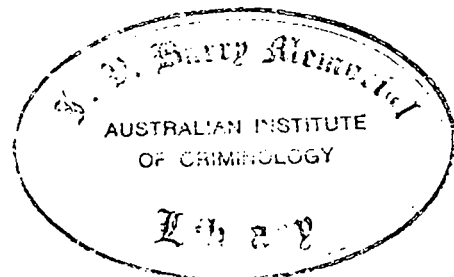
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P.A. Jones,
Sunshine,
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FOREWORD

The publication of this book provides practitioners with access to the practical experiences of Mr. Peter Jones, the former Inspector-in Charge of the Victoria Police Audio Visual Division, Melbourne. Mr. Jones is a recognized Australian authority in the management, enhancement and overall processing of evidentiary audio and video recordings.

The increasing use by Australian law enforcement agencies of audio and video tape recordings as evidence has resulted in a concomitant increase in workload for those responsible for ensuring that these recordings are managed in a manner which meets all the associated evidentiary requirements.

Mr. Jones has provided a document which will serve as an invaluable guide for those who have chosen to work in the specialist field of law enforcement audio and video recordings.

The publication of "Evidentiary Tape Recordings - Their Management and Control" has been made possible through a grant from the Criminology Research Council. This grant was provided to Forensic Science Technology International Pty. Ltd. who engaged Mr. Jones as a consultant. The book's publication therefore arises from a unique combination of a specialist private-sector company, devoted to law enforcement-related technology and a retired police specialist with considerable experience in evidentiary tapes.

The reader will come to recognize that this book presents the direct views of a highly-skilled practitioner in his field; it is not a theoretical treatise, but rather is intended to clearly impart practical advice based on 30 years of experience as a police officer with 15 of these being "hands on" experience in the field of evidentiary tapes.

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PREFACE

Much has been written on the wisdom of allowing police to continue the practice of interviewing suspects without the benefit of electronic recording. In some Australian States, police forces have initiated their own systems of magnetic recording while others continue to debate the issue.

The ideas which follow, reflect the experiences of the former Officer in Charge of the Audio Section of the Victoria Police, covering a period of fifteen years. During that period, the Audio Section of the Victoria Police has been recognized as leading other Australian Police Forces in Audio Tape Recording, Magnetic Tape Audio Intelligibility Enhancement and the Validation of Magnetically-Recorded material. Within this time scale there developed, within the Section, a video operations group using Broadcast Standard television equipment. The amalgamated audio and video operational areas became the Audio Visual Division. The experiences of this group are also relied upon in the discussion on video evidence.

The findings of extensive trials conducted with both the English and Scottish police forces have brought forth some remarkable results, many quite unexpected by the police themselves. The promised time savings in the courts are not quite so well documented.

In the United States of America, extensive use is made of both audio and video technology in evidentiary recording. Regrettably, due to the numerous small police forces, meaningful comparisons with Great Britain are not easily derived.

Magnetic evidentiary recordings are by no means new in Australia. Examples of the continuous application of audio recordings of the read-back of suspects' records of interview are available in Victoria, dating from the nineteen-sixties. State-of-the-art technology is now in operation in many States, some State police now also using video in evidentiary recording and other forensic areas.

A detailed examination of the application of magnetic recording technology will be undertaken for all Australian States and Territories. This examination will include departmental procedural guide-lines and relevant legislation. Examples of evidentiary recording origins, apart from police, will be presented and two case histories involving externally-contrived evidence will be discussed.

Before being incorporated into police procedures, evidentiary recording must be legally, technically and economically acceptable to the courts, the police and the government of the day. The introduction of the new internal interview procedures should be preceded by appropriate architectural design modifications resulting in improvements to existing building acoustics. Desirable, yet practical, features for interview rooms are suggested, many of which could be obtained by the intelligent re-allocation of office space in established police buildings.

Equipment requirements, including the systems introduced in Britain, parts of the United States of America and Australia for the tape recording of suspect interviews are discussed. The need for 'protected' systems compared with conventional recording systems are covered, along with a discussion on the need for evidentiary continuity.

A revision of general police training procedures for all police force personnel, commencing at the recruit training stage, should accompany the introduction of the extended use of magnetic recording for suspect interviews. In view of the on-going technological changes in both audio and video equipment, additional reviews are recommended during sub-officer, detective and officer training

Despite the most careful planning, technical problems may be anticipated from time to time. The provision of qualified personnel in the areas of audio intelligibility enhancement, video processing and magnetic media analysis as professional technical support to all operational areas is necessary for the effective use of the proposed magnetic recording technology.

The statement is made that 'any magnetic recording can be tampered with. The trick is not getting caught'! The introduction onto the world market of Tamper-Protected Recording Systems will not automatically eliminate allegations of evidentiary tampering. The provision of laboratories staffed with qualified personnel will give confidence to the courts, in the acceptance of magnetic evidentiary recordings.

The professional presentation of tape-recorded evidence combined with accurate transcriptions will assist the prosecution and defence in the presentation of their arguments. Equally, expert evidence relating to the analysis of suspected magnetic recordings should be not be couched in such language, nor presented in such a fashion, as to introduce confusion. Technical evidence, which is unclear to any member of the jury is as well not given at all.

Through preparing this publication I hope that the benefits of magnetic recording will be highlighted while, at the same time, its limitations and the needs for training and strong technical support will be recognized.

When responsible Government implements properly-enforced procedural guide-lines, and budgets for educational programs and ensures adequate technical support within the individual police forces, cogent criticism of police practices will diminish.

I would like to place on record my appreciation for the assistance provided in the preparation of this book. Dr. Malcolm Hall and Mr. Tony Collins from Forensic Science Technology International provided the initial inspiration for its publication. They were also of great assistance in editing the manuscript.

I would also like to thank Mrs. Fabienne Leicester for her patience in accurately retyping the many versions of the manuscript; hers was a demanding task.

P.A. Jones.

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PART I

EVIDENTIARY MAGNETIC RECORDING PRACTICES OVERSEAS

At a time when the Sony Corporation of Japan, and other similar companies, are launching fully digital, high fidelity audio recording technology on the world's domestic market, argument still rages over the police use of the most basic tape recorders for evidentiary magnetic recording.

In Great Britain and Australia, Criminal Law Reform Committees have made various recommendations regarding the introduction of audio/video tape-recorded evidence. In Great Britain, field trials have been conducted with great success to determine procedural and technical requirements and the results of these field trials are well documented.¹

In both Australia² and the United States of America³ practical examples of the successful application of evidentiary tape-recording by police, which commenced in the early sixties in Australia and earlier still in the United States, continue successfully today.

Argument continues, in some parts of Australia at least, as to the sufficiency or extent of the use of taped evidence.⁴ Some arguments and recommendations would seem to go beyond the bounds of that which might be considered practical.⁵

AULD. writes: "... as long ago as 1942 the following comment appeared with Rule 505 in the Model Code of Evidence drawn up by the American Law Institute:

'In some instances confessions taken by the police have been recorded by a sound film. To impose a requirement on the police that they should take no confession unless recorded is believed to be practical, effective and desirable. Certainly, wherever it is practical to supply and use the necessary equipment in a reasonably efficient manner it should be done and the courts should encourage such procedure in any legitimate manner' "⁶

One might think that by now the use of electronic evidentiary recording would be widespread across the United States of America but such is not the case.

What is happening with audio-visual evidentiary recording and are there any advantages?

AULD. states further: "In criminal trials, tape or wire recordings have been particularly useful in three respects; firstly, with regards to confessions, secondly, where the recorded words are themselves a constituent of the offence, and thirdly, where it is important to catch the tone of the words, what prompted them and what effect they had on the hearer".⁷

In November 1985 a confessional video tape was replayed in the writer's presence by the Assistant District Attorney for the Borough of Manhattan, Mr Pat DUGAN. The video-tape showed a conversation taking place between a coloured youth and the Assistant District Attorney regarding a series of homicides in the City of New York. The youth had confessed to the homicides in which randomly selected victims were killed by a shot to the head. When asked if he felt any remorse for having hurt so many people the youth replied that he had never hurt anyone. Had he wanted to hurt someone he would have shot them in the kneecap! The whole confession was conducted in a calm and relaxed manner. There was no sign of remorse, anger, anxiety or fear. The youth's attitude was not one of bravado, just 'matter of fact'.

To persons far removed from a world of such violence, such a confession heard replayed on an audio tape without the benefit of visual 'body-language' might have been hard to accept. How much more difficult is it for the 'average' juror to understand and accept a hand-written statement read to them by the investigating officer in the witness box? This, however, is still the method employed in the majority of investigations, even in the United States of America.

Why then is there the general reluctance by police to use magnetic recording techniques in the documenting of evidence, (and the reluctance is not all just from the police)?

The cynics will say that the police fear that the introduction of tape recording will inhibit their investigative style, preventing deals being done or threats made. In the NORRIS Report,⁸ there is the suggestion of the fear of change. Of course, police personnel may be seen to have this in common with many others. Many people fear change from that with which they are familiar.

This fear may be unfounded however. The Victoria Police experience with the relatively sudden introduction of television cameras, and the video-taping of all homicide investigations, is a case in point. Special modifications were carried out to already 'specially constructed and acoustically treated' interview-rooms to provide for the use of television cameras. Very little time for personnel training was possible. This was due partly to the speed of introduction of the new techniques and partly to the general work-load of the C.I.B. personnel involved.

Concern was expressed by some Squad members as to their lack of experience in the conduct of interviews with this recording medium. (The Victorian Homicide Squad was one of the first groups to use audio tape recording in 1966 and were therefore, not without some considerable experience in magnetic recording). Despite this perceived concern, the new system was introduced and became 'normal procedure' almost over-night. By the middle of 1987 the first of the video-taped suspect interviews had been presented to the courts with acceptance.

In Great Britain, fears were also expressed by some investigating officers as the result of the introduction of a 'pilot scheme' to audio tape-record all interviews while other officers attempted to blame 'the system' for the status quo.

WOZNIAK reported:

"One of the things which has struck me is that, I think, in some ways police have been their own worst enemies. It is not by their own causing but the fact that the courts have demanded, over time, information presented in a certain manner and the police force in some ways have replied to that request of co-operation with a voluntary statement to look all neat and tidy and one doesn't see this sort of question and answer situation in real life. No, I think situations are contrived so that the presentation of evidence is acceptable. I wouldn't like to commit myself and say that this happens on every occasion; or even guess at what percentage, but there are obviously occasions when evidence is gained in a manner that if it was presented in the fashion it had been obtained it would never have been allowed.

"The remarks above are quoted at length because they are typical, if more explicit, of the opinions of a good many officers who were interviewed. They recognize the dilemma in which they have to operate: on the one hand in daily interaction with a 'client group' which is not constrained by concerns for legal propriety; while, on the other hand, having to preserve the prescriptions of a strict system of admissibility which does not lay down definite guidelines but rather, as was said above, leaves matter fluid. In such a paradigm, in the view of most officers, they would face a distinct handicap if they were forced to obey the letter of the law strictly. In their view much crime is solved and many accused brought to trial because of the willingness (though largely reluctant) of police officers to operate a dual standard in the questioning of suspects. To achieve results they feel they must act or adopt a particular strategy in the knowledge that when reporting matters to the (prosecutor) they must, of legal necessity, portray events in a different way"... "Interestingly, most policemen who were interviewed see their behaviour as justifiable since, if they did not adopt this position, 'society would be the losers'. By this rationale they, in fact, turn their actions, and the risks they run, into a form of altruism often expressed by them as 'public service', or duty. Against this background, where control of the course and content of events is firmly in police hands, one can recognize the threat that the proposed introduction of tape-recording posed to certain policemen".⁹

John Baldwin, Director of the Institute of Judicial Administration, University of Birmingham,¹⁰ conducted a survey in an attempt to answer the question of why the introduction of magnetic tape-recording had taken so long to introduce in Great Britain. Mr Baldwin is reported to have:

"... interviewed over a dozen people, including senior officials at the Home Office, the Home Secretary, the Rt. Hon. Mr. Leon Brittan, members of the Royal Commission on Criminal Procedure and of the Hyde Committee (including both chairmen), and members of the current steering committee which is responsible for monitoring the field trials now being carried out in six areas",¹¹

Mr Baldwin points to the suddenness of attitude change after such prolonged argument, which brought about the "...extraordinary volte-face on the part of the police service" all of which appears to have taken place in the "...last two years"¹² (This refers to the period 1984-85)

The time scale regarding debate, decision and introduction of police interview tape-recording apparently had its start with the Brodie Report (1965) which was influential in police circles. It was, however, essentially a private document, and the first important public discussion was prompted by the publication of the eleventh report of the Criminal Law Revision Committee in 1972.¹³

Considerable obstruction by the police themselves was evident for more than a decade after the report by Mr. P. E. Brodie in 1965.

"There was no thawing in the police view in the 1970's. Indeed, attitudes only hardened with the passage of time, and it became increasingly clear that a national system of tape recording could not be introduced unless the police service was in general prepared to support it. It is obvious that officers could easily thwart any system forced upon them simply by conducting interviews outside the station".¹⁴

By March 1984, attitudes had obviously made a dramatic volte-face and :

"When I interviewed the Home Secretary, he referred to the police being 'widely enthusiastic' about using tape recorders in these trials".¹⁵

The police are not alone in Baldwin's criticism regarding introductory delays.

"Though mindful of the difficulties, a majority of members of the committee (Criminal Law Revision Committee 1972 Ed.) recognized the potential value of tape recorders in police interviews and recommended that experiments in their use be undertaken. This proposal survived the acrimonious reception that greeted publication of the report although the Home Office took almost three years to set up a steering committee to advise on how such an experiment might be conducted".¹⁶

The Steering Committee under the chairmanship of Mr. Wilfred Hyde produced a :

"...slender report...which concluded that a modest experiment would be feasible".¹⁷

Hansard, 5th August 1976 at col. 2196 reports Mr. Ivan Lawrence M.P. commenting that:

"Everyone with a ha'porth of common sense can see that an experiment is feasible".¹⁸

Government-funded police forces apparently all have at least one area in common, that of limited financial resources.

"When I (Mr. Hyde) interviewed the Home Secretary, Mr. Leon Brittan, in January 1985, he indicated 'I think there are real problems of resources and all sorts of other difficulties. But we're on the way ...'"¹⁹

"Problems of resources" are not the province of the British Government alone. The South Australian Police system for video recording of interviews demonstrates the ingenuity of the Adelaide photographic and other technical police personnel, it does however owe some of its design limitations to 'problems of resources'. The introduction of the Victorian Homicide Squad system was considerably delayed, again, due to resource problems. This was remarkable, considering the government pressure to implement wider magnetic recording. The limitation of necessary funding despite governments' public pronouncements on the need for magnetic recording of interviews by police would seem to be a virus which afflicts police forces world-wide.

It is interesting to compare the similarities of arguments between the Australian and British authorities.

"Questions such as tampering with tapes, inhibition of suspects or the feigning of assaults (all of which were central concerns in the 1970's and earlier) are now scarcely discussed at all. The talk nowadays is all of resources, transcription of tapes, and increasing the proportion of guilty pleas. Fears about the security of the tapes themselves and possible abuses of the machinery have been largely allayed by technological advances".²⁰

The fear or suggestion of the inhibition of suspects and feigning of assaults has a very familiar ring to it, in Australia. The suggestion of 'tape tampering' was not altogether unknown in Victoria during the 1970's and later, however rational education and intelligent debate quelled much of that fire. The early establishment of departmental integrity which reflected downward from the Chief Commissioner, was also a help.

So what brought about the sudden change in thinking by the British police? What caused the volte-face?

Sir Cyril Philips, chairman to the Royal Commission saw it thus:

"The police, being practical chaps, (which they are above all) didn't think it worth their while to go on arguing about it. The writing was on the wall; the battle was over. I think that's the explanation. I don't think it was any great intellectual conviction or anything like that. I think they began to realise they'd been beating a big drum and found it was only a little drum."²¹

McConville and Morrell introduce the rather inflammatory opinion that:

"For their part, the police have generally been opposed to the introduction of any 'electronic surveillance' of their activities,"²²

a point seemingly overlooked by many other writers on the subject.

Do we then still require law enforcement officers to magnetically record their investigative activities? Is it the best way to proceed? AULD has stated:

"In criminal trials tape or wire recordings have been particularly useful in three respects...where it is important to catch the tone of the words, what prompted them and what effect they had on the hearer"²³

After the introduction of full colour video-taping of homicide suspect interviews and crime scene re-enactments in Victoria, a private viewing was arranged by the Victoria Police for members of the Judiciary and others of the Legal Profession. The impact on the Defence Lawyers present was dramatic, to say the least.

This demonstration then, goes a step further than the 'effect on the hearer' mentioned by AULD for this now includes visual information which encompasses, among other things, 'body language'.

One Victorian authority involved in research into the police use of magnetic recordings has expressed great concern regarding the possibility of prejudice imposed by the availability to the jurors of evidence of the so-called 'body language'.

Despite the claims of possible injustice, the availability of visual information provides the opportunity for the jury, for the first time, to enter into the world of the actual interview. How this can be construed as an injustice or be seen to be prejudicial is difficult to understand. It provides the VIEWER rather than the HEARER with the best evidence which is not available in any other way.

While magnetic recordings may be seen to be a general 'cure-all' for police investigative activities by the various pressure groups, the results derived from the use of the colour video camera may prove to be too dramatic to satisfy many defence lawyers.

In Victoria, while no attempt has been made to over-dramatise or contrive the situation, the police interview rooms have been acoustically treated to optimise voice recordings. Light output levels have been slightly increased by modifying light fixture reflectors in order to enhance photographic results. Procedural guide-lines have been promulgated and are adhered to by investigating officers, resulting in a smoother and more professional recording. The accused person is seen in the state and with such demeanour as was evident at the time of the arrest or interview. (The possible exception to this arises when a suspect is brought in and whose 'undressed' state might be argued later as prejudicial; under these circumstances the suspect is provided with adequate clothing during the interview).

The result of the application of this technique is evidentiary material which may be far removed in its appearance from that associated with the person who will ultimately be presented to the jury in court. This then is the vastly more accurate and honest picture which the jury can now be expected to see and hear through the introduction of video/audio technology in evidentiary recording.

Magnetically-recorded evidence however, originates from a far wider field than just the police interview-room. The introduction of legislation for the mandatory use of magnetic-recording of evidence must automatically open the door for the total acceptance of magnetically-recorded evidence from all sources. Legislation will bring with it procedural guide-lines and thereby, control of police use. What then of the recordings emanating from sources other than the police? Can procedural guide-lines or statutes have any effect on uncontrolled recordings produced by the general public?

What advantage does audio recording alone have to offer over video with audio? Is there an advantage in its general or partial application for evidentiary recording? It would seem to be so by the continued efforts of some pressure groups within our society. In addition, the impact of the existence of an audio recording, either upon the government or the people, can be gauged by the world-wide interest in evidence reported on 8th July 1987 regarding Col. Oliver North.²⁴

AULD²⁵ cites an article published in The Times, February 11th, 1961 reporting the case of R v Chipembere in Nyasaland where the defence case rested largely on the reaction of the crowd listening to two seditious speeches. A recording was valuable in translating those indeterminate and incoherent crowd noises of approval and disapproval which the printed word could not convey.

Much later, in the Supreme Court of Tasmania in Hobart 1976,²⁶ the Crown relied upon the existence of a cassette tape recording to prove charges, including perjury, against three serving police officers. The defence relied upon the same recording, only more correctly transcribed and analysed, to prove the existence of recorded words missed by the Crown as well as evidence of tampering with the content of the tape.

On these points alone there would seem to be merit in the introduction of magnetically-recorded evidence for both the defence and the prosecution, however, which of the two media is to be preferred? Which offers the greater advantage while still remaining within economic bounds? Procedural guidelines imposed, either at departmental level or by legislation, can both impose economic penalty and may go beyond the bounds of practicality.

In Victoria, the State Police commenced a 'pilot study' in July 1987, (The second 'pilot study', actually, since the present widespread use of audio tape-recorders for evidentiary recording commenced in Victoria in 1966, and continued, uninterrupted to the present day). The second pilot study will cover parts of two police districts, one metropolitan and one rural. The pilot study is the extension of the use of audio recording both in the field and at the police station. The recorder type recommended for use in the field, a recommendation imposed by economic structure, is the micro-cassette format which relies upon a built-in microphone as its signal source. In 'ideal' circumstances, excellent results can be achieved with micro-cassette tape-recorders, however, in practical police operations, where does one find 'ideal circumstances' in an uncontrolled environment?²⁷

The enforced use of inappropriate recording equipment, either by Force Regulation or Government Legislation, does not necessarily lead to useful recorded evidence. I suggest that there is a distinct possibility of quite the opposite. In fact, it is quite possible that when the recorded results are replayed to the court, the lack of quality may tend to suggest ineptness either on the part of the government by way of legislation, or on the police. In its 1984 Report to the New South Wales Attorney-General, the Criminal Law Review Division attempt to add to the widespread belief that the mere existence of a tape recording will necessarily shorten trials when it states:

"The use of evidence by recording interviews electronically will reduce both the number and the complexity of court-room disputes over the conduct of police interviews. The reduction in the incidence and duration of disputes will result in a decrease in the average length of criminal trials".²⁸

Clearly, some arguments regarding when and where recorders shall be used will never be satisfactorily answered for all people. Many arguments are put, unsupported by any technical research. If a degree of confidence can be achieved between those with the technical expertise best fitted to advise, and who are available in many parts of the world, and the authors of proposed legislative police controls, a realistically-economic and workable solution can be achieved.

PART II

EVIDENTIARY ELECTRONIC RECORDING IN AUSTRALIA

Some years ago, it was common practice in some States for the Communication Divisions of their Police Departments, to have available, an open-reel tape recorder, usually of exceptionally high quality, for the purpose of recording radio signals. Today, all police communications around Australia are tape-recorded on twenty-four hour voice logging retrieval systems rather than semi-portable recorders.

In earlier times, the open-reel tape recorders were sometimes deployed to tape-record whole interviews or typed statements while being read back. By design, these tape-recorders were 'transportable' rather than portable and for this reason the use of these recorders appears to have been limited to within the close proximity of headquarter stations.

Due mainly to the economic constraints imposed by all State Governments, the most common recorder in general police use is the micro-cassette, hand-held and battery operated dictation recorder. The micro-cassette recorder is manufactured by many of the world's recognized electronic and tape-recorder companies. The micro-cassette tape recorder is perhaps most commonly employed for 'aide memoire' recordings although its application is far more extensive, depending upon which Australian State one considers.

While it would be improper of me to suggest that many complaints lodged against police are either false or trivial, one area where formal complaints have been fruitful in the past, for the complainant, is in road traffic policing. Prior to the more widespread availability of the micro-cassette tape recorder, many complaints were made against traffic police regarding their alleged rudeness or threatening or overbearing manner in dealing with the public. These complaints are of course, still being reported, however, many traffic police are now 'protected' by the existence of a tape recording of the events at the time of the interception. The various State Police Internal Investigation Departments are able to quickly investigate such complaints, dispensing with unsubstantiated allegations and greatly reducing workloads in the process. It could be argued of course that the existence of the recording device has brought about an improvement in police manners when dealing with the public, particularly in the area of traffic policing.

The 'aide memoire' application of tape recorders requires that the device be small, portable and simple to operate as a recorder and in replay mode. The various Nagra recorders, including the SN, SNST, and the new JBR models are all small, portable and simple to operate as recorders. They do however, require additional replay units and the current Australian prices for the recorder alone are in the vicinity of \$8000 (Aust.). They must therefore be regarded as both too sophisticated and expensive for use as an electronic note-book.

The standard "Philips Compact Cassette"²⁹ tape-recorders, while not always designed to be 'hand-held' and operated, are sometimes used as an electronic note book in the office by police. The practice is both common and widespread in the world of commerce, law and medical practices of course and may approach the micro and mini tape-recorder for general dictation purposes.

During the nineteen-sixties, criticism was repeatedly directed at the practices of certain police in Victoria and accusations of 'verbals' were commonplace. In the Murray Report it was recommended "...that a number of tape recorders be purchased for police use in conducting trials to examine the practicality of tape recording interviews".³⁰

The formal practice of tape recording began in Victoria in 1966. The recording was conducted in a covert manner and on a discretionary basis and was usually confined to a small range of criminal offences. Only the reading back of the formal interview was recorded. While Victoria was commencing interview recording with Tandberg open-reel recorders, other States occasionally used the communications recorders mentioned previously. Until the introduction in Victoria, of the 'new' pilot scheme in July 1987, the procedures introduced in 1966 had seen no significant change. During the above period there has however been a considerable increase in audio recorder availability around the State of Victoria. In addition, there has been considerable expenditure directed towards the improvement of interview room acoustics and a marked up grading of user education at all rank levels. In the Sallman Report it is stated that "Victoria has one of the most advanced systems of tape recording in Australia and possibly in the world."³¹

In the new Procedural Guide-lines, 1987, Victoria's Police are instructed that "...the criteria for tape recording interviews shall be:

- (i) Where a member interviews an offender for an indictable offence, or
- (ii) Where a member establishes a reasonable belief that a person has committed an indictable offence,

The Member Shall Record The Entire Conversation." 32

The requirement to tape-record the entire conversation will be the subject of further comment later but for the time being, suffice it to say there is a danger that too many of the 'field' recordings, which must be presumed to be included in the above directive, will cause a contra effect to that so often suggested by pressure groups, when the tapes are reproduced in court.

In parallel with the AUDIO tape-recording pilot scheme, the Homicide Squad of the Victoria Police now video-tape the entire interview with homicide suspects. The video tape, of course, includes an audio recording of all statements by all persons present in the interview room. In parallel with the video taping system, a stereophonic audio recording is produced on a separate but integrated audio tape deck. The audio tape serves a number of purposes. In the event of a typed transcript being necessary, transcription from an audio tape copy is easy to provide, (direct transcription from a video tape being both ill-advised and impractical). In the event of video equipment failure, a high quality audio tape recording of all conversation exists. (There are no reports of any equipment failures to date). Investigators needing to listen to the interview at a later date can do so privately by means of head-phones attached to an audio cassette recorder, while seated at their desks, thereby causing no interruption to other normal office procedures.

Copies of the video-taped interviews are provided, at cost, upon receipt of a request from the accused persons, usually through their respective defence counsels.

In Adelaide, the South Australia Police, who were the first Australian Police to employ video-taping techniques in suspect interviews, have opted for a simpler, but more economical video system which does not require the services of a trained camera operator. The camera, video and audio recording systems have all been integrated into a rack designed for single button operation by the investigator. In its present form, the South Australian system employs a VIDEO 8 Camcorder (8 mm), the Video 8 recorded tape being the Master Tape. The video signal is fed to a VHS video recorder which provides the investigator with a 'working copy'. The audio signal from a table-mounted microphone is fed to the video tape recorders but is split to a Master Audio Recorder which runs uninterruptedly throughout the interview. The entire system is contained within the interview room in plain view of the suspect. (Victoria's system is operated through a mirrored window by a qualified camera operator and is thus more costly of manpower as well as equipment. The system is believed superior in that a clearer view of the interviewed person is provided. The system mimics that of the Borough of Manhattan, New York

City which has operated with success for a great many years).

The South Australia Police guide-lines regarding Interview Procedures state:

"RECORDING CRITERIA

Where members are investigating offences they shall video record the interview UNLESS -

The circumstances of an investigation require a suspect to be questioned away from a police station;

The offence is declared a major crime or a commissioned officer indicates that it is likely to become a major crime,³³

A Commissioned Officer directs otherwise; or

The video interview room is unavailable.

When it is decided that an interview with a suspect is to be recorded, the entire interview ought to be recorded"

For some years now, the Northern Territory Police in Darwin have employed video tape-recording in line-ups although the system is not formalised by either departmental regulation or legislation. Also, the use of the video taping is discretionary upon the investigating officer. To date, the Northern Territory Police is the only police force in Australia to use video recording in this particular manner although the procedure is under consideration in Victoria. No other evidentiary magnetic recording procedures are in everyday use in the Northern Territory.

The filming of crime scene re-enactments has been widely used in the various Australian States for many years, usually by means of 16mm film. This medium has become both expensive and difficult to have processed and there is a general and logical move over to the use of video cameras. With the magnetic medium there is no processing necessary although the Victorian experience has shown that both tape copies and material composition (a reluctance here to say editing) provide both the investigator and the court with what is really required. The ORIGINAL material is retained and if called for, can be reproduced in the court-room.

The reason for the editing, is that at the scene, as well as investigators being present, there may also be crime scene forensic examiners, photographers and the video camera-team, all going about their various duties. As a result the scene is not always recorded in image form in logical order. The officer in charge of the investigation directs the manner in which the tape is to be composed and the video operator prepares the material as directed. The composition tape includes approaches to the crime scene as well as titles and the identities of all C.I.B. team members. The use of video tape recordings in crime scenes now also provides far greater flexibility in enhancement processing than was ever available with 16mm film. Using advanced computer technology, digitally-stored information (video images) can be processed in a variety of ways.

A range of enhancement techniques can be applied to images, including contrast enhancement and colour correction. Where faint bloodstains exist at a crime scene, infra-red video camera sensitivity can provide an image which can be subsequently enhanced and the bloodstain patterns more readily identified. The Australian FIRST image processing workstation provides facilities of this type.³⁴

Overall, the single greatest advantage of the use of video recording is that of speed of processing. A video-tape copy of the crime scene can be awaiting the return of the investigators to their offices, (and in Victoria due to rapid turn around of material, such is usually the case).

The practice of police operating 'under-cover' is both common and accepted as necessary in most parts of the world. Frequent newspaper and television news stories highlight the operation of U.S. Police and FBI agents relying on covert video recordings as evidence. This type of activity is not restricted to the United States of America however, as drug-related charges have been successfully prosecuted in both the Australian States of Queensland³⁵ and Victoria,³⁶ through the use of covert video recording techniques.

Due to the inherently nervous nature of drug dealers, setting up covert video operations is nearly always impossible. When it is possible to install a remote video camera with which to capture criminal activities by means of video tape, the parallel operation of a radio microphone relaying back to the video recorder the conversation taking place, can be in breach of the Listening Devices Act.³⁷ This is only true if the operation is not protected by the issuing of the appropriate warrant.

Another area employing covert video/audio recording techniques is that of intelligence gathering. All Australian States have Crime Intelligence Units and they collectively, support the Australian Bureau of Criminal Intelligence in Canberra. Without these highly-organised, dedicated and frequently grossly-overworked personnel, Australia's crime statistics would be measurably higher.

As is so often the case, the 'intelligence-gathering' exercise can suddenly become an 'evidence-gathering' procedure and frequently, the standard of the recordings is inadequate for court presentation. If the particular State or Federal group are not supported by a technically-competent team, little or no enhancement will be possible and considerable time and manpower wastage will result. The frustration imposed on anyone who has worked very long hours, frequently for a year or two on a single investigation, only to see no effective results for his efforts, can only be imagined.

In all State Police and Federal Police operations, there are investigative groups which appear to attract greater financial support. Meanwhile, those groups which are perceived to be less 'glamorous' (or less newsworthy) continue attempting to manage with meagre resources while any results which are achieved, are done so, thanks mainly to ingenuity and dedication on the part of the police team.

The sad truth is that the 'top criminals', (or the so-called organised crime syndicates) are operating in areas of such high finance and with such incredible mobility and communications at their disposal, that if the police are to compete at all, a considerable upsurge in technology and financial support will be needed.

A crime, which is probably as old as the 'oldest profession', is that of child abuse. It is an area suddenly attracting considerable and justifiable media attention. It has to be recognized, that children of the most tender years may rarely, if ever, be able to withstand the rigours of a superior court trial. This being so, the offenders will never be successfully prosecuted. There is a way however, in which high-quality video recordings may allow the statements of such children to be satisfactorily presented to a jury. There are, naturally enough, arguments that the video tape cannot be cross-examined and this is a natural right of the accused. A way has to be found to deal with such offenders and C.C.T.V. and/or video taping may be the way. Video recording of child abuse victims is practised in New York.

"Since 1975, the Bronx District Attorney's Office has pioneered the use of video for suspect statements, line-ups, crime scenes, perpetuation of testimony of witnesses who are unavailable for trial, surveillance, and training. We have done over 5858 tapes which consists of some 4092 statements of suspects, 317 line-ups, 1151 crime scenes, 107 post crime scenes, 173 witness statements and various other uses...."38

On 24th July, 1985, the Criminal Procedure Law was amended to add article 65 "Use of Close Circuit TV for Certain Child Witnesses" The memorandum issued by the Bronx District Attorney's Office relative to this amendment is reproduced as Appendix 2.

A similar system introduced into Australian courts would go a long way to overcoming the 'protectionism' which our present system affords paedophiles and other persons charged with crimes against children.

WHAT ARE SOME OF THE ORIGINS OF EVIDENTIARY TAPE-RECORDINGS?

The most obvious source of an evidentiary tape recording is the police investigator who either has, at his/her disposal, departmentally-supplied station and/or field recorders. In Australia, until fairly recent times, this scenario was only common in Victoria although tape recording did occur in other States. The actual purpose for making the recording however, as already discussed, can range from the 'aide memoir'-type recording using the ubiquitous micro-cassette recording to the latest, most sophisticated miniature Nagra JBR Series concealable tape-recorders employed to gather evidence covertly.

Much of the writings on the police use of, or the need for police to use, evidentiary magnetic recordings, appear to be targeted at the conventional police interview situation. It is true that the greatest percentage of recordings would, if such recording procedures were to be introduced, emanate from this source.

There are however, other areas such as tape recordings produced by the Crime Intelligence and other surveillance groups, as well as material from non-police sources which need consideration. Many discussions on the introduction of magnetic recording for police interviews suggest stringent rules for the acceptance of non-formally recorded evidence. However, the Criminal Law Review Division, N.S.W. reports that, resulting from the extensive British Field Trials on evidentiary recording:

"...it is not anticipated at this stage that any special rules of evidence will be necessary to deal with the system. In particular, it is not intended that there will be rule excluding non-recorded admissions, but this will depend on a review of police practices"³⁹

As any practical police officer knows, evidence is more commonly gathered outside the police-station, than inside. Certainly, the formal interviews usually take place inside a government building, however any legislative limits placed upon the acceptance of recordings must also consider all other possible evidentiary sources.

In addition to traditional police sources, sophisticated evidence gathering techniques are now being employed by investigators from the National Crime Authority, investigators of the Bureau of Customs, Telecom Australia, and other State and Federal Government Departments. The numerous advantages claimed for electronic recordings will ensure that expansion of this technological practice will continue.

It is an historical fact that members of the general public, quite innocently, have captured cogent evidence on video-tape, while operating 'home movie' equipment. Video camera-recorder systems being operated in retail stores as a sales gimmick have captured shop-lifters removing goods from the store. Recordings of televised horse-race meetings have been used to identify persons in the crowd and have been used in an attempt to identify 'ring-in' horses participating in race meetings.

Video-tape recordings have been seized showing an accused person involved in sexual acts and acts of gross indecency as well as offences with minors. In some instances, video recordings have existed of the accused persons introducing the minors to drugs prior to any sexual advance, all these acts being recorded by the accused, on video tape complete with sound track.

Audio recordings have been produced by an accused person in an attempt to disprove charges laid against them. In one particular case in Perth, Western Australia, an accused person having already served a prison sentence, was using an audio tape recording in an attempt to have a former witness against him, charged with perjury. The evidence tape was handed to detectives of the Fraud Squad of the Western Australia Police. Upon examination of the tape, concern was expressed regarding the composition of the tape which 'just didn't sound right'. Through analysis in the tape laboratory of the Victoria Police the submitted tape was found to be an edited composite of numerous conversations. In this instance, the accused was convicted of making a false report to the police.⁴⁰

PART III

EXPECTATIONS OF EVIDENTIARY RECORDINGS

In almost all instances where a magnetic recording has been produced in the gathering of evidence, the expectation of the investigators are that the recording will contain cogent evidence regarding the guilt of the accused. There are occasions, where, due to circumstances beyond the control of the investigator, or the recording device operator, a fault occurs or some overlying noise is evident, which, when the tape is replayed in court, will tend to render it useless as evidence. The aim however, is the production of **admissible, comprehensible and cogent evidence.**

In a trial before the Melbourne Supreme Court in 1978 ⁴¹ evidence was produced in the form of an audio recording which had been recorded via a listening device. The recording was of poor quality, but a transcript of the tape recording which had been transcribed by a specialist audio group within the Victorian Police Department was admitted by the Court, and provided cogent evidence in a murder charge against Anastasia Leone and her alleged lover Makoul. While other evidence against the two existed, the tape recording obtained by means of a listening device, the content of which was then transcribed, amounted to a confession in the eyes of the jury.

In the process of managing evidentiary magnetic tape recordings, excellent **exhibit continuity and magnetic tape registration** is necessary at all levels.⁴² With delays of many months, or years in some cases before court appearances, disputes will often arise over some small detail of evidence. Much time, effort and argument can be saved by **good tape management** in the first instance. In a modern exhibit control system, which makes use of 'state of the art' technology, both control and access to evidence can be greatly enhanced. Digital storage and access systems will allow isolated detail to be rapidly located and identified, providing the courts with a service not previous available any other way.

In any tape recording produced by means of a listening device, considerable innocuous detail can be anticipated. This type of material, while on the one hand of no apparent interest to anyone, can sometimes be most useful to either the Prosecution or the Defence, in tying together other matters which may prove important while the case is in progress before the court.

For reasons of cost, in intelligence recordings only such areas as are of immediate interest are usually transcribed. Because there may be hundreds of cassette recordings in one case covering a period of many months, finding additional details, for the present at least, is dependent entirely on the memory of one or more members of the investigative team. In some of the more enlightened intelligence groups, teams of analysts collate detail for later use. Digital storage of detail at this stage also makes for a more efficient use of the intelligence obtained.

There is a vast difference between AUDIBILITY and INTELLIGIBILITY and the difference continues to cause considerable time wasting, both to the courts and the police in their initial investigations. It is obvious that an evidentiary tape recording which is not intelligible will be of little value in a court of law. Such a recording will also quickly try the patience of the presiding judge. However, early in the investigative period, signal intelligibility, or lack of it, should cause considerable concern.

It has been recognized, both in Australia,⁴³ and overseas, that the transcription of magnetically-recorded material does impose an enormous financial penalty on the user as regards to time. In fact, Wozniak, reports that:

"The time taken by audio typists to transcribe tapes was directly dependant on the actual quality of the tape-recording which was the subject of the transcription."⁴⁴

Further: "However, by far the greatest area of difficulty that typists encountered related to diction, accent or dialect of the suspect or police officers and those passages of the interview where there was more than one person speaking simultaneously."⁴⁵

The New South Wales Institute of Technology, in their report, would seem to agree:

"Transcription on any extended basis would be the largest single running cost."⁴⁶

From a relatively modest beginning in 1974, the Audio Visual Division of the Victoria Police eventually employed nine staff, engaged full-time in the production of transcripts of tape-recorded evidence. The Division is believed to have been the first Australian force to engage visually-impaired transcription typists in the preparation of evidentiary transcriptions. Overseeing the civilian staff were two sworn police-women whose task it was, not only to supervise the group but to attest in court to the accuracy of any transcripts produced.

Over a period of twelve years, very few of the transcripts produced by this group were from what might be described as 'good' tape-recordings. Indeed, many were appalling. Only by considerable effort were some tapes able to be transcribed at all. The number of hours of transcript preparation time per hour of recorded interview or conversation is a measure of the degree of difficulty of transcription. It is therefore with some reservation that the author reads projected ratios of 8:1 promulgated by the New South Wales Criminal Law Review Committee, and some British authorities. The truth lies much closer to the figures given in the Scottish Trials Report e.g. 20:1.

It was the practice in Victoria, that each transcript was checked at least three times (counting the first attempt as one check). The visually-impaired staff produced excellent work, in some instances, so accurate in the first strike that only a cursory check and retype were necessary. The reasons for their apparent enhanced capacity to perform such tasks alas, remains a mystery. Remarkable concentration capability perhaps?

Their forced redundancy brought about by budget constraints imposed by the Government of the day was a regrettable decision for the Force. They provided a bounty for the 'other' Government departments who snapped them up, fully-trained and very experienced.

These statements on evidentiary transcription all directly relate to the lack of intelligibility of the detail contained in any audio recording. It is interesting to note that the New South Wales Institute of Technology costing of any implementation of transcription is based upon the transcription ratio of 8:1. The Scottish 'experience' (rather than estimation) is closer to 20:1. No doubt one 'estimation' is based on intelligible tapes, while the other experience, is based upon 'real world' police tape-recordings.

As has been stated earlier, the tape recordings produced by many 'intelligence gathering groups', frequently result in many audible recordings of which little is intelligible. Such recordings however, often meet the needs of the Intelligence Group supplying much needed information on criminal activity.

In two Australian States, police are regularly using video tape recording techniques to document suspect interview statement and confessions. Procedural guide-lines between the States differ somewhat in that in South Australia, the investigators are responsible for the entire operational success of the achieved recordings. In Victoria however, the technical aspect of the operation is performed by technically-qualified camera operators and the investigators play no part in the operation of the technical equipment. In both examples, back-up audio recording takes place, supplementing the audio track of the video recorders.

It may be said, that in both the examples given, there are advantages and disadvantages. In South Australia, apart from the fact that this sophisticated equipment is operated totally by unqualified personnel, the persons being interviewed as well as the interviewer, are seated side-on to the camera at such an angle that their faces are slightly inclined towards the lens. In this way, the camera angle for all participants is optimised.

In the Victorian example, the equipment is installed in a separate room fitted with a one way mirror-window. The interview-room is lighted while the equipment room is darkened. The camera angle is inclined towards the diagonal, across the interview-room and directly faces the suspect being interviewed. The back of the interviewing officer is directed toward the camera and his/her face is never in view. The angle of the lens is changed during the conduct of the interview in such a way as to identify all persons in the room. Once the interview-room door is closed, the angle of the lens and direction of the camera is changed to show a clear view of the face the suspect over the left shoulder of the person conducting the interview.

The camera is not moved again unless an exhibit is held up by the interviewer before being shown to the suspect. In such a case, an attempt is made to produce the clearest possible image of the exhibit before returning to the suspect's face. The only other reason the camera might be moved is in the event of an additional person entering the room during the course of the interview.

Doubtless, arguments will be put against the techniques employed in both States. Each attempts to provide a fair and unbiased video-recording of an interview situation which, at best, is a foreign environment for most people and at worst, a shattering experience, even for a confessor. Each strives to provide an audibly-intelligible, as well as a visually intelligible, tape-recording of an interview.

In both States, financial strictures were imposed in the development of the video-taping facilities. In Victoria, at least, it was known at the outset how much money was available to develop the Homicide Squad Interview-Room facility for three interview rooms. Regardless of these strictures, the best quality cameras, within the financial limits, are presently in operation, coupled to industry standard VHS video tape recorders. In parallel with the video audio circuit, is a high quality, domestic stereo audio cassette deck. High quality, covertly placed, stereo microphones are powered by a separate power supply. A time and date generator, which is powered constantly, feeds the digital information directly to the video tape. Protagonists of the 'tamper proof recording systems' (i.e 3M TPR) may find fault with this type of system. But how possible is it to tamper with all aspects of this system, and escape detection? Glanville Williams, in his 1979 paper to The Criminal Law Review comments thus on tape tampering:

"The machines would require special devices to prevent interference with the tapes (if only to safeguard the police against the defence accusations that the tapes had been tampered with).

Opponents of tape-recording have always made great play with the possibility of falsifying the tapes, but the difficulty is greatly overstated. Altering the tapes in a way that will pass the scrutiny of an expert requires special apparatus and great expertise; and it is not certain that it can be done at all."⁴⁷

In common with all Australian States, remoteness is sometimes a problem to the investigator. In Victoria, when homicide investigations develop to a possible interview stage and it is clear that returning to C.I.B. Headquarters is impractical, a video crew, either already on stand-by or at the crime scene attend at the remote location and the interview is overtly recorded using broadcast standard High-Band video recorders and professional E.N.G.(Electronic News Gathering) cameras. The duplicated systems mentioned above are not employed in these circumstances although time and date generators are inherent in all the E.N.G. systems.

South Australia, faced with similar financial constraints, installed a cleverly-engineered integrated system, combining the SONY Video-8 Camera and Recorder system. As the system stands at the time of writing, the Video 8 Camcorder produces the 'master' tape which, at the conclusion of the interview, is sealed and locked away until the court date. A video signal is taken from the Video 8 Cam-corder and is fed into a domestic quality VHS video recorder. This unit produces the 'working' copy tape recording. The conversation during the interview is recorded on the video recorders, but is also split to two audio recorders. Again, one recorder produces a 'working' copy while the other records continuously throughout the interview and is filed away as the 'master' copy.

The system is single button operated requiring only the application of A.C. power by the investigator followed by the loading of the appropriate tapes. Time security on the recording is achieved by means of a wall-mounted-clock equipped with a sweep-second hand.

The end result is similar to that used by the Victoria Police but was developed ahead of, and in isolation from, Victoria. As an operational system, it is vastly more economical than Victoria's, particularly so in the area of man-power, which for all authorities, remains the greatest long-term expenditure. As finance becomes available, it is understood that an upgrading of the camera system will take place in South Australia and a second system is to be installed at a police station outside the city of Adelaide

The New South Wales Institute of Technology report 48 provides an "...overview drawn from a literature search provided by the CLR" (Criminal Law Review Division) and as one might expect, all avenues and arguments on the use of video in suspect interviews are well researched. 'Body language' and suspect demeanour are raised and many of the arguments are convincing regarding possible prejudice but at para 7.4, under the heading "Stereotyping" it is reported that:

"The recorded appearance of the interviewee may be problematic before a word has been uttered. Appearance is open to stereotyping - the process whereby a person is placed in a social category ... and is said to possess all the critical attributes of that category" (skin colour, sex characteristics, employment status, etc) FONTAINE and EMILY 1978. p.325."⁴⁹

I confess that I remain unconvinced by that particular argument since one may expect the suspect to appear in court, perhaps slightly better dressed, cleaner and better groomed, (all on the advice of his/her counsel), but would not the skin colour and sex be the same? Also, in today's economic climate, can one person discern the employment status of another merely by appearance?

Written comment on video-recorded suspect interviews tend to ignore the much wider use of this medium. The N.S.W.I.T. 1986, report states:

"Where video recording is used, its applications extend across several functions in which a visual record is essential - testimony by 'expert' and unavailable witnesses, identification parades, documentation at scenes of crime are cited (McCrystal 1977, Kmet 1980, Kessler 1980, Hurley 1982)." ⁵⁰

Not listed are the many examples of drug dealer activities which are documented on video tape for court presentation. The New York Police Narcotics Bureau employ video surveillance around the clock in the fight against the narcotics trade. When an organised raid takes place against a large drug outlet, specialised video camera teams move in immediately following the investigator's usually-forced entry, and before anything or any person is moved, the entire area is recorded on video tape. All seized narcotics and monies are clearly displayed before the video camera. The video tapes serve a dual purpose. That of evidentiary material and also departmental internal security. These recordings supplement the surveillance videotape-recordings.

The use of video recording within Australia for other than confessional purposes has already been mentioned. The problems have not. In audio recordings, we refer to speech intelligibility. In some video recordings there exist problems of what might be called, 'visual intelligibility'.

The 'problems' referred to may stem from a number of sources, not the least of which may be inexperienced operation of the equipment involved. An un-skilled camera operator, in an attempt to capture evidence on video tape might employ a camera lens of 200-300mm focal length (a telephoto lens) without the aid of a sufficiently-solid camera mount. In operating over this extended range, the effect of vibration on the resultant images may prove anything but useful if they are to be used as evidence. The same operation by a skilled person could produce a great deal more valuable and usable evidence.

For obvious reasons, it is difficult to get close to drug dealers with a television camera during the operation of their business dealings. An inadequate camera or camera lens, may very well show someone doing something in a location which may or may not be identifiable, but just as a microphone can detect an audible signal and yet not necessarily lead to an intelligible tape recording, so a camera lens may detect an image but yet that image may not be usable as evidence.

Surveillance cameras operating under difficult and changing lighting conditions, frequently result in recordings which are barely usable as intelligence recordings.

In order that usable evidentiary material may be recorded on video equipment, the appropriate equipment for the occasion, operated by qualified and experienced personnel should be provided. To do otherwise, is to waste time and effort, both of the courts and the police, not to mention the resources which are so difficult to obtain.

PART IV

PRODUCING TECHNICALLY-ACCEPTABLE RECORDINGS

One of the problems facing police forces around Australia, and quite probably in other overseas countries when the introduction of interview recording is contemplated, is that originally, police stations were never designed for the production of magnetic audio tape-recordings.

The buildings, and in particular those of older construction, are Spartan to say the least. Walls are usually quite high, around eleven feet, bare plaster painted with a high gloss paint for ease of maintenance. Windows are shielded with either holland or venetian blinds and floors are usually covered with a good, heavy duty sheet vinyl or tiles. The acoustics of the building were never a consideration and in some instances, little thought was given to the allocation of individual rooms.

As a consequence, we now have a situation where the only room in a police building, available for use as a 'recorded interview room' is probably, immediately adjacent to the busy watch-house, which also accommodates the station telephone switch-board, or, it abuts the station's main entrance which looks out into a busy street, and there is probably a bus stop right outside.

The selected room may have once been a store-room and measures ten feet by ten feet with an eleven foot ceiling - almost a perfect cube!

The room selection now having been made by the Officer in Charge of the Station, (who also knows nothing about acoustics), government engineers will be called in and be requested to make the room sound-proof, or at least, suitable for the production of audio recordings.

At this point in time, budget considerations are usually raised. A decision has to be made regarding how soundproof the room needs to be, off-set against the cost of meeting this criterion. The compromise, and in almost all instances it is a compromise, will provide a room which, while it is still almost a perfect cube, has been provided with some insulation against the intrusion of outside noise. Ventilation has been disturbed by double-glazing the windows and corrected by the installation of air-conditioning (which introduces a new noise of its own). The lino-covered floor has been concealed beneath carpet and acoustic tiles have been attached to the ceiling surface. We now have our 'recording studio'.

Unfortunately, the compromise did not replace the original door, which is a good solid timber door, but which displays a three quarters of an inch gap at the bottom and is by no means 'air tight' around the sides and top. Our first tape-recording therefore, will include the sounds of police members tramping up and down passageways, telephones ringing, people whistling, and buses pulling up and departing, outside the police station.

This is not good enough by far, as I am sure the Judge who first hears recorded evidence from this hypothetical station, will no doubt be happy to point out.

Technical standards for the construction of interview-rooms will vary according to the type of magnetic recording introduced, that is, AUDIO or AUDIO-VIDEO. Even in the use of video, variations will exist depending upon the location and type of camera employed.

The acoustic criteria will be identical in both audio and audio-video recording.

INTERVIEW-ROOM CONSTRUCTION

Assuming that one is not restricted to an undesirable room in an existing building, what are some of the desirable features of an 'interview room' in which it is intended to produce magnetic tape-recordings?

The first consideration is location within the building, with respect to the other rooms and the purposes for which these other rooms are used. The 'interview room' should be adjacent to the quietest rooms in the station. If the station is located in a dense vehicular traffic area, the room should be as far as possible, removed from the street.

Following upon location, the dimensions of the room are most important. A CUBE IS THE WORST POSSIBLE SHAPE TO BUILD AN INTERVIEW-ROOM.

It has been the experience in Victoria, in some instances, that rooms originally designed as store-rooms, have been re-designated for conversion to interview-rooms. These rooms, when stripped of all in-built wall-mounted shelving, frequently turn out to be almost square. At 9 feet by 9 feet with a similar height ceiling, enormous acoustical problems are immediately present.

Obviously, cube-shaped rooms are to be avoided at all costs. Rectangular rooms constructed such that their height, width and length, are unequal are the most suitable. The room size selection, must also take into consideration that the room may be required to house quite a large number of persons comfortably. It is impossible here, to be too pedantic about the actual final dimensions of the interview room in view of the possible mandatory variations between States.

The **material construction** of existing buildings will dictate, to some extent, the modifications which may be necessary in the development of suitable interview rooms. Solid brick and stone constructed buildings may already display good sound transmission loss figures and require minimal modification.

Older brick and stone constructed walls were frequently fitted with ventilators close to the ceiling. These open air channels are also open to sound transmission and need to be bricked-up. Outside walls of buildings are usually either solid stone or double brick separated by an air cavity. Given that no open-air channels exist, such walls are almost certainly adequate for interview-room recording purposes.

In the case of plaster covered, timber framed walls, it is recommended that the stud frame portion of the wall be completely re-constructed. Regardless of the mass of the new covering material, if there exists an uninterrupted mechanical transmission path, from one side of the wall to the other, the **transmission loss** factor will be diminished.

In re-constructing the stud frame of the timber wall, the studs should be staggered in such a way that the vertical stud surfaces are not common to both sides of the wall. In this way, the mechanical connection between opposing wall surfaces, is broken. The cavity between the wall panels should be filled with porous infill such as rockwool, hairfelt or some similar material. If the individual wall surfaces are also perforated, reverberation times within the interview-room will be reduced resulting in enhanced intelligibility in audio recordings.

Standard thickness plaster board is inadequate when used alone to establish the degree of sound transmission loss necessary. The options available in both construction material and technique, are extensive, and the subject is covered nowhere better than in the "Handbook of Noise Control" Edited by Cyril M. Harris, Charles Bachelor Professor of Electrical Engineering and Professor of Architecture, Columbia University.⁵¹

Other useful publications on the same subject include "Acoustic Designing in Architecture" by Vern O. Knudsen & Cyril M. Harris,⁵² "Fundamentals of Acoustics" by Lawrence E. Kinsler & Austin R. Frey,⁵³ and "Building Acoustics" edited by B.F.Day, R.D.Ford and P.Lord.⁵⁴

The New South Wales Institute of Technology reported to the Criminal Law Review Division (New South Wales) June 1986, on "Recording Police Interviews."⁵⁵ The research carried out by the Institute covered such areas as sound levels and desired sound levels in existing police-buildings. An interestingly-practical test was employed to determine the critical noise level in interview rooms with respect to the intelligibility factor determined by the transcription typists.

"Error rates in transcription, and the rate of replay of individual words, rose significantly when the ambient noise level in the room exceeded 43 dB(A)."⁵⁶

The Report goes on to say that the newer police buildings should have little difficulty meeting the criteria recommended for interview rooms while in some of the older buildings, they may prove impossible to realise. Two examples were cited as being under the control of the National Trust:

"... which would apparently preclude remedial attention to reduce the intrusion of external noise. (At Balmain the detective areas overlook a pre-school playground, and it was reported that ordinary conversation is frequently difficult due to the level of noise generated.)"⁵⁷

As the result of the tests conducted by the Institute staff, there is contained in the report a recommendation, relative to the acoustic criterion for interview rooms, that:

"Isolation of 35 dB(A) has been specified for interview rooms in the Police Centre. A background noise level of 35 dB(A) was measured in the level 3 rooms by simulating loud conversation in an adjoining room. With additional activity in all the areas adjoining, it would be expected that these rooms would still meet the background noise figures specified"⁵⁸

Interview rooms on the ground floor of buildings constructed on a concrete slab, will experience little difficulty with mechanically-transmitted noise through the floor (in all normal circumstances). First floor (and higher) interview rooms, and in particular, those constructed of timber, may cause problems due to transmitted noise.

Regardless of mechanical modification to the floor and wall structure, the floors should be completely covered with good quality carpet laid over a thick underfelt.

The ceiling should also be treated with an acoustic tile. A simple fibre acoustic tile attached to the original ceiling by means of contact cement will be found to be quite satisfactory in most circumstances.

A problem which exists, particularly in newer buildings, is the practice of constructing 'dropped or suspended ceilings'. This type of ceiling can be almost a metre below the concrete surface of the floor above. This very large cavity can serve as a sound transmission area if not properly treated. The only really satisfactory treatment is to extend the walls of the interview-room up to the concrete surface of the floor above, in an uninterrupted panel.

Another method of treatment is to cover the entire surface of the suspended ceiling with a sheet of very thin lead. This is awkward to install, expensive and makes any future maintenance a nightmare.

Another problem in the same region, is the **air-conditioning ducting**. Unless otherwise specified at the time of designing the building, the main air ducts may be trunked down the length of the building with branches to all adjacent rooms. This can result in a perfect communication channel between all rooms on the particular air conditioning trunk. Later alteration to the trunk layout is possible but expensive. In any event, the air ducts will require the attention of an air-conditioning engineer to inhibit the transmission of sound.

Windows may only need attention if the usual outside ambient noise levels dictate the need. The windows, should however be rendered impossible to open. An open window will admit vastly more sound than even a single pane closed window.

In areas which are subjected to constant traffic noise, school playgrounds etc, double glazed windows are essential. The gap in the double glazing which is used for the purpose of thermal insulation is quite small (a gap of the order of only 10mm) and is quite inadequate for sound insulation.

The glass panes should be at least 6mm in thickness and the air gap between these panes should be between 100 and 200mm to be really effective. A further increase in effect can be achieved by insulating the window surround for the complete frame.

Many air conditioned buildings are equipped with doors fitted with open 'returns' for the circulation of air within the system. They usually take the form of aluminium louvres fitted to the lower portion of the door. Without an air return, the air conditioning system cannot function efficiently. It is not possible however, to meet the acoustic criterion for the interview room while this type of return remains in the door.

There are a number of solutions to the problem, such as a tuned return fitted into the wall adjacent to the doorway which will permit air to pass but resists the transmission of some sounds. A more costly and engineeringly-difficult solution is to modify the ducting above the dropped ceiling. Again, a qualified air-conditioning engineer can provide the answer.

The door giving access to the interviews room should be of such a construction as to inhibit the transmission of sound from adjoining rooms. The door will be considerably thinner than the walls of the room, however the same type of construction techniques for the door should be considered. These are, a double leaf constructions of two thin sheets of steel separated by approximately 50mm of air gap which contains a filling of rockwool or similar material. The outer surfaces of the door can be faced with stained and varnished timber without jeopardising the effectiveness of the inner-door construction.

The door frame, of course, must display no gap between the frame material and the wall to which it is attached. Around the door frame there should be a door seal which inhibits the passage of both air and sound when the door is fully closed.

Finally, the room lighting may need some attention as the generation of mains hum by fluorescent light fittings is not unknown. Low-noise chokes are available for this type of light fitting and are well worth the trouble of fitting.

If the interview room is to be used for video recording then some consideration should be given to the light levels necessary.

There is a method by which the light levels in a given room can be almost doubled without increasing the number of lighting fixtures (not to mention the heat levels resulting from additional lighting fixtures). The 3M Company market through other outlets,⁵⁹ a sterling silver film which is fixed to the surface of sheet aluminium. The sheet aluminium may be converted to any shape necessary and in fact can replace the existing backing sheet usually found behind the fluorescent tubes. By means of careful engineering, these new reflectors can be made to focus light rays and in this way, together with the natural properties of the sterling silver film, the light levels are greatly increased.

The product, as produced by 3M, was intended as a 'power-saving device' since, with the increased efficiency of the light fitting, one of the fluorescent tubes can be removed without any loss of available light.

In view of the efficiency of modern day video cameras, acceptable video recordings may be achieved without turning the interview room into an oven.

RECORDING EQUIPMENT

Almost all opinions published on tape recorded police interviews demand some safeguard system either to inhibit tampering or to guard against equipment failure. One such way in which these two safeguards may be achieved is by signal path-recording-equipment duplication. In the case of videotape-recorded evidence, the portion of the recording most open to challenge will be the voice recording. This being so, it is only necessary to duplicate the audio recording. In such a case, an audio recording device would be operated in parallel with the video recorder. In addition, with video, a digital Time and Date Generator should be incorporated into the camera system. With the generator installed, a continuous digital signal will be recorded on the video-tape. The generator display may be adjusted so as to appear at some convenient point on the viewing monitor. Any later interference with the video tape will automatically cause a discontinuity to the Time & Date recorded signal which will be apparent to the viewer.

The equipment recommendations for interview rooms exhibit some common ground in the recording of audio signals when compared with the video recording requirements. Both video recorder and audio recorder can be capable of recording a stereo audio signal.

While all electronic equipment is subject to occasional breakdowns, today's technology makes for some very reliable recording equipment, in particular, that from the better known audio and video equipment manufacturers.

In view of the difficulty of obtaining portable stereo audio tape recorders of high quality and medium price, as were once available, it is recommended that domestic stereo cassette decks be employed in their place. (It is acknowledged that both the Sony Corporation and Marantz produce excellent portable stereo audio recorders, however, given the financial strictures imposed upon most government instrumentalities, domestic cassette decks are the more economical alternative).

It would be imprudent to recommend specific makes and models of cassette decks since individual models change quite regularly. Known and respected manufacturing companies can generally be relied upon to keep in stock, sufficient spare parts to allow for in-house maintenance, even after several model changes. These same companies are usually well represented throughout Australia by people jealous of their company's reputation, thus assuring continued good service and support.

The 'cheap', almost unknown brand name purchase, can frequently turn out to be a long-term disaster when any sort of technical support is called for by in-house (police) technical service staff.

The same comments are equally true of video equipment purchases. For those forces required to video-tape interviews, while there are available on the market, extremely high quality and very expensive professional video recorders, excellent results can be achieved by the use of domestic video recorders, either VHS or Beta format. (Both the South Australia and the Victorian Police make use of VHS video recorders for evidentiary suspect interview statements with excellent results).

Regardless of the actual video recorder model selected, it is recommended that the video recorder should be capable of recording **two audio tracks**. The reason for the dual track recording is, as has been previously described for the audio decks, that, parallel recordings, in stereo, should be recorded on both the **video recorder** and the **audio recorder** and they should be recorded **contemporaneously**.

To provide the audio signals for these two recordings, the advice from overseas and from the South Australia Police would seem to recommend the **boundary effect microphone**. These microphones, over a wide range of circumstances, will provide excellent audio signals for recording. Two such microphones operating in stereo would provide outstanding recording quality. The Sennheiser Product Review 12, describes their model MKE 212 thus:

"The MKE 212 is an acoustic boundary microphone which utilizes the effect of increasing the sound pressure which occurs on 'live' surfaces and which does not absorb reflections from the surface into which it is fitted because it is flush mounted. With this special microphone, particularly transparent recordings with unusually broad spatial effect can be achieved - using two microphones as a stereo pair" ⁶⁰

However, as will be most obvious to anyone who has taken the time to look at the 'average' police station, (regardless of which Australian State is selected) it is difficult to find one which was apparently designed with the aid of an acoustic engineer.

The COMPROMISE mentioned previously, will frequently result in the development of an interview room, which is still far from perfect. In these circumstances there is a microphone alternative which from the outset, was designed to cope with a wide range of acoustic variation. The reason for this range is that the microphone referred to is a **hearing-aid microphone insert**. Since persons with hearing problems differ in their disabilities, **tailored-response microphone inserts**⁶¹ are available which are ideally suited to interview-room recording applications.

These microphone inserts require a low polarizing voltage in order to operate and the power supply for the microphones can be incorporated into the audio/video recording equipment console.

The tailored responses available enable the qualified audio technician to select the most appropriate insert to suit the acoustic response of the particular interview room. This in turn will result in equipment capable of producing the best audio recording with best possible intelligibility.

While the stereo recording signal is recommended as a dual safeguard (against tampering and against breakdown) it offers something, which to the courts is of infinitely more importance...**INTELLIGIBILITY**.

If the original recording is not intelligible, the transcript typist will not be able to transcribe the tape fully. The magistrate or judge and jury, will not be able to understand the tape when replayed in court and will gain little comfort from the incomplete transcript.

Much room for argument will exist from a tape recorded in this way, and there will be considerable waste of court time instead of the so-often-proclaimed time saving. There is a strong possibility that the tape may not be admitted into evidence at all, thereby creating a further waste of time, effort and expense.

The Victoria Police Pilot Study on suspect-interviews tape-recording currently underway, has provided for instances where portability of recording equipment is necessary. A professionally-constructed shockproof carry-case,⁶² was commissioned which accommodates two cassette decks, one above the other, a microphone power supply and twin electret-condenser microphones built into the inside front of the case. In the lower section of the case is located a small drawer for the carriage of head-phones, spare tape etc. A similar scheme may interest members in other States with remote police stations and where little need exists for permanent interview-room equipment installations.

Pressure has been applied in Victoria to have suspect tape recording commence at the point of arrest (or interception if not an arrest). This of course, gives rise to the selection of a suitable tape recorder with which to arm the police officer while away from the police station.

If one ignores all the other equipment that the modern police officer has to transport in his/her daily tour of duty, one might be forgiven for believing that a small, standard compact cassette recorder would be no burden. Not all police officers carry all the equipment available to them all the time. If however, legislation required that a tape recorder be at the ready all the time, then it must possess certain properties.

Not the least of these properties will be that it must be **small** and very easily **portable**. Even this is not sufficient. Portable, suggests only that it must be capable of being carried in the hand. The officer just may need his/her hands for something else, such as self protection, writing a ticket, operating a torch etc. The recorder therefore, has to be capable of being conveniently carried on the person.

The 3M company, in its development of the 3M TPR System has produced a uniform leather carrying pouch in which to both carry and operate their TPR recorder system. Its design blends well with the design of some gun holsters and most VHF/UHF portable radio pouches (in particular, the Motorola type).

Regardless of the recorder type selected, it obviously must be capable of being carried in the pocket, or in a specially-designed pouch.

There are tape-recording devices designed for easy transport and concealment about the person. Those from the Swiss-based manufacturing company, Kudelski, manufacturers of the **NAGRA** range of recorders (including SN, SNST and JBR), are so designed. The cost of these recorders however, precludes any government from equipping all its investigators with NAGRA recorders

A choice made in Victoria, many years ago, has shown that with user education, the **MICRO-CASSETTE** range of recorders are a valuable aid in suspect and witness interview recording.

It may well have been the convenience of the size of the MICRO-CASSETTE format, which caused the 3M Company to choose this type of recording format for their TPR System.

The micro-cassette recorders are now available as two speed models, capable of producing a one hour recording on each of two sides of the micro-cassette. When operating at the faster speed, while demonstrating an expanded frequency response, only thirty minutes of recording per cassette side is available.

Any Force intending to move towards large scale use of recording devices for suspect and/or witness evidentiary recording, must consider two vital requirements.

- (a). qualified technical support,
- (b). user education programmes at all levels.

The introduction of staff in area (a) will lead to the continuous availability of either lecturers or lecture material support for area (b).

The Victoria Police have had formal lectures by technically-qualified personnel since the mid-seventies for all staff in training at the Officer Training College at Airlie, the Detective Training School and the Sergeant's Course .

Due to the manner in which recording was introduced into Victoria in the late 1960's, initially only detectives were ever required to tape-record evidence. As the use of recorders became more wide-spread, the lectures were extended to Officer training and later, to Sub-Officer training. So extensive is the use of evidentiary recording now, that consideration should be given to the introduction of lectures at basic recruit level. These lectures should be continually reinforced at sub-officer, detective and officer training levels.

The technical training recommended may be extended to cover many areas, as is the case in Victoria. Alternatively, just bench maintenance and only basic tape duplication may be deemed necessary.

The development in Victoria may prove to be a guide to other States, particularly in view of the use to which other States put the Victorian service.

Apart from an extensive service area for both audio and video equipment, two audio recording processing laboratories are staffed full time, (40 hours/week). The work carried out there ranges from basic tape duplication, duplication with format change (from micro-cassette to standard cassette) audio signal enhancement for greater intelligibility through to the actual production of recordings produced by the qualified personnel rather than other unqualified members of the force.

'Impact Noise' is commonly found on evidentiary recordings, frequently tending to inhibit intelligibility and making accurate transcription almost impossible. Hugh FASTL in his paper entitled "Temporal Masking Effects"⁶³ describes the effects on the listener regarding intelligibility, due to pre and post masking created by impact noise. Much can be achieved by qualified personnel in a well-equipped laboratory to edit out much of the impact effect, thus rendering the tape-recording more intelligible.

Still in the audio area, a laboratory is available for the authentication of magnetically-recorded signals and, over the years, have examined some noteworthy recordings.⁶⁴ It is doubtful that each State introducing the use of evidentiary tape recordings, will require such a laboratory, however, there should be more than just the present one in Melbourne.

Still in Victoria, there is a sophisticated video-tape processing laboratory capable of processing up to Broadcast Standard video tape (High Band U-matic). The Unit is staffed by qualified personnel, on call, twenty-four hours daily for the production of video-tapes of crime scenes, crime re-enactments, and suspect interviews recorded on video (presently restricted to the Homicide Squad). In addition, the staff give technical support, in the field, to the Drug Squad and to other specialised personnel.

In the video laboratory, tape copies are produced as working copies for the squads' reference and master copies are secured in a strong-room. Format change copies to VHS, Beta, Video-8, U-Matic and High Band U-Matic are possible. Photographic Polaroid prints and sensitized paper monotone prints are available from digitally-stored images from any of the video-tape formats.

The video unit also operates the control point for the video broadcast transmission/receiver systems which can be operated either from land-based video transmitters or signals transmitted from the police helicopter.

The overall audio/video technical support in Victoria has been developed over a period of years, commencing in 1974. The present day total cost of such a development could prove prohibitive for any government to introduce within a single fiscal year. The reality is more likely to be towards a more gradual introduction of technical personnel for maintenance and tape processing on a more humble scale, at least in the first instance.

The reports written on the subject of 'tape-recording police interviews' frequently ignore the fact that technical problems can, and frequently do, impinge on an otherwise 'perfect' recording. There is a tendency to imply, that most people own and successfully operate a tape-recorder at home, and therefore, no difficulties will be experienced at work!

The truth is far removed from the above statement and the workload in the Tape Laboratory in Victoria since 1974 bears testimony that in Victoria, and in almost every other State the police have frequently needed technical help with evidentiary recordings.

Investigators have many things to consider during the normal course of a day's work, and the last thing they need is to have to worry about is the condition of the recorder's batteries or if the recorder is in fact working properly. The rest is taken for granted after all 'reasonable' care has been exercised.

The results can often be disastrous. Batteries that appear to be all right at the commencement of the shift decline rapidly when under load while the tape-recording is being produced. Slight distortion becomes apparent on the recorded signal followed by the slowing down of the motor transport system moving the tape. As the condition of the batteries declines even further, distortion increases and tape speed variations become more of a problem.

Some time later, the investigator receives the first indication that he/she has a problem. The tape refuses to play-back until the batteries are replaced. After the new batteries are inserted, the quality of the recorded material is fuzzy in play-back followed by an apparent increase in tape speed and voice pitch. Before long the recording sounds more like the voice of a cartoon character and is totally unintelligible.

An isolated example? Not at all. In fact a very common problem with recordings produced during investigations in quite a number of States. Much of the information which exists of the recording can be recovered - **by technically-competent personnel who are adequately equipped.**

Stringent budgets imposed on various forces have introduced problems where members have been forced to buy the cheapest possible cassette tape. Not only is the magnetic tape inside the case of poor quality, but the packaging itself is cheap and there is just no way that the tape can run smoothly during record or replay. Many of the problems associated with faulty or poor quality magnetic tape are discussed in depth in a publication by the National Police Research Unit, June 1987.⁶⁵

Is not unknown for a recording to have been recorded on one recorder, the record head of which was slightly out of alignment, and be played back on a second recorder. Since the two record/replay heads were out of alignment with respect to each other, there may be little or no signal evident in an attempt at replaying the tape-recording.⁶⁶

When dealing with recordings which have their origins outside the Force, the recording instrument may be in any condition at all and may have suffered much abuse from children or the adult owners. The actual tape used in an evidentiary recording may have already been recorded on many times and may have suffered from prolonged storage in the high internal temperatures which can be experienced in a motor vehicle.

As a result of prolonged poor storage conditions, considerable oxide shedding may have occurred leaving precious little oxide with which to record the signal. A common fault with many privately-owned tape recorders is the lack of cleanliness to the record/replay head area. This area can be heavily contaminated with an agglomeration of oxide, dust and lubricant.

Any portion of this residue which finds its way across the head of the recorder during the recording process, will inhibit the recording to some extent.

Since recordings of such dubious quality as this are frequently the possible source of cogent evidence, it is necessary to have available to the investigators technically-qualified personnel capable of rendering such tapes usable.

Confronted by some of the problems outlined, the technician could rectify speed variation faults by copying the original material onto an open reel recorder, the speeds of which are continuously variable (Nagra T.R.V.R.). The tape could then be replayed while necessary speed adjustments were made and a copy produced. Continuously-variable speed problems require the technician to 'ride' the speed control throughout the copying of the tape, but rectification is still often possible.

Low-level tapes caused by faulty microphones, badly placed microphones, dirt on recorder heads and a variety of other faults, can be corrected by copying the original tape through an amplification circuit, usually with some degree of equalization. (Amplification of selected frequencies rather than broad-band amplification is necessary).

Tapes that have been ripped from the cassette housing and broken repeatedly, even hundreds of times and then flushed down the toilet have been recovered, cleaned, reconstructed and rendered re-playable.⁶⁷

Education within the individual force units will serve to eradicate many of the problems which can occur in police interview-room tape recordings, as well as recordings made elsewhere.

Investigators should be made aware that doors and windows need to be closed; a fellow member in the adjoining office with the radio tuned to the races should be instructed to turn down the volume; type-writers should be banned from all interview-rooms or should never be used while tape-recording; persons within the interview-room area should be aware of the effect of tapping an aluminium drink container lightly on the desk during conversation. (The high frequency content of such a noise can render a voice recording totally unusable).

Self control by the investigator regarding over-talking the suspect while recording is in progress is required. This is particularly true in instances where there are two or more police officers in the interview-room with the suspect or witness.

WHAT CAN BE ACHIEVED IN THE PROCESSING LABORATORY?

The perfectly-recorded, completely-intelligible audio tape recording is only ever handed into the audio laboratory to be duplicated for security purposes!

The 'horror story' tapes usually arrive in quantities rather than singularly. They arrive between 8am and 9am and are required for presentation at court at 10.30am that day.

In audio tape processing there are practical limitations regarding that which is possible and that which is not. There are also limitations of time. Sometimes, this is a little difficult to explain to the 'man in a hurry'.

A tape which displays, either a single fault or multiple faults, has first to be listened to in its entirety. Only following such an examination could any correction procedures commence. It may be, that various faults in the one tape require a variety of techniques to correct them. Such an exercise can frequently not be undertaken in a single pass of the tape.

It follows therefore, that a thirty minute recording with a couple of minor faults could take up to two hours to rectify.

Simple duplication of standard compact cassettes can be performed on **high speed duplicators**. They frequently operate at up to eight times the standard tape speed for cassettes and copy both sides 'A' and 'B' simultaneously. Effectively, the entire tape can be duplicated in a sixteenth of the time taken to play at normal speed. In addition, tape duplicators come in a variety of multiples. That is, they will accommodate the original and two or more copies simultaneously.

Open reel tape duplicators are of course available, but are more frequently found in commercial enterprise and are used in the production of domestic music tapes, as well as in recording studios, radio and television stations.

At this time, the only commercial tape duplicator to accommodate **micro-cassette** tape, of which the writer is aware, is marketed by the 3M Company as part of their 3M TPR Recorder System package.⁶⁸

The most frequent workload of the sound laboratory is cross-dubbing from one format to another, usually from micro-cassette to standard cassette. This type of operation may also include Mini-cassette to standard cassette and Nagra SNST (or SN) to standard cassette. Since these operations may only be performed at **normal** speed, frequency equalization may also be more easily performed at the same time.

In some areas, open reel tape-recorders are still in use, and while transcription from open reel tape recorders is quite feasible, most transcription typists employ standard cassette transcription recorders. For this reason, open reel tapes are frequently dubbed down to standard cassette to facilitate transcription.

In Forces where VHS video-recording is carried out, it would be possible to cross-dub from the VHS tape to a standard cassette that portion of the recording contained on the audio tracks. Transcription from VHS or Beta recording tape, while probably not impossible, is definitely **NOT** recommended. The repetitious operation of the **PLAY** and **REWIND** functions of the recorder would ultimately cause tape transport problems within the cassette. This in turn could cause the tape to break.

As already mentioned earlier, the tape speed variations which occur commonly as the result of slight variations in the individual recorder tape speed adjustments, may give rise to slight speed correction during copying. More severe speed degradation resulting from equipment malfunction can also be corrected but is a more time-consuming exercise.

Since the primary aim of an evidentiary tape recording is that it may be later played back in court **and be understood** by the court, frequency equalization is a common request. This operation does nothing to the original material but imposes various levels of amplification to selected frequencies (the voice frequencies) The same process also allows for levels to be **cut** instead of amplified when necessary. In its simplest form, this operation is performed by a **graphic equalizer**.

The next stage up in sophistication in equalizers is the **parametric equalizer**. This device permits greater flexibility with individual frequencies, permitting the centre frequency of the particular band selected to be varied plus or minus several Hertz. It also allows for **boost** and **cut** of individual frequency bands.

In audio recorded conversations where there is wide variation in dynamic range between the two voices (one voice is vastly more loud than the other) a **compressor-limiter** is used. The effect is that the perceived difference in loudness between the two voices is less widely separated. An un-corrected tape when replayed in court must be played at a high volume in order to hear the **quiet** voice. When the **L O U D** voice speaks the result can be 'ear shattering'!

Advanced de-convolution processing of voice recordings can often be carried out by means of computer-based technology. Faulty recordings where the voice is well recorded except that due to some technical fault an equally loud **mains hum** is recorded, causing the speech to be absolutely masked, can be corrected using this technology. Frequently, recorded degradation cannot be improved in any way using **analogue** means while the **digital** technology may restore it completely.

Although not so common, tape breakages and tape twists in cassettes and micro-cassettes require repairs from time to time. The standard cassettes, the cases of which are screwed together, are a simple matter to separate. After repair, the technician should immediately copy the original and issue a recommendation against the original being again replayed before court presentation.

Cassette tapes and micro-cassettes, the cases of which are welded together, must necessarily be forced apart. After repair the tape can be restored in a cassette shell secured by screws.

In the conduct of some interviews, questions may be asked or comments made, which are later deemed to be prejudicial to the accused when the tape is replayed to a court. The judge may order that any such prejudicial words be deleted from the tape. The preferred method of carrying out such an instruction from the court is by editing. The technician is first provided with a transcript of the taped conversation with the offending words clearly marked. An open reel copy of the recording is made and the required passages are physically cut out with a razor blade.

The re-constituted open reel tape is then dubbed down to a standard cassette which may be replayed to the jury without prejudice.

I have already mentioned 'Horror Tapes' which arrive, usually in quantity, and invariably with a sense of urgency.

All police organizations operate crime intelligence groups within their crime squads and, without denigrating their unselfish and totally dedicated efforts in any way, in many cases, the horror tapes referred to earlier, emanate from within these groups.

The reason is simple. These groups are usually primarily concerned with gathering INTELLIGENCE and if the whole the tape recording is not too good, it usually doesn't matter. The purpose is generally served with the availability of vital information about criminal movements and activities.

The problem arises , however, when the intelligence becomes EVIDENCE. When this occurs, a Crown Law Department Prosecutor has generally heard the quality of the tapes and ordered that they be 'fixed up' as quickly as possible. The effect of this instruction is then a detective staggering into the audio tape laboratory with a large card-board box containing 150-200 cassette tapes, each tape necessarily requiring individual processing in an attempt to fulfil the instruction.

These statements may sound exaggerated, but this scenario has been repeated many times in the Victoria Police Audio Visual Division and has probably occurred in many other laboratories as well.

Good technical support is necessary at all levels in the production of magnetically-recorded evidence.

PART V

AUTHENTICATION OF MAGNETIC RECORDINGS

The expectations of the authorities regarding all magnetic evidentiary recordings, audio and video, is that they should be 'authentic', that is, that they should not have been subjected to any form of alteration which changes them from their originally-recorded state. An audio recording tape protective system has been introduced onto the world market by the 3M Company under the trade name, "3M TPR" (Tamper-Protected Recorder System). At present, the system is restricted to operating in the Micro-Cassette format on specially-prepared Scotch (3M) MC60 micro-cassette tape. The tape operates at the standard micro-cassette speed of 2.4 cm/second and provides 30 minutes of recording per cassette side on a Field Recorder. The same tape recorded in a 'Station Recorder' (in-house operation) provides a total recording time of only 30 minutes per tape (using only one side of the tape).

The system is protected by a digital, encoded signal which is developed proportionally with the 'voice envelope' of the signal being recorded. Encrypted within the total recorded signal is the time, date, and recorder identification serial number as well as other data essential to the 'verification' system.

The tape may be 'verified' by means of a specially-developed '3M Verifier' which contains a tape replay unit, a miniature video screen and a paper printer to facilitate the read-out of analysis results. The operation of the 'verifier' provides the user with an immediate indication of any data variation or interruption to the recording under examination. A more sophisticated analysis facility is available which incorporates computer software with an I.B.M. PC.

The system works well, and provides excellent conversation recordings in average surroundings. It suffers the same disabilities that all similar recording devices suffer, in that, as a microphone-tape-recorder chain, it is not discretionary. It hears and records almost everything. (The system has a cut-off frequency of approximately 4Khz) Sometimes, it is the 'everything' that makes the resultant tape recording unintelligible. It therefore is capable of recording a tape which no-one can freely tamper with, but which, in the event of unintelligibility, may still not be usable as evidence.

With so much documented argument and authoritative opinion in favour of recording equipment protected from outside interference, there would seem to be a need for technology such as the 3M T.P.R. System. The technology required however, comes at a price. The development of the 3M system, over several years employing many highly-qualified personnel in design, engineering development and marketing, has been costly. At the time of writing, there appears to be no similar product available on the world market.

The operation of this type of technology by police, may go some of the way towards satisfying the demands, emanating from all areas, for a 'self-authenticating system'.

In view of the unavoidable cost of such sophisticated technology on the one hand, and the financial strictures imposed on most Australian police forces on the other, one might imagine that a simple but **tight administrative exhibit control system**,⁶⁹ to be an attractive alternative.

Manual administrative exhibit controls also bring with them a price which usually involves the introduction of additional paperwork, forms, labels and registers. This presents an unattractive prospect for a government instrumentality already burdened with too much paper. Tighter continuity controls complemented by a **computer-based exhibit control system**,⁷⁰ could however, go a long way to satisfying many of the protagonists for the police use of tape-recorded evidence, at least in the area of ensuring against tampering with such evidence.

In June 1984, The Criminal Law Review Division made recommendations regarding safe custody of tape recordings which are open to serious debate⁷¹. The proposition that an unstaffed magistrates' court building, over-night, be a safer venue for the storage of evidentiary material than the present practices involving storage in secure police environments can hardly be taken seriously. Such a suggestion invites the conclusion that an in-depth knowledge in security measures, is lacking by the writers.

There is no dispute regarding the basis of their argument however, which is that tight control is necessary for all evidentiary material, including magnetic tapes.

It is interesting to note that the Criminal Law Review Division, in 1984, included among their recommendations to the New South Wales Attorney General, that the preferred option for the equipment required to record suspect interviews, was videotape recording technology.

Indeed, in the 1984 report the writers go so far as to say:

"However this problem may be less serious with video recording because it enables more of the behaviour of the participants to be seen, thereby enabling a more accurate assessment of the demeanour of the parties than audio taping can provide".⁷²

The arguments contained in the New South Wales Institute of Technology report of June 1986 are clearly biased strongly against the use of videotape technology. Such arguments as: "self incrimination; ... the impact on the legal profession; ... suggested increase in convictions (based upon overseas experience); ... the danger of the viewer stereotyping the videotaped suspect; ... the dangers of staging and 'body language'" are also included.⁷³

In all these reports, there appears to be an over-riding pre-occupation with trying to design a 'tamper-proof' recording system, while at the same time stating, that if video recording is used, conditions inherent in the video recording technology employed, will make tampering, if not impossible, very easy to detect. This oft-repeated misnomer 'TAMPER-PROOF' deserves some additional consideration.

ANY MAGNETIC RECORDING TAPE CAN BE TAMPERED WITH!

The trick is to tamper with the tape in such a way that it might be judged authentic after scrutiny. The 3M Company might well have called their system the 3M S.A.S. (Self-Authenticating System), for indeed, that is exactly what the system does.

The 1984 Criminal Law Report states:

"The type of video equipment which is most suitable for recording interviews and for other police purposes is the portable model which incorporates the recorder in the camera. This equipment is durable, simple to operate, portable and has qualities which make it difficult for falsification and tampering to occur."⁷⁴

Also, at para 12.5 :

"Video equipment is much cheaper and, if sufficient care is taken in formulating rules of practice relating to the conduct of interviews and the custody of recordings, there should be no cause for concern that tampering, if it occurs at all, will not be able to be detected."⁷⁵

The report goes on at para 12.10 :

"Secondly, the tape itself should have a coded message recorded on it which would be erased if the tape were wound back and the recording of a previous interview erased. The absence of this coded material would be prima facie evidence that the tape has been tampered with."⁷⁶

The statement that video equipment is much cheaper is rather at odds with the requirement for the purchase of specially-encoded video tapes, and why the need for any of this when the '...equipment has qualities which make it difficult for falsification and tampering to occur'(sic)?

The requirement and expectation of the court, the prosecutor, the investigator and the defence counsel, that any magnetic recording produced as evidence, be authentic is crucial. The first and most urgent consideration should be towards rigid exhibit control procedural guide-lines, regardless of any other 'tamper protected' facilities which are considered necessary. It is noteworthy, that the 3M Company, in their publications regarding the 3M TPR System, also recommend exhibit control.

If, in the future use of recorded police evidence, the 3M TPR system, or some other manufacturer's similar technique were employed and such evidence were to escape challenge regarding validation, what of recorded evidence emanating from persons other than police?

If magnetically-recorded evidence is to be regarded as admissible by the courts, certain criteria have to be satisfied. These include:

- (a). Authenticity and accuracy;⁷⁷
- (b). Originality,⁷⁸ and
- (c). Voice identity.⁷⁹

These are the legal requirements. In practical terms, how are we to meet these criteria?

In any discussion on magnetic evidentiary recordings it is as well to divide the subject into two practical and logical fields, **controlled** and **un-controlled** tape-recordings.

A **controlled** tape-recording, might be the type of recording which is produced in a police station, equipped with a specially-designated Interview Room. This room, having been professionally equipped with a magnetic recording instrument which, it can be shown, has been operated according to strict procedural guide-lines.

An un-controlled tape-recording, might be the type of recording produced by a person who used a concealed tape-recorder which was operated in a crowded area such as a hotel bar-room. In such circumstances, there can be no control over the content of the conversation captured by the recorder, neither can there be any great degree of control over the duration of such conversations. Tape-recordings originating from the operation of listening-devices might be similarly considered as un-controlled. The same must be true of telephone intercepts since only half the target is controlled; the content of conversation together with duration, are both uncontrollable.

Throughout the police forces of the Western World, various techniques are employed in an endeavour to satisfy all three criteria set out above, but in particular, (a) and (b).

Detective Chief Inspector R.J.J. PIERCE, of the Royal Hong Kong Police in an undated, internal report entitled "PLASTIC PERJURERS" states:

"The best and simplest method of proving that a tape recording produced in court is authentic is to show that it has been, since the time it was recorded, continuously in the custody of persons who assert that it was not tampered with."

There are of course, some who would suggest that Chief Inspector Pierce's method is not only simplistic but naive in the extreme. He is, nevertheless, correct. But since in the defence of an accused, little is sacred, particularly the integrity of a police investigator, if such integrity could be proven beyond question, such a method as Pierce suggests might succeed.

At page twenty-eight of his report, the Chief Inspector recommends:

"The ideal long term solution would involve the development of recording tapes that were tamper-proof. Such a method might involve the issue of sealed and numbered tape cartridges, perhaps issued by a court, which were protected against re-recording and splicing. To be effective these tapes would have to be so designed so that they could only be played back on special machines kept by the courts, thus avoiding the possibility of the tapes being copied and the subsequent copies falsified.

Another approach might be to implant information, such as a serial number, tape speed, elapse time, and the strength of the recorded signal, all along the tape, so that when the tape was played back on a specially designed machine capable of de-coding this information, any splicing, copying, transformation, deletion, obscuration, etc. would be instantly detectable." (This functionality is offered by the 3M TPR system)

Chief Inspector W. Wilson of the Planning Directorate, Northern Territory Police Force, reported in July 1986 to the Director of the National Police Research Unit, Dr. G. McGrath, regarding a recent tour of the British Home Office and Police tape-recording establishments in Great Britain,

"Experience in Scotland

At the start of the Scottish experiment in 1980, five interview rooms in Dundee and three in Falkirk were selected in each room, a bank of three NEAL FERROGRAPH 302 Cassette recorders were ganged together ... "and later ... 17 Hanimex Duplicorders were purchased for evaluation purposes, which were cheap domestic machines producing two identical cassettes ..." Later in the report, the Scottish Home and Health Department is reported as having drawn up specifications for interview recording devices and ultimately the previously used recorders appear to have been replaced by NEAL model 662C dual cassette decks.

Further south, the Metropolitan Police, Hampshire Constabulary, Leicestershire Constabulary, Merseyside Police, and Northumbria Police appear to have been equipped with the DMW 611/1307 dual recording decks".⁸⁰

The recording devices referred to have specifications which approximate those of the NEAL Interview Recording System.⁸¹

"The NEAL 6221/6224 tape recorder makes recordings on two cassettes simultaneously on two channels. A tape timer is incorporated to display the total time of recording on one side of the cassette. Channel 1 is connected to an external microphone.

On the model 6221, channel 2 is connected to an internally generated announcement of time of day and date.

On the model 6224, channel 2 is connected to an internally generated announcement of the time of recording displayed by the tape timer.

The recorder ensures that two cassettes must be inserted and running correctly in order to engage the record mode and that the signal and bias currents drive both recording heads. It is not possible to run only one cassette or to drive only one recording head.

An LED display shows the recording level on the microphone channel.

An internal alarm sounds if:

- (a). either cassette jams or reaches the end;
- (b). the cassettes have reached a point 2 minutes before the end;
- (c). the microphone channel has been silent for 30 seconds;
- (d). the recording bias oscillator has failed
- (e). for 15 seconds after RECORD has been selected.

Philips Compact Cassettes,⁸² are to be used in all cassette decks used for police interviews, the duration of which shall not exceed forty-five minutes per cassette side (C-90 cassettes)"

The Procedural Guidance published by the British Home Office in October 1983,⁸³ for the general guidance of Police Officers and others concerned in the use of taped interviews with suspects are comprehensive. While the details contained within the British Home Office Guide-lines are important to this discussion, they are too extensive to quote in full. With respect to AUTHENTICITY, ACCURACY and ORIGINALITY however, great emphasis is placed on the security of the master tape. At paragraph 2.7:

"The security of the master tape is a vital matter and the procedures in the guidance (especially section 11) have very much in mind the need to ensure, and be able to prove if necessary that the tape contains a true record of the interview.

2.8. The tapes to be used will be cassette tapes which will run for 45 minutes. Before use the tapes will be clean and sealed. To avoid confusion in turning tapes over they will be used on one side only"

The Section 11 referred to states:

11. Tape Security.

11.1 The provisions of this section are concerned with the security of the master tape which will have been sealed with an exhibit label at the conclusion of the interview. Care should however also be taken of working copies of tapes, since their loss or destruction may lead unnecessarily to the need to have access to master tapes.

11.2 It is recommended that each police station taking part in the field trials should make arrangements for master tapes should be kept securely and their movements accounted for on the same basis as other material which may be used for evidential purposes.

- 11.3 The seal on a master tape should not be broken except on the authority of a court. Where there is need to have access to a master tape before the case is before the courts application should be made to the clerk to the trial court in writing. The applicant should inform the other party, if the application is successful, and give the other party the opportunity to be present when the seal is broken on the master tape. If it is impracticable for the defence to be present when the seal is broken the seal should be broken in the presence of an officer of the rank of Chief Inspector or above who is not connected with the investigation in connection with which the tape recorded interview took place."

Despite the implementation of stringent guide-lines, it is obvious that it has been anticipated that challenges to the validity of produced evidentiary tapes will still be made in the courts. The Home Office Scientific Research and Development Branch Tape Laboratory at Sandridge, St Albans, Hertfordshire, offers to all British Police Forces, the following services:

- (a) Direct & enhanced copying of audio tape recordings.
- (b) Examining tapes for authenticity.
- (c) Examining tapes in support of police investigations.
- (d) Providing the means for making written transcripts.
- (e) Providing and installing replay facilities in the courts.
- (f) Giving expert evidence and advice.

So much for Authenticity, Accuracy and Originality in the British system, but what of VOICE IDENTITY?

The British Home Office reports that:

"...in some circumstances weight may be given by the court to a witness who knows the suspect's voice while in other circumstances the Home Office relies upon reputable phoneticians engaged from outside Government office circles."

Professor U.G.E. Hammarstrom (1985), in his paper entitled, "Voice Identification" quotes Professor Ladefoged of the U.C.L.A., the best known phonetician in the United States of America who concluded:

"Nobody knows how many individuals share similar characteristics. There are occasions when one can say that the voice on a particular recording is probably not the same as the voice on some other recording, and times when one can say that the voice on a recording could be the same as the voice on another. [...] In my view, it is completely irresponsible to say, as I have heard witnesses testify in court, 'The voice on the recording is that of the accused and could be that of no other speaker'."⁸⁴

Professor Hammarstrom characterises 'voice-prints' which are popularly employed in the United States of America, thus:

"The term voice print is a fanciful name for a sound spectrogram which is also called a sonagram. A sonagram provides a good representation of speech sounds in amplitude (or intensity), frequency and time."

Both Professor Hammarstrom and Professor Ladefoged are clearly at odds with Kersta and his disciples in the United States and elsewhere. Hammarstrom and Ladefoged rely instead on a panel of linguistic experts to reach an opinion regarding voice comparison.

In a paper entitled, "Status Report of 'Voice-print' Identification in the United States" Harry Hollien⁸⁵ attacks proponents of the "Voice-print", technique, particularly when it is relied upon as evidence in a court of law:

"Introduction

It is claimed by the proponents of "Voice-prints" that this approach to speaker identification now has been accepted by courts-of-law in 25 of the states in the U.S., by two U.S. Military Courts, plus two courts in Canada.⁽⁴⁵⁾⁸⁶ How could this situation occur in countries as technologically advanced as the United States and Canada? Perhaps more alarming, if the proponents of "voice-prints" are to be believed, their techniques soon will be accepted in several Western European countries, Israel, Japan and South Africa. Of course, whether their technique is successfully introduced into the courts of these countries remains to be seen. Never the less, the method appears to be spreading rapidly even in the face of numerous setbacks and the general disapproval of the relevant scientific community. Emotions Flare.

Without question, this controversy has produced a great deal of emotional dialogue in the relevant scientific community. Perhaps the reasons for these intense feelings is that this issue has severe social implications. That is, it does not seem acceptable that it should be possible to send an individual to jail solely on the basis of a procedure that many of us believe does not work. Small wonder then, that Hollien (55,59,61),⁸⁷ has testified he believes 'voice-printing' to a "fraud being perpetrated upon the American public and the courts of the United States" Not to be outdone, the proponents of 'voice-prints' have indulged in emotional outbursts also. For example, Truby (81),⁸⁸ has indicated that the tactics of those opposing 'voice-prints' are 'inappropriate and ethnologically anachronistic', 'hysterical', 'indefensible'; that their behaviours constitute 'outlandish demonstrations'; that they are 'misinformed' and have acted 'impetuously, naively, aggressively and ...dissidently'; that they are guilty of 'latter day book burning or worse'; exhibit 'professional ineptness', and 'engage in dissension for dissension's sake'. Apparently he also feels that anyone who opposes his beliefs on 'voice-printing' is engaged in 'some ill-designed witch-burning adventure and should be severely censured as a trouble-maker'. Indeed, the scientists who venture into the court-room to counter the claims of the 'voice-print' enthusiasts is made to feel that he is somehow equivalent to a person who believes the world is flat (this analogy actually has been used). However, it is never mentioned that for every 'new idea' that a given group of scientists incorrectly oppose, there are thousands that they appropriately discredit.

Nevertheless, no matter how inappropriate are these passionate outbursts, the fact remains that this technique is being accepted by a considerable number of courts. There appears to a number of reasons for this situation. Some of the more relevant will be discussed in the following sections....."

With the overwhelming arguments by the scientific community being against 'voice-prints', it would seem that in the event of challenges made in court concerning voice identity, the prudent course may be to either follow the British Home Office practice of engaging the services of a phonetician, or to follow Professors Hammarstrom and Ladefoged and employ a panel of experts.

I return now to the issues of Authenticity, Accuracy and Originality. If, as the result of tightly-controlled procedural guide-lines, police investigators are able to satisfy the courts that the chain of custody of an exhibit tape-recording is complete, that should be the end of the matter. What, however, if the accuracy of a recording is still required to be proved (R. v Ali & Hussain, 1966), regardless of proof of custody and procedures. What is possible and what may the courts reasonably expect?

FORENSIC EXAMINATION OF MAGNETIC TAPE

If there is a **Text Book** on the forensic examination of magnetically recorded signal on tape, then it must surely be the technical report prepared by a panel of experts selected by Judge J. Sirica, of the U.S. District Court for the District of Columbia, Washington, D.C., in the matter now known internationally as the "Watergate" affair.⁸⁹ In July 1973, it became known that the Office of the President of the United States of America was very expertly 'wired for sound recordings'. This fact was brought out in a statement by a Mr John Dean, a White House Counsel. It became apparent that the firm denials by President Nixon that he had prior knowledge of the Watergate break-in might be supported or negated by the production of such recording tapes.

On the 23rd October 1973, President Nixon agreed to hand over nine tape-recordings being sought by the court, however, two of the promised tapes were found to be missing. Another, containing conversation between Nixon and two of his senior aides, contained a gap in the recording of approximately eighteen minutes duration, during which only buzzing sounds could be heard.

The Advisory Panel engaged by the U.S District Court to examine these tapes consisted of some of the most eminent engineers and scientists in their particular disciplines in the United States of America, and included:

Richard. H. Bolt,
Franklin S. Cooper,
James L. Flanagan,
John G. McKnight,
Thomas G. Stockman, Jr. and
Mark R. Weiss.

In an Interim Report dated December 12, 1974 addressed to Judge J. Sirica, the panel states in part:

"The questions that we have been addressing are these:

Is this tape the original one that was recorded on June 20, 1972? Does it contain erasures or splices? Or is it a copy that has been edited by operations such as cutting and splicing before re-recording?

How was the 18 minute section of buzzing sounds produced? Was all the buzzing produced continuously at one time?

Can speech sounds be detected under the buzzing? If so, to what extent can the speech be recaptured and made intelligible?

In order to answer these questions, we must obtain information on many technical details. Toward finding the information, we have set up and started to use several tests and approaches described briefly as follows:

Critical listening: Using human analytical capabilities to check for anomalies in the signals recorded and for inadvertent signals such as hum, which might provide useful clues for studying the tape.

Flutter signature: a unique "finger print" that may help us to identify the particular recorder on which a given tape was recorded.

Bias signal: a high frequency tone that "carries" the audio signals on a tape and may help us to identify the recorder and recording events.

Magnetic images: direct visual observation of "developed" tape to find track widths, the type of recorder used, and the presence or absence of residual speech signals.

Physical measurements: lengths of tapes and presence or absence of physical splices, to provide further evidence on tape integrity.

Long-term frequency spectra: sensitive analysis technique to help in characterizing the acoustic quality of the buzzing sounds and in identifying their source.

Computer processing and graphic display: sophisticated technique for analyzing frequency spectra, start and stop transients, and other features of speech and noise.

Voice operated switch: measurement of operating characteristics of devices used in the White House recording system, for our use as signature information.

Recorder performance: various electrical and mechanical measurements of standard and modified recorders for use in finding possible origins of buzz sounds, hum, etc....."

The final report sets out the foundations of a 'new science' in magnetic tape analysis and is the 'first reference' of many persons now working in this new field in Australia, New Zealand, Great Britain and of course, the United States of America.

In the early months of 1974, a new technical group named the Audio Section was formalised within the Victoria Police.

The initial responsibility of this new group, was to improve the standard of magnetic tape recording within the force, and support the use of this technology in all areas of its use.

Audio tape-recorded evidence originates from many sources, some of which cause concern to prosecutor and defence counsel, alike. For these reasons, an audio magnetic tape analysis facility was developed with the assistance of the Los Angeles Police Department, the Management and Staff of A.A.V., Melbourne as well as many Australian acoustic and audio design engineers and university academics in both Victoria and the Australian Capital Territory.

With Victorian Government financial support, the necessary equipment was purchased and an analysis capability developed. Included in the purchases were the U.S. computer-based NORLAND Waveform Analyzer and peripherals including disc-drive, printer and X-Y plotter. A Polaroid camera to capture images displayed on the analyzer screen was also purchased.

A Bruel and Kjaer chart recorder coupled to a measuring amplifier and band-pass filter set was also purchased.

Magnetic tape recorded signal development was made possible using a special solution which is applied to the surface of the tape. After the evaporation of the solution, the tape is photographed using a 35mm camera fitted with a Macro lens. The 35mm negatives are enlarged to 10" X 12" by the State Forensic Science Laboratory Photographic Section for subsequent examination and/or production in court.

The procedure which is adopted in all cases where a magnetic tape is to be examined with a view to the possible presentation of evidence in court is as follows :

VISUAL EXAMINATION OF TAPE

All test equipment and recorders checked.

One to one copy made of exhibit.

Working copy prepared for transcription. This copy may require equalization for clarity.

Transcript of recording prepared for use as time log of events during analysis.

Visual examination of exhibit tape including:

- (a) Is it physically damaged?
- (b) Does cassette shell appear to have been opened?
- (c) Are there breakages in tape or leaders?
- (d) Do tape-leaders comply to manufacturer's specifications?
- (e) Does playing-time of tape comply to the specification limits?
- (f) Does the actual tape conform to the manufacturer's specifications?
- (g) Any evidence of splicing (edit block or welding method)
- (h) Was it possible to purchase the exhibit tape at the time recording said to have been made?

AURAL EXAMINATION OF TAPE

(Critical listening) Tapes Examined for:

- (a) Clicks,
- (b) Pulses,
- (c) Transient events,
- (d) Perceived echos,
- (e) Multiple recordings,
- (f) Fade-outs,
- (g) Ambience consistency,
- (h) Signal level changes,
- (i) Compression/Limiter action,
- (j) Overdubs,
- (k) Discontinuity in conversation,
- (l) Reverberation, natural or induced, Consistent,
- (m) Speed variation in recording,
- (n) Recorded hum, continuous?
- (o) Gut feeling for recorded content, does it 'sound right'?

Note: Some of the most difficult tapes transcribed in Victoria could only be handled in laboratories with special facilities. Monaural recordings were sometimes converted to quasi-stereo recordings in an attempt to enhance intelligibility. In his autobiography entitled "Spy Catcher", Peter Wright, the former Assistant Director of MI5 describes similar techniques:

"Microphone transcription is difficult because you usually only have one microphone source for a multichannel conversation. I decided to design a piece of equipment to ease this problem. I went out to an electronics exhibition at Olympia and bought a tape machine which provided two heads. The second head gave a constant number of milliseconds (or more) delay on the sound as it went through, making it much fuller bodied. In effect it simulated stereo sound, and made even the worst tapes easier to understand. I installed the equipment on the seventh floor, and it made me a friend for life in Mrs. Grist. It was my first small victory of science".⁹⁰

Similar procedures can now be achieved employing digital delay lines.

During these stages of examination, the tape is replayed a great many times during which noted events are timed and recorded on the working copy of the transcript.

Using the Bruel & Kjaer instruments, a chart of the entire recording is run, usually at a 'paper economical' speed at this stage, to highlight level variations and transient events.

Having identified areas of tape which require closer examination, chart paper speeds are increased to obtain greater definition. At this stage, the Norland Waveform Analyzer is employed to capture and store signal data of interest. These might include:

- (a) Head signatures for comparison with the reported recording instrument.
- (b) Dynamic range and rise time of transients,
- (c) Lowest level of signal on tape, bias erase noise, virgin tape noise.
- (d) Noise measurements of unrecorded tape.
- (e) Comparison of Record Off transients (if several available).
- (f) Presence of mains hum. Is it constant?

The tape may then be developed with a substance such as Magna-See for viewing the track configuration and alignment, switching signatures, mono or stereo heads and tape skew at Pause Control operations.

At the completion of the examination a comprehensive report is prepared for the investigator, prosecutor or court, as the case may be.

These services have been available in Victoria since the mid 1970's and have been freely used by most other State police forces. Much of the equipment and methods detailed above can be replaced by a computer processor such as a technical **COMPUSCRIBE** workstation which employs digital techniques. The Australian **COMPUSCRIBE** system can produce a 'road map' plot of the recording in a far more economical manner than existing methods. (see also Reference 42)

Suggested definitions of controlled and un-controlled tape-recordings were highlighted earlier.

In the preparation for the analysis of magnetically-recorded evidence, presumptions might be thought of as ill-advised. They are, nevertheless made in some instances, particularly in the case of a recording made under controlled conditions. The precise recorder may be known. The precise venue may be known. In the cases of the South Australia and Victoria Police at least, the microphone installation, location and type is known. The magnetic recording tape quality and type specification are known.

In such circumstances, it is not too unreasonable to assume that certain results will be found upon examination. If the expected is not found, something is indeed wrong.

In the un-controlled recording the analyst starts with very little information, as a general rule. It is not unusual for the whereabouts of the original recorder to be unknown. Frequently, very little information is forthcoming regarding recorder type. The label identifying the brand and type of magnetic tape is frequently unavailable. Due to the nature of the inquiry, there is usually no opportunity (or it may be deemed inadvisable) for the analyst to speak with the person who made the recording.

Consider the differences between these situations and the information demanded by, and made available to the panel of experts in the Watergate affair; not that their task was any the less challenging.

The list of technical equipment required in magnetic tape analysis, is both formidable and expensive. There are, however, occasions when little or no equipment at all is necessary.

During the "Age Tapes" inquiries in Australia, it seems that there were 'Age Tapes' and 'Age' tapes.

The Victoria Police Audio Laboratory was requested to examine three cassette tape-recordings. They were duly delivered from 'inter-state' by the police custodian and the basic stages of examination commenced.

In view of the information which had been freely available in both the press and from other sources at that time, a time scale for the production of 'the tapes' was easy to arrive at.

The tapes were very new in appearance and while 'old' tapes may still appear in an 'as new' condition, it seemed prudent to investigate the longevity (a reluctance here to say 'Age') of the exhibit tapes.

The cassettes bore the labels of the TDK company and the head office of that company in Sydney was contacted by telephone. Once advised of the batch numbers stamped on the shell of the cassette, TDK Australia quickly informed us that the tapes were less than twelve months old.

What had first been delivered back to Melbourne, were the 'Age' tapes. Later information pointed to the fact that journalist from the Age Newspaper had made copies of the tapes, no doubt, as a precautionary measure and it was these copies which had been delivered for analysis.

In another tape analysis, hard evidence existed that the recording had been produced on a cassette-radio system which was not stereo-capable.

During the examination of the tapes' magnetic tracks, (through employing the Magna-See solution) there appeared a short portion of clearly-defined STEREO track. As with the previous example, very little equipment was involved if one ignores the photographic stages usually employed in this type of examination.

In another case, on the other hand, there was one micro-cassette tape from a State other than Victoria, insignificant enough in appearance, which had been produced, as it turned out, through visits on a variety of occasions, to the office of a motor transport repair depot. (See Reference 40).

With this tape, came scant information, but the results of the analysis were quite interesting.

The person who originally produced the tape recording, while talking with another man, was attempting to turn the course of conversation towards a particular subject. He only required matters pertaining to that subject to be present on the tape. It turned out that it was impossible to obtain the required information all in one visit. The solution to his problem, was to repeatedly return to the same office and engage the other man in conversation whilst on each occasion attempting to control the course of the conversation. When the conversation was steered in the required direction, the recorder was activated.

This practice continued over an extended period and filled almost both sides of the tape. The eventual total of recorded interruptions exceeded a dozen. The examination required all the equipment available in the Melbourne laboratory to complete the task including many days of work. And what happened to the offender - he was charged with making a false report to police.

Magnetic tape-recorder identity is often a matter of some concern to the courts and this can often be arrived at by a number of tests, or rather, the proof of the identity is the sum of a number of tests.

The Watergate investigation into the White House Tapes in no way introduced the phenomenon of 'flutter' to the technical world, for it had been a well-recognized cause of concern for many years. The documented analysis of the various tape recorders within the White House regarding the differences which existed between the various tape-recorders highlighted the phenomenon.

Technical Note 6 of the Final Report to the District Court introduces the subject:

FLUTTER ANALYSIS FOR IDENTIFYING TAPE RECORDERS.

"1. Principles

When a magnetic tape is moving at a constant speed, a recorded signal having a constant wavelength is reproduced as a constant frequency. In reality the tape drive mechanisms of all tape recorders have mechanical imperfections that cause the tape speed to vary slightly above and below its average value. The constant-wavelength recording is reproduced as a slightly varying frequency because the reproduced frequency is directly proportional to the reproducing speed. In other words, the signal is frequency modulated by the speed variations [1]. This effect is well known in the field of sound recording, and explained in detail in the references to this technical note....."91

From the reference in the above text it can be seen that the awareness and the analysis of flutter in magnetic tape-recorders is by no means new, as the quotation comes from an article published in November 1935.

In view of the variety of revolving circular components inherent in a magnetic tape-recorder, any or all of which could be slightly out of true, any analysis of this area alone could provide considerable evidence leading towards positive proof of recorder identity.

Another area of interest is the recorded track pattern left by the magnetic head of a tape recorder during the recording process

In the examination of tape recorder record, replay and erase heads, it is not unknown for a minute imperfection to have occurred during the manufacturing process. It is also possible that faults may develop within a magnetic head while in use during the life-time of the recorder.

The technique used in retaining magnetic heads in place inside tape recorders varies somewhat. The difference is particularly noticeable between domestic and studio or laboratory tape recorders.

Despite these differences, in all cases the location of the individual heads may be varied through several planes. These settings, once made by the manufacturer or service technician, are usually locked into position by means of a lock nut or a varnish-like substance solution. In the normal course of events, once set, these heads should not be able to move during normal recorder operation. The exact dimensions of the recorded track configuration with respect to one edge of the tape and one head against the other, can be measured and compared against a test tape in an analysis.

It is possible to view the recorded tracks (as well as the erased tracks) by the application of a special fluid. Technical Note 1 of The EOB Tape of June 20, 1972, describes the technique thus:

"MAGNETIC MARKS AND THEIR RELATION TO RECORDER FUNCTIONS AND CONTROLS.

Magnetic Marks

1. 'Magnetic Marks' is a term we use to describe the visible patterns appearing on a magnetic recording tape that has been "developed" by a fluid containing microscopically fine iron particles. The magnetic marks appear on the oxide surface of the tape, the side that is touched by the record and erase heads, wherever the iron particles collect in the vicinity of the magnetic poles produced by the recorded magnetization.

This development technique resembles a technique used in elementary science laboratories, when iron filings placed in the vicinity of permanent magnets demonstrate the shape of the otherwise-invisible magnetic field. The principal difference in the case of magnetic marks produced on recording tape is that the iron particles are very much smaller than the filings used in the science laboratory. Also, the tape itself, instead of being a single magnet, is in effect a two-dimensional mosaic of many tiny magnets, the strength of each having been adjusted by a magnetizing field usually produced by a varying current flowing through the coils of a recording head in a tape recorder. The magnetic marks visible on a section of recording tape on which ordinary speech or music sounds have been recorded, bear a striking resemblance to the widely used motion-picture sound track of the variable density type".⁹²

The examination of Electrical Signatures

Magnetically-recorded record head electrical signatures, created by the switching on or off of the record function of a tape recorder may be examined in a similar fashion to the examination of magnetically-recorded tracks. In addition to viewing the actual signature of the record head or the erase head, absolute measurements may be obtained of the gap between the record head and the erase head. Details of such an analysis appear in Technical Note 3.8 of the EOB Tape, where the operation of a UHER Tape Recorder Model 5000 is described:

".....Several facts about the physical configuration of UHER 5000 Exhibit 60 are also relevant. The distance between the erase and record heads is 28.6 mm, corresponding to 1.2 sec. in time at a tape speed of 15/16 ips. Therefore, if tape is in contact with the record and erase heads, an erase-head-off waveform is always paired with a record-head-off waveform at a 1.2 sec. time interval in the electrical waveform.

The erase head is designed with twin air gaps of width 3.0 mm, while the record head has a single air gap of width 2.4mm. As a consequence, transient magnetizations produced by the erase head 'protrude' from the half-track width of the record head and can be seen in direct magnetic development of the tape....."⁹³

In the examination of magnetic tapes even unrecorded or 'silent' passages can sometimes produce damning evidence. At such a time, one is reminded of Paul Simon's words

"...And the vision that was planted in my brain, still remains, within the sound of silence".⁹⁴

Summary

It is not within the scope of this document to cover all of the possible techniques employed in the forensic examination of magnetic recordings. Indeed, no attempt has been made to describe in depth, those examples which are provided.

The application of visual examination alone is demonstrated in identifying the 'Age' tape as being far from 'original'. Visual examination examples were also covered in the segment from the U.S. E.O.B. tape analysis employing track development by the application of a fluid containing microscopically fine iron particles and in the Western Australia example (Reference 40). The highly sophisticated technique of flutter analysis is derived from the U.S E.O.B. tape analysis.

Part VI

PRESENTATION OF RECORDED EVIDENCE AND TRANSCRIPTS FOR COURT PRESENTATION

In the preparation of magnetically-recorded tape exhibits and their associated transcripts for court production, the requirements of the prosecutor or the court should be known well in advance of the court date.

In instances where several persons are accused and are to appear together, it should be anticipated that the defence will request copies of evidentiary tapes. In most instances they will be entitled to copies and to fail to provide them will serve only to unnecessarily delay the court.

"In simple, single tape situations, the cost will be no burden to the laboratory. With several hundred tapes and multiple accused persons, the cost of copies will be considerable, both in materials and time."⁹⁵

All police personnel will be well versed in 'notes taken at the time' and tape processing is just one more area where considerable value can be gained by good notes.

Much court argument can be avoided by careful documentation in the laboratory. Exactly how many tapes were processed? To whom were they given? What processes were involved? Were any additional 'quick copies' produced later after the original processing - if so, how many and for whom?

This might appear a trivial matter, but it can provide the basis of considerable dispute in court later.

In all courts there will exist a requirement for the production of the original recording tape. The problem that may confront the court is that the original tape be barely intelligible and will not enlighten those who listen to it.

"The original tape will necessarily exist in its original form and will be produced by the prosecutor. It will be the prosecutor's responsibility to successfully argue for the admittance of an enhanced copy".⁹⁶

Due mainly to the lack of technical understanding, some requests (directions) from the court are difficult, if not impossible, to carry out.

"It is frequently requested by the Judiciary, Prosecutors or Defence, that small segments of a recording be repeatedly reproduced as evidence. The Nagra SN, SNS and SNST being a manual rewind instrument and without a tape counter, does not lend itself to easy court replay. A cassette copy can be a great time saver and the counter facilities of the cassette recorder enable individual passage location with relative ease.

It is common for a 'direction' of the court to be received by the laboratory technician. These should always be followed - except perhaps when the directions are a technical impossibility. At such a time, the technician should attend at the court and with the assistance of the prosecutor, be prepared to ASSIST the court regarding the impossibility of the situation."⁹⁷

In some states of Australia, the authority overseeing the operation of the courts may have the responsibility for the provision of tape replay facilities. This is as it should be, however, there are sometimes arguments to the contrary.

"The Federal Bureau of Investigation in Lorton, Virginia, U.S.A., put forward a convincing argument on evidence presentation. The eventual presentation of evidentiary tapes in court may be (and frequently is) the culmination of months or years of pains-taking investigation. The FBI supports this tape presentation with the finest replay equipment. They encourage the use of Sennheiser Infra-red audio transmission equipment to overcome acoustic problems in some court rooms.

In Melbourne, as in other Australian cities there are court buildings designed and built with 'Cathedral Ceilings'. While it is truly architecture of considerable beauty, the reproduction of evidentiary tapes in such an environment, is a nightmare.

It not uncommon for the Judge to experience difficulty in 'hearing' the tape and in such circumstances will instruct that the volume be increased. This of course only compounds the problem and the situation quickly tries the patience of all concerned".⁹⁸

In cases in which a transcript of the exhibit evidentiary tape exists, and where the court agrees to admit the document, the document must be accurate.

"Transcription of a tape for evidentiary purposes presumes ACCURACY. Anything less than accurate is worthless and if produced in evidence, grounds for protracted argument..."

'...Accuracy is everything in transcribing, and historically, has produced cogent evidence in a case where police members were accused before a court of law, on false evidence."⁹⁹

The Phillips Commission (1981) found, with reference to transcription :

"Transcription is boring, time consuming and not particularly enticing work. There might be recruitment difficulties if audio-typists are in short supply. Lack of transcription facilities could lead to delay in pre-trial preparation. There are also substantial problems in transcribing accurately the unstructured conversation of which many interviews consist".¹⁰⁰

In any analysis of magnetically-recorded evidence, there must be several areas of concern by the technician. The presentation of analysis results must of necessity, be impartial.

At the outset, the technician must prepare extensive notes regarding all test procedures. It is always a mistake to rely on memory for any test or calibration procedures, as in many instances, the evidence adduced may not be required for one or more years.

At all stages of the inquiry, the end result of the effort should be born in mind, i.e. **the presentation of evidence before a Judge and Jury.**

In view of this, all diagrams and photographs, if employed, must be either of such dimensions that all in court can see them, or, they must be of convenient size and duplicated sufficiently for the needs of the court.

The transcription documents mentioned above are invaluable to the analyst as a time log of events throughout the test procedures. In this way, the working transcript also becomes 'notes taken at the time' for the analyst.

With any event of interest clearly marked on the transcript and cross-referenced to other documentation such as photographs and charts, the transcript becomes the focal point of all the complex detail which may be required by the court.

Any witness called to give evidence regarding the production of evidentiary magnetic recordings must, at all times, observe impartiality, accuracy and integrity. Anything less, will destroy the value of the witness in all future court appearances.

Part VII**CONCLUSION**

The rate at which technology progresses is such, as to suppose that any decision made today, by any government regarding the recording of confessional evidence, must of necessity trail technological advances.

Procrastination, and there is ample evidence to suggest that it is not just an Australian practice, does not appear to have made us any the wiser for our continued delays.

The introduction of evidentiary or confessional magnetic recording in various parts of the world has ultimately been applauded, even by those who first argued most strongly against its introduction.

The let-down, where it exists, is usually with government funding. Legislating without adequate funding is a recipe for disaster and the humiliation of our system of justice.

When responsible government implements properly-enforced procedural guide-lines, and budgets for educational programs and adequate technical support within the individual police forces, cogent criticism of police practices will diminish.

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APPENDIX 1

The following questionnaire was addressed to the various States in an endeavour to determine differences and common ground between state practices in the use of magnetic recording techniques.

STATE POLICE QUESTIONNAIRE

- A. Authority reference, i.e. Sergeant, Commissioner
- B. Office of authority, i.e. Commissioner's Policy
- C. Explain purpose of phone call ...preparation of a document on Evidentiary Magnetic Recording funded through the office of the Criminal Research Council, Canberra and managed by Forensic Science Technology International of Adelaide. Subjects to be covered in the document include:
 - (a). Evidentiary Magnetic Tape Management
 - (b). Validation of evidentiary tapes
 - (c). Enhancement of magnetically recorded material.
 - (d). Transcription of recorded material.
 - (e). Continuity of evidentiary recordings.
 - (f). Registration of evidentiary recordings
 - (g). Ideal recording environments.
- D. Is there any history of evidentiary magnetic recording within your State?
- E. If not a current practice - how long ago?
- F. Under what historical circumstances?
- G. Is there any legislation in force requiring the use of tape-recorders for evidentiary purposes?
- H. Is there any legislation prohibiting the use of tape recorders?
- I. Are there any Departmental Regulations in force covering tape recorded evidence?

- J. Are there any Regulations prohibiting the use of tape-recorders?
- K. Are there any specific areas within the Force who do use tape-recorders while the Force as a whole, does not? i.e B.C.I., Internal Affairs.
- L. If there are examples of specific sectional use, are there any sectional or departmental regulations regarding the use of such recordings?

VIDEO - TAPED - EVIDENCE

- M. Is any use made of Video-Taped Evidence?
- N. If so, for which purpose of the following:
 - (a). Interviews / Confessions
 - (b). Crime Scenes
 - (c). Crime scene re-enactments
 - (d). Suspects line-ups
 - (e). Witness interviews

APPENDIX 2**DISTRICT ATTORNEY - BRONX COUNTY**

Memorandum

Subject: Article 65 Close Circuit TV for Child Witness.
Date. February 28, 1986

PROCEDURE FOR AN ARTICLE 65 CCTV EXAMINATION

Effective July 24th 1985 the Criminal Procedure Law was amended to add Article 65, "Use of Close Circuit TV for Certain Child Witnesses"; the article is retroactive in its application.

The article provides for the use of a simultaneous closed circuit TV (CCTV) link between a court-room and a separate "testimonial room" designated by the court in cases where a child, 12 years old or less, is a victim of an offence defined in Article 130 or Section 255.25 of the Penal Law. The court conducting the hearing or trial must by clear and convincing evidence, in accordance with 65.20, make a finding that the child witness will "suffer severe mental or emotional harm if required to testify" without the use of CCTV and that the use of CCTV will help to lessen the harm to the child witness. If the court makes a finding that the child is a vulnerable witness under the criteria set forth in 65.20 then CCTV testimony will be taken in accordance with 65.30.

Either party may prior to a hearing or trial pursuant to 65.20 (2) or during a hearing or trial pursuant to 65.20 (10) make an application to the court for an order declaring that a child witness is "vulnerable" and permit the use of CCTV to take the child's testimony. If the application is made prior to a hearing or trial then formal motion papers, hearing, and judicial findings in accordance with 65.20 (3-9) must be completed. If the application is made during the testimony of a child witness at a hearing or trial, the court may declare a child witness to be vulnerable based on its own observation of the child witness and permit the use of CCTV without motion papers or a hearing pursuant to 65.20 (10).

LOCATION OF THE PARTICIPANTS

Once the court has found a child to be vulnerable the court must make a further specific finding pursuant to 60.20 (12) as to whether placing the defendant in the "testimonial room" with the child during the testimony would be detrimental to the child. If the court finds that it would be detrimental, then the court will have the defendant remain in the court-room during the child's testimony.

Section 65.30 (2) reads that

"the court-room shall be equipped with monitors to permit the judge, jury, defendant, and attorneys to observe the vulnerable child witness..."

This sub-division places all the participants in the court-room except the child witness. The court however may permit the attorneys to be with the child witness in the testimonial room when the defendant is removed from the testimonial room to the court-room pursuant to 60.12. In this event a separate and independent intercom link, which is not recorded or connected to the video audio CCTV link, must be established between the defendant in the court-room and the attorney in the testimonial room. If the defendant is not removed from the testimonial room presumably the attorneys will be in the testimonial room, the statute, however, is silent on this point.

The special testimonial procedures to conduct an examination by CCTV are contained in 65.30. A two-way close circuit TV link is established between the court-room and the court designated "testimonial room" The testimonial room should be in close proximity to the court-room--e.g. robing room--in order to facilitate the laying of cables as well as providing quick access to the court-room for the attorneys in the event of a need for a side bar conference.

Section 65.30 (8) states that the court stenographer shall take testimony as if the child witness testified in the court-room. Technically it does not matter if the stenographer is in the court-room or in the testimonial room since both are wired for sound from the other room; therefore it might be best left to the stenographer where he or she will be most comfortable in taking the testimony although 65.30 (8) might be interpreted to read the location at the court-room.

Although Article 65 is silent as to the location of an interpreter for the witness during CCTV examination, our experience has shown that the interpreter should be in the testimonial room next to the child witness.

CCTV PROCEDURES

Section 65.30 (1) specifically details what shall be transmitted from the "testimonial room" and shown to the "court-room" for viewing by the court, jury, parties, and public on the monitor: "the image and voice of all other persons other than the operator present...". Section 65.30 (2), likewise, specifically details what should be transmitted from the "court-room to the testimonial room for viewing by the child witness and parties on the monitor: "the image of the jury...[and if the defendant is in the court-room pursuant to 65.20 (12)] the image of the defendant...[and if the attorneys are not in the testimonial room present to 65.20 (5)] and the image of and voice of the person examining the witness". The video technician never appears in the picture. The transmission shall be live and simultaneous. At the request of the defence counsel, the jury must be instructed to draw no inference from the use of CCTV. The conduct of the examination is in all other respects conducted in accordance with the rules of evidence and oath requirements.

Article 65 is silent with respect to the recording of the CCTV examination. Although stenographic record is the official record of the criminal proceeding it would be wise to record both transmissions simultaneously on a long playing tape e.g. 2 hour VHS in order to show an appellate court how the examination was conducted and what effects the CCTV had on cross examination since this will surely be an issue in the appellate process.

PRACTICE COMMENT

The prosecutor would prefer to have the child witness testify live in the court-room before the jury and the defendant. Therefore, the best course is to present the child witness in the court-room for examination without an application for a CCTV examination pursuant to 65.21 (11). If the child testifies, you have avoided a constitutional law question and present a stronger case; and you have an in-court ID of the defendant before you go the CCTV. Article 65 does not deal with how a defendant can be (identified) on CCTV. If, however, the child witness falters while on the stand because he or she is afraid you have the best record to support a CCTV examination; both the judge and jury will be able to form their own opinion and understand the need for a CCTV examination. You have also avoided the extensive hearing requirements set forth in 65.20 (11) because the court may pursuant to 65.20 (10) make its own determination sua sponte that a CCTV examination is necessary from having seen the child testify before it.

Furthermore, the court will be able to deal directly with the issue whether the defendant can be present in the testimonial room and where the attorneys will be located during the examination. You do not want to have the child witness try three times to testify; first in the court; second in the testimonial room with the defendant present; third then try in the testimonial room without the defendant. Child witnesses may be timid because of the setting in the court-room but they are intimidated by the presence of the defendant. It is this argument that you must make to the court to avoid having the child witness testify in the testimonial room in presence of the defendant.

If one has the potential for an Article 65 application during the course of the trial, you must, first, check the availability of equipment and personnel to do your CCTV, and, second, brief the court and defense on the legal and practical issues prior to trial to avoid a mid-trial crisis and panic decisions. In our office you should consult with me well prior to trial.

NECESSARY EQUIPMENT AND SPECIFICATIONS

The following is a list of video equipment necessary to present CCTV testimony and permit the viewing by the court, jury, parties and spectators:

- 3 Rolling carts
- 3 25" Monitors
- 3 Speakers
- 2 VCRs (optional)
- 2 Amplifiers
- 2 Microphone mixers or (1) stereo mixer
- 2 Equalizers (optional)
- 2 Colour cameras
- 2 Tripods
- 4 Microphones
- 1 Intercom'

CCTV EQUIPMENT SPECIFICATIONS

ROLLING CARTS (3)

The top shelf should be 54 inches high for the monitor. When at this height it can be easily viewed over a wider area, and little likelihood of obstruction. The casters should be large enough to roll easily with heavy cart.

MONITORS 21" TO 25" (3)

Monitors should be used because a plain TV receiver does not have the line-in and VCR inputs as well as line-out, monitor-out connectors. By using a monitor you can switch the picture displayed. Before proceeding with the examination the judge for the record asks to view the shot compositions of each camera from the monitor at his location. This can be done simply by switching from line to VCR on a monitor. The larger the monitor obviously the better the picture unless resolution is severely compromised solely for a larger screen. These monitors will be viewed by the entire jury panel as well as the defendant, judge, and other court personnel, the spectators and the child witness in the testimonial room. If one camera is used in the court-room then in all probability the defendant must be moved closer to the jury to permit all being in one picture.

SPEAKERS. (3)

Large enough for adequate sound reproduction in the area where they will be used. They must be compatible with the amplifier being used.

VCR's

Either VHS, Beta or any other format. A long record time capability may be a deciding factor if recording will be done.

AMPLIFIERS

Capable of providing sound amplification for areas in which it will be used. Recommendation 50 watts per channel minimum.

MICROPHONE MIXERS

Capable of mixing at least two microphones.

EQUALIZERS

To enable audio signal to be shaped for poor room acoustics.

COLOUR CAMERAS

Lowest light performance so as not to have to use any auxiliary lighting, which would be very cumbersome as well as distracting. The camera should also be equipped with a lens which would give the greatest flexibility; you want to be able to get a wide shot without moving back so far as to make people or things indistinguishable. Remember when working in available light situations with most inexpensive cameras you would utilize for this purpose, they are limited because minimum amount of light with camera at its widest F stop produces least picture clarity, shortage of depth of field, and poorest colour rendition, and most of signal to noise.

TRIPODS

Non-specific tripods, except it must be capable of handling camera weight and also have telescopic ability to raise the camera up to at least seven feet. This extreme camera height is very useful when composing a wide shot of the entire court-room.

MICROPHONES

Non-specific except microphones should have low verses high impedance because long cable runs will have less interference. They must also be compatible with audio inputs on the microphone mixer.

INTERCOM

Non-specific, could be through telephone type devices, both hard-wired or wireless. Our recommendation is hard wired intercom system used in video productions for communications between camera operators. Hard wired is preferable because there is little chance of interference as in wireless systems, and the integrity and privacy of this system can be easily checked by defense by simply tracing the wire layout.

APPENDIX 3

AUSTRALIAN TRANSCRIPTION PRACTICES & TRAINING

VICTORIA

As outlined in the main document, the Audio Section of the Victoria Police evolved gradually, meeting demands for tape processing. This was followed by a requirement to partial and later, complete transcripts.

At no time did the Section enjoy modern technology, such as word-processors, for the production of transcripts, so taken for granted in the commercial world, even in 1974.

As a result, commercial tape-transcription machines were combined with manual typewriters. The transcription recorders used were from the SONY BM range, starting with the BM 25's and gradually keeping pace with the newer SONY models as they became available. When faced with micro-cassette tapes to transcribe. When faced with micro-cassette tapes to transcribe, the OLYMPUS T500 transcription was usually performed on Standard Phillips Compact Cassette format tapes. The reason for this was that the micro-cassette tapes presented for transcription were frequently the 'original' tapes.

Only in comparatively recent times, were the actual numbers of transcription staff increased. By this time the typewriters employed were electronic with a small level of memory.

A number of visually-impaired personnel were engaged. These new staff members were trained by two police-women who had been engaged for some years in tape transcription within the division. Regrettably, due to Government-imposed financial structures, this trained group was disbanded. At the same time, the use of evidentiary tape recording within the Victoria Police, was expanded!

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