Critical Incident Management:

Engendering Experience Through Simulation

By

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Dedications

In memory of my Grandfather Joe Crego.

To my wife Sharon, who has been so supportive and patient. Her understanding and love has kept me going, even when I thought I would never complete this work.

To Adam Robert and Jessica, whose daddy has been pre-occupied for far too long.

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Declaration

I hereby declare that this thesis has not been accepted in any previous publication for a degree, that it has been composed by myself and that the work described has been performed by myself unless otherwise stated.

J. Powell
Supervisor

Jonathan Crego
Candidate

Abbreviations

ACPO	Association of Chief Police Officers
Br	Bronze Commander
BTP	British Transport Police
C&C	Concise and clear
C.C	Command and Control
CCTV	Closed circuit television
CD-ROM	A optical storage device used to store computer data
CIM	Critical Incident Management
CPS	Cycles per Second
CPTU	Central Police Training Unit
E(n)	A scenario event number
ECS	Environment Control Software
HCI	Human Computer Interaction
I(n)	An scenario incident number
LFCDA	London Fire and Civil Defence Association
M-JPEG	Motion Joint Photographic Expert Group (a video compression technology)
Mb	Megabyte
MDS	MicroWorld Display Software
MPS	Metropolitan Police Service
Ms	Thousand of a second
NSE	National Sporting Events Course
PSU	Police Support Unit
RGB	Red Green Blue
RPD	Recognition-Primed Decision Making
SME	Subject Matter Expert
TSU	Tactical Support Unit
TXT	An ASCII file

Glossary

ALEPH 1 Model Q Relaxometer	A device for measuring Galvanic Skin Response
Ambulatory Electrocardiography	Measurement of heart rate
Analogue	A continuously variable measure
ASCII	Text based computer data
Behaviour Code	Classification of observed participant behaviour
Bitmap	Computer graphic
Brain Hemispericity	A classification of brain function
Bronze Commander	Tactical Commander
Checking Cycle	Time taken for MDS code to operate
Command Layer Interaction	Communication between any command officer
Decision Lag	Decisional time delay after simulation problem is recognised
Digital	A measure in binary steps
Environment Control Interface	Technology controlling the simulation system
Event Sequencing	The method by which the unfolding incident is represented to the participants in an order that promotes pattern recognition
Exercise Controller	The training officer charged with managing the simulation
Frame	A unit of measure for video sequences
Galvanic Skin Response	A measure of the conductivity of the skin
Global Level	Event data relevant to the overall command of an incident
Gold	The strategic commander
Ground Commander	Commander in-charge of a sector
Holter Monitor	Recorder of heart rate
Hybrid Sector	A Geographical area generated specifically for a simulation exercises

Incident Commander	The most senior police commander managing an event
Juke-box	A device for playing one from many CD-ROMS
MicroWorld	An immersive simulated command environment
Multi-Threaded	Parallel problems presented to more than one command MicroWorld
Non Response Formula	An means by which the exercise controller can decide the point at which a participant has failed to respond,
Operations Order	Strategic plan of the event
Overlay	The technology required to present video pictures on a computer monitor
POD	A controlled command environment
Protocol	A fixed syntax for exercise design
Recognition Delay Measurement	A measure of the time between firing a trigger and its impact on the participants
Sandford	An imaginary town created for training purposes
Sector	Geographic section
Silver Commander	The strategic co-ordinator
Simulation Agent	Participants representing players that are other than the participants simulation e.g., press officer
Situational Awareness	A participants mental model of the incident
Situational Back-drop	Video that provides the participants with background information about the unfolding simulated event.
Story Board	A time sequenced planning tool for generating exercises
Sub-sector	Sub-divided geographic section
Systemic Testing	A research methodology that seeks to capture the interplay a system and its component parts
Template	A data entry device

Trigger and Cues	Happenings designed to stimulate reaction
Trigger Types	A class of triggers
Video Data Capture Program	A purpose built device to record behaviour codes
Workstation	A computer driving the MicroWorld environment

Abstract

The world of operational police command is a challenging and complex one, where significant command decisions need to be made amid uncertainty and within narrowing time-frames. The consequences attached to these decisions can often be far reaching and have been in some cases grave, as in the case of disasters such as those at Bradford and Hillsborough football stadia. Accordingly, there is a pressing need to instil within key command officers, the skills and the experience necessary to make these bold and effective command decisions, but within an environment where such dire consequences (as those that follow a disaster) do not arise from mistakes or inadequacy. The question then becomes how to create such an environment which is at the same time both safe and sufficiently realistic to provoke similar decisional reactions to those that would occur at a real event. Even if this was achievable a further stage would be necessary in which such learning came to be transferred back into an operational command situation.

This thesis explores in a systemic way the design, implementation, testing, modification and re-testing of a critical incident management command simulator whose central tenet was to create an immersive simulation that, by virtue of its high degree of fidelity, was capable of engendering experience of the management of critical incidents for a target population comprising senior police command officers.

From tentative beginnings to its operational installation as a fully functional command training simulator, this thesis maps out the key development decisions which were informed by the findings of a series of trials, observations, interviews, surveys and physiological measurements. At the same time, it describes the theoretical models used to explain the relationships between and functionality of the system and its individual components, whilst exploring the dimension of human computer interaction.

This is action research in that the findings it generated led to an incremental series of modifications to what became an operational training simulator (named MINERVA) on which useful and transferable command training actually took place.

Preface

Minerva is a guided team-based simulation system that supports real-time naturalistic decision making by senior officers tasked with managing a critical incident. Because the management of such incidents typically requires a co-ordinated team-based response, the system provides for group learning, allowing members of a management team to tackle an incident individually whilst at the same time co-operating, communicating and co-ordinating their efforts with other members of their team. The learning provided is experiential in that the learners are actively and directly engaged in resolving a shared series of problems which accurately mirror those arising from a real critical incident.

Uniquely for a computer based training system, problems arising within a Minerva exercise tend to be multi-faceted and potentially complex, mirroring the real-world of critical incident management in which unresolved issues often impact on the way the unfolding situation might develop.

A core skill within critical incident management is the ability to make effective decisions within narrowing timeframes, this is a central and recurring theme within the Minerva simulator which requires players to think and act as quickly as they would have to at a real event.

Running across a computer network, the simulator makes use of video footage and audio material that shows each player the scene of the problem from their own individual location and perspective.

(Crego et. al. 1996)

This work describes the system, the educational technology and the theoretical decision making model upon which it is based.

1. Introduction

1.1 The Research Question

This research is concerned with addressing the problems associated with the development of a computer based critical incident management simulator designed to support the management development of senior police officers. It is about exploring the complex problems of making critical decisions during the management of crises. The research also has to do with generating experience of managing such incidents, by exposing commanders to a wide range of command and control problems. When police commanders have to command any incident they have to make decisions quickly and in doing so they have to manage large amounts of data, dealing with complexity and chaos. Rittel, and Webber, (1973) would have called these *"wicked problems"*, as the world that Police Commanders are trying to manage is changing in front of them very quickly and is filled with increasing uncertainty.

1.2 Traditional Police Response to Critical Incident Management (C.I.M.)

Such officers cannot get the necessary experience of managing this uncertainty from books, as such texts deal predominantly with matters concerning legislation and operating procedures. Senior police officers have all been junior officers (the organisation insists that all officers start from the rank of Constable), so they have all been through a rote learning process requiring that they learn from books in order to pass examinations and progress through the ranks. However, the problem of command and control is very different from this as it is concerned with how police officers obtain the necessary experience *before* they are in the position of managing a real crisis event. In this world of complexity, where chaos needs effective management, the choice of a suitable replacement for the existing

training philosophy is dependent on choosing an appropriate educational strategy.

At present senior officers receive training built on a military model of operating practices. They have to 'know' the rule books inside out. Such traditional training methods within the police training organisation, rely mainly on 'chalk and talk' didactic learning styles.

However, there is much anecdotal evidence that many officers at command level cannot cope with the complexity of crisis management. It is my belief that the existing type of training poorly prepares them for operating in the chaotic world of critical decision making.

1.3 The Research Questions

1. Can a ***critical incident management*** (CIM) ***simulator*** provide a sufficiently effective ***learning environment*** to enable ***students immersed*** within it, to generate effective ***command and control decisions*** that would prove to be valid and workable in the real world.

2. What ***educational technologies*** are needed to create a C.I.M. simulator that is capable of ***engendering experience*** in police commanders, concerning the strategic management of critical incidents as exemplified by command and control practices.

These question include a number of statements which need defining.

Critical Incident Management

> This refers to the process associated with the police management of crisis. The environment to be managed is complex, uncertain and changes quickly. This environment is discussed in detail in **chapter 3**

Simulator

This relates to technology designed to re-create the working environment within a laboratory setting. Simulation is examined in detail in **chapter 4**

Learning Environment

This relates to an environment within which effective relevant and meaningful learning can take place, a subject dealt with more fully in **Chapter 4**

Students

The target population of this study. They comprise senior police officers who are required to manage critical incidents. They are described in **chapter 5.** Other populations associated to this study are described in **chapter 7**

Immersed

This term relates to the suspension of disbelief and is associated to generating a "genuine but restricted" (Powell 1995) simulation of the real world. **Chapter 5** discusses the role of immersion in the context of learning.

Command and control decisions

This term relates to the process by which decision makers are able to control their resources. **Chapter 3** discusses this notion and deals with a number of issues, such as communication, hierarchical command structures and roles and responsibilities of police commanders.

Educational Technology

This relates to the combination of learning theory and the enabling technology required to support the application of it. This is discussed in **chapter 4.**

Engendering Experience

This relates to the ability of students to take the experiences generated by the educational technology and relate them to their previous experience of critical incident management and thereby transferring the learning gained within the simulation environment to the real world.

It is important at this early stage to make clear the exact scope of this research.

1.4 The Scope of the Thesis

Is it possible to train senior police officers in how to command and control major incidents, within the safety of a simulation environment and what are the most effective ways of handling this training process?

Chief Superintendent Doug Hopkins, Gold Commander at Arsenal Football Stadium(1990-94) put it this way:

> "Crisis management is the black art of
> managing the achievable"

This thesis will chart the logical development path taken by the author from early concepts of defining the training problem to the eventual design, development and implementation of a C.I.M. training simulation facility, now installed and operational at the Metropolitan Police training centre London, and subsequently a second identical system, installed at the Fire and Civil Defence Agency, also situated in London England. A detailed 'time-line' charting the research and development phases of the system can be found at appendix 1.

1.5 About the Researcher

This research was undertaken whilst I was a full and active member of staff at the Metropolitan Police Training Centre, Hendon North London. This centre is the principal police training site in the United Kingdom for police recruit and continuation training. The

Metropolitan Police Service is the largest of the 43 police forces in England and Wales, employing some 42,000 police and support staff.

I was recruited directly into the post of Learning Technology Advisor after graduating with an honours degree in Computer Science and a post graduate Certificate in Education from Middlesex University. This combination proved useful in identifying at an early stage that I could combine computer technology with learning theory, to create training for police officers. Early research work in the police, carried out by myself and my team, proved that multi-media (video, computer graphics, audio and text) could converge to become effective in the training of 'cognitive knowledge', defined by Binstead (1980),. as "the acquisition of knowledge, facts, information, ideas, theories, models, definitions and concepts"

In 1991, when I became head of the Metropolitan Police's Learning Technology Unit, I was confronted by a particular series of problems. Much of my earlier work was concerned with developing multi-media solutions to meet cognitive training needs relating to law and procedure. This is because police officers in the course of their operational duties have to apply the law. This means that they have to be skilled in a number of areas; most notably, interaction with the public and the knowledge of many statutes and procedures. Much of their training in general interpersonal skills and the mechanics of arrest etc. are dealt with during initial training and then later on the job, during their two year probation. However, because they are bound by the law they must also have a knowledge of their statutory powers under which they can operate. To arrest a suspected person for theft requires; a knowledge of the law with regard to theft; what constitutes the offence and what are the main points of the offence that have to be proved in order for a person to be arrested. This requires officers to, not only learn by rote but also to be able to interpret the law in different situations. This requires deep cognitive

learning and the ability to apply such skills to the differing situations in which policing problems arise.

I was able to identify a number of common principles in the development of training programmes for law and procedure relating to 'cognitive knowledge'. These principals involved a number of different delivery methods at the workplace, using computer based learning, paper based workbooks, audio and video cassettes and combinations of all these media.

In my early work at Hendon I developed ten prototype training systems and evaluated their effectiveness together with their acceptability, from the perception of the police officers, of multimedia based learning. A great part of this early work centred on developing the 'soft systems' necessary to promote learning in the workplace, i.e., support personnel, accommodation, access etc., to enable police officers supported access to the programmes. A great deal of effort also went towards educating middle and line management in the concepts of student centred learning mediated by computer. By the end of that research I had gained a deep working knowledge of police management and operational systems.

The findings of these early educational evaluations showed that a multimedia based approach to learning at the workplace was beneficial to the organisation as it began to support the requisite training needs of 27,000 police officers split amongst 70 separate police stations and other buildings across the 800 square miles of London. These training needs relate to the necessity to reduce the abstraction rate for training across the whole service and to provide training that had a greater operational relevance. In support of these findings, technology enhanced training became written into the five year training strategy for the organisation. A Training Design and Research Unit was formed to generate the necessary training packages. I was asked to head that unit and within a short time

recognised that whilst the materials being developed were effective in the simple traditional cognitive domains (remembering definitions and procedures) they did little in the complex skills domain (the application of knowledge). Also, whilst the developed material met the needs of the junior ranks, no examination had been made of the needs of senior officers.

As I had been charged with the development of a comprehensive learning technology strategy for the organisation, I now looked towards senior officer development as a possible area where learning technology may be effective in training. The Training Design and Research Unit now had a strategy, competent staff and was a successful production house for basic computer based training and paper support materials. I felt my efforts would be better spent researching senior officer development. At the same time, in the light of recent disasters at football stadia, the Management School at Hendon had been charged with the task of senior officer development in the domain of command and control. I was asked to examine how learning technology could be applied to this area. This is how I became involved in the work underpinning this thesis.

The research that I have undertaken in the thesis had to be under the organisational authority of the Commander for Police Training. I was not at liberty to do exactly as I wanted. Nevertheless my supervisor believed there to be sufficiently repeatable work at the doctoral level to make this endeavour appropriate. Before carrying out any experiments I had to seek permission from my police Commander. There had to be a major reason why I did any particular research. Actually what turned me from general issues to a particular one was the Taylor Report. This report was written in the aftermath of the Hillsborough Stadium Disaster on 15 April 1989 where 95 people were crushed to death. I was charged to make my first project that of training senior officers in command and control of complex decision

making, specifically looking into the command and control of crowds at football events.

1.6 The Taylor Report

After the Hillsborough Stadium Disaster 15 April 1989 and the subsequent publication of the Taylor Report, the police service through its Association of Chief Police Officers (A.C.P.O.), recognised the need to develop a training programme for senior police officers in skills associated with the management of major sporting events.

The Taylor Inquiry, commissioned by the Right Honourable Douglas Hurd CBE, MP, then Secretary of State for the Home Department, had the following terms of reference:

> "To enquire into the events at Sheffield Wednesday Football Ground on 15 April 1989 and to make recommendations about the needs of crowd control and safety at sports events"
>
> (Taylor 1989)

Recommendations emanating from that inquiry had a significant impact on both the operational policing of sports grounds and the training of senior and junior police officers. Unfortunately the Hillsborough Stadium Disaster was not an isolated football tragedy. To develop an understanding of the role of police at football events and the difficulties they face I felt it important to review the Taylor Report and previous inquiries into football stadium disasters and their associated recommendations. Chapter 1 looks in detail at these reports. However, before getting into detailed discussion on the command and control of major incidents, it is important to understand a little more of the context of policing in general.

1.7 The Metropolitan Police Service (MPS.): A Militaristic Metaphor

All Senior Police officers have to start their careers as junior officers. It is pre-requisite that all officers serve a minimum of two years 'on the beat' before they can sit examinations for promotion, or transfer into specialist units. To understand the kinds of learning they undertake during this time it is useful to examine, in broad outline, their first two years in terms of the training they undertake. A police recruit spends the first eighteen weeks of their service at the training centre. They learn large amounts of law and procedure by rote. They sit an examination at the end of each week of study. Those making each grade move on, those who don't are given a chance to retake the examination and if they fail for the second time are put back to another intake group studying five weeks behind. If they fail again they are dismissed from the service. Throughout their eighteen weeks they are taught discipline skills, such as drill, and operational skills such as how to arrest suspects and how to appear in court. At each juncture great emphasis is placed on physical fitness and displaying a 'proper attitude' to authority. At the end of the twenty weeks they are posted to a police station where their training follows a more practical 'on the job' approach. They are given study packs prepared by the training school. When they have completed the course they are given a final examination at 104 weeks. This examination, being criteria based, provided the organisation with officers known to have reached a standard and minimum level of theoretical and practical knowledge.

The promotion from constable to Sergeant and Sergeant to Inspector also requires the officer to learn by rote, ever larger amounts of information. This mechanistic approach (now slowly being modified) stems from the military's methods for training. To explore the connection between the police and the military we have to look further back at how the Metropolitan Police Service was founded.

The Metropolitan Police Force was formerly established on 19 June 1829. It was on this date that a bill entitled 'An act for improving the Police', received royal assent. The bill was drafted by Sir Robert Peel, who was the Home Secretary at that time, he gave the bill its first reading in the house of commons on 20 May 1829. The bill was carefully drafted, designed to ensure the minimum controversy and any suggestion of radical change. Under the terms of the bill, the Home Secretary became the Police Authority for London and a new Police Office was created in Westminster, under the control of two 'Justices', later renamed Joint Commissioners. All existing police institutions were to be phased out and replaced by a single force of paid constables.

The two justices appointed in 1829 were Colonel Rowan, a soldier of some distinction and Mr Richard Mayne, who was an eminent lawyer. Peel referred to Rowan as Chief Magistrate and Mayne as Military Magistrate, indicating from the very outset that although both men were supposed to be of equal status, that the military man took precedence over the 'lawyer'.

Within six weeks they had recruited upwards of 1,000 officers both of junior and senior ranks.

The actual mechanics of the organisation fell to Rowan. He chose to organise the Metropolitan Police on military lines, while emphasising that the police were not soldiers. The objectives that Rowan laid down for his organisation were set out in the instructions issued to everyone when they started duty as policeman. "The principle objective to be obtained is the prevention of crime." The word principle implied that the police force had wider social objectives and this was demonstrated by the involvement of police in the detection of criminals and the intervention in matters associated with public order.

The Metropolitan Police Service is still handling the situation in a very similar way to this day. "This picture is little different from Rowan's model back in 1829 and is clearly based on an army model" (Bunyard 1978)

Although the police service was built on military lines it was not to be fully military. Police forces are not an arm of the state but servants of the community (Scarmon 4.56-4.60). The underpinning philosophy behind the formation of the Metropolitan Police Service, was a military one but the officers are civilians and members of the community. There is an important balance to be maintained between policing by consent and maintaining the Queen's peace. This concept was to be tested only four years after the inception of the force.

1.8 Public Disorder in London: The First Police Intervention

The first major demonstration that the Metropolitan Police had to deal with occurred on 13 May 1833. A meeting was held in Cold Bath Fields, Clerkenwell, by the National Union Of The Working Classes. There was ample evidence, well in advance, that a number of the movements leaders would be armed with knives, coshes and a number of other weapons, but not firearms. Rowan decided to deal with the situation using divisions of 100 of his police each under the supervision of a superintendent, with himself in overall command. The government, unsure of the likely success of the police, had the military in reserve in case they should fail. The objective of the exercise was to break up the meeting before it could form into a mob and go on the rampage, as had happened at Spa Fields in 1816, when a similar mob broke into a gunsmith's shop and tried to take the Tower of London.

The result was a successful operation; the meeting was dispersed and a number of arrests were made. However the costs were high, as three policemen were stabbed and one of them Constable Robert Culley was killed. At a subsequent inquest a verdict of 'justifiable

homicide' was pronounced on this death. This was a clear statement on public mistrust of the new police service. This verdict effectively concurred with the fact that a murder had been committed but that the act of murdering a police officer was justifiable. The coroner left the court in disgust.

The importance of the Cold Bath Fields incident was that it showed how a properly constituted police force could deal with a hostile crowd, without the need for arms or the military to help them. The assertion of a measured but restrained use of force to protect government, people and property was to become a fundamental role for the police service from then on.

1.9 Police and the Community - Today

Since 1833 London has grown into a international city with a working and resident population of 7 million. Community policing i.e., policing by being part of the community is now the only way the police service can operate if it is to police by consent. This policing by consent philosophy does occasionally break down, for example in the Brixton riots of 1981, where sections of the community violently rose up against what they saw as inequitable policing. At these events the maintenance of law and order breaks down and the police have a central role in managing the transition from disorder to order. This can be seen historically through many disturbances over the last 150 years. When the police are seen as the arm of control. By way of example, Lord Scarman said during a interview on BBC television November 1985 after the Broadwater Farm disturbances in October of that year:

> "People do not attack the forces of the law out of mere wickedness or a sense of fun. Public disorder usually arises out of a sense of injustice"

The police clearly have it in their minds that it is important to police by consent, to be trusted and appreciated by the public. Sir Paul Condon, the present Commissioner of the Metropolitan Police said:

> "We remain committed to seeking constant improvement in every aspect of policing and ensuring that the public trust and reliance upon us is not misplaced. It is not a responsibility we take lightly and our performance has been testimony to that fact."
>
> (Report of the Commissioner of the Metropolis 1994/5)

The development of senior police officers must take into consideration this view of the community. It is not appropriate to train critical decision making, command and control skills in a vacuum. They must be applied to the reality of policing by consent. Trica Zipfel, consultant to the Department of Environment, put this well when she said "The training for the police is vital, however when they are of the 'old guard type' then they dammed well have to be trained into new attitudes, new approaches and new styles of management where appropriate." (Zipfel 1981)

1.10 The Role of the Research

The Metropolitan Police Training School at Hendon was looking to improve the effectiveness of the training of its senior officers in all aspects of crisis management. The studies in this thesis attempt to underpin this improvement by attempting to design and validate a series of experiential learning programmes using the most advanced educational technology available. Detailed observations made during the delivery of these programmes would hopefully lead to the generation of relevant theories associated with crisis management. The eventual hope would be to develop a series of guidelines for those wishing to develop programmes of experiential learning in related

areas. These generic guidelines and a prototype educational package would be developed through the detailed consideration of the problems of football crowd control, which will be fully investigated in the following chapter.

1.11 Section Summary

This introduction has tried to provide some historical contextualisation to the work, to aid the reader's understanding of the research questions. It has described the author's position and seeks to help define his organisational responsibilities.

The remaining thesis is in two parts: Part one fulfils the original terms of reference, given by Commander Training i.e., the development of a training system for football police commanders. It opens with a review of the Taylor Report and its impact on police training and closes with an attempt to generate some general principals. These general principals are the conclusion of part 1.

Part two of the thesis tries to take those general principals and put them into an alternative framework and to show that the simulation system could support training in other areas of command and control. The areas explored are the management of armed siege, hostage negotiation and management of the Notting Hill Carnival, a street carnival held in London attracting 1.5 million participants.

2. Crisis Management in Football

2.1 Résumé

This chapter looks firstly at what has caused the need for training in critical incident management (CIM) at football events. It will explore recent disasters and their associated public inquiry findings and recommendations. It will introduce the Taylor Report which looked into the disaster at Hillsborough Stadium (15 April 1989), this being the report that spurred the police service to invest in senior officer training specifically associated to the management of sporting events and to create a nationally accredited Major Sporting Events Course. This chapter will also attempt to illicit from these inquires training objectives for senior officers.

Armed with these criteria, chapter 3 will review the training solutions developed nationally and the end of this chapter will distil this information into a training requirement or specification for command and control training.

2.2 Historical Review of Football Inquiries

> *"If men could learn from history, what lessons it might teach us! But passion and party blind our eyes, and the light which experience gives is a lantern on the stern, which shines only on the waves behind us"*
>
> Specimens of the table-Talk of Samuel Taylor Coleridge 18 December 1831

A review of the literature reveals that over the last seventy years there have been many unfortunate disasters involving football crowds. There have been ten inquires or reports into safety at sporting events. The recommendations emanating from these reports were largely ignored. The last was written by Mr Justice Taylor in 1989

The Taylor Report was commissioned after a tragedy at Hillsborough Stadium where 95 people were crushed to death. This report had a major impact across the whole sphere of crowd management at football grounds. Its recommendations were aimed at the police, the football clubs, the football associations, local government, legislation etc.

The significance of the Taylor Report in this thesis is that its recommendations were the first to be taken up by government in a significant way, principally by the Home Office, and it forced the publication of a number of operation guides and manuals. It also prompted a major change in the way spectators were managed at football games and forced structural changes to the fabric of football stadia. As a direct result of the inquiry, the Home Office F5 Department, working closely with the Association of Chief Police Officers (A.C.P.O.), tasked the National Police Training Unit to create a number of training courses aimed specifically at senior police officers.

The course associated with the management of football event is examined in detail in Chapter 3

Before we can examine the Taylor report in detail, it is important to review previous inquiries into football disasters. By doing so we will get a feel for the way the problems were perceived at the time and the solutions that were offered.

It is my argument that these reports provide an important understanding as to why crowd problems were perceived as being rather mechanistic. Crowds and crowd behaviour was seen by those involved in crowd management in a mechanistic way. Sime (1993), referred to this view as; "if people were acting as ball bearings" in the way that their dynamics could be predicted . I have generated a table comparing each report with its recommendations. The table charts the reason why the report or inquiry was commissioned, its recommendations and what if anything was its outcome.

2.2.1 Table Summarising Inquiries

Name of Report or Inquiry	Brief Summary of Tragedy or reason for report	Recommendations	Outcome
Shortt Report 1924	First FA Cup final at Wembley Stadium. The numbers of crowds turning up far exceeded expectations. A Large crowd tried to gain entrance to the stadium.	Training for Stewards and central telephone control	No action was taken to implement recommendations
Moelwyn Hughes Report 1946	Bolton in Lancashire 33 people were crushed to death. Again estimates of attendance were inaccurate with 50,000 expected and 85,000 arriving.	Mechanical counting of spectators entering and central co-ordination of turnstile count. Call for urgent legislation	No action was taken
Secretary for State commissioned a report in 1966 called the Chester Report.	By mid 1960's hooliganism was on the increase and disorderly behaviour by spectators forced government to commission the report	Recognised the complexity of the problem but made no recommendations other than further time and resources were needed. Suggested that Birmingham	Harrington Report

		Research Group undertake a study into football disorder	
Harrington Report conducted by an independent research group 1966	Had some difficulty obtaining the co-operation of the football clubs and governing bodies	The report had no power to make formal recommendations to parliament and there was little change after its publications	None
Lang Report 1969	Working party set up by government	Loosely worded report focusing on problems and not solutions	None
Wheatley Report 1972	New Years day Derby match at Ibrox stadium. Fans leaving early turned back when they heard cheering from the stands. 68 people were killed and 140 were injured in the resulting crush.	Emphasis on crowd safety. Grounds to be licensed. The Guide to Safety at Sports Grounds 'Green Guide' published	Safety at sports ground act 1975
McElhone Report 976	Prompted by trouble with Scottish fans partly attributed to the sale of alcohol in the ground	A whole number of recommendations on the use of alcohol at or on the way to a football event. Additional recommendations into segregation, number of turnstiles, high fencing, cctv and stewards.	Became law in Scotland but due to anomaly in British legal system remained no more than discussion points in Britain

Table 1.1

The reports make interesting reading because they exemplify my previous assertion that decision makers then saw the problem in a mechanistic way, continually providing additional rules or procedures, manuals and operational guides. The recommendations of these enquiries were mostly ignored or if they were taken up, made a negligible impact on the way football matches were managed.

By way of example of this mechanistic approach the Wheatly Report 1972, led to the first edition of a publication entitled "The Guide to

Safety at Sports Grounds", commonly referred to as 'The Green Guide', issued in 1973. This guide, coupled with the Sports Grounds Act in 1975, provided a set of rules supported by legislation for football grounds and the management of large crowds.

It is not my intention here to explore in detail the sixteen sections of the guide, but my purpose of discussing it in a little more detail, is to paint a picture in which the local authorities and the police were desperate to find a set of rules to follow to avoid similar tragedies from re-occurring. Also, there may have been a belief that referring back to a set of rules after a tragedy would somehow mitigate blame from any occurrences. It is fair to say that at this time the football clubs themselves did not want large amounts of guidance as this would undoubtedly require them to spend substantially on modifications to stadia.

To give a flavour of the mechanistic approach taken by the guide, I quote the following section relating to the egress of supporters through an exit gate:

> "The capacity of an exit system can be calculated by assessing for each element in the system (i.e., each gangway, doorway, stairway, exit, etc.) the number of persons who can pass the limiting point in that element in 8 minutes. The capacity of the emergency system is the number of people who can pass through the designated emergency route in the appropriate emergency evacuation time given by the formula:
>
> $$\frac{\text{width of element}}{\text{Unit width (.550)}} \times \text{appropriate flow rate} \times \text{approp. time}$$

This 'scientific' approach was common throughout the guide. There were sections dealing with stairways and ramps (section 8) using a formularistic approach. What the guide failed to deliver was any insight into crowd behaviour, or what motivated such collective action, and strategies to deal with these behaviours.

After subsequent tragedies the guide was amended, and additional rules were added to ensure public safety. However, the guide did not have statutory powers and because of this there was uncertainty as to how it should be applied. This posed a conflict to the mechanistic way that football events were managed. If a rule book existed, then the rules were either mandatory or they were advisory. The matter was put to rest in 1992, by a question put to the House of Commons Home Affairs Committee Report on Policing Football Hoolliganism. John Ashton (MP) asked:

> " You mentioned the Green Guide and I served on the committee that set up the Green Guide on Safety of Sports Grounds. I must admit and put it to you that we have a guide there that some local authorities take as a Bible and insist on implementing every comma and full stop. Other local authorities and the police as well - because there are 43 different police forces - seem to take no notice at all. I am not blaming you for this, but do you think this Green Guide set up, where it is a guide, is good enough."

The reply by Mr Fox the Chairman of the Football League:

> "No, the Green Guide, in my opinion, should be mandatory which is how it is treated in

> Lancashire and they go by it word for word and that's how it is; and then you go to some other authority and they say its near enough. You only have to look at that when they were on the spectators per square metre and it did not tally up with the Green Guide. If we are going to have a Green Guide, it has to be mandatory."

Now with support from government the Green Guide would become a mandatory guide that both the police and the other institutions could look to, for reassurance during the event, and justification for actions after the event.

The whole issue of rules and manuals had to be revisited after the disastrous fire at Bradford City Football Ground (11 May 1985) where 56 people died and coincidentally on the same day, May 11, rioting that occurred at St Andrews Birmingham where 236 people were injured (88 police officers). As a result of these events Mr Justice Popplewell chaired an inquiry into Crowd Safety and Control at Sports Grounds.

2.3 Stewards - A Partnership Approach

Popplewell's report approached the problem more systematically. He viewed the various agents associated with a sporting event as systems whose interactions required greater examination. He introduced the notion that the football club was no different from any private individual or body. He believed that clubs were responsible for the arrangements for securing safety on their own premises (Popplewell par. 3.4, 1985) and for ensuring that whatever entertainment they allowed to take place on the premises was conducted in an orderly way. The "police had responsibility for controlling breaches of the peace and that the public got to the ground safely" (par. 3.5, 1985)

Here there exists a conflict, because although this was the stated position, or the formal view, in practice the police took responsibility for the football event in respect of crowds and crowd behaviour both on the way to an event and during the event itself. The club may have employed stewards to manage the entry into, and safety of spectators inside the ground, but these stewards received no training, they were unclear of their responsibilities and were generally recruited as dedicated fans who wanted to see a bit of football every week. "They were given no financial reward or training in safety, fire fighting or crowd management and had an average age range from 73 to 12" (Popplewell par. 3.101, 1985).

During a visit to a football club in 1990, I was observing the policing style of police ground commanders when I noticed that a steward had removed his Geltex jacket and had rolled it up and was holding it behind his back. When I asked him why he replied "If the away side are losing their fans identify the stewards as belonging to the club and beat you up". His perception of his role highlighted to me that there was a gap between published intent and the stewards perception of their own role on the ground at that time. After interviewing the Inspector with responsibility for football planning in the Football Unit at New Scotland Yard, (the headquarters of the Metropolitan Police), he said that the police at that time were really on their own as far as crowd management was concerned both inside and on the way to the club and that the perception from ground commanders was that this was entirely appropriate.

The Popplewell Report (1985) raised the issue of the role of stewards and declared that they had a major role at a football event and sought to recommend specific training for them. He clearly states "Stewards should not regard themselves or be regarded, simply like usherettes at a cinema showing people their seats". They should have a real regard to the safety of spectators at grounds. (Popplewell par. 3.117, 1985).

His report was radical as it attempted to look at the whole management of football as a complex system. He recognised that the club had a responsibility for the safety of the crowd and that although some of that responsibility could be devolved to police, i.e., facilitated entry into the ground and support on the way to the ground. He implies that their role should be subjugated to dealing with legal matters. Popplewell's interim report recommended that the Green Guide should be amended in respect to stewards. Of the many recommendations in regard to stewards the following support the argument.

> "that they should be given practical instruction and training appropriate to their responsibility"
>
> and
>
> "That no one should be employed as a steward unless they have been so instructed and trained"
>
> (Popplewell par. 3.117.4, 1985).

2.4 A Radical Systemic View

Popplewell's report also attempted to study the spectators as human beings with a complete section devoted to hooliganism. Here again he broke with tradition and talked about the dynamics of crowds. This radical break away from the 'ball bearing' metaphor is significant to this thesis because Popplewell's report represented something of a major paradigm shift in the way that the problems associated with crowd control at football matches were perceived.

Finally, his report was a refreshing break from the mechanistic rules and procedures seen before as the 'answer to the problem'. The Popplewell Report had begun to change the way football operated. It took a systematic approach to the problem by looking at the

boundaries of systems and developing strategies to enable the efficient co-operation of these systems and their associated sub-systems. Lucy (1993) coined the phrase 'Sub-system sub-optimality' referring to a system state where the immediate goals of a sub-system compete or run contrary with the goals or objectives of the overlying system. This state was clearly apparent in reports of previous disasters. One cannot avoid the fact that football clubs are run along business lines. Modifications to the structural composition of stadia cost money initially and, in the long term, may impact on revenue generation, i.e., the reduction on capacity. It was clear to Popplewell that the clubs had to be "encouraged to share the problem" and legislation would be required to force their hand.

2.5 The Taylor Report

As the recommendations of the Popplewell report started to be implemented another tragedy hit the football world. On April 15 1989. 96 people were crushed to death at Hillsborough Stadium. This was the worst football disaster in the history of British football.

The Right Honourable Justice Taylor was appointed to carry out an inquiry. His work built on the work of his predecessor and this report had a far greater impact on the football world than any report before it. It refers constantly to the work of Popplewell and is highly critical of club management. Taylor states, " ..... positive leadership has often been lacking and on occasions counter productive" (par. 53). He also poured scorn on behaviour of footballers on the pitch in defiance of decisions made by the referee, e.g. dirty tackling, etc.

Altogether the report made 76 recommendations the principal ones are summarised in the following diagram (fig, 1.2).

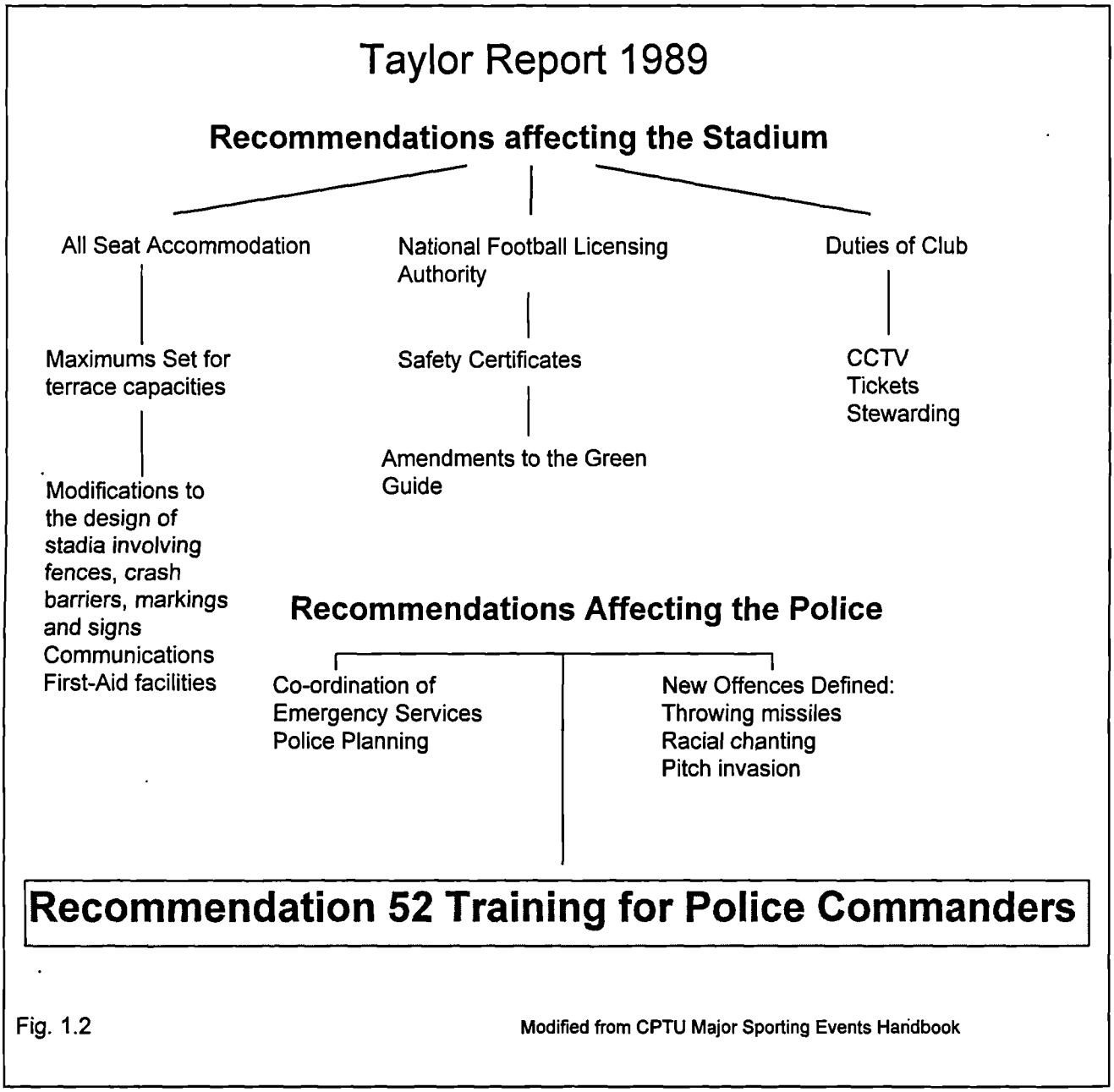


Fig. 1.2 Modified from CPTU Major Sporting Events Handbook

2.6 Policing Impact

Some of Taylor's recommendations changed the underlying philosophy of a football match and its requirements for policing. For example, he recommended that stadia become 'all seater'. This altered the very heart of the football event. Hitherto, supporters would come to a match and stand in the same spot in a particular terrace sometimes for three generations. This territorial dimension had become part of the ritual of being a supporter. But the desire to do away with the

standing terrace was not new and it had been tried before. Coventry City was the first English club to install seating throughout its ground in 1981, however, in 1983 it reverted to 2000 standing after visiting fans from Manchester City tore up the seats and used them as missiles. Seating also had a great impact on the policing of a match. If there were trouble makers the CCTV camera system could quickly identify the offending fans and police officer could be directed right to the correct seat. Taylor's recommendation also catered for seat allocations being referenced to the name and address of a supporter, still further strengthening the evidential side of law enforcement.

In addition, Taylor defined new offences at sporting events to deal with the chanting of racial abuse, missile throwing etc. The tactics necessary for the policing and enforcing of these new offences clearly generated a training requirement for the police, a subject I shall return to in some detail in the following chapter. Taylor, raised a number of other recommendations most notably the introduction of a National Membership scheme (par. 353). Each recommendation has an impact on the way a football match is managed. Instead of detailing them here, I will refer to them in the next chapter when I identify the training programmes developed for football ground commanders and will also chart their impact on the training design.

2.7 Recommendation 52, Training for Police Commanders

The most significant recommendation of Taylor for this thesis was to be No. 52:

> "Consideration should be given to the provision of a specific training course for senior officers presently acting as Police Commanders and those in line to do so. Such a course should include training in the basic strategy of policing football matches"

This short recommendation generated a tremendous response from the police world. The Association Of Chief Police Officers (ACPO) as representatives of the operational police commanders, approached the Home Office and agreed the formation of a sub committee to generate a national training course. The Central Planning and Training Unit (CPTU), the national co-ordinating body for police training, was tasked through F5 department, of the Home Office, to produce a training programme. This programme was developed as part of an emerging scheme of management development for senior officers. It did not follow the mechanistic approach of previous courses. It proved to be a tremendously supportive authority for the present research work and led to the eventual commissioning of the simulation training system which forms the focus of this research endeavour. The next chapter will explore this course in detail.

3. Senior Officer Training

The National Course

3.1 Chapter Résumé

The previous chapters have sought to define the research problems associated with senior officer training in critical incident management (CIM) and more specifically the impact on such training of the Taylor Report into the Hillsborough Stadium Disaster. This chapter looks in detail at the police response to the Taylor Report and its recommendations for senior officer development, particularly within the realm of managing large football events.

The chapter starts by examining the design of the training courses which resulted from Taylor's recommendations. It then reports on how observations, including a questionnaire based investigation, led me to a more complete understanding of the effectiveness or otherwise of the Major Sporting Events Course, which represented the Association of Chief Police Officer's (ACPO) response to Taylor's requirements for more effective police training in this regard. Finally it concludes by arguing that the course failed to meet the expectations of either its intended audience or those of operational command.

This chapter will attempt to place this nationally recognised course within the context of real world operational police management of major sporting events through observations made of a number of such events. In order to aid discussion and to provide a firm theoretical base for the development of this section of the research, it is important to clarify the nature and extent of the problems the national course was designed to address and to put it in context through a systems model of analysis, which will serve to reveal the major characteristics of the command and control of sporting events. The model will then be used to examine theoretical decision making and to

contrast such a theoretical point of view with real world observations of both the national training course and the management of real sporting events. The chapter will then conclude by redefining the original research question and will argue that a simulation approach can be applied to the problem, providing a learning environment that is capable of engendering relevant experience in this complex command environment.

3.2 The Training Need - Defined by Taylor

Recommendation 52 of the Taylor Report says:

> "Consideration should be given to the provision of a specific training course for senior officers presently acting as Police Commanders, and those in line to do so. Such a course should include training in the basic strategy of policing football matches.

Taylor continues.

> "The ultimate control at any match must be that of the Police Commander. He has authority to decide how many officers he needs and to deploy them in and outside the ground. He has, if necessary, to take such decisions as to postpone kick-off, or to stop the match, to evacuate the ground or any area of it"

The officer in command is therefore a key player in such command and control situations and needs careful and effective training if effective decisions and their resultant resource deployments are to follow at an operational level. The range of their responsibilities is wide and complex, as they have to control uncertainty and often

chaotic situations. Just some of the problems that impact on their areas of responsibility are shown in the diagram below (fig. 3.1.):

As the diagram indicates, Gold is the most strategic level of command. Gold commanders have to stand back from events to understand them as a whole.

Silver commanders, co-ordinate the tactical activities of the Bronze ground commanders and must ensure that the ground commanders are properly supported with resources.

Bronze commanders are the closest to the event. They work at the tactical command level. They continuously provide Silver Gold and other Bronze commanders with up-to-date information about the unfolding event.

Command and Control: Gold, Silver and Bronze

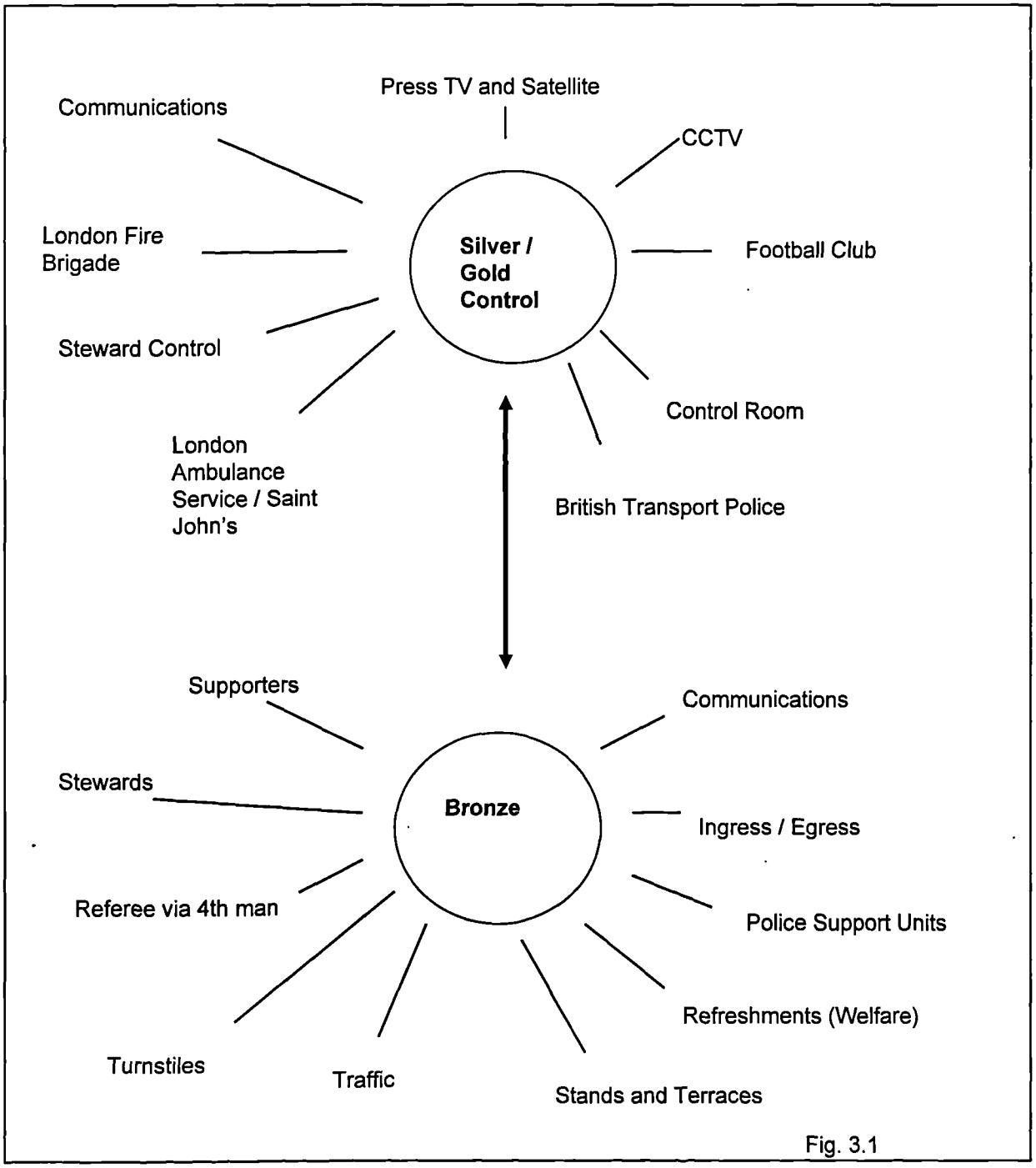


Fig. 3.1

3.3 The Major Sporting Events Course

A national course was commissioned by the Association of Chief Police Officers (ACPO) and developed by the Home Office F5 (Police) through the Central Planning and Training Unit (CPTU). The CPTU are charged with creating national training programmes for a number of police needs, predominantly recruit, probationer and sergeants development.

The CPTU are the national police training authority for the U.K. and seek to control the standard of training delivery on the National Sporting Events (MSE) Course, by making it a pre-requisite that any trainer wishing to deliver the course must first be accredited by them. This means that all trainers from the Metropolitan Police wanting to run such courses, would first have to undergo specific training. This, the CPTU argue, is to ensure that all courses meet a national standard, such that the consistency of training delivery is maintained from one training centre to another. Repeatability and consistency of the training delivery, seemed to be paramount to the originators of this course (rather than the learning content), a point I will return to shortly.

The Metropolitan Police recognised that such a command and control course was crucial to its own operational command and to its strategic response to the problems of policing football events. It had thirteen football stadia distributed around the London area, plus the National Stadium at Wembley and several other sporting stadia, such as cricket and rugby grounds Consequently it had over 300 officers who required training in respect of command and control. It was felt that the only way it could service its own need was to be accredited by the CPTU as a training centre for the delivery of the fully specified national course. Two trainers from the Management Development School were sent on the six week CPTU trainers course to allow the Metropolitan Police to be able to deliver the training to its own officers and to officers of adjoining forces in the manner nationally prescribed.

The Metropolitan Police Service started to deliver the course for itself in 1990 to the ranks of Chief Inspectors and above, i.e., those senior officers responsible for command at a football match. The course was not well received. Feedback from the participants indicated that the course was not meeting their real operational needs. The Commander (Training), who had overall responsibility of this training programme, was approached by operational command with a request to review the course as a matter of urgency. Operational Command (the customer) had serious doubts about the value and relevance of the course as it then existed. The Commander (Training) , aware of my previous work approached me to examine the course and to determine if any of its elements could be improved or supported by learning technology. My first job was to look at the course in detail and to try to understand its strengths and weaknesses.

3.4 Major Sporting Events Course Structure

The existing national course was modular in design with a number of discrete components delivered over a long period, typically several months.

The course comprises four phases (fig. 3.2.)

The Four Phases of the Major Sporting Event Programme

Phase 1	Historical Perspective, Roles, Responsibilities, The Law, Public Order Tactics
Phase 2	3½ Day Residential Programme Understanding Planning, Strategy and tactics
Phase 3	Students attend a range of events as an observer and commander
Phase 4	1½ days consolidation through exchanging views on personal experiences

Fig. 3.2

3.4.1 Phase 1

Phase 1 consisted of a workbook and an audio tape forming a distance learning study pack that contained learning material on the historical perspective of football tragedies, the role and responsibilities of policing a sporting event, the public order act 1986 (Exclusion Orders), the football spectators Act 1989, and other legislation including the control of alcohol and football offences. The final part of the study pack covered public order tactics, (Specifically excluded from this thesis for security reasons) and the Taylor Report and Green Guide.

The material was sent to the students at least eight weeks in advance of the residential phase two and they worked through this package in their own time.

3.4.2 Phase 2

Phase 2 is held at a Regional Training Centre,(the Metropolitan Police is accredited as a Regional Training Centre). It consists of a number of exercises and group work. It is designed to provide the student with the opportunity to develop an understanding of police strategies and tactics, together with the ability to function effectively within the nationally defined structure for command and control.

One complete day (day three) is set aside where the group works through a paper generated simulated event known in the organisation as a 'table-top exercise', based on events occurring in a fictitious football match held in a fictitious town. The main thinking behind this element was that, as the course was designed to be national, the designers believed that it was necessary to stage both the stadium and the town in an imaginary setting so as not to

cause difficulties for any one part of the country, where the venue may be recognised and therefore inferences made may compromise the training programme.

A great deal of work was required by the trainers, to provide students with information about the fictitious event and venue. To this end the design team developed a town called Sandford along with detailed maps and other intelligence. (This town was used for other nationally designed courses including assessment centres as part of the national police constable to sergeants promotion process).

3.4.3 Phase 3

In Phase 3, students attend a range of events to observe and experience the practicalities of policing large crowds at sporting venues. They act in two roles at this stage:

- As an observer tasked with examining the management structure at events, gaining an awareness of the process of command and control and to understand the practical aspects of a Police Commander's role and subsequently:
- As a police commander, practising those skills appropriate to the role and then reflecting on that experience, critically analysing their own actions.

To summarise this action phase, the student are required to 'shadow' experienced police commanders and consolidate knowledge gained in phase 2 and then be given the opportunity of taking command at a sporting event.

3.4.4 Phase 4

In Phase 4 all previous phases are consolidated. Here officers will be given the opportunity to examine the learning experience and to exchange personal experiences between other course members. In this last phase, students are encouraged to develop personal action plans for their future needs within their own force.

3.5 Identifying the Significant System Objects

When trying to analyse the course in terms of its strengths and weaknesses I faced a number of temporal and logistical constraints. The programme phases are spread over several months. It was not practicable to observe all the phases directly. Phase 1 was a student centred learning module completed at a time and place convenient to the learner. Likewise, the phase 3; 'shadowing and consolidation' module, took place at a football event at a time and venue convenient to the individual officer's police division and in line with local management. No phase 4 modules had been run with the first one scheduled to run six weeks from the start of my own research.

I initiated informal discussions with training staff engaged in delivering this course, past students and officers working in the headquarters department dealing with football planning. These groups represented respectively those involved in the course delivery, the customers and the subject matter experts. During these discussions it became clear that there were major problems with significant elements of the national course. From this early investigation I established that the residential module of the course (phase 2) was failing to meet its training objectives. This was the message common to all with whom I spoke with the exception of the training staff who, by and large, were satisfied with the course as it stood.

To analyse this concern in greater detail, I undertook a questionnaire survey using my survey population comprising those participants who had experienced phase 1,2 and 3. I was aware at that time that no one had been through phase 4 of the existing course but I never-the-less included a question in the hope that the first group may have finished phase 4 before receiving the questionnaire. (In fact neither group had completed phase 4 on receipt of the questionnaire and consequently there were no responses given to the question explicitly relating to that phase.

I designed the questionnaire with a view to exploring the value of the course from the students' perspective. It was important to consult the students directly as the trainers had invested a substantial amount of time and effort in preparing the course. Whilst the trainers felt there were some problems in its delivery, I felt they were too close to the problem to provide an objective analysis. Conversely. the participants would not only be free of this potential bias but would also have been on the receiving end of such training delivery and as such would be better placed to comment on its effectiveness, (or otherwise) in meeting their learning needs in this domain. Their 'real world' views on the value of the course would provide a solid starting point for my investigation..

3.6 Questionnaire

I designed a questionnaire which asked both specific questions and contained statements with accompanying attitude scales with summated ratings (Likert 1932). The statements were designed to provide a diagnostic tool and to compare the student's perception of the effectiveness of each module. The direct questions were designed to find out if all the students had completed all the modules. This served as an internal check for 'validity of response'. If a respondent implied that the course did not prepare him or her for a particular phase, but had not actually experienced that phase, the answer would

have been invalid. It transpired that all the respondents who returned their questionnaires had completed all stages barring phase 4 (the consolidation module). The questionnaire can be found at appendix 2

In all, 26 questionnaires were sent to students, there being fourteen participants on the first course and twelve on the second. 20 respondents returned their questionnaires, giving a return rate of 76.9% A graph comparing responses can be found below (fig. 3.3):

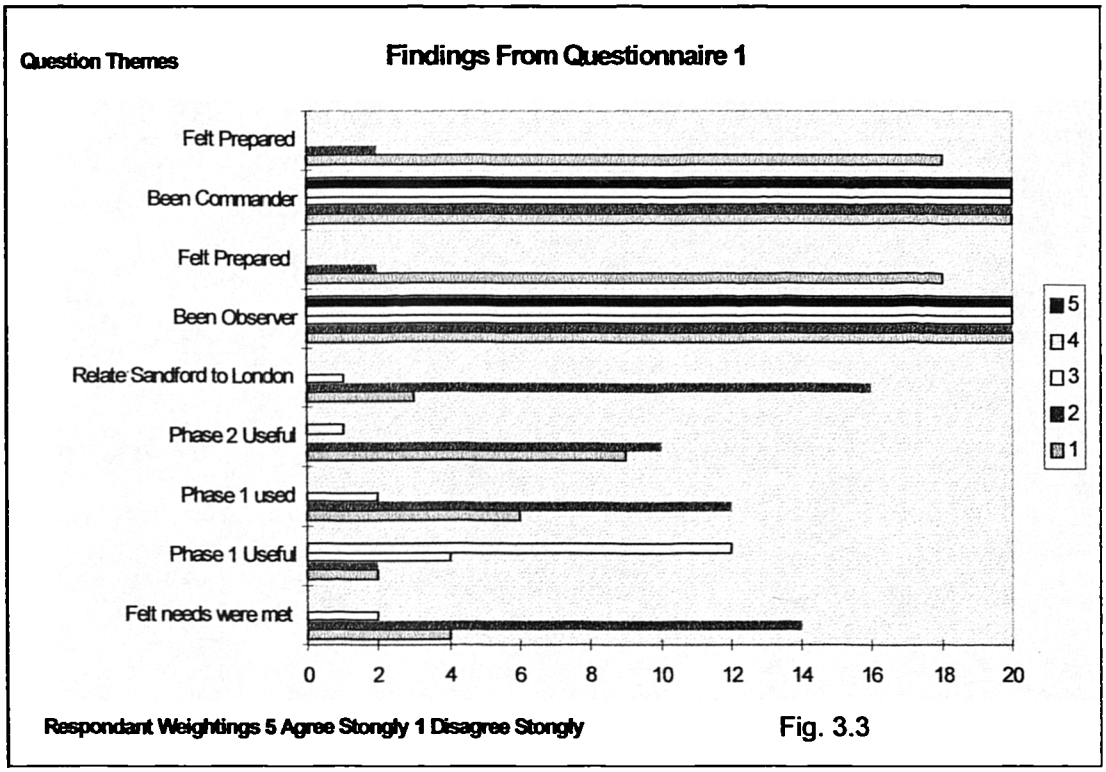


Fig. 3.3

The graph compares the responses for each question contained within the survey. For each question the spread of responses are shown. A rating of 5 meant that the respondent strongly agreed with the question statement, a score of 1 meant that the respondent strongly disagreed with it.

Questions 6 and 8 were Yes/No questions. All respondents replied 'yes' to both questions and this is shown in the graph as a maximum score for each weighting. (Question 10 related to phase 4 'consolidation' and as no participant had experienced this phase it is not shown on the graph.

3.7 Findings

Initial analysis of findings showed that the students did not rate the course as useful to them. In fact 90% of the participants 'disagreed strongly' with the statement relating to feeling prepared for the role of commander".

This response suggests that the course failed to deliver Taylor's training requirement as set out in his report. Nevertheless, it was the only nationally accredited course and that remains the case to this date. I recognised that some parts of the programme were seen as useful by the students. By way of an example, 60% of the respondents concurred with the statement "I found the self learning package called Phase 1 useful". This, combined with evidence gathered through informal interviews with of students led me to believe that the phase 1 module was not only well received, but was subsequently used as a reference document by them in their operational environment.

3.8 Brain Hemisphericity and Learning

Analysis of findings suggest that the respondents found the theory and law section both necessary and helpful in preparing them for Phase 2. There is also evidence that the respondents found the 'rote learning' requirement an effective means of gathering and retaining factual information.

However, whether this module could have gone further to prepare learners for phase 2 is a different question. The responses and subsequent discussions with students led me to believe that they were happy to undertake the rote learning contained within Phase 1, but the design and delivery of phase 2 was weak in applying the knowledge obtained through rote learning to a meaningful context.

Roger Sperry (Sperry 1973, McCarthy, 1980) established that the human brain can actually function almost as two brains in certain

situations and that the way in which we experience the world and experience training is fundamentally affected by which hemisphere is dominant. While the right hemisphere is the initial receiver of all incoming information, the left side is called the dominant hemisphere because it is here that language and speech are produced. In terms of processing information and stimuli, the left brain does a *linear, rational* sequential type of processing (rote learning, absorbing factual information), while the right brain uses a more *global* approach where data is perceived, absorbed and processed even while it is in the process of changing. Sperry concluded that people who had been trained to use one side of the brain more than the other find it difficult to "switch" when necessary. He also showed that when the weaker side of the brain is stimulated and encouraged to co-operate with the stronger side there is a great increase in ability and effectiveness.

Taking this theoretical position as a means of analysing the methodological adequacy of the teaching strategies adopted on the course, I formed the view that any effective training package on critical incident management would require the integration of phase 1 and 2. The response given to the statement (Q.3), "Much of the material in Phase 1 was used during Phase 2 (the 3 ½ day course)" indicated that 60% of respondents disagreed with this statement, suggesting that little integration of the initial two modules was taking place and that rote learning and the application of knowledge gained through this learning process was kept separate.

Questions 5 and 7 related specifically to the phase 2 module and in its ability to preparing the students for phase 3 (observation and command phase). 90% of respondents indicated that they strongly disagreed with the suggestion that phase 2 prepared them for the activities in phase 3, (the observations/participation in real events). This finding, clearly added to my concerns about the phase 2 module.

Officers did respond favourably to questions asked about the phase 3 module; observation and command module. When asked "did you feel that learning took place at these observations", all who took part in the informal discussion (twelve officers) said "yes", and furthermore, they felt that this phase of the course was particularly testing. They viewed this phase as the 'acid test' of their command ability.

The questionnaire concluded with a section where students were given the opportunity to write their own comments in an unstructured way. Below are a representative selection of their responses.

> " The trainers lacked 'street credibility in the policing of football ..."
>
> " I kept on asking myself why we were using a Mickey Mouse town called Sandford when we have loads of problems in our real city, London"
>
> "The best part of the course was the specialist speakers"
>
> "I needed to know what the policy was and the trainers (no offence) didn't know, only what was written down in the course blurb"
>
> "The paper feed exercise was boring and unrelated to the Metropolitan Police"
>
> "The workbook (*phase 1. JPC*) was good, I found the course a bit 'hammy' but I felt the best bit was out on the ground observing operational officers commanding an event"

3.9 Questionnaire - Findings; Conclusion

From analysis of the questionnaire and informal interviews with students and the training staff and analysis of the course

documentation, I concluded that the phase 2 module had failed to reach its design objectives. Which were:

> *'To develop the knowledge, understanding, skills and attitudes to perform the role of Police Commander at any major sporting event'*
>
> (CPTU Trainers Guide August 1994)

The questionnaires indicated quite clearly that the phase 1 distance learning module was well received. I also found out subsequently that operational officers were happy to use this module as an operational support document when managing sporting events, as such I concluded that it had credibility with its users.

The phase 1 module was designed to provide a baseline of knowledge for all course participants attending the remaining three phases. However the students were themselves concerned that they were unable to use this material to any depth. This view was in juxtaposition with the view given by the trainers, namely that the phase 2 relied on a thorough understanding of the material, suggesting that something was wrong with the integration of the phase 1 and phase 2 modules..

I knew it would prove difficult to change such a nationally prescribed training course despite evidence that significant numbers of students found application of knowledge gained during phase 1 difficult in phase 2. There were two options presenting themselves to me at that time. I could suggest ways of changing phase 1 and attempt to convince the Home Office that it needed changing. Or I could turn my attention to phase 2 and work towards providing a learning experience that would properly locate learning gained during phase 1 within the context of the real world of operational command. Ideally, I felt I needed to do both, but aware of the difficulties of changing such a

nationally recognised course, my choice was to further explore the phase 2 module.

These findings were fundamental to my thinking at the start of this phase of my work. I was concerned that, even after all the research by Taylor and his teams, identifying the problems at major sporting events (and the substantial investment from the Home Office into the development of a specific training programme), that the final outcome, namely the nationally developed course, still did little to meet the needs of ground commanders. A conflict existed between the objectives outlined in the nationally specified course documentation, which were focused and fully supportive of the Taylor recommendations, and the students' perceptions of the relevance and value of the course. It was clear to me that I would have to carry out detailed observations of the phase 2 module as this was the major cause of concern with the students and their senior officers. . I therefore arranged to observe the next running of module 2, as a non participant observer.

I had an additional need to observe the training course at this stage in my police career. My experience of police procedures was limited due to the fact that I was a civilian officer and had not myself undertaken any training in command and control, nor had I any experience of command and control at football matches other than from the perception of a spectator. I felt it was necessary to observe at first hand the operational environment.

This led me to carry out three exploratory observational studies in the real world of policing and a literature survey of the supporting documentation. These key elements are summarised in the diagram below (fig. 3.4.).

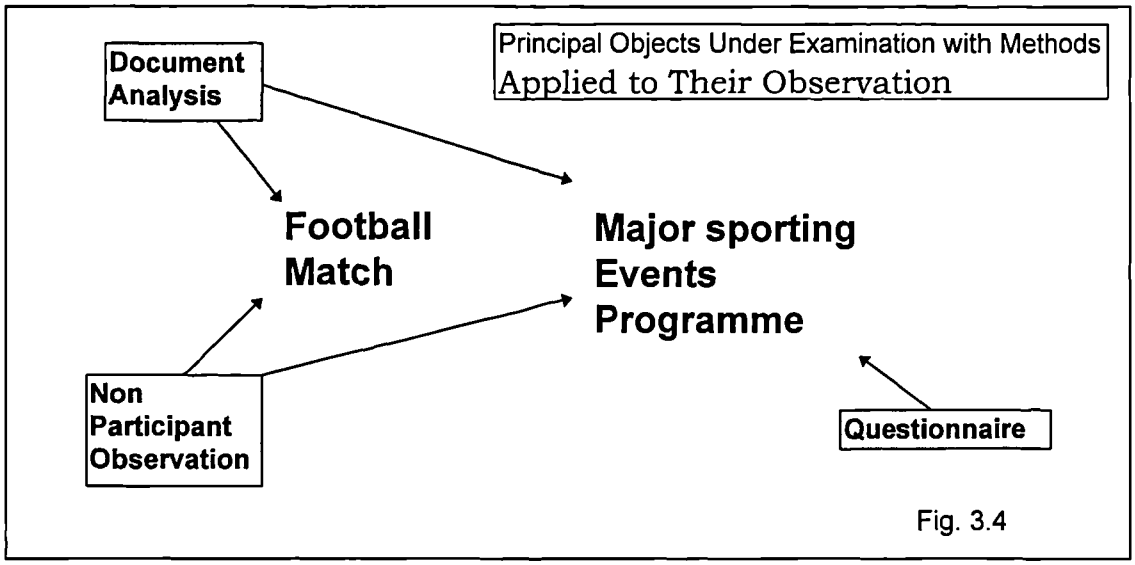


Fig. 3.4

3.10 Non Participative Observation of the Training Course

The log of my observations of these events can be found at appendix 3. The first two days of the phase 2 event consisted of a cycle of trainer input, student involvement in some sort of activity or exercise, followed by a reflective consolidation session with both trainer and student involvement.

The course ran for three and a half days, during which the students were given exercises to complete, either in small groups or individually. Of particular interest was the third day of the course, where the students were encouraged to make decisions during a slowly unfolding simulated football event. Here the students worked as a large group analysing the event in small time slots. They were asked by the trainers to consider problems happening at specific times, encompassing; pre-match build up; the match itself and post match phases. As a group, students were required to formulate solutions and talk through the 'what if' possibilities for any given solution or set of solutions. The exercise was timed from the start of the football event (which would probably be about two to four hours before kick off time), until the release of police resources and the area surrounding the event reverted to normal policing status (which would be approximately two to four hours after the final whistle). The

students were given a very wide range of problems to deal with, ranging from minor traffic control to significant management issues involving public and police safety. The technology used to support the day included cassette recorders, used to play pre-recorded audio tapes of radio messages aimed at supporting specific problems together with video tape units capable of playing back recordings of significant physical structures around the football stadium and other problems.

3.11 Time Constraints During the Day

The day was full of group activity, heated argument and in-depth discussion. Throughout the discussions the trainers did not impose any time constraints or sense of urgency on the group. The trainers were keen to explore all the possible outcomes from any decision or sets of decision. To give some example of this approach, I will describe how a particular problem was dealt with, this outline is indicative of how the group dealt with many 'problems' throughout the day. Participants were given information about a developing traffic management problem, timed at 10:30 am.

The group discussed in detail the problem i.e., what elements of the information given, constituted the problem, the possible solutions to the problems and finally the outcomes of the various solutions. All the generated outcomes were worked through and the most favourable one chosen This particular problem took about forty five minutes of class time to work through. When all the possibilities had been exhausted another problem was introduced to the group. Problems were presented serially and at no time did they consider parallel problems, whose possible solutions may have an impact on other problems occurring at the same time.

When the group had exhausted all the options for one problem they were given the next problem. However the next problem was timed at a match day time of 10:40, only ten minutes in real time later than the original problem. This pattern of problems and exhaustive

analysis carried on for the rest of the day. In reality most of the problems would have been solved either instantly, with a thought, or in just a few minutes. So there appeared to a be reality gap in the course design. In contrast, the emphasis of the course was on thinking through problems in a very formal and exacting way, this ran in direct contradiction to my later observations at a 'live' event.

It was as if there was a different and undisclosed agenda for the course. I asked myself, what were the trainers trying to achieve? Pointers to the answer came when I analysed the comments made by trainers throughout the case study. Typical comments were:

> "this is helpful in the coroners court"
>
> "when your facing the national press its handy having the logical reasoning behind your actions"
>
> "You've got to ask yourself when you are making these decisions, how will it look at the inquiry"

I believed that these comments and attitudes presented by the trainer's demonstrated that there was an operational 'experience gap' between the perceptions of the trainer's i.e., what it must be like to be a senior officer at an event. They had no personal experience of command and control other than that which they had received as a direct result of ***being*** an officer ***under*** command at an event. The CPTU had insisted that accredited trainers deliver the course but it is important to note that these trainers need not necessarily be operational experts. During the courses I observed this was definitely the case. The trainers had no previous command experience. It appeared that they were putting across their own uniformed perceptions of what a senior officer needed to know, and part of their perceptual schema included strategies aimed at helping officers avoid

blame after the event if things went badly. Conversely, when I interviewed senior officers, who had actually been engaged at a command level at such events, I found that their needs were for strategies to enable them to cope with complexity during the event so that the outcome would be a good one.

The learning associated to the third day of phase 2 also seemed to have been developed on the basis of Classical Decision Theory (a theory I shall explore in depth later). This formal analytical approach does provide a powerful 'audit trail' of decisions taken and provides for useful post event justification, further reinforcing the trainers desires to present the course as some form of 'insurance policy' to protect officers from post event criticism.

The course trainers comments give some useful insight into the philosophy operating within the organisation at that time. Analysing the course literature, it seemed that the purpose of the day was to explore a number of set problems and within a group setting, encourage students to collectively identify and apply strategies to resolving those problems.

I recognised that this led to two contradictions. Firstly, the course was run in the quiet surroundings of a classroom with no time pressures (decisions were constructed using classical decision making models). This was in contradiction to the fast time, stressful world of a real football match. Secondly, although decisions in the real world are made by the interactions of commanders working in teams. At the individual level ground commanders work alone, assessing their individual command situation, and conveying that information to their fellow commanders working elsewhere at the event, in order that the whole team might see the big picture. The classroom environment gave the whole picture (or the state of the system) to all students simultaneously, so effectively, all the students took on the role of the highest level of command . This was in keeping with the stated aims

of the course i.e., to train that command level officer. However there was no complexity, no partial information and no early recognition that the problem presented 'looked like' a similar problem, i.e., typicality. In other words the 'reality' had to be removed from the 'real event' experience.

This formal approach to decision making seemingly adopted by the course, follows the Classical School of Decision Making. Within this school are a number of models such as Decision Analysis (von Neuman & Morgenstern 1947, Edward 1954), Multi Attribute Utility Theory (Baron 1988) and Bayesian statistics (derived from the work of Bayes in the 18th Century).

3.12 Classical Decision Making - Defined

Classical theories of decision making arose from mathematics and game theory and are therefore objective and analytical. Early research into decision making was highly controlled, attempting to examine the decision making process in isolation by excluding all 'extraneous' variables. These experiments typically involved giving college students novel tasks in a laboratory environment.

Experience seems to play only a limited role in classical models, which are analytical methods for using available information, (without recourse to experience) in order to make optimal judgements and decisions. This quantitative, analytical nature of classical decision theory has undoubtedly contributed to its popularity, especially amongst those wanting to teach decision making in a traditional pedagogic context. I would argue that this makes the theory too restrictive for applied purposes. Beach and Lipschitz (1993) describe Classical Decision Making as follows:

> "In its normative role, classical decision theory is an abstract system of propositions that is designed to describe the choices of an

ideal, hypothetical decision maker - omniscient, computationally omnipotent Economical Man"

(Beach and Lipschitz, 1993 p. 21)

In Classical Decision Making, the job of the decision maker is to generate utility values and to estimate probabilities.(Hendry 1994) However the generation of utility values does not necessarily reflect skill levels, as novices may be able to generate utility values as easily as experts, so the generation of utility values does not reflect expertise. All the possible options are systematically evaluated using various criterion dimensions. Each option is rated on each dimension, the importance of each dimension is weighted, so the final score for each option takes both ratings and weightings into account. The option with the highest score is identified as the best solution.

Experience does have a role in classical decision making, as people with greater experience should be able to generate more accurate probabilities. This seems to be a very different form of decision making to the one I observed in a real command and control environment such as the one described early in this chapter. However, such decisional estimations as arise from a classical decision making process, are notoriously unreliable. (Baron 1988) So even though the estimation of probability should require a level of experience, it is not clear from the literature how these estimations of probability, suggested by the decision maker, reflect their skills or experience. A summary of the classical decision making process can be found below in fig.3.5.

Classical Decision Making Process

1. Specify all relevant features of the task
2. Identify the full range of options
3. Identify the key evaluation dimensions
4. Identify weights for each dimension
5. Rate each option on each dimension
6. Tabulate results
7. Select best option
8. Implement best option

Fig. 3.5

During my observations of the training course it was clear that this classical approach formed the decisional framework for the group problem solving activity, a consequence of the way that the training was structured and also the way in which students were encouraged to deal with problems set.

There are significant difficulties with the classical decision making model when it is applied to real world problems of command and control. Firstly, there are a number of elements unrecognised in the model. For example, Wohl (1981) argues that when investigating tactical decision making in command and control, analytical theories "cannot help us to understand the creative act of a commander who rejects a recommended course of action by a junior..." I believe it is the feel of this real world approach, in which other competing elements such as the need to make decision under conditions of uncertainty, the application of judgement, belief and opinion, subjective estimates of the situation (uncertainty), plus what ever objective data is available, that reflects the true decision making environment of command and control.

Simon (1959), states "Classical theory is a theory of a man choosing among fixed and known alternatives, to each of which is allocated known consequences. But when perception and cognition intervene between the decision maker and the environment this model no longer proves adequate ".

The strength of the classical approach, is first of all, that it is reliable if decision makers have the time to consider every possibility, logically and at their own pace. Such strategies work the same way, over and over again. They are quantitative so they are easy to measure. They are very rigorous and thorough and they can serve as a general strategy for problem solving. However the shortcomings of such approaches are that their assumptions are too restrictive; "analytical decision strategies are rarely applicable. It is difficult to observe any of them in an operational environment" (Kaempf 1992)

I felt it necessary in order to gain a systematic view of command and control to observe the policing of a real world of a football event, the next section details these observations.

3.13 Observations in the 'Real World' -Sporting Events

In total I attended six football matches. Three were daylight games and three were night kick off games. Football matches are graded events depending on a number of factors. The category of a game reflects a number of issues defined in the following table (Fig. 3.6.):

Match Category	**Description**
• **Category A**	Those matches at which neither the crowd size nor the potential for disorder are considered to be significant enough to cause difficulties
• **Category B**	Those matches where a capacity of near capacity crowd is expected or where a particularly large 'away' support is possible but where the potential for disorder is

	considered to be less serious
• **Category C**	Those matches at which a large crowd can be expected which is likely to give rise to serious public safety considerations and/or where intelligence suggests that serious disorder is likely to occur between rival supporters

Fig. 3.6

I was advised by experts in the field of football event planning, to attend each category in both night and day settings, as there were many differences between both the categories themselves and the time the match in any category was played. During each observation I was given free access throughout the stadium, including the police control room, I was issued with a police personal radio to monitor all radio transmissions and I was given open access to all police and ground personnel. I was also given access to all operational documentation including; emergency procedures, police tactics and deployment of police resources etc. I kept a log of the event from the pre-match briefing which took place as many as four hours before the game, to the dismissal of all police personnel at a time ranging from one to three hours after the game had finished. This log cannot form an appendix as it contains details of police tactics and procedures that are not for publication in the public domain. However I am able to refer to them here in broad terms.

I recognised there to be several layers of command operating before during and after the event. Before I introduce a systems model for describing command and control at a football event I will briefly define

these command and control systems, as they are viewed from the perspective of the police service itself.

3.14 Command and Control - Layers of Command

Command and Control in the police service follows predetermined command structures laid down by The Association of Chief Police Officers (ACPO). A three layered approach is used and the layers are called Gold, Silver and Bronze.

Gold	has overall command and strategic responsibility
Silver	ground commander; tactical co-ordination to carry out strategy
Bronze	tactical implementation of the strategy

ACPO Public Order Manual 1994

3.15 Boundaries of Command

According to ACPO doctrine, Gold commanders set the strategy for the event, they develop this in close discussion with their teams of both 'Silver' and 'Bronze' commanders. There is only one Silver commander in this command structure.

According to the Public Order Manual, Gold has little role in the command and control of the match, this assumes the event unfolds in a pre-considered way. Assuming all is well the Silver Commander has responsibility to ensure the event follows a set plan or strategy.

During my observations I found this was not the case. There appeared to be no consistency of command. In some stadia; Gold remained in the control room and Silver was mobile, in others this was reversed. In some stadia both Silver and Gold operated in the control room together. Only in one observed match, did I see Gold act in a role consistent with nationally approved policy.

This finding was consistent with observations made by Powell and his colleagues (Powell et. al. 1992) on the command and control of major fire events. In that context there exists a nationally agreed protocol for command and control strategy and its training. Typically though, officers in command adapted to working practices with which they felt comfortable.

This gap between the organisational policy and the real world implementation of command and control was clearly known by all the officers it effected.

It was important to consult with the policy makers at Headquarters Branch to understand the policy and strategy aspects as far as they were concerned, in order to determine whether they were content with the situation described above.. They informed me that the Gold, Silver and Bronze structure only really operated as described in the ACPO manual in Public Order situations that were co-ordinated by headquarters. Any command structures occurring at Divisional level (local) were up to local Divisional Command. The knowledge of the inconsistency between policy department doctrine and operational procedures and their real world implementation was instrumental in the shaping of questions asked during my next series of observations. Based on these findings I realised I could now make no assumptions about the structure of command and control and would have to develop a model from my own observations.

From these observations it was clear that if the unfolding event generated problems that had been anticipated during the pre-event planning state (state 1 fig. 3.7), there was very little for the Gold commander to do. As the Gold commander was physically located in the football control room, the commander began to take decisions that should have been left for the Silver commander.

With this in mind, the roles of Silver and Gold at football events can often be seen as interchangeable, if Silver and Gold are both in the

football control room and the event being managed is unfolding in a way that was predicted. This observation is at odds with the stated command and control policy. However if the event becomes truly 'wicked' (Rittel, and Webber, 1973) and out of normal control then the Gold commanders will concern themselves only in the strategic role, leaving Silver to carry out the tactical implementation of the developing strategy.

Silver has the major command during most normal events. All decisions relating to maintaining command strategy are relayed through 'Silver Control'. Bronze commanders are simply responsible for the tactical implementation of that strategy. The football stadium arena is typically divided into sectors with a Bronze commander having responsibility for a sector or a number of sectors within the stadium. The exact sector/s allocated to a Bronze can change during the event. Consequently a Bronze may have responsibility for a sector outside the ground before kick off and inside during the match, only to be reassigned to another location near the end of the game. These locations would be designated either in the operation order or could be re-designated at any time by Silver Command.

Bronze Commanders have a number of police units under their command. These Police Support Units (PSU) are normally made up of an Inspector three Sergeants and twenty one constables. They have a radio call sign which relates to the call sign for their commanding Bronze. Deployment of these PSU's is carried out through the control room.

3.16 System States

The three command layers have different roles and responsibilities associated with distinct times during the event. From my observations I was able to define a number of system states throughout the event, I have classified these states as either dynamic

or static system states The table below (fig. 3.7), describes these states in more detail.

System States

State Number	Dynamic / Static	Description
1 - Planning	Static	the planning stage which operates well before the match is to be played. Here the management team at the local police division plan the event and consider all the contingencies. An operation order is written and the order will contain the deployment details of police resources before during and after the event. In addition it will define emergency procedures.
2. Before the Match	Dynamic	This stage operates when the police resources muster at an event. It is a dynamic stage because decisions made at this point have a dynamic relationship with the event.
3. During the Match	Dynamic	This is a transition stage after the spectators have arrived in the stadium, the police commanders are allocated command of specific sectors either inside or outside the stadium. The allocation is either defined in the operations order or ad hoc through senior command. Again it is dynamic as decisions have a relationship with the event.
4. 15 Minutes Before the Final Whistle.	Dynamic	Preparation is made for the fans to leave at the end of the game. Majority of procedures pre-planned and written in the operations order. Extremely dynamic stage as the time frame between decisions and their

		effects is very short.
5. Event De-brief	Static	The de-brief normally occurs after the event if at all. De-briefs are more likely to be held if something went wrong as opposed to exploring what went well. Static because the event is now over The exception to this is one de-brief observed that occurred at half-time. This de-brief was a dynamic state as the resultant information communicated and decisions made during it had a major impact on the second half of the game, in that the de-brief pro-actively avoided difficulties at the end of the match. The decision made was to keep the visiting supporters inside the ground for fifteen minutes at the end of the game.

Fig. 3.7 System States

3.17 Communication - Information Gathering

Detailed observations were made of the six matches. Content analysis of these observations revealed that both Bronze and Silver Commanders were making decisions based on information available to them at the time or on information they expected to receive shortly. By tracking several Bronze Commanders for a long period, I was able to ascertain that they spent most of their time communicating with, either officers under their command or their senior officers, or agents around them such as club officials, press officers, etc. in a continual attempt to gather information about their environment or other sectors that may have an impact on their own. It became clear that communication was a key element throughout these observations namely; communication.

Analysis of policing command and control activity within the football stadium police control room revealed similar patterns of continual

communication with officers, actively seeking out information from subordinates or from stadium agents. Command officers were dealing with complexity and were continuously trying to make sense of the information received. Much of the information was fragmented being relayed in small pieces, interrupted by other messages.

3.18 An Example from the Real World

An example taken from my log will hopefully give the reader a feel for one of the many situations I observed. The log for Match D revealed the effect of a lorry crash on the main ring road serving a particular ground. The event occurred at about thirty five minutes before kick-off of a typical football match. Information from traffic units was scarce and in addition there was a radio transmission defect caused by a flyover blocking the radio signals. This required the traffic sergeant to move from the incident to a suitable transmission location before he could radio in information. This in turn led to a logistical problem caused by the time delay occurring between the asking for information and the transmission of that information to football control (Silver). As time moved on, Silver contemplated delaying the kick-off so that the supporters stranded in their coaches on the ring road would be able to gain entrance to the ground. This problem had been anticipated at the pre-event planning state. Delaying the kick off was a pre-considered option and therefore 'Silver' was considering the tactical implementation of that strategy. Sky TV, who were covering the match were very anxious not to delay the match as it was being transmitted across the world at a set time, and time had been pre-booked on the necessary satellites to carry the programme. The football club were insistent that the game should kick off on time as they would lose a great deal of money from the loss of the broadcast. The main difficulty for the Silver commander was that without good quality information (from the traffic sergeant) he would have difficulty in making an accurate prediction of the time the road would be cleared and the fans would gain access to the ground. Against

tremendous pressure Silver contacted the referee and advised him that he was delaying the match by twenty minutes.

The significance of this example is to illustrate that command and control involves dealing with complexity, making decisions under pressure and dealing with partial information. The next section will introduce, the commander's need to recognise patterns in chaos, where information is fragmented and often contradictory. From the above you will see that there are two critical factors;

1. The continual need to communicate and be communicated with.

2. How that communication influences decision making

In crisis management, complex events demand that 'Bronze' 'Silver' and 'Gold' commanders make decisions irrespective of whether they have partial or rich information gathered by imperfect systems of communication.

3.19 Natural Decision Making - A Better Theoretical Viewpoint

From a literature review of decision making, and the models defining the decision making process, I concluded that there were two opposing schools of thought; the school of classical decision making used to underpin the previously mentioned National Sporting Events Course, and the school of naturalistic decision making to which I shall now turn.

In section 4.12, classical decision making was described in detail and I showed how it lacked fit within the context of crisis management. An alternative model associated to Klein and Zsambok (1991), based upon naturalistic decision making, did provide a closer fit with the behaviours and communication patters I have observed in the sporting events I visited.

Real world tasks differ along many dimensions from the serial choice decision as defined by classical decision models. (Means et. al 1994).

In particular, in naturalistic decision making theory, decision making is not considered a task, the police commanders do not set out to make decisions, they set out to control a football match. Obtaining this goal requires the making of many decisions but decision making is part of a larger activity, not an end in or of itself. Therefore, the commander is making a whole string of decisions which form a decision-action-feedback loop. This means that the decision making process demands flexibility, as the environment changes dramatically as events evolve.

Within this complexity, the decision makers often have multiple, sometimes competing goals, e.g., 'clear the pitch from a pitch invasion' and 'protect the officers under my command'. These goals compete for their attention. There are time pressures or 'windows of opportunity' (Crego 1993), periods in which decisions made are able to influence or change the environment. There comes a point where decisions being made are no longer relevant to the situation in a pro-active way. If this occurs decision making becomes reactive. It is at this stage that classical decision making breaks down. Such a situation can be likened to a baby trying to catch a bouncing ball. S/he sees the ball and puts his or her hand out to catch it but by the time s/he has co-ordinated the motor skills necessary to move his arm the ball is not where s/he saw it. The baby continually snatches at air as the ball bounces, these reactive decisions are often referred to as being, or operating, 'behind the curve'.

Naturalistic decision making is not an isolated activity but occurs in the context of complex diagnostic, command and control. When command officers arrive at the scene, within a matter of a few seconds they are able to diagnose the situation and implement a course of action. The naturalistic or operational world is identified by some key characteristics (as shown in the following diagram fig. 3.8), which are very different from those contained within the Classical approach.

Features of Naturalistic Decision Making

1. ill-defined Goals And Ill-Structured Tasks
2. Uncertainty, Ambiguity, And Missing Data
3. Shifting And Competing Goals
4. Dynamic And Continually Changing Conditions
5. Action-Feedback Loops (Real Time Reactions To Changed Conditions)
6. Time Stress
7. High Stakes
8. Multiple Players
9. Distributed Teams
10. Organisation Goals And Norms
11. Experienced Decision Makers

Fig. 3.8

3.20 Applying Naturalistic Decision Making Theory to the Real World

Observing the command and control at the football match I witnessed all of the above characteristics. The football event is a dynamic, fluid situation, it is not a static and well constructed environment, things change as the situation develops. Taking the example provided earlier of the traffic problem, decisions made at the time had a direct effect on the environment. The decision to delay the kick off, solved or eased the problems in one dimension of the management of the event but generated new problems with other dimensions. Timing is critical. There are many action feedback loops, acting simultaneously. "If I do something now it is going to effect what happens in two minutes time". Actions in one place change the goals elsewhere and, significantly, they change the way that cues emanating from the environment become interpreted. There is stress associated with the pressure of time. By this I mean that time is compressed, problems typically have to be resolved within narrowing time-frames. There are high stakes, both in terms of the safety of large numbers of people and the safety of the officers under command.

In command and control there are multiple players, the senior commander does not work in isolation. He or she works within a team and the individuals within that team have their own goals and expectations which also impact upon the operational world of event management.

This complex, fluid and dynamic world, populated with parallel and inter-dependent problems was is in stark contrast to the experiences I had had hitherto in the organisation and the general principles I had developed during my earlier work on creating learning technology solutions for police officers. In this earlier work an assumption was made that officers would work on their own, interacting with the computer learning programme. Here in the operational area the world view was different. Officers operated in teams, decisions were made as a direct result of co-operation at all levels. This point in my research was to prove extremely significant. Previously I had felt that learning technology would be useful in enhancing individualised learning of certain aspects of a training course. Based on the findings of my investigations into ground commanders at football events I had come to realise that learning technology could be developed to reflect the multiple player aspect of the decision making process, and to develop team learning and team building exercises which captured the true essence of this multi-faceted reality.

Football commanders are experienced decision makers, they have either undergone training or they are have been in command for some time. Generally, there are no novices in command and control, so there are no naïve students, the naturalistic environment is very different from that in a laboratory. A Naturalistic decision making approach seemed a perfect base for the educational technology I was to develop.

3.21 Naturalistic Decision Making: More Detail

Klein (Klein et. al. 1993) defines a particular naturalistic decision making model that provides a close fit to the decision making I witnessed at sporting events. The model he has developed is called Recognition-Primed Decision (RPD). It has three levels; simple; developing; and complex.. At the 'simple' level, decision makers receive 'cues' (sensory information from the environment), recognise their typicality relating to past experience, and implement a tried and tested, appropriate course of action. At the 'developing' level, decision makers receive cues, but an option does not immediately present itself. Mental simulation is then used to evaluate a possibility. At the 'complex' level, aspects of the situation are unfamiliar to decision makers and so they search for recognisable cues until enough information is available to allow functioning at a developing or simple level.

The key differences between the RPD (naturalistic) and the normative model (classical) are defined in the following table. (fig. 3.8)

A Comparison of Normative and Naturalistic Models of Decision Making

RPD	Normative
First option usually workable	Exhaustive generation of options
Serial evaluation of options	Concurrent evaluation of options
Satisficing	Optimising
Evaluation via mental simulation	Formularistic analysis (Bayesian Multi-attribute Utility etc.)
Improving first option	Choosing between alternatives
Focus on situation assessment	Focus on decision event
Primed to act	Decision waits completion of analysis

Fig. 3.9

The naturalistic model recognises experience (Kaempf 1992) and the need to develop it as part of learning. This leads us to define our problem in another way by asking the question;

Is it possible to create an environment that generates better decision making for crisis management by engendering experience?

For it is precisely that experience that enables a command officers to recognise from any situation, what is typical, (what has he or she seen before). This pattern recognition follows the simple match level of the recognition-primed decision making model detailed in the diagram below.

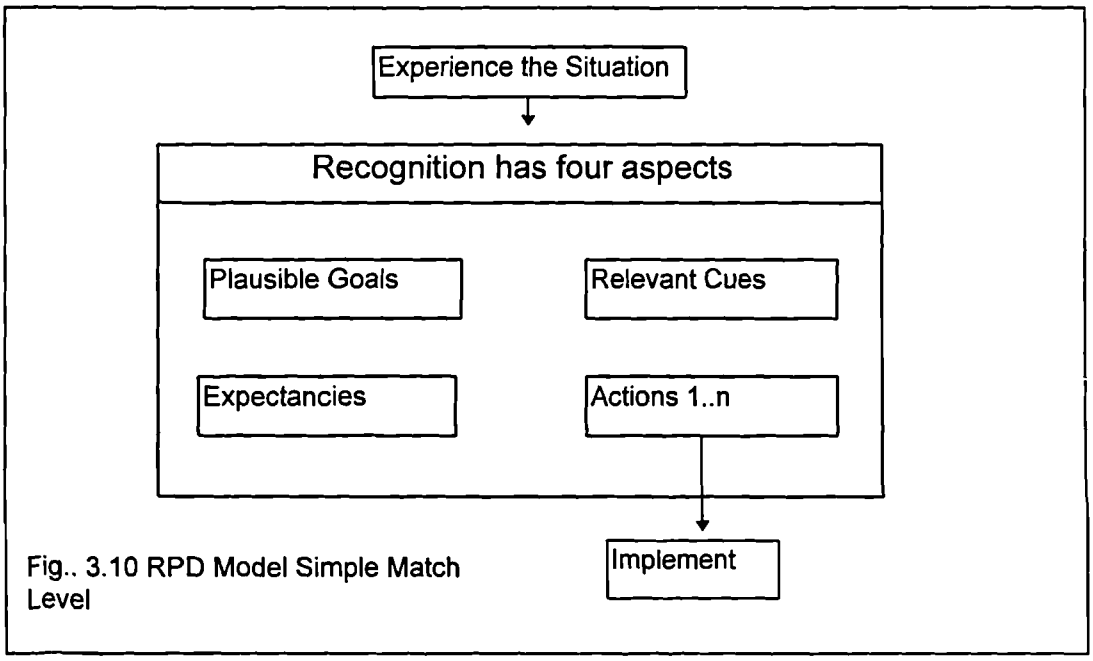


Fig.. 3.10 RPD Model Simple Match Level

Klein gives us a clue as to how we might proceed. He states that at the 'simple level' police commanders would have cues coming from the changing environment. They look at the cues and recognise those cues as being typical of some experience of the past. There is simple recognition of that typicality. To illustrate this point it is worth studying the conclusions from an experiment carried out to identify the effect of time pressure on decision making of chess masters (Calderwood 1988). The quality of chess moves from real games was

measured against routine conditions (150 seconds per move) and 'blitz' conditions (6 seconds per move). Chess masters showed virtually no reduction in move quality as the time pressure was increased. The experimenters suggested that that the chess masters could maintain 'fairly high levels' of performance despite time pressures, that should have prevented analytical strategies for decision making and problem solving from being effective.

This is a close fit with my observations at football matches. Police commanders were faced with complex decisions made in fast time. They recognised the problem within a few seconds and applied strategies that produced not optimum (classical decision theory) but satisfactory goals. The commanders use their experience to generate a plausible option as the first one they consider.

3.22 The Impact of Recognition-Primed Decision Making on The Training of Senior Officers.

In summary of the previous discussions, real world tasks differ from the one step choice decisions of the classical school. In the real world the problems are complex and ill structured. This stands very much in contrast to the laboratory study of decision making processes, exemplified by the Classic Decision Making biased, National Sporting Events Course content and structure.

Decisions in natural contexts are embedded in a wider context. Through years of experience and thousands of trials, experts build up a set of patterns for organising information in their domain (Means, Salas, Crandall & Jacobs, 1994). The expert or experienced officer, comes to see this world in terms of these patterns. This ability to pattern recognise facilitates rapid action, because certain plans or procedures have become strongly associated with certain patterns.

Given the impact of pattern recognition in command and control the important training issue becomes;

How do we build environments that highlight these useful patterns ?

"The main thing we know about doing this, is that it takes many practice trials. This doesn't mean that training cannot be designed to facilitate and speed up the process". (Lesgold et. al.1981)

My preliminary and incomplete understanding of simulation seemed to offer the possibility of a solution because I believed I could present problems to a commander in training, that had been designed around patterns that are both common and useful in expert reasoning. I also believe simulation can provide many more trials than would occur naturally. This in turn would produce a significant experiential element enriching the stock of experiences from which an operational commander might draw when seeking to recognise these patterns inherent in problems in the real world. The requirement was to present problems that allow inexperienced commanders' to recognise developing patterns thus engendering experience. Take for example, a pitch invasion. It is unlikely that a ground commanders would experience even one *pitch invasion during their career as a* commander of football events. Simulation would provide not only trials of that which occur infrequently, it could also allow for trials of problems that would be prohibitively complex and expensive to recreate for training purposes. It can also expose novices to experiences that may be impossible to create in a training environments.

3.23 Chapter Summary

This chapter has taken us from the initial identification of the research problem towards the possible training solution. It firstly examined and then rejected the classical decision models as inappropriate to this environment, where decision are made in compressed time frames. It defined the decision making environment as complex and incomplete where solutions are implemented by teams. It introduced Klein's Naturalistic Decision Making model as one appropriate for the education of crisis Management. It has indicated that expert decision makers require relevant experience if they are to recognise quickly, that the problem they are attempting to solve has any typicality.

The next chapter explores simulation, as used in training in detail. And will chart the author's successful search for a suitable simulation training solution that incorporates naturalistic decision making and in particular the Recognition-Primed Decision Making Model.

4. The Design of Suitable Educational Technology: From Theory into an Educational Specification

4.1 Résumé

In the previous chapter my literature study led me to modify the research question in recognition that command and control was about making decisions amidst complexity and chaos. The naturalistic decision making model offered in that chapter shared a close fit with my observations of decision making at the football ground during the management of a public order event. Such operational events see multi-player teams having to deal with partial information and to deal with a great deal of uncertainty. From these observations and examination of supporting literature, the previous chapter concluded that experienced commanders are likely to make better decisions when they are able to recognise at an early stage attributes of problems that are typical.

The Recognition Primed Decision Making model (RPD), (as defined by Klein and his associates and described in detail in the previous chapter) provides the basis for understanding such events, because this model takes into account the decision maker's experience in recognising patterns in the chaotic environment of command and control. This chapter builds on the concepts underlying that model and argues that simulation should be useful in creating learning environments for senior police commanders, since such environments engender relevant and useful experiences. The chapter will also examine the theory surrounding how experience is stored in human memory and methods by which it is believed to be recalled. The recognition phase of the recognition-primed decision making model

provides the most compelling theory examined in explaining what I have observed in practice at major events. The chapter will go on to examine the subject of learning by experience and how, by using a simulation of a command environment, senior police officers can be exposed to a range of experiences - and how these personal experiences come to be stored in 'autobiographical memory' and come to appear meaningful to the learner.

The chapter also recognises the important work of the police staff college in the development of its simulation command complex and briefly describes some of the exercises generated in that facility. The chapter ends with a description of an experiential learning simulation environment, developed by the Scottish Police College and describes how their system met my early needs.

4.2 Introduction

"The process of interpreting the meaning, relevance and significance of new information, of capturing its essence and implications requires that the learner should access his or her existing stock of knowledge and beliefs, ideas and values and that he or she should reflect upon their past experiences, using these as the tools by which such new information is rendered intelligible and meaningful."

(Spinks, Clements 1993)

Senior police officers are not novices they have experienced command at all ranks as they rise to their current position. New information that they come across will be continually compared with their existing knowledge base, and it is only after this refection and comparison that they can make any sense of new information. 'Existing' knowledge relies on memory, and it is important to identify the current sate of theory concerning memory to understand how senior officers compare new information with previous experiences.

4.3 Knowledge and Memory

Tulving (1972) distinguished between memory for personal experience and 'general world' knowledge considering them as two separate and distinct memory systems. According to this distinction *episodic* memory consists of personal experiences, and the specific objects, people, and events that the subject has been exposed to at a particular time and place. *Semantic* memory on the other hand consists of general knowledge and facts about the world. The following table (fig. 4.1), highlights the differences between episodic and semantic memory.

	Episodic	Semantic
Type of information represented	Specific events, objects, people	General knowledge facts about the world
Type of organisation in memory	Chronological (by time) or spatial (by place)	In schema or in categories

Source of information	Personal experience	Abstraction form repeated experience or generalisations learned from others
Focus	Subjective reality; the self	Objective reality; the world

Fig. 4.1

This model suggests the provision of a particular kind of learning environment to provide both personal experience (episodic) and repeated experiences through which the subject could create generalisations (semantic). In 1982 Shank modified this model by drawing relationships between generalised event knowledge and memory for specific episodes. He argued that memories are organised at many different levels of generality. The main features of his model of human memory are:

1. Memory structures are constantly re-organised in the light of new experiences and repetitions of previous experiences and links between different experiences.

2. Memory is systemic and dynamic . Instead of using pre-stored pre-compiled scripts to understand experiences and organise memories, memory structures are assembled as and when required. Different kinds of knowledge can be activated and linked up to create an appropriate representation for a particular occasion. That is to say that new knowledge will inherit attributes of previously assembled structures.

3. Instead of replicating elements that are common to many scripts, (like starting the car, driving to work, parking the car, locking it etc., which belong to the 'going to work' script, 'going shopping' script, 'going on holiday' script and so on, these common elements are each represented separately at a higher more general level and can be called in and incorporated into the current script when required. So the generalised actions like parking and locking can be activated,

when a memory structure for say driving to a football event is being created, but the football event script itself now contains only the actions that are specific to football events like, reading the police operations order, briefing the officers, etc.

Shank argues that this organisation, where generalised actions are common to different scripts, is more economical in storage and can account for the way people sometimes make confusions between related scripts.

4.4 Memory Organisation Packets.

In Shanks model, higher level generalised event representations are called Memory Organisation Packets (MOP). MOPs can be thought of in a similar way to object orientated programming. A mop is a kind of high level script which is related to other MOPs. In the example given earlier (driving to the football event) the memory of this particular visit would involve law MOPs, football matches MOPs, traffic MOPs etc. The memory representation for this event would involve general knowledge from all these MOPs as well as the standard football event MOP.

But how does one access a particular MOP? Neisser (1986) suggests that non-standard aspects of a particular occasion are stored as specific pointers, tags or indices, which serve to retrieve the memory of a particular occasion. Standard occasions, or standard aspects of novel occasions are absorbed into the relevant generalised event representations (the MOPs). These tags or pointers are a close fit with Klein's Recognition-Primed Decision Model. In the present context one can see how a command officer, facing an uncertain situation, immediately seeks out elements that are typical and these 'identifiers' are linked to the pointers and tags stored within the relevant MOPs.

In the previous chapter I introduced the Recognition-Primed Decision (RPD) model and described its first layer, the simple match. However, in uncertain situations the second and third layers of Klein's model become significant.

The second layer of the RPD model shows how human memories operate as a diagnostic function. Diagnostic activity, according to Klein (1990), is initiated in response to uncertainty about the nature of the situation. The purpose of a diagnosis is either to evaluate an uncertain assessment or to compare alternative explanations of events. Two common diagnostic strategies are 'feature matching' and 'story building'.

In the study of US Navy anti-war incidents (i.e., incidents where the mistaken shooting down of non-threatening enemy aircraft was avoided) Kaempf et. al. (1992) examined 103 instances of such diagnosis. Of these, the most common strategy adopted by the operators was to use feature matching to assign a diagnosis (this occurs in 87% of the cases). Feature matching consists of identifying the relevant features of a situation in order to categorise it. (i.e., using indices, tags or cues to compare features with pre-stored MOPs).

Story building (12% of cases) often involved a type of mental simulation in which a person attempted to synthesise the features of the situation in a casual explanation of the state of events. Pennington and Hastie (1993) have also examined the *various* functions of stories; one of which is to build causal explanations. In the following diagram (fig. 4.2.) the RPD model has been augmented to accommodate the diagnosis element in uncertain situations. This process of diagnosis has an intended end result, defined as 'Situational Awareness' (Brehmer 1993), a concept explored later in the section dealing with 'Distributed Decision Making in Simulated Environments' later in this chapter.

Recognition Primed Decision Making - Diagnostic Layer

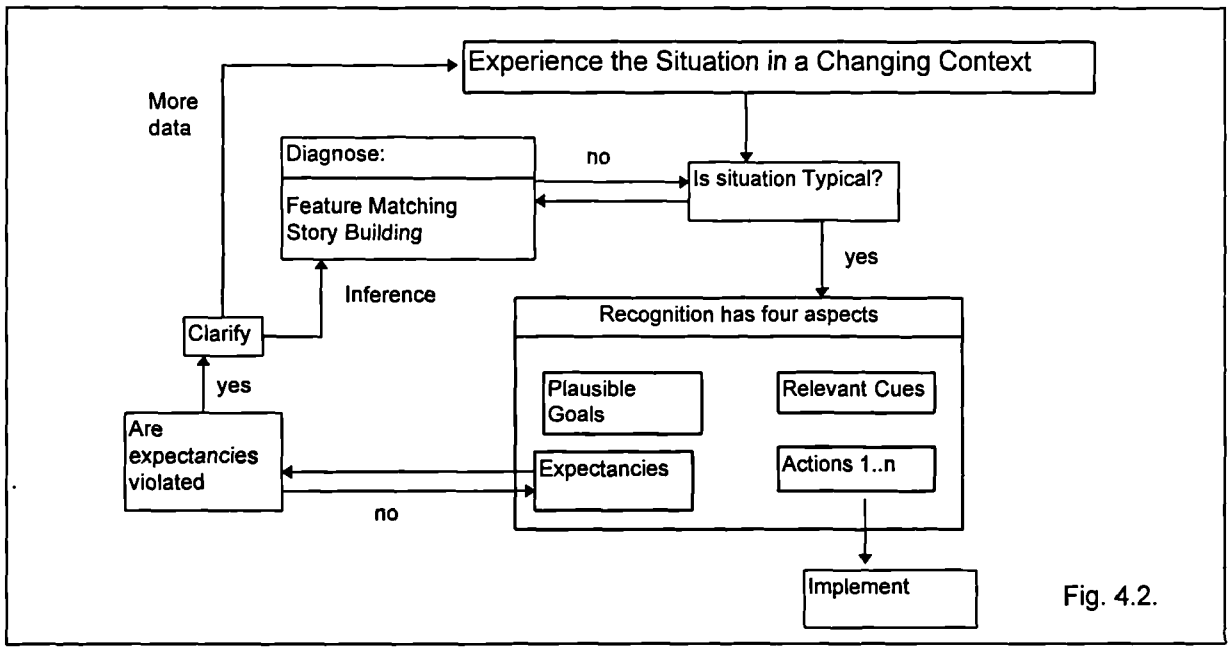


Fig. 4.2.

4.5 Autobiographical Memory

Personal experiences are usually stored without conscious intention to memorise them. They can be of different kinds. Autobiographical memories may be *declarative* or *experiential.* Neisser (1986)

Declarative memory can be described in the following way: "I have a declarative memory of going to school in Redbridge East London" However I have an experiential memory when I re-live the experience with associated imagery and emotions. Autobiographical memories may be specific or generic e.g. remembering eating lunch at a specific restaurant at a particular time or generic memory of family dinners. Neisser has also noted that a personal memory maybe one that is representative of a series of similar events and has termed this type of memory "Repisodic".

Brewer (1986) suggests that memories vary in the extent to which they are copies or reconstruction's of the original event. Nigro and Neisser (1983) support this view and found that when people examined their own memories, some were remembered from the original viewpoint and others were from the point of view of an external observer. I would argue that these "observer" memories cannot be copies of the original perception and therefore must have been reconstructed.

Any learning environment designed to increase the knowledge base of senior police officers must take into account how Memory Organisational Packets are constructed and the triggers and cues used to aid recall and particularly in terms of the ability to reconstruct existing memories. By definition, autobiographical memories can only be obtained by personal experience and therefore a learning environment should be designed to provide police commanders with first hand experience of an unfolding command and control event. To explore the theory behind personal experience it is useful to review the theory associated to learning by experience.

4.6 Experience and Experiential Learning: Further Theory Building

Starting from a definition of experiential learning such that:

> "..... the learner is directly in touch with the realities being studied.....It involves direct encounter with the phenomenon being studied rather than merely thinking about the encounter or only considering the possibility of doing something with it"
>
> (Keeton and Tate 1978 p.2)

One can see that experiential learning is about learning by doing. This contrasts directly with didactic classroom lectures and rote learning.

Piaget (1951) was interested not in the answers given to problems but the process of reasoning used to arrive at an answer to a given problem or set of problems. Stated simply Piaget's theory describes how intelligence is shaped by experience.

For it is this process of recall that recognises from a new problem, elements of that problem that are familiar or typical. From my non-Participative observations at football matches, ground commanders were approaching problems by applying coping strategies that seemed to have worked well in the past. Similarly they did not select coping strategies that had failed to be effective. When faced with new problems they were able to recognise patterns from the complexity of events presented to them. By way of example; during my observation of a night football game, (category B) the radio channel used as a command channel between ground commanders stopped operating. A Bronze Commander immediately sent two officers back to the local police station to collect a number of patrol radio's, ones that operated on a separate channel, and then he attended the football control room. The Silver Commander then briefed his Bronze commanders on the situation. He told them that he would be adopting a field telephone communication procedure, as prescribed within the operations order for the event (as the possibility of a radio failure had been pre-considered). The failure of the radio's was traced to a repeating transmitter breakdown close to the football stadium. Towards the end of the briefing the two officers that had been dispatched for patrol radio's , returned. Silver dismissed the use of patrol radios as without the repeating transmitter they would have an inadequate range from one side of the stadium to the other. The

Bronze commander suggested posting an officer at a half way point to relay any messages that were beyond the overall transmitting range.

This strategy was agreed by Silver. I questioned the Bronze commander after the event on how he had come up with this solution. He explained that during a public order march five years previously, he had been an Inspector and the Radio channel he was working on had failed. He remembered how vulnerable he felt, isolated from command decisions. All communication had to take place by word of mouth and police officers took on the role of 'runners' relaying messages up and down the chain of command. His bad experience of this occasion led him to attempt to find any solution that would avoid a radio loss. His idea of using an officer to relay messages came from a recent television documentary he had seen on communication between remote Tahiti Islands, using low powered citizen band radio's and using relay stations placed strategically around the islands.

In summary this, the bad experiences of this particular officer enabled him to recognise, at an early stage, the seriousness of the radio failure and to classify the problem as needing immediate resolution. Knowledge of other forms of radio communication equipment (the patrol radio) helped him recognise that this was the only other radio system he had available, or likely to have access to, within the time constraints of an ongoing football match. The low power of these radios was a 'tag' or pointer to a Memory Organisational Packet held in his memory about low power communications. The use of a relay police officer came from the context of relay radio operators on the Tahiti islands.

It would seem that there is a link between autobiographical memory, either declarative or experiential, and the ability to recognise familiar patterns contained within an unfamiliar event. This realisation was significant to me at this time as it shaped my thinking and directed

me towards looking for a learning environment that would be able to provide active involvement of police officers and hence provide a rich context for their autobiographical memory. The environment would necessarily need to be active as the officers would need to interact with it to classify similar events as Repisodic and in turn create MOP's along with their associated Tags and indices. In looking for an environment that would provide this rich involvement I turned to the literature on experiential learning.

> "I never teach my pupils;
> I only attempt to provide
> the conditions in which they can learn"
>
> Albert Einstein

A working definition of experiential learning for this section is a follows:

> Experiential learning is defined as a sequence of events with one or more identified learning objectives, requiring active involvement of the participants.' (Walter,Marks 1981)

and

> "Experiential learning is the process whereby knowledge is created through the transformation of experience" (Kolb 1984)

Experiential learning is integral; genuine learning is not an addictive experience but a remaking of experience (Cantor 1953 pp. 286-312) Cantor recognises that learners access their original stock of knowledge (Spinks Clements 1993) and create new memory organisation packets. This experience - comparison - reorganisation

model is a close fit with the Lewinian (Lewin 1951) Experiential learning model see in Fig. 4.2 below.

Lewin's Model of Experiential Learning

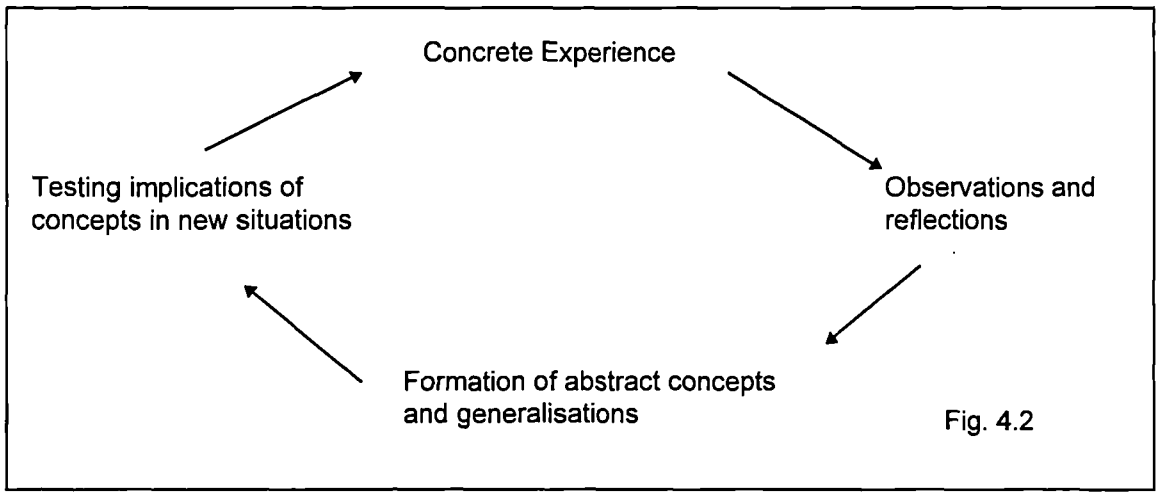


Fig. 4.2

The model begins with the 'here and now' experience (Kolb 1984) followed by collection of data and observations about that experience. The next stage is the generation of theories based on the observations, after comparing those observations with previous experiences held in autobiographical memory. The third state is to take the theories and generalised concepts and to test the implications in new situations which lead to new concrete experiences and so the model is a cyclical.

The model presents us with conflicts. There is conflict between concrete experience and abstract concepts and also between observation and action as seen in the following diagram (fig. 4.3).

The Resolution of Conflicts

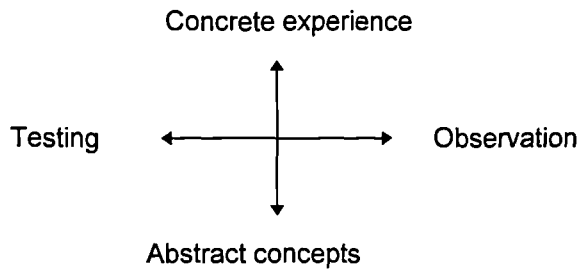


Fig. 4.3

Hagel (1953) termed these conflicts a 'dialectic' and that the "process of learning requires the resolution of conflicts between dialectically opposed modes". This experience, refection theory-building-testing-cycle also mirrors the experience-based learning environment of successful senior police commanders. The real world reality of this model is a harsh one as the cycle expects and predicts mistakes, miscalculations and misconceptions, for it is by these experiences that deep learning takes place.

Hagel's phrase "Any experience that does not violate expectations is not worthy of the name experience" is especially true of the Lewinian model. However, the police culture is unforgiving and major mistakes result in public inquiries and when mistakes of judgement are recorded, the unfortunate commander is seldom allowed to continue in command. Therefore the cycle is broken and the commander is unable to carry the learning forward to the next concrete experience.

What is needed, for the Lewin model to succeed, is a safe environment where mistakes are not accounted for in lost lives or major property damage. The model requires independence from blame and organisational constraints. It needs to be incorporated in an

experiential learning environment where reflections on personal performance and that of others can be reflected on objectively.

Unfortunately Lewin and Kolb do not discuss the nature of this stage of the cycle in much detail (Keogh, Walter 1985 pp.13). To complicate the issue Van Manen (1977) refers to this phase as 'experience' whereas Moore (1974) uses the term 'learning'. However the philosopher Dewey defined reflective thought as:

> "... active persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions to which it leads.....it includes conscious and voluntary effort to establish belief upon a firm basis of evidence and rationality" (Dewy 1933 p.9)

Grundy's (1982) view of reflection is particularly useful as she considers the experience of a person within the context of a group of autonomous learners with a common learning objective. Grundy pointed to several places in the learning process where reflective activity occurs. She states that "Each person, interacting with other group members, brings their informed practical judgement to bear on ideas relevant to the event". (Grundy's 1982). What was particularly enlightening about her work was that she recognised that reflection does not have to be an isolated personal process, that people operate and make decisions as groups and that "the relationships which must be obtained between teacher and students and among students if critical reflection is to occur" (Grundy's 1982). Her ideas were a close fit with my own research observations at football matches. Here command officers made decisions as a function of their team identity. 'Silver' was powerless without information and co-operation from other 'Bronze' commanders as well as interactive involvement with 'Silver'.

After the football match 'Silver' carried out a reflective review on events that had occurred during the match with his team who actively contributed to the discussion. This review or de-brief is consistent with the Lewin learning model. Here the group worked to reflect upon good and poor performance, formed theoretical concepts as to how to avoid poor performance or maximise good performance. The next match would be the first opportunity to test the validity of these newly constructed concepts, which would of course result in new concrete experiences. The cycle would continue to operate, supporting intuitive observations and questioning counter-intuitive observations.

Such a de-brief would need to be included into any successful learning environment in order to meet the reflection (the what?) stage of the Lewin model Also, such a debrief would also need to serve as a vehicle in the group construction of abstract concepts (the why).

Peerson & Smith (1985) state that "historical roots of debriefing lie in military campaigns and war games.....". This function of debriefing in relation to military action and training still continues today and in a number of ways the original purposes of de-briefing are directly relevant to programmes of experiential based learning. However, formal debriefing is likely to be more effective if the purposes of the learning are clearly identified from the outset (Smith 1981). Briefing occurs at the opening stages of learning, it is the time when participants are oriented to the experience.

Significant Elements Required In An Experiential Learning Environment For Naturalistic Decision Making



Fig.. 4.4

From the previous discussion it is possible now to draw up a model of the main characteristics of the experiential learning environment (fig. 4.4).

Senge (1990) has taken this slightly further with respect to his development of 'MicroWorlds' in the context of 'practice fields for management decision'. He describes MicroWorlds as safe learning environments which promote learning by doing. In the context of management development, he states that MicroWorlds provide managers and management teams with "enhanced means of learning from experience".

In a MicroWorld, participants can safely question their assumptions about their environment and gain new insights into their own behaviours and the functioning of their organisation and command systems. (Davidson 1993) These MicroWorlds are simulations of reality and need to be carefully orchestrated as they are to impart relevant and meaningful experience. Both Davidson and Senge are concerned with not only the participant as an individual, but also the wider context of teams.

4.7 Distributed Decision Making in Simulated Environments

In the present context, a situation is said to involve distributed decision making when a number of agents have to work together towards a common goal in a dynamic context where each agent has local information about the problem (Brehmer 1991). Significantly, this means that each decision maker is looking at the problem through his or her limited perspective. Under these circumstances the decision makers must communicate in order to achieve a common picture or "Situation Awareness" (Brehmer 1993). Such distributed decision making highlights two key features in the naturalistic decision making model described in detail in the previous chapter, principally; multiple players and distributed teams themselves (Resnick 1987).

Simulations and MicroWorlds are broad and general descriptions and for the purposes of this work some tighter definitions are required.

4.8 Simulation Within The Context Of Experiential Learning

The concept of simulation means different things to different people. The terms simulation and game are often confused and some see the two words as interchangeable. Jones (1980) attempts to provide some clarity by stating "instead of thinking of a simulation as being like a game or an informal drama, it is more useful to think of it as being like a case study but with the participants on the inside, not on the outside ", a simulation, like a case study is essentially a group activity with a serious educational purpose. But there is a significant distinction in the case study vis. simulation debate within the policing context. A further refinement of the definition of a simulation becomes:

> A simulation is a working representation of reality, where events move forward in time. A simulation can be drawn directly from reality, i.e., based on something

> that has already happened, such as a train crash or a football disaster, or based on something that could conceivably happen.
>
> (Jones 1980)

A case study is distinguished from a simulation as a case study, is an 'in-depth study of a real life or simulated situation carried out in order to illustrate special and or general characteristics (Percival, Ellington 1980). Note how this definition uses terms like 'study of', this implies non-participatory observation and analysis of historical data. This is in direct contrast with experiential learning environments which generate direct personal experience.

"Managers attempting to manage complexity are often overwhelmed by demands for decisions which for some part they will not be capable of addressing" (Mathis, McKiddy,Richard,Way 1982). Mathis and his colleagues go on to say that "the situation in disaster will be dominated by emotions, frantic rescue efforts, with the initial response being unco-ordinated, with little or no control over personnel". The experiential learning environment must reflect these stressors and must provide experience to the overall commander and to his or her team

4.9 Simulation in the Police Service.

The concept of simulation as a means for training in the police services is not a new one. In the early 1970's Superintendent Brian Fisher, then emergency planning officer for the City of London Police wrote a series of articles about the policing of disasters and major incidents (Fisher 1978). He identified the need for realistic exercises to assist in preparing people to deal with major disasters. Fisher pointed out that during the 1970's such training consisted in the main of: "Instructing personnel in procedures and law relating to situations that have probably never occurred before and which

individuals cannot readily envisage occurring in the foreseeable future" (Fisher 1978). Unfortunately the response to Fisher's comments was minimal (Moore 1986) and nearly ten years later in the aftermath of the Bradford Football ground tragedy, Lord Justice Popplewell found that "very few police forces had received any training in briefing or into the question of evacuation" (Popplewell 198)

In response to Popplewell's recommendations a simulated operations complex costing in excess of £3m was opened at the Police Staff College, Bramshill in 1988. The college was responsible for senior officer development and ran courses of junior, intermediate and senior command, supporting Inspectors, Chief Inspectors and Superintendents respectively. The training objectives for the new unit were:

1. To prepare senior officers for a crises that my occur in the future.
2. To prepare senior officers for a known event.
3. To examine or research into crises which occurred in the past.
4. To experiment with or test new forms of policing strategy or tactics.
5. To assess which individuals are likely to measure up to the requirements of a particular job or task relating to the handling of a crisis

(Moore 1985).

There was a strong emphasis on the simulated operational exercises developed using the new complex, in Moore's terminology, "to equate with reality" But what does the term reality mean. According to Binstead and others there are three dimensions of reality; Content,

Process and Environmental (Binstead, Rogers 1979 p.15). Relating these to the police context:

4.9.1 Content Reality

This is the extent to which the activities required to be undertaken in the simulation relate to activities the police officer undertakes in reality at work.

4.9.2 Process Reality

Process is used in the behavioural sense and includes such things as the human interaction police officers become involved in when dealing with crisis either internally with fellow police officers or externally with people from other organisations (fire, ambulance, etc.) or the general public.

4.9.3 Environmental Reality

This concerns the extent to which the physical conditions under which police commander is required to operate during the simulation relate to those s/he is likely to operate under in the event of a real crisis. Cooper (1979) suggests that a crisis simulation "must contain sufficient complexity and detail to be accepted by the player as realistic..... (it must be) designed and played in such a way that each player believes he has a meaningful participative role in a fully interactive (exercise) involving other purposeful players", (Cooper 1979)

4.10 Exercises Developed at the Police Staff College

There have been many exercises developed at the Simulated Operations Complex at the Staff College, most notably:

CRUSOE -

Designed to help prepare Chief Superintendents for the post of Assistant Chief Constable and above. In this simulation the participants are divided into groups of between 6 and 8 people . Each group represented the Policy Group at chief officer level of a typical United Kingdom Police Force. The exercise lasted for five days with each day representing one year in the life of the police force.

The simulation was controlled by a VAX 11/750 mini computer which contained a large database of information relating to finance, manpower and resources, vehicle fleet, crimes committed (including clear up rates), road traffic accidents and traffic offences, civilian establishments, the police building and equipment procurement programme, the number of emergency calls, level of population etc. (Moore 1988)

CROSSPATCH -

Grew out of the need to train Senior Officers in the "command of men and in the strategy and tactics for handling disorder" (Scarman, 1981) This exercise can be described as a series of nested, multiple-choice problems of the kind known as an action maze (Hartley et al 1981) This exercise simulates a series of events in a busy inner-city area. One of the team took on the role of the senior police officer of the area in which the simulation events take place. The exercise is controlled from another room using a flowchart programme on which all the possible lines of action have been programmed into a computer.

SCIMITAR -

Relating to the Peter Sutcliffe rein of terror from mid-1975 to January 1981 where he attacked twenty women, killing thirteen of them. In this simulation the participants take on the roles of

senior detective officers and were divided into groups. The original simulation was run as a card index system but in 1985 the project was sufficiently well advanced to be able to introduce the system known as HOLMES (Home Office Large Major Enquiry System) to control the flow of information throughout the exercise.

These exercises were particularly interesting for a number of reasons. They all involve police commanders, working in teams. They are about operating within complex and uncertain environments and they were about communication

The simulated operations complex was equipped with high technology, (for the time). This included a VAX 11/750 mini computer and a number of B.B.C. microcomputers. This enabled the exercise designers to simulate police radio and telephone systems. In addition the control centre at the complex had the ability to direct video taped sequences to individual rooms and to monitor participants using close circuit television.

The ability to isolate up to twelve rooms and to control the information flowing from room to room was a powerful method of producing a simulated environment, process reality and environmental reality were high as the control room staff were able to present problems to the participants in real time. The communication systems available to the participants were a close match to systems available in the real world, (the rooms were furnished with real world furniture and equipment (particularly the incident commander's room). and therefore a high level of environmental reality was obtained.

In all the exercises, the exercise controller was located in a separate control room. Using a flow chart on which all the possible lines of action and outcomes programmed into the computer have been

included, the controller decided what was likely to occur next in the light of the decisions made by the participants. The controller entered the appropriate page number (from the flow chart) into the computer and according to the pre-set programme, information was displayed on monitors situated in the participants rooms.

There were two weaknesses associated to this approach. Firstly the system was limited to a small range of possible outcomes and secondly the computer system was only able to send limited information to the simulation rooms.

4.10.1 Evaluation

It has been difficult to find any evidence of a formal evaluation of the complex or the exercises developed. "Little attempt has been made to evaluate it using any systematic or systemic evaluation techniques" Moore (1985). Feedback from the participants was obtained by asking them at the end of the simulation how they felt about it. However, there is much anecdotal evidence that participant feedback was positive and that the exercise designers improved the exercises based on these comments

De-briefing sessions were held and these sessions, facilitated by the training staff, highlighted some unforeseen problems

"Because the police service is a hierarchical organisation the presence of junior officers at the simulation seemed to discourage the role-players from experimenting with new theories in fear of looking foolish in front of subordinates should they fail". (Bramshill Simulation Complex (unpublished) 1986)

It was not possible to carry out my own evaluations of these exercises as the simulation complex is no longer used for command exercises.

These early simulations were powerful and well accepted experiential learning environments. In 1987 Tony Moore, the driving force behind

the complex, retired from the police service and no real development has taken place in the complex since. During a recent visit, the exercise control room was being used as a store and the equipment had ceased to function. However my discussions with the training staff and examinations of the available literature at the Staff College significantly influenced my thinking at that time. I felt its design was well founded on experiential learning theory and I wanted to take the work forward and develop a similar system for the Metropolitan Police.

4.11 Developing a Systemic Prototype of a Simulation Learning Environment

Using my observations of real world command and control, together with my theoretical understanding derived from the review of the literature, I could now create a model that would highlight significant attributes that would have to be present in a learning environment in order for that environment to engender experience in senior police officers. A systems view of that model can be seen in the following diagram Fig. 4.5.

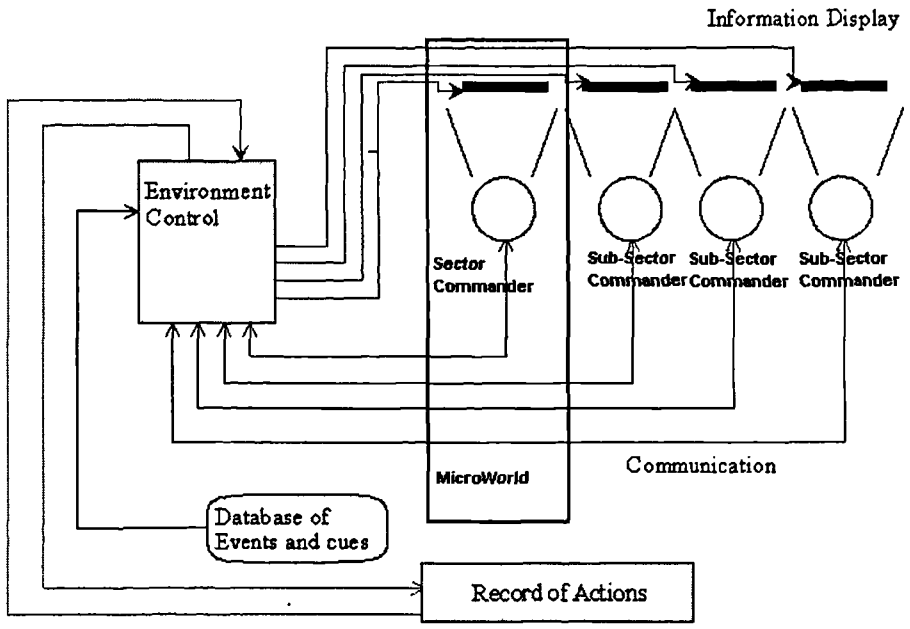


Fig. 4.5

The prototype system I would need to develop would have to recognise that officers make decisions in teams and that they share information through communication. The model shows a number of police commanders and the precise number incorporated into the simulation would be dependent on the event. For a category C football match (defined in chapter 1) there may only be four 'Bronze' commanders working with 'Silver' and 'Gold'. However, for a higher risk football match there would undoubtedly be more 'Bronze' commanders and the training system would need to be flexible. Each participant would require a 'MicroWorld view' (Senge 1990) as described earlier in this chapter of the unfolding event. This view would need to provide both visual and audio information of the participants changing world within the event. Participants would also have to communicate with each other and with relevant agents (police support units, football club stewards, the press et.). A communications system would be necessary and this system would have to be a close match with the

systems available in the real world if meaningful and timely information is to be available at all times. The system would need to be able to control not only the MicroWorld view as shown to the participants, but would also need to be able to call upon a database of events and cues to provide a changing context for any particular participant's MicroWorld view. These cues would provide a mechanism for controlling the complexity of the MicroWorld view both as perceived locally by a participant whilst at the same time controlling complexity at the global level, generated through communication between the command officers. Collectively they (the participants) would be presented with information about their environment and should be able to interact dynamically with that environment (and with each other), the system should facilitate that interaction.

The system should also be able to capture significant actions and interactions throughout the simulated event to provide for post event reflection (Lewin's model of experiential learning) on these actions and behaviours. My task now was to see whether any such system already existed.

4.12 VISTRAIN (Networked Interactive Video for Group Training)

At the time when I had come to the conclusion that I would need to develop a crisis management simulation, the Scottish Police College were developing a simulation for group training. I went to Edinburgh to observe the system and was tremendously excited about its potential. It was a quantum leap forward from the computer based programmed learning systems I had been developing in the Metropolitan Police and it represented a significant advancement over the simulation training I had seen at the Bramshill Police Staff College.

The system was called VISTRAIN (which stood for Video Based Integrated System for Training applications) I will describe Vistrain from a systems perspective in this section. The technology supporting its functionality is covered in the next chapter.

When I met with the development staff and the National Computing Centre, much of my time was spent observing the exercises running in the simulation system. I had good opportunity to talk to the subject matter experts, and training staff in Scotland as well as the technical personnel.

The system is designed to create a command and control environment able to present information to the various command layers simultaneously. To achieve this, the command layers are separated into work areas relating to 'Silver' and 'Bronze' command. The system had been developed to simulate a football event and there were four work areas. The areas represented were:

1. The Football Control Room 'Silver'
2. Officer In Charge Inside The Stadium 'Bronze 1'
3. Officer In Charge Outside The Stadium 'Bronze 2'
4. Local Police Station 'Sandford Division'

The room was laid out as shown in the following diagram. (fig. 4.6)

Room Layout for the Vistrain System

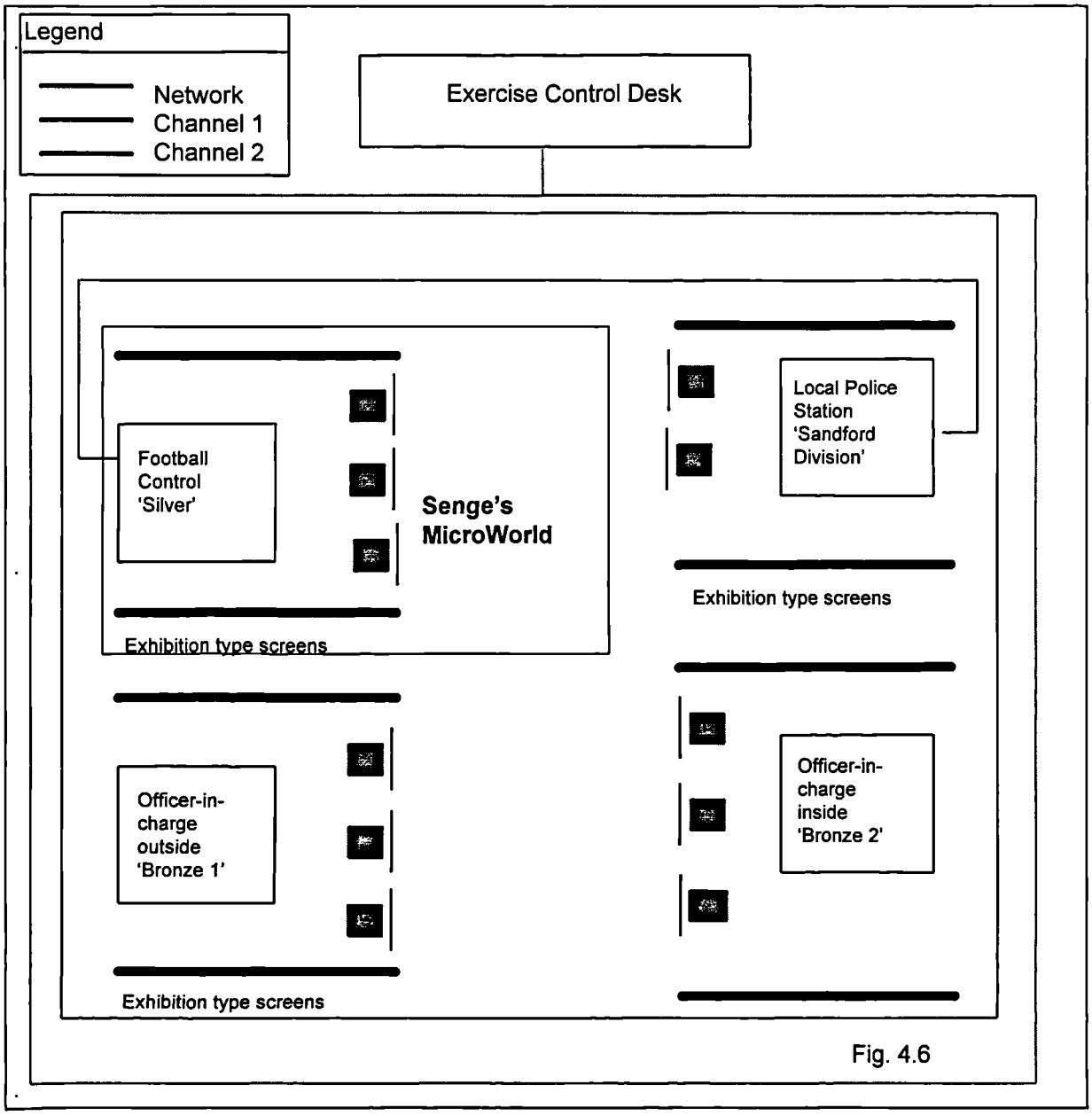


Fig. 4.6

"The officers attended a simulated briefing at which the layout of the ground and briefing details are given. They are split into four groups of four officers, each group taking on one of four senior command roles"

(Eary 1992)

Each area was equipped with an Amiga computer system able to present video and audio to the participants. In addition, each area had simulated radio equipment able to transmit and receive on one channel. The exception to this was the football control area, the radio system here was able to transmit and receive on one of two channels. All the three areas immediately associated to the football stadium (Bronze 1,2 and Football Control) shared a common radio channel (shown as channel 2) and the local police station was connected to the football control room by a different channel. The radio system in the Vistrain system was the only means by which commanders could communicate with each other throughout the exercise. The separate channel associated to the police station was appropriate as the football stadium would not be monitoring radio traffic that was not associated with the command of the football match. Video presented on the screen at each work area was appropriate to the command position during the event. This meant that the monitor in the work area representing the command officer with responsibility outside the ground ('Bronze 1') would present video information relevant to that position, no inside stadium video would be available at this work area. This provided a locational context for that command position as the officers collectively playing the part of that ground commander would be presented with information about their surroundings and position through the display. This video together with the radio communication system was the only way information could be received by a work area.

Each work area had seating for up to four students. The work areas were separated visually from each other using exhibition panelling material, however there was no acoustic separation between areas.

This configuration of isolated work areas and simplified communications systems is a well established approach to simulation

and is common in military gaming. A typical example of the genre is the MANEX Game (Boardman, Mitchell 1971), this is team based game in which uses as its focus a crisis in the middle east in 1968. The team was split into a number of countries including Israel, America, Egypt, Lebanon etc. and placed in isolated rooms. The only means of communicating between countries was by written message passed to the directing staff. The directing staff were "God and nature ... determining the outcomes of particular actions ordered by the teams" Groom A, Banks M (1966) This configuration was similar to the VISTRAIN system, although a communications system and wall charts, maps, and text based information via computer graphics and full motion video had replaced the paper passing. The role of the directing staff in these early simulations was to determine the likely outcome of events based on the actions of the players. In VISTRAIN the likely outcomes were represented by a database of possibilities held on a control computer at the heart of the system. This database operated as a flow chart determining which piece of video to present to any particular work area in response to a pre-determined set of actions from the students. The role of the directing staff during a VISTRAIN simulation was to determine which branch of the flow chart matched the responses from the teams. Determining the strengths and limitations of this approach, is a significant research question addressed by this work.

4.13 Simulation Structure

The philosophy underlying the design of the Vistrain system was described by Chief Inspector Peter Willis as "an attempt to build a flight Simulator for command and control". From in-depth discussions with his trainers and those attending a course using Vistrain, I understood this to mean that the system was open in that it had been designed to allow commanders to solve problems in any way

they felt appropriate. This would mean that the system would have to accommodate their decisions at any point. I immediately saw a conflict in this argument as it was clear to me that the database of possible outcomes was very small, perhaps only two possibilities at any point in the simulated exercise. If there were so few possible outcomes during the simulation then how could the simulator allow team decisions to be free?

This conflict is described by Steufert and Sweezy (1992) as "free simulations" and "quasi-experimental simulations". In free simulations the participant's decisions modify the simulated task environment. "The more decisions made, the more the task requirements will vary from simulation to simulation. As a result, one team participating in any one simulation will experience a quite different set of sequential task demands and task conditions than another" (Steufert 1991)

The exercises I observed with the VISTRAIN system were a much closer match to the quasi-experimental simulation model developed by Steufert and Sweezy (1985). In their *"Strategic Management Simulations"*, certain fixed events require each participating team to sequentially deal with the same issues under the same conditions. For example, each simulation scenario generated exactly the same emergency at exactly the same point in time. However to allow the participants to perceive that the simulation was 'free' some simulated events must be influenced by the actions of the participants.

In Binstead's terms the "environmental reality" of the Vistrain simulation was low. This was a direct result of the accommodation. The simulator was assembled in a television studio part of the audio visual department of the police college. The poor fidelity of the environment generated some difficulties for the participants. With this poor environmental reality, it was difficult for the participants in

the football control area to immerse themselves into the role of 'Silver' command. "Process reality" was also low, as the officers assigned to a particular work area had to operate as a team, when in the real world decisions made by a ground commander are individual, with the team element derived from interactions with other ground commanders. In the VISTRAIN system, police commanders were forced to operate in small groups with decisions made by 'committee'. This in turn led to difficulties during the debriefing element of the simulation. When decisions were discussed I noted disquiet from some team members who didn't agree with the group decision but were forced into the position of having to defend it during the debrief discussions.

These difficulties seemed to be in conflict with the stated objectives of the system, being:

> "On completion a thorough de-brief takes places where decisions taken are examined and discussed by all participants. The sharing of mistakes made or events dealt with effectively make the de-brief an invaluable learning experience."
>
> "...He (the facilitator) can, depending on decisions made by the students operating the exercise, select other events to highlight the complexities involved in the decisions required of a match commander at a real event. His remit is to watch, listen and record the responses of the trainees, dissecting their decisions at a de-brief session to highlight the shortcomings of their actions in the presence of their peers"

(Evaluation Document Scottish Police College 1991)

4.14 An Internal Evaluation

A questionnaire was designed by the development team to compare the students' perceptions of the effectiveness of the system with the stated aims of the system.

The questionnaire was completed by 72 students from the following categories: (Table 4.7 summarises the findings)

Newly promoted Inspectors Course	
2/91	16 Inspectors
3/91	12 Inspectors
4/91	9 Inspectors
5/91	13 Inspectors
6/91	15 Inspectors
Accelerated Promotions Course	7 Sergeants
	72 Total

Fig. 4.7

I felt the most significant question was question 4:

Have you had experience of policing a major sporting event at command level?

Only 13.8% of the respondents replied 'yes' to this question. This was at variance with the target student population attending training at the Metropolitan Police. There is probably two explanations for this;

firstly the students attending training session in the simulator were of the rank of Inspector or below. In the Metropolitan Police, the target audience would be Chief Inspector through to Chief Superintendent. Secondly there are perhaps only six major sporting venues in Scotland, with over thirty in London. Therefore the possible exposure to command at sporting event was most definitely higher in London. Looking back to Klein and naturalistic decision making, the Vistrain model operates with experienced decision makers, whose body of experience, through autobiographical memory and semantic abstraction, would enable them to recognise typicality within a complex problem. An interesting research question would be to explore the effectiveness of experiential learning environments to engender experience in novice decision makers. Remembering that 86.2% of VISTRAIN's participants had not experienced command at a sporting event.

Another revealing question was question number 5;

Did you find the exercise demanding?

Out of the 36.1% who responded 'no' two revealing responses stated in the evaluation report were:

> "Being in a group saved any real pressure"

and

> "Would have been better if one took the hot seat and the others in the small group sat behind observing but not contributing. Thus putting the individual under more pressure."

These comments seem to support my observations during the de-brief, where it was clear that the lack of 'process reality' detracted from the

level of immersion that the participants were able to achieve during the exercise.

The concluding remarks in the evaluation report reflect the enthusiasm with which the system was received not only by the students and the training staff, but also through recognition from outside the Scottish Police Service. The system won two awards from the British Inter-Active Multi-media Association in the Bespoke Training and Innovation categories, as well as winning first place at the European Training Technology Event in 1991 in Vienna.

The system was highly innovative for the time of its design and impressed me greatly. I recognised that there were some design weaknesses, particularly in the way that it presented problems to the participants. Their seemed to be particular problems with the design of the training scenarios and the very formal, uncomfortable de-brief sessions. However I felt that the system had great potential for exploring the research issues surrounding the engendering of experience in senior police commanders in the Metropolitan Police.

4.15 Designing and Building of a Prototype Simulator: (Computer Based Public Order Training system) CB-POTS

Even had I wanted to use the Vistrain system as it stood, I faced some internal difficulties: The information technology strategy for the Metropolitan Police precluded the installation of computer systems that were not I.B.M. compatible. The VISTRAIN system was a Commodore Amiga system and therefore fell foul of this strategic constraint. In addition, the cost of the VISTRAIN system was beyond my research budget and the time delay I would experience in making a case for additional funding would have been untenable.

However I was given authority to develop a similar (and hopefully more appropriate) system using I.B.M. compatible equipment working

closely with colleagues in the Scottish Police Training Centre. The new system would have to incorporate the educational specification contained within the systemic model described earlier (fig. 4.8). The system I would develop as a prototype would have to incorporate the strengths of the VISTRAIN system but would also attempt to overcome its weaknesses. These strengths and weaknesses, are summarised in the table below

Strengths and Weaknesses of the Vistrain System

Strengths	**Weaknesses**
Active and action learning, fulfilling part of the requirements for experiential learning.	Not I.B.M. compatible technology
Novel implementation of technology. Allowing for video to be controlled remotely by exercise control team	Limited to four work areas
Ability to control complexity throughout the exercise. Environment dynamically linked to some actions of the participants	Inflexible
Good communication system allowing command officers to exchange information	Too expensive
Stores communication messages for access during de-brief	Formalised Debrief
	Exercise rigidly coded into the system
reasonable but limited process reality	Low level of both Content and Environmental reality

Fig. 4.8

4.16 Chapter Summary

This chapter has reviewed relevant theory associated to human memory as related to the ability to recall personal experience. In it I have argued that memories of events are created by relating new knowledge to previously stored memory organisational packets (MOPs). I have then further argued that the organisation of this autobiographical memory system is dependent on triggers, indices and cues for its efficient retrieval. Klein's Recognition-Primed Decision Making model supports this view, principally that command decision makers when faced with complexity and uncertainty, search the chaotic environment for patterns of typicality, i.e., attempt to recognise elements of the problem that are familiar. Klein's second layer model includes feature matching and story building as processes in decision making. The chapter recognised that decision makers do not work in isolation, they are dependent on their fellow command officers, to supply them with information about the changing environment. This reliance on communication is a major factor in the decision making process.

This chapter also reviewed the original research question and argued that if experienced police commanders are to make better decisions than inexperienced commanders, then any learning environment designed to engender experience, must support the underlying issues of communication, recognition (through story building and feature matching), and knowledge represented by experience. It must take into account the distributed decision making that operates within command and control management teams.

The chapter then went on to review experiential learning environments and introduced the Lewin model of learning by direct personal experience. The chapter described the use of simulation in the

context of experiential learning and went on to examine simulation in the more focused context of the police service.

The chapter then introduced a systemic model of a learning environment using simulation as a method of providing the context for experiential learning. This model was developed into an educational specification that represented a significant milestone in the research work. The specification, now based on sound theoretical argument, contained all the necessary elements for the design and construction of a simulation system and a reference by which other systems could be compared.

The chapter closed by examining a system developed by the Scottish Police College called VISTRAIN and compared it with the educational specification. In table form it highlighted the strengths and weaknesses of the system and detailed the decision made at that time, to create a new system which would incorporate the strengths of the VISTRAIN system while overcoming its weaknesses.

The next chapter will discuss the design of the new prototype in some detail.

5. The Design and Development of a Workable Prototype Command and Control Simulator

5.1 Résumé

The previous chapter introduced a systemic model of the key issues to be considered when creating an experiential learning simulation of command and control. This chapter takes the model and, using it as a basis for further work, describes a prototype simulation system I developed to explore the research questions, discussed out in chapter 1. these were:

> Can a *critical incident management* (CIM) *simulator* provide a sufficiently effective *learning environment* to enable *students immersed* within it, to generate effective *command and control decisions* that would prove to be valid and workable in the real world?
>
> What *educational technologies* are needed to create a C.I.M. simulator that is capable of *engendering experience* in police commanders, concerning the strategic management of critical incidents as exemplified by command and control practices?

The chapter will show how the various components of the educational technology have been integrated to fulfil the requirements of suitable educational design in order to produce an interactive learning environment for command officers. This simulation environment provides information to participating officers about the unfolding events and problems associated with the simulated football match they are to manage. Of necessity, this environment would have to

present a world view to the learners which is complex, uncertain and chaotic.

The chapter will also examine the structure of the training simulation exercise, recognising the organisational constraints placed upon its design. These constraints included requirements from the project sponsor and also the national dimension, in other words, the simulation exercises to be developed had to integrate with an existing nationally prescribed command and control training course.

The chapter will also introduce the design template, needed to support the creation of simulation incidents and events. Contained within this chapter are also details of two experiments designed to test the effectiveness of the prototype simulation environment that was created. Evaluation is made of the interface design, the way information is presented to the learners and the whole design of the system.

The chapter ends with conclusions from the experimental observations which formed this evaluation and the recognition that modifications were necessary to the educational design of the simulation, the simulated environment and the technology associated to the control of the environment.

5.2 Introduction

The development of a prototype system required the integration of 2 elements namely:

1. The appropriate educational design of a suitable training simulation.

2. The development of the technology necessary to support an experiential learning environment of the type required.

Both issues reflect the systemic model described in the previous chapter. It is difficult to discuss these two discrete issues in isolation, as they are interdependent, since the design of any simulation technology must, by necessity, be driven by the educational specification. For this reason, this chapter will chronologically chart the development of the simulation exercise as a transition from a simple 'case study' component of the national course called 'Major Sporting Events', to its present form.

Importantly the learning environment to be developed required two technological systems; a control system and technology supporting the information display to the participants. These systems are defined in this chapter and their performance is evaluated in two major experiments. The findings of these experiments drive modifications to the design of both systems.

5.3 Development of the Prototype System

5.3.1 Objective of the Simulation

Since the crisis management simulator had to complement the Case Study of the 'Major Sporting Events Course' it had to be designed to reflect the objectives of that case study. These are shown clearly in the diagram below (fig. 5.1).

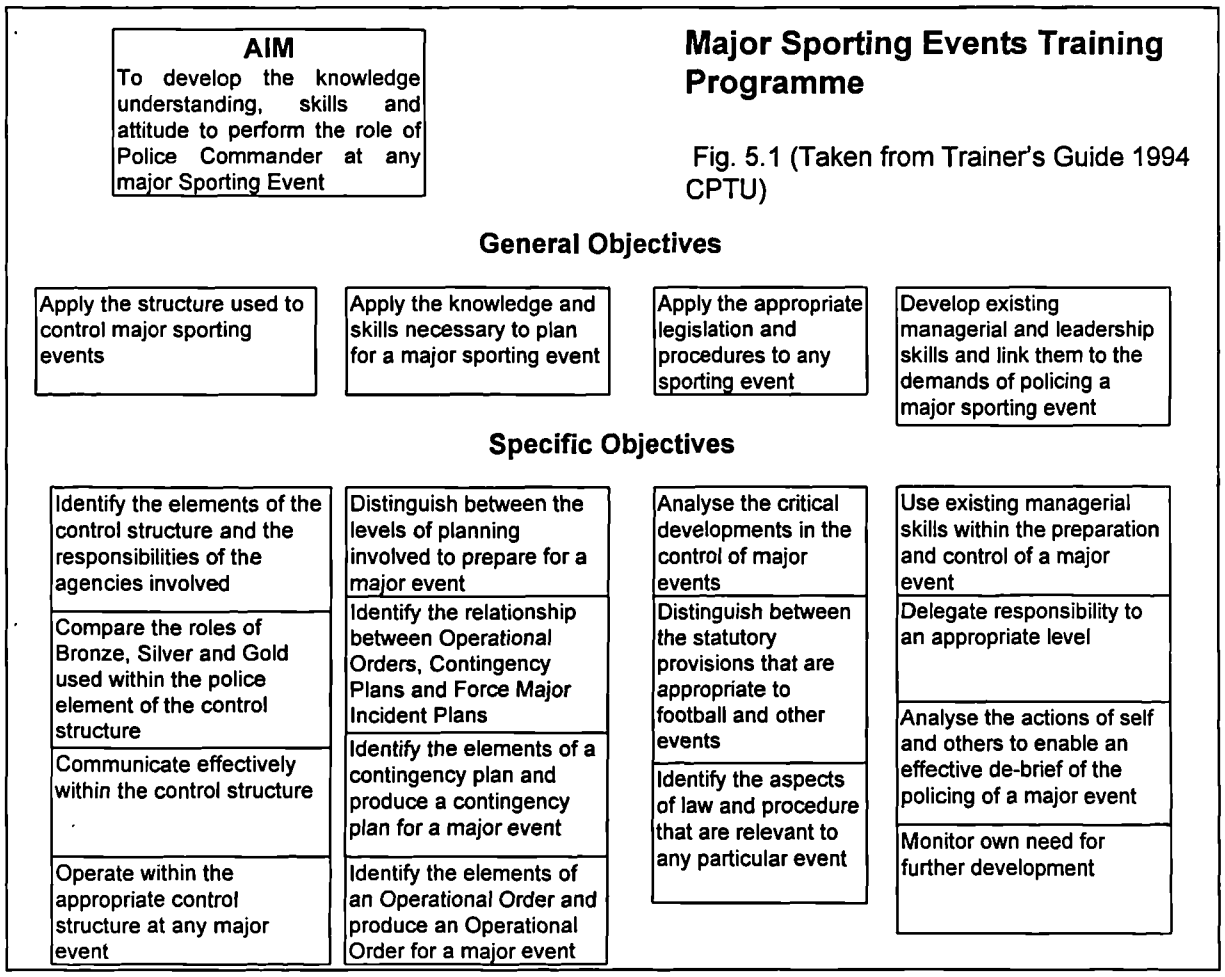


Fig. 5.1 (Taken from Trainer's Guide 1994 CPTU)

The above table details the aim and objectives of the Major Sporting Events Programme and provides perfect criteria against which to judge the effectiveness of the proposed development.

5.3.2 Constraints

It was agreed with Commander Training, the sponsor of this work and the officer responsible for the Metropolitan Police Service's delivery of the 'Major Sporting Events Course', that any prototype and subsequent operational simulation system developed in support of this course, must follow the objectives laid out in the course documentation. This decision was made on two grounds; firstly the Metropolitan Police had 'signed up' to delivering the national course in accordance with its stated aims and objectives. Secondly there were concerns, that if the course was modified without reference to the CPTU and the Association of Chief Police Officers Public Order Committee (the original sponsors for the national training course), then the Metropolitan Police Service may be placed in a compromising position, if, after a major inquiry, it was found to have deviated from the nationally recognised course structure.

There were strengths and weaknesses to this decision. On the positive side, I would be able to design the learning environment around a pre-researched and validated set of learning objectives. This would present a significant time saving on having to generate them from first principles. I would also be able to take advantage of the many staff hours already invested into the design of the objectives. The possible weakness of the arrangement was that I was shackled to a set of objectives without the authority to modify them in the light of research findings. This concerned me greatly and further discussions with the Commander Training and his management development staff, resulted in a small movement from the original position, namely that I was given permission to include *additional* objectives as deemed

necessary, after consultation with subject matter experts and appropriate operations departments. This agreement was given on the understanding that all the objectives contained within the national course were written into the simulation.

With this new authority I was able to start to look in detail at the structure and design of the case study element.

5.4 Structure of Case Study Material

The day was split into four sessions:

1. Session 1 — pre-match
2. Session 2 — First half of football match
3. Session 3 — Second half of football match
4. Session 4 — Post match dispersal

(CPTU Trainer's Manual 1992)

Through an analysis of the course design documentation, learning objectives can be related to associated incidents at the football event. These have been related to the training sessions, in a systemic form in the following diagrams.

5.5 Session 1 - Pre-Match

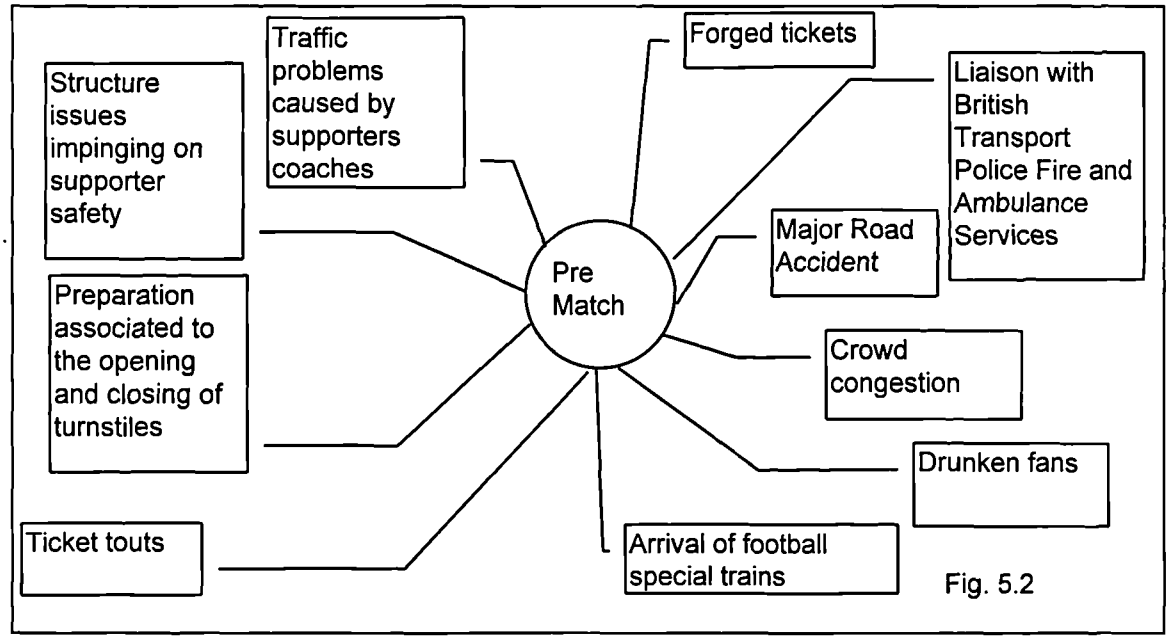


Fig. 5.2

In this first session the training objectives were designed to engage the students in discussion about the event and incidents occurring at, and around, the football stadium in the time between the assembly of police officers and the start of the football game. This session closed with 'kick off'.

5.6 Session 2 - 1st Half

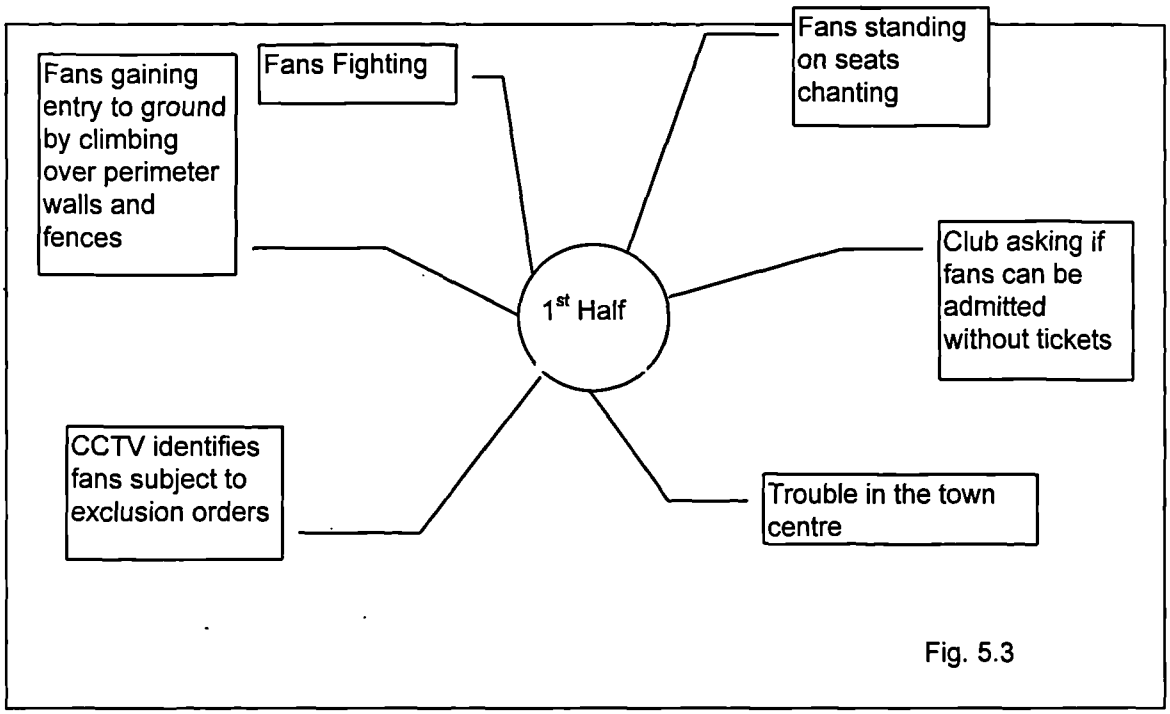


Fig. 5.3

This session dealt with incidents occurring during the first half of the match. In the early stages of this session the learning outcomes were focused on the co-ordination issues associated to incidents occurring outside the stadium as well as in the town centre.

5.7 Session 3 - 2nd Half

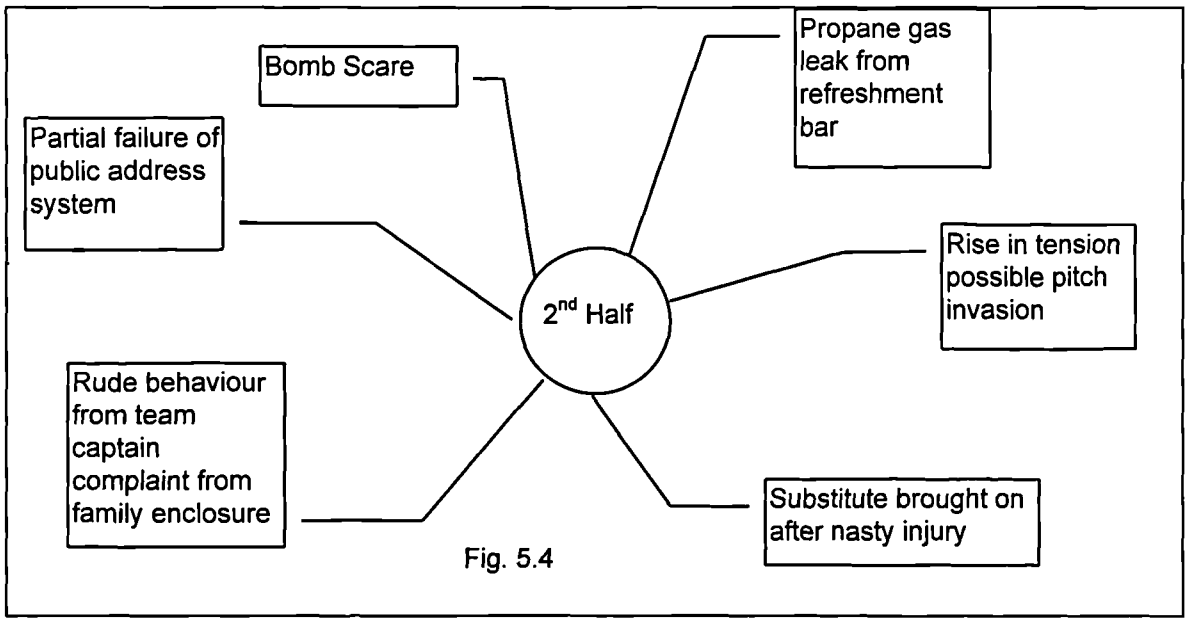


Fig. 5.4

This session focused on incidents occurring inside the stadium. It looked at crowd behaviour and crowd dynamics. The bomb scare and the propane gas incident's learning outcomes were designed to invoke discussion about inter agency liaison (fire, ambulance, transport, stewards etc.).

5.8 Session 4 - Post Match and Dispersal

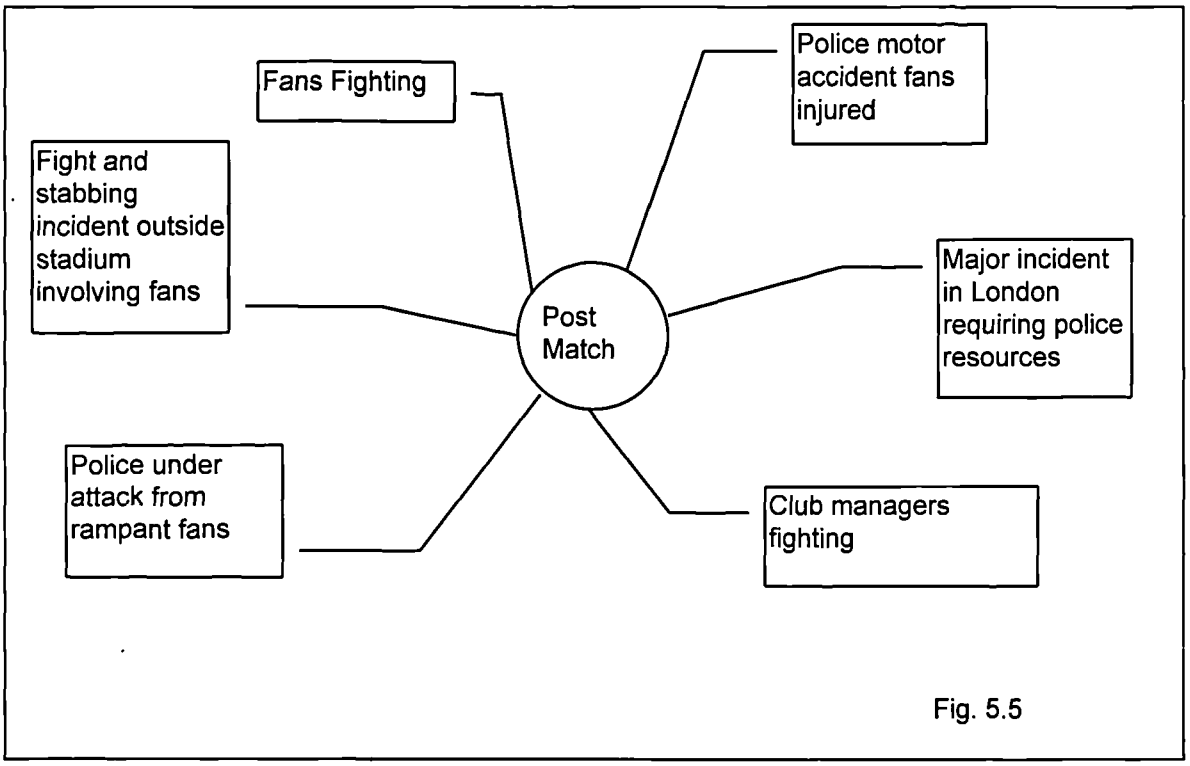


Fig. 5.5

In this final session, the case study concentrated on the hand over from a football management situation to the normal policing of the area. The two significant learning objectives here were to recognise the overlap between the policing of the football match and the policing of the local area. The request from headquarters for police resources dedicated to the football event being re-deployed to other parts of London.

5.9 Simulation Design

5.9.1 The Learners

The next process in the simulation design was to determine the principal participants or "simulation agents". I decided that the simulation must include the 'Silver' (strategic) and 'Bronze' (tactical) command layers. Relating this to a typical football match management structure, this would equate with the overall match

commander, the officer in charge inside the stadium and the officer in charge outside the stadium. Referring back to chapter 3, I had decided to combine the roles of 'Silver' and 'Gold' as their command roles had typically become deeply entwined, almost synonymous when associated with the management of football matches. Consequently there would be no 'Gold' command layer in my prototype simulation. In support of this, the principal participants were assigned the command names as 'Silver Command', 'Bronze Inside' and 'Bronze Outside'. This was a close fit with my observations of football match management and consistent with Brehmer's 'Distributed Decision Making' model, where he stated that "distributed decision making operates when a number of agents have to work together towards a common goal in a dynamic context, where each agent has local information about the decision problem" (Brehmer, 1991). These key participants differed from those operating in the only other comparable simulation system, (Vistrain), where a fourth agent, the local police station was included as a participant position. As already mentioned, Vistrain was developed at the Scottish Police College where this extra dimension was deemed necessary as, in Scotland, the local police station, being some distance from the stadium, provided additional communication support for the football control room. Within the context of policing a London stadium, all the services of the police station would be available in the football control room inside the stadium, therefore the simulation was designed to incorporate three key agents normally commanding a football event in England.

5.9.2 The Study

The CPTU course was developed as a case study where

> "all the scenarios are intended to be viewed as
> if the students are in the match control room

and are performing the role of the match commander"

(CPTU Major Sporting Events Trainer's Manual 1992)

This design criteria from the original course presented me with a significant problem.

There are many agents, operating in different teams, who work together to keep control of (football) events. It would therefore be inappropriate and inaccurate to develop a simulation that related solely to the match commander's role, since commanders, and other layers of control influence each other in an interdependent way. A simulation was required which could train for "Situational Awareness" of all command layers as well as the education of interdependent decision makers in a distributed decision making situation. The work of Brehmer (1991) indicates the importance of training for such decision making in a systemic and holistic way. It was therefore necessary to restructure the national course objectives, without ignoring any of them, as had been agreed with my sponsor. This meant changing the scenario's viewpoint from that solely of the match commander to the multiple perspectives of other command layers.

5.10 Simulation Design - Story Boarding

Having recognised the importance of the dimension team to the management of a football game, the first task was to rewrite the national exercise giving it a team perspective. Recognising the layers of command to be 'Silver/Gold' (combined) and 'Bronze', the exercise would incorporate these command layers. However, to support the conditions imposed on me from my management, I would have to design the simulation in such a way that by the end of the exercise all participants had been exposed to the match commander role as well

as other command layers. The logistics necessary to support this required the whole group to be divided into three smaller groups before each session. These sub groups would be assigned individual command roles for the simulation session. At the start of each new session the sub groups would be reassigned to another command role. By the end of four sessions all students would have experienced all command roles represented in the simulation.

5.11 Controlling Complexity

As the case study course as detailed in the National Sporting Events design documentation was written from the Match Commander's perspective, it was necessary to analyse each of the stated learning objectives and outcomes and consider the information requirements for each command layer. To illustrate this, I will use an example event from session 1 (pre match) which is about a forged ticket problem. In this example, I consulted with subject matter experts to determine which commanders would be involved in such an incident, and what were the indices and cues as specified by Klein's Recognition Primed Decision Making Model (1993), that would contribute to the match commander's recognition that the problem was associated to a forged ticket situation. More particularly, what patterns of cues (portrayed through the MicroWorld Display Interface) would lead commanders to recognise an incident for what it was. This would then enable me to recreate these patterns in the simulation.

For instance, according to Klein, a simplistic view might be to provide the officer in charge, outside the ground, with sufficient information about the problem for him/her to recognise it as 'forged tickets' and then ask him/her to convey that recognition of the problem to the match commander. If the communication conveyed a significant number of the triggers and cues leading to the initial recognition of the problem, then the match commander should also recognise the

problem. Relating this to our theoretical perspective, this would conform to the 'simple match' layer of Klein's Recognition-Primed Decision Making model.

However, such an approach could have low "process and content reliability" according to Binstead (1982), because in the real world, patterns that generate recognition would be composed from subtle cues. Furthermore, the difficulty of recognising patterns might be compounded by the fact that important cues could be distributed across more than one command viewpoint. Commanders are clearly faced with the difficulty of having to 'tune out the noise', from the event, the situation, or the environment, i.e. having to recognise significant cues amidst the 'background noise' of other cues being generated by other unfolding events

My observations of real command and control events convinced me of the importance of subtle and complex cues. This seemed to be confirmed by my early anecdotal studies. It would therefore be important to portray subtle cues and complexity and chaos to make my training simulation appropriately 'real'. Let me give you an example of the sort of cue that I would need to portray in the event. A likely sequence of events in a real football match where forged tickets were being sold might be as follows.

> *A small argument might start between two fans holding tickets for the same seat. If forged tickets are in circulation and the majority of the seats have been sold, then there will be some fans holding duplicate tickets for the same seat. Arguments between fans would come to the notice, (eventually) of an officer in charge inside (Bronze Inside). It may not be immediately apparent that the argument is about forged tickets and Bronze Inside may not recognise the problem immediately. However a time will be reached when sufficient patterns or cues will emerge from this*

complexity to enable the commander to recognise the problem and communicate it to the match commander.

The question is how during the simulation can the degree of complexity be controlled?

The degree of complexity associated with this incident is controllable within the MicroWorld (Senge 1992 defined in chapter 4) view available to the ground commander, by controlling the subtlety and the number of information triggers presented through it to that participant. In this case the patterns, cues and indices (triggering recall of 'memory organisational packets' and recognition of patterns of typicality) presented through my MicroWorld must be controlled. *How* this is achieved through my MicroWorld Display is described later in the section associated with the technology behind the MicroWorld Display control. Here, my intention is to introduce to the reader, the notion that controlling complexity means controlling the patterns of cues that lead to recognition. Such cues can be broken down into small and subtle triggers. By distributing these triggers across a number of MicroWorlds pattern recognition is only likely to occur when sufficient information is communicated between the command team ('Situational Awareness'). It is this distribution of emerging patterns which I regularly witnessed during my observations of real events. For example, the forged ticket problem detailed earlier could be considered thus:

The forged tickets problem only becomes recognised when information from the commander inside the ground, together with information from the commander outside the ground, and perhaps other agents, comes together. Brehmer's (1991) reference to the importance of local information fits closely here since each commander only has a local perception of the problem. Therefore the learning environment must be able to control the complexity surrounding an incident if it is to

foster recognition of typicality and hence provide an experiential environment that truly engenders experience.

Looking at the systemic model of the simulation system, developed towards the end of chapter 4, (shown below in fig. 5.6), I believe the control of complexity is critical, not only to the MicroWorld view of an individual commander, but also to the combined or shared perception of the environment held by all the participants, i.e., 'Situational Awareness'

To summarise, in order to create a simulation that supports team decision making, events occurring throughout an exercise have to be broken down into small information 'triggers'. These 'triggers' need to be distributed to the relevant participant's MicroWorld so, collectively, through communication, and local observation, participants can call upon their 'memory organisational packets' to recognise patterns of typicality from the environment. According to Klein's second layer model it is through this process of Recognition-Primed Decision Making that participants will generate expectancies and undertake decisional action.

5.12 MicroWorld Control

Any MicroWorld design should create a real perception of an actual event in the mind of the participant immersed within it. To achieve this it needs to present information in a number of differing ways. Visual and audio information, representing the participants world view, has to be relevant and of sufficient quality to generate similar patterns to those that would exist in the real world. Referring back to the systems view introduced in the last chapter, shown below in fig. 5.6, these MicroWorlds need to be controlled in a *very realistic* way. The design of such a control system, which is critical to the effectiveness of my simulation, formed a major part of my technical

educational technology studies. For such a control system would have to dynamically control the change of any MicroWorld view in response to the changes in the overall environment. This could be as a result of the team's interaction with it through decision making, or by systemic state changes brought about by the unfolding event.

Furthermore, my MicroWorld control system would need to have fast and ready access to an audio visual database of "triggers' i.e., different cues that come to be presented (by way of the MicroWorld display interface) as the participant's specific view and local view of the unfolding event. Such a database would have to reflect the educational design for the unfolding session. Each event in the database would have to portray its own story in "a genuine but restricted way" (Powell 1995). Genuine, so that it stimulated the required response, restricted so as not to overload the database. Each event will have its own 'Story Board'. The term 'Story Board' is introduced here as a method of charting out events in respect to session time. The Story Board method used in this work is taken from a similar method used in the production of films and action sequences and is a creative device for depicting the unfolding events of a story. In our case the story would be the events associated to a football match session, such as all the events contained during the time period leading up 'kick off'

Systemic View

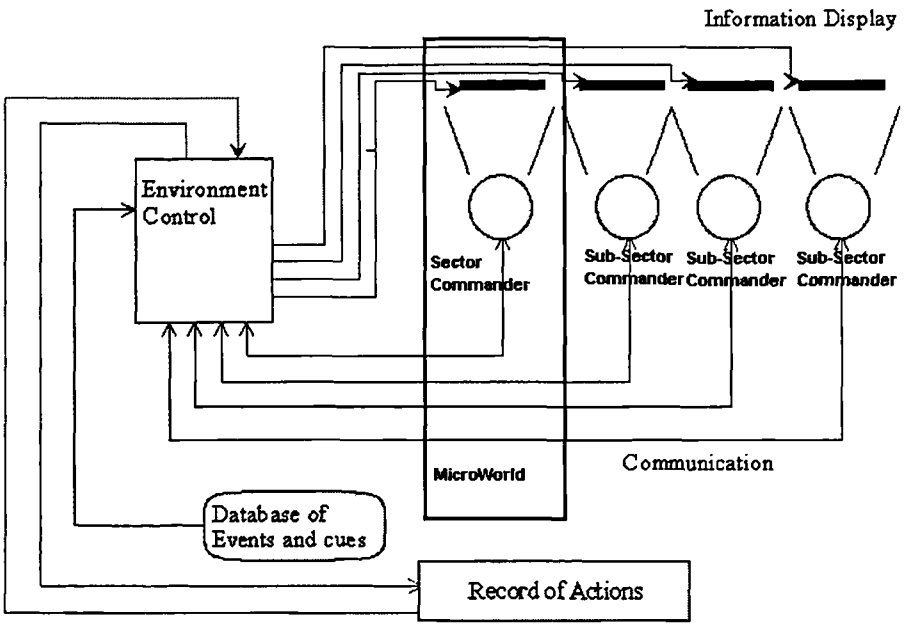


Fig. 5.6

5.13 Generating the Story Board

In order to create the entire story board, I firstly analysed the objectives detailed in the national course design documentation and matched them with the comprehensive records of real football events, to create a series of story board sub-protocols. These were linked together to form an overarching protocol. This protocol operates as an hierarchy as shown in the following diagram (fig. 5.7).

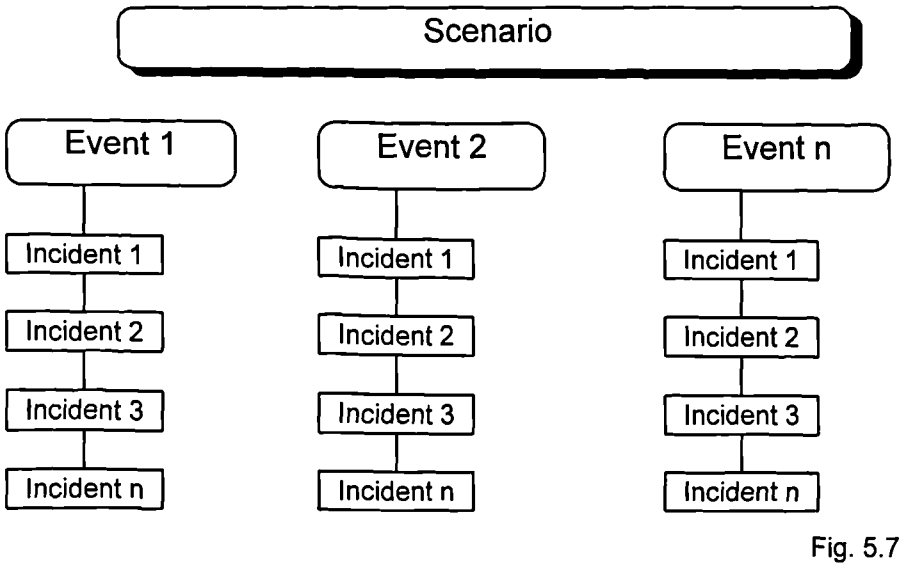


Fig. 5.7

The top layer of this protocol represents the session number in the national course documentation (pre-match, 1st half etc.). Each scenario contains a number of events, the forged ticket problem discussed earlier, would be classified as one such event. Events have associated and underlying incidents. Incidents are classified as the subtle cues and triggers presented in the participant's MicroWorld representation. These cues may individually hold little meaning in themselves but taken together are intended to generate patterns of typicality. If this typicality is recognised through 'Feature Matching' (Klein 1992), and if the participants are allowed to communicate this recognition, the command team will begin to achieve "Situational Awareness" (Brehmer 1993).

It is important here to introduce the notion of what I have termed a "Situational Awareness Filtering". Clearly it is not necessary for all members of the command hierarchy to achieve the same level of understanding of the problem. However, the overall commander, being at the top of the command pyramid, can easily be overloaded with information. Individual commanders must filter all data passing through them and then only pass on the relevant information

emanating from their specific world view of the event. Importantly, all the commanders must constantly be aware of the information needs of the overall commander so as his or her decision-making is based on an accurate 'Situational Awareness'.

5.14 Multi-Threading Events

Referring to my observations of the complexity faced by ground commanders during real football matches, I noted that the most significant dimension was that they were facing a number of different and difficult problems simultaneously.

The commanders seemed to have a limit to the range and complexity with which they could cope. It appeared from my observations that, through experience, they could become capable of dealing with more. At the lowest command layer, the Bronze Commanders are trying to filter out and select from the data, information that can either assist them in the resolution of their own sector specific problems of needs to be passed up the line. However, this filtering process related only to their own command specific context and the situation as they saw it. In their own minds they probably have a good idea of what they think the overall problem/solution is generally and that impacts upon their interpretation of the situation.

Often what compounds the problem for the Silver Command level is that they receive filtered information from their subordinate commanders, information describing only their individual problems (and their proposed solutions). However, the Silver Commander continuously receives information from all his or her subordinate Bronzes. This information, whilst fleshing-out the Commander's view of the event, also creates its own complexity as the Silver Commander has to handle any number of simultaneously occurring problems,

whose solutions may well be interdependent or may be collective team based problems.

Complexity of MicroWorld presentations can therefore be controlled at two levels, either by controlling the number of problems presented to a particular commander (local complexity) or by controlling the total number of problems operating across the whole environment (global complexity).

In terms of educational technology, this represents a significant sequencing requirement for the environment control sub-system. (systems view diagram fig. 5.6.) Also, the environmental control would need to be able to dynamically handle the simulation in response to the participant's actions. Ideally, this control subsystem would be able to generate "Free Simulations" (Steufert, Sweezy 1992). However, I recognised at this early stage that I would not be able to generate all the possible outcome choices necessary for a 'free simulation'. Given that I had to generate a simulation that supported only the learning objectives written into the national course, I elected to design a control system that would follow a pre-defined learning specification with sufficient additional choice outcomes to support a limited but effective degree of flexibility and accommodate 'creative' decisions from participants. This approach follows the 'quasi-experimental' (Steufert and Sweezy 1992) model where the participants would follow a fixed path of problems throughout the simulation, with sufficient flexibility within each problem to support a perception that they had some control on the outcomes of their decisions.

5.15 Simulation Design Template

To enable the efficient and effective story boarding of the simulation, I developed a design template which laid out a set of protocols for the development of the exercises. Shown in the following diagram is that

template holding a story board example of the first incident in the forged ticket event, (fig. 5.8). This story board template ensures that for every incident designed into the exercise, a clear indication is given for the information to be presented at each of the MicroWorlds. The form contains the following headings:

1. Summary.

For each incident a summary would indicate the name of the incident and the significant Commander that would receive trigger information

2. Type

This would classify the type of trigger. Available triggers at this period of the system's development were:

2.1. Video information, in the form of video sequences held on laser video disk

2.2. Audio information, in the form of pre-recorded sound clips. These clips could be recordings of telephone conversations received by the football control room or recordings of radio messages from police units to the Bronze Commanders.

2.3. Text information, in the form of a graphical representation of a note pad on the MicroWorld computer screen. These notepad messages would contain relevant supporting information for the video sequences or information that was best presented to the commanders in text format.

3. Pod

This would classify which pod (the abbreviation used in the simulation development for a MicroWorld) the code was relating to.

4. Radio Summary

This was the resulting radio traffic, expected to occur between the commanders after the incident had been fired.

6. Learning outcome.

This was taken from the simulation design documentation and would be presented in full on the environment control interface screen. Its purpose would be to prompt the person running the eventual exercise as to the thinking behind the incident that was about to be 'fired'.

This template was used as a way of standardising the story board construction and ensuring completeness of each modular event, a consequence of its ability to display a summative snapshot of the environment at any time during the exercise. This representation became particularly important when, after running the simulation, modifications were required of the story board and its sub system components. The template proved to be a useful tool in enabling these modifications to be implemented in a systematic and rigorous manner, and to help recognise at this design stage, the impact these changes may have on other MicroWorld views

StoryBoard Template

Scenario Number	1
Event Number	1
Incident Number	1
Timed at	14:34
Decision Time	75

Summary

Forged ticket event. Significant players are: Bronze Inside, Outside, Sliver Control

Type

Video

To:

Bronze Inside (Bronze 1)

Video

Pod 1	Two fans arguing over a seat	20175-30642
Pod 2	Background	17043-32002 Loop
Pod 3	Background	19234-22793 Loop
Pod 4	Background	10474-23932 Loop

Radio Summary

Expecting Bronze 1 to communicate the problem to silver control

Learning Outcome

This event is concerned with forged tickets. Control of ingress, ticket checking, liaison with football club, safety issues, criminal activity and avoiding setting precedents for future match policy

Fig. 5.8

Let us look at the template in more detail. The scenario number top left on diagram 5.8. corresponded with the session number of the National Sporting Events Course. The event number and incident number relate to the simulation hierarchy detailed above within the description on protocol templates. The 'type' section refers to the type of cue to be presented in the MicroWorld view. These cues could be

video, audio, or text messages. The Video section refers to the exact video sequence displayed on the MicroWorld monitor display. The system originally developed provided the information on videodisks so the numbers in this regard would refer to the frame numbers on the videodisk surface. The radio summary refers to radio communication expected from this commander after recognition of the incident. Finally the learning outcomes section refers to the learning objective written into the national course. Every Event and its associated Incident had a design template form.

5.16 Environment Control Computer

The environment control system operated on a control computer termed the 'Exercise Control Workstation'. The environmental control software displayed a graphical representation of the design template information, inputted by the exercise design team. The screen layout for this computer is show in the following diagram (fig. 5.9):

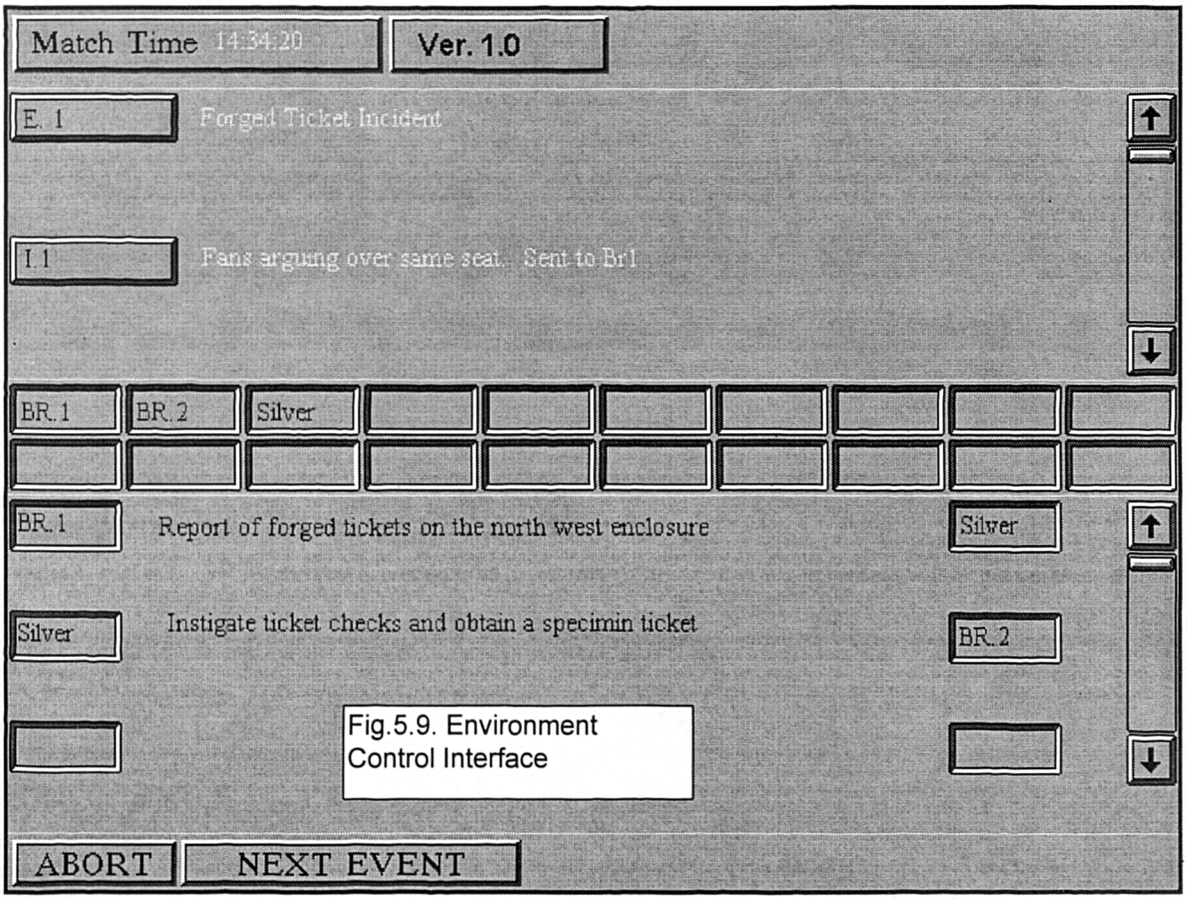


Fig.5.9. Environment Control Interface

The exercise controller first selects the scenario or session number. Once the scenario has been chosen the system is locked into that scenario until it is reset. This is to prevent events and incidents from different scenario's being activated during a simulation. When the scenario has been chosen the events and incidents are displayed on the control screen. The controller can 'scroll' through all the available events and incidents by using the slider controls shown at the right hand edge of the screen. The session time for any selected incident is displayed at the top of the screen.

The screen is split into two areas. In the top area the headings of the events and incidents are shown. In the bottom section (divided by an indication of the participants) is the radio traffic that is expected to be generated by the participants when they are responding to the event. I have used the forged ticket event to illustrate the environment control screen. The participant indicator shows only, Bronze 1, Bronze 2 and Sliver but there are additional spaces for another seventeen participants. I designed the system to be able to accommodate up to twenty participants in total.

The system requires a trainer to control the exercise who uses the environment control computer to direct the exercise in particular ways. This trainer will be referred to throughout the rest of this work, as the 'Exercise Controller'. During an exercise, the Exercise Controller would be seated in front of the environment control interface screen and would be able to control the way the exercise unfolded. He or she would control the exercise, by selecting an incident to be 'fired' and then 'clicking' on the incident button. The environment control software would then access its database for that event and the associated incident would be translated into control commands to be sent down the network to the learners workstation screens for display. The participants' computers are connected via an

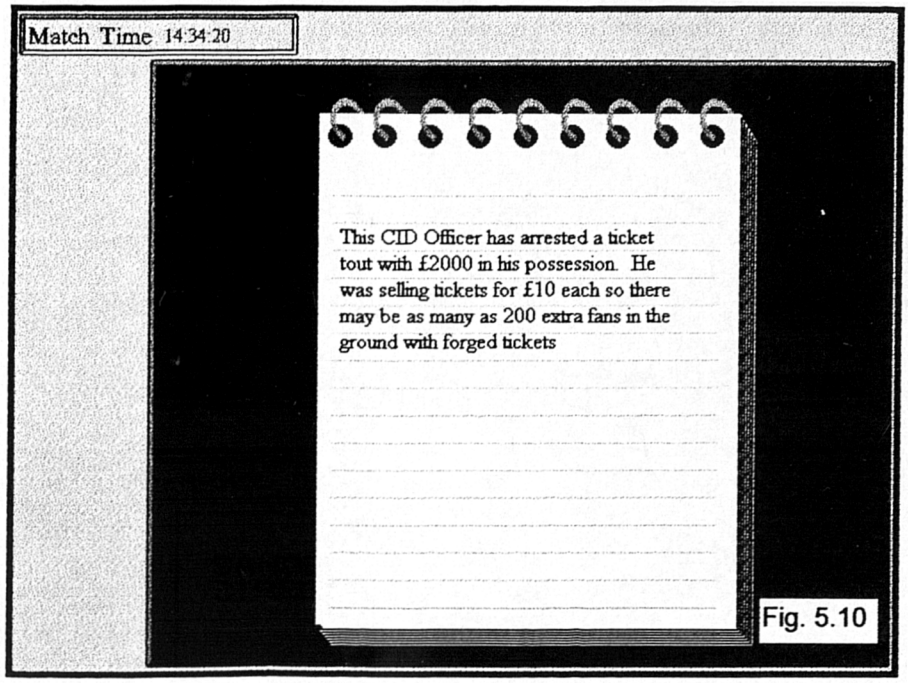
Ethernet computer network and therefore were continually in contact with the exercise control computer.

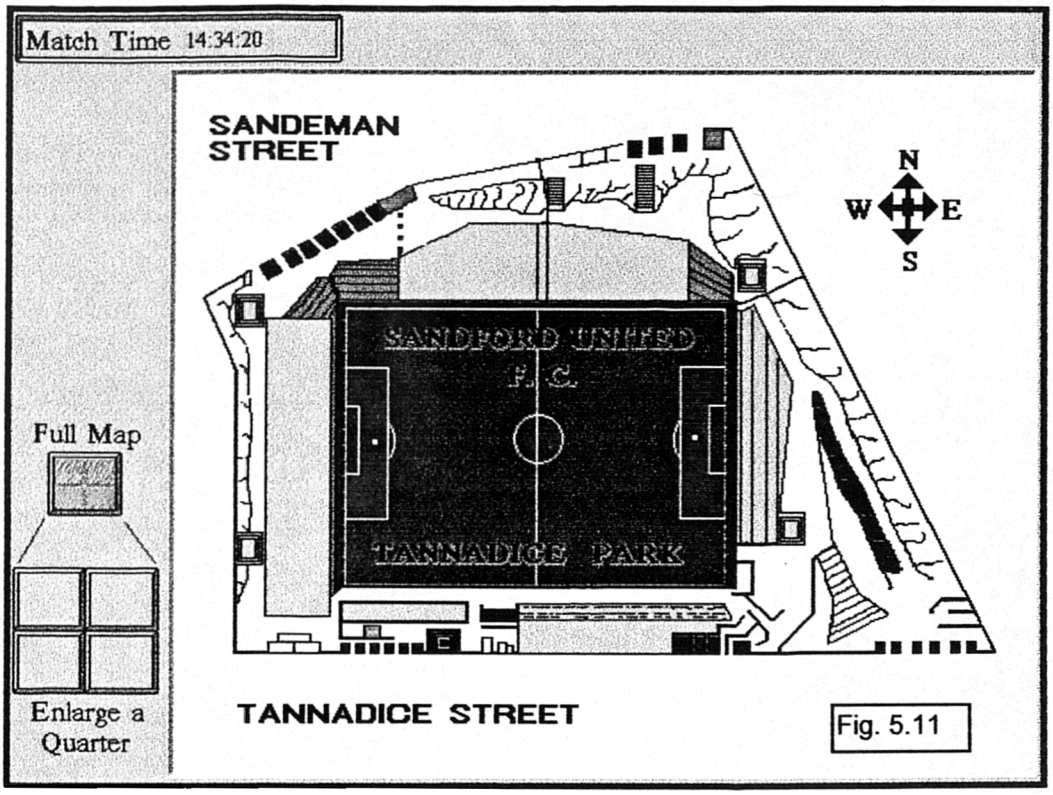
5.17 MicroWorld Computer Interface

The following figure (fig. 5.10), is a typical screen shot of the participant's computer screen display. The match time is displayed in the top left hand corner of the display. The black centre area is where live video from the video disk is displayed to the participants. On top of the video, additional information could be displayed in the form of a notepad. This graphical representation of a paper note-book was designed to help the participant identify that the information, provided in this form, was additional textual information and not part of the video sequence. It was presented in this way to attempt to represent how a commander would receive this type of information from a fellow officer at the football match. An attempt was made to make the screen interface as 'user friendly' as possible, especially in light of the fact that my target learners were not likely to be computer literate.

In addition to the video sequences and graphical messages, the participant's workstation display was also able to replay pre-recorded audio sequences, such as radio messages and telephone conversations. Furthermore, the participant was able to 'call up' maps of the football ground by clicking on map buttons (shown in figure 5.11). Either a full map (as shown) or individual quarters could be called, providing greater detail. The participants would need to have ready access to this type of information during the unfolding event as they would not have local knowledge of the stadium. The intention here was to make available, detailed information on the location of specific parts of the ground such that commanders would be able place into context, incidents occurring in and around the stadium. It should also be realised that this facility added to the

simulation fidelity in that ground commanders would typically rely on a map of the stadium when policing a real event.





MicroWorld Interface Development Experiments

To test the effectiveness of my MicroWorld Interface and Communication systems, I devised a series of experiments. These

experiments had two purposes; firstly to test the effectiveness of the computer display and communications systems and secondly to test the interaction of all the command layers during the simulation itself.

5.18.1 Experiment Objectives

These experiments sought to determine whether the participants were able to recognise the information presented to them through the MicroWorld Interface Display (MID). Details of these experiments appear below.

Later experiments were designed to look at how the team dealt with problems presented at the local level (i.e., at Bronze command) and at the global level (Silver Command). I decided to standardise the methodology for all observational experiments in an effort to increase the validity and reliability of findings, whilst also providing for meaningful inferences to be drawn where this was possible.

5.19 Methodology

5.19.1 Subjects

It was important that, in selecting the subjects for this experiment, I chose a representative sample group, one that closely matched the profiles of officers who would form the simulation participants. To support this requirement, I consulted with the Football Planning and Policy Unit situated in Police Headquarters, New Scotland Yard, London. They informed me that the most likely rank for a football Bronze would be that of Chief Inspector and for Silver Commander in all but the highest risk matches that of be a Superintendent. In addition the most likely radio assistant to a Bronze Commander would be a Sergeant.

I was constrained by the maximum number of officers I would be allowed to have access to, I was also aware that the officers I would be using all had operational responsibilities and that time spent on the

project represented an abstraction from operational strength. The number of officers available for such testing seemed to me to be large enough to enable generalisable conclusions to be drawn, for internal purposes in the knowledge that any generalisations arrived at would be re-integrated as system modifications and subsequently re-tested. Also such sample sizes were in accordance with the sort of sample others had found led to repeatable results (Newland, Powell 1993). Test groups were selected from only relevant levels of officer, and these were officers fulfilling the criteria for attendance on the Major Sporting Events Course, namely Superintendents and Chief Inspectors with experience of policing football events. In all experiments the Chief Inspector or Superintendent were given a supporting Sergeant. A Superintendent and a Sergeant were assigned to Silver Command and the Bronze Command layers both inside and outside the stadium were represented by Chief Inspectors and their supporting Sergeants.

5.19.2 A Test Event

A small event structure was created (the forged ticket incident) and the simulation was designed to involve all three commanders. The incident started with a video clip (of fans arguing over a seat) to 'Bronze Inside', followed by an arrest of a ticket tout witnessed by Bronze Outside. Silver Command would be contacted by the football club's Steward Control Centre. To support this, various video clips were chosen and a set of simulation design templates were completed for the event. The environment control database was programmed from these templates.

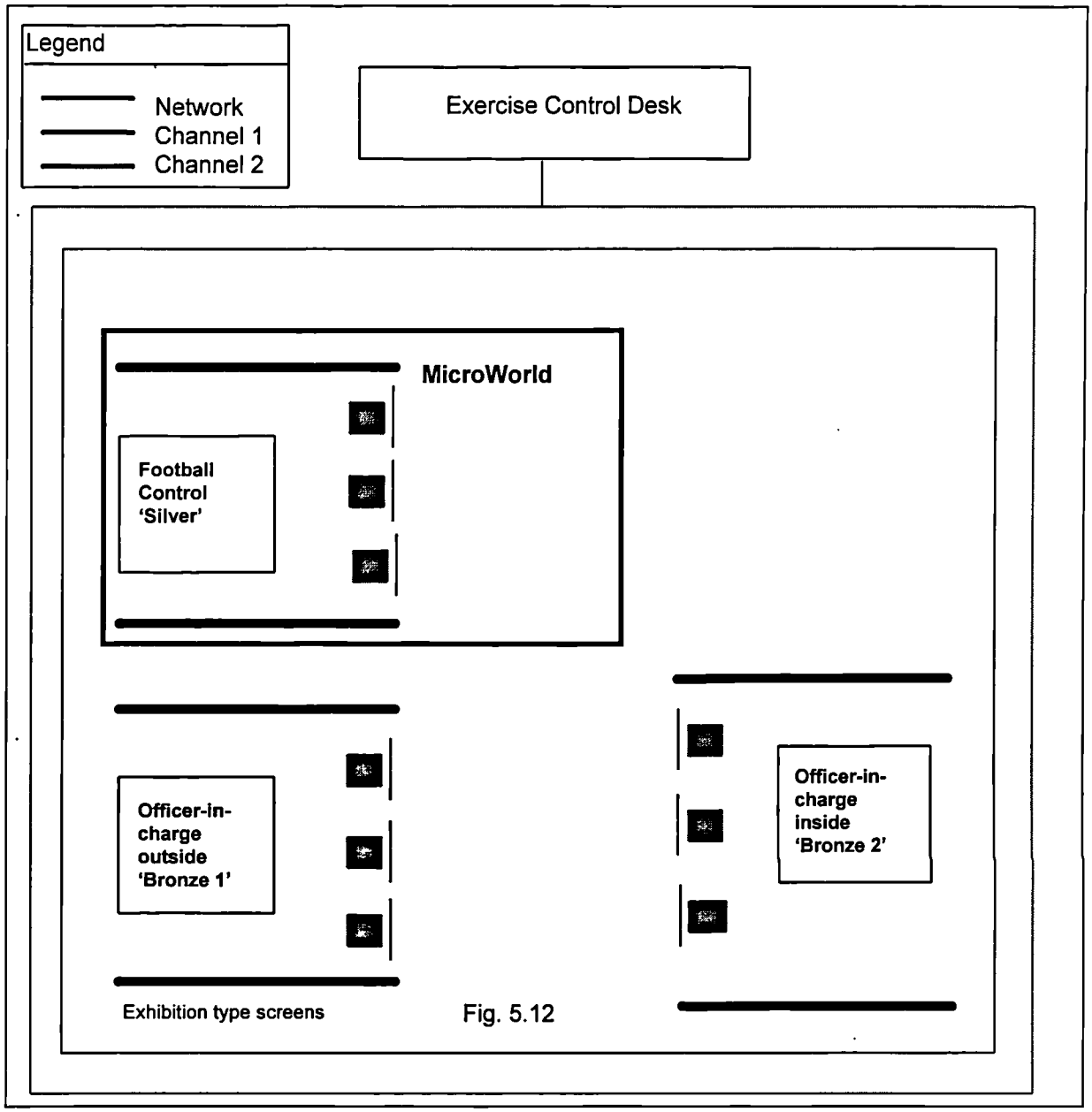


Fig. 5.12

The officers were then assigned ground positions and introduced to the MicroWorld environment areas. These areas were screened from each other by exhibition stand material. The screens were poor sound insulators which added to the noise around the command area, but ensured the subjects could not see each others computer screens or each other. The layout of the experimental environment can be seen in the above diagram (fig. 5.12).

5.19.3 Independent and dependent variables

My first experiment was simply designed to determine how the participants interacted with their MicroWorld. You will see from the diagram showing the whole situation that each participant was able to understand his or her event through looking at a screen which would contain video sequences, graphics and text messages. Thus a useful measure would be to observe what proportion of the event the participants spent looking at the screen. The participants were also given text based information in the form of an 'operation order' (standard reference documentation generated for each and every real life football match) which contained all the necessary information on the football match they were expected to police in the simulation. This included maps of the local vicinity and information on the radio call signs of specialist units, (horses etc.). Sufficient time would be set aside to allow the experiment subjects to familiarise themselves with this information and ask any questions.

As it would prove impossible for the participants to both look at the computer monitor and at their notes simultaneously, a good measure of the importance the participants placed on either would be the amount of time they spent either reading from their information packs or looking at the computer screen. The observations would therefore set out to record these as two separate dependent variables.

I felt it necessary to observe and record the time delay between recognition (of patterns of information presented through the computer monitor display), and the communication of that recognition to relevant team members. To accommodate this data requirement the observation would also record this time delay.

To measure the distribution of a problem amongst relevant team members and 'Silver command' the time spent communicating would also be recorded for each participant MicroWorld. This measure

would be a 'check-test' to confirm that the simulation design did generate problems that involved the relevant command layers.

A final measure, recording the amount of time a commander spent discussing the problem with his or her support officer, would also be included in the observation. This data would be necessary to properly time-sequence events occurring in the simulation. My real world observations of football events had revealed that the commander and the support officer spent a considerable amount of time during the management of an event discussing the possible options. The time delay associated to these conferences would have an impact on the sequencing of the events presented during the simulation.

In summary, I considered there to be five parametric criteria giving an insight into the participants engagement with the event. I was trying to understand how I could get a reasonable engagement from the participants of the event. Therefore the dependent variables that needed recording were:

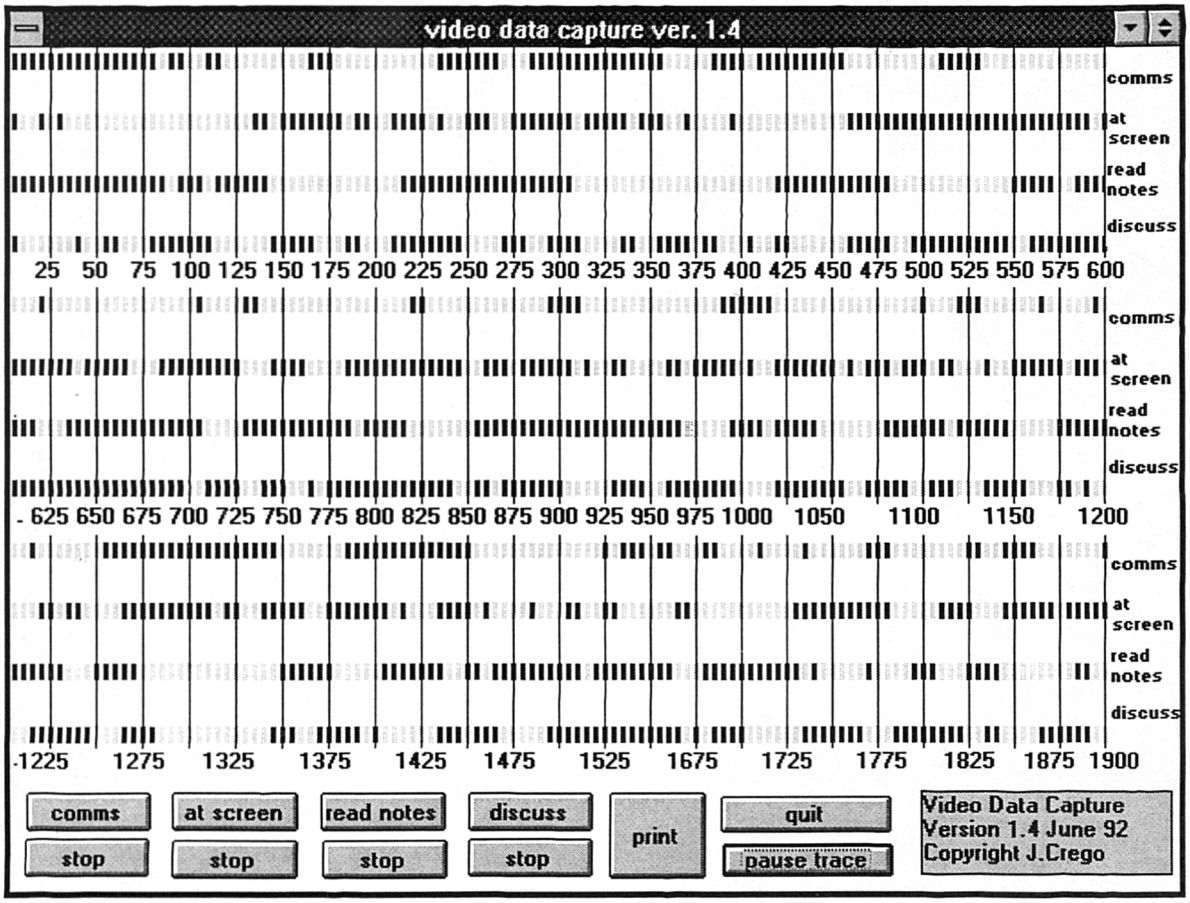
1. The length of time the subjects looked at the screen
2. The length of time the subject discussed the situation between themselves.
3. The time delay between the display of information, recognition of the information and the communication of that information.
4. The length of time the subjects were engaged in communication through the simulated radio system.
5. The length of time the subjects spent looking at their notes.

The independent variable was the video sequences and text messages presented on their display monitors.

5.19.4 Observation of the Dependent Variables

In order to observe the dependent variables I chose to make video recordings of the subjects throughout the experiments. I placed a video camera and recorder in each room and subsequently undertook detailed content analysis of the tapes at the end of each experiment. This obviated the need for three observers, one at each command MicroWorld, and any reliability problems associated to their data capture. In order to accurately record the behaviours of the participants I devised and developed a dynamic recording system.

This device was able to generate charts as shown in the following diagram.(fig. 5.13). The time scale of the charts was five second intervals.



I designed the recording system software so that on review of the video tapes, the behaviours observed could be recorded by 'clicking' on an appropriate button shown on the interface screen. Looking at the

above screen shot of the system, the behaviour buttons are shown at the bottom. Looking left-to-right the uppermost buttons are pressed when the associated behaviour is observed. When that behaviour is no longer observed the stop button situated below the behaviour button is clicked.

The system marks out the behaviour on the chart in five second intervals. When a behaviour is being observed the chart pen changes to yellow and when that behaviour ceases the chart plot colour changes to red. By this approach each of the four behaviours can be plotted against both time and each other.

For example; looking at the screen shot above, one can see clearly that the first trace line, representing the times the participant was observed using the communication system, is shown in red for the fist 80 seconds. The 85 second mark is shown in yellow and the 90 second mark is shown in red. From this one can say that the participant was observed using the communications system for five seconds, 85 seconds from the start of the experiment.

5.19.5 Analysis of Data

By comparing the observed behaviours of each group, analysis can be made of the interaction of a participant group and its MicroWorld and the interactions of command layers within the simulation. Quantitative analysis of the observed behaviour charts, enabled me to determine a level of engagement for that particular commander within the simulation.

5.20 Experiment 1 - Recognition Delay Measurement

The objective of the first experiment was to determine the capability of the display system in presenting a particular incident such that it could be naturally recognised. In other words, that its chance of

recognition was similar to that occurring at a real event. The experiment was repeated three times with a similar sample group.

Each experimental group conformed to the criterion based selection specification detailed in the methodology section above. These groups were briefed on the need to communicate with 'Silver Command', information about their environment in the normal way, i.e., as they would at a real operational event. They were shown a five minute video sequence of a section of the stadium slowly filling with spectators before the start of the match. The video contained no other significant information. At the end of five minutes they were shown a three minute video sequence, depicting a full row of seats. Two fans could be seen arguing and behind them an empty seat was clearly visible. The sequence ended on a still frame of the two fans. The fans often pointed to the empty seat and then examined each other's ticket several times. The video data capture system developed for recording actions in all the experiments was used to record (from the video tape) the behaviours of the experiment subjects. The following table summarises the findings (fig. 5.14).

Table 5.14 Showing Findings For Each Sample Group

Group	Time group began communicating (Argument) Video Sequence starts at 300 - seconds from start of exp. and continues for 180 seconds)	Communication Content
1	27	Information about fans entering the ground being in good spirits
1	174	Request for information on turnstile computer count (to determine how many fans had entered the ground)
1	375	Request for stewards to be sent to stand to find out what the argument was about
2	50	Information about fans entering the stand all looks well
2	390	Request to deploy some officers to the stand to speak to arguing fans
3	405	Fans arguing, send stewards to find out what is going on

This table shows different responses from each of the three experimental groups. The first group used the communication system three times during the experiment at 27, 174 and 375 seconds from the start. The second group used it twice at 50, and 390 seconds and the third group only used it once at 405 seconds. The significant response is any response after 300 seconds as this is when the trigger video sequence was presented. Any communication before that time is generated by the participants whilst looking at the background context video sequences. There was only one trigger designed into the experiment

5.21 Analysis

The results of this first experiment were surprising in several ways. No group recognised from the video that the problem as projected was

associated to forged tickets. Two of the three groups generated radio communications in response to background video alone, video which had been chosen as it contained no command and control information other than the fact that fans were slowly entering a seating area. This video sequence was shown to subject matter experts before the experiment was run to ensure that it had no specific command and control implications. The fact that two groups generated radio communication messages whilst viewing this seemingly inert background information, was an early indication to me of the possibility that, in future simulations, participants were likely to generate radio messages in addition to those I had specifically designed-in, because they might engage in a process of 'scene setting' (or providing a sit. rep. as it is termed by police). In support of this finding looking at the table, Group 1 managed to create two radio messages on the background video sequence alone.

The following graph compares the findings from each group (fig. 5.15).

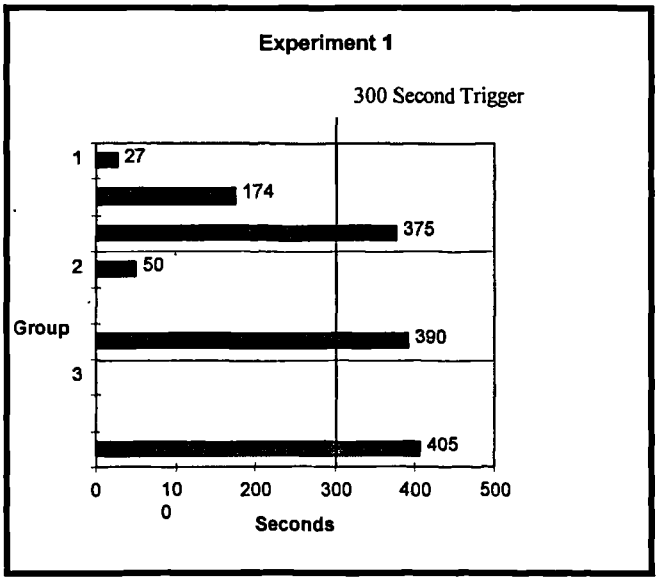


Fig. 5.15

Whilst the additional radio communication times are shown, attention is drawn to the period after 300 seconds, which was the time the trigger video sequence was fired. The mean of the response times for all three groups was 390 seconds

Group	Mean Deviation (Mean 390s)
1	-15
2	0
3	15

Fig. 5.16

This table shows the range of response times against the mean response for all three groups.

The spread of response times for all three groups to the second video sequence deviated only by -15 and + 15 seconds from the mean time of 390 seconds . This amounted to a range of response times with only a maximum of 30 seconds between the two extremes. I felt that this range was small and therefore I questioned each group at the end of the experiment and asked them why they had decided to transmit at that time. All three stated at that time they were of the belief that the argument would degenerate into a fight and wanted to ensure that 'Silver' was aware of the situation. On reviewing the video, it became clear that at 362 seconds, the body movements of one of the fans can be taken as being very aggressive.

I became aware of a major issue being raised from these results. None of the three groups had recognised from the video that the problem was forged tickets . It was also clear that the officers were unaware as to where precisely within the stadium the problem was occurring. To resolve this problem I added a text message notepad overlay, onto the video at 60 seconds (360 seconds into the experiment) after the start of the sequence. This message contained information about the problem and a location within the stadium. When I repeated the experiment with another three similar groups, with the inclusion of

the text message at 360 seconds, the commanders all started to communicate as soon as they had read the message at a mean response time of 370 seconds with a mean deviation for all the groups ranging from -5 to +7. Significantly, the information communicated had been placed in its proper locational context, in regard to the stadium location.

From this substantive experiment and its follow-up I was able to conclude two things; firstly the commanders did not easily recognise the information I had included in the video sequences. If necessary, I would have to include additional information by way of text messages or other indicators to contextualise the information for the officers. As an aside it is illuminate to mention here that this was in stark contrast to how the Vistrain system operated. Here participants recognised the information every time it was presented to them because the participants expectations were externally primed. Secondly, I would have to ensure that all video was displayed with a clear indication of its location within the stadium. These officers had not seen the stadium before and were therefore not able to recognise a location quickly.

5.22 Experiment 2 Command Layer Interaction

The next series of experiments arose from my need to understand the interaction between command layers in more detail. The objectives of the experiment are as follows.

5.22.1 Objectives

1. To observe the command interactions between various participants in the simulation environment.

2. To test the system design model to find out if the environment control system (ECS) can sequence events to the relevant participants and respond to their actions. .

5.22.2 Sample Criteria

Again the sample group conformed to the sample criteria defined in the methodology, namely officers that would be eligible for attendance on the Major Sporting Events Course.

5.22.3 Subject Grouping

There were three groups included in this experiment. Each group comprised a 'Silver Command', 'Bronze Inside' and 'Bronze Outside'. Each commander was given a sergeant support officer. The experiment was run twice with six subjects per trial.

5.22.4 Sequencing

The example event I chose as the basis of this experiment focused on the forged tickets problem. It was chosen for several reasons, firstly it involved all three command layers. Secondly I had available a comprehensive set of video clips that would support this event. Thirdly, my observations of this event led me to believe it generated decisional activity that was typical across a number of like events and one which dealt with recognition of the problem, with complexity and with the filtering of information both up and across the chain of command. Such an event should and thus generate a need for Situational Awareness amongst the team members.

The associated incidents were created from the video and other text cues and triggers and were coded into the environment control database.

The sequencing for the event is shown in the following diagram. (fig. 5.17).

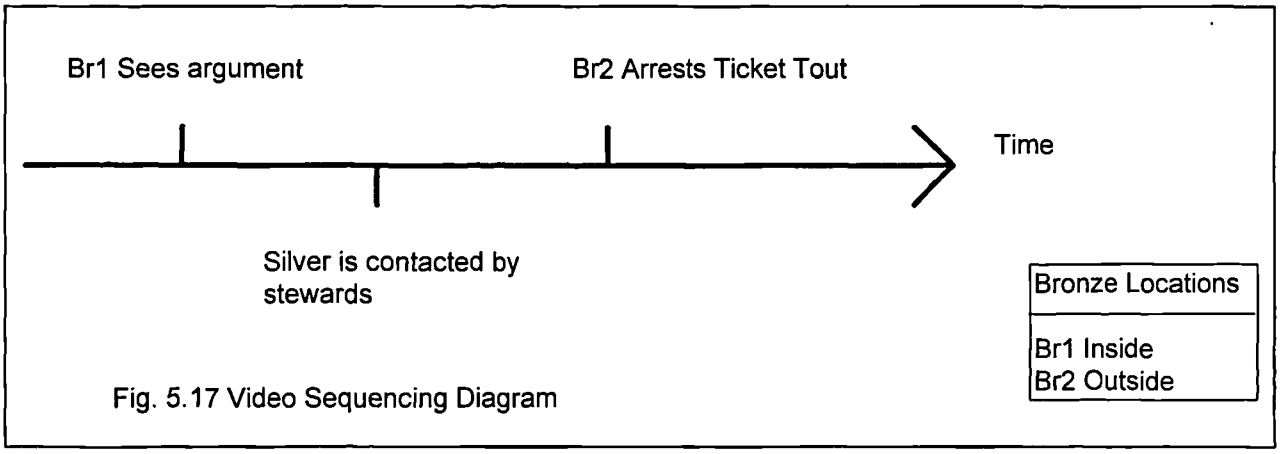


Fig. 5.17 Video Sequencing Diagram

The event begins with all workstations displaying background video sequences providing the relevant situational back-drop for each of the command locations represented in the simulation. As the forged ticket event takes place in the first session, before the start of the football game, 'Bronze 1' (Br1 Inside) will see video footage from an inside stadium perspective. This video would depict sequences showing the stands filling with spectators. 'Bronze 2' (Br2 Outside) sees outside ground sequences, displaying appropriate activities such as fans queuing at the turnstiles or on route to the stadium. 'Silver' sees a random combination of inside and outside stadium video footage, with occasional footage from television cameras on board the police helicopter, affectionately called 'helli-telli'. It is important to note that whilst the Silver Commander is presented with video sequences from all around the stadium, he or she does not see the same sequences as the Bronze Commanders. The video presented at the Silver MicroWorld is indicative of the close circuit television systems available in the football control room. The Bonze's MicroWorld views depict line of sight, and therefore the video displayed on the monitor display is always from the perspective of a police ground commander actively patrolling his or her allocated sector i.e., it is a

representation of what a ground commander would 'see' during the management of a football match.

Incident 1 begins with the background footage on Br1's screen changing to 'incident trigger' footage, which shows an argument between two fans.. Responding to findings from experiment 1, (that additional text information was required to place this scene in context), a few seconds after the start of the 'fans arguing' footage, a text message is displayed (using the notepad graphic) over the video sequence.

The role of the exercise controller is significant at this point. He or she, after firing the first incident, observes the response from the participants. Based on these responses, he or she has to make the decision as to which subsequent incident should be fired next.

The second incident is designed only to be 'fired' by the Exercise Controller if Br1 did not communicate the problem to 'Silver'.

If this should be the case then incident 2 comprises a video sequence showing the Chief Steward (football club employee) sliding a glass partition representing a communication window in the control room, between police football control and the club steward control. Using a 'head and shoulders' presentation, the Chief Steward is seen with his head shown through the window opening, informing police control that he has just been informed by stewards deployed in the stadium that forged tickets are causing a problem in the West Covered Enclosure, which is a location in the ground detailed in the participants information packs, (note: additional information is also available though the stadium maps coded into the MicroWorld display interfaces).

Incident 2 contains most of the information that should have been communicated by the Bronze Inside Commander and therefore is a method of relaying that information directly to 'Silver'

Incident 3, contains more information about the forged tickets event and is presented to Bronze Outside. The exercise controller will fire this incident when 'Silver' has completed discussions with his or her 'Bronze' Commanders. It is a head and shoulders sequence of a detective officer approaching and reporting information about the arrest of a ticket tout. The ticket tout was searched and found to be carrying a considerable amount of money in his possession and some tickets which are believed to be forgeries.

Therefore this incident involves all the command layers and requires that the commanders communicate with each other in order for Silver to obtain a' Situational Awareness' of the problem.

5.22.5 Impact of this Experiment on the Environment Control System

Looking at the sequencing diagram (fig. 5.17), background video is replaced with 'incident trigger' video some time after the start of the event. The exact time is indicated on the video data capture graph shown in the findings section. To achieve this the environment control software needs to be able to 'fire' this trigger video automatically at a pre-set time after the event had started.

This requirement had design implications for the environment control software. The control software had been designed to fire incidents which contained the necessary video and text information. This was achieved by the simulation control operator 'clicking' on the event button. However if all the MicroWorld workstations were to display background video at the start of an event and particular workstations to display 'incident trigger' video at pre-set and independent intervals, then these triggers would have to be 'fired' by the controller at the

correct time. This would be a complicated task, especially as exercises would eventually incorporate multi-threaded problems. I therefore made modifications to the environment control software, to allow incident database entries to contain more than one command and automatic delays were incorporated into the simulation design template. A sample generated from the story board design template now included a new command which would enable automatic event firing. This new script protocol is shown in the following table, (fig. 5.18).

```
[1.   E.1]
2.    Fans with forged tickets
3.    [I.1]
4.    [MT:14:35]
5     [RT:1:00]
6.    [1:VL 3087:4079|DL:75|VP:1782:2277|DL:15|TM:S2E8I1.TXT|DL:20|GD:WEST.PCX]
7.    [3:VL:20395:21998]
8     Bronze 1 sees video of fans arguing over a seat,
9.    followed by text explanation
10    [I.2]
11.   [MT:14:38]
12.   [RT:1:00]
13.   [0:VP:0879:1213]
14    [1:VL:6670:10495]
15.   [3:VL:23771:45917]
16.   Chief Steward tells Control about forged tickets
```

Fig. 5.18 Sample Scenario Script (Forged Tickets)

Lines are numbered for clarity

Line 6 is significant. It contains the control message sent to workstation 1 (Br1). VL is a command that the workstation will interpret as play video frame number 3087 to 4079 in a continuous loop until told otherwise. The DL code means delay for 75 seconds before reading the next command, which is VP 1782:2277. This command means play video from the video disk from frame number 1782 to 2277 and stop on the last frame. The next command is another DL so this means wait 15 seconds before reading the next command, which is, TM. TM means display a text message on the notepad graphic shown in fig. 5.10. The text message is a file called S2E8I1.TXT, a standard word processor file shown below (fig.5.19.)

and this information is displayed over the video picture. Finally another short delay DL:20, before a graphic picture giving the exact location of the incident is displayed. Now incidents could have more than one trigger and these triggers would operate automatically. You can see that the second incident [I.2], (line 10) sets workstation 1 back to background video loop and fires up workstation 0, which is 'Silver Command' with a VP, video sequence, which is in fact the steward sliding back the partition and informing Silver about the problem.

Note Pad Overlay

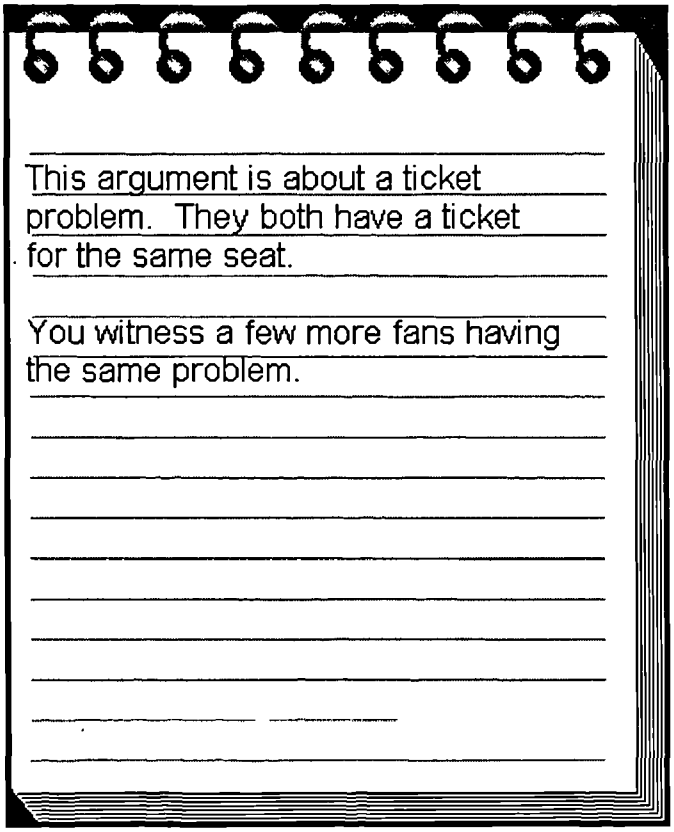


Fig.. 5.19 Note pad overlay

The experiment was run three times with three separate groups. Video tape recordings were taken of the experiments and the tapes were observed and behaviours recorded using the data capture software as detailed earlier.

5.22.6 Findings

The traces recorded for each commander for group 1, are shown in the following diagram, (fig. 5.20.)

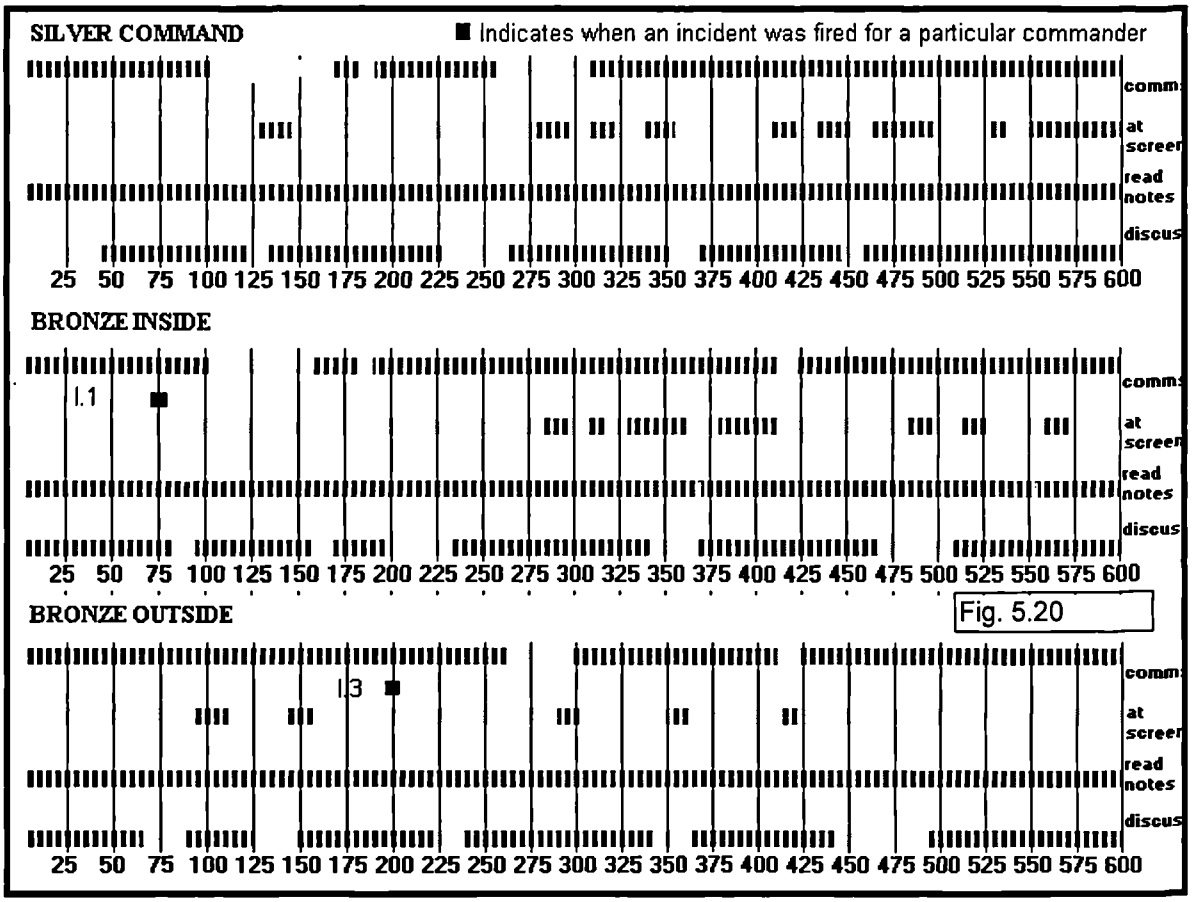


Fig. 5.20

Looking at the above chart it can be seen that the response from Br1 following the firing of the incident 1 video sequence (75 seconds from the beginning of the exercises) was to communicate the problem to Silver Command. The findings across both experimental groups were as follows. Group 1 35 seconds , Group 2, 39 seconds.

As both groups responded to the first incident, there was no need to fire incident 2. Incident 3 was fired 1 minute 20 seconds from the start of the experiment for both groups. Again both groups responded similarly. With Group 1, at 72 seconds and Group 2 , at 80 seconds. This means that there was only 8 seconds difference between the two groups. The main difference between the groups was that group 2, transmitted the information but also anticipated the need for Silver to obtain a specimen ticket (to support any ticket checking that may be

set up) and therefore spent more time discussing the proposed radio message before they sent the information.

In one group (shown above) there was some additional radio communication between the Bronze commander's with Br2 warning Br1 that he expected some trouble at the turnstiles and that he might need some of Br1's resources to meet that need.

I was able to use the data to generate a formula for the purpose of classifying a 'non-response' from the participants. The outcome of which would prove useful in the implementation of in-built delays, whilst also assisting the Exercise Controller with the decision as to when to move the exercise forward and in what direction. The exercise contained an additional incident to be fired if the Bronze Inside did not communicate his or her situation. Now, after recording the times taken for the participants to communicate, I was in a position to formularise these findings by developing a simple formula by which the exercise controller could classify the response from the participants. (fig. 5.21)

$$R_D = (P_D + I_T) + C_D$$

Fig.5.21

Where Response Delay ($\mathbf{R_D}$), represented the total time the exercise controller would have to wait before he or she could state that a participant had failed to respond to an incident presented on their MicroWorld display. $\mathbf{R_D}$ would be equal to the total of three variables:

1. Participant Delay ($\mathbf{P_D}$), set at 56 seconds. This being the mean time of response of both groups over both experimental incidents.

2. Incident Time ($\mathbf{I_T}$), which is calculated as the time (from the start of the incident) that trigger information is presented to the participants

3. Communication delay ($\mathbf{C_D}$), set as 60 seconds, the longest time communication was observed during the trials.

Using this formula the exercise controller could now fire an incident and wait for the responses from the participants for a time indicated by $\mathbf{R_D}$. Any responses observed within the $\mathbf{R_D}$ would indicate that the participant had recognised the trigger and the exercise controller could then fire the appropriate following incident. However if after the $\mathbf{R_D}$ time had expired the participant had failed to respond, the exercise controller could now be certain that the participant had failed to recognise the trigger and could now fire the non-response incident programmed into the environment control database.

5.22.7 Additional Observations

There were some unexpected observations from this experiment worthy of mention. Firstly, I had not anticipated the amount of discussion that took place between the participants in the MicroWorld environments. Secondly, I noticed that Br2 in all groups, started to look away from his monitor before incident 3. When I questioned them on this behaviour they said that they had become bored with the video. This behaviour can be seen in the Bronze Inside trace, after incident 1 and in the Silver Commander's trace throughout the experiment. There are long periods where the commanders do not look at their monitors It is significant that Silver was shown background video throughout the exercise. This video was deliberately chosen because it did not contain any incidents likely to confound the exercise objectives. Likewise, both Bronze Inside and

Outside, were shown background video sequences before and after their information rich, video incident triggers.

5.22.8 Discussion

My observations of the simulation of the forged ticket event in the simulator matched my observations of the real world of football events. This firstly gave me confidence that the simulation effectively represented the reality of the real world. Secondly that the officers did seem to be exposed to the same range of problems that they might incur in other events. Therefore it was my belief that findings from this series of pilot observations might stand as core principles capable of being transferred to other simulations design situations and I felt confident that in my handling of all such MicroWorld developments I could take these finding from the simulation and create a model that would become the basis for system pre-requisites.

All groups communicated appropriate information, based on their perception of their location at the stadium and their command responsibilities, to Silver Command. The radio messages were a close fit with those expected and consistent with radio communications I had observed at real football matches. I played the tape to Chief Superintendent Douglas Hopkins, Gold Commander at Arsenal Football stadium. He confirmed that they had (in his words) "street credibility". All commander layers appeared to be carrying out their responsibility congruent with that of the real world.

The second objective was also met. The environment control software was able to fire incidents both automatically and under the command of the exercise control staff. Corresponding software modifications to the MicroWorld control computers enabled the incident to be presented automatically.

5.23 Chapter Summary

This chapter has covered the initial development of a prototype system. The findings from the experiments point to a need to develop better environment control software and display software. When I created the video data capture system, I recognised that there was a need to observe other participant behaviours and so they were coded at that time. The other two behaviours to be recorded were; discussions taking place between the participants within a command layer environment and the use of supporting documentation. Both of these behaviours were observed in detail in the real world of a football match. They were not recorded in these early experiments as the experiment objectives were such that only observations of the communication system and the time participants looked at the computer monitor were necessary. However, it became clear to me that the participants needed far more background information if they were to make any meaningful sense of the environment I was immersing them within. Development work was necessary to provide commanders with supporting documentation and to ensure 'process reliability, this documentation would have to conform to material that they would expect to have reference to in the real world.

The next chapter examines the development of a four session exercise and uses this exercise as a vehicle to explore further the interactions of the team in decision making and any necessary modifications to the simulation system.

6. Generating Simulation Exercise

6.1 Résumé

This chapter describes the construction of the enabling educational technology developed to support the presentation of information to the learners through the MicroWorld displays and describes the technological design issues surrounding the creation of both the hardware and the software in the development of the simulation system.

Taking the educational design issues developed in the previous chapter, this chapter can provide the reader with a model of a simulation system that will present information to the participants with sufficient contextual richness to allow them to recognise the patterns of typicality contained within the unfolding event.

6.2 Introduction

Chapter 5 explored in detail the education requirement for an experiential learning environment. It also detailed the pilot experiments on the system designed to test the operation of this prototype.

The present chapter concerns itself with the issues surrounding the technological development of a simulation system capable of delivering an appropriate training experience. Much of the development time was taken up with building an 'open architecture' approach to simulation development. Such an open system would separate the technological operation of the system, from the educational design of the training exercise, this represents a significant advance in flexibility of approach over the hard-coded nature of the Vistrain system. This philosophy was adopted because, from the very beginning of this work, it was recognised that the design of simulation exercises, should be driven by trainers and subject matter experts within the organisation. To achieve this the underlying operation of the simulation system would have to be transparent, allowing non-technical training staff to develop exercises without reference to technical staff.

6.3 Story Board Collation of Video Sequences

Having classified the events contained within the national course programme in chapter 3, it was necessary to identify video sequences that would provide supporting visual triggers and cues (to be sent to the MicroWorld Display for a complete football simulation exercise. The Scottish Police College had created video in support of their own football exercise operating on the previously mentioned 'Vistrain' system. As a result of their work, master tapes of a football event were available through Crown Copyright to the Metropolitan Police. In

particular, four, thirty-four minute tapes were available, showing the complete coverage of a football match shot on video footage taken from the inside and outside of Ibrox football stadium, the Scottish National Stadium. In addition, the video footage was also available from the perspective of the local police station's involvement with the football match.

After reviewing the 'Vistrain' tapes in detail, I felt, with a small amount of re-editing, I would be able to re-use the video sequences for the purposes of properly piloting a London based football exercise. This decision was also influenced by the long delay and additional cost that would beset the project if it was decided to generate new video footage. Furthermore, at this stage the Metropolitan Police Force was not sure whether to invest the resources that this would have entailed. Nevertheless, I felt that the video footage available more than adequately met the requirements generated from my story board.

As the Scottish simulation system utilised four separate viewpoints, namely inside and outside the stadium, the football control room and local police station, the tape contained sequences from all these perspectives. I was able to re-edit the tapes, taking scenes from one location and adding them to another. This allowed me to make the most effective use of the video material.

6.4 Quality of Laser Disks

The video tapes were edited in a form suitable for my experiments and taken to a video disk pressing facility. There were three types of video disk media suitable for the simulation. Each offered a compromise between price and quality of reproduction. The highest possible quality was a stamped disk made from a master die. This was extremely expensive and used for large numbers of disks for the mass market, as the experiments only required a single disk from each tape

this option was not appropriate. The other two alternatives were either glass or plastic disks. The glass disks were better quality and more expensive. I took the view that the quality of the video was an important factor, especially as the footage contained a lot of detail such as crowd shots, also the fragility of the glass media would not present a problem as the installation would be a permanent one.

In fact, four glass disks were pressed from the video material. Although there would only be three command positions in the simulation, it was not possible to divide all the video sequences amongst three disks. This was due to the running time of the video and the limitation of the video disk storage, which was approximately 34 minutes per disk. As a result, two laser disks were needed accommodate of the video material for the football control room MicroWorld.

Video disk technology is an analogue medium, with an ability to access directly any one of the 52,000 frames stored on its surface. The disk players used in my system had a serial communications port allowing for external control by computer. My MicroWorld control software controlled the video disk, which displayed video by precisely controlling the video disk reading head position. Delays on finding any start frame of a video sequence were small, no more than 10 milliseconds, which is insignificant when set against other delays in the control room, so such access was deemed perfect for my experiment.

6.5 MicroWorld Control and Environment Control Software - An Overview

The overall system is designed to take information held in its database itself, held at the centre of a computer network and process this into command messages that are distributed through the network, to the

remote computers. The remote computers are used to present information to the participants in their MicroWorld environment.

Two major components of the simulation system are the Environment Control Software (ECS) and the MicroWorld Display Software (MDS). Both these sub-systems are discussed in detail in the next two sections. These interdependent systems operate in a 'master' / 'slave' relationship, with the ECS controlling the simulation presentation via the MDS (MicroWorld display).

Both the ECS and the MDS programmes were written in 'C'. This language was chosen because, being a 'low level' language, it would operate at high speed and could also easily accommodate changes in program functionality, that would result from ongoing development. Overlaying video information onto a computer screen places great demands on the processor and as other tasks need to occur simultaneously, a fast execution time for the code was therefore an important consideration. The code was written in a modular way, which meant that it was broken down into small units of operation. This enabled quick and easy modification to small parts of the control software as needed. The MicroWorld Display System has a number of modules seen in the diagram below which are discussed in detail later.

6.5.1 MicroWorld Display Software (MDS)

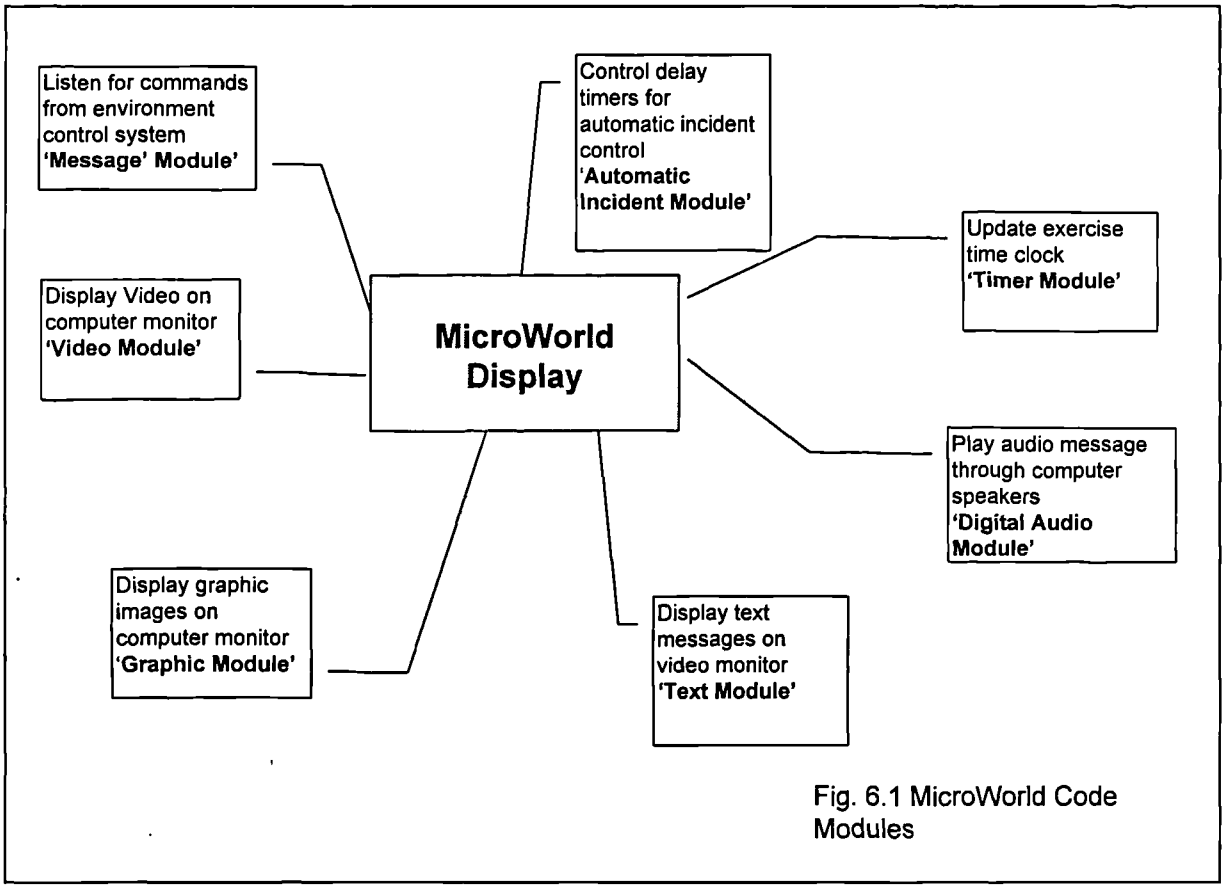


Fig. 6.1 MicroWorld Code Modules

Each of the above modules is now described in some detail.

6.5.2 Message Module

The MDS and ECS communicate with each other via control messages which pass through a single computer network which connects them together.

The MDS continually scans the network waiting for command messages. The code associated to this module carries out three operations firstly it 'listens' for messages addressed to itself, secondly, if it recognises a message, it decodes the message into commands for MDS operation; finally it informs the ECS that it has received the message and is waiting for another. As messages are in the form of 'files', the 'Message' module generates three disk accesses every time a message is passed from the ECS. The first access checks the network

file server to see if there is a message file waiting, the second access copies the file from the file server to its local hard disk, the final access deletes the message file from the file server. This checking cycle operates at 500 ms intervals. Therefore the minimum delay that can occur between the ECS sending the message and the MDS responding is set by the checking cycle frequency. In order to avoid the file server having to handle competing requests from different MDS computers the checking cycle delay period is stepped for all MDS computers. The range across all work stations was 500-1000 ms.

6.5.3 Timer Module.

The first command in any ECS message is the exercise time for any incident of event. The MDS interface screen shows the event time in the form of a digital clock on the top right (see chapter 7). The clock moves forward in real time from the time specified in each 'exercise time command' contained within the ECS message. This enables the simulation to operate in 'real time' when an incident is active. It also allows for time compression i.e., moving the clocks forward between events.

6.5.4 Automatic Incident Module

In the previous chapter we discussed the need to automate the firing of individual MicroWorld triggers during the unfolding of a single incident. This required the introduction of a new protocol called 'Delay'. The Automatic Incident Module enables a Delay command embedded in a command message, to link two or more triggers to be displayed by the MDS.

6.5.5 Video Module.

Video held on the video disk was displayed on the computer monitor of the MicroWorld. This method of combining moving video images with computer graphics is known as 'Video Overlay'. There are many overlay computer cards on the market, but the leading specification at

that time was one produced by MicroVitec, a Bradford based video company. The card used in the system (at this time) was the "DAVID" card. This card had a substantially higher quality output, than others available at that time as it was digital. The advantages of digital conversion of the analogue video produced from the laser disk is discussed in the graphics module section, however, the digital benefits in overlay were that the image presented on the computer screen did not flicker. This is a problem caused by traditional cards 'interlacing' the computer display because they are not able to operate at the high horizontal scan rates of computer generated graphics. The flicker produced by the analogue overlay cards meant that viewing the screen for more than a few minutes was extremely irritating.

The video module therefore understood commands relating to the display of video. The code directly controlled the video overlay card and the laser disk player. Functions available at this time were to loop, play and pause the video disk player.

6.5.6 Digital Audio Module.

The digital video overlay card also had a digital audio 'daughter board sub system'. This system would enable me to record and replay audio to and from the computer's hard disk.

The module 'understood' audio commands held within the messages sent by the ECS and enabled the playback of digital audio, to one or to many MicroWorld environments.

6.5.7 Text Module

This module was able to 'understand' commands associated to the displaying of text messages on the computer display. The text was displayed against a background resembling that of a shorthand note pad and were held in the form of plain ASCII text files that were held locally on the computer's hard disk. Commands sent from the ECS to display text messages on the display were handled by this module. It

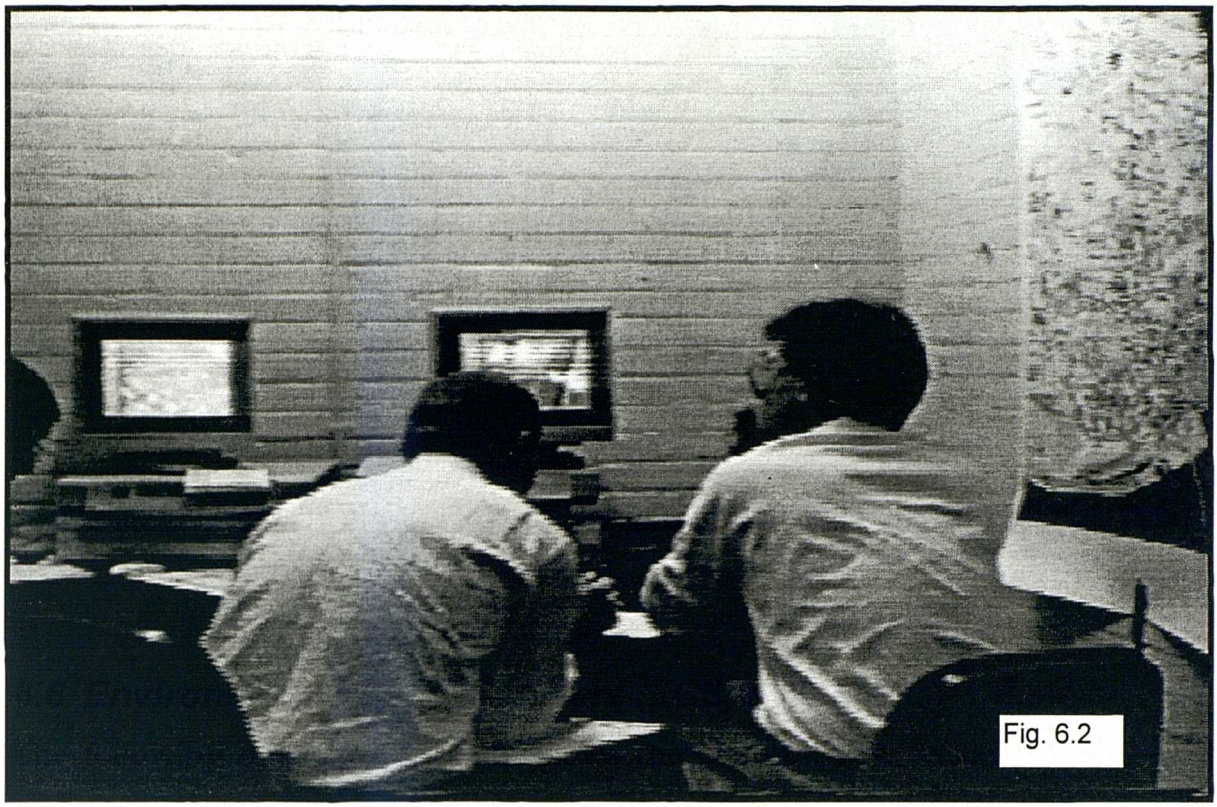
may prove illustrative in this regard to refer to the screen shot of interface in chapter 7

6.5.8 Graphics Module

This module was able to 'understand' commands sent from ECS that were associated with the display of computer graphics on the computer display. Graphic images were stored as 'Bit Mapped', again files held locally on the computer's hard disk. This module displayed the graphic file on top of both the video and text information. In addition, it also handled the display of stadium information graphics by presenting graphical maps in response to participants activating the map button on the MicroWorld interface. It also had the ability to digitise and store graphics from video disk, or other video inputs. This capability was not used in the prototype developed and discussed in this chapter but will be discussed here for clarity and completeness.

In later developments of the system, the ability to show the participants graphical stills of useful information was utilised. For example, in one incident officers are presented with a problem where the managers from each football team are brawling in public. It was possible to digitise (from the available video) images of a manager's 'dug-out' at the side of the pitch and to provide additional context for the location of the problem. This graphics module was able to display such video stills in 'true colour' i.e., 16.7 million colours on the screen at one time, whilst the rest of the display operated in 16 colour mode. Although this latter situation might appear limiting in the design of maps and other information, the 16 colour possibilities did not appear to provide any problem to system users and so did not lead me to change the interface design. In later developments it was possible to upgrade even the fidelity of this presentation, This will be discussed in detail later.

MicroWorld Environment in Reality (fig. 6.2)



6.6 Environment Control Software (ECS) Modules

The following diagram (fig. 6.3) shows the code module associated to the operation of the Environment Control Software. The sections that follow contain detailed discussion on each sub module of the ECS.

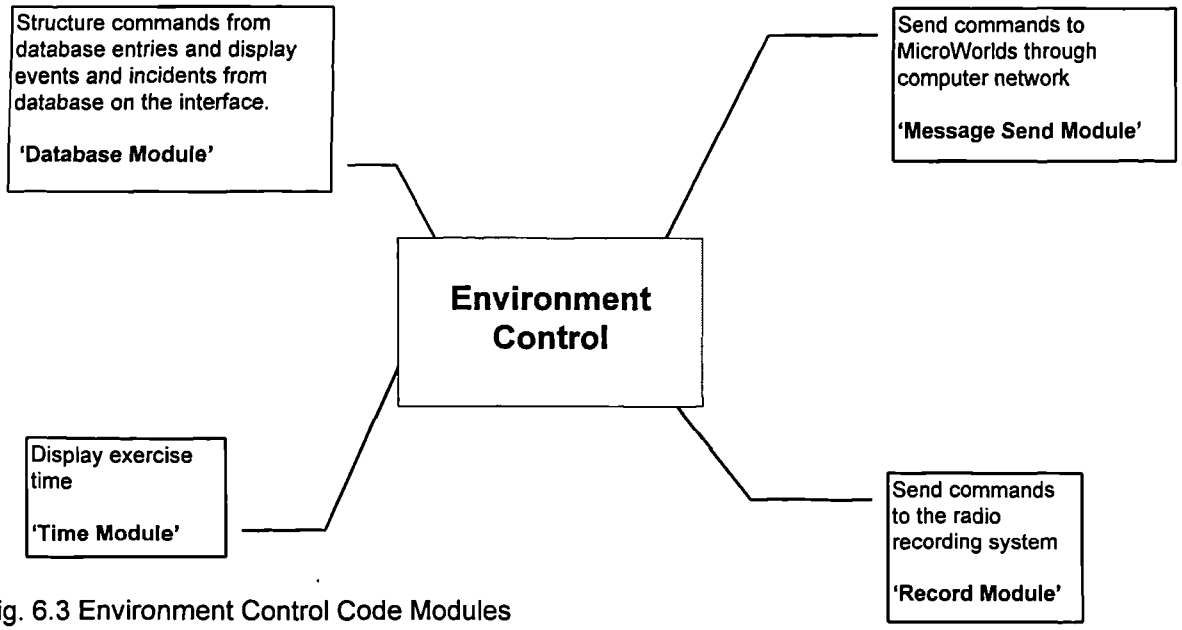


Fig. 6.3 Environment Control Code Modules

6.6.1 Database Module

All the possible events, incidents and their associated triggers and cues were held in a database. The database did not conform to either flat file or relational database conventions, as it was designed to be generated and modified by trainers, who may not be fully computer literate. Consequently, the database was in the form of a plain ASCII text file. This file could be generated and modified using a simple word processor. (Its complete design may be seen later in this chapter.

The code associated to the database elements of the ECS was extremely complex. This was due to the resulting 'trade off' between ease of development using plain English, and converting that text into a computer recognisable format. Therefore, this conversion formed a substantial element of this code module. In addition, the conversion had to be extremely fault tolerant, as long and pedantic protocols of some text files often lead to typing mistakes, such as the omission of comma's or the inclusion of characters by mistake. When the module had encountered such an error, it was important to generate

meaningful error messages to highlight where they occurred. This would aid correction.

The second function of this code module was to present newly converted, and now useable, information to the Environment Control Interface Screen. A 'point and click' interface enabled the Exercise Controller to select and fire appropriate events, incidents and follow-on incidents easily, quickly and reliably. The controller would be presented with an interface which would allow him or her to scroll through the available events and incidents within a given chosen scenario. When an event was selected and its associated incident fired the Message Send Module operated

6.6.2 Message Send Module

When an incident had been fired this module took over the processes necessary for command messages to be written to the computer network for transmission to the MicroWorld Control Software programs.

As soon as an incident was fired, this module accessed the internal (converted) database and constructed message files for all the workstations. The files would be encoded with event time information and a range of command statements, such as to display video, play video and audio files, etc. The number of message files written to the network file server was dependant on the number of MicroWorld workstations registered in the system. The software was technically able to operate up to 20 workstations although the system was extensively tested with only ten computers.

6.6.3 Record Module

This module was designed to capture the audio communication messages generated by the participants using the communications systems available during a simulation exercise. The program operated on an additional computer system, located in the exercise control

room (and shown below, (fig. 6.4). The code had to operate on this additional computer, as the main exercise control computer did not have the necessary processing capacity to operate all the code modules simultaneously. These two computers were linked not by the network system but through serial communications. This was because, at that time, the process of digitising and storing audio was such a processor intensive task that there was no time available for the processor to manage network interaction.

The record code module digitised the generated audio at a sample rate of 6000 cycles per second. This fairly low quality audio (high quality would have been up to 44,000 cycles per second), was a compromise between the need to maximise the storage capacity of the recording system and the need to provide easily understandable reproduction. Nevertheless, since the speech range is between 500 and 4000 kHz the audio was felt to be acceptable for speech recognition purposes. The recording computer's hard disk had a capacity of 100 Mbytes and this amounts to a maximum recording capability of about four and a half hours

6.6.4 Time Module

This module operated as a 'master clock' for the system. For the ECS it generated on screen time, indicating the exercise time and the time displayed on the MicroWorld display interface. All event and incident command messages were based on the master clock time generated by this module. Later developments with the system included decision count down timers and these also became synchronised by this module.



Fig. 6.4. Environment Control in Reality

6.7 Generating Simulation Exercises

As discussed earlier in concept, the system is designed to take the information held in its database, and process this into command messages. These messages are generated in a suitable format for transmission to the MicroWorlds via the computer network, under the control of the Exercise Controller. The following section examines the process required to generate complete training exercises, which in reality means the required sequencing and referencing of large numbers of different types of triggers and cues that call in the story boards. The database would eventually hold a large collection of time referenced pointers to MicroWorld display activities.

The mechanics of producing a trigger at the workstations is inexorably linked with the enabling technology of the system and its various components discussed above. However, the creation of the educational design underpinning the simulation exercises required the assembly of specific information triggers aimed at specific participant

commanders at specific times throughout the exercise. The following section examines the types of triggers the system is able to deliver.

6.7.1 Simulation Trigger Types

By following the event sequencing diagrams defined at the start of chapter 5, It was possible to generate a simulation exercise by deciding what information to display to each participant at any moment of the exercise. This was achieved by classifying simulation information into three classes. These classes were:

1. Background context information
2. Trigger information
3. Supporting information

6.7.2 Background Context Information

Video information displayed on the computer monitors, would provide a Situational back-drop for the participants. This background contextual information was intended to be inert but attention keeping. The decision as to precisely which background information to present is not trivial, as was demonstrated in the earlier pilot studies. In other words the intention was to ensure that this background information would not contain triggers and cues leading to specific problems, or provide any specific patterns leading to the recognition of any single problem. For example, if information presented as background had to have sufficient contextual information so that the participants would be aware of the stadium slowly filling with spectators at the start of the match, then Situational back-drop information would show the fans, entering the stadium, finding their seats, buying food, visiting the toilets, queuing for tickets etc. The real intention of such video is to help provide participants with the feeling that they are immersed in a real event so that they focus on the task in hand. One cannot ignore the fact that the participant is not

physically at a football stadium, so this mechanism tries to help overcome this problem.

These factors are labelled 'immersive' as they may lead to an experience of presence (of being actually at the event). A great deal of time was spent choosing immersive video which did not contain any major triggers or cues. The success of this strategy will be seen later and is reflected in the responses received to questionnaires given to the participants on immersion, also evident is the fact that responses to 'non-triggers' seemed not to occur in the next series of trials.

Background video sequences are necessary to enable participants to immerse themselves into the simulation. Even though they're designed to be inert, providing no specific information, they were not viewed as such by the participants. An example of this would be that seeing a seating area at near full capacity would provide triggers and cues to a number of event states that had not been specifically programmed into the educational design. Such attention capturing based on other irrelevant cues in the background, is typical of real events. There is therefore a limit to the degree to which it was possible to limit such cues, it would be improper and de-contextualising

Seeing for example, a supposedly 'inert' video of the stand only half full would take on a new meaning if at that time in the exercise, there were only a few minutes to the kick off. Here the video would be full of triggers and cues prompting decision makers to recognise that the scene was not as they expected and there may be trouble outside the stadium heeding the ingress of supporters. The choice of background video was difficult to determine as it was important to be aware of the conflicting information it may portray.

Such immersion is also referred to in the literature as 'presence' and is defined by (Witmer, Singer and Michael 1994) as "the subjective experience of being in one environment (there) when physically in another environment (here)" They go on to state that "Presence may be based on external factors and internal tendencies that support both awareness of the current situation and the transition from the immediate physical location (here) to a remote or artificial environment (there)".

6.7.3 Trigger information

In contrast to the background information, trigger information presented through the MicroWorld display was intended to provide key triggers and cues promoting pattern recognition and thus decisional action. This trigger information could be presented in a variety of different ways.

6.7.3.1 Direct Trigger information

Direct trigger information is presented directly to the participant by either the 'firing' of a relevant video sequence containing relevant and pertinent information, for instance the argument between the two fans over the same seat, or the 'firing' of audio information (a pre-recorded radio transmission from one of the police units under the command of the participant), or by some text or graphical information on the computer screen or some combination of all cues which are complimentary.

6.7.3.2 Indirect Trigger Information

Indirect trigger information is that which is directed at one participant but displayed through the MicroWorld of another. Such information usually contains small but timely, additional cues to provide a global context for a participants local problem. For example, if a participant

inside the ground sees the seating area only half full five minutes before the kick off, this is a direct trigger. Indirect triggers could result from the participant outside the ground being made aware of a major road accident near to the ground, transmitted from the Silver commander. The inside participant would overhear the radio transmission and this information would provide an indirect trigger as it would provide greater situational understanding for the information s/he was observing. Indirect triggers may even prompt him or her to transmit other information he or she has knowledge of from earlier events to the overall commander as s/he now understands the global relevance of that information. They become actualised by their 'Situational Awareness', (Brehmer 1991), from this extended MicroWorld view of the problem.

6.7.3.3 Supporting Information

Supporting information is additional local information that is designed to help the participant recognise the cue or triggers associated with any problem. Remembering that the simulation is a learning environment designed to engender experience, and taking the hypothesis that more experienced decision makers are better able to recognise the patterns or typicality of a problem than their inexperienced counterparts, a mechanism was required to enhance the significance of these triggers and help the participant to recognise significant patterns from a given situation. Supporting information should become an additional cue and trigger that enriches the recognition of information contained within the environment.

An example from present training design might be for example, a problem associated to an activity at an exit gate just before the end of

the match. Commanders should be aware of certain safety procedures that should always be implemented before the end of the football game. These, amongst others, are to ensure that the exit gates are opened and that either stewards or police officers supervise the exit of supporters from the stadium at the end of a game. A Direct Trigger Information cue would be to show the officer in-charge inside the stadium, video footage of a steward reporting difficulties in opening an exit gate. Experienced commanders would recognise this might become a significant potential safety hazard if certain decision steps are not taken to prevent a build up of fans at the gate leading to the possibility of crushing. A less experienced commander may not at this early stage recognise the potential of such a problem. In this case, additional *Supporting Information,* could then be directed at this commander. For instance such enriching information would be a pre-recorded radio message from a police unit suggesting to the commander that they are concerned about the possibility of crushing occurring and asking for guidance about preventative actions.

Such supporting information would be delivered to the commander with high 'process reliability' as just in the real world, a subordinate unit would prompt the commanding officers for actions.

If appropriate, such supporting information will assist the commander in the recognition of the potential problem. They would then be able to re-code this information to form part of their autobiographical memory and hence their experience base, within the context of both final whistle procedures and safety procedures. (Memory Organisational Packets, Shank 1982)

6.8 Entering Data into the Environment Control Database

Utilising the simulation design template as described in the previous chapter, background context information, trigger information and

supporting information was appropriately coded. The design template is reproduced again below for clarity. (fig. 6.5)

Scenario Number	1
Event Number	1
Incident Number	1
Timed at	14:34

Summary

Forged ticket event. Significant players are: Bronze Inside, Outside, Sliver Control

Type

Video

To:

Bronze Inside (Bronze 1)

Video

Pod 1	Two fans arguing over a seat	20175-30642
Pod 2	Background	17043-32002 Loop
Pod 3	Background	19234-22793 Loop
Pod 4	Background	10474-23932 Loop

Radio Summary

Expecting Bronze 1 to communicate the problem to silver control

Learning Outcome

This event is concerned with forged tickets. Control of ingress, ticket checking, liaison with football club, safety issues, criminal activity and avoiding setting precedents for future match policy

Fig. 6.5

A separate form was used for each incident within a scenario. When these were completed, they were transferred to a text file. A sample of this file is also reproduced below for clarity (fig. 6.6). The complete set of text files for all four scenarios can be found at appendix 16.

[E.8]
Fans with forged tickets
[I.1]
[MT:14:35]
[RT:1:00]
[1:VP:1782:2277|DL:15|TM:S2E8I1.TXT|DL:20|GD:WESTCOVE.PCX]
[3:VL:20395:21998]
Bronze 1 sees video of fans arguing over a seat, followed by text explanation
[I.2]
[MT:14:38]
[RT:1:00]
[0:VP:0879:1213]
[1:VL:6670:10495]
[3:VL:23771:45917]
Chief Steward tells Control about forged tickets
[I.3]
[MT:14:45]
[RT:1:00]
[2:VP:1115:1596|DL:18|TM:S2E8I3.TXT]
[0:VL:11599:12977]
CID tell Bronze 2 they have arrested a tout with £2000 and some forged tickets
[I.4]
[RT:1:00]
[1:TM:S2E8I4.TXT]
Bronze 1 gets a text message that 50 supporters have gained entry on forged tickets
[I.5]
[MT:14:55]
[RT:1:00]
[2:VP:1597:2142|DL:15|TM:S2E8I5.TXT]
[1:VL:10557:15021]
[3:VL:17236:20376]
Bronze 2 sees crowd getting worried about missing the kick off, followed by text explanation

Fig. 6.6 Text File Script Sample

From this sample you can see that the incident involves all participants. The syntax of this text file required that the information had to be inputted in a very pedantic manner, as the Environment Control Software (ECS) had to interpret each line of the text file and create from it the session database, which was then displayed on the

control interface screen. Unfortunately a weakness of this design was that if as little as one colon or bracket was misplaced then the control software could not create the database file from the text. However the strength of my control design was that it could be created by anyone who understood its syntax and had access to any primitive word processor. Also, being text based, modifications could be easily made to the design of an incident (this entry procedure was greatly simplified in later developments of the system). In reality this was extremely important as commands such as the delay command, needed to be modified by a trial and error approach. That is to say, one would estimate the amount of delay required from say, the start of a video sequence to the displaying of supporting text information. Only when an incident was fired was it possible to see if the delay programmed into the database was too long or too short. Modifying the incidents was then a simple task of calling up the text file and increasing or decreasing the delay value.

The added advantage of this approach was that the events and incident database was independent of the environment control software. This meant that the database would accommodate any number of different simulations and therefore any exercise developed to operate within the system would exist entirely separately from the training environment, this lies at the very heart of my desire to develop a truly open system able to accommodate any number of critical incident management training exercises.

6.9 System Potentials and Constraints

The system had the potential to present timely and relevant information to the participants through the MicroWorld Display. The ECS was able to interpret text based scenario script files and convert them into the exercise database. The MDS had sufficient functionality

to present to the participants a range of cues and triggers in the form of video, audio, graphical information and text.

The system. utilising video disk technology, was severely constrained by the limited storage capacity of the video disk. Sessions were planned to run for about twenty minutes and this meant that the disks could only technically support a maximum of thirty four minutes of motion video This figure was even further reduced as the video quality of the first three minutes of video was extremely poor, this was due to slow angular velocity towards the centre of the disk surface. To maximise the video quality only thirty minutes of video was recorded onto the surface of the video disk. This meant that the video disks could support only one scenario. Video loop background context information therefore was combined with short video sequences, to provide the trigger information. Supporting information was supplied by the displaying of text messages to particular participants during the unfolding of an incident, under the control of the Exercise Controller. With all the incidents coded into the text files it was now time to test the simulation design.

6.10 Chapter Summary

This chapter has examined the technological requirements needed to support a simulation system that would provide an engaging and immersive environment for command officers. It has explored the principal code modules of both the MicroWorld display and the Environment Control.

The remainder of the chapter was concerned with the classification of the types of trigger information that could be displayed through the MicroWorld display interface. By combining trigger types it was possible to generate a range of cues both locally within a MicroWorld environment and globally across many environments.

The mechanics of entering the information into the session database were described and the chapter ended with a brief look at the system constraints at that time and these were associated to both the length and the quality of video material.

The next chapter will detail the first major trials of the Football Simulation

7. The Major Evaluation

7.1 Chapter Résumé

This chapter will open up a discussion on a number of theoretical positions which may find use in attempting to understand the interplay between system elements, as these are viewed individually as components and holistically in terms of their contribution to the overall function of the system.

The chapter will also explore ways in which the learning process might be structured so as to ensure that immersion within the system engenders experience in critical incident management command.

Importantly the chapter contains a great deal of detailed information describing a series of major trials on the effectiveness of the system and goes to great length to lay out and interpret data resulting from these trials. Furthermore, this data is analysed and meaning is drawn from it through a process of interpretation. The chapter concludes by mapping out how this research should be taken forward in order that a continuing process of testing-observation-assessment-modification and re-testing might take place.

7.2 Overall Methodology

7.2.1 Systemic Testing

The experimental methodology chosen for the development of the simulation system was systemic testing (Jones, 1970) where the developed prototype system, described in chapter 5, was tested, observed, assessed, modified and re-tested to establish its effectiveness as a simulation environment which is as near to the one the participants would normally be exposed in an actual or 'real' football incident. The following diagram (fig. 7.1) indicates that after the initial development, several cycles were needed to hone the simulation into this effective state.

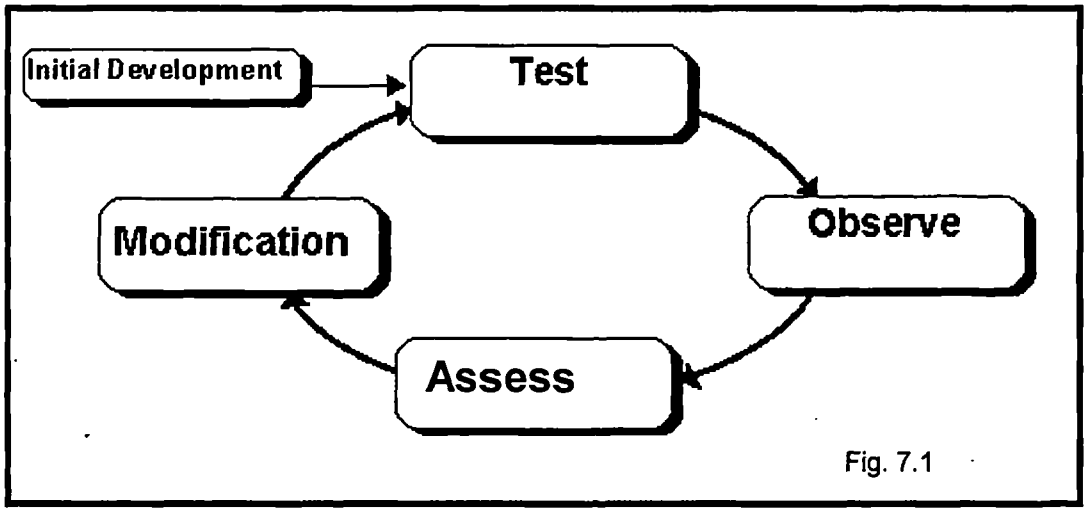


Fig. 7.1

Jones explains "that systemic testing is an efficient and effective means of identifying the features of the existing situation that are not as desired" (Jones, 1970). Through the use of systemic testing it is possible to "identify actions that are capable of bringing desired changes in situations that are too complicated to understand" (Jones, 1970). With such systemic testing, gross problems with the system as a whole are easily realised within a context that also indicates possible solutions.

The benefits of systemic testing are that it can be used in situations such as those in this research, where there is doubt as to the identity

of, and relationships between, causes and effects in a real situation. Jones states that "it is particularly relevant when the available models fail to take account of all the important cause/effect relations that are thought to exist"

Beer (1966) indicates that the results of systemic testing are only truly applicable to the situation that has been tested. However Powell (1974) has shown that for "like systems, in like contexts" there can be generalisable findings capable of transference. Since Command and Control structures conform to a standard protocol which is easy to replicate, it was believed that the findings from the research would be generalisable within the context of the crisis management. I felt that the key to such a successful transfer of general principles lay within the degree of the fidelity established as a result of creating a correct structure and context for the system.

7.2.2 The Football Command and Control System

The initial development of the system was tested and observed in its football training format, using students attending the National Sporting Events Course. I set out to focus my observations on both the individual components of the system and the system as a whole and from these observations, duly analysed and interpreted, I realised that certain modifications would be needed.

7.2.3 Major Trials and Modifications

In the early stages of these trials detailed observations were made using a comprehensive set of observational indicators, together with interviews. In particular, to save unnecessary early re-working on the basis of ad-hoc findings, no systems modifications would be made until three trials had been completed. Modifications were then made on the basis of significant trends or typical problems observed. After the first two sets of (3) trials it appeared that the major problems had been resolved as a result of the modifications made to the system.

7.2.4 The Minor Trials

After the major trials had been completed a further series of trials, less obtrusive observations and measurements were made, with an eye to correcting the minor problems that remained. These less obtrusive observations were also designed to give confidence that the observational techniques themselves had not unduly influenced the findings of the major trials. During all trials I sought to confirm or refute the effectiveness of all previous modifications made to the system. In this way, several cycles of these less obtrusive observations enabled the final improvements to the system to be made to ensure its total effectiveness.

7.3 The Trial Events

7.3.1 The Subjects

With the previous observation based experiments discussed in chapter 6, these trials used police officers attending the National Sporting Events Course as their subjects. As this testing cycle which, as I have stated, involved extensive and intensive observational work, it could not be accommodated within the existing phase structure of the training programme, I secured agreement from both the course leaders and my sample group that the course would be extended by one day..

7.3.2 Student Briefing / Documentation

At the start of their course, students received a briefing back containing information about the football stadium, the teams, their supporters, etc. This included an operations order for the football match. This briefing pack cannot form an appendix to the present thesis as it contains details on police strategy, tactics and emergency procedures, this information is classified. However, it is acceptable to say that the order was created by combining the information found in Metropolitan Police 'real world' operations orders, with additional

information included about a fictitious stadium called Sandford United. The National Course was designed around a fictional town and extensive work had already been done by the Home Office Central Training Unit (CPTU) to ensure its systemic fidelity. Also available from CPTU, was supporting information about the town, its population, as well as local intelligence about the football stadium and the local town centre. With permission from CPTU, this information was also utilised and included in the briefing packs.

7.3.3 The Systems MicroWorld

In addition to the briefing packs the MicroWorld environment representing the football control room, was equipped with wall maps and white boards marked out with police and other resource deployments. The support material in this environment created a high "environmental reliability" in Binstead's terms, as only resources and decision support materials likely to be found in a real football control room were included in the MicroWorld. The following picture depicts the football control MicroWorld as it was constructed in the simulation system.

Silver Command MicroWorld

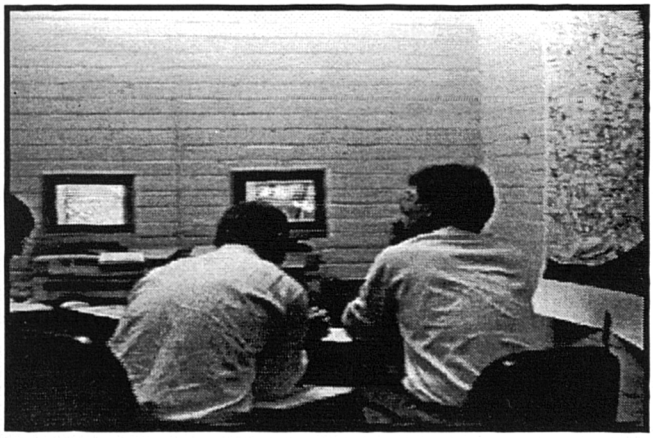


Fig. 7.2

Also included in the individual packs were detailed maps of the stadium and it surrounding area. Again this was consistent with

what ground commanders would expect to have sight of during a match and so they added to a high 'procedural reliability'

7.4 The Overall Simulation Structure Underpinning the Educational Design

The simulation structure used to underpin the educational design is based on Lewin's (1951), model of "experiential learning", described in detail in chapter 4 and shown below for clarity (fig. 7.3.)

Lewin's Model of Experiential Learning

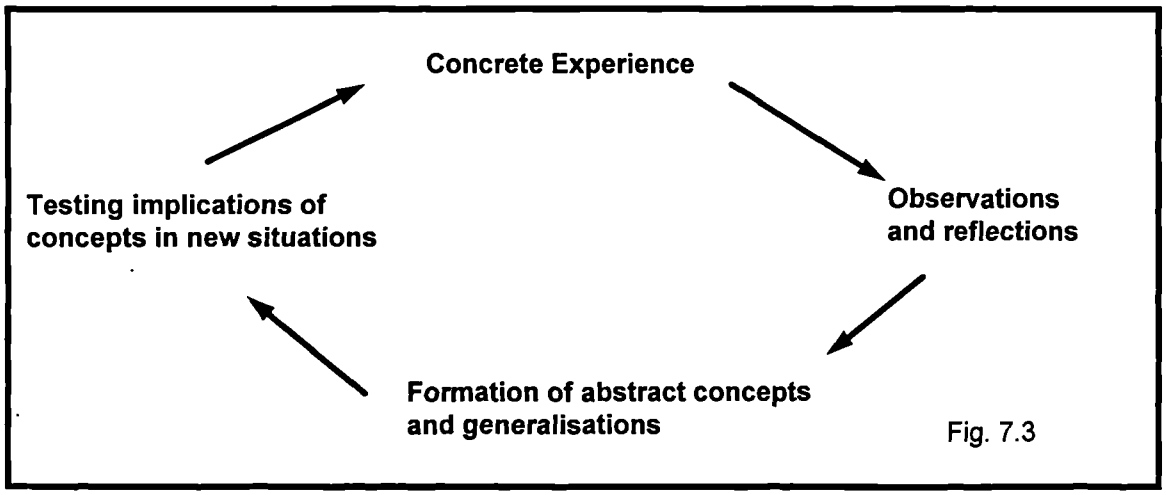


Fig. 7.3

To remind the reader, Lewin's model suggests, that the simulation begins with the "here and now" experience (Kolb 1984), followed by collection of data by learners and then observations about that experience. The next stage in Lewin's model suggests theories based on these observations are compared with previous experiences held in autobiographical memory. The third stage is for the participants to take the theories and generalised concepts and to test their implications in new situations. This leads to new concrete experiences and so the cycle is repeated. Indeed, a main aim of the simulation was to portray the underlying Lewinian model in the hope that it would help participants develop an appropriate model for

themselves of such situations. In many senses systemic testing itself is a form of Lewinian experiential learning cycle.

Participants would not just come to the simulation system with a 'tabula rasa', but would instead bring with them all their experiences from previous events in their operational world. It would therefore be important for them to link experiences gained whilst immersed within the simulation with their existing stock of experiences and knowledge and this linking process demanded a high degree of fidelity between the simulated event and its real world counterpart. The reflective review of personal and group performance requires participants to be aware of what was expected from them from the outset of the simulation (Pearson, Smith 1981). Therefore the participants would require a full and thorough briefing before the exercise is started. This is dealt with in the next section.

7.5 Briefing Phases

It was decided to split the briefing phase into two discrete elements. The first phase would be a direct briefing on the exercise itself. It would follow the traditional briefing protocol used within the organisation at real football events. This briefing included information on deployment of police resources, contingency and emergency plans and some last minute intelligence information on the supporters (both visiting and 'home'), as well as local information which may have implications on the management of the match. The briefing officer used to present this information was a 'seasoned' and respected match commander, an officer well known within the organisation. To assist with this briefing an information sheet was developed for that officer and a copy of this sheet can be found at appendix 5. Furthermore, as it was the intention to video all the sessions for data gathering purposes, the briefing also gave the participants an opportunity to object if they did not wish to be video'd.

In the second phase of briefing, care was taken to explain to the participants how the simulation system operated and what they could expect to see on their computer monitors and hear through their audio and radio communication systems. There was also an explanation concerning the design philosophy of the whole exercise and what was expected from the officers driving it.

7.6 Experimental Trial Set 1: Observation of Original Prototype

7.6.1 Objective

The objectives of this experiment were

1. To observe the general command and control interactions between the MicroWorld representations of various command layers associated to the management of a football event.
2. To test the overall educational design of the simulation exercise.
3. To measure the relationship between information provided through the MicroWorld display and the behavioural responses of the participants, both within a MicroWorld and inter-MicroWorld responses.
4. To determine major problems with the system, the educational protocols and any significant trends.

7.6.2 Sample Criteria

As with the sample set utilised for earlier experiments, the sample for these trials comprised those officers already enrolled for the National Sporting Events Course, run at the School of Management, Metropolitan Police, London. Consequently, the subjects matched exactly the target group for whom the simulation had been designed. All officers on the course, had been nominated by their Area Commander as requiring training in command and control

management of sporting events. The groups attending the first three trials comprised thirty six officers all of the rank of Chief Inspector and six were asked to volunteer to be observed for each of the first three sets of trials.

7.6.3 Detailed Methodology for First Trial

The groups of six officers were split into three sub-groups of two officers. Each sub group was respectively assigned to a command role, Bronze Inside; Bronze Outside; and Silver Command.

A particular exercise was developed for testing purposes that dealt with events and command problems occurring before a football match begins, such as the ingress of fans into the stadium, the segregation of home and away supporters etc. These events and associated incidents were taken directly from objectives detailed in the national course documentation.

For each event, incidents were designed that would involve one or more of the developed MicroWorld environments. At the start of any event all the participants would be shown background video to assist with immersing them into the event. This video was developed to provide the necessary back-drop against which 'trigger' and 'supporting trigger information' could be presented. These are the triggers which officers must learn to recognise clearly.

The educational design of the first exercise incorporates alternative incidents to be 'fired' in response to participant reaction. By this approach the exercise controller needs to fire the appropriate "following incident". The decision as to which incident to fire from the environment control database, in response to participant's reactions, is coded into the design of the exercise and this is illustrated in the following diagram (fig. 7.4). The controller listens to the responses from the participants and selects the appropriate follow-on incident.

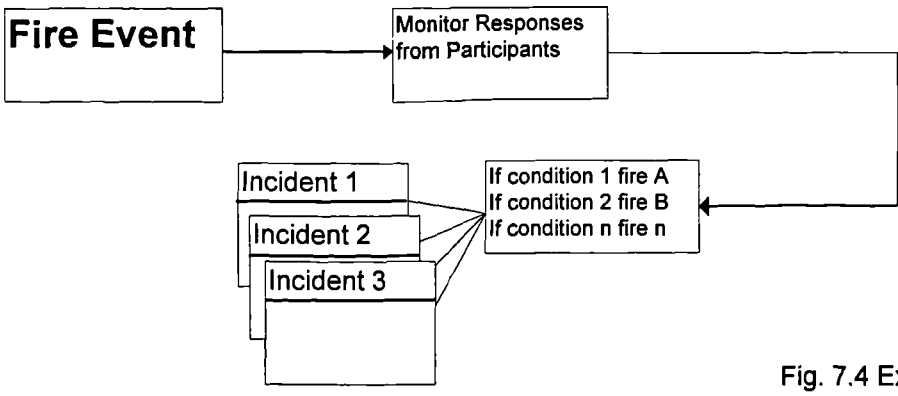


Fig. 7.4 Exercise Controller Decision Tree

By way of an example; the initial event fired may be a video sequence showing a build up of supporters queuing at the turnstiles to gain entrance to the ground. The Exercise Controller would monitor the response from the participants after the event had been fired. A typical response could be a request from the ground commander for a report from the Stewards controlling the turnstiles. In this case an appropriate following incident may be a video clip showing the steward reporting a situation update to the commander.

A possible outcome of firing an incident could be a 'nil response'. The educational design of the exercise had to consider this possibility and therefore follow-on incidents were generated which could be fired in such circumstances. The 'nil response' eventuality has been explored in chapter 5, where an incident was incorporated into the sequencing experiment that would provide a 'Situational Awareness' to a commander through his or her MicroWorld, as a direct trigger. This additional incident would be fired if the commander receiving the original trigger had failed to respond to the incident trigger.

7.6.4 Observations and Interviews

In order to record my observations of actual behaviour and to enable me to ascertain the reasons for it and its associated participant

attitudes, three research methods were employed enabling a triangulation of findings These were:

A. Direct observations of whole systems in use.

These were made using video cameras, by the video-taping of all participants at each command layer MicroWorld location. These observations were analysed after the simulated event, using a purpose built video data capture and analysis program, as described in the previous chapter. The behaviours observed and recorded were; for how long and when the participants:

1. communicated on the radio system

   This was felt to be the most direct way of ascertaining *their* thinking and analysing their decisions

2. looked at the computer monitor

   This would give some idea as to the value and relevance (in terms of information) they gave to the video material

3. looked at their support documentation

   This would give an indication of the value and relevance of the material in providing context and decision support information

4. entered into discussions with each other

   This would be valuable in examining the interaction between the participants.

These behaviours form the initial behaviour codes referred to throughout this experiment.

B. Open ended questionnaires:

Open ended questionnaires were to be completed at the end of the simulation day. The purpose of these questionnaire was to allow the participants to record, in their own words, their immediate feelings about the exercise. The questionnaire was not created specifically for this experiment but one which had regularly been used in evaluating management courses. This gave me a useful comparison with previous courses. It contained free text questions, that would, help me in interpret the findings of the present research. See appendix 6.

I chose this 'free-text' format as a methodology which would prevent any overlay of my own ideas and values on those of the respondents, by structuring their responses. Such an open ended structure would allow respondents to state their own thoughts and feelings on their simulation experience.

C. Semi Structured interviews.

The purpose of these interviews was to determine, a short time after the simulation experience, (typically one week), personal perceptions of the training experience. It also enabled me to explore any modifications that participants felt would prove beneficial

The findings from the these methods of observation, would form a triangulation of methods research methodology which in itself would enhance validity and reliability of resultant findings. In particular the semi-structured interviews were chosen to clarify and provide some corroborative evidence in support of the observations made of the participants and findings drawn from the questionnaires and thus assisted in the classification of the variables to be measured during this experiment. The classification is shown below, (fig. 7.5).

Method / ***Variable***	Video Taped Observation	Semi Structured Interviews	Questionnaire
Sequencing of events and incidents	Comparison of response within a single MicroWorld and also inter-MicroWorld	Analysis of personal perceptions from transcripts looking specifically for comments associated to workload	Content and textual analysis of responses
Interaction	Observation of discussion between officers in a specific MicroWorld and observation of communication between MicroWorld s	Analysis of personal perception from transcripts looking specifically for comments associated to 'Situational Awareness'	Content and textual analysis of responses
Immersion (as defined in the section dealing with background context video)	Analysis of time spent looking at either the computer monitor or the accompanying documentation, active discussion with colleagues and time spent communicating to other command layers.	Analysis of personal perception of simulation experience looking specifically for comments associated to involvement in the exercise	Content and textual analysis of responses
			Fig. 7.5

7.6.5 Experimental Exercise and General Observations

The first trial exercise consisted of a number of session 1 events, i.e., pre-match scenarios shown in summary below. The scenario scripts for these trials can be found at appendix 7. The students were given a thorough briefing by the briefing officer, before being shown into the partitioned simulation areas that contained the MicroWorld representation of the three command positions. A video camera was situated in each area. A layout plan is shown in the following diagram. (fig. 7.6)

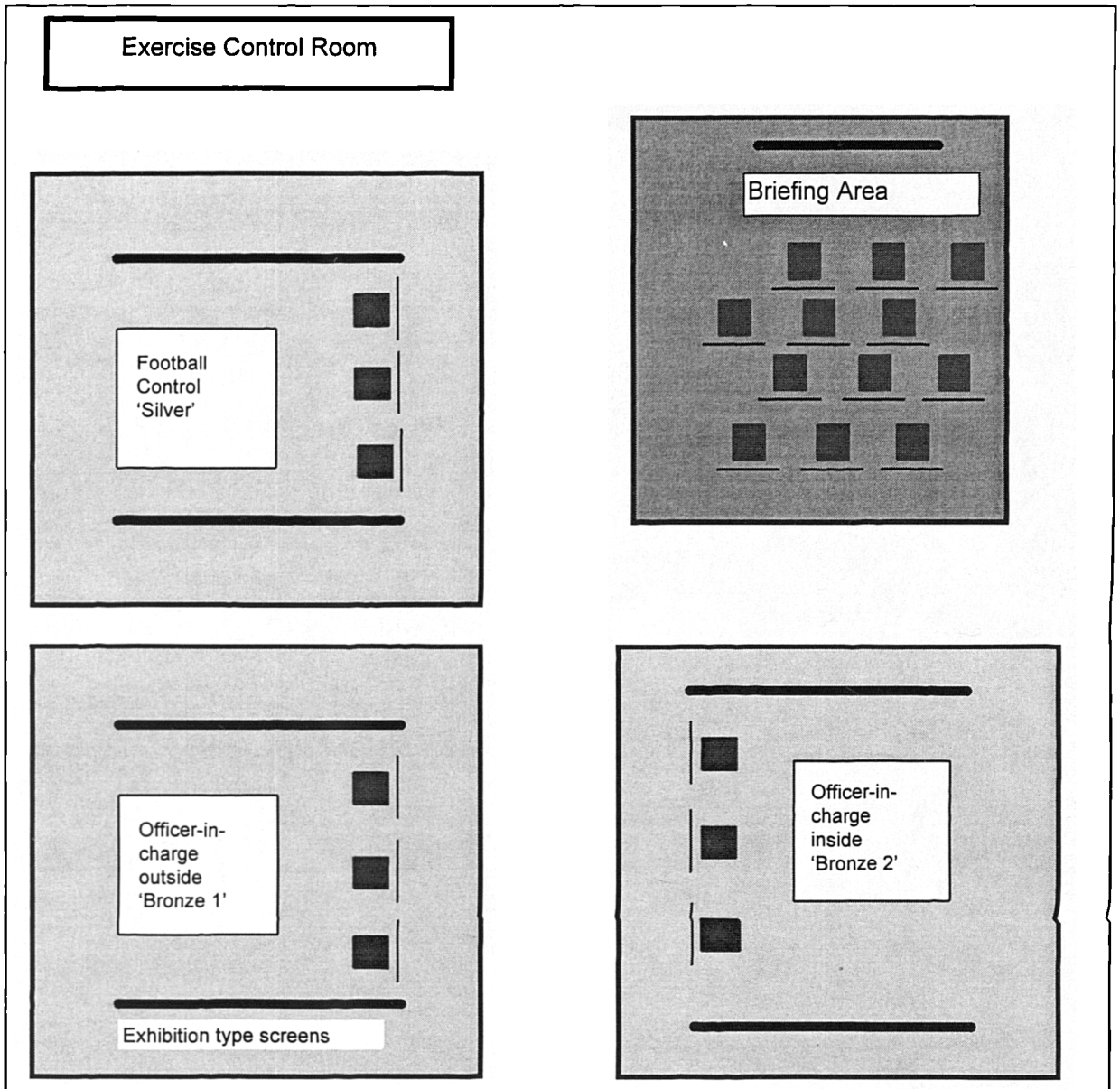


Fig. 7.6 Plan showing Layout of Simulation Environment

The following table contains the events and the subsequent incidents included in the exercise. (fig. 7.7)

[E.1] Coach loads of supporters have been dropped off early in the City Centre [I.1] [MT:13:00]	[E.2] Commander to be aware of Turnstiles [I.1] [MT:13:20] Bronze 1 reminds Match Commander that turnstiles open in 10 minutes	[E.3] BTP report special train arriving at 1340 [I.1] [MT:13:25] BTP telephones to tell Match Commander that a football special is arriving at 1340 with 250 supporters on board
[E.4] Large crowds building at the turnstiles [I.1] [MT:14:25] Radio message from Serial Inspector to Control that crowds are building up and he is going to investigate	[E.5] Fans with forged tickets [I.1] [MT:14:35] Bronze 1 sees video of fans arguing over a seat, followed by text explanation	[E.6] 200 fans want to move to other side of ground [I.1] [MT:14:58] Bronze 1 gets text message that 200 fans are in the wrong terrace, and want to move. He should check with Gold
[E.7] close down workstations		Fig. 7.7 **Events in Exercise**

Looking at the first event; "Coach Loads Of Supporters Have Been Dropped Off In The City Centre". This event was designed to explore the pre-match problems associated with supporters congregating at the city-centre prior to the football match. The coaches are designated to a car park close to the ground, to allow for the ingress of supporters with the minimum amount of disturbance at the city centre. The event starts with coaches that have dropped off supporters in the wrong places and this causes difficulties for, initially the Bronze-Outside and Silver commanders and then, subsequently for the Bronze-Inside commander.

7.6.6 Data Collection and Results

The video data capture traces for this series of observations are found at appendix 7. A transcript from the semi-structured interview with a Silver Commander can be found at appendix 8.

The first trial was run with three groups of students from three separate courses. A full table of comparison is shown below comparing each of the trial group findings.

For completeness and to remind the readers of the observation protocols, I have repeated here the behaviour classifications developed in chapter 5 below: The earlier discussions indicated the importance of recording the following 4 variables.

1. ***The length of time the subjects were engaged in communication through the simulated radio system***
2. ***The length of time the subjects looked at the screen***
3. ***The length of time the subjects spent looking at their notes.***
4. ***The length of time the subject discussed the situation between themselves.***

These behaviours were coded in the following way and are referred to throughout this experiment as the *initial behaviour codes*: (fig. 7.7)

Behaviour code	
1	**Comms** (The length of time the subjects were engaged in communication through the simulated radio system)
2	**Screen** (the length of time the subjects looked at the screens)
3	**Notes** (The length of time the subjects spent looking at their notes)
4	**Discuss** (The length of time the subject discussed the situation between themselves)
	Fig. 7.8 Initial Behaviour Codes

Behaviour combinations were coded in relation to the 'initial behaviour codes' and an additional code (9) 'none' was added, shown in the table below (fig. 7.9)

Code Number	Combination of initial behaviour codes
5	Number Code 1 and Number Code 2
6	Number Code 2 and Number Code 4
7	1 Number Code and Number Code 3
8	3 Number Code and Number Code 4
9	None
10	1 Number Code and 2 Number Code and Number Code 4
11	1 Number Code and Number Code 3 and Number Code 4

Fig. 7.9. Combination Behaviour Codes

7.6.7 Set 1 Data

Data from trial set 1 was analysed as a percentage of the total time for the exercise which was 27 minutes, (1625 seconds). (fig. 7.10)

										Behaviour codes	
	1	2	3	4	5	6	7	8	9	10	11
Trial 1											
Silver	14	71	15	21	11	14	1	3	19	1	0
B-Inside	6	69	9	30	4	23	0	3	25	0	0
B-Outside	8	62	18	28	6	15	1	5	23	1	0
Trial 2											
Silver	18	72	17	26	19	20	6	8	25	4	5
B-Inside	14	74	12	35	10	28	5	11	31	5	6
B-Outside	12	67	24	36	10	17	9	9	29	9	3
Trial 3											
Silver	17	73	18	24	15	16	4	7	21	3	1
B-Inside	10	72	10	34	7	26	3	7	27	4	3
B-Outside	9	64	20	32	8	16	5	7	27	5	1

Fig. 7.10

7.6.8 The need to Combine Initial Behaviour Codes

when the results from the four *initial* behaviours are added together, the total is greater than 100%. (Silver 121 %, Bronze Inside 114 %

and Bronze Outside 116 % For Trial 1). This suggests that some of the behaviours occurred simultaneously.

The relationships between these behaviours warrants further investigation. Combining behaviour codes and analysing their relationships gave more meaning to their values. Some behaviours would be mutually exclusive, such as looking at the MicroWorld display monitor (screen, code 2) *and* reading the supporting documentation (notes, code 3). The next section describes these relationships.

7.6.9 Behaviour Relationships

The possible two-way relationships were:

- Watch screen and discuss with colleague.

  This would give a good indication that the participants had recognised trigger information from the MicroWorld display screen and from it interpreted, through discussion, the size and nature of the problem to be resolved.

- Watch screen and communicate on the radio system.

  This would give a good indication that the participant had recognised from trigger information the need to share a 'Situational Awareness' of that problem with colleagues.

- Read notes and discuss with colleague.

  This suggests use by the participant of *supportive information* which provided background and additional information of procedures, resources and other related data.

- Read notes and communicate on the radio system.

This would give a good indication that the participant had recognised from the supportive information a need to share specific facts with colleague, either pro-actively or re-actively.

- Watch screen and communicate on the radio system and discuss with colleague

  This was seen as a valuable measure as this combination would give a good indication of immersion. As it would indicate when the commander was consulting with his or her support officer in the process of decision making.

- Read notes and communicate on the radio system and discuss with colleague.

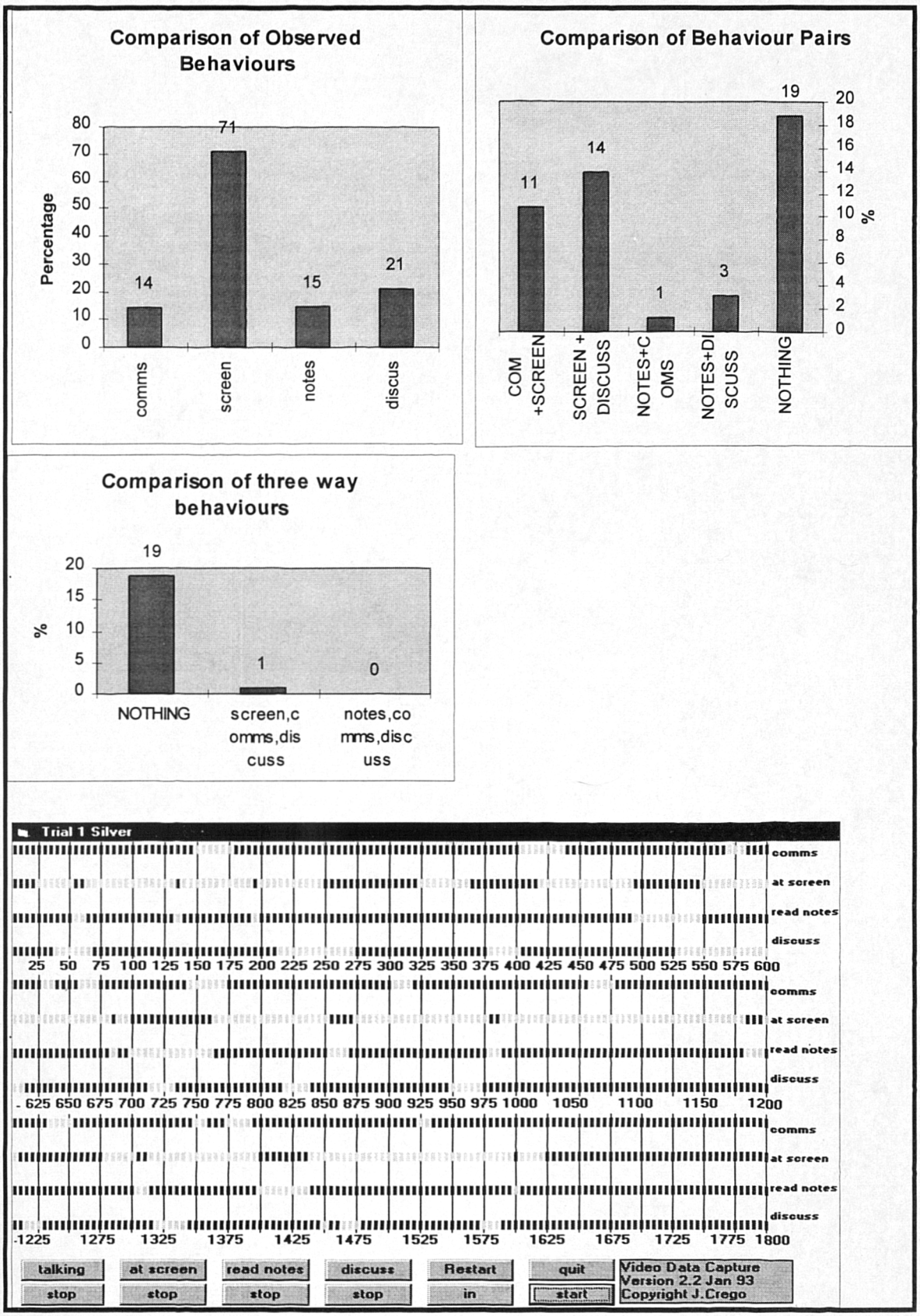
  This would be a useful measure of when the commander was consulting with his or her support officer and, as reading notes or watching the screen were mutually exclusive tasks, would also identify consultation times when the commander was not looking at the computer monitor.

7.6.10 Graphical Representations of Findings

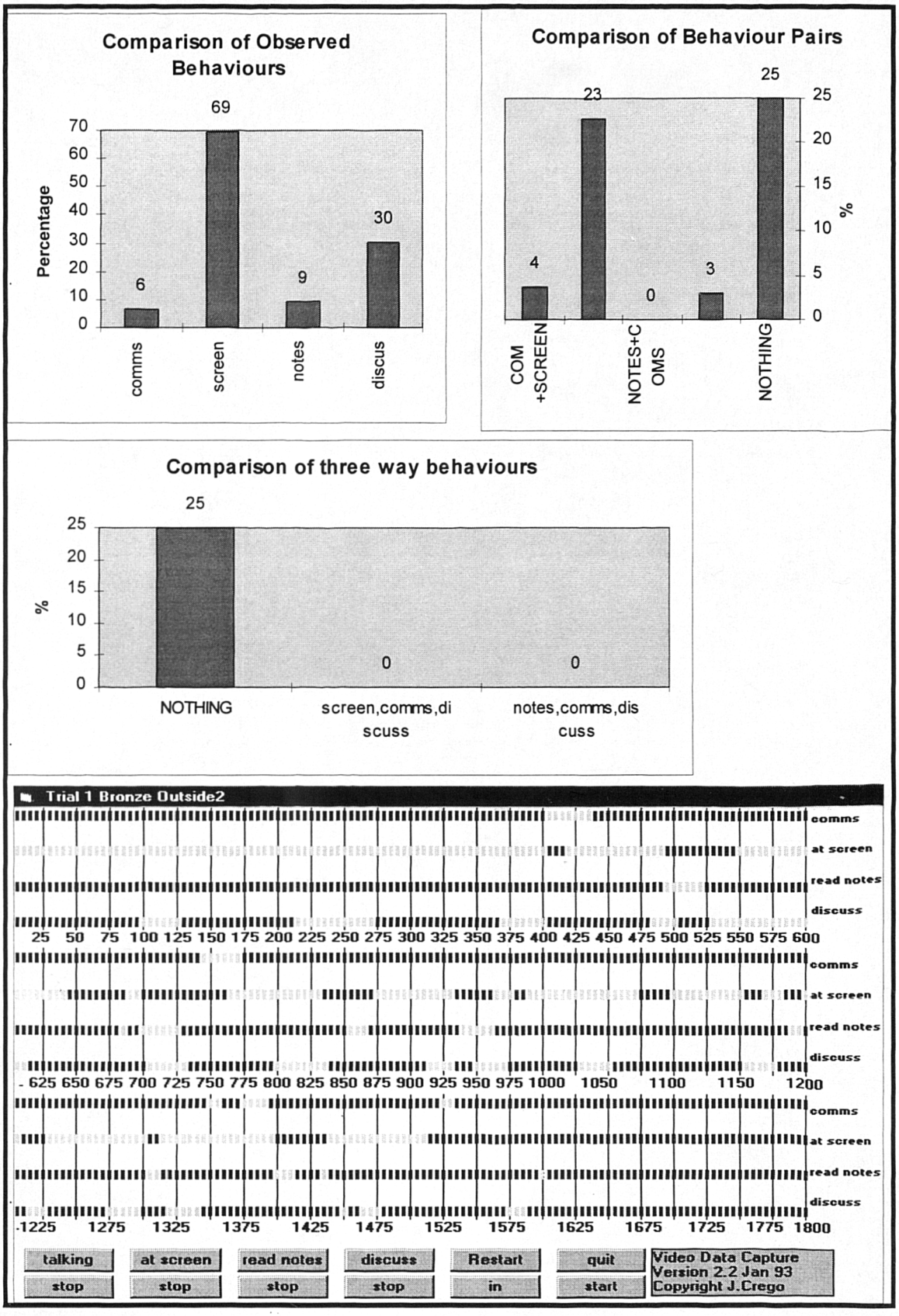
The following three pages are a graphical representation of the data found from trial 1, which represented a typical set of data .

All the charts all follow the same protocol. The graph in the upper left hand corner of the page compares the four initial behaviours observed during the trials. The top right hand graph compares four behaviour pairs, and the percentage of the time that none of the initial behaviours were observed. The graph in the centre of the page compares the three way behaviours defined above. Finally the bottom graphic is a reproduction of the video capture plot generated by the video data capture program, whose function was described in an earlier chapter.

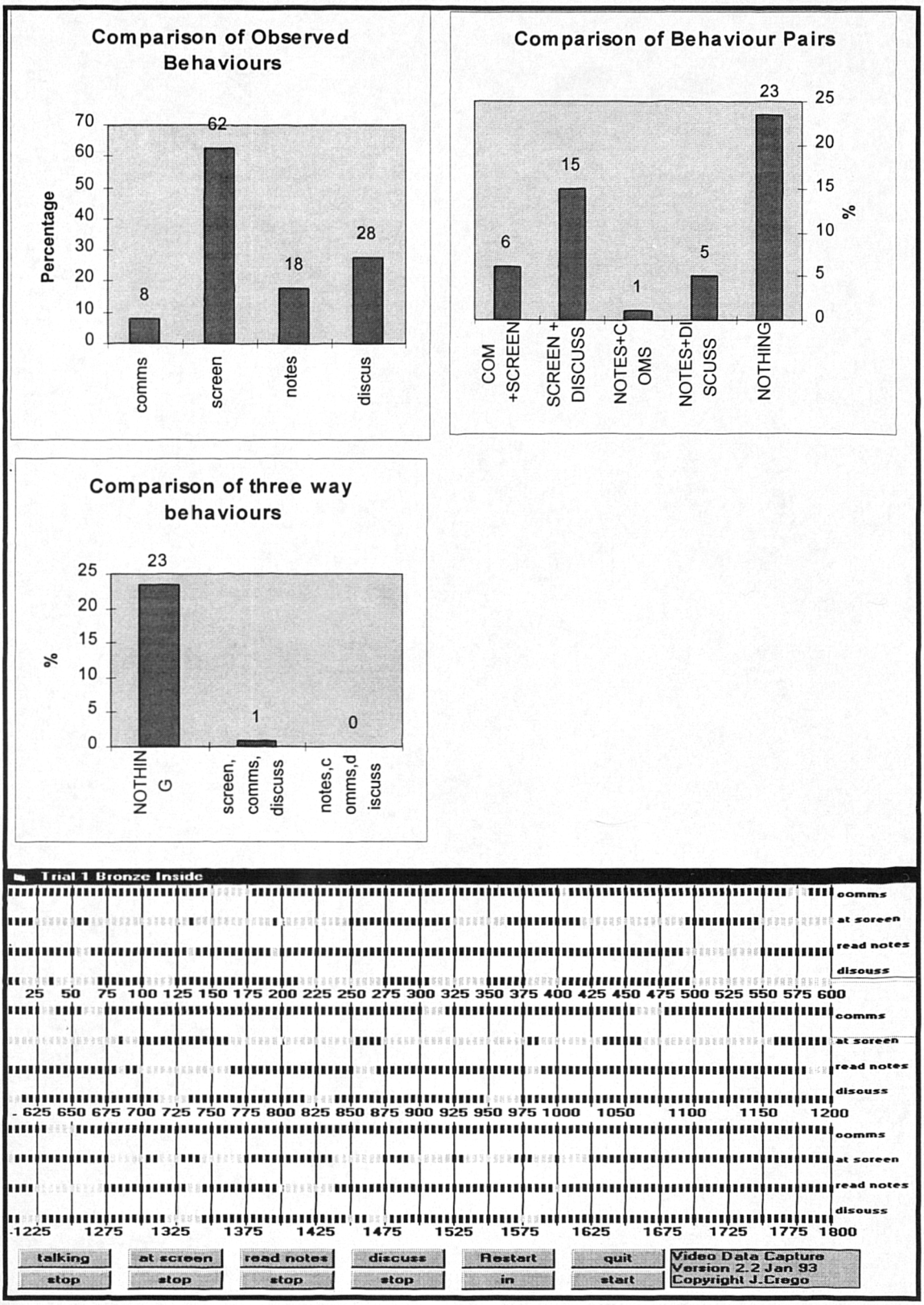
7.6.11 Fig 7.11 Silver Command



7.6.12 Fig 7.12 Bronze Outside



7.6.13 Fig. 7.13 Bronze Inside



7.7 Analysis of Findings and Discussion

7.7.1 Participant Communication

Looking at the previous studies it is interesting to compare the amount of time the commanders spent communicating with each other. All commanders were located in sound proofed rooms where, after the initial briefing, the only way they could update their 'Situational Awareness' of the overall event was to communicate with their command team using the normal communications channels built into the system. In spite of this being the only way of keeping themselves aware, the Bronze commanders collectively spent only 14% of the time communicating. (which equates to only 3.9 minutes)

Indeed Silver also spent only 14% of his time communicating. This corroborates the Bronze's score as all Bronze communication were directed at Silver command, as is the correct command and control radio protocol. Two possibilities would support this finding. Either the messages being transmitted around the group were extremely concise, i.e., the time taken for the transmission of important information was small, or some other explanation was needed. Looking back to my observations made in the real world of policing football, I observed that not only were the police commanders communicating for a significant amount of time, but also the radio transmissions were reasonably verbose. On analysis of police recorded radio transmissions, recorded for evidential purposes at three football stadium, I noted that no message lasted for less that twenty seconds (ignoring simple acknowledgements). It was much more likely that the reason for such a low observation of communication within the simulation for both the Silver commander and the Bronzes, was that they were missing the triggers contained within the incidents.

In reality commanders were not transmitting short messages, they were transmitting messages very infrequently. This was in stark contrast to my observations at real events. Reviewing the video tapes, it was clear that the officers were again missing most triggers completely. This finding is also supported by the number of 'non response' follow-up incidents that had to be fired by the Exercise Controller in accordance with the non-response formula described in chapter 6.

This finding contradicted the results of my previous experiments, where triggers were presented to the participants and they responded within a small time. (approximately 30 seconds from a significant video trigger).

Referring back to the observations made on the Vistrain simulation, where each trigger was presented as a separate incident requiring response, outside an overall systemic context, participants could not help but recognise triggers to which their attention had been called. During my observation of a Vistrain exercise I witnessed the training director shouting "another one's coming!" into the training room, prior to the presentation of a new incident. This meant that in nearly all

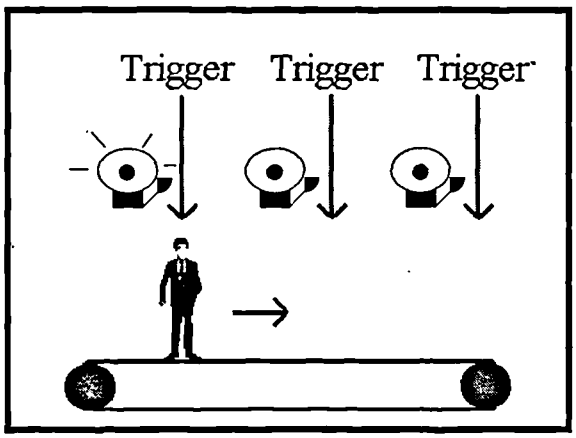


Fig.. 7.14 Incident Triggers as presented by the Vistrain System

circumstances, the participants responded immediately because they had been cued to do so. This concept can be explained better by the diagram above (fig. 7.14)

The diagram shows a participant on a conveyor belt slowly passing single incident triggers over time. Before he or she reaches a single trigger a bell sounds and the participant is then able to focus on the trigger. From my observations of a real event and within my more life-like simulation, triggers were normally missed because participants did not recognise them as such. It was my belief that missed triggers and cues were a direct consequence of the necessarily subtle nature of such triggers- a necessity borne out of a desire to sustain high 'process' and 'content' reliability. The problem of subtle triggers and cues is compounded by the complexity of the unfolding event with its inherent 'noise' in the form of competing messages distractions and signals.

This observation was consistent with observations made during the management of real football events, where commanders similarly did not always recognise the unfolding incidents. Within the complexity of such a real event pattern recognition is not as simple as that faced within a single trigger environment, such as Vistrain or table-top, in which problems and their associated triggers are serial.

7.7.2 Comparison of Behaviours

By comparing all the behaviour combinations I was able to calculate the percentage of the experiment time participants were not involved in any of the behaviours under investigation.

The calculated times for the participants were:

Silver 19 %

Bronze Inside 25 %

Bronze Outside 23 %

The findings were extremely interesting with regard to the first experimental objective concerning the sequencing of events. From the

observations two issues emerge. The first relates to the timing of triggers and the second to the activities these triggers generate from the participants. Command and control is often anecdotally referred to as:

> "long periods of boredom, interrupted by short moments of sheer terror"
>
> (Supt. M Barker during Briefing at Arsenal Football Stadium 1993).

Therefore it is credible in terms of process and environmental reliability to have periods during the simulated exercise in which participants may have little to do. However, these quiet periods must form part of the design and therefore be incorporated into the educational structure of the exercise. This is achieved through the sequencing of incidents within the unfolding event.

While it is clearly necessary to simulate the boring or low activity of actual events, the simulation was also trying to provide an accelerated experiment. In this context many vital triggers were presented in a shorter time, while recognising the need to properly contextualise them. The behaviour observations to be made on the influence of the triggers would clearly give a strong indication of the 'no response' relationships. However, it was only through the semi structured interviews that I came to better understand the mechanism of response.

7.7.3 Semi Structured Interviews in Relation to Sequencing

Analysing the semi structured interview transcripts was a long, but extremely productive process. Below is a transcript fragment, depicting their semi structured style.

Interviewer

What did you think of the video information on the monitors?

Interviewee

Well, this was good when it was interesting. Most of the time it was just like boring going over the same thing all the time. I suppose it is difficult getting the right material and you have just begun. Look this is not a criticism but well I didn't really think it helped showing the same thing all the time, better to just wait to you had something interesting. Do you have lots of stuff?

(Taken from Trial 1 Interview 1 shown in detail in appendix 8)

Such responses were consistent with the comments made to me by all the participants after the trial. I concluded from this that the video as presented in this pilot study, needed more careful selection, if it was to hold the attention of the officers and provide a credible situational back-drop for the incident triggers.

In order to triangulate these findings the answers given to the questionnaire were also examined. These open questionnaires were given to all the participants directly after each trial, and again after training exercises on the modified system.

Looking at the questionnaire, typical responses were:

"unreal - briefing and planning might help"

"long pauses of action - needs continuity of incident, unreal"

"incomplete video system"

"the repeats" (here the participant is referring to the video loops)

"lack of scenario development"

"lack of realistic video"

To remind readers, this background video was that used throughout the award winning Vistrain simulation. It consisted of six video loops each of two or three minutes duration, repeated many times throughout the simulation setting.

In addition, letters were sent by the football subject matter expert observers who were present at the trial (appendix 9). A typical extract in relation to the background video material is shown below:

> "Again a disappointment. To see repeatedly the same pictures is unprofessional. If the intention is to "police" a match for 2-3 hours there has to be consistent, up-to-date pictures - not showing a few scenes over and over.

This observation was extremely significant and clearly indicated the need to undertake a major review of the background video and its influence on incident development, immersion and levels of participant engagement.

Looking at the responses from the questionnaires, a number of issues became evident that required addressing within the systemic testing cycle. These issues included the presentation and sequencing of the background video and the briefing session prior to the simulation.

7.7.4 Participant Interaction Locally and Globally

The findings also clearly support the notion that Silver's MicroWorld had significantly more activity than the other two command layers.

The Silver's 'nil' finding was only 19% as compared with 25% and 23% for both the other MicroWorlds.

This also reflects reality since Silver command co-ordinates the activities of the Bronze command layers. Clearly this aspect of the educational design of the simulation was working well and in-line with that occurring in real events.

Participant officers in the exercise also spent a significant amount of the time in discussion inside their MicroWorld environment (Silver 21%, Bronze Inside 30%, Outside 28%). The most frequent combinations of activities were watching the screen whilst discussing amongst themselves; Silver command 14%; Bronze Inside 15% and Outside 23%. Following analysis, these findings suggested that participants within a command MicroWorld were truly interacting as part of their command processes.

However, on closer inspection of the 'three way behaviours' this view is not supported. The combined behaviours of discussion, communication, and watching the screen, were observed only 1% of the time. This is not difficult to reconcile, as participants clearly missed a great many incident triggers. They therefore had little "Situational Awareness" of the emerging problems. For this reason these discussions were categorised as 'un-specified chatter'.

7.8 Conclusions From First Trial Set (1-3).

Several conclusions were derived from the first trial set.

1. The pilot simulation did *seem* to produce the same sort of pressures occurring in real events. (This initial intuitive feeling is subsequently afforded credibility from the findings from a series of heart rate monitor experiments described in detail in chapter 9)

2. When officers recognised incident triggers the communication interactions were similar to those I had observed at real events

3. When the incident triggers were recognised, the information passed between the command team was accurate and contained sufficient detail to promote a "Situational Awareness" between the team members.

4. The briefing needed more structure so that participants were more aware of what was expected from them and what they could expect from the simulation system.

5. The sequencing of events would have to be modified so as to involve all the command layers more equally.

6. The video sequences had to create a more relevant situational back-drop.

7. There was a significant "decision lag" observed during the trials. This had to be corrected and I felt one way to do this might be the inclusion of a decision timer on the screen.

In addition, I also felt that some modifications would be needed to enhance the general running of the system. For instance, in prototype 1, it was not possible to review the radio transmissions after each exercise. To provide such functionality it would be necessary to incorporate an audio-digitising computer into the system. Such a function should have the capability of recording any audio associated with radio 'traffic' generated by the participants. By digitising audio and recording it onto the computer's hard disk, it could be replayed from any point at a later time.

I also felt it important to include a 'scoring' system on the environment control interface so that during an exercise, a note could be made of the performance of the participants. This note could then

be used in the de-brief to prompt the de-brief facilitator of relevant incidents worthy of discussion.

These modifications are explored in some detail in the next section.

7.9 System Modifications

7.9.1 Event Sequencing

Referring to the data table associated to trials 1-3 (6.9.2), the Bronze Commanders were communicating for less than 9.8 % of the time over the three trials. This seemed to be due to the commanders failing to recognise 'incident trigger information', and also to the actual sequencing problems within the exercise design.

Two approaches were attempted in order to resolve this, these were:

Video Loop Modification

Due to the limitations of storage capacity of the video disks, only short video loops could be generated to serve as the "situational back-drop video" if this were to be the storage medium. It was clear from the questionnaires and the semi-structured interviews that such repetitive video loops were not providing a proper context. This was because the participants were quickly able to recognise the video sequences as loops and thus discount their importance. This had the effect of lowering the attention, vigilance and concentration of the officers towards the background context video, and led them to miss important information contained within incident triggers when they were fired and displayed on the MicroWorld screens.

To address this problem, all video loops were broken down into much smaller lengths, from 30 to 90 seconds in duration. This provided for a much greater number of available loops. By 'shuffling' these loop sequences to the participants, the hope

was that they (the participants) would find it more difficult to recognise the video as a background context sequence and therefore would increase their vigilance and concentration.

Video Content

Unfortunately, there was little that could be done at this stage of the research to enhance the actual video content of the material given by the Scottish Police College, especially as glass laser disks had been created and they were permanent recordings. It was beyond the resources of the project to re-shoot the video until I could prove to the Metropolitan Police Management School, the overarching validity of the simulator. However, I was able to provide more detailed information about the relationship between the video content and the stadium location. This was achieved by overlaying in a transparent video colour, a graphic image of the incident location. Fortunately this required no modification to the MicroWorld control software. By utilising a graphic image, instead of the 'Notepad' text overlay shown below, it was possible to supply additional contextualising information without obscuring the video as occurred when the 'Notepad' was displayed. The new approach also had the benefit of enabling the 'Notepad' and the graphic location to be displayed together on the screen. A screen shot is shown in the following diagram (fig. 7.15)

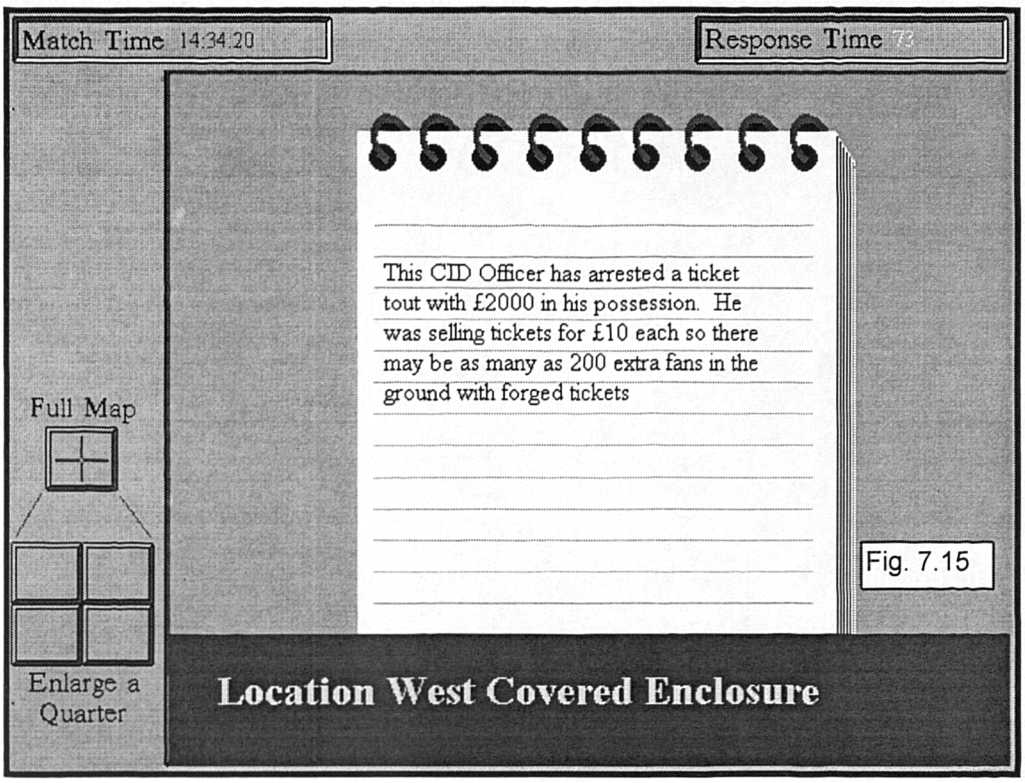


Fig. 7.15

In this diagram the coloured area behind the notepad graphic would be transparent to the video display.

7.9.2 Decision Count-Down Timer Modification

From my observations during trials 1-3, it was clear that the participants did respond to problems quickly. Following the theoretical discussion in chapter 3, the main difference between naturalistic and classical decision making theory is this important dimension of time. Decisions are made quickly apparently on the basis of fast acting thought rather than long time scale thinking. Such decision making reflects the naturalistic decision making model described earlier, rather than the classical approach.

To provide a proper critical time frame, it was felt necessary to include a decision count-down timer on the MicroWorld Display. This can be seen on the right hand top corner of the screen shot shown at fig. 7.15. Its starting value was included in the incident design template and the timer was reset at the start of

every incident fired. To avoid the 'ringing bell' phenomenon found in the Vistrain simulations, the decision count down timer was displayed on all MicroWorld views. By this approach, the timer did not signify the start of an incident to any particular commander, more that an incident was active at some location within the simulated environment. When an incident was fired the decision timer counted down in seconds from the value set for the incident. Participants were briefed on the purpose of the timer during the pre-simulation briefing and during the instruction they received in the MicroWorld environment before the experiment started.

7.9.3 Briefing

7.9.3.1 Discussion

The briefing sessions held before each trial exercise were split into two themes, Command and Simulation Design. It was clear from my observations and discussions with command officers participating in the first three trials that, prior to the exercise, they were anxious about the technology supporting the simulation. In particular how they would interact with the simulation and what was expected of them.

7.9.3.2 Briefing Modification

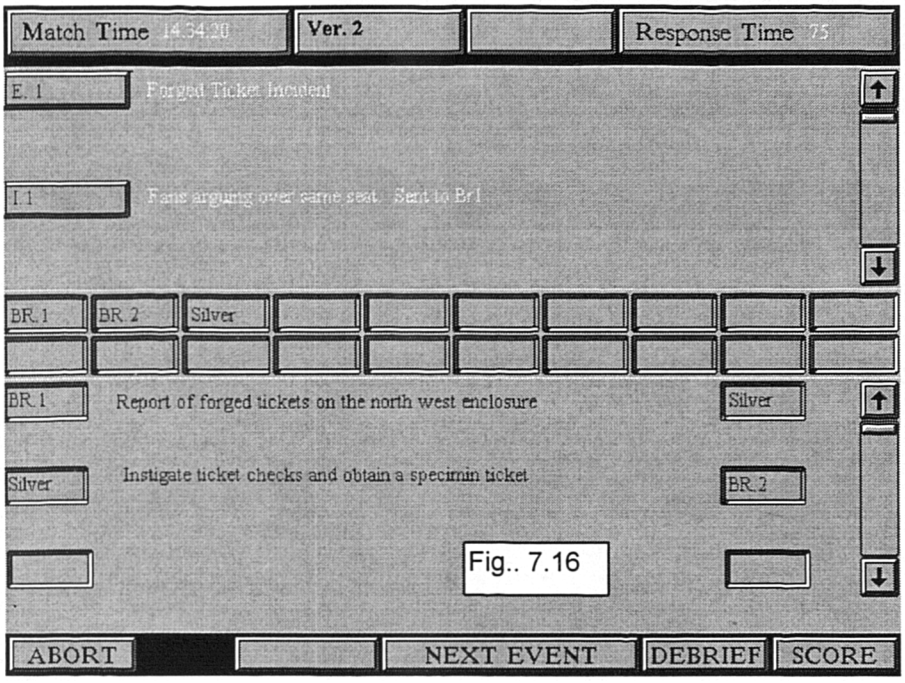
Consequently, it was felt that these anxieties could be better dealt with if officers were given a more intimate briefing in their MicroWorld environments. Here individual questions could be answered and reassurance given. This meant that the technical input at the briefing could be reduced.

The briefing was re-designed to concentrate more on strategic and tactical, command issues. In accordance with the now dominant command theme, the structure of the briefing would therefore now follow the organisational protocol used throughout the Metropolitan

Police Service for pre-match briefings. More attention was thus given to intelligence information about the fans, the local area and issues surrounding the event.

7.9.4 Environment Control Interface Modification

The environment control interface was modified to provide additional functionality and to provide the 'Exercise Controller' with more information whilst running an exercise. A screen shot appears below. (fig. 7.16)



During the firing of incidents it was observed that once the Exercise Controller had selected and fired an incident, he or she was not able to view all the available supplementary triggers. To rectify this problem additional functionality was written into the Environment Control Software to enable access to incident summary information available at all times

In an attempt to reduce "Decision Lag", the inclusion of a decision timer on the MicroWorld interface display, spawned the need to indicate the decision timer status at any time, on the Environment Control Screen display. The participants were told during briefing,

that the time value shown on the MicroWorld screen display interface was an indication of the expected time for decision making. It was observed from the trial exercises, that there was no indication of time pressure and so these modifications reflected this need. The value was indicated in the top right hand corner of the screen.

This modification required development of the environment control code and the MicroWorld display code.

Also included was a 'Score Button' which when pressed, provided the following overlay or pop-up (fig. 7.17) appearing on top of the environment control screen.



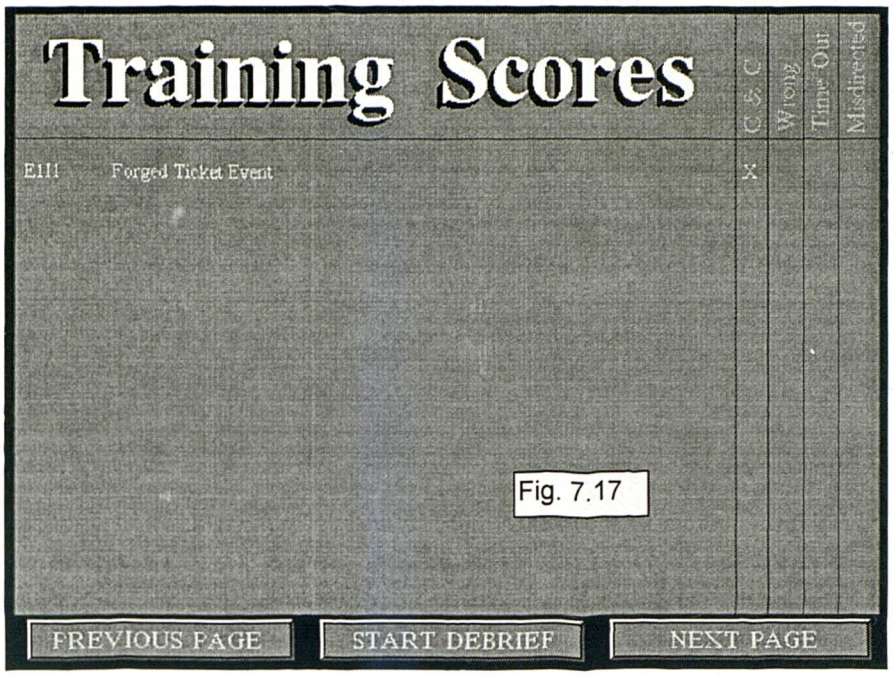
Fig. 7.16

This overlay allowed the controller who was a subject matter expert to select the most appropriate classification for the team performance by 'clicking' on the button that was the closest fit. The categories were:

1. Concise and Clear
2. Wrong
3. Ran out of time
4. Information directed to wrong command unit

A confirm button was pressed after a category was highlighted to complete the process.

This scoring system generated its own scoring screen. This screen was to be printed out after the exercise and become a record of how the exercise controller had viewed the performance from the participants for every incident fired and is shown below (fig. 7.17)



7.10 Experimental Trial Set 2 (4-6)

All the hardware modifications were completed in time for the next series of Major Sporting Events courses. The Management School at Hendon agreed to repeat the trial utilising the modifications to the hardware and exercise design.

In addition, enhanced paper support materials were provided to include more specific information about police support units and their pre-match deployments. During this next series of trials, the participants were instructed that they would be able to communicate directly with their police resources. To support the extra radio traffic that would generate, The services of a radio operator was enlisted for the exercise control room staff. His or her job would be to plot deployments on a map, as the commanders directed their resources. In addition, their role was to answer the radio communication directed at these police resources using the appropriate radio call sign.

7.10.1 Objective

The objectives of these trials were identical to trials 1-3:

7.10.2 Sample Criteria

The same sampling criteria was used.

7.10.3 Methodology

The same methodology for trial 1-3 was repeated in these trials.

7.11 Trial 4-6 Data

Trial 4-6 data is summarised in the following table. (fig. 7.19)

The table is divided into the three trials (4-6) represented in rows. The columns represent the observed behaviour codes which were defined earlier. (see trial 1-3). For each value the corresponding average value of earlier trials is given for reference.

7.11.1 Fig. 7.18 Trial 4-6 Data

Behaviour codes	1	AV.1-3	2	AV.1-3	3	AV.1-3	4	AV.1-3	5	AV.1-3	6	AV.1-3	7	AV.1-3	8	AV.1-3	9	AV.1-3	10	AV.1-3	11	AV.1-3
Trial 4																						
Silver	**18**	16	**50**	72	**30**	50	**30**	23	**8**	15	**14**	16	**4**	3	**7**	6	**11**	21	**1**	2	**0**	2
B-Inside	**57**	10	**75**	71	**33**	10	**37**	33	**38**	7	**27**	25	**17**	2	**6**	7	**4**	27	**13**	3	**2**	3
B-Outside	**24**	9	**64**	64	**26**	20	**30**	32	**14**	8	**19**	16	**3**	5	**6**	7	**11**	26	**2**	5	**0**	1
	1		**2**		**3**		**4**		**5**		**6**		**7**		**8**		**9**		**10**		**11**	
Trial 5																						
Silver	**21**	16	**53**	72	**33**	50	**31**	23	**12**	15	**15**	16	**8**	3	**8**	6	**15**	21	**3**	2	**3**	2
B-Inside	**61**	10	**78**	71	**36**	10	**38**	33	**41**	7	**30**	25	**20**	2	**8**	7	**7**	27	**14**	3	**4**	3
B-Outside	**25**	9	**68**	64	**28**	20	**34**	32	**16**	8	**23**	16	**4**	5	**7**	7	**12**	26	**6**	5	**1**	1
	1		**2**		**3**		**4**		**5**		**6**		**7**		**8**		**9**		**10**		**11**	
Trial 6																						
Silver	**20**	16	**53**	72	**34**	50	**32**	23	**15**	15	**19**	16	**9**	3	**11**	6	**18**	21	**5**	2	**6**	2
B-Inside	**62**	10	**80**	71	**39**	10	**42**	33	**43**	7	**32**	25	**23**	2	**11**	7	**10**	27	**16**	3	**7**	3
B-Outside	**29**	9	**69**	64	**30**	20	**35**	32	**20**	8	**26**	16	**6**	5	**10**	7	**13**	26	**7**	5	**3**	1

The key to the observation codes appears below.

Behaviour code number	Description
1	**Comms** The length of time the subjects were engaged in communication through the simulated radio system
2	**Screen** (the length of time the subjects looked at the screens)
3	**Notes** (The length of time the subjects spent looking at their notes)
4	**Discuss** (The length of time the subject discussed the situation between themselves)
	Initial Behaviour Codes

	Combination of initial behaviour codes
5	Number Code 1 and Number Code 2
6	Number Code 2 and Number Code 4
7	1 Number Code and Number Code 3
8	3 Number Code and Number Code 4
9	None
10	1 Number Code and 2 Number Code and Number Code 4
11	1 Number Code and Number Code 3 and Number Code 4
	Combination Behaviour Codes

The chart is laid out with the observation code for the trial printed first and in the next column the average value (AV) recorded for that behaviour, for example trials 1 to 3 (AV.1-3) is printed.

7.12 Discussion

7.12.1 Immersion

Looking at the findings I concluded that the modifications made had had a tremendous impact on the subsequent observed behaviours. All behaviour codes (except 9, nothing), showed a significant increase in this second set of trials. This data supports my observations that the participants were far more engaged in decision making and team based activities.

Taking trial 6 as typical, substantial increases were observed in all initial behaviours (codes 1-4). An example of this is that Bronze Inside increased the percentage of time on the radio from 10% in trial 3 to 62% an increase of more than six times. Bronze outside had also increased the time by over three times as long under the new system.

It is clear that the commanders were recognising far more incidents then before. However as in real events, they were still missing some key triggers.

This gave greater confidence that the simulation complexity was approaching that which I observed at football events. It also indicated the simulation's validity as a means of testing officer's ability to recognise more subtle triggers presented to them against this background of complexity.

This is supported in the following fragments of transcripts taken from interviews held with the participants after their experiences.

I want to talk about the video that you saw. Just talk me through how you thought about the media itself. Other than the fact that it was Scottish.

I think that the wonderful thing is the scenario, and really at the end of the day, it doesn't matter whether it is England, or Scotland or where-ever, you can set up any situation you want, whether it be bomb threat, whether it be crowds rioting, whether it be a fatal accident, we have a scenario of an accident so that the coach is coming in while a traffic jam and should we delay the match, etc. etc. I think the great thing is that you can look at history, Hillsborough, Bradford and everything else, and you can make from that any scenario that you want quite honestly. And I think the scenarios were excellent, as I previously stated my only criticism was that as Bronze One at the time, and I think he must have been mentally exhausted, at the end of it, but he was doing all the work and just when you were going on to the bronze 2 the

time had elapsed and we stopped. And I was literally sitting on the edge of my chair on tenterhooks thinking I want to get into this. From that part I think the timing could have been equalled out a little. But as far as the scenarios that you put in, I am sure you have done this from the other exercises that you have done, and yes, they were very, very realistic.

All right so can just talk me through the sort of experience you had in the cinema.

And then as the incident started to run I felt quite happy, quite comfortable and there comes a time when whether it is real or practice times suspended, because you are involved in it, and its perhaps at my stage of service you have done so many of them that it becomes real, because it is part of preparation for the type of responsibilities you might find yourself faced with, so I have no doubt at some stage, I couldn't tell you exactly when, in terms of making judgements, making decisions, consulting people, doing all the sorts of things you do in managing a real life incident, that the fact that it was an exercise was totally immaterial. It was a question of what type of responses were required in these sort of circumstances. And I suspect that became the case probably became more or less as soon as the real thing started to happen. I said real, I mean actual parts of the exercise was designed to make us make decisions, started to come in.

7.12.2 Questionnaire Responses

The following are comments taken from the questionnaires in response to Question 4; "What was best about the day?"

"The ability to run a very life like exercise. Much better than the table top with individual responsibilities

"De-brief"

"very impressed with the equipment and videos"

"Testing nature of the exercises"

"silver control"

"the exercise was very good, my only regret is that it was too short"

"Ability to think about 'what ifs' without putting lives

at risk"

"Silver command because in the centre of action and acting on own initiative"

"play value - experiment"

"raised valid issues which resulted in valuable discussion"

These comments are typical of the positive feelings of the participants

7.12.3 Behaviours

The findings from the first set of trials (1-3), led me to believe that the two behaviours; watching the screen; and reading notes, were mutually exclusive. This conclusion was reached after reviewing the video capture traces generated by the video data capture software and noting that at no time, did the participants look at the screen, and read from the supporting information packs. However this was not the case, looking at the data from the second set of trials, there are times throughout the observations that overlapping behaviours are recorded. This is because, by properly associating the video cues with location information and by reducing and varying the video sequences, the participants were able to recognise triggers and become more immersed. They were constantly using the notes in support of the video information presented to them. This was a close fit with the observations I had made whilst attending football events. There Ground Commanders, where they continually referring to their clip boards which held stadium maps, police resource information etc.

Also due to the increased workload during the simulation exercise, the commanders began to delegate responsibility for either watching the screens, or referring to the support packs, to their support officer. This only occurred because in the final three sets of trials, the commanders were further immersed by the environment. This is because the MicroWorld now presented a view to the commander which was sufficiently complex. Using a support officer for data gathering, radio communications and other information management, is entirely consistent with the real world of policing a football event that I witnessed in the real world.

In the real world such a supporting officer is affectionately or colloquially referred to as a "runner". and providing the commanders with a 'runner' further enhanced the environment, process and procedural reality generated by the system. These were sufficiently

close to reality to further immerse the officers. This view is supported by comments made on the questionnaires completed after the trial and interviews carried out with the officers.

OK Let's just back chat a little big, When you said you felt it became more real, was there a point where you would suggest that you had completely forgotten you were in the simulator? Or were you always aware that this was a game?

I think it is probably fair to say there must have been parts when the fact that it was a game wasn't a factor in my mind, it was two or three senior police officers consulting about a problem, and I say, having been involved in enough training, it goes beyond a game in as much as you are testing yourself whatever the circumstances are presented, in whatever way, whether its SOS part exercise, or part of real life.

I can't give you a point where - I can say almost definitely that there would have been times when I was unaware of it being a game or being a training scenario,

OK so if we - to explore that - you actually felt good, you had performed well, does that mean that you believed that the events and incidents that you had performed well in were realistic?

Yes as I said I think reality had been suspended, so the fact that we won or not didn't matter. What was important is that as a management team we had dealt with what was thrown at us, if you like, so the reality was that there were problems thrown at us and we had to deal with them, and come up with some meaningful solutions to them. And I felt that we had done that so I am not sure that a game aspect by then really was a feature in my mind. That was in terms of how I looked at it.

The amount of the time 'no response' behaviours occurred also dropped noticeably. The percentage dropped to as low as 4% (trial 4 Bronze Inside). This was another good indication that the participants were involved in the exercise.

Typical supporting comments made in the interviews and on the questionnaires are presented below.

What things do you take away as learning? I mean have you learned anything, and if you have how do you qualify that?

I can see it changed my view of management, I don't think as a Bronze enough is done, to provide experienced officer that's what matters, officers like me obviously got good experience, however you system completely changed the way I performed, that's just two hours

I was a hands on officer, you know I have been in the job long enough to remember when it was sergeants and PC's making arrests, it was how I began in the job, not a manager, not like it is now, and even now whilst they develop me in the role of manager to the rank of Inspector, individuals like me still want to be hands on. So the one thing I learned is that there aint no way I can deal with a disorder problem - totally disorder problem - and still be hands on. Very much like it was at the match yesterday.

We must really take that back step - if you can't take that back step you are only working at 50% of your capability. So it has changed, the way I manage myself, at football matches.

When you talked about the simulator you spoke about a number of things that you saw that were learning objectives. Out of all of those which do you think is the most important and why.

The opportunity to be confronted with a problem. The opportunity to be able to actively get involved in the problem and be able to come up with a solution. Back to self testing yourself analysis.

7.13 Further General Discussions For the Second Series of Trials

The modifications identified in the first set of trials indicated that much more needed to be done to the educational design of the exercise but that no significant changes were needed to the supporting technology. It was clear to me that the officers were less concerned about the technology once they been given an individual briefing in the MicroWorld environments. This indicated the importance of a good briefing.

The level of immersion or involvement in the exercise was greatly enhanced in these second series of trials. A far busier radio channel led to the normal frustrations from command officers not being able to gain easy access to the communication channel. This was true to life, as it is often difficult for a command officer to transmit his or her message as the radio systems only allow one person to transmit on the radio channel at one time. This required officers to raise the priority of their messages by starting a transmission by prefixing their message with the code, "Urgent Message", or "Active Message", which meant that their messages were more important than the radio traffic presently being transmitted.

Because commanders were now recognising more of the incident cues and triggers, Silver command's workload becoming increasingly heavy. The co-ordination function of the Silver Command officer, within the simulation exercise, now meant that they would have to deal with a greater number of parallel problems, having only partial information. Looking at the data, the time Silver spent doing 'Nothing' (behaviour code 9) fell by an average of 30 % over trials 4,5, and 6 (47, 28, and 14). The time spent communicating and referring to notes (a

indication of immersion, behaviour code 7) rose by an average of 166% over trials 4,5, and 6 (166, 300 and 33). This was now approaching the workloads I had observed in the real world of policing football events. Decisions made by Bronze Command officers often generated even more work for Silver as the solutions they offered may have solved problems, at the local level, but compounded the global difficulties for Silver command.

A good example of this, taken from the trials, would be a problem associated with drunken fans travelling from the rail station. This presented the Bronze-Outside Commander with many problems, who as a result asked for police horses, dogs and other resources to assist in getting the fans into the ground. Support was given by Silver, however the resources deployed generated major difficulties for him. When faced with disorder inside the stadium associated with home and away fans fighting on the terraces, a substantial amount of his resources was committed outside the ground. This made a co-ordinated response difficult. Never-the-less such problems were dealt with effectively by the participants and were seen to be reasonable in the sense that they happen in the real world.

7.13.1 De-Briefing the Exercises

The debrief sessions that took place after the trial exercises were observed very closely. The necessity for a de-brief as part of the experiential learning process was discussed in chapter 4. This second set of trials sought to gauge its relevance and effectiveness. On reflection the decision to use a highly credible football commander to lead such developing sessions proved problematic. Participant officers did not respond well to the confrontational style of this officer. As a result the participants felt that the debrief environment was not a 'safe' one. The de-briefing officer's approach was to examine each incident in detail and to determine if the officers' performance was

acceptable. The concept of group reflection, looking at concrete experience both as a group and as an individual and the formation of abstract concepts and generalisations is a significant and essential part of the learning process. This confrontational de-brief environment did little to facilitate reflection and the development of generalisable theories with the participants.

The educational technology modifications made to the Environment Control interface was seen as useful. The Exercise Controller was able, during the exercise, to record his judgement of participant performance by selecting an appropriate category from the scoring buttons. This mechanism was useful as it enabled the de-briefing officer to refer to events that had been 'flagged up' as worthy of discussion, by the Exercise Controller, during the de-brief. However, within the autocratic framework of the de-brief generated by this officer, identifying specific areas of participant inadequacy, did little to enhance learning.

It became clear to me that the debriefing session required substantial re-working if it was to prove an effective part of the entire learning environment. Its design would need to be underpinned by the relevant learning theory. In chapter 8 I set out to re-design the de-brief element by examining relevant theory on reflective learning and subsequently generate a new design specification for the de-brief element, this specification also includes the educational technology requirements for such an effective process.

7.14 Conclusions to Experimental Set 1 & 2

My conclusions from these sets of investigations were:

- The re-sequencing of events in trial 2, did provided a greater degree of immersion. Participants were better at recognising incident trigger information.

- Providing relevant and properly sequenced video produced a far greater degree of participant immersion. Bronze commanders spent considerably longer watching their MicroWorld Display. Silver spent less time watching as this activity was now competing with others and it became delegated to supporting officer.
- The count-down decision timers did reduce the decision-lag found in the first set of trials.
- The two-part briefing was effective. Participants were able to focus more specifically on the strategic and tactical element of the briefing. The second part technical briefing now held in the MicroWorlds was effective in dealing with the anxieties observed during the first set of trials.
- The modifications to the environment control interface, although not having any impact on the overall running of the exercise, was helpful in highlighting the judgements that trainers had made on participant performance during the exercise.

7.15 Development of General Principles

The findings from both sets of trials provide a general set of principles or tools that could be used, in the generation of future simulation exercises. Observations of participant officer behaviours, together with analysis of semi structured-interviews, indicated that the design of the simulation exercises generated a truly immersive experience. The participants partook in this simulated reality with sufficient engagement to indicate they had had a genuine experience.

These trials had also provided an understanding of how to sequence events and present information to the participants via their MicroWorld environments, in a way that closely matched the types of information and problems they were likely be confronted with in the real world.

These general tools were in a form that could be used to generate another three scenarios, supporting all the learning objectives contained within the National Sporting Events Course. These additional scenarios were:

- Kick off to half time
- Second half to final whistle
- Post match

The general principles generated after these two major trials were:

1. That participants should be given a 'two track' briefing;

   (a) Identifying their role in the simulation, appropriate information about the incident they are going to manage and what is expected from them during the exercise.

   (b) A thorough briefing on the educational technology, its functionality, how participants should interact with its various sub systems.

2. The participants should be encouraged to 'take ownership' of the operational plan for the event, by being allocated sufficient time to generate an operations order for the event,. Sufficient information about the simulated event should be made available and the team must be given total autonomy to generate their own strategic plan.

3. Incident trigger information needs to be properly contexualised. Video must accurately portray the command position. If this is not possible then other triggers are effective. Such triggers are graphical or text overlays.

4. To enhance immersion, the video and other information presented through the participants MicroWorld view, should contain trigger information that represents the patterns of typicality leading to recognition Such information should be built up from small information triggers that provide an increasingly rich informational context. This will enable the participants to recognise, at an early stage within an unfolding event, patterns that are typical of those found within their autobiographical memory of similar incidents. Supplementary cues and triggers must be a available, should participants fail to recognise the primary incident triggers.

5. To reduce 'decision lag' an on screen indication of the decision time must be given to the students. This provides a measure of urgency in decision making. However this decision timer must appear on each of the MicroWorld display monitors to avoid the 'ringing bell' approach adopted in other simulations.

6. Sequencing of incidents is critical to the immersion of all participants in the simulation. It is vital that the incidents occurring are multi-threaded, incorporating more than one command location. By proper sequencing, the workloads of all the commanders can be controlled and approximate those found in real events. For example, triggers associated to an incident need to be distributed amongst the command locations represented within an event. Then, only by the recognition and subsequent communication of these triggers by the group members, will the team as whole

attain a Situational Awareness of the developing incident.

7. Distributed decision making implies the need for 'Situational Awareness'. This sharing of mental models is only achievable by efficient communication. 'Incident triggers' including 'supporting information triggers', should not only be sufficiently 'information-rich', but must also be presented to the participants with sufficient 'locational context'. The information communicated to the team, must include such an accurate orientational context if it is to provide the team with a valid 'Situational Awareness'.

The next series of trials were designed to enhance participant 'immersion' or 'involvement' in the learning environment. As reported earlier they were also designed to test only small changes or modifications to both the simulation design or the enabling technology. Findings from these next series of trials would augment findings from the two major trials and would provide a set of general principals for the generation of other training exercises for other subject areas, such as the command and control of major events or major incidents.

7.16 Modifications to the System to Enhance Involvement.

After the simulation had been run for a further three times, the general feedback from both the training staff and the participants was that they were very impressed with this new approach to training command and control. Commander Training stated:

> "The personnel and training department can now at last offer senior command officers highly realistic training in a simulated

> environment as close as you can get to the real thing. Officers can now practice their skills and learn from their mistakes"
>
> Commander Training 'The Job' Police Newspaper (December 1994)

Even though the participants were indicating from their semi structured interviews, that they were fairly immersed in the event, modifications were still felt necessary to enhance this feeling of immersion. The following sections define the modifications made to the system to improve the simulation still further.

7.16.1 Additional Location Information.

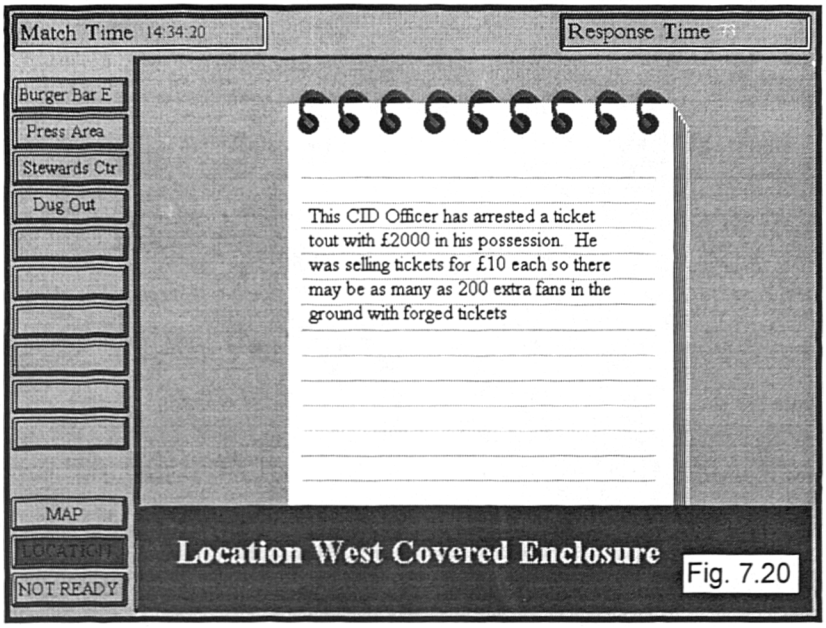
During the unfolding of events in the exercise, officers were faced with problems where additional information about the location, design or even identification of operational items would provide additional and relevant situational cues.

For example, at one point during the second half scenario, Bronze Inside, was required to deal with an incident where a manager from one of the two clubs has been hurling abuse at the referee and swearing. A complaint was received from the family enclosure and Bronze Inside is tasked by Silver, to deal with the problem. During informal discussions with the participant officers after an exercise, they had indicated that they would have liked to have seen pictures of the managers 'dug-out' as this would have influenced their strategy, in dealing with the problem. As there was no video of the 'dug-out' on the video disks, such information would have to be presented in an alternative way. Additional location information in this context would be a still image of the 'dug-out' presented on the video display.

Other useful additional information could include images of the police charging centre, fire control, etc. To accommodate this an additional

set of 'buttons' were provided on the MicroWorld interface screen that would display this information if 'clicked' during the exercise. The use of these buttons would be examined in the coming trials.

Fig. 7.20, shows the interface screen with additional location buttons.



7.16.2 Creation of an Operations Order.

Participants were given a pre-generated operations order, developed specifically for the exercises, the evening before the simulation exercise. The order contained police procedures for the event, including emergency and safety procedures. The order contained information on the deployments of all police officer, before, during and after the football match. They were asked to study the order and the exercise was 'played' based on the resources indicated in the order.

However, this approach did not appear real to the participant of the simulation, as in the real world officers would have generated the order themselves and they would 'own' its design. If problems arose because officers were under-resourced for an event, this lack of foresight from their management team had to be reflected in the simulation. During the de-briefing sessions of all trials (trial 1-6), officers had made comments about their not having a 'good

understanding' of the event and they were inheriting "some-one-else's" plan.

For the following series of trials, the officers would therefore be asked to create their own operations order, specifically for their event, from information they were given in briefing packs. Two hours were allocated in the morning to the generation of such an order. The order was then photocopied and given to all the participants. This order and its information then constituted the supporting documentation in the MicroWorld environments.

7.16.3 Additional Simulation Agents.

In the reality of the sporting event, the Silver command layer interacts, not only with Bronze Commanders and Central Operations, but with a host of other agents. These include, the Fire Service, British Transport Police, Club Officials, The Press etc. Many command decisions are made after referring to such agents. To support this interaction during an exercises, an additional member of the Exercise Control Staff was utilised. Their job, was to represent such agents if they were called upon by Silver of Bronze commanders. Also a telephone link was installed into the Silver MicroWorld to facilitate communications to agents that would not be in contact via the radio system.

7.16.4 Support Staff.

In the real world of a football control room, command officers' rely on support staff either handling the radio communications or presenting information on white boards. The trials so far had seen the command officers themselves operating the radio systems and marking up charts (if they wished). In this observation, a support officer would be offered to the Silver Command officers. The tasks given to this support officer would be a matter for the command officers. With this support it would be interesting to see if the command officers became

more immersed in the exercise, without the distraction of having to manage systems that they would be buffered from in the real world.

7.16.5 Combining Scenarios

Observing each scenario, it seemed that the participants were taking approximately five to ten minutes to 'get into role', to immerse themselves within the unfolding problems. The first three scenario lasted approximately twenty minutes, with the last about fifteen. A complaint often made by the participants before the start of the de-brief session, was that they had only just begun to "get going" when the scenario ended for the de-brief session. Consequently, it was decided to combine the four scenarios into two,

- From assembly of officers to the end of the first half
- From second half to the standing down of police and the return to normal policing in the area.

7.16.6 Additional Radio Channel

The command and control of public order in the Metropolitan Police, operates on a communication system where there are two radio channels. One is termed a 'Communications Channel" and the other a "Command Channel". During the management of a football event, such channels are combined so that all officers can monitor communication. If an incident occurs, the bandwidth of a single channel is insufficient to handle the radio traffic generated by command officers and those being given tasks from the control room. In these situations, the channels are split. A modification in the system would be to give the command officer the choice of using one or both channels. This was an attempt to combat the communications delay constant, developed in chapter 6.

7.16.7 CD-ROM Storage of Video Data

Throughout the trials I was constantly reminded of the shortcomings of the Scottish football video footage, both in terms of its over reliance on video-loops and its potential lack of fit with the reality of policing stadia in the Capital. In the section discussing video disk technology, I described how this format was a 'write once' technology requiring master tapes to be sent to a special processing facility for the generation of video disks. The resulting disk held 37 minutes of video in an analogue format.

However, such an approach made it difficult for modifications to be made to the video material. Another system was required if modification of the video sequences could become an in-house operation. CD-ROM mastering was a possibility at that time as the cost of the blank CD-ROM disc was less than £10 and there were many digital video compression systems available. The ability to record new video sequences was also a major requirement of the system both in the short-term, if I was to be able to modify the supporting and trigger video sequences and in the longer term when developing new critical incident management, command and control exercises.

The system that offered high quality reproduction was a Motion JPEG (image standard for still images) solution. I therefore obtained a CD-ROM recording machine and the associated hardware for Motion JPEG play back. The maximum video length I could place on the CD-ROM was 20 minutes, 17 minutes less than the Video Disk. To provide for extra storage, I installed a 'juke box' CD-ROM drive at each MicroWorld location. Each of these drives were capable of accessing six CD-ROMs. This meant that my maximum storage capacity over the six disks was 120 minutes. The impact of such digital video on participant immersion during the trials would also need to be tested, by transferring the information held on the video disks onto CD-ROM

7.17 Experimental Trials 7-15

To measure the impact of these new modifications a further series of trials were carried out.

7.17.1 Methodology

The methodology for experimentation during these trials would need to be different from that used for the first six. The evaluation from trials 1-6 convinced the Training School's Management Team to issue a directive that the 'Case Study' element of the National course must in future be delivered through the simulation system. Ten courses were programmed into the training calendar. To remind the reader, the Major Sporting Events Course was a national police training response, supported by the Home Office to recommendations emanating from a public inquiry into football disasters. My organisation, after reading my research and observing my training simulation sessions, had made the decision to deliver the 'case study' element of the nationally validated course, using the simulation system I had developed.

This meant that the organisation would, if necessary, be called upon to defend this decision to another public inquiry, coroners court, or any such body that sought to determine whether senior police officer were adequately prepared to manage sporting events. Consequently I would not have much opportunity to make large changes to the system between courses as the decision to use the system had been made on its development state at this time.

Any future experiments would have to utilise less obtrusive observations and measurements. As a result I chose to use the questionnaires developed in the first six trials and my own observations to evaluate the success of this round of modifications. The next series of trials would be split into three sets of three

exercises, no changes would be made until all the results of three trials were known,

Therefore, in the next series of trials, these observations and measurements were made with an eye to correcting only the minor problems that remained. This most unobtrusive approach to observations gave me confidence that the observational techniques themselves were not unduly influencing the situation

7.17.2 Discussion

The impact of the seven tests are represented in the following table. (fig. 7.21)

7.17.2.1 Bullet points associated to the modifications

Modification	Effect
Trial 7 Additional Location Information.	**Positive**; the additional location video enabled participants to orientate themselves to their view point shown by the video sequences. This led to communications including phrases like "I'm there now and it doesn't look too bad to me"
Trial 8 Creation of an Operations Order.	**Positive**; The participants spent a great deal of time generating this document. As the supporting documentation was given to them the night before the simulation, they had to do a considerable amount of their own work in understanding the fictitious town of Sanford. The generation of their own operations order. The main effect of this modification was it generated a far greater awareness of the principal locations used during the simulation and the exact deployment locations of officers, before, during and after the match
Trial 9 Additional Simulation Agents.	**Positive**; During the simulation an additional officer was tasked to respond to the participant commanders in the guise of external police agents such as a representative of the London Fire Brigade or Council safety officer etc. This greatly increased the speed of communications as pertinent information was made available to the commanders at all times.
Trial 10 Support Staff.	**Positive**; Although the support staff were used in different ways by Silver command. In some cases they were used to plot the deployments

	of officers and other resources on white boards in the MicroWorld environment. In other cases they were used to manage the radio and other communications during the exercise, freeing the commanders from these tasks. This enhanced the environment and process reliability of the command MicroWorld.
Trial 11 Combining Scenarios	**Positive and Negative**; A criticism made during the de-briefing sessions, was that "just when the simulation began to get going, it stopped for a de-brief" It was clear that a significant time was required for the participants to "get into role" and begin to become immersed in the simulation. By combining the scenarios from 4 to 2 the simulation session lasted longer and this enhanced the immersion felt by the participants. The negative side was that with only two scenarios the officers could not experience each command position in the original teams. Two officers out of the six, never experienced the Silver Command. This difficulty was later overcome by introducing a third scenario.
Trial 12 Additional Radio Channel	**No impact**; The officers were briefed that they had available two radio channel that could be split into a command and communications channel at any time under the command of Silver. This represented a good process reliability as this option would be available in the real world of policing a football match. However in none of the trials was a decision given to split the channels.
Trial 13 CD-ROM Storage of Video Data	**No Impact**; The video disk material was recorded onto CD-ROMs using M-JPEG and the MicroWorld Control software was modified to manage this video under a new operating system called Windows. The operation of the MicroWorld interface remained identical and the impact of the video (which was of slightly lower clarity) was not noticeable during the trials or in any comments made by the participants.
	Fig. 7.21

7.17.3 Questionnaire Responses in Support of Enhanced Immersion

It was clear from the observations of the simulated exercises that the modifications taken together increased both the immersion and the fidelity of the simulation. It is difficult to relate the statements on the questionnaire directly with each modification, however taken as a whole the following are typical. They relate to answers given to

questions 1 through 8. The questionnaire can be found at appendix 6.

The following are typical questionnaire responses;

"the second half final whistle"

On questioning the participant explained that this relates to his relief that the scenario was over and that he had performed well.

" My colleague in 'Silver' shared my feelings. Bronze appeared frustrated by Comms. crowded air time. Again very realistic

"Yes very realistic surge of adrenaline / anxiety as the information flow increased. Scenarios became very realistic"

"Simulation equipment was excellent"

"involvement"

"colleagues were under stress when more than one incident needed to be attended to"

"it was apparent that as the programme developed the players got more excited.

" ... because it makes you think on your feet"

"Setting the strategy and policing from scratch"

"building the deployments made the whole thing credible"

7.18 The Next Stage Of The Research

These small trial observations led me to believe that the participants were now much more immersed in the exercise. Overall the development of the system had provided me with a range of tools that I had successfully combined to create a simulation exercise. The one remaining problem which I had not been able to correct was the

content of the video sequences I had been given by the Scottish Police college. Looking at comments made in the questionnaires and during the semi-structured interviews, undertaken with the participants, it was recognised that the need to produce more relevant video material was a major requirement for any future development of the system.

The physical structure of London football stadia were different from the stadium depicted in the Scottish video. In addition, in response to the Taylor Report, many of the London stadia were being re-furbished and being made 'all seating' style stadia.

The success of the simulator meant that finance would be made available from the Football planning Unit to re-shoot the video sequences to meet my needs. However, it was not possible to obtain the necessary footage at that time as the football season was nearing its completion. My subject matter experts informed me that I would have to wait until the 1995/6 football season. Any experimental work that resulted would be completed too late for inclusion in my present thesis.

It was felt necessary to test the principles developed in the specific design of the football exercises, and see if they were generalisable to the wider sphere of command and control management training in other policing areas. At this same time I was approached by the Public Order department and asked to generate a training exercise for the Notting Hill Carnival, a two day street carnival attracting around 1.5 million people.

To test the generalisability of the principles obtained from my research during the football development I was given permission to carry out development work to generate simulation exercises to support senior officer training for the carnival event. Chapter 9 explores participant immersion in this new area of training

7.19 Chapter Summary

This chapter has dealt almost exclusively with the 'concrete experience' (defined by Lewin) of the experiential learning cycle. It has charted developments in the design of both the MicroWorld environment and the enabling technology. Measurement of the involvement of the participants have been made by observing their behaviours when faced with the management of a simulated football event. In the light of these findings changes have been made to the design and sequencing of the unfolding incidents presented to the participants through their MicroWorld displays. These changes have generated a more immersive environment where participants are able to 'get into role' and experience a genuine but restricted exposure to the management of a football event.

Many of these changes have led me to generate principles of training design specifically associated to this training exercise. Indeed Beer (1966) states that "The results of systemic testing may be applicable only to the situation that has been tested". I believe that many of these principles are transferable to other simulations of other command and control activities.

The question of how to test whether principles developed during this systemic research are transferable to other command and control environments will be addressed in chapter 9, where I generate another training exercise in a related but different aspect of command and control. If the specific principles generated in the design of the football scenarios can be applied to other command and control simulations then the findings from this work can be said to be generalisable within that scope.

The Lewinian experiential learning cycle, underpinning this work contains a phase devoted to reflection. In this phase the learner is encouraged to reflect on his or her 'concrete experiences' and to begin

to generate 'abstract concepts and generalisations' which compare these recent experiences with previous experiences held in autobiographical memory. The following chapter, recognising the importance of this phase of the cycle, explores both the theory surrounding reflection in learning, and will attempt to generate a specification for the enabling educational technology.

8. Reflection in Learning

8.1 Résumé

This chapter moves focus onto consolidation of learning gained within the simulation through structured reflection, and in particular details efforts to support this phase of learning by way of developments of the educational technology. The educational design of the present simulation system accommodated the need for structured review, a phase I saw as fundamental in ensuring that a meaningful and usable link was to be forged between experiential learning gained in the system and the reality of operational command. The design also recognised the benefits of team de-briefing, which would enable officers to share experiences and from them extract shared meaning, bearing in mind their joint and recent simulation experience.

Observations of the de-brief sessions held after each exercise, led me to believe that the design of this crucial stage of the learning environment required a better theoretical underpinning. Therefore this chapter starts by undertaking a further literature review in this crucial area and draws on this theory to develop a better specification for a new de-brief based element within the overall system design.

8.2 Introduction

The previous chapter looked closely at the interactions of command officers both within the context of a command location (a command layer MicroWorld) and across the hierarchy of command (inter-layer MicroWorlds).

Experiments and observations of the earlier simulation exercises concentrated on the 'concrete experience' element of Lewin's experiential learning model (Lewin 1951). This chapter explores in detail the ('observations and reflections'), phase of the cycle; where learners spend time reflecting on their recent experiences. It builds on concepts of de-briefing introduced in chapter 3, which define reflection in learning through de-briefing. This chapter uses a working definition for the de-brief developed by Dewey (1933) namely;

> "Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions to which it leads.....it includes conscious and voluntary effort to establish belief upon a firm basis of evidence and rationality" (Dewy 1933 p.9)

This consideration of belief or knowledge is considered to be a necessary part of all experiential learning experience. Debriefing as a result of a total experience in the simulation has been shown to be a powerful educational tool (Powell 1991).

8.3 Reflection - The De-brief

Pearson and Smith (1988) state that "de-briefing is not simply 'having a chat' or 'rapping' about what happened in the experience". Active experience is required to make the learning both involving and interesting, even exciting. The debriefing stage is bounded. It starts

at the cessation of the experiencing activities of the simulation exercise and includes the decision to reflect on action. Debriefing is not therapy, counselling or encountering, although sometimes elements of these activities are present (Harvey 1979). The term 'de-briefing' within the context of this work, refers to that intellectual and affective activity in which individuals engage in a process whereby they explore their total experiences. Powell (1991) has shown this leads to new understandings and appreciation's of command and control. 'Intellectual' in Lewin's terms refers to the 'formation of abstract concepts and generalisations'. These relate to the third phases of Lewin's model. It is my belief that the second and third phases are so interconnected that they can only be regarded as a single phase; reflection and the formation of abstract concepts should not be separate processes.

The term 'affective' used by Lewin, refers to the personal and interpersonal feelings within the de-brief group. Such reflection deals with emotions i.e., how the participants *felt* during their experience. The exploration of these feelings can be seen as a threatening activity by some participants if not handled correctly as we saw in the last chapter. However, exploring how participants felt during the concrete experience is an important stage of the de-brief process.

8.4 Stages in The De-briefing Process

The stages for the de-briefing process can be summarised as a series of questions (Pfeiffer & Jones 1975)

Van Ments (1983) defines theses questions as

- What happened?
- How does the participant feel?
- What does it mean?

8.4.1 Stage 1 in The De-briefing Process - What happened?

According to Van Ments, participants should initially be asked to describe what happened. This description provides a common start point. This is particularly useful in exploring participants awareness of each others experiences. The design of the MicroWorld environment is deliberately isolating and 'Situational Awareness' is only achievable through the communication of those experiences during the exercise. Therefore the 'what happened' stage is critical in introducing a shared understanding of the issues and problems dealt with by the individual participants.

The 'what happened' stage provided a functional specification for the de-briefing stage of the simulation technology. It had to provide a mechanism during debrief where participants could gain a clear understanding of what happened at theirs and other's MicroWorlds during the unfolding of events. This functional specification requires that the educational technology should be able to replay any video trigger sequence or any audio during the debrief.

8.4.2 Stage 2 of the Debriefing Process - How Did The Participants Feel?

In this stage the participants were asked how they felt during the experience. To deal with such feelings, an atmosphere of trust, acceptance of others and a willingness to take risks must be established. Generating such an atmosphere is not easy. It requires the development of what Johnson (1972), terms 'group processing skills' and a sensitivity to the underlying feelings and emotions within the group (Mumford 1977).

Mumford (1977) recognises that the debrief leader may also need skills in handling interpersonal anger, conflict and resolution. These emotions may be unpredictably released, even arising as seemingly innocuous activities during the debrief. This may lead to the release

of pent up emotions of anger and frustration if it is not handled sensitively.

An example of this was seen during a debriefing session when the group was reflecting on an incident associated to a potential crushing of supporters leaving the stadium. (the facilitator used here was a subject matter expert and not trained in facilitating groups of learners)

The commander who had been taking on the role of 'Bronze Inside' was describing how he 'felt', after he had decided to change locations in order to get closer to a potential crushing incident at one of the exit gates. His decision to visit the scene resulted in the unfortunate outcome that he became lost in the 'sea' of supporters and had become trapped at the gate location. The learning objective associated to this incident had been designed specifically to highlight the potential problems of getting too close to the problem, as opposed to remaining detached and commanding from a safe distance. The commander had acted impulsively by attending the scene when his attempts to gain more information about the incident had failed. His actions had effectively taken him out of the exercise for the rest of that particular incident.

During the debrief he became most agitated when the group were discussing the concept of remote management. He became increasingly angry and abusive to the facilitator. The facilitator who was able and experienced, asked the commander why he had gone to the exit gate. The commander in his reply said that "the exercise was only a game and in the real world I would not have gone". The facilitator then asked the commander why, even if he had felt he was just in a game, he had actually gone to the exit gate. To find out more the facilitator also tried to ascertain, how the response, 'being just a game', was a justification for his

actions. This was a difficult question to answer and in a tribute to the skill of the debrief facilitator, by re-focusing the problem away from the difficulties of a simulated exercise and towards matters of command and control, he defused the moment and utilised the energy in the emotions to involve the group in a reflective discussion on the difficulties of commanding remotely from the source of the action.

This event demonstrates the potentially emotive nature of the debrief session. However if it is properly managed, then within the context of a recent experience, learners can share their knowledge and using Lewin's terms, assist in the "formation of abstract concepts and generalisations"

8.4.3 Stage 3 of the Debriefing Process - What does it mean?

The third and final stage of a debrief process links Lewin's stage 2 and stage 3. This debriefing stage involves the participants in the process of generalising about their experiences and their reactions to them. During this stage participants are able to gain real insights or argue on particular points as they are discussed during the session. The conclusions they draw need not be unique or original, however, in the process, individuals and the group achieve meaning that is personal and relevant.

Collectively, the participants had a varied knowledge base due to their individual experiences of commanding events. However their individual and personal autobiographical memories, and therefore their personal knowledge, is limited. By discussing emerging issues against the context of a shared experience (the simulation), group members were able to share their knowledge in relation to their real world experiences of incident management. The de-briefing element of their learning environment, provided the context and the shared

experience necessary to highlight patterns of typicality within each of the participants own experiences.

> *An example of this was seen when de-briefing the use of police dogs in the management of crowd behaviours. During a particular debrief, a commander was defending his decision, during the simulation, to deploy police dogs to an incident involving a pub fight outside the ground. This decision was discussed by the participants in some detail. In defending his decision to act in a particular way, a commander cited many instances where this type of tactical deployment had been successful at his local football stadium. The facilitator explored the issues associated to dog deployment and the group contributed to the discussion. One of the other commanders suggested that when he had deployed dogs at his local stadium, they were attacked by the crowd and innocent people had been badly bitten and had instigated legal action against the police department for damages. There followed an animated discussion which not only focused on the command and control issues associated with the deployment of police dogs, but also the legal implication arising from civil litigation against the Police and the liability faced by the officer giving authority for their deployment.*

This example demonstrates that the group collectively had a wealth of personal experience, but individually that experience could well be limited or patchy. The debrief environment, if allowed to develop, generates acceptance or trust of others and a willingness for the participants to take risks. This can provide a powerful learning environment, where both personal experience and group experiences can be explored. It also leads to the 'formation of abstract concepts and generalisation' as defined in the third phase of Lewin's model.

A schematic of the de-brief being developed for use in the simulator is shown in the following diagram. (fig. 8.1)

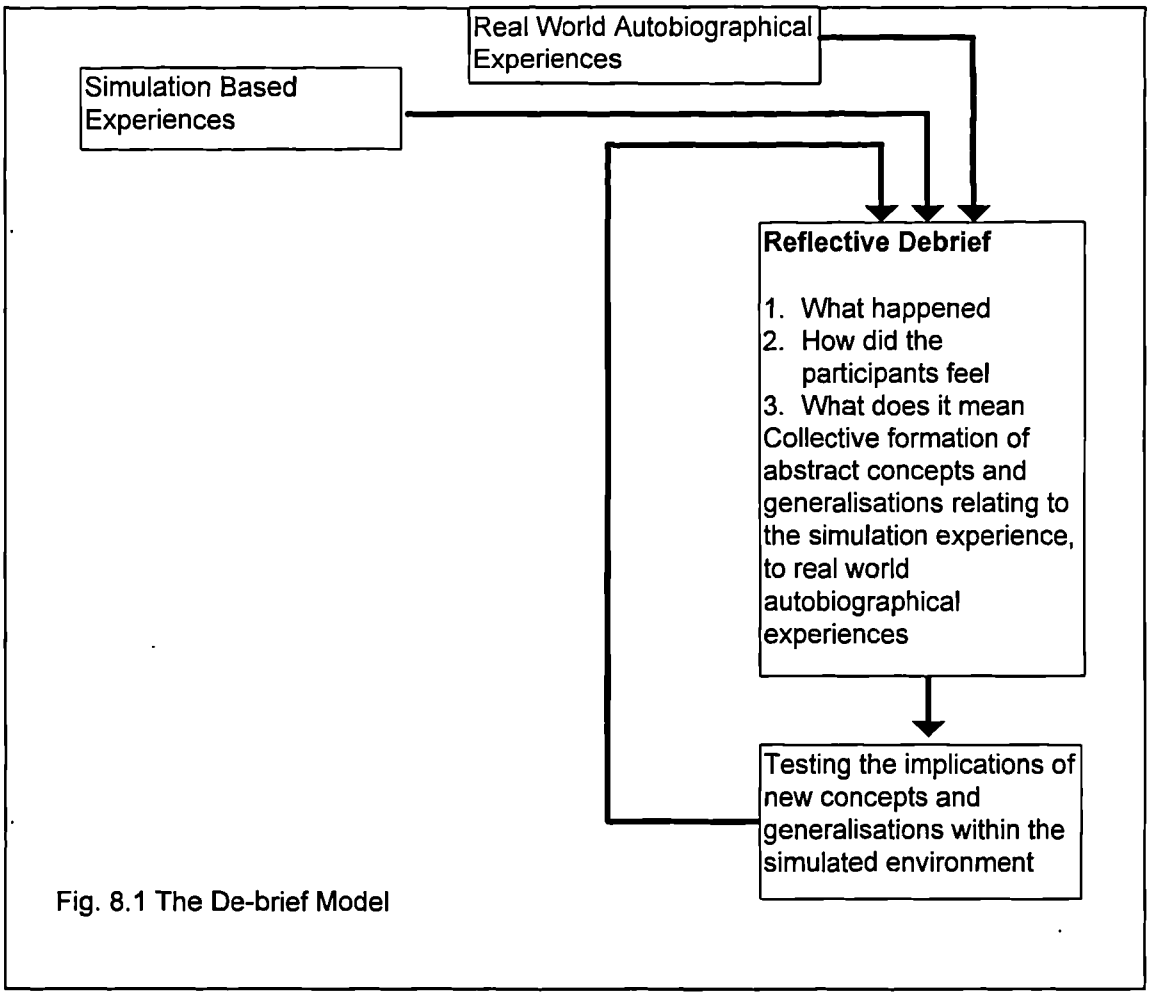


Fig. 8.1 The De-brief Model

8.5 Facilitator Profile

Over many de-brief trials, different facilitator profiles have been tried. In the early trials of the system, the facilitator was a subject matter expert in the field of policing football events, he had no formal training in the facilitating learning groups. This turned out to be problematic. As previously discussed, the debriefing environment can be volatile and challenging and needs to be carefully managed. The facilitator needs to be able to control that environment and this requires substantial skill and flair. These facilitation skills were not apparent

in our first facilitator who was a subject matter expert. During the review, he was very focused on the performance of the officers during the simulation exercise and had difficulty relating the learning outcomes with similar problems faced in the real world. During discussion, when exploring the actions of the participants, he repeatedly came up with statements like, "well you got that one wrong" or "the right way to handle this is.." or "if you make decisions like that at the sharp end you're going to end up with a riot!".

Such approaches may well be effective in highlighting the seriousness of the operating environment and the possible outcomes of poor decisions. They may be appropriate in instructing novices in the art of command and control. However, the learners had all experienced command and control decision making in some way during their careers and the approach taken by the subject matter expert was at variance with their experience and thus the educational (experiential learning) theory underpinning the exercise. De-briefing sessions with this officer turned into unpleasant and 'unsafe' learning environments where the participants became defensive, this hindered effective learning.

During the semi-structured interviews it became apparent from the first two series of trials that this debrief was not a safe, trusting environment ere learners could establish trust and frankness. The participants clearly found difficulty with the debrief on the first trial. This is typified by this fragment of transcript (the full text of the interview can be found at appendix 8)

Interviewer is shown in bold.

There are 2 areas of learning. There is learning in the general simulation also exchange of ideas during the debriefing. Its very difficult to know the balance because some people who I've interviewed have indicated that they have felt very stressed and they were perhaps junior in the rank or not very experienced, especially in Silver. Others have said no we weren't at all stressed out. I would like to have had more and also less people in there so its more down to the command officer. I'm very interested in stuff that I've have seen. Some of the decisions were made to deliberately to find out what would happen. They weren't real time

solutions they were the what if I say this what's going to happen and listening to his team, his bronzes responding to him based on those decisions he found some learning from that. Anything else I can get from you?

I think that what came out of the debrief coppers being what they are as a culture would expect the worst thing to happen. Its very difficult to be brave and say yep I got it wrong. The debrief needs to be friendly and that means trust. This certainly wasn't the case. We had some high ranking officer telling us that we did it wrong. There is no wrong in this sort of thing. So, I don't know, I got very fed up with being lectured at all the time. In the end of the day if it went ok then it went ok and maybe we could have done it better but to say we did it wrong, well I stopped listening after that.

In subsequent trials, facilitators with different profiles were used. For instance, trial 2 used a non subject matter expert who was a trained facilitator. Whilst his debrief was non confrontational, his lack of subject matter knowledge left the learners frustrated as he was unable to answer their questions associated to force policy or matters of procedure. Without such knowledge the facilitator had difficulties in arbitrating between participants with differing viewpoints.. The requirement for a facilitator to have both substantial subject matter knowledge and the ability to facilitate such a volatile and fragile stage of the learning is clearly identified as important. This is exemplified in an extract from a semi-structured interview,(the full text of the interview can also be found at appendix 8).

Let's talk about the debrief. The debrief when you were running it was run by trained facilitator. The way that the brief worked was bringing up various instances which occurred and then exploring how the team felt that it went. How did you the debrief.

I can't recall having any problem with, in most of the situations and that is true in real aspects of policing but of course there may well be some disagreement over issues but to be honest its the learning exercise of what is discussed that is the most important thing so really although you are getting an interpretation of how it could have been, which is fair and right because of course he is undertaking that role, nevertheless I think there was scope for discussion. There is the old thing about right or wrong answers, I know and it sounds dreadful, but often you learn more form the discussions surrounding the comment rather than the actual comment itself. I think the real problem was that there was nobody around who really new the Force policy and this was frustrating as I just wanted someone to say, well the book says da da da and then we all would have known for sure.

In the third series of trials two facilitators were used. The first was trained facilitator who's remit was to develop the learning environment. The co-facilitator was a subject matter expert from the football planning and policy department. His role was to consult with the group on matters associated to organisation policy, best practice and legal matters. Both officers were trained facilitators and the

officer from the football planning unit had attended a six week facilitator's course delivered by the Central Police Training Unit (CPTU), specifically developed for trainers on the Major Sporting Events Course. This third, and subsequent de-brief sessions, was well received by the learning participants. The following transcript extract is typical of how the de-brief session was regarded by the participants. This co-facilitator style was repeated in many other simulation exercises and was continually successful.

How did you find the debrief in that context

Not to any great extent. The only interesting fact was that if it hadn't been replayed that I was asked how was that problem solved on occasions that surprised me that I would have said that it had been dealt with differently to what we actually did when on the playback, if that makes sense. There was a problem how do you think you reacted. I thought the Fulham guy on the radio put it a certain way, and then actually when you played it back, we did the debrief in the class and said this is how we come to resolve the solution rather than come to guess work and it actually came out over the broadcast showed exactly what we said in the classroom. If you hadn't played it back on the debrief I would have said that we had said something completely different. The debrief is actually very useful to confirm. It could be used wrongly. I think there could be dangers in that. The fact that we had a guy from TO20 planning office was good. I think there's always the possibility in these things becoming a pat on the back old friends society. The TO20 guy, Inspector Norman, I think was his name, kept saying well "that's really interesting because that's not what it says in the book". I like that. You know you don't have to do it by the book but its good to know what the book says (laughter).

8.6 Debrief Supporting Technology

To support the de-brief model (fig. 8.2), it was necessary to develop specific educational technology to replay incidents to the whole group, during de-brief facilitated discussions. Prior to the de-brief, participants had experienced their representation of a football match from one command position only. To provide all the participants with an overall perspective of the problems faced, from all the command layers, an additional de-brief sub-system had to be designed and developed.

This system had to be capable of replaying any incident during a de-brief session to support the discussion. This requirement represented a substantial development of the system and had an impact for both

the environment control software and the MicroWorld control software. Also, additional hardware was required to support control and projection of the incident information. The debrief sub system schematic is shown below. (fig. 8.2).

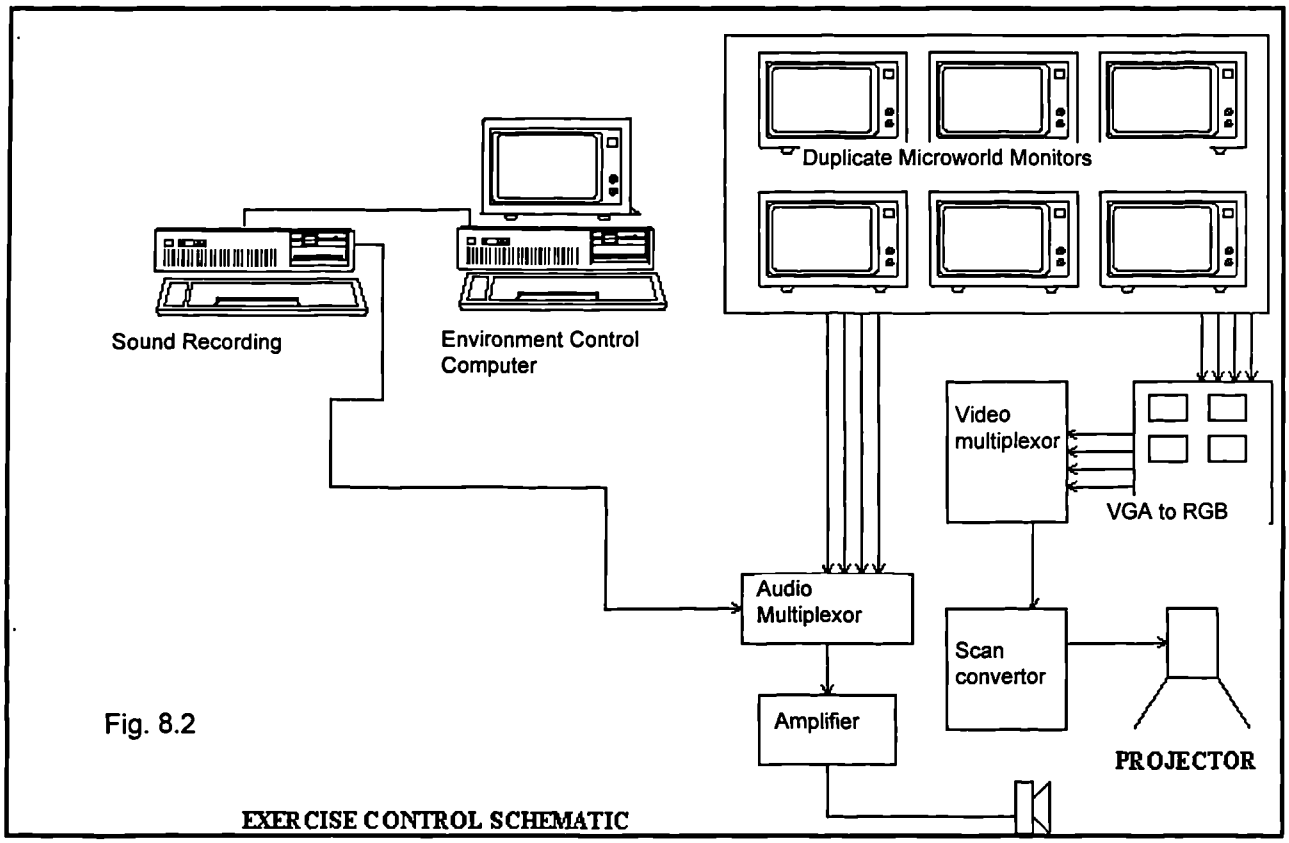


Fig. 8.2

The actual de-brief control is best understood by detailed consideration of its 3 constituent systems;

- Video Control
- Audio Control
- Sound Recording

8.6.1 Video Control

All MicroWorld displays were duplicated in the exercise control room. This was to provide the exercise controller with immediate feed back at any time on what information was being presented and to which MicroWorld environment it related. Such visual feedback was a

significant aid to the sequencing of exercise incidents. For example, if an incident required that a commander be shown a specific incident relating to a particular decision made by his team, then the exercise controller needed to see exactly what the MicroWorlds were displaying to ensure that he did not fire a new incident before significant information had been displayed on the relevant MicroWorld displays.

To ensure that any incident could be replayed in exactly the same manner during the de-briefing session, a complete record of the incidents had to be made during the exercise. This database also contained relevant information such as the time an incident was fired.

The duplicate monitors already installed in the exercise control room provided easy access to the MicroWorld display video. This required the ability to present to the participants (during the de-brief session) a projection of the MicroWorld display screen. This enabled all the participants to observe the incident from any command layer perspective. The first stage of this system development concerns the RGB conversion of the video signals. The computer graphics display needed conversion to RGB so they would be in the correct format for the multiplexor. The function of the multiplexor was to take all the video from all the MicroWorlds and be able to select from a number of inputs a single output for projection. This selection was made under the direct control of the environment control computer through an RS232 (industrial standard serial communications system) link between the control computer and the multiplexor. The output of the multiplexor was a computer video signal. This signal was then processed by a scan converter system to convert the computer graphics video to a standard that could be projected by a large screen projector. This projector was situated in the de-brief area (see figure 8.2).

8.6.2 Audio Control

In parallel with any video projection, was the need to provide the associated audio in the de-brief area. To route the audio from the MicroWorld computer required the use of an audio multiplexor. The function of this component was identical to the video multiplexor, except it selected from all the MicroWorld audio systems the audio to be replayed in the de-brief area. It too was under the control of the environment control computer through a separate RS232 line.

8.6.3 Sound Recording

The radio communication generated during the exercise was an important record of decisions made during the simulation exercise. A requirement for the de-brief session was that any radio message should be able to be replayed in reference to any incident. To support that requirement, a sound recording system was developed that would capture all the radio communications generated by the participants. This captured audio would be time referenced to the active incident at the time it was generated. The sound system comprised a computer on which the sound information would be stored and the development of software for that computer that would control the audio capture. The system was initially capable of capturing two channels of audio simultaneously. The capacity of the hard disk on this computer provided a maximum recording time of two hours.

8.7 Debrief Facility - Impact on Exercise Design

The functionality of the de-brief technology clearly had an impact on the development of exercises. The de-brief sub-system needed to be able to differentiate which of the MicroWorlds to display on the de-brief projection system. To accommodate this it was decided to enhance the syntax of the simulation exercise script, so that relevant MicroWorlds could be identified. To highlight the principal MicroWorld used for the de-brief, required putting that MicroWorld

label as the first line in the control sequence. Taking the sample code script shown in the last chapter as an example one can see the difference between the first and second incidents of event 8. On the first incident MicroWorld 1 is the first line after the [RT] and on the second incident MicroWorld 1 is the first listed. The de-brief sub system would interpret this script such that the principal MicroWorld was taken to be the one designated as the first line and this would be the display projected on the de-brief screen during the de-briefing of that particular incident. The selection through video and audio multiplexor control was automatic and invisible to the exercise controller.

To initiate the de-brief system the controller would click the de-brief button included on the environment control interface screen. Before the system switched between exercise control and de-brief control the incident scores would be displayed.

8.8 Debrief Limitations.

The debrief sub-system was able to place on the projection screen a display of any MicroWorld. However, whilst this was a major improvement on the management of the de-brief session it was not possible to present on the projection screen more than one MicroWorld at any one time, this was limiting as it was not possible to show two or more MicroWorlds simultaneously.

This limitation meant that it was impossible to replay multi-threaded incidents (incidents where seemingly unconnected problems occurred on more than one MicroWorld or across MicroWorlds). As the complexity of the exercises increased the ability to observe the problem from all of the command perspectives became a significant requirement of the de-brief. To support a multi-MicroWorld projection

capability, modifications were made to the debrief sub system and these modification are shown in the following diagram fig. 8.3

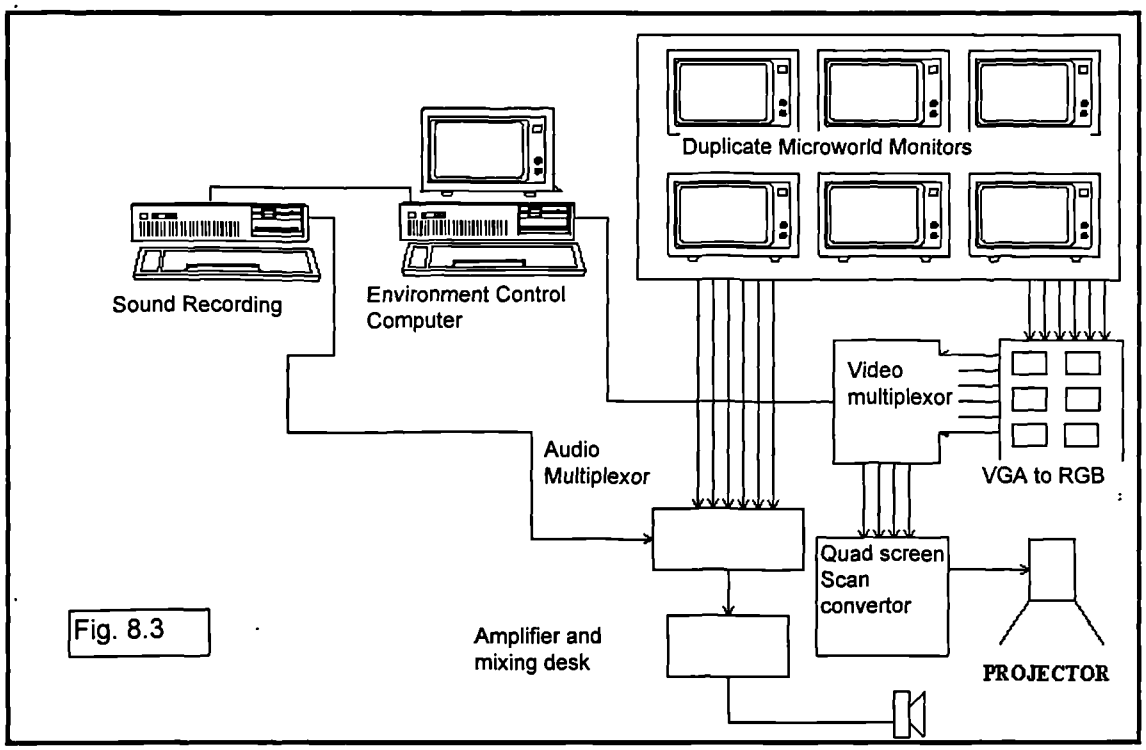


Fig. 8.3

It was now possible to project up to four MicroWorld displays at any one time on the debrief projection screen. The associated audio was amplified via an audio mixing desk in the de-brief area and this desk was controlled by one of the de-brief facilitators.

As a result of these system developments it became possible to review all the MicroWorld displays simultaneously or to switch to a single MicroWorld at the press of a button during the subsequent discussions. The ability to view the problem from the perception of all command layers was a significant enhancement to the facilitated sessions. By way of an example I will recount a particular session where the silver commander was concerned that he had failed to recognise a problem early and as a result he had spent most of his time reacting to it. His argument was that, had he recognised the problem in its early stages, he would have been able to instigate some command decisions that would have prevented a minor problem

escalating in the way that it had during the exercise. It was only when the facilitator was able to replay the incident and use the multi-screen projection capability, that it became abundantly clear that the reason that Silver did not recognise the problem, was that one of the Bronze officers had misinterpreted the information presented to him during the incident. It was only after viewing the display video shown on the Silver MicroWorld display, alongside video shown on the Bronze display, together with the recorded radio transmissions, that Bronze's misconception of the problem came to light. The facilitator then managed the discussion and the value of timely and accurate information was clearly appreciated by the group.

8.9 Chapter Conclusions

In this chapter we have explored the value to the learning environment of a properly managed and formalised de-briefing session. The development of an atmosphere of trust, acceptance of others and a willingness to take risks is of paramount importance if the session is to provide a reflective view of both personal and group experiences during the simulation exercise.

The de-brief session forms a close fit with the Lewin model of experiential learning and is essential if experiences generated in the simulation system are to be reflected upon by the learners and in so doing ensure that these new experiences can lead to the 'formation of abstract concepts and generalisations' which the learners will be able to take back into the workplace.

The chapter recognises that the de-brief session can be a volatile arena where the emotions of the learners need to be properly managed. It has explored the profiles of effective facilitators and concluded that a mix of subject matter expertise and facilitation skill provides the necessary learning climate.

Armed with the theory underpinning the mechanics of the de-brief session, the chapter has described the necessary technological developments required of the system. In doing so it highlighted the impact this technology had on the design of simulation exercises. It recognised the limitations of the de-brief sub system, which were principally the inability to replay more than one MicroWorld display. The chapter detailed the subsequent modifications made to the system and the introduction of a multi screen de-brief control system.

The next chapter takes up the question raised in the previous chapter, namely can the principles generated by systemic testing of the football exercise be applied to another command and control context.

9. Testing the Generality of Principles Developed During Research Associated to the Management of Football Events to Other Command and Control Management Simulations

Résumé

The body of this thesis has been concerned with the development of an experiential learning simulation environment, designed to engender usable and transferable experience. Much of the development work and systemic testing set about developing tools and protocols that could be applied to the development of a training system which attempted to engender useful experience in the domain of public order management associated to football.

I recognised that learners needed to be immersed in a realistic but restricted simulation environment, where critical decision making skills could be exercised at an appropriate level and within a relevant context. The central theoretical models underpinning the design of the training environment include the Lewinian Experiential Learning Cycle and Klein's Recognition Primed Decision Making model.

This chapter draws on the findings from my research in order to address a new question, namely;

> "Are specific principles, developed from the research associated to the development of a football simulation system, generalisable to the wider dimension of command and control

training. And if so how can one evaluate their effectiveness".

The chapter uses as its base the development of a new simulation exercise and through analysis of this development seeks to evaluate the applicability of principles generated through earlier work which might prove transferable to the design and building of this new simulation environment.

9.1 Introduction

The Management Development Department of the Metropolitan Police were extremely pleased with the operational football management simulation system that I had created. The simulation was regarded as successful by both the learners and their line management. As a result I was approached by the Central Area Operations department with a request to develop a similar training simulation exercise in support of the Notting Hill Carnival, a two day street festival held in London and attracting more than 1.5 million people. The officers requiring training were again senior command officers who would be policing the event.

The traditional training for these officers was provided by the Public Order Department, by way of table-top exercises, (defined here as role playing radio communication exercises), and case studies. This was consistent with the training provided to officers for football management prior to the development of the simulation system. There existed a considerable overlap with officers involved in football events and officers involved in the Carnival both coming from the same pool of officers who were 'public order' trained. Within this small and select community, many of the officers had experienced the initial simulation system in the context of football. This led to the Commander with responsibility for Carnival, to initiate a project to develop a Carnival simulation exercise. The project would be managed by the Central Carnival Office. Subject matter experts also would be made available from this office.

The above request provided an ideal opportunity to undertake research to discover whether the conclusions I had made in the development of the football exercise were generalisable to another command and control situation. It also gave me the opportunity to develop an event in which I had control of the video content which

formed the video triggers and cues within the exercise. This request was formalised in May 1994, three months before the carnival, with a delivery date for the training set at one month before the 1995 carnival event. The following section will outline the structure of command and the exercise design.

9.1.1 Previous Training

The exercise objectives were based on the 1993 radio training exercise developed by the Public Order Department (CO11). The only literature available to indicate the way such training was structured was single sheet of paper titled 'Individual Questions' which can be found at appendix 10. The nature of the training delivered by the Public Order department was such that the training officers would undertake the training activity as a form of radio exercise. In order to provide some immersion, the trainers took on the role of police units and other resources and by way of radio messages, provided the commanders with information associated with the unfolding event. The trainers were skilled at this type of exercise and were able to dynamically change events based on the decisions made by the command officers. To build simulation exercises I needed to understand the command structure of policing Carnival and for this I needed access to subject matter expertise.

9.1.2 Command Structure

For the purposes of policing Carnival, the Notting Hill area (West London) is split into five sectors. Each sector is policed by a Sector Team. The team, led by a Superintendent called a Sector Bronze Commander, would be in control of up to five Sub-Bronze Commanders. The following diagram illustrates this. (fig. 9.1). In this set up the role of Silver was far more clearly defined than in the football command structure.

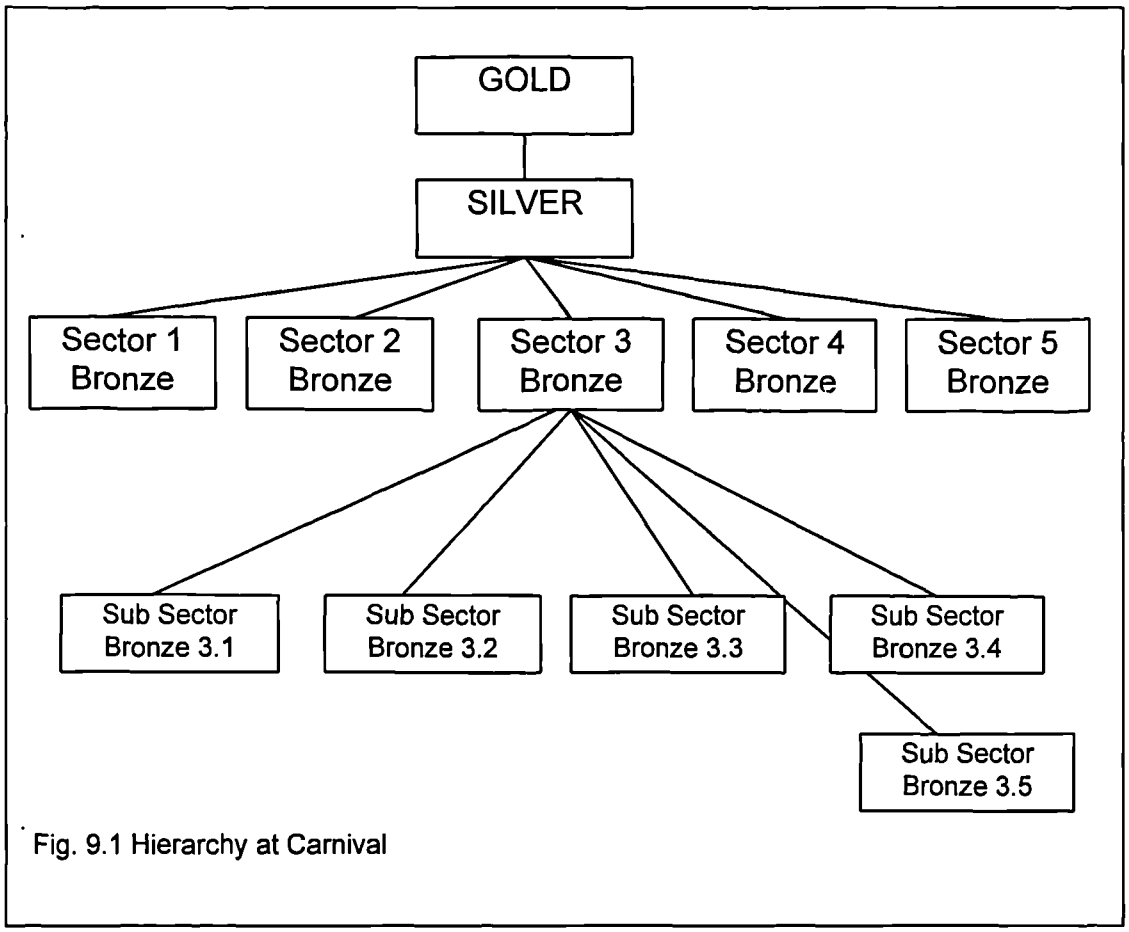


Fig. 9.1 Hierarchy at Carnival

It was agreed with the sponsors, that the training would accommodate each sector team taking each team as a learning group, consequently five days of training were required, one per sector.

There were two possibilities influencing the design of the exercise, I could either create five separate exercises, each one specifically designed to provide high environmental reliability with a real sector, or I could create a generic sector which would be a hybrid of all the five sectors.

During several 'brain-storming' sessions with the subject matter experts (from the central carnival office) the problems facing each sector team were identified. Unfortunately much of this design documentation cannot form part of this thesis as it again contains classified operational information. However this chapter is not about the design of the exercise specifically, instead it is concerned with the

possibilities of generating a generic command and control simulation system.

On review of the subject matter experts findings, it was decided that there was a sufficient overlap of policing problems to justify the generation of a new hybrid sector. To achieve this a sixth sector was generated, designed so that each sector's management team would recognise from it, the problems directly associated to their own sector.

9.1.3 Exercise Philosophy

The design of the objectives proved somewhat problematic. Firstly, unlike the football development, no formal training design work had been done by the Public Order Unit. This unit had been providing Notting Hill Carnival training for some years and I was not able to identify any documentation. The public order department, who ran radio exercises for a whole range of public order policing (riots, marches, ceremonial occasions, royalty etc.) operated by a philosophy where training sessions were created 'off the cuff'. This was achieved by developing a 'set of questions' for each training event. (appendix 10).

During the exercises the trainers took on the role of police units. By using the radio as a way of communicating problems to the Bronze commanders, trainers were able to involve the officers in a partial and restricted world view of the unfolding event. By reporting incidents and responding to the decisions made by the command officers, the training staff were able to generate a role playing simulation exercise.

The weakness of this approach was that whilst the exercise may be considered as a 'free simulation' (Steufert and Sweezy 1992), there was little consistency between one exercise and another. Also the incidents could easily grow disproportionately beyond the reality of Carnival. In anecdotal discussions and inquiries with participants it was suggested to me, that the incidents introduced by the training

staff were often unrealistic and 'over the top'. A typical comment made by a senior officer was:

> "I was always waiting for a plane to crash into the carnival area, we had major fire, gas explosions, terrorist incidents you name it they threw it at us. To be honest the better we did the worse it got. Eventually we were working out how to win, we did it by killing the game"

I observed three exercises at the Metropolitan Police Public Order Training Establishment at Hounslow, West London using this ad-hoc training methodology. During these observations it was clear that if the exercises became unreal the participant would attempt to "kill the game". Participants when faced with problems that were either over complex or lacking credibility would attempt to destroy the exercise, by attempting to deploy police resources, out of all proportion to those that would be deployed (or indeed available) in the real world. This had the effect of overloading the control staff in dealing with the extensive radio traffic this tactic generated. When I visited the radio room, (exercise control) I witnessed at least ten training staff trying to recreate the communication traffic between police units and the command officers.

From my discussions with the participants and subsequent discussion during the development of the Carnival exercise, there was a general feeling that the exercises delivered by the Public Order Centre were unrealistic, and disliked by the command officers.

When I discussed my initial findings with the training staff at the centre they defended their philosophy on the grounds that it enabled each team to explore incidents occurring on their sector in "real time"

and that "anything could happen" (Superintendent Douglas Brand 1994). Therefore their argument was that the content would always dynamically reflect the world they were about to police.

It was clear to me at this time, that a simulation exercise delivered on the system and developed to support the needs of carnival commanders, would have to address the concerns of the target training population.

9.2 Turning Principles into Practice

The creation of a new critical incident management command and control simulator which embraced a new set of learning objectives, but which, at the same time, conformed to principles and protocols developed during the development of the first simulator. This raised the following significant questions for me:

> Can the general principles (as defined in the body of this thesis), be applied to the development of the educational technology, associated to the creation of a Notting Hill Carnival simulation exercise developed in support of senior officer development?
>
> and
>
> After the experience, can the learners take the general concepts and theories generated from the learning environment and apply them to the real world problems of policing the real Notting Hill Carnival?

If the general principles generated from the research associated to the football training system, are applied to the creation of the Carnival exercise, and this results in the generation of an effective experiential

environment that allows for and encourages effective and transferable learning, then these principles can be said to be generalisable (at least to this new training event). If concrete experiences, gained during the management of a hybrid Carnival Sector are transferable to a specific Carnival Sector, then the environment can be said to engender effective, and meaningful learning.

The question was asked in a slightly different way by Bateson (1987). He categorised learning into a hierarchy of 'logical types'. He defined a number of levels of learning. At level 1 the learning can be said to be conditioning, such as Pavlovian conditioning. Rote learning exists within this category. The conveyor type exposure to incidents as seen in the Vistrain system would also fall under this category. The context for learning must always be the same in order for the learner to perform the learned behaviour The neural circuits of the learners can be said to be 'soldered in'. Only when information is presented in the identical context can the learned behaviour be applied. However at level 2 learned behaviours from one context can be adapted to a different context. This is only the case if the learner recognises in the new context patterns of typicality from the original learned context. It is Bateson's level 2 learning I have attempted to generate throughout this work. This concept of transferability of learning from one context to another underpins the main thrust of this thesis. Klein (1995) through his Recognition Based Decision Making model suggests that for effective decision making, decision makers need to recognise relationships between the context that they are dealing with at any given time and patterns of typicality identified from autobiographical memories of previously experienced contexts.

The following section deals with an exercise designed to test whether Bateson's level 2 learning is achievable though the simulation system.

9.3 Exercise Design

9.3.1 Exercise Objectives

This new simulation exercise was generated using the 'Set of Questions' document from the Public Order Department, and additional incidents developed by the Subject Matter Experts (SME) from the Notting Hill Carnival Office. Their objectives were to:

1. Ensure commanders recognised the command structure.
2. Raise the Commanders' awareness of the consequences of their actions.
3. Ensure that commanders understood their role in the context of the management team.
4. Raise awareness of available support resources.
5. Prepare the Commanders to deal with the press agencies.
6. Expose commanders and their teams to a range of incidents likely to occur during the Carnival.
7. Help the command team to understand each others strengths and weaknesses (team building).

9.3.2 Story Board

The responsibility for the development of the story board for this exercise, fell to the subject matter expert SME's. Working closely with the sponsor (Commander for Central London Operations), a set of events and incidents were generated.

The events contained within the simulation are summarised and referenced to their associated command officers in the following table (fig. 9.2).

Event Number	Sub Bronze 1	Sub Bronze 2	Sub Bronze 3
1	Child Abduction		
2	Rogue Float	Suspicious Death	Drugs
3		Serious Disturbance	Stage Collapse
4	Bomb threat		Assists at LTE
5		Crush and Steaming	
6	Serious RTA		Pub Fight

Fig. 9.2

There was also a seventh event, which was a 'warm up' event, to orientate the participants with the technology, including the communications systems

The sector Bronze (not shown in the table) has a co-ordinating role. Referring back to chapter 2 where I described the command structures for command and control, the Sector Bronze's function at the sector level can be viewed as broadly similar to that of Silver in a football event or other public order event. The sheer size of the carnival event dictates that the ground is sectorised. Therefore at the sector level, the command chain is localised to that of a Sector Bronze (co-ordination) and a number of sub-sector Bronze Commanders. At the global level each sector's co-ordinating Bronze, comes under the overall command of 'Silver'.

The detail associated to each of these events and their associated incidents can be found in the 'Trainers Handbook' developed to assist the 'Exercise Control Room' staff included as appendix 11.

9.3.3 Supporting Video

The project was funded by the 'Operations Department' and therefore was given an 'Operational' status. This meant that the resources available included two professional camera crews at the 1994 carnival. They were given a briefing on what video sequences were required. In addition, I had a small team of officers looking through archive video

material of previous carnivals, to find useful footage. I also had access to material held by other emergency services and the news and broadcasting companies.

9.3.3.1 Generation of CD-ROM video

When all the video sequences had been identified and edited, the process of mastering CD-ROM's of the video was begun. The technology, developed during the trials of the football exercise, enabled the manufacture (on site) of CD-ROM's. The process involved digitising the video material to a Motion JPEG format. This high quality video format meant that it was only possible to store 20 minutes of video on each CD. To meet the large amount of video data required for the Carnival exercise, six CDs were generated for each MicroWorld computer workstation, providing 120 minutes of video.

9.3.4 Supporting Documentation

Supporting documentation was designed for the participants, it included maps of the sector, deployments of police resources and an explanation of the simulation system, now given the name 'The Minerva Project'.

The documentation was delivered to the sector team two weeks before the training session. This documentation can be found at Appendix 17.

9.3.5 Support Agents

The simulation exercise would involve a number of support agents. These would include officers from the British Transport Police, London Civil and Fire Defence Agency and the Area Press Officers the Metropolitan Police's Press Office. In addition, I had a video crew from the Specialist Operations Department. Finally the Silver Commander for the Carnival has an active role in the 'Exercise Control Room' during the exercise.

At various points during the exercise, these agents would be used as part of the unfolding events. Associated to the bomb threats at underground tube stations, British Transport Police officers would be on hand to provide advice. They were used for 'environmental reliability' reasons, as the SME's believed that their knowledge of command systems associated to the underground railway would allow them to present the information to the Bronze commanders with a high environmental and process reliability.

At various times during the simulation, the Bronze commanders would be asked to leave their MicroWorld environments and attend a press interview with waiting journalists from various press agencies. Here the officers would be supported by a police press officer. The interviews were designed to last no longer then about ten minutes, and they were recorded, hence the need for the video crew.

9.4 Exercise Logistics

9.4.1 Participants

Each sector had a Sector Bronze and three sector Sub Bronzes, Northern Bronze 5.1, Central Bronze 5.2 and Southern Bronze 5.3 Each Bronze commander has a supporting officer, typically a trusted Sergeant (but also Inspectors could fulfil a support function). Other significant players, were the Office in Charge of the Tactical Support Unit (TSU), late duty Bronze and Bronze in charge of specialist serials such as; Street trading, sound systems, float liaison and Mounted (horses) Serials.

These key personnel represented 13 participants. Representatives from BTP (2), and Press Office (3) provides a total of 17 participants .

9.4.2 Support Personnel

9.4.2.1 The officers in the Exercise Control Room were:

- Exercise Controller

- Radio Operator (2 at any one time but selected from a rotating group of 4)
- Plotter
- Silver Commander

Making a total 7 people

9.4.2.2 Officers Associated to the Press Interviews

- Press officer
- Journalists
- Video Crew (2)

Total 4 People

With the addition of the de-brief facilitator and other miscellaneous staff, each day there were approximately 33 people involved in the simulation exercises.

9.5 Simulation Structure

The timeline for each exercise day is detailed in the following chart.

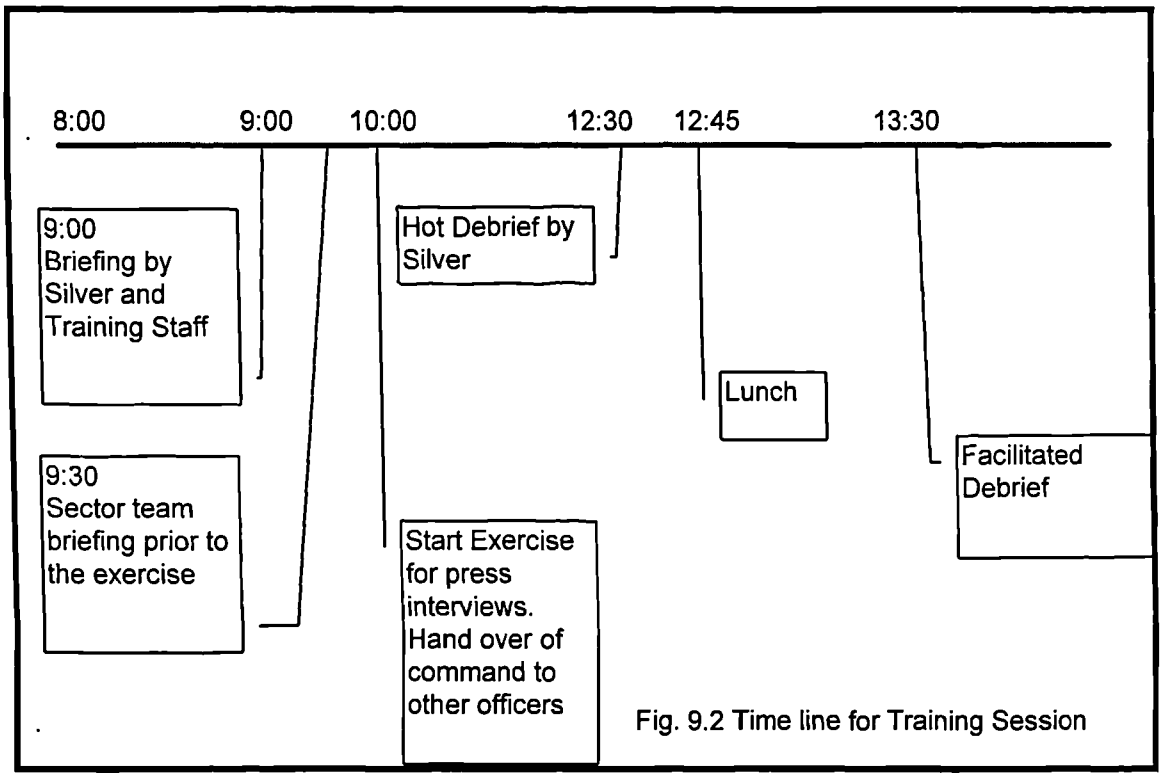


Fig. 9.2 Time line for Training Session

In the following sections of this chapter the general principles developed from my research will be described through their direct application to the task of simulation design and utilisation for the Notting Hill Carnival training exercise.

These principles deal with the following areas of simulation design:

Principle 1

The participants should be given a 'two track' briefing;

(a) Identifying their role in the simulation, appropriate information about the incident they are going to manage and is expected from them during the exercise.

(b) A thorough briefing on the educational technology, its functionality, how they are to interact with its various sub systems.

Principle 2

The participants should be encouraged to 'take ownership' of the operational plan for the event, by allocated sufficient time for the generation of an operations orders and any other appreciation's for the event, by the participants. Sufficient information about the simulated event should be made available and the team must be given total autonomy to generate their own strategic plan.

Principle 3

Incident trigger information needs to be properly contexualised. Video must accurately portray the command position. If this is not possible then other triggers are effective. Such triggers are graphical or text overlays.

Principle 4

To enhance immersion, the video and other information presented through the participants MicroWorld view, should contain trigger information that represents the patterns of typicality leading to recognition Such information should be built up from small information triggers that provide an increasingly rich information context. This will enable the participants to recognise, at an early stage within an unfolding event, patterns that are typical of those found within their autobiographical memory of similar incidents. Supplementary cues and triggers must be available, should participants fail to recognise the primary incident triggers.

Principle 5

To reduce 'decision lag' an on screen indication of the decision time must be given to the students. This provides a measure of urgency in decision making. However this decision timer must appear on each of the MicroWorld display monitors to avoid the 'ringing bell' approach adopted in other simulations.

Principle 6

Sequencing of incidents is critical to the immersion of all participants in the simulation. It is vital that the incidents occurring are multi-threaded incorporating more than one command location. By proper sequencing, the workloads of all the commanders can be controlled and approximate those found in real events. For example, triggers associated to an incident need to be distributed amongst the command locations represented within an event. Then, only by the recognition and subsequent communication of these triggers by group members will the team as whole attain a Situational Awareness of their relevance.

Principle 7

Distributed decision making implies the need for 'Situational Awareness'. This sharing of mental models is only achievable by efficient communication. 'Incident triggers' including 'supporting information triggers', need not only to be sufficiently 'information-rich', but must be presented to the participants with sufficient 'locational context'. The information communicated to the team, must include such an accurate orientational context if it is to provide the team with a valid 'Situational Awareness'.

9.5.1 Team Briefings (General Principle 1)

Using the proven model for experiential learning (Lewin 1952) the day started with a full briefing. Applying the general principles associated to briefing developed in part 1, the briefing would have two dimensions; that supporting the educational technology; and that supporting the strategic command and control issues.

The day opened with the real Silver commander for the event, addressing the sector team. Information associated to the tactical and operational strategies for the event were presented. A detailed briefing on information associated to the training exercise was then presented by the subject matter experts. The student information packs (sent to the participants three weeks before the exercise) were carefully described and any difficulties or confusions were dealt with in this session.

A multi-media supported briefing on the simulation was presented to the participants. This presentation described the operation of the educational technology and the overall philosophy of the learning environment, and followed the structure developed during the football, briefings. Information associated to the operation of the MicroWorld technology was to be given to participants privately within their MicroWorld environment, as per the successful approach adopted in earlier trials.

The Carnival is an annual event, consequently the sector teams managing it, comprise officers who do not normally work together, and although they are public order trained, their geographical distribution around the London area, suggests that they would have had little experience of managing other public order events as a team. Consequently after the initial briefing, the next activity timetabled, was a team based briefing. This briefing was managed by the sector Bronze and was dedicated to discussion about the command

responsibilities of the team members. The team would have had several opportunities to meet prior to the event, as part of the planning process for the Carnival.

This team briefing was a good opportunity for the team to meet as a group and clarify responsibilities and boundaries of command. This session was timetabled for thirty minutes, however no group took less than forty five minutes to complete this task.

9.5.2 Ownership of the Plan (General Principle 2)

The Carnival, being such a major event, differed (from the planning viewpoint) from other command and control events, by virtue of the fact that the command officers were not individually involved in the creation of the Operations Order (which was generated by the Carnival Office).

This meant that trying to apply the general principles developed from earlier research, associated to the generation of planning and operations orders could not be applied in this study.

Unlike the difficulties encountered in football when the command team did not feel that they 'owned the plan', (as discussed in chapter 7), for carnival the command officers would have had many weeks prior to the event to understand and agree the strategy and tactics contained within the Operations Order. They would have had the opportunity to raise any issue and to be actively involved in the creation of the final operations order at the many pre-event briefings that took place prior to Carnival.

I did not therefore envisaged that operating with a pre-defined Operations Order would present a problem during the simulation exercise, and this was indeed the case during the subsequent. training.

9.5.3 Generating The Exercise - General Overview

The exercise began with a short introductory incident which introduced many of the command characters to the participants. For example the Silver commander was shown walking on the sector and various officers known to all the participants appeared in this opening sequence. The overall aim of this introduction was to familiarise the participants with the MicroWorld educational technology and to provide a transition in to the simulation environment. To remind the reader of my definitions of 'immersion' and 'presence' introduced in chapter 5, I have reproduced them below

> *Such immersion is also referred to in the literature as 'presence' and is defined by (Witmer, Singer and Michael 1994) as "the subjective experience as being in one environment (there) when physically in another environment (here)" They go onto state that "Presence may be based on external factors and internal tendencies that support both awareness of the current situation and the transition from the immediate physical location (here) to a remote or artificial environment (there)".*

It is clear that involvement or immersion in the exercise involves the suspension of disbelief. This suspension (analysed from the semi structured interviews) only occurs when the participants 'get into role' and this is dependent on them becoming involved in the decision making after obtaining a good 'Situational Awareness'. This view is typified by a interview fragment taken from the interviews held after the second set of trials (chapter 6).

I mean you actually really get into the role when you are doing this, it is amazing just how much you get into the role. I have done table top exercises before but nothing on this scale,

because you are not just round a table doing it, you are actually physically involved with it, and virtually you are there with it at the time.

The introductory event and its associated incidents, concerns a report of a missing child. This problem is routine at Carnival and the event is structured in such a way as to involve each of the team in what can really be defined as a communications exercise. The simulation events that follow then becoming increasingly complex over time. However the team is at no time subjected to unreasonable or insoluble problems. Also unlike the traditional Carnival training, problems contained within the exercise become resolved, if the team generates workable solutions.

During the unfolding event each of the Bronze Commanders is subjected to an interview with representatives from the mass media, press, TV, Radio etc. The following section describes this in more detail.

9.5.4 Press Briefings

The sponsors for the project wanted the commanders to experience a press briefing as part of their training experience. Press briefings are normally carried out by the command officer in charge of the sub-sector where the incident occurs. Depending on the sensitivity of the incident the Sector Bronze may take on the briefing role. In serious cases the briefing may be carried out by the event Silver, Gold or even the Commissioner of police. It was agreed that in the training exercise, both the Sector Bronze and the Sub Bronzes would each experience a press briefing. To ensure that this experience had high environment and process reliability, Press Officers from the organisation were used to take on the role of mass media journalists. This decision was taken in the light that our Press Officers face the media journalists on a daily basis and were well versed in their techniques. Also, to improve the fidelity of the press sessions, our internal video production unit set up broadcast quality equipment in

an attempt to induce the reality of facing imposing and realistic camera equipment. The following picture shows such a briefing taking place. (fig. 9.3)

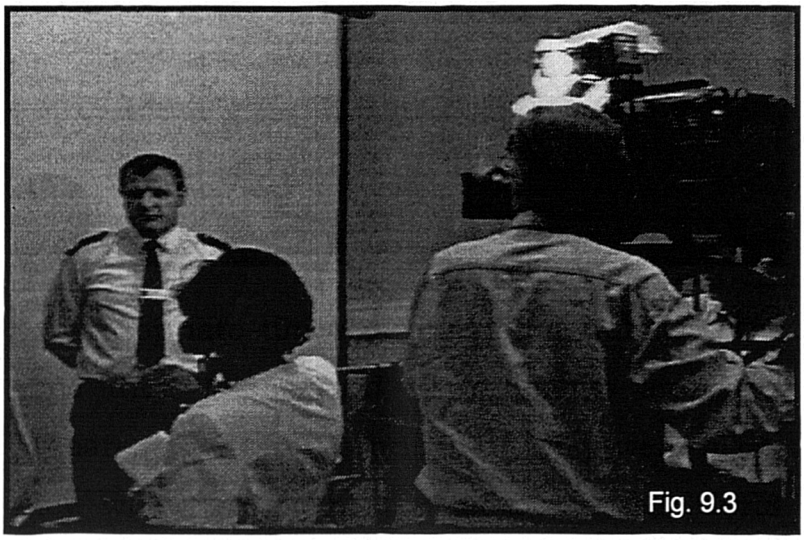


Fig. 9.3

At appropriate times during the simulation, the Bronzes were taken from their MicroWorld environments and given a few minutes to prepare for the press-briefing. They were allocated a press officer if they wished and this reflected the real world. Whilst they were attending the press interview, the event continued in their absence, just as it would in the real world. Therefore that officer had to nominate a deputy to manage their sub sector. The deputy was chosen from a number of sector officers attending the training session but not allocated a MicroWorld role. These officers would be available to the command officers during the day of the carnival and so again reflected reality.

At the end of the press interview, (which lasted no longer than 5 minutes) the command officers was given the opportunity to review the video that resulted with a media relations expert. This provided immediate feedback to the officer. At the end of this session the officers was given a copy of the video tape and re-entered the MicroWorld environment. There then followed a hand-over session where the command officer was appraised of events that had occurred

during their absence, by the deputy. The exercise was designed so that each of the command officers could leave and attend the press briefing without generating a major impact to the unfolding event.

9.5.5 Hot De-brief

At the end of the exercise, the officers were assembled in the presence of the real Silver Commander for the Carnival for a 'Hot De-brief'. The objective for this session, was to raise any strategic issues. Any uncertainties of the overall strategy were raised during this short session. The sponsor wanted this session to take place as he was asked by my design team not to attend the longer reflective review sessions later in the day. The rationale for this was that, based on lessons learned during the football exercises, the reflective review should be seen by the participants as a very safe and non judgmental learning environment where they could explore their own performance. To have the overall Silver commander present would have undermined this feeling of safety.

9.5.6 Facilitated Debrief

After a break for lunch, a facilitated de-brief took place using the de-brief technology described in the previous chapter. The debrief technology accommodated the 'reflective review' stage in the Lewinian model and the strength of having a trained and able facilitator driving this session was seen by the active discussion he initiated with the participants. The de-brief technology enabled individual radio messages to be replayed as well as video triggers. The philosophy used here was to allow the de-brief discussion to drive the technology and not the other way round. The technology was only used when there was either a need to properly contextualise an incident in terms of problems each commander was dealing with at the time, or when there was a disagreement amongst the group about what happened during the simulation.

9.5.7 Creating The Video Trigger Information (General Principle 3)

The video shot at Carnival 1994, was combined with archive footage held by the public order department. Applying general principle 2, namely that incident trigger information needs to be properly contextualised, the three classifications of video triggers developed in chapter 6 were applied. These were:

1. Situational Back-drop video
2. Trigger information
3. Supporting information

The background video information was generated from long sequences of material, either shot especially for the project or taken from the archive footage. The laser video storage constraint of 37 minutes per disk had now been resolved with the development of CD-ROM storage capability for the system. Now it was possible to store up to 3 hours of video locally at each MicroWorld computer workstation. The Situational Back-drop video consisted of long *inert* sequences, which provided an appropriate backcloth against which to present the trigger video information.

9.5.8 Unfolding Incidents (General Principle 4)

Incidents within the simulation developed in a very realistic way. Looking at general principle 4, the incidents were "*built up from small information triggers that provide an increasingly rich information context*" (general principle 4, chapter 7). To achieve this, a number of 'transfer' video sequences were generated. A transfer sequence, is one where the video depicts the movement of a command officer from one physical location to another. For example, there is an incident involving a serious accident, where a person has been badly hurt after coming in contact with a moving float. If the command officer dealing with this problem wishes to visit the scene (or is commanded to by his

or her commander) , he or she would have to walk from their present location to the location of the accident. The *transfer* sequence would be video depicting the walk. A major benefit afforded by the large storage capacity for video now built into the system, was that if in the real world of carnival it would take eight minutes to walk between these two locations, I could now play a transfer incident which would run for the same eight minutes during the simulation, thus affording increased content validity.

Again, using earlier findings, a number of *supporting information* incidents were designed to be 'fired' should participant fail to recognise cues.

9.5.9 Sequencing Incident (General Principle 6)

Recognising from the major trials that the command officers became deeply immersed in the exercise when they were presented with multi-threaded incidents. I carried this forward into the carnival exercise. Using the story board template protocols developed in chapter 6, I was able to generate such multi-threaded events and distribute them to the relevant commander. The exercise contained six major events, equally distributed amongst the command team (fig. 9.2). These events were not serial however. Artefacts from decisions made earlier in the simulation, still impacted on the decisions made subsequently. For example, if a commander decided to send in an arrest squad then he or she may feel the impact of that decision sometime later, when those resources were not available (due to processing prisoners) for deployment. Also a high profile decision e.g., the re-routing of the carnival procession, would have artefacts which may last for the entire carnival event. The storyboard protocol templates were a useful tool in the construction of the exercise, as they provided the design team with a useful representation of the simulation at any one time and the

relationships between possible decisions and their knock-on' effects could be seen easily.

9.5.10 Situational Awareness (General Principle 7)

This general principle was applied to the design of incidents whose triggers were distributed between different command locations. Particular incidents were broken down into small incident triggers and these triggers were presented to the participants' MicroWorlds. Only after initial recognition and then by the subsequent communication of the information through radio of telephone systems, would the team be able to obtain a Situational Awareness of the problem.

9.6 Evaluation of the Simulation Exercise

Two methodologies were employed to provide an evaluation of the exercise. Firstly the participants were asked to complete a questionnaire. The questionnaire differed from the one used for the first, second and minor trials of the football exercises in that I was not constrained on this occasion by training school policy, to adapting a general questionnaire for my purposes. Instead I developed a questionnaire that would provide specific information on a number of simulation dimensions The questionnaire was sent to the participants *before* the Notting Hill Carnival. The questionnaire can be found at appendix 12. I will explore the data generated by the questionnaire in greater detail later in the chapter.

Secondly I wanted to evaluate participant immersion during the unfolding event and in particular the stress they were under while in the simulation compared to those of the real event. A comparative measure of stress levels would, I believe, validate the effectiveness of triggers problems, layering, complexity and sequencing within the system by establishing if these elements synthesise to evoke a real world response in participants.

9.6.1 Relating Immersion to Stress

Decision making within complexity, where conflicting information and competing goals vie for priority and attention in the mind of the decision maker generates stress. Stress is defined by Flin who argues;

> "Stress occurs when the commander judges that the degree of demand in the environment (danger, time pressures, responsibility) is greater than their personal resources (knowledge, skills, support from others) to match this perceived demand" (Flin 1996)

One commander faced with a complex set of choices may feel calm, confident and totally in control, while another in the same situation could become uneasy and irritable (Cox 1993). Therefore stress (or the lack of it) is dependent on a number of factors and these include, skill, knowledge and prior experience. Weiseath (1987) in his description of stress in leaders of rescue personnel states, "the most important single factor determining how one reacts and manages in a crisis situation is the level of training and experience one has"

Flin goes on to state that team co-ordination appears to be a critical factor in effective emergency response and team training needs to be conducted in realistic pressure situations to give commanders exposure to the management problems.

Looking at the video tapes of participants during the simulated football exercises, one can clearly see (especially in later trials when the system had been further refined) considerable signs of stress. At times the commanders became intolerant of their colleagues and this presented itself in shouted or angry radio messages, lack of communication or disagreements between commanders and support officers in the MicroWorld environments.

This is consistent with a report sponsored by the Home Office on stress in police officers responding to disaster, it states:

> "Some common physical signs of stress are flushing, sweating, irritability or itching, aggression, inefficiency, over zealousness, loss of confidence or interest, or any combination of these factors."
>
> (Home Office 1992)

There were two explanations for these observed behaviours. Either the participants were becoming agitated as a response to their frustration in not having access to information that they were likely to be party to in a real event. This indeed was most likely the case in early trials, where the commanders were presented with information relating to the unfolding incidents through their displays and had difficulty orientating the incident triggers to a logical location within the stadium. These frustrations were reduced substantially by improvements made to the system over subsequent trials as detailed in chapter 7. Or, as the workload increases, commanders were faced with less time to analyse information, obtain a 'Situational Awareness' of the problem or set of problems and communicate their decisions. This compressed time dimension (mirroring reality) is a likely contributor to stress as defined by Flin and others.

9.6.2 Objective

The objective of the evaluation was to determine whether there was any correlation between measured participant stress levels whilst undertaking training in the simulation system, and stress levels measured whilst those individual officers managed the event, i.e., the 1995 Notting Hill Carnival.

9.6.3 Physiological Effects of Stress

The physical responses to stressors are related to the flight / flight response where the consequent release of hormones (e.g. adrenaline) into the blood stream prepares the body for action by slowing down non-essential functions, such as digestion (hence the feeling of dry mouth, butterflies in the stomach) and gearing up the heart, lungs and muscles with extra power. Thus the heart beats faster to pump more blood to the lungs for oxygenation. Breathing rate quickens to increase oxygen intake and there is an enhanced blood-flow to the muscles. Sweating occurs to provide the necessary cooling during this process.

These physiological effects presented in response to stress can be measured. The two least intrusive methodologies for measuring indications of stress are the monitoring of heart rate and sweat rate. There are a number of methods available for the real time measurement of these stress indicators. (Brody et. al. 1994)

For heart rate, the two common methods are; using a transmittance pulse transducer attached to the ear lobe or fingertip; or to attach electrodes to the chest to measure the electrical impulses controlling the heart. This method is called ambulatory electrocardiography and was the preferred method for the evaluation as unacceptable errors were anticipated when using ear lobe and fingertip measurements for mobile participants such as in this work.

For measuring sweat output, the electrical conductivity of the skin can be measured. As sweat is produced the electrical resistance of the skin reduces. This phenomenon is also known as the Galvanic Skin Response. To measure this value electrodes are strapped to the fingers of the subjects and a device applies a small voltage across the electrodes. The resultant current flowing between the electrodes in

proportional to the conductivity of the skin surface provides a measure of sweat present between those points.

9.6.4 Equipment

For the heart rate measurement a Holter Monitor was chosen. This device comprised two components; a recorder unit and the electrodes to be fixed to the subject chest area. The recorder (looking much like a 'Walkman') held a compact audio cassette onto which were recorded the impulses collected from the chest electrodes.

For the galvanic skin response a Aleph 1 Model Q Relaxometer was chosen. This device also comprised two components, the signal generator and the fingertip electrodes. There was no facility to record readings.

9.6.5 Field Tests

The services of technicians from the Wellhouse (a NHS trust comprising Barnet and Edgware hospitals) were secured. The heart rate equipment selected was equipment routinely fitted to heart disease patients who needed heart rate monitoring for extended periods of time away from the hospital. The technicians were very familiar with the technology and had sophisticated analytical equipment to analyse the recorded heart rates from the device.

The galvanic skin response equipment proved to be problematic. The field test readings obtained by using a sample of officers working at the training school were unusable. The device was extremely sensitive to body movements and consequently if a subject just raised an arm a few centimetres the reading changed dramatically and would not return to the value prior to the arm movement. After much modification to the electrode set it was concluded that the equipment was unsuitable for the sort of research anticipated here and therefore the collection of galvanic skin response readings was abandoned. The

major measurement of psychological stress in this series of experiments was consequently, ambulatory electrocardiography.

9.6.6 Subjects

The subjects chosen to take part in this evaluation were the overall Silver Commander and Sector Bronze Commanders from each of the five Notting Hill sectors. In total this represented six command officers.

9.6.7 Minimising Extraneous Variables

According to the literature (Sharpley 1994,Pucheu et. al. 1993, Dobkin & Pihl 1992) care must be taken to ensure subjects readings are not effected by "sympathetic stimulation caused by emotional, exertional, or other physiological stress". Also it was important to ensure that the subjects were not under any medication that would effect their heart rates.

Consequently, the subjects were sent a briefing note which contained a consent form which required the subjects to complete a small questionnaire to determine whether there were any extraneous variables to consider. The briefing note can be found at appendix 15.

9.6.8 Methodology

The subjects were each sent the briefing note and consent form to sign and return. For the laboratory experiment, the subjects were to be 'wired up' to the monitors thirty minutes before the start of the training day in the simulation facility with the units removed at the end of the training day, approximately eight hours later.

For the field experiments, the participants would have the equipment attached when they arrived at 'ground assigned' on their sector. The overall Silver Commander would be 'wired-up' at a location of his choosing. Each unit would be removed at the end of the de-briefing

approximately sixteen hours later. (note, it would not be possible to arrange for removal whilst the Carnival was running)

For both the laboratory and field measurements a log of activity would be generated noting the activities the commander was engaged in throughout the time the monitors were recording heart rate. This log was to be generated in real time, in the field, by the commanders 'runner' and a full briefing would be given to this officer in anticipation of that role. For the laboratory, a video tape recording would be synchronised to the tape held in the heart rate recorder. A detailed log would be generated after the simulation exercise as all actions of the command officer and his or her support officer would be captured on video tape. Logs for all subjects both from the laboratory and the field experiments appear at appendix 13.

9.7 Data from Simulation

Out of a possible six, four participants signed an agreement to participate on their consent forms. The following data represents the maximum heart rates recorded from the participants during the simulation exercise. These heart rate values were generated by a diagnostic tool called the Pathfinder 3 Analysis Machine. The tapes were analysed by technicians at Edgware General Hospital, the full charts generated by the analysis machine can be found at appendix 14. Below are the summary charts produced by plotting the maximum heart rates recorded by the machine to a resolution of 5 minutes. (fig. 7.4-7.7.7)

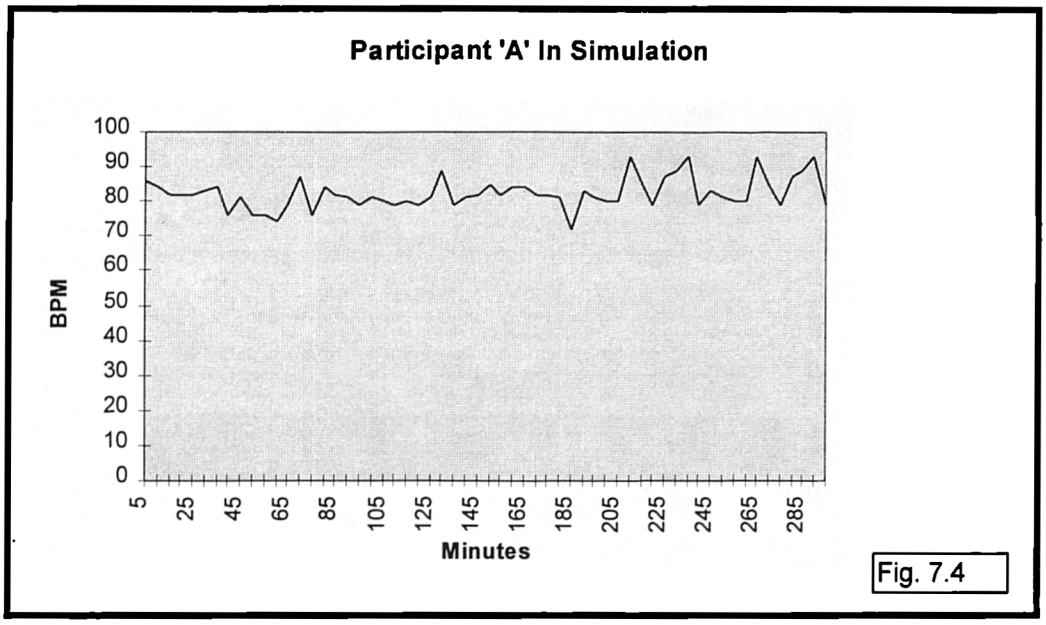

Participant 'A' In Simulation
BPM
100
90
80
70
60
50
40
30
20
10
0
5
25
45
65
85
105
125
145
165
185
205
225
245
265
285
Minutes

Fig. 7.4

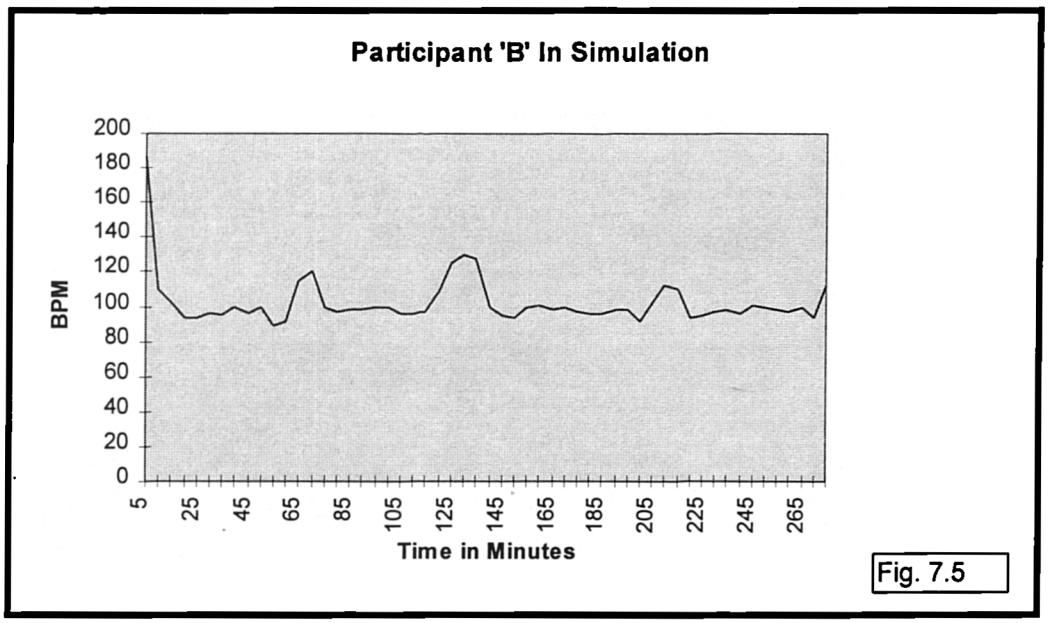

Participant 'B' In Simulation
BPM
200
180
160
140
120
100
80
60
40
20
0
5
25
45
65
85
105
125
145
165
185
205
225
245
265
Time in Minutes

Fig. 7.5

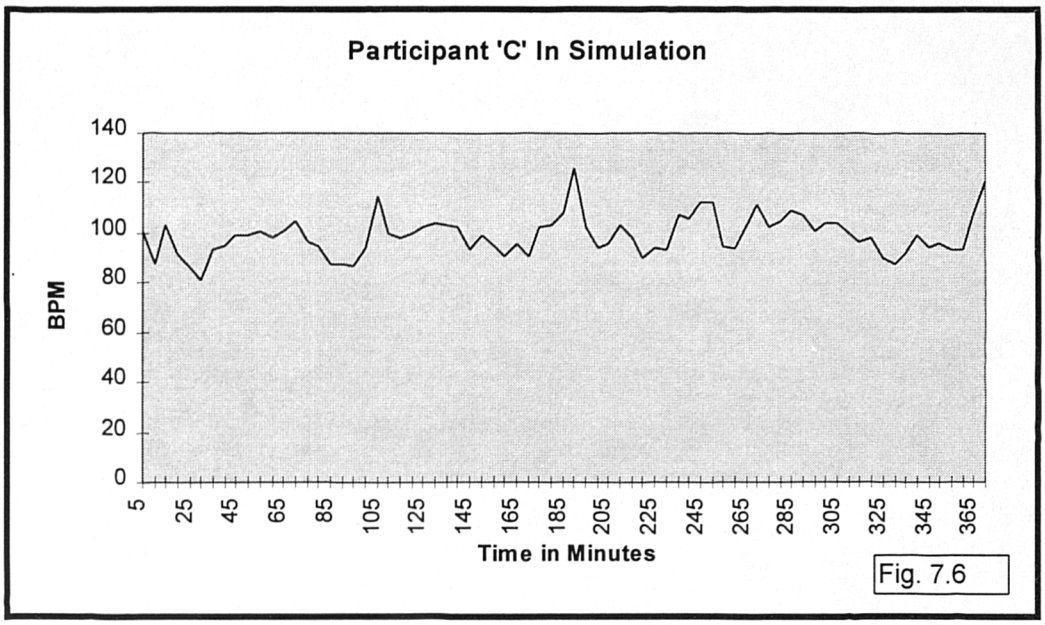


Fig. 7.6

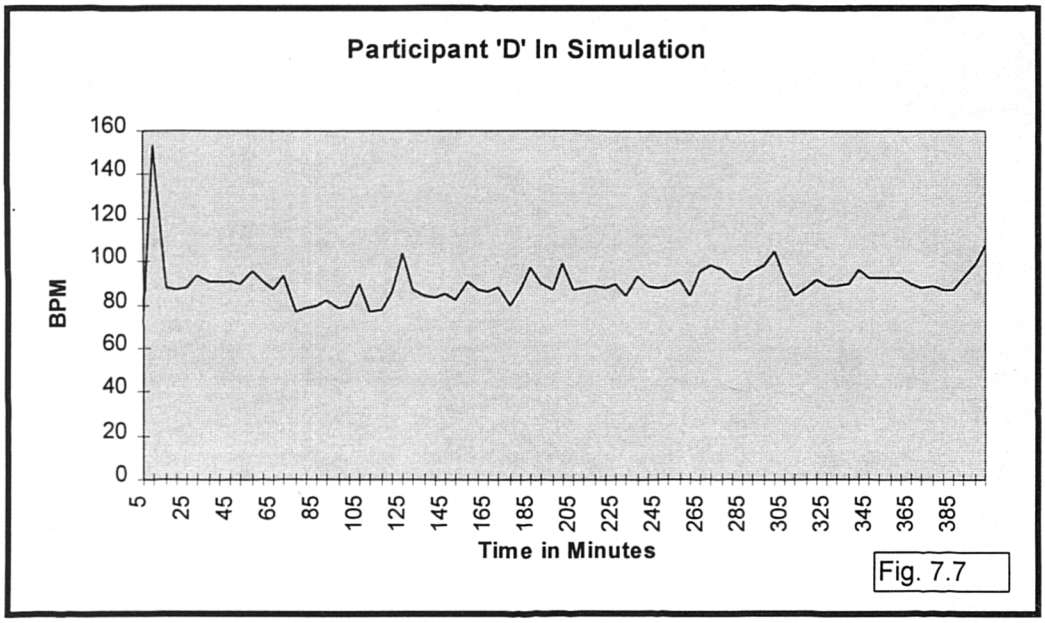


Fig. 7.7

9.7.1 Analysis of Activity Logs

For each participant an activity log was generated from the video tape of the MicroWorld environment. These analyses were made after the simulation sessions and appear at appendix 13. There purpose was to provide a record of participant activity that could be overlaid on the heart rate data.

Comparing Participants

Below is a chart comparing heart rates recorded by all participants Each trace is colour coded to represent a particular participant. (fig. 7.8)

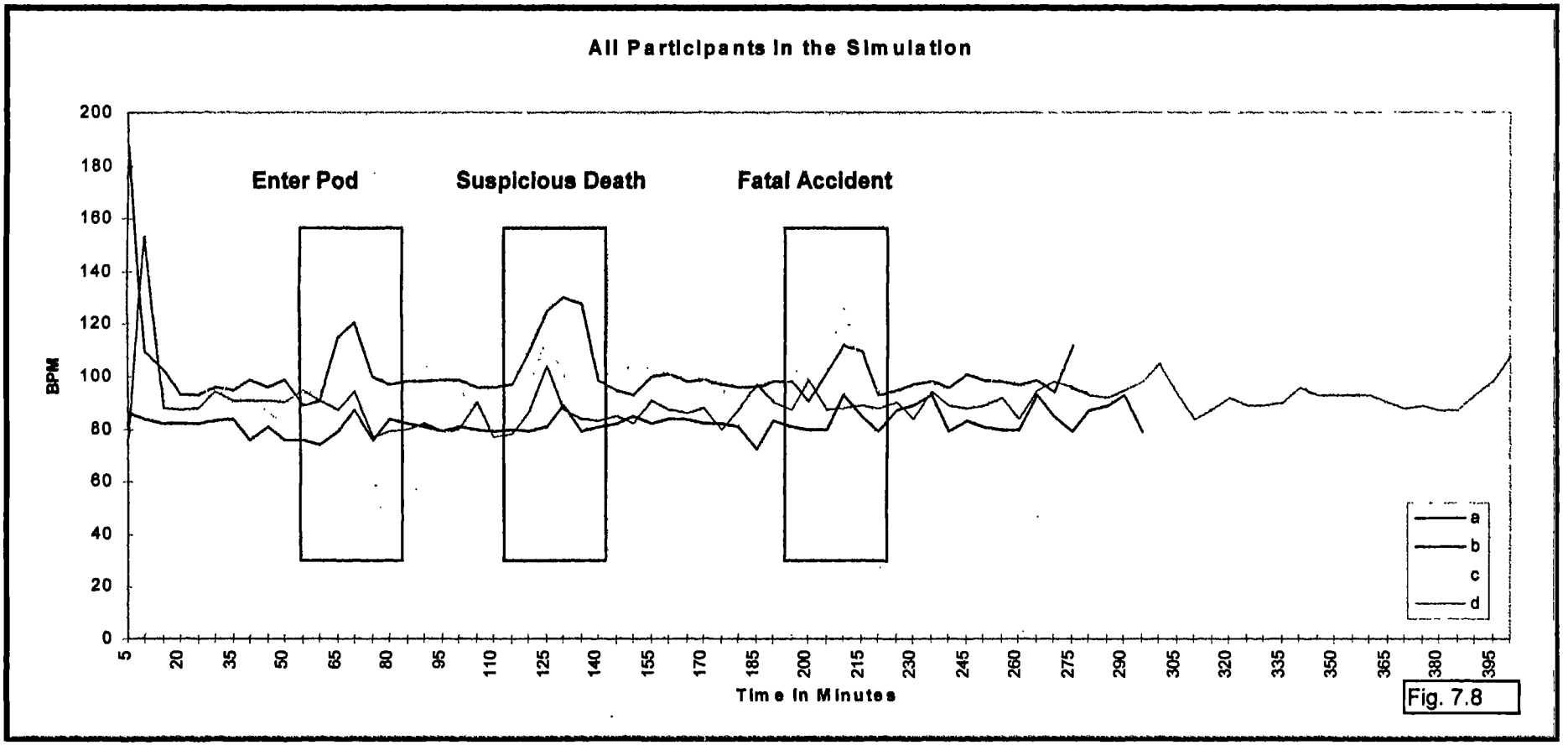


Fig. 7.8

9.7.3 Data From Real Event

Below are the summary charts of officer's heart rates recorded at the real Carnival Event. (fig. 7.8-7.11) The officers had the recording equipment on for approximately twelve hours.

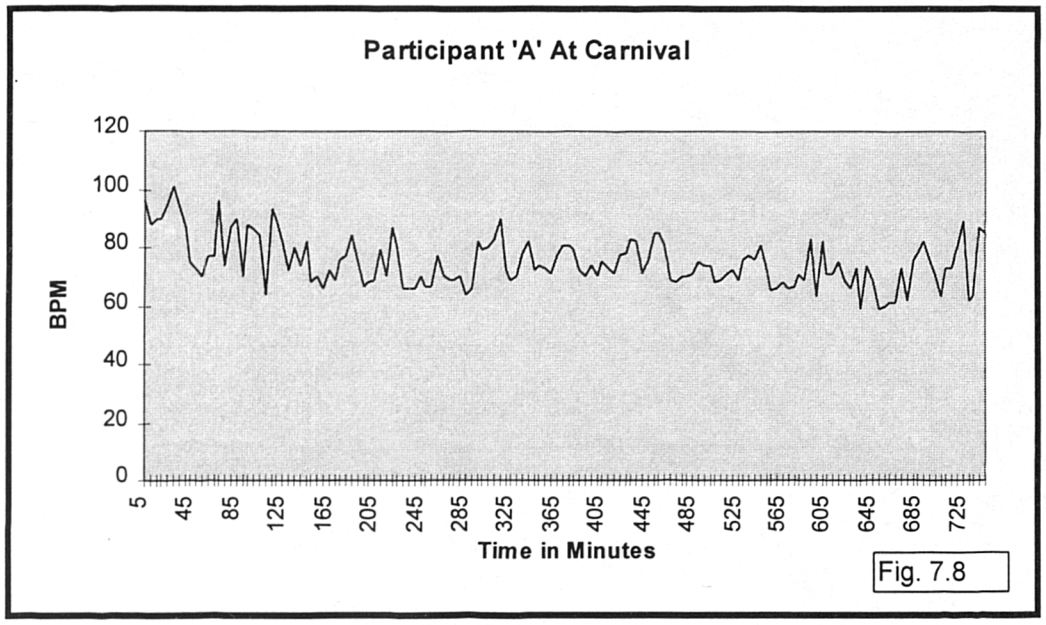


Fig. 7.8

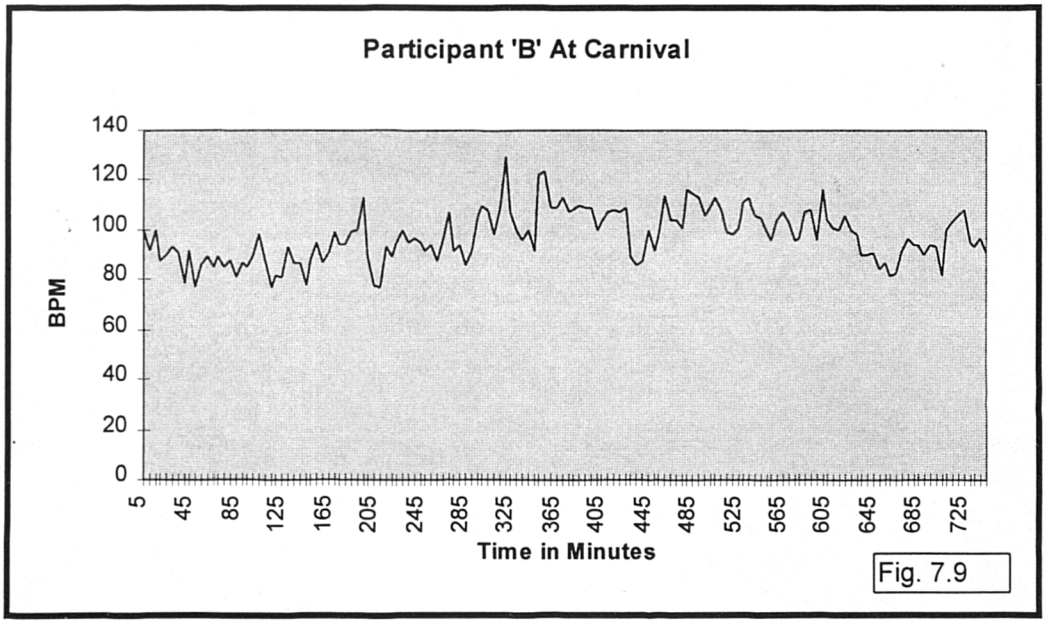


Fig. 7.9

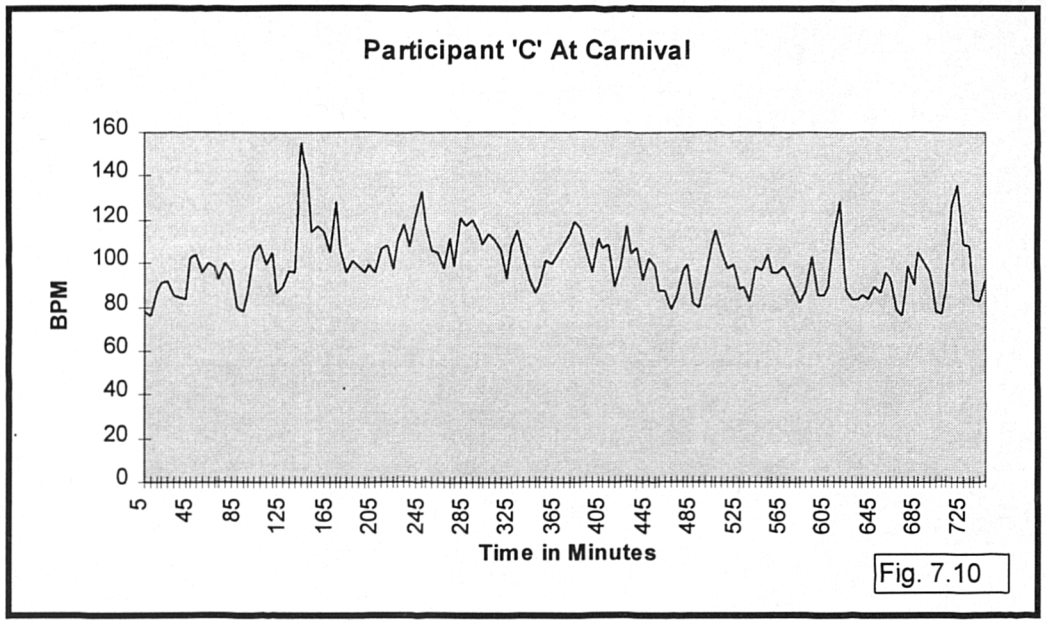


Fig. 7.10

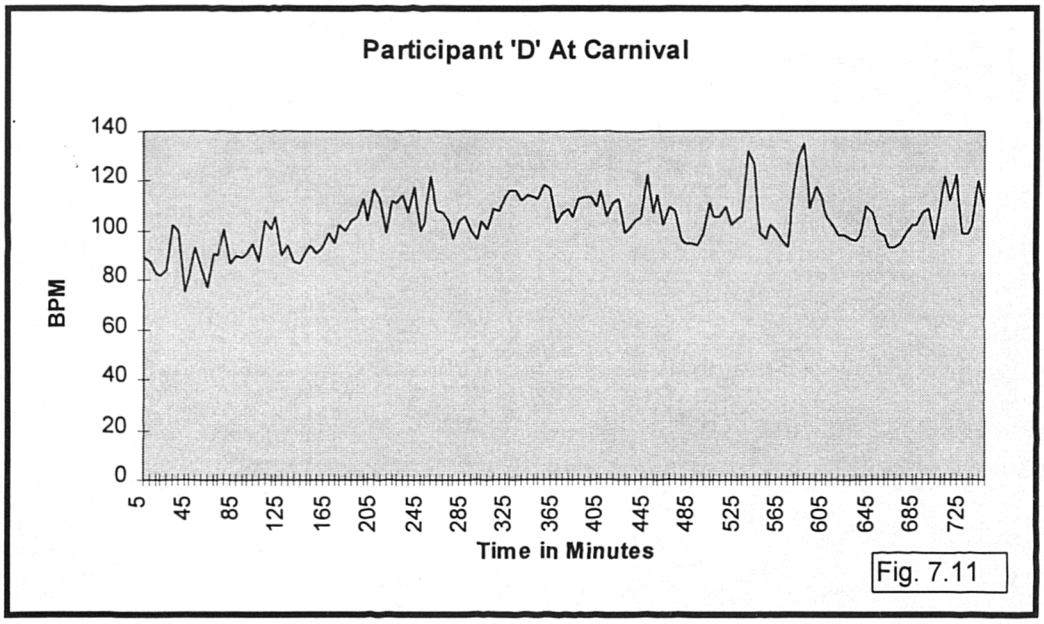
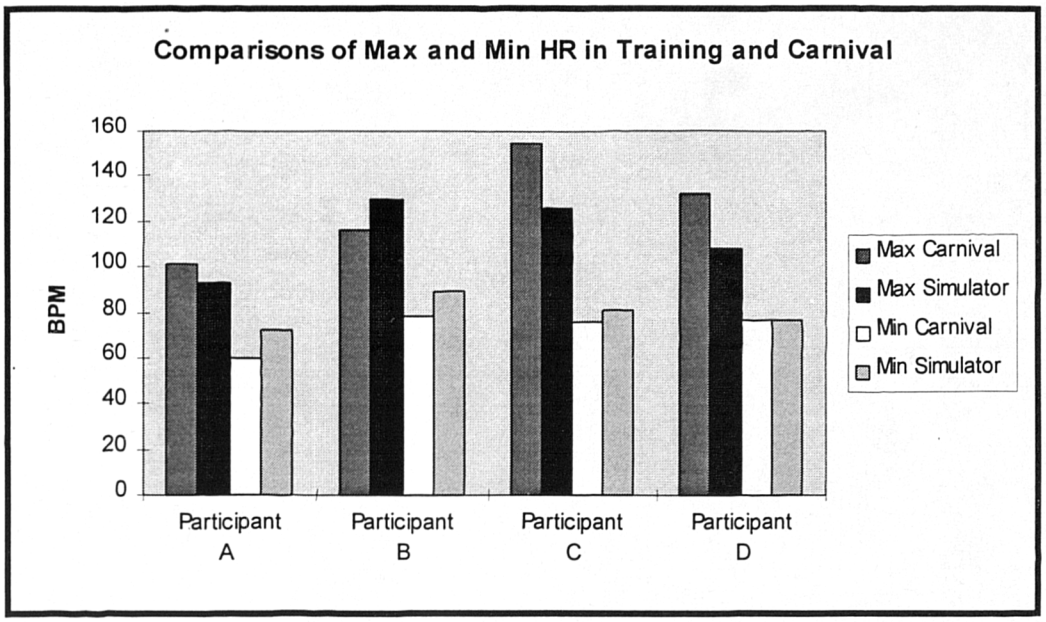


Fig. 7.11

9.7.4 Comparison of Raw Scores from Real Event and Simulation



9.8 Discussion

9.8.1 Heart Rate Measurement

The findings from the heart rate recorders were particularly interesting. Firstly it is clear from the chart comparing all the participants in the simulation, that all four readings correlate at least three times during the simulation. The four officers were in two different classifications; those officers who were commanding the simulation from within a MicroWorld environment and the Silver officer who was managing the exercise and providing command and control advice to the directing staff. Consequently, looking at the chart comparing all the subjects it is interesting to note that the measured heart rate from the Silver officer correlated with the readings from the other three command officers. This was initially counter intuitive as the Silver officer's role had not been built into the simulation design. However, on further reflection the fact that this officer's heart rate fluctuated in unison with the officers who were immersed in the 'hot seat' is a measure of the systems ability to

immerse all the participants including the observing 'Silver' into managing an event.

Looking at their heart rates compared to readings taken at the real event I found that the subjects presented similar patterns of heart-rate peaks and troughs during both experiments.

The reader is reminded that officers in the simulation were measured whilst sitting at a computer screen inside the MicroWorld environment. Increases in heart rate could not be influenced by physical exertion and this is supported by video tape recordings made at the time. This however was not the case at the carnival, where such an intervening variable arose because officers were on foot patrol and sometimes running to different vantage points.

There was great value in having activity logs completed on each participant, as in analysing the readings, a differentiation could be made between heart rates associated to command stress and those related to physical activity. The following charts compare the heart rate readings for all of the four participants in both the simulation and the carnival activities.

Participants During Simulation

	Max. Heart Rate	Min. Heart Rate	Difference
Participant A	93	72	21
Participant B	130	89	41
Participant C	126	81	45
Participant D	108	77	31

Participants at Carnival

	Max. Heart Rate	Min. Heart Rate	Difference
Participant A	101	60	41
Participant B	116	79	37
Participant C	155	76	79
Participant D	132	76	57

Looking at the chart comparing the heart rates found in the simulation exercises, each participant followed a similar pattern but the whole pattern was shifted up or down the 'y' axis indicating the range of upper and lower limits for each subject. This trend can be seen repeated in the readings for the real event with a significant difference; namely that all the participants had lower minimum heart rates during the carnival itself. There may be many explanations for this, including the possibility that the officers were more anxious when taking part in a technology driven simulation than in their natural command and control environment. However, it is likely that as the participants were connected to the heart-rate monitors for twelve hours during the Carnival event, the lower levels obtained when the officers were resting or taking refreshments, was more of an accurate 'resting' heart rate, than that recorded during the relatively short time of the simulation exercise.

For clarity, I have over-laid some indications of simulation events at specific times insofar as these events coincide with heart-rate peaks which would indicate levels of significant stress. These markers however relate not to a single event but to compound events and incidents. The reader is reminded that events in the exercise are multi-threaded and this means that more than one command problem

is active at one time. As only the sector commanders were monitored, it is important to note that at these times of peak stress, the officers were managing a number of related and unrelated problems, in accordance with their role as a sector co-ordinator.

Addressing the first part of the research question associated to this part of the work;

> Can the general principles defined in the body of the research, be applied to the development of the educational technology, associated to the creation of a Notting Hill Carnival simulation exercise developed in support of senior officer development, where command officers recognise from the simulated environment significant patterns of typicality?

The evidence from the stress levels recorded from the participants suggest that they were most definitely recognising the triggers from the environment. This view is given further support by the response from the questionnaires.

9.8.2 Questionnaire Responses

25 Questionnaires were sent out and all were completed. The full questionnaire can be found at appendix 12.

Looking at question 1 "How realistic was the simulation? 36 % of the respondents agreed that it was highly realistic with the remaining 64 % agreeing that it was moderately realistic. When asked "To what level did you gain a sense of actually being at Carnival 80% of respondents agreed with either a moderate or a deep sense of actually being there. Coupled with the readings from the participants taking part in heart rate monitoring, clearly the system was able to encourage a 'suspicion of disbelief' and immerse the participants.

Looking at the effects of the simulation facility on the immersion of the participants, only 8% of respondents felt that the cinema facility (the location of the simulator) hindered the sense of realism. When commenting on the MicroWorld environment (pods) 88 % of the respondents felt that the audio levels assisted in the sense of realism.

Looking at the second part of the research question;

> After the experience, can the learners take the general concepts and theories generated from the learning environment and apply them to the real world problems of policing the real Notting Hill Carnival?

Again the questionnaire responses suggest that this is the case in response to question 5 "How easy was it for you to relate what you saw and heard during the exercise to Carnival itself" 76% agreed that they found it easy to relate the simulation to carnival. Bearing in mind that the exercise was built on a fictitious sector that contained the sorts of command and control problems found on each of the five Carnival sectors, the response suggests that the reflective review element of the simulation exercise was successful in generating general concepts and theories and these were indeed transferable to their real operational environment.

In relation to the success of the system as a learning tool, the participants where asked "How would you rate Minerva as a group learning exercise?", 88% of respondents agreed that the system was either 'very' (56%) or' moderately' (32%) effective and when asked how they rated the system as an individual learning exercise 76% rated it as very effective and 24% as moderately effective.

Perhaps the 'acid test' of the system as a learning tool is to ask whether the participants felt prepared to manage the policing of

carnival (question 18), 84% felt that they were either fully (20%) or mostly (64%) prepared to manage the policing of Carnival as a result of immersion within the simulator.

96% of respondents felt the initial briefings either fully (44%) or mostly (52%) prepared them to tackle the exercise. This implies that the structure of the initial briefings developed from the early trials were applicable to this new simulation exercise. Support information also proved effective with 92% finding the materials enabled them to be either fully (44%) or mostly (48%) prepared for the exercise.

The principles associated to event sequencing developed from initial trials were also transferable to this simulation and this is supported by the levels of immersion experienced by the participants.

9.9 Chapter Summary

This chapter was designed to test whether principles developed in the design of a football simulation exercise were transferable to the design of other command and control simulations. A new exercise was developed using the identical educational technology. Design principles associated to all elements of the simulation were applied to this new context.

Two direct measures were used to determine how involved the participants had become during the experience. The decision to use physiological measurement of participant heart rate to support observations and questionnaire feedback methodology, proved to be a useful measure and one worthy of further research.

The general principles developed from the main research did prove transferable to the new exercise. This is supported by the responses made by the participants on the questionnaires, observations that I made, from the comments of the directing staff together with comments and letters received from the sponsor. The main benefit of this operationally based research was that in parallel with the experiment, the system delivered high quality, relevant and timely training prior to a major policing event in the capital city.

The last chapter of this work provides a summary of the whole thesis and describes the possible directions for further research

10. Concluding Discussion

10.1 Overview of the variability and validity of the experimental observations across the thesis.

10.1.1 An analysis of systemic testing as applied to this work

"According to Jones (1970) systemic testing will identify "group responses" far more efficiently than traditional scientific methods, providing that those responses show a marked and systematic trend" (Powell, 1974).

However, the findings from systemic testing, are only applicable to the system being tested and will only be reliable if the conditions of the experiment remain constant. This work has taken findings from its experiments whose methodology was systemic testing and applied them to like problems in like situations. For example, the general principles that arose from the application of systemic methodology to the investigation of the effectiveness of the system, were then subsequently applied to the design and implementation phases of both a second and third generation simulation system as a means of validating the quality of immersive experiential learning they were able to generate. The outcome of this application of 'systemic testing' methodology suggested that Jones's position on the narrow scope of systemic reliability may have been understated. I recognise however, that this cross-system application maybe considered a relatively narrow expansion whereby the findings from the application of this methodology became tested within a comparable simulation environment.

In retrospect, this methodology has proven to be a powerful research tool, in that it has enabled complex systems components and their interaction to be rendered understandable in both their integration

within the overall system when viewed holistically, and individually (as contributory elements within that system) when viewed from a reductionist perspective. Limitations did arise, principally associated to the examination of the effect of single variables on the functionality of the system. It was not possible, for example, to identify with absolute certainty the impact of all of the small changes made during the development of the educational technology, specifically, the impact of subtle changes to the MicroWorld interface on the users.

10.1.2 Implications of sample size and selection criteria

A significant research issue throughout this thesis has been the constraining nature of sample selection criteria. This issue was inextricably bound-up with the need to create meaningful, relevant and usable data on the effectiveness of a command simulator which had a real and important role to play in the preparation of skilled ground commanders who would be policing major events and whose actions would have significant consequences. These constraints arose because there was a need to ensure that participants selected for all trials, experiments, observations, physiological stress measurement and interviews, had sufficient and valid operational command experience in order to interact at an appropriate level with the simulation elements presented to them and therefore provide qualified and meaningful feedback on their perception of the fidelity of the system. This constraint also arose for another reason, namely, that I was under an obligation to integrate simulation activity within the National Major Sporting Events course and as such would have to ensure that any system developed met the learning needs of this student population.

An obvious result of this constraint was that sample size was necessarily small and would arguably impact on the generalisabillity of findings to a wider population. This is not the case. It must be

remembered that the true size of the population of public order trained ground command officers is in actual fact relatively small, (no more than 200) and as such, the size of my samples was sufficiently representative as to throw up significant findings applicable to this broader population. Even nationally the pool of public-order trained and experienced officers is of a size that my samples retained their representative character and, as such, I would argue that findings arising from this research would be transferable to the national police population of the United Kingdom.

Within the real world of operational policing the availability of specific officers for my research purposes will always be subject to the exigencies of operational duty, the consequence of this for my research is that, sampling criteria (for example, random, stratified etc.,) has to reflect this ongoing reality. The result being that I was forced to work within the limitations imposed by the availability of a limited but select group of officers who met my sample criteria by virtue of their skills base and their experience. It must be said that this would have had no impact on the reliability of findings as fortunately I had access to officers across a broad spectrum of command positions.

10.1.3 The triangulation of chosen methodology

I acknowledge that the choice of research methodology for this work necessarily impacts upon the shape and nature of its findings. Clearly, the choice of alternative methodology may have thrown up different results. It is my belief that the nature and complexity of the system under analysis was itself suggestive of the means by which its workings and effectiveness should be studied. I have already spoken at length about systemic testing and its strengths and limitations both in the body of the thesis and in the opening section of this chapter and would add only that it had a very good fit with the subject of the research and was chosen because of this.

In an effort to 'play to the strengths' of specific methodology whilst accepting and accounting for their individual limitations I set out (where possible) to examine any given element, behaviour or process from a number of different methodological perspectives. Typically, I sought to triangulate methodological approaches and then compare and contrast the finding in an effort to tease out ambiguity, similarity and latent meaning.

Learning is quintessentially a human activity whose meaning can only be fully captured by allowing for unique, personal lived experience. As before, this factor is suggestive of methodology able to account for this uniqueness, by way of example, a respondent having been immersed within a complex and challenging learning experience may interpret its significance and meaning in ways that are personal and relevant only to him or her. To capture this meaning it is imperative that chosen methodology provides space without imposing structure, such that the respondent is free to explain his of her thoughts and feelings on the matter. Open ended and semi structured interview techniques have this flexibility of approach and were adopted extensively for this reason.

At the same time, the behaviour and activities of this subject were viewed from an external and more objective position through video observation, the findings from which arose through a detailed interpretative logging activity where behaviours were encoded and recorded against a temporal framework which was also 'activity-referenced'.

To overcome observer bias, possible from external behaviour observations and their interpretation, and to account for and overcome the subjective nature of open-ended and semi-structured interviews a third methodology, that of structured questionnaire, was

also utilised. This had the strength of being susceptible to numerical reduction and statistic analysis.

I would argue that through the integration and comparative interpretation of data gathered from these three discrete methodologies I was able to generate reliable and valid findings.

10.1.4 The Validity And Reliability Of The Findings

Questions of the reliability of findings turn, in part, upon the question of the repeatability of experiments, trials, observations and physiological measurement that form the methodological basis for this work. I recognise that in the world of action research, in which the subject of investigation develops as a result of incremental previous findings, it may prove difficult, if not impossible, to recreate a situation in which such tests may be repeated within anything like a 'like-situation'. This is not to say that the development of a critical incident management simulation, based upon similar premises, would not have to pass through similar phases of design, implementation and testing. Were this the case, the human computer interface issues and perhaps more importantly those issues surrounding immersion and fidelity would arise as significant and pressing features, albeit in a different guise.

Because of this fact there is no reason to suppose that the findings developed from this work should not be testable in this new environment and their validity checked through the adoption of identical or at least similar methodologies as those adopted here.

Questions of immersion are not specific to this research and continue to pose problems and demand answers in a wide range of research activities centred upon critical incident management and command and control. Such work is ongoing, particularly within the military and off-shore petro-chemical environments. Findings from this research, resulting from enquiries into levels of immersion (as these

relate to simulation fidelity) should prove testable in these other non-police disciplines, particularly where such simulation involves the use of computer mediated team based problem solving activities.

10.2 Summary of results

10.2.1 Comparison With Previous Research And Simulation Developments In Like Areas.

At this juncture it is important to set this work against other related simulation development and research in an effort to locate its significance and project its impact in this area. I will examine three parallel approaches to critical incident management simulation, whether currently in operation or not, and at each stage compare the findings of such work with the research themes contained within this thesis.

10.2.1.1 ICCARUS (Intelligent Command and Control Acquisition Review Using Simulation)

The ICCARUS project set out to produce an 'intelligent' interactive multimedia package to provide simulated experience for senior fire officers in the command and control of large fire incident management. The project also sought to investigate the feasibility of the provision of a de-brief element for the simulation participant.

Through a combination of artificial intelligence (AI) techniques and interactive multimedia simulation incorporating a "realistic fire model running on a transputer" (Learning Technologies Project Report D.O.T. 1992) it was hoped that a valid and genuine training experience would result.

This award winning system provided a much needed multi-sensory learning experience for fire ground commanders who faced the need to make significant decisions within a complex and "wicked" (Rittel, H.W.J., and Webber, M.M. 1973) problem-set. In particular their use of audio as an information trigger heightened the level of participant

immersion. I realised that the audio was a far richer simulation element than I had first thought and led to increased 'environmental reliability'. As a result I further developed the audio functionality of my system through greater use of audio triggers, whilst recognising the importance of realistic communication systems.

The relevant and information-rich video sequences, evident within the ICCARUS system, pointed me towards the significance of presenting my participants with valid contextual video-triggers throughout the simulation experience. The video generated during the ICCARUS project was shot to a precise educational specification. Having inherited the video for my system from another project (namely VISTRAIN) I came to realise the benefits I would accrue from further development of my system by using a bespoke video approach. This realisation drove the production of simulation specific video sequences contained within the Notting Hill Carnival exercises.

The powerful use of mapping as a participant orientational device was particularly relevant within the police command and control arena, as a locational tool and provided supporting information enabling participants to more fully develop individual and ultimately global Situational Awareness.

10.2.2 Vistrain

I have described the VISTRAIN simulation system in great detail at a number of points within the body of this thesis. At a time when I was seeking to enhance the effectiveness of phase 2 of the National Major Sporting Events Course this system proved immensely influential in my thinking and subsequent early work in the development of usable critical incident management simulation system. I have already alluded to the close working relationship I developed with the VISTRAIN design team and have described how elements of this system came to be used in the football simulator (CB-POTS) which

was the precursor to the more open and generic command and control simulator (MINERVA) now installed and operational at the Metropolitan Police Management School and the London Fire Brigade Officer Development School. The systems development (in its embryonic form) and its similarities and differences to the VISTRAIN system form major arguments within early chapters and it is to these that I refer the reader for more information.

10.2.3 Cactus (Command And Control Training Using Simulation)

In contrast to the simulation systems detailed up to this point, CACTUS represents somewhat of a departure from what may be described (perhaps simplistically) as multimedia based simulation. This system relies more on an expert model to predict the likely interaction taking place between police units and the civilians they are attempting to manage within a public order event. Based around a mapping and plotting metaphor, the system seeks to depict outcomes of strategic resource deployment, whereby these outcomes are shown as crowd dynamics overlaid onto a graphical street map interface. This system approaches the problem of training senior officer from a different angle, by only dealing with a 'whole-event' view held by the most senior command officer at an event. It does not concern itself with the fidelity of this view, but seeks to calculate the impact of decisions using a model that is both logical and probabilistic.

I considered the use of this approach to incident command exposure as a method of meeting my sponsor's requirements but felt there was a lack of fit between the experience likely to follow from a CACTUS based training session and the stated learning aim and objectives of the National Sporting Events Course (Phase 2 element). However, the use of the calculative engine contained within the CACTUS system may be of value in supporting the activities of the deployment staff in my MINERVA exercise control room.

10.3 Realistic Crisis Decision Making From A Learning Theory Perspective

Within the thesis I have explored in detail theory which has proven of explanatory significance in my investigations of two crucial and interlocking elements of simulation design and implementation as these relate to the area of critical incident management and command and control. On the one hand I was keen to explore how senior ground commanders made significant decisions within an operational environment (such as a major sporting event) where, by virtue of the large numbers of people involved, the constraining environment of the stadium itself and the potential for conflict between fans of competing teams, a myriad of complex and interwoven problems may arise. On the other hand, I had need to examine how best to structure a simulation exercise such that learning and experiences gained on the system would become transferable and transferred to this operational world. This led me to consider a number of decision based and learning theories some of which were contradictory and others complimentary. From the perspective of command decisional activity within a command environment, the work of Klein proved seminal in my understanding of the processes involved. His work on Recognition-Primed Decision Making (RPD) shaped my thinking on such elements of the simulation system as multi-threaded and multi-layered problems, sequencing and distributed team based decisions. In regard to learning theory I found the learning cycle model offered by Lewin and (further developed by Kolb) offered me a means by which I could structure the learning experience and ensure that participants followed a coherent learning path. This path necessarily involved key stages incorporating; thorough pre-briefing, concrete experience gained through immersion in the training exercise and finally reflection on this concrete experience, and through such reflection,

the formation abstract concepts and general principles transferable to an operational environment.

Within this doctoral work I have set out to synthesis these two theoretical positions and through this process, construct a theoretical model for engendering experience of critical incident management through simulation. Within this new theory I have forged theoretical links between; the way in which ground commanders make significant decisions at times of uncertainty and within a complex and changing environment; and the means by which such decisional activity, and the experience that results, can be engendered, without recourse to a live event (with real and possibly dramatic consequences that might follow) through a learning experience, generated by immersion within a simulation of that live event.

The outcome of this theoretical synthesis is, I would argue, the construction of a new theoretical model whose explanatory power lies in its ability to describe how the process of engendering critical incident management experience relies on an immersive episode that not only has high fidelity but that is carefully structured to ensure that the stages necessary to produce deep and transferable learning are in place. Furthermore, it describes how this engendering process promotes a form of decisional activity that is fully in keeping with the Recognition-Primed Decision Making model provided by Klein.

10.4 Guidelines for the development of generic simulation systems (general principles)

From the outset I was concerned to answer two central research questions. I have re-stated these below for purposes of clarity:

1. Can a *critical incident management* (C.I.M.) *simulator* provide a sufficiently effective *learning environment* to enable *students immersed* within it, to generate effective *command and control*

decisions that would prove to be valid and workable in the real world.

2. What *educational technologies* are needed to create a critical incident management simulator that is capable of *engendering experience* in police commanders, concerning the strategic management of critical incidents as exemplified by command and control practices.

In my search for answers to these two central questions I designed, built and used a simulation system that developed over time from humble beginnings to a fully functional integrated and complex command and control simulator. During the many hours of testing and re-testing, and from findings resulting from the various research methodologies detailed fully within the body of the thesis and re-visited in a critical way above, I generated a set of general principles that I would argue, exist as a series of both useful and transferable pre-requisites for the design and development of an effective computer mediated critical incident command simulator. As these represent significant findings of this work they are repeated here in summary.

Principle 1

The participants should be given a 'two track' briefing;

(a) Identifying their role in the simulation, appropriate information about the incident they are going to manage and is expected from them during the exercise.

(b) A thorough briefing on the educational technology, its functionality, how they are to interact with its various sub systems.

Principle 2

The participants should be encouraged to 'take ownership' of the operational plan for the event, by allocated sufficient time for the generation of an operations orders and any other appreciation's for the event, by the participants. Sufficient information about the simulated

event should be made available and the team must be given total autonomy to generate their own strategic plan.

Principle 3

Incident trigger information needs to be properly contexualised. Video must accurately portray the command position. If this is not possible then other triggers are effective. Such triggers are graphical or text overlays.

Principle 4

To enhance immersion, the video and other information presented through the participants MicroWorld view, should contain trigger information that represents the patterns of typicality leading to recognition Such information should be built up from small information triggers that provide an increasingly rich information context. This will enable the participants to recognise, at an early stage within an unfolding event, patterns that are typical of those found within their autobiographical memory of similar incidents. Supplementary cues and triggers must be available, should participants fail to recognise the primary incident triggers.

Principle 5

To reduce 'decision lag' an on screen indication of the decision time must be given to the students. This provides a measure of urgency in decision making. However this decision timer must appear on each of the MicroWorld display monitors to avoid the 'ringing bell' approach adopted in other simulations.

Principle 6

Sequencing of incidents is critical to the immersion of all participants in the simulation. It is vital that the incidents occurring are multi-threaded incorporating more than one command location. By proper sequencing, the workloads of all the commanders can be controlled and approximate those found in real events. For example, triggers associated to an incident need to be distributed amongst the command locations represented within an event. Then, only by the recognition and subsequent communication of these triggers by group members will the team as whole attain a Situational Awareness of their relevance.

Principle 7

Distributed decision making implies the need for 'Situational Awareness'. This sharing of mental models is only achievable by efficient communication. 'Incident triggers' including 'supporting information triggers', need not only to be sufficiently 'information-rich', but must be presented to the participants with sufficient 'location context'. The information communicated to the team, must include such an accurate orientational context if it is to provide the team with a valid 'Situational Awareness'.

10.5 Future Research

Immersion in the MicroWorld environment is a key dimension to the experience. It is my belief that much can be done to provide for this need. The MicroWorld display is the key interface of the system. At present, the world view of the participant is presented through a 14 inch computer monitor. This may be entirely appropriate if the MicroWorld is designed to represent a view of the unfolding incident, using a high fidelity reality, for example; an Incident Commander located in a control room, may see the environment through a bank of close circuit television monitors. However ground commanders view incidents from a street-level viewpoint. Human vision is approximately 180 degrees, (horizontal) before one takes into account head movement. The effects on immersion, in providing a wide field of view from within a MicroWorld is the author's next area of research enquiry. Prototype equipment has been built that provides a wide field of view to the participants and early experiments have shown that this vision is deeply immersive.

I have carried out some preliminary work on the possibility of providing three dimensional vision (3D) at the MicroWorld. Projecting video to the participants in three dimensions provides a deeply immersive effect. There are many difficulties to overcome with this technology, Controlling the viewpoint is a significant research question. Merely providing three dimensional video is not difficult,

what is extremely complex is projecting this video in a truly interactive way. The initial immersive feel of the video is quickly lost if the participant cannot interact with the environment in real time. There are also difficulties in providing the effect if more than one person is viewing the video at one time, (from within a MicroWorld).

An alternative to 3D video is to project the video with a wide field of view (>140 degrees). The technology I have developed for 3D video projection can be utilised for the projection of wide field. My early tests of this idea have demonstrated that when commanders are presented with a wide filed of view projection of an operational environment, they report that they experience a greater degree of 'presence' (Witmer, Singer and Michael 1994) I believe that this development could lead to enhanced participant immersion and is to be the subject of further research.

As I indicated in my discussion of the many strengths of the ICCARUS system above, audio is a significant simulation element and one which can carry important immersive properties. At present audio presented on the system is mono. I believe that, as with early investigations into the benefits of 3D, the audio element would prove more immersive if spatially placed. This would provide an integrated 3D audio-visual experience that more closely mirrored the way in which participants see the world. I view this as another rich vein for future research.

The use of heart-rate monitoring proved to be an interesting and useful indicator of participant stress levels and, I would argue, a good measure of the effectiveness of the immersive environment. I envisage moving this research forward by exploring the use of less obtrusive means of obtaining ambulatory electrocardiography values and also enlarging the sample population by involving fire ground commanders in this experiment.

The possibility will be explored of combining the calculative engine contained within the CACTUS model with the exercise control system to better support the subjective judgements made by the Exercise Controller.

The network supporting the transfer of command messages from the Environment Control Software (ECS) and the MicroWorld Display Software (MDS) is a standard ethernet link. The messages themselves comprise a short binary sequence which poses no real impact on the bandwidth. Consequently future research will look to establishing an ISDN telephone link between the police MINERVA system and its identical cousin installed (under license) at the Fire Brigade headquarters. By linking these two systems, distributed, inter-agency major incident command training could take place.

In the real world there are times when commanders (who may be distributed by location at an event) may choose to come together for a face to face meeting to discuss strategy. Within the limitations of journey time and distance, a higher degree of fidelity would be achieved by allowing, within the simulator what takes place in the real world. Accordingly I would want to explore the provision of a 'closed loop' video conferencing facility that would accommodate such face-to-face meetings.

Outside of the police context I see great scope in the use of such simulation technology in support of special needs therapy. By this I refer to conditions involving difficulties in the ability to relate the self to the outside world and differentiating between the two. By way of example, I foresee an application in which a person who is diagnosed as being autistic and who may, as a result, have some difficulty in handling new environments (such as a shopping centre or trip to the zoo) being presented with audio and video that will generate a

controllable level of immersion, such that, they will come to recognise the same environment in the real world with less difficulty and fear.

10.6 Conclusions

Finally, below are listed a series of conclusions drawn from the findings of the research that underpins this thesis. I realise that within such a substantial work a large number of conclusions may be drawn but I have elected to list only those conclusions that I consider refer directly to the research questions at hand. (I would also invite the reader to the chapter summaries which provide an outline of conclusions drawn within specific chapters).

1. Properly constructed immersive environments containing sufficient fidelity with a real world command and control event can engender command experience.

2. The experience gained within the simulation environment is equally valid to experience gained from a real operational event.

3. Pattern recognition and decision making skills, developed through immersion in the simulation, provide an effective means by which unexpected and unconsidered problems, arising in the real world, become intelligible and resolvable.

4. The marriage of Recognition Primed Decision Making Theory with Lewinian learning theory has provided a new model whereby the structure of the learning process that takes place within the simulation exercise engenders experience of critical incident management.

5. That the creation of a truly immersive and effective computer mediated critical incident management simulator requires adherence to a set of general principles and these are set out above and described in detail within the body of this work.

6. In a like command and control environment (fire ground command) the general principles **were** found to be applicable in the creation of an effective critical incident management simulation system.

7. The open nature of the system was found to be effective in providing a simulation framework within which a number of differing critical incident events could be developed. For example the football, street carnivals, siege and hostage negotiation, fire ground command exercises.

8. Klein's Recognition-Primed Decision making model has great explanatory potential in providing insight into the subtle and often chaotic world of critical incident decision making, particularly when applied to compressed time frames and complex problems.

9. The experiential learning cycle as defined by Lewin and Kolb provides a powerful mechanism whereby the process of experiential learning may be structured.

Systemic testing provided a workable if flawed means of examining the interplay between system elements whether viewed from a holistic or a reductionist perspective.

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Critical Incident Management:

Engendering Experience Through Simulation

By

Jonathan Paul Crego

Volume II of II

(Appendices)

A Thesis submitted to the University of Salford

For the

Degree of Doctor of Philosophy

Technology, Information, Management and Economics Institute

Graduate School,

University of Salford

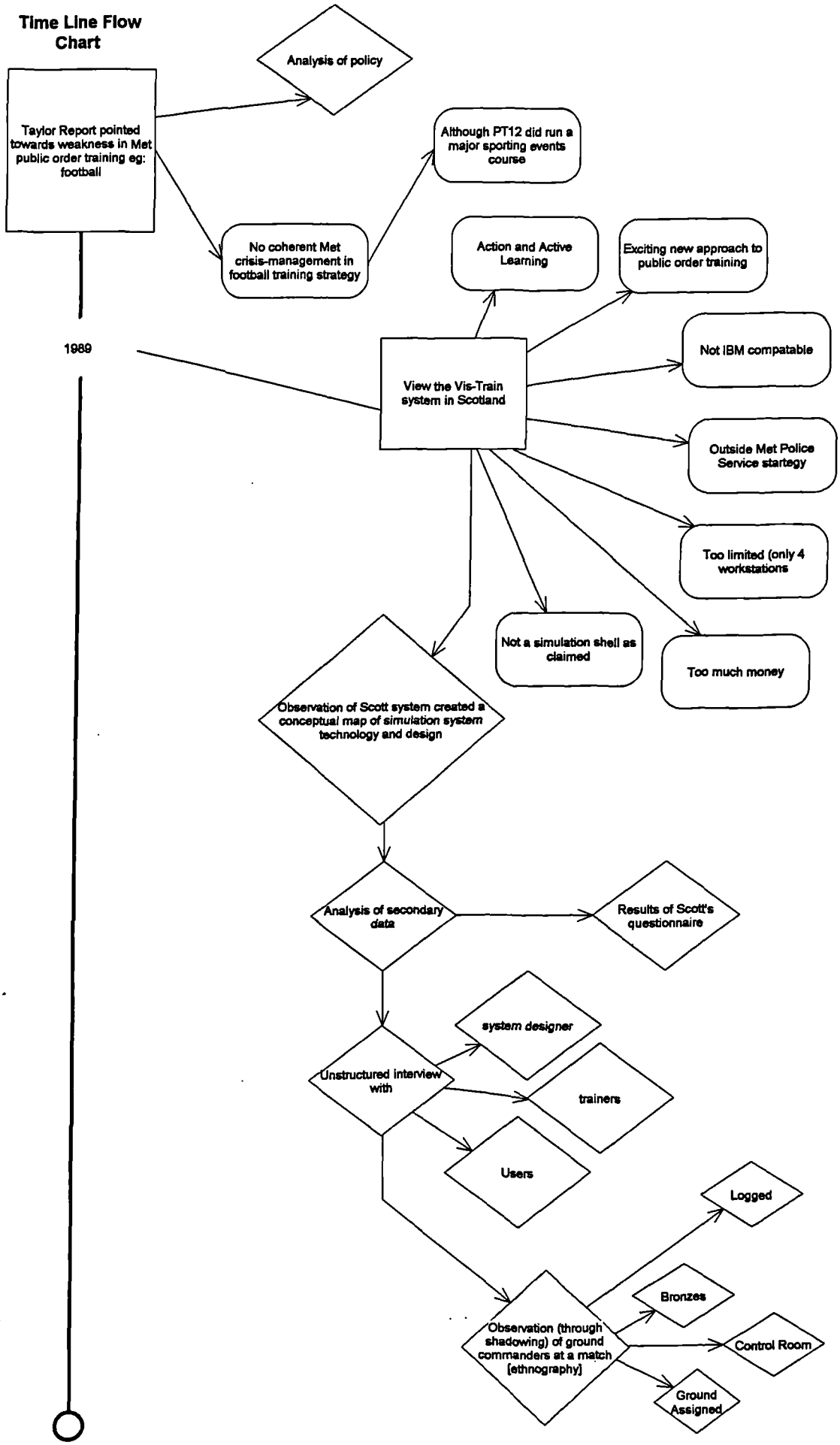
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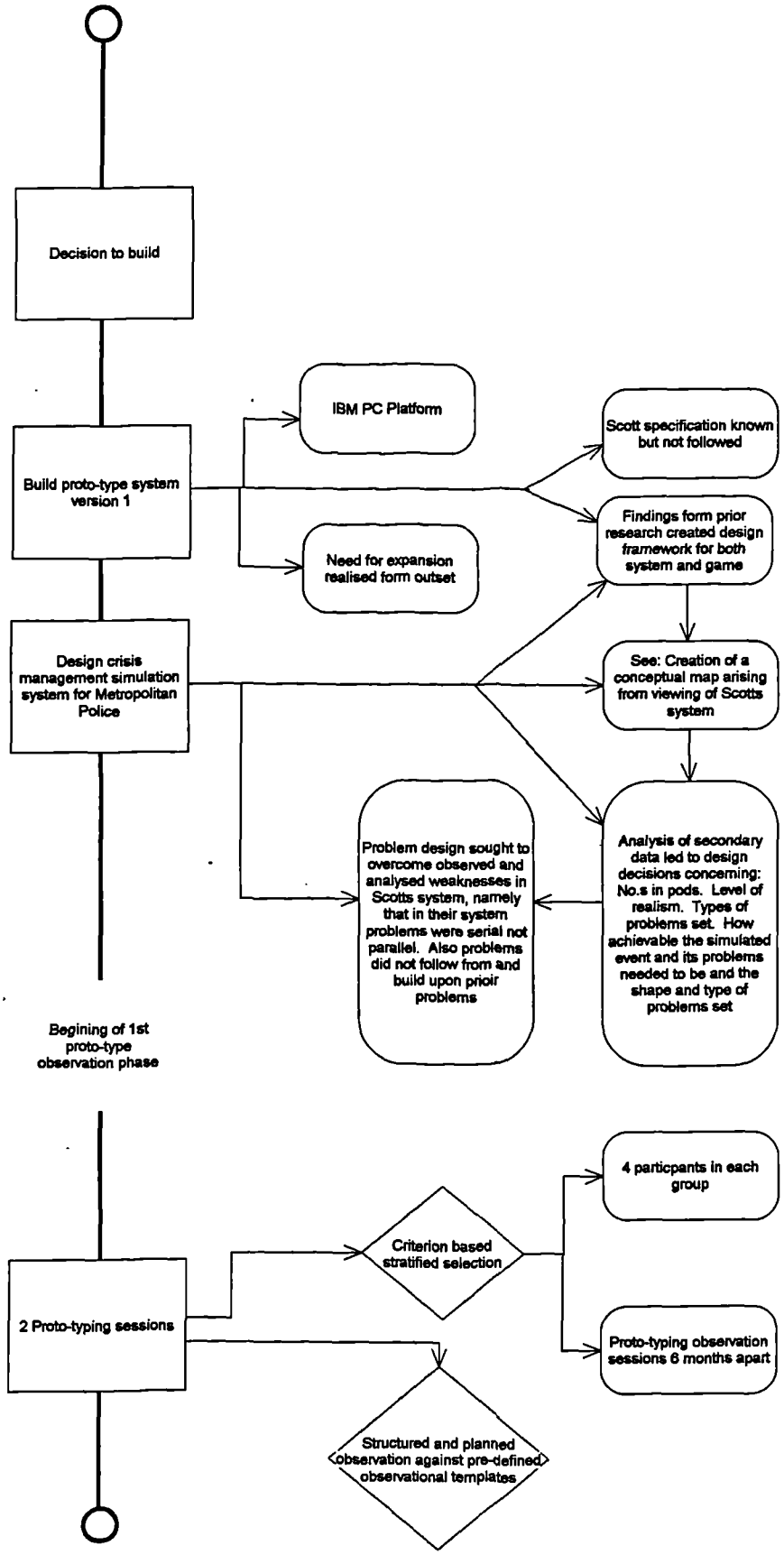
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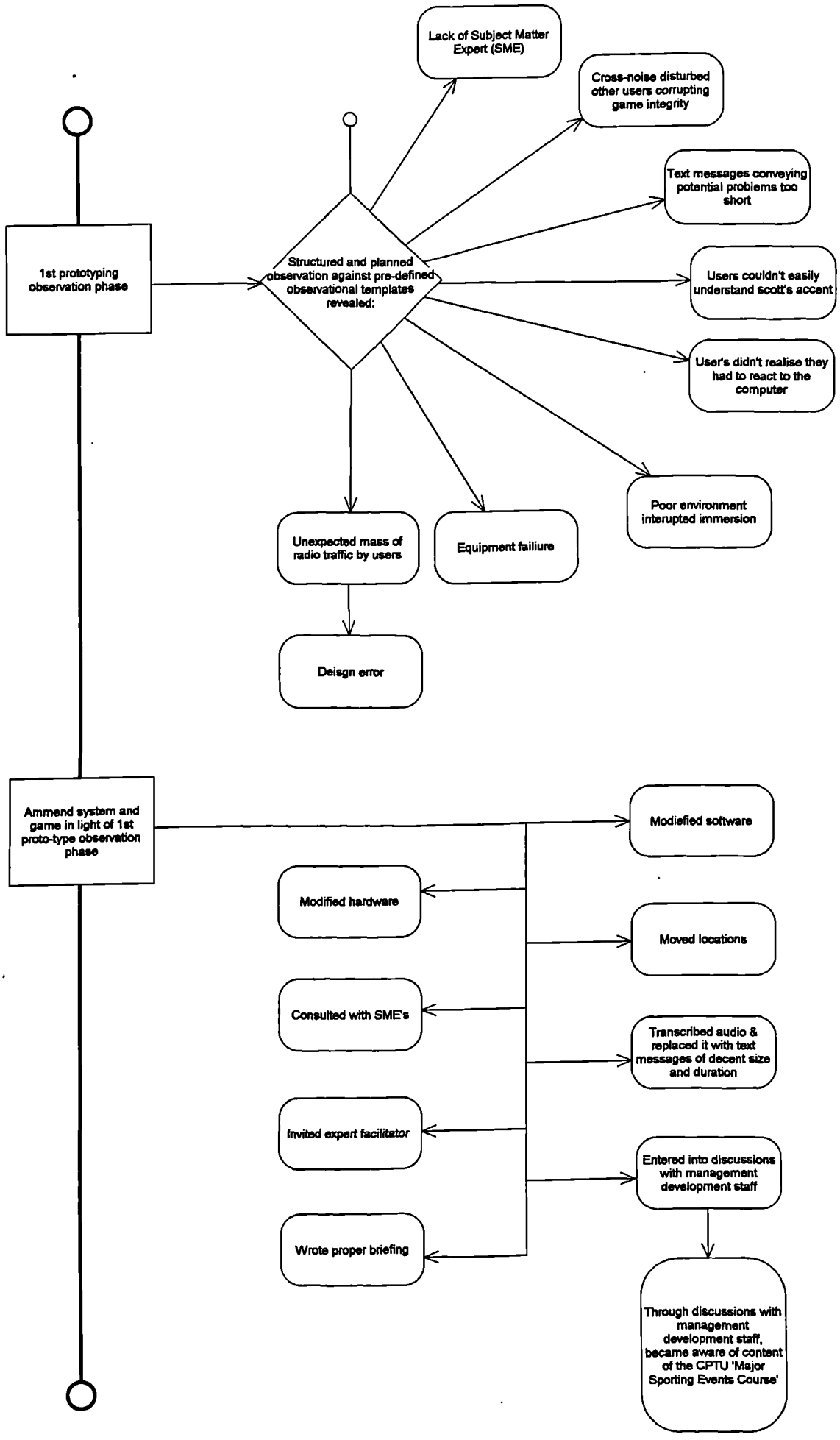
1. Time-Line
2. Questionnaire For National Sporting Events Students
3. Log Of Observations From National Sporting Events Course
5. Briefing Note For Ch. Supt. Hopkins Gold Arsenal
6. Questionnaires For Football Students
7. Video Capture Traces (Trial 1)
8. Transcripts Of Semi-Structured Interviews
9. Letters From Participants
10. Question Sheet From TO18 Carnival
11. Trainers Handbook For Carnival
12. Carnival Questionnaire
13. Log Of Participants In Simulator And At Carnival
14. Heat-Rate Charts
15. Consent Letters And Forms
16. Scenario Text Files
17. Carnival Student Packs

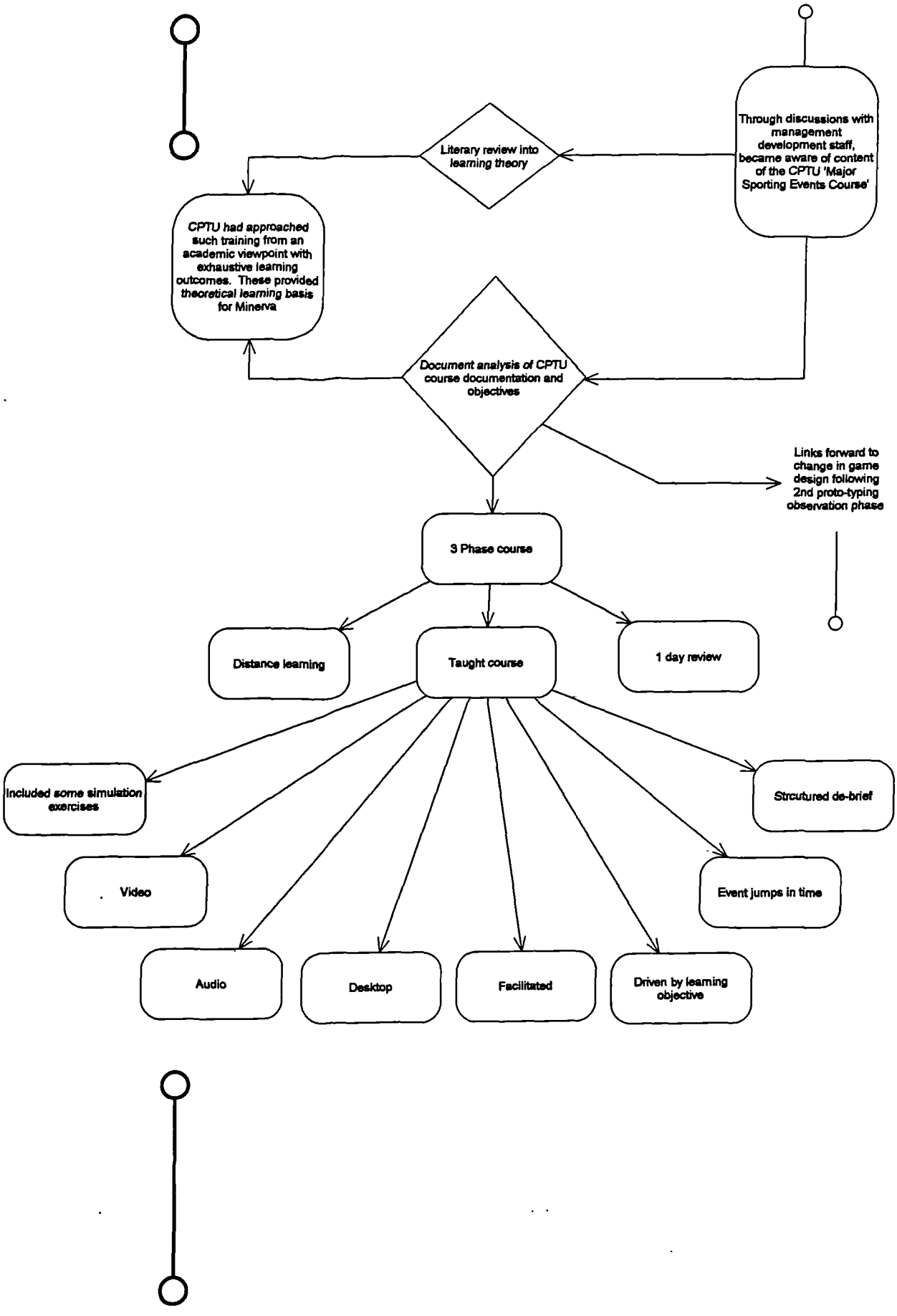
Appendix 1

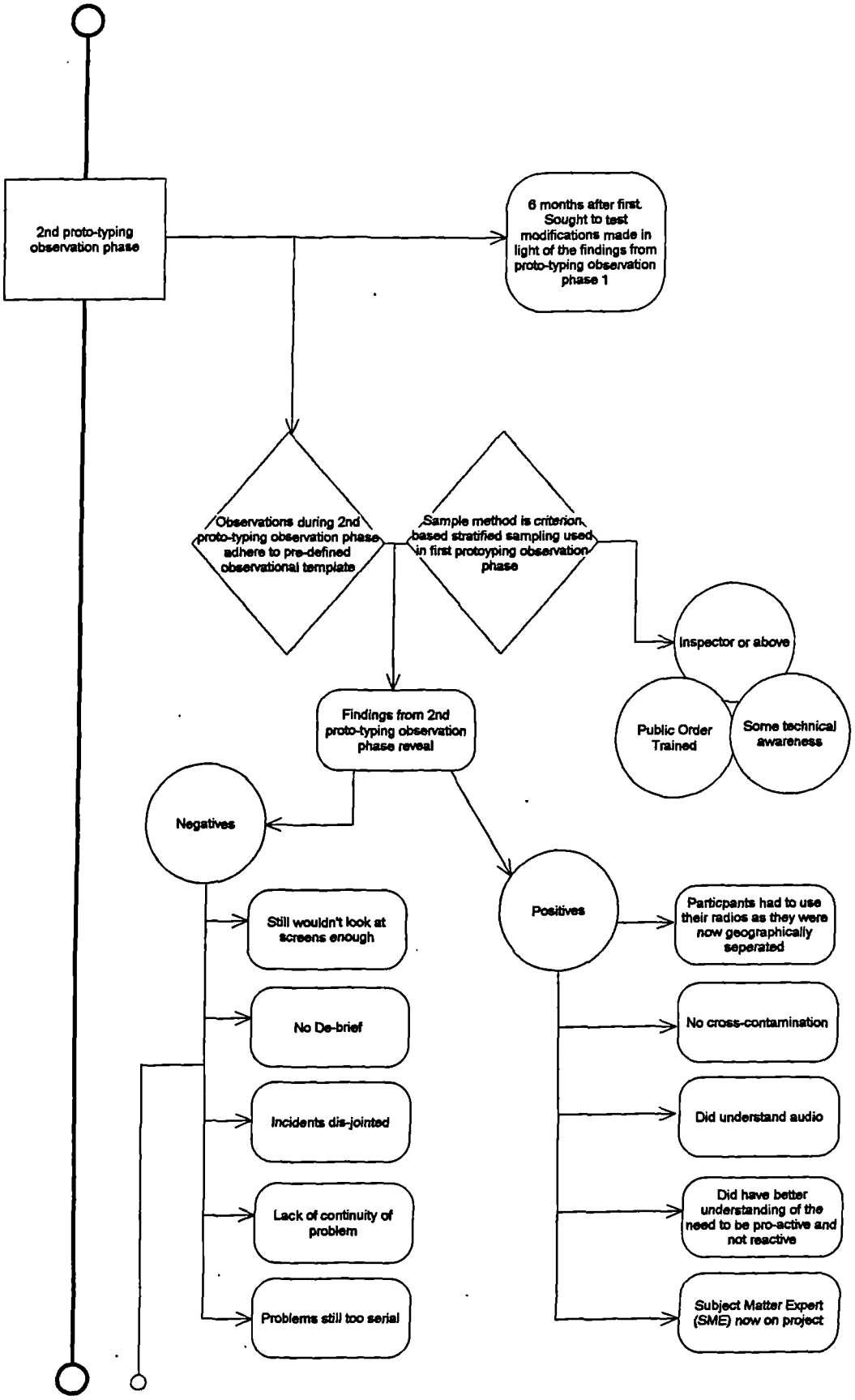
Time Line Flow Chart

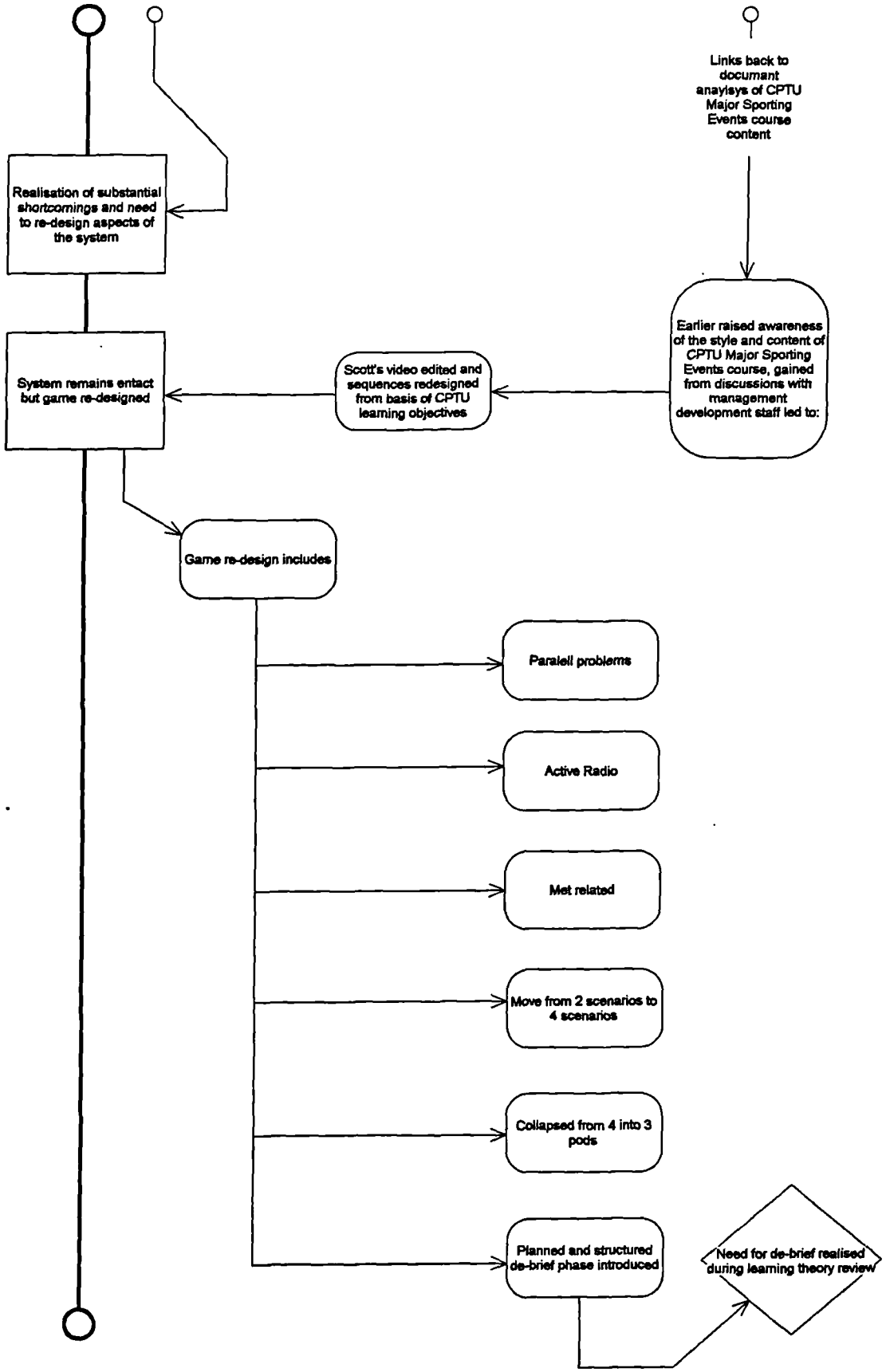


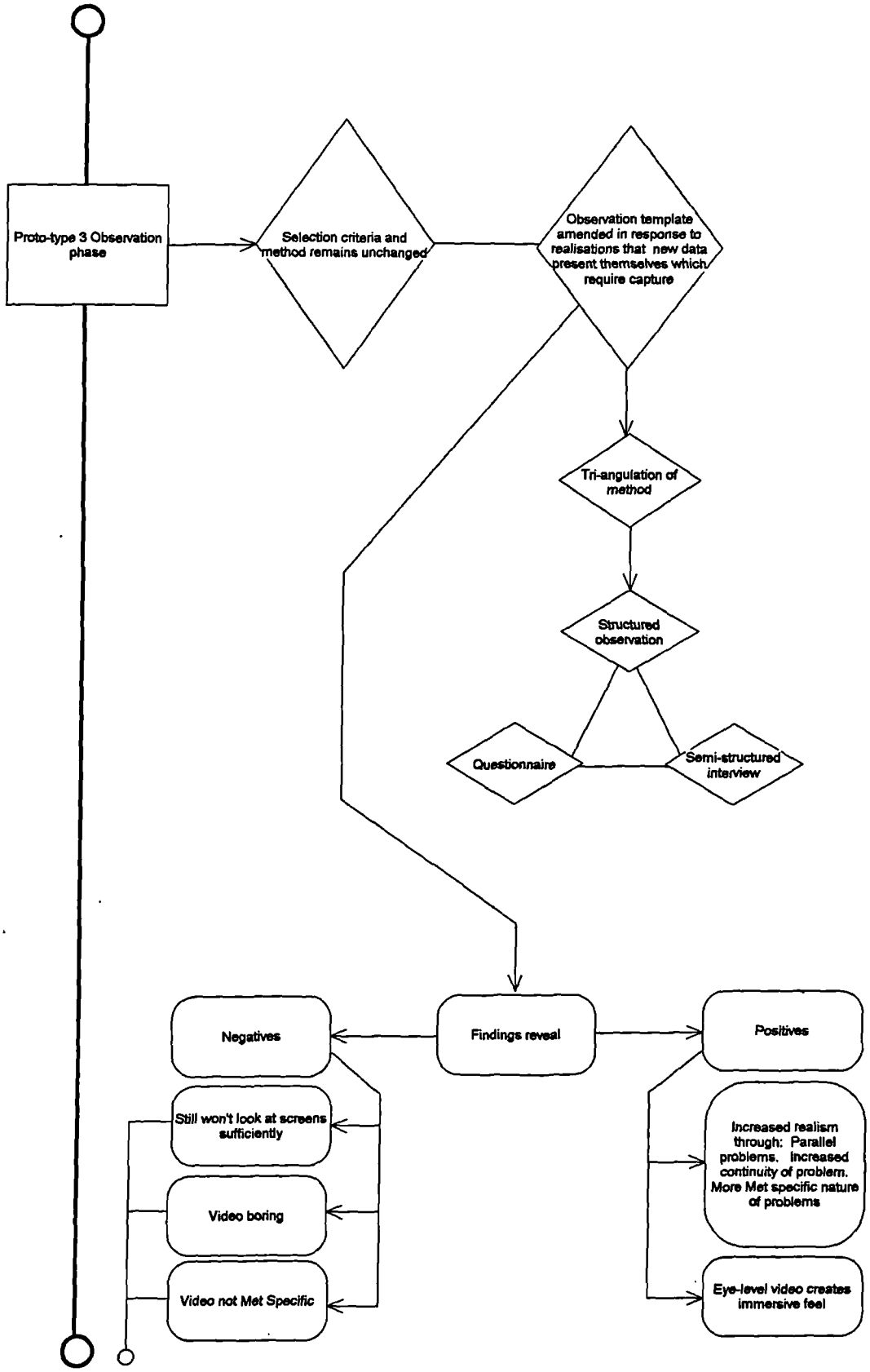

Decision to build
Build proto-type system version 1
IBM PC Platform
Need for expansion realised form outset
Scott specification known but not followed
Findings form prior research created design framework for both system and game
Design crisis management simulation system for Metropolitan Police
See: Creation of a conceptual map arising from viewing of Scotts system
Problem design sought to overcome observed and analysed weaknesses in Scotts system, namely that in their system problems were serial not parallel. Also problems did not follow from and build upon prioir problems
Analysis of secondary data led to design decisions concerning: No.s in pods. Level of realism. Types of problems set. How achievable the simulated event and its problems needed to be and the shape and type of problems set
Begining of 1st proto-type observation phase
2 Proto-typing sessions
Criterion based stratified selection
4 particpants in each group
Proto-typing observation sessions 6 months apart
Structured and planned observation against pre-defined observational templates

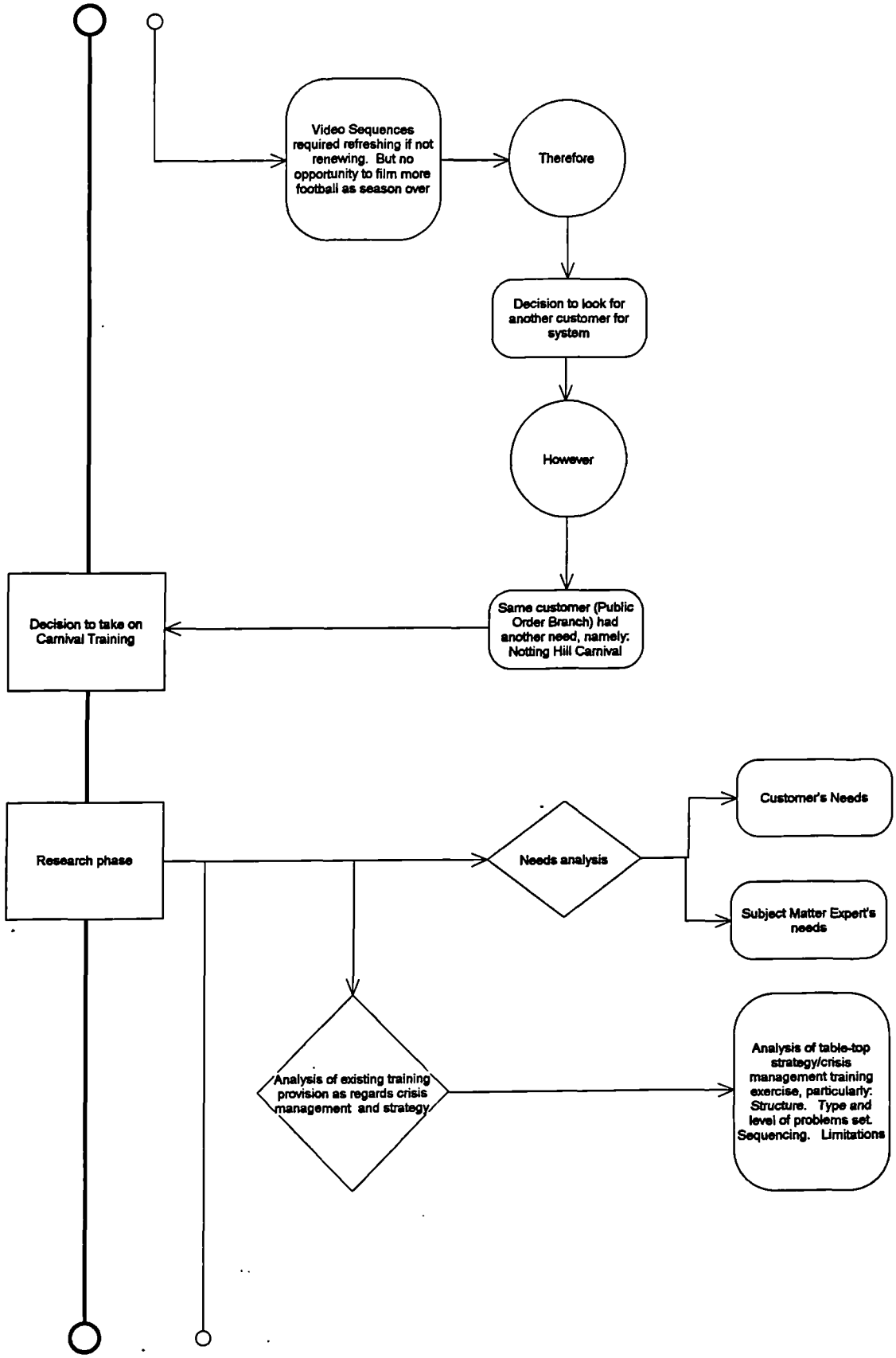

1st prototyping observation phase
Structured and planned observation against pre-defined observational templates revealed:
Lack of Subject Matter Expert (SME)
Cross-noise disturbed other users corrupting game integrity
Text messages conveying potential problems too short
Users couldn't easily understand scott's accent
User's didn't realise they had to react to the computer
Poor environment interupted immersion
Equipment failiure
Unexpected mass of radio traffic by users
Deisgn error
Ammend system and game in light of 1st proto-type observation phase
Modiefied software
Moved locations
Transcribed audio & replaced it with text messages of decent size and duration
Entered into discussions with management development staff
Through discussions with management development staff, became aware of content of the CPTU 'Major Sporting Events Course'
Wrote proper briefing
Invited expert facilitator
Consulted with SME's
Modified hardware

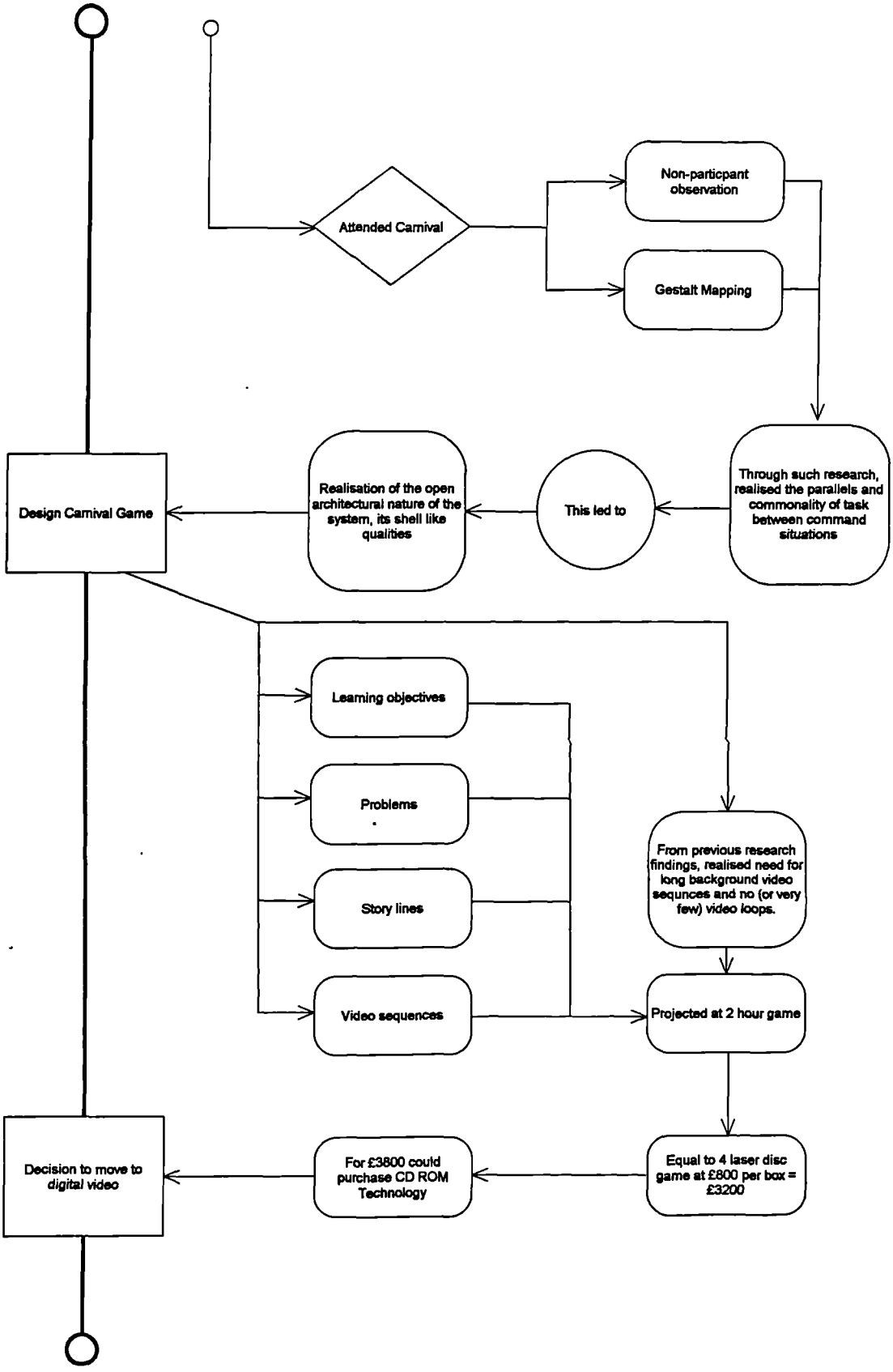

Through discussions with management development staff, became aware of content of the CPTU 'Major Sporting Events Course'
Literary review into learning theory
CPTU had approached such training from an academic viewpoint with exhaustive learning outcomes. These provided theoretical learning basis for Minerva
Document analysis of CPTU course documentation and objectives
Links forward to change in game design following 2nd proto-typing observation phase
3 Phase course
Distance learning
Taught course
1 day review
Included some simulation exercises
Video
Audio
Desktop
Facilitated
Driven by learning objective
Event jumps in time
Strcutured de-brief

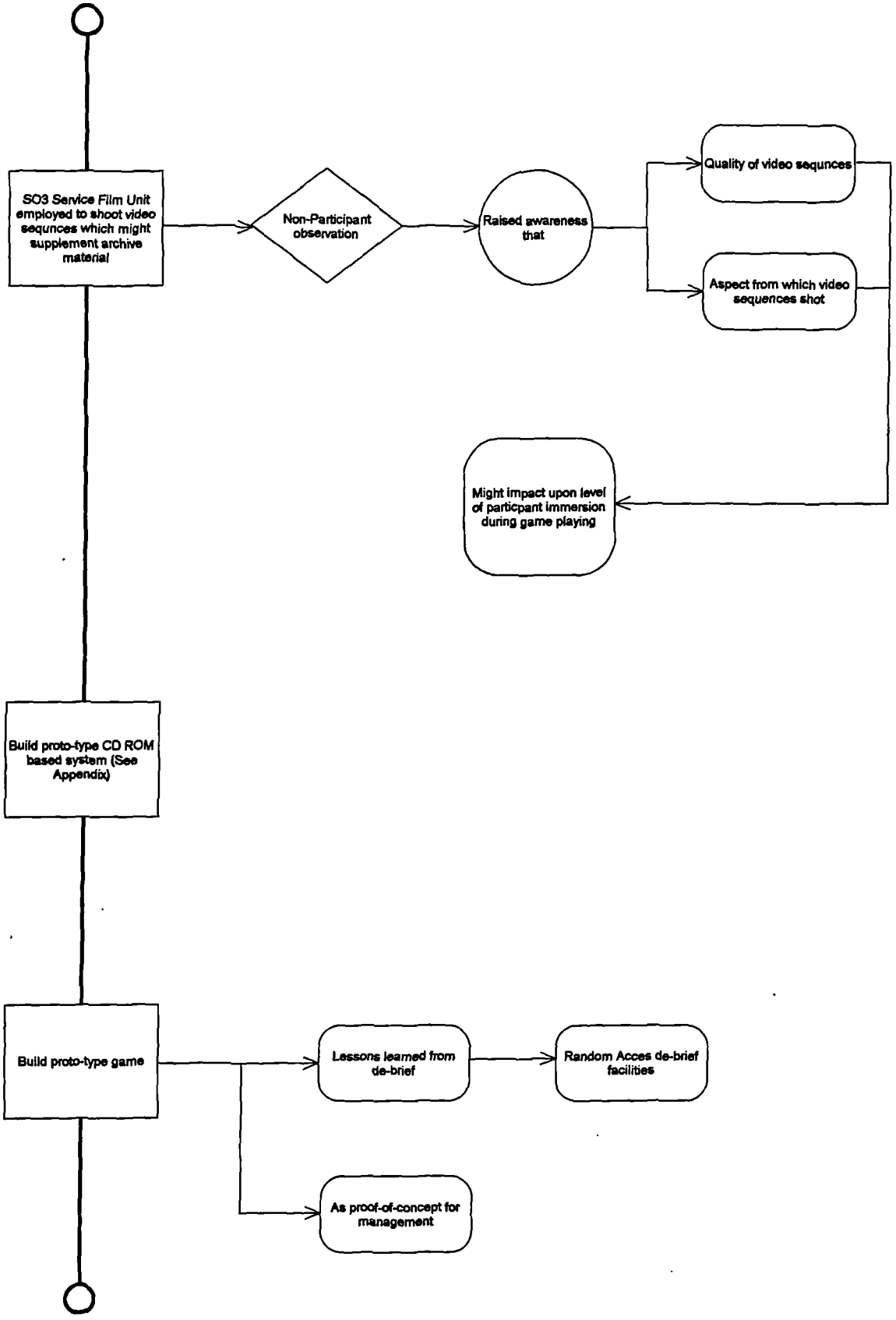

2nd proto-typing observation phase
6 months after first. Sought to test modifications made in light of the findings from proto-typing observation phase 1
Observations during 2nd proto-typing observation phase adhere to pre-defined observational template
Sample method is criterion based stratified sampling used in first prototyping observation phase
Inspector or above
Public Order Trained
Some technical awareness
Findings from 2nd proto-typing observation phase reveal
Negatives
Positives
Still wouldn't look at screens enough
No De-brief
Incidents dis-jointed
Lack of continuity of problem
Problems still too serial
Particpants had to use their radios as they were now geographically seperated
No cross-contamination
Did understand audio
Did have better understanding of the need to be pro-active and not reactive
Subject Matter Expert (SME) now on project


Links back to document anaylsys of CPTU Major Sporting Events course content
Realisation of substantial shortcomings and need to re-design aspects of the system
Earlier raised awareness of the style and content of CPTU Major Sporting Events course, gained from discussions with management development staff led to:
Scott's video edited and sequences redesigned from basis of CPTU learning objectives
System remains entact but game re-designed
Game re-design includes
Parallel problems
Active Radio
Met related
Move from 2 scenarios to 4 scenarios
Collapsed from 4 into 3 pods
Planned and structured de-brief phase introduced
Need for de-brief realised during learning theory review


Proto-type 3 Observation phase
Selection criteria and method remains unchanged
Observation template amended in response to realisations that new data present themselves which require capture
Tri-angulation of method
Structured observation
Questionnaire
Semi-structured interview
Findings reveal
Negatives
Positives
Still won't look at screens sufficiently
Video boring
Video not Met Specific
Increased realism through: Parallel problems. Increased continuity of problem. More Met specific nature of problems
Eye-level video creates immersive feel


Video Sequences required refreshing if not renewing. But no opportunity to film more football as season over
Therefore
Decision to look for another customer for system
However
Same customer (Public Order Branch) had another need, namely: Notting Hill Carnival
Decision to take on Carnival Training
Research phase
Needs analysis
Customer's Needs
Subject Matter Expert's needs
Analysis of existing training provision as regards crisis management and strategy
Analysis of table-top strategy/crisis management training exercise, particularly: Structure. Type and level of problems set. Sequencing. Limitations


Attended Carnival
Non-particpant observation
Gestalt Mapping
Through such research, realised the parallels and commonality of task between command situations
This led to
Realisation of the open architectural nature of the system, its shell like qualities
Design Carnival Game
Learning objectives
Problems
Story lines
Video sequences
From previous research findings, realised need for long background video sequnces and no (or very few) video loops.
Projected at 2 hour game
Equal to 4 laser disc game at £800 per box = £3200
For £3800 could purchase CD ROM Technology
Decision to move to digital video


SO3 Service Film Unit employed to shoot video sequnces which might supplement archive material
Non-Participant observation
Raised awareness that
Quality of video sequnces
Aspect from which video sequences shot
Might impact upon level of particpant immersion during game playing
Build proto-type CD ROM based system (See Appendix)
Build proto-type game
Lessons learned from de-brief
Random Acces de-brief facilities
As proof-of-concept for management

Appendix 2

Questionnaire 1

Jonathan Crego
Force Technology
Enhanced Training
Co-ordinator Room
G61 Main Block
Peel Centre

Dear Major Sporting Event Programme participant.

This questionnaire is being sent to you to review the Major Sporting. The purpose is to examine the training programme and to determine if it is meeting the needs of football event commanders such as yourself. I would be extremely grateful if you could spend a few moments completing the questions below.

Please send the completed form back to me at the above address for compilation no later then 15 June 1990. They are as you can see anonymous.

Thanking you in advance

Jonathan Crego

There are ten questions with a marking scale from 1 to 5. I wanted to know your feelings so 5 means you agree strongly and 1 means you disagree, 3 indicates that you neither agree or disagree with the statement.

Q. 1.

I felt my needs were met by the course.

1	2	3	4	5

Q. 2.

I found the self learning package called Phase 1 useful.

1	2	3	4	5

Q.3.

Much of the material in Phase 1 was used during Phase 2 (the 3 ½ day course)

1	2	3	4	5

Q.4.

I found Phase 2 useful.

1	2	3	4	5

Q.5.

I could easily relate Sandford (the fictitious town), with London.

1	2	3	4	5

Q.6.

Have you had a chance to be an observer at a football match

YES	NO

Q.7.

The course made me prepared for the role of observer

1	2	3	4	5

Q.8.

Have you been a police commander at a football match

YES	NO

Q.9.

The course made me prepared for the role of commander

1	2	3	4	5

Q.10

I found Phase 4 helpful.

1	2	3	4	5

The space below is reserved for your own comments. If you need more space please use the back of this questionnaire. Thank you for you co-operation.

Appendix 3

Observations of the MSE Course

Phase 2 Day 1 Observation Log Summary

Day 2	Activity	Notes
9:30-10:30	Icebreaker Exercise. Students were split into pairs and were asked to find out about the other and give a 5 minute presentation to the group	Disorganised noisy atmosphere with officers looking embarrassed and generally not very interested in the activities.
10:30-10:45	Talk by trainers on module structure. Ground rules such as confidentiality were stated.	Passive listening by group no questions asked. Over emphasised by trainers, possibly because they were not receiving any response from students
10:45-11:15	Discussion on next task. Students split into three groups of four and given worksheet asking to identify their Concerns Needs and Expectations	Passive listening no questions asked. Trainers suggest coffee break
11:40-12:45	Groups work on their presentations and elect a spokesman to present to the rest of the group.	Lot of flip chart paper prepared. Dominant members of each group take control. Two groups not really contributing
12:45-14:00	Lunch	
14:00-14:30	Presentations	Dynamic and humorous presentations lots of questions asked the most animated I have seen them
14:30-14:50	General Discussion	Well facilitated, making great efforts to involve all. Laid down the ground work for the rest of the course. Clear
14:50-15:00	Showing video	Problems with equipment - no picture
15:00-15:30	Showing Video	Lord Justice Taylor Mr Justice Popplewell. Going over material that was contained in phase 1 workbook
15:30-15:50	Coffee	
15:50-16:30	Video and discussion	Metropolitan Police Planning for Disaster
16:30-17:00	Lecture on the value of Contingency Planning	Split into groups again and given task sheet. Groups look weary and fed up. Task sheet ask them to look at planning who should be included on the planning team and what areas should be considered. Little effort seen by groups exercise failed. The trainers did a chalk and talk summing up and dismissed the officers at 17:10

Phase 2 Day 2 Observation Log Summary

Day 2	Activity	Notes
Initial notes:	Students arrived early and were chatting about the course. Comments overheard were "thought I'd better read the notes so I read the phase 1 book last night for the first time" This was accompanied by some laughter and many knowing looks around the room. I thought I bet they all haven't done phase 1.	
9:30-9-45	Arrival and introduction to the day	Passive listening, one student said that they had to leave at lunch time as they had been recalled by their local management. Trainers showed no sympathy and were quite angry
9:45-10:15	Exercise 7 Group split into two Exercise each group represented either the home or away side. Shown video and then asked to intelligence on their team. Provided with a lot of notes data etc.	Both teams quickly realised that this task was large and allocated jobs to individuals. A team effort highly immersive
10:15-10:30	Coffee	
10:30-12:30	Talk on Match categorisation. Introduction to exercise. Each student given a worksheet with historic view on both teams. Students split into two groups again given another worksheet to work out manpower for the match Finance, talk by trainers on the implications of match categorisation and manpower on finance	Students worked on their own with their own flip chart paper most finished in ten minutes Lots of discussion and some argument flip charts prepared Long complicated session mostly passive except the occasional question. Students ended by complaining that they felt their role was policing not financial and that they were unhappy about the changing world of policing.
12:30-13:30	Lunch	
13:30-14:45	Talk about the control room at a match. Students given a task sheet to develop an aide memoir on checks to be carried out before a match	Students start to work on their own but ended up working in small groups. All lot of anecdotal swapping of disaster stories and generally a lot of exchange of information going on. Good session.
14:45-15:00	coffee	
15:00-16:15	Talk on briefings. Introduction to IIMAC (Pneumonic used for the briefing structure) Groups split into two given an operations order (all students asked to bring a specimen ops. Order from their local police station) and asked to work through sheet. Given an operational order and told that this was the basis of the next day's activities. Students asked to study the order before tomorrow.	Lot of discussion on the value of the order they were asked to review. Again lots of anecdotal exchange of personal experience. A bit over long this session with not much guidance from trainers

Phase 2 Day 3 Observation Log Summary

Day 3	Activity	Notes
Initial Notes	Students came early and were in good spirits. They started to discuss the course (out of the trainer's hearing). They had found the course hard going generally the consensus was that they had had to do all the work and the trainers had had an easy time.	
9:30-10:00	Talk on the role of match commander. Students told that the rest of the day would be case study.	Task sheet students asked to determine the appropriate time to open the match control room.
10:00 -Finish	Group split into three. Match Commander (Silver) Inside ground Commander (Bronze 1) Outside Commander (Bronze 2)	Went through paper exercise (pink papers). Incident supported by audio tape of radio messages at any time. The messages were really poor sounding like they had been read directly from scripts with a broad northern accent. Students derided them and said that they were against the radio protocol used by the Met. Facilitators tried to keep the course on the planned path and were quite skilful. Students tried to take the issues seriously but were continually troubled by the lack of credibility of this exercise. Day was a long one and very tiring for all. This must be where learning technology has a role. Could do lots with the automation of events, the fidelity of the radio messages and some video. An exciting application.

Phase 2 Day 4 Observation Log Summary

Day 3	Activity	Notes
9:30-11:30	Students Arrived late and were showing signs of having enough of the course. Started with a discussion on how yesterday went for them. First worksheet on debriefing an event discussed and handed out. Group split into three	Students argued that the exercise wasn't real and that they had increasing difficulty trying to make the comparison between Sandford and their real world of football in London. Each group given problems from yesterday's paper feed exercise. Asked to prepare a debrief on them and present to the other groups. Presentation sessions was lack lustre and hard work for the trainers. There was a feeling that the course had become a challenge, finish or die! A very dreadful session.
11:30-11:45	Coffee	
11:45-12:15	Wash up and introduction to the phase 3 module.	Discussions continued in the same lines as before with little now added by students. Many questions asked about the observation phase and the taking of command at an event. Some anxiety shown by students about the command element and any assessment that might take place. Facilitators reassured them that the module carried no formal or informal assessment.
Course Ended		

Appendix 5

Douglas

Please find attached a briefing note for the training day. I thought about your possible reactions to a prepared speech and took the view that you probably would get reasonably irritated and do your own thing anyway. Please take it as a base and do with it as you will, I wont be videoing it!

Day Structure

1. Initial Briefing
2. Exercise 1
3. Break
4. Debrief Exercise !
5. Exercise 2
6. Debrief exercise 2
7. Lunch
8. Exercise 3
9. Break
10. Debrief Exercise 3
11. General comments fill in happy sheets

The last course ended at 3.30. However they did not have an expert to assist with debrief.

I have attached general points you may wish to include during your initial briefing. The briefing will be more orientated to the day ahead than a traditional pre-match brief. Also there will not be time and probably sufficient interest from students to debrief entire match as debrief occurs throughout the day.

I am aware of the inadequacies of not supplying manpower resource information to the officers. However whilst I would love to throw in a whole range of enhancements identified from the previous course I must run the day identically to provide a true comparison.

I am informed by PT12 that these students do not have a great deal of experience, this is excellent as the previous group were pretty good (by my standards). So the comparisons will be extremely useful.

I will be recording the day with two cameras from each end of the room and all the radio traffic. I need you to ask their permission but in a low key way. Please tell them that the material will only be used by me for research purposes.

Initial Brief to Officers

Welcome to METPOST Metropolitan Police Public Order Strategic Training. During today you will be faced with policing a football match. Unlike traditional simulation exercises you will solve problems presented to you by computer.

Each station represents a vantage point within a football game. There are four:

Match Control Call sign Sanford Control
Officer in charge inside Call sign Bronze 1
Officer in charge outside Call sign Bronze 2
Local Division Call sign Sanford Division

The day will be split into three scenarios

Pre match
First Half
Second Half

Match end and crowd dispersal will be dealt with tomorrow.

The training is principally designed to train the Match Commander. Therefore the majority of events are designed at him or her. This means that if you are not Match Commander you may find that you are either involved or not. The positions are changed each scenario so you should all get some action. You do have a radio so inform the control room of all your decisions. You do not necessarily have to ask permission for all your decisions but you should communicate them.

For this game assume that you do not have any manpower restrictions. This is to your advantage, as the simulation suite develops your colleagues will not have this luxury.

The control room has a telephone use it to communicate with whoever you wish. It will be answered, so if for instance you wish to contact the SAS, then we have an amazingly dedicated switchboard operator who will endeavour to contact them for you and ring you back. Seriously anybody you expect to be contactable will be.

The suite is leading edge that is to say there is no other like it in England. It has been developed from a model designed by the Scottish Police and we are grateful for the use of their video

material. It is possible if not likely that anything can happen to the computers from a malfunction to a small fire. You are .... pioneers.... and you comments and advice will be of tremendous benefit to Jonathan. Please feel free to make comment on possible improvements.

I ask permission that this day be videoed. The video will be used solely for the purposes of continuing research and development. Does anyone object.....thankyou.

After each scenario I will hold a debrief session where interesting decisions can be discussed. Please view these as positive as we will explore the effects of decisions and discuss issues that arise. You not being assessed this is not test of your abilities.
The suite is in its prototype form here and will shortly be moved to Beak Street where a simulation suite will be custom built. Conditions are cramped and less than ideal. Because of this we will only using on channel for communications. However if you wish to use two feel free to do so.

The ground is Tannadice Park. The game is between Sanford United and Millsborough F.C. It is a first division cup final. Match capacity is 30,000.

Entry to the ground is by ticket only - all have been sold. Match will be played to conclusion. The Minister for Sport will present the cup. The match will be televised for live transmission.

May I remind you that your entering into the spirit of the training is essential, hopefully we will all gain a lot from today. Enjoy yourselves!

Appendix 6

Questionnaire

The simulator is in its very early stages of development. It would be of tremendous use to me if you could spare a few minutes to complete this questionnaire. Please give as full an answer as possible.

I would like to interview a sample of the officers who have used the simulator tick the box if you do **not** want to be interviewed.

I do not ask you to give any scores just an indication of your feelings.

1. Tension

Did you feel that the simulator generated any feelings of stress or tension?

2. Do you feel that stress is important

yes .....

no.....

3. Did you think any of your colleagues were under stress or tension during the day. If so can you remember when?

4. What was the best about the day?

5. What was worst about the day?

6. Did working away from your normal teams have any influence on your performance?

7. What additional equipment would you have liked?

8. Would you say this type of training could be developed for other police scenarios? if yes please specify?

Thank you for completing this questionnaire. Please do not discuss the training scenarios with anyone as it is important that officers come into the simulator with no prior knowledge of the problems they will have to solve.

Jonathan Crego
Learning Technologies

Name

Rank

Location

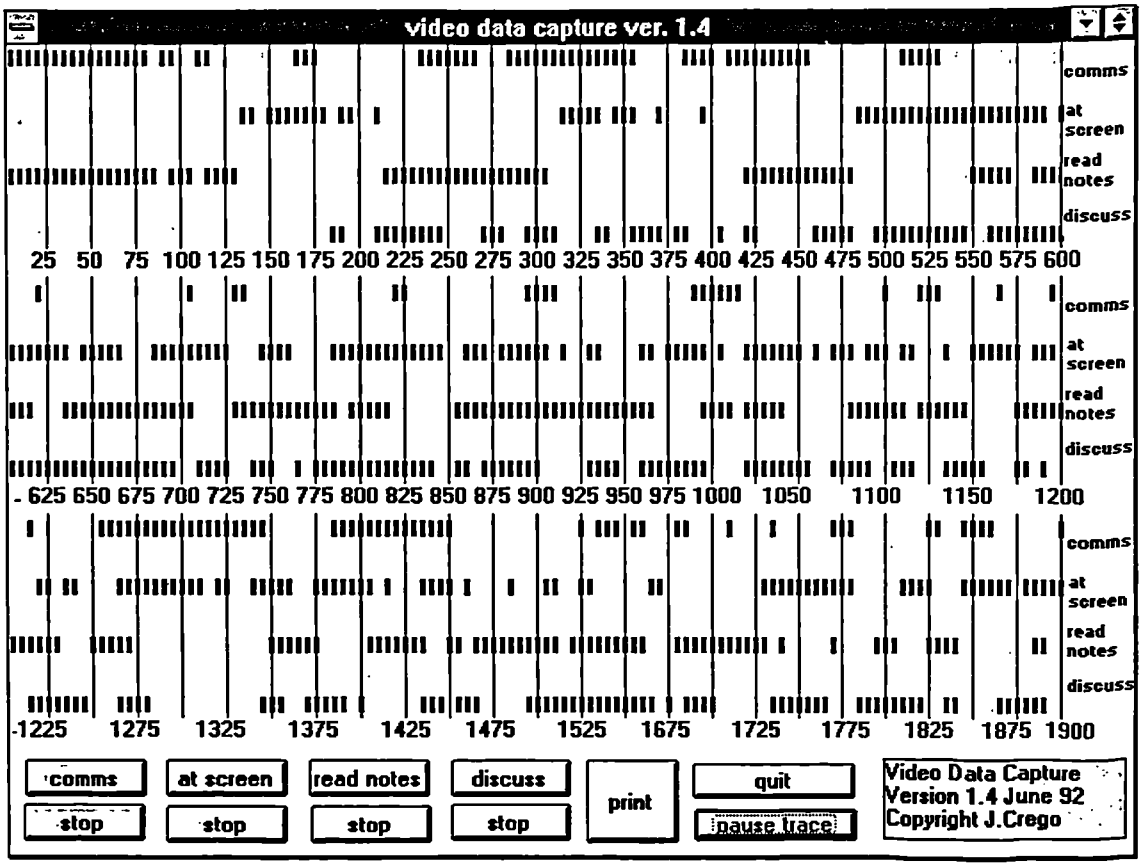
Telephone Number

Appendix 7

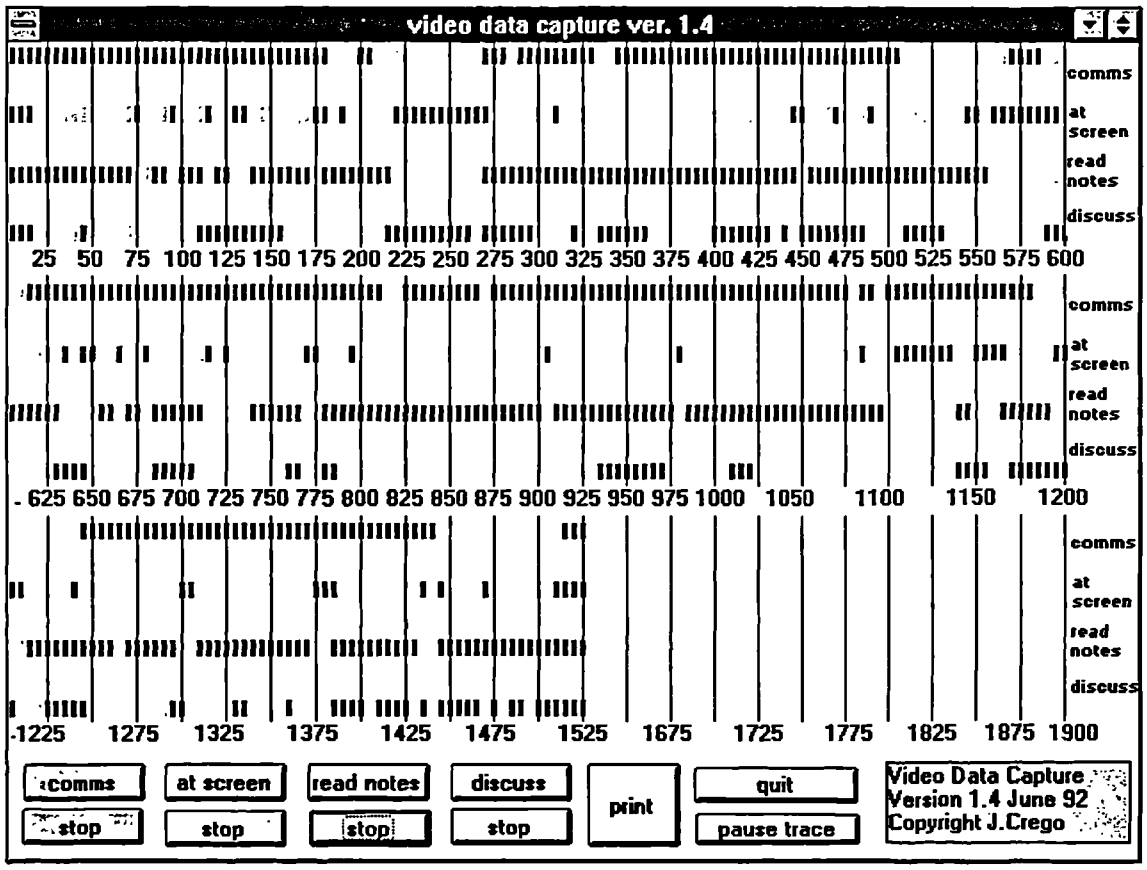
Appendix 6

Charts of observations of participants

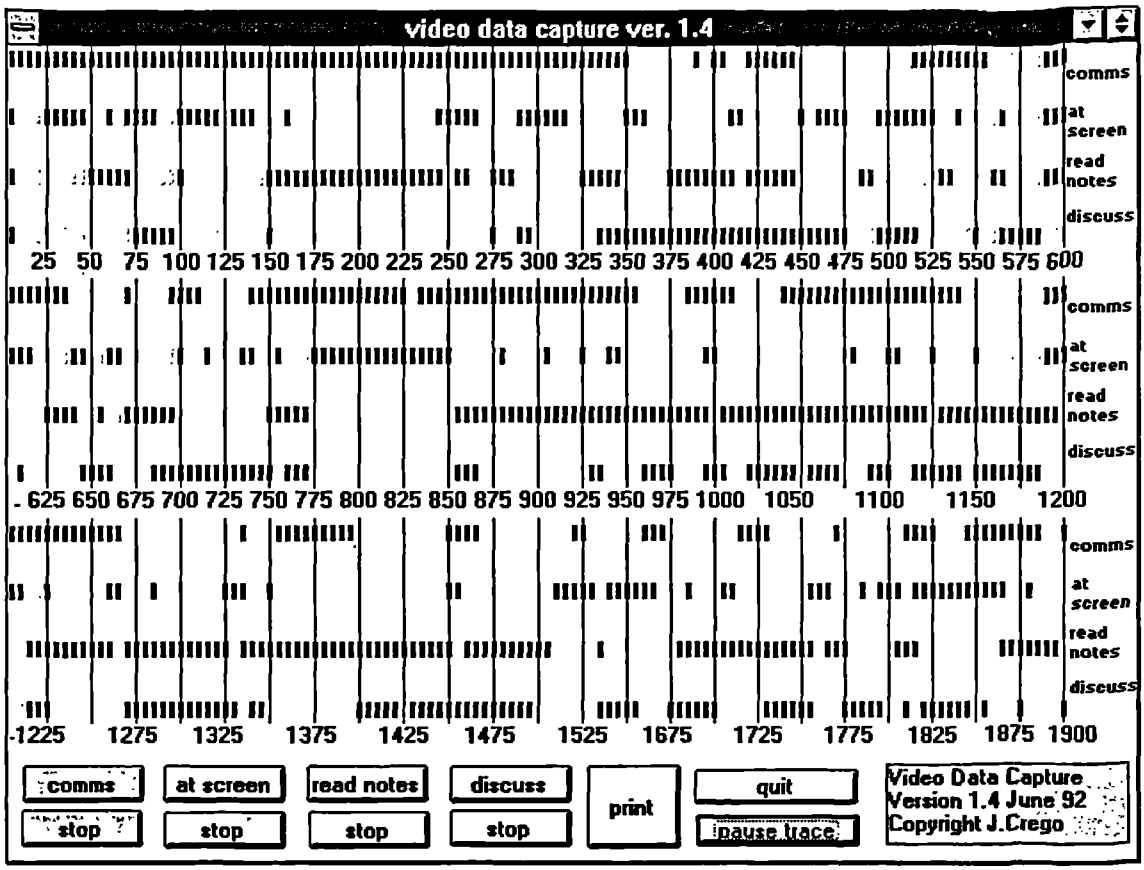
Silver Command



Bronze 1 (Inside the Stadium)



Bronze 2 (outside stadium)



Appendix 8

Interview 1

I'll start the interview straight away by saying to you, you recently played a game on the simulator, tell me from the beginning how you felt about it.

If I start at the very beginning the two days - the week in fact - were excellent the day it was presented by Inspector Norman and the other gentleman that was there. The last part which was the part that you are talking about now on the computer, I think speaking to everyone we were a little apprehensive, because we didn't know what to expect, and especially I know there was one superintendent there whose knowledge of computers is very minimal, and I think he was a little bit apprehensive as well, because he was wondering whether he could actually cope with the system, let alone anything else that was going to be thrown at him. I think maybe to improve it we could have had the night before, 15 minutes down there, to show us the computers and what's going to be done so that we could go away and just take in some of that before starting on the Thursday doing the actual scenarios, but on the Thursday we went in and they explained to us how the system works, and then we went straight in, so maybe if that part of it could be brought forward to the Wednesday evening, for just half an hour, so that you could explain something of the technology that is in it. It obviously helps if the Metropolitan Police could use a London Club as opposed to a Scottish Division, which we are miles and miles away from, but the principal is excellent.

On the first part of the exercise I was in the silver control. I would actually argue because of the sheer numbers that were involved. Two of us were playing the role of silver, that actually took away from it slightly, it should only be one individual as silver, and that person is making the decisions themselves, even if for the second part he just oversees it. But it was very easy which a silver wouldn't have to bounce it off the second person. Make a decision and then he'd turn round and say "Hang on, if you actually look at this I don't think that is the right decision", so you can change your mind. Whereas if you are doing it as a Silver on your own it might be better, but what I am trying to say is you have got the support of someone else there, and the pressure might be slightly greater, as it would be in the outside event of doing it purely on your own.

As far as the second part of the scenario is concerned, I was bronze 2 which was outside the ground, and as I have said to you, when it started off, obviously the match was still in progress, but from the second half onwards, because of the number of incidents that were thrown at the Bronze one chief inspector, I was sitting at the edge of my seat on tenterhooks, thinking "well my time is going to come any minute" maybe I should have offered services to assist him, but I was thinking I have only got a minimal amount of resources available to me, I don't want to use them up at this stage, because I am going to need them later on when it comes to me. Just when I thought my time had come it finished, because we went for 30 minutes, and the time just flew by because that is how involved you get with it. But I personally think that that could have been divided up a little better, maybe the game finishing a little earlier, so that we could have the problems outside the ground. The scenario actually said that there was going to be problems, or it was envisioned problems in the town centre. It could have carried on to that stage so that the bronze 2 had to deal with those things, because Bronze One was absolutely overworked - he was inundated - I don't know how he coped with everything that he had to do, and bronze 2 was really sitting there thinking my

time was going to come any minute, and it never did come I think the whole system is excellent.

There are a couple of things that you were saying, if you wanted to be on your own as a decision maker, and if we reduced the numbers would you still need all the communication facilities available to you?

I think so, because you could actually do with two PC's . -One PC could be used as the RT Operator to communicate to the Bronzes, it would have been quite nice to have had a second PC and maybe one of the silver's could have done it, in that role, but there was a board available to show on that board all the deployment, because you've actually got to the stage where you are thinking Who the hell have I deployed, and who have I got left. Because everything was happening so quickly.

In the real world we would have a CAD and I don't know if you could actually have a CAD there, where it is typed in, you find somebody who can type, so that you can see what responses you got. no more than that ....

What I was thinking of doing there was putting a computer screen in, which is would be a representation of plot board, which can be updated and plotted by the control, so you wouldn't have to do the plotting - you would have a screen where it appears, although you deploy serials or officers they would appear on that screen. What do you think of that suggestion.

That would be marvellous because when you get well into it, because so many things are going on, you are reminded - as I previously mentioned, the kind of thing, - hang on - have I got this person already deployed?. ... A couple of times when we called out to someone to be deployed, they were working on another job that we had given them.

getting back to that, when you are trying to pull uphill, and you are trying to actually watch what is happening on the screen, and you are trying to listen to everything that is going on, you do after 10 or 15 minutes, see that not everything is plotted as it should be, and you have got to have somebody doing that, it would make life a lot easier.

Tell me what you thought about the communication systems that were available - were they adequate?

There is a problem that you can overhear what others are saying, because of the logistics of the room, unless you had facilities to put someone in a separate room I can't see any way out of it. Unless you used earphones or something, which would possibly stop you knowing what your partner was saying.

Well, things will change, I want your views on this, I am considering taking Silver into the de-brief room. What do you think?

It will actually make it more realistic

So apart from overhearing, were there any other communication device mechanism that you would like that wasn't there?

Not that I can think of No, but I am not a whiz kid when it comes to technology, or anything like that, fortunately when I was Silver on the first occasion, no-one was standing over us and I didn't hear, maybe I missed it at the initial briefing, the phone ring. And I was obviously dealing with something else at the time, and that said I will get them to replay it, and once we knew about that we were looking for just a little bit more. But that apart, no, I thought the way the whole day went was excellent.

Now I want to talk about the video that you saw. Just talk me through how you thought about the media itself. Other than the fact that it was Scottish.

I think that the wonderful thing is the scenario, and really at the end of the day, it doesn't matter whether it is England, or Scotland or where-ever, you can set up any situation you want, whether it be bomb threat, whether it be crowds rioting, whether it be a fatal accident, we have a scenario of an accident so that the coach is coming in while a traffic jam and should we delay the match, etc. etc. I think the great thing is that you can look at history, Hillsborough, Bradford and everything else, and you can make from that any scenario that you want quite honestly. And I think the scenarios were excellent, as I previously stated my only criticism was that as Bronze One at the time, and I think he must have been mentally exhausted, at the end of it, but he was doing all the work and just when you were going on to the bronze 2 the time had elapsed and we stopped. And I was literally sitting on the edge of my chair on tenterhooks thinking I want to get into this. From that part I think the timing could have been equalled out a little. But as far as the scenarios that you put in, I am sure you have done this from the other exercises that you have done, and yes, they were very, very realistic.

How much video do you think was stored in the system?

Probably not a lot, because I think a lot of it kept repeating itself, that I did notice, but I don't think it really made a vast amount of difference, you are not looking so much as what is on the video, it is the information that is coming up and the information that is coming over the radio. So yes, although the video itself was repetitious, and I would say it was probably about 10 minutes, before it was on the loop and came back, that didn't make a great deal of difference, because the concentration wasn't on that. You suddenly realised "Hang on - I've just seen that" and then you go back to really getting on with what you are doing, and forgetting that part of it.

OK - the thing is that the whole system is 20 minutes, for everything, that video disc stores only 20 minutes of video, so a loop of 2 minutes and 3 minutes, but you made an interesting comment, that is that when you realised it was a loop you then said to me - I think your words were - then you can concentrate on the other things. If you didn't realise it was a loop, or if it wasn't a loop, would you have spent more time searching the video for information?

Possibly, although knowing what technology is, when you realise it is a loop sub-consciously you are still tuned in on it in case you throw something else in, in case the phone rang or something, at that point, and so maybe it would make it a little more realistic if it was a continual effect without having the loop scenario, but you are still concentrating because you might have put something else in, so you are still really looking at it and looking for the text that is coming up.

Now you played Silver first, that is interesting because there were no tricks in the first scenario, there was no engine dropping off an aeroplane in the middle of the pitch,

I was waiting for that...

And you managed to resolve problems reasonably well, and they resolved themselves for you in the game, so you were in charge of the game, the game wasn't running you, you were actually running the game, we have had groups that haven't had that situation. When you then played Bronze two in the second scenario, were you still distrustful of the game, did you think something was going to come along and trick you?

No, I didn't think anything was there to trick us, I thought all the scenarios that were put in were there to try and ascertain what we would gain from the weeks course that we had had, and all of these as I previously stated, one could look at Hillsborough, one could look at Bradford, and any other situation that was going, and from that I personally wasn't looking for tricks; I mean you actually really get into the role when you are doing this, it is amazing just how much you get into the role. I have done table top exercises before but nothing on this scale, because you are not just round a table doing it, you are actually physically involved with it, and virtually you are there with it at the time.

Let us go back to the role thing, that is a significant thing for me, Lets take the first scenario when you were in Silver. Although you argue that you had some artificiality because you had two of you, and you weren't on your own, in time in minutes - remember you were in there for about 40 minutes,

It seemed quite less than that I must admit

How quickly would you say you fell into the role of a Silver Commander.?

No, I think you got straight into it within the first 2 or 3 minutes, and you really became absorbed in it. At no time do you actually think it was a game, you actually got into the role body and soul,

That isn't always the experience, as I say, I some people refuse to get into role, deliberately,

It would be interesting, and maybe you would tell me after, what my counterpart played - I know you saw him just after, that is probably slightly better because it's still very, very fresh in his mind, whereas now 2 weeks has passed by since I was there, and certain aspects do go

Now let me go back again to this video, first of all you said that you did recognise they were loops, that is not always the case. Sometimes when I tell people they were loops they are surprised. If I had used enough video not to have to keep looping it how do you feel about that.

I think it would only make it even more realistic to what it was at the time. You actually get so into the role that yes, you are looking at a television screen, but if you are in the control room you are probably looking at a screen anyway, you wouldn't be looking at the match itself, you would be getting all the information that is coming in, collating it, and putting everything out. And I think it would only make it more realistic doing what you are suggesting, that said, I personally really got into the role, and didn't find that a disadvantage,

Let's go into the de-brief now, in the de-brief you had the facilities to replay the system, the audio and the video. What were your feelings just after you broke from Silver into de-brief, and throughout de-brief.

I remember my feelings it was quite honestly a relief, because I was expecting the world and his wife to be thrown at me at any minute, because Bronze 1 as I have said, they really hit him with everything that was going, and suddenly it was finished, and I went in there with a sigh of relief, because at one stage I was thinking how would I cope with all this that was going to start coming at me. And I can't even recall that we had a de-brief after the first scenario I thought we just went for coffee,

Some of our students have said that they have still been working through the first half in the second half. Did you have any sort of feelings about problems that you dealt with in the first half as you did in the second half?

I think initially especially probably because I wasn't so involved in the early stages, my mind is going back to what the two bronzes were doing in the first half, and similar situations, and because we have the scenario which we have looked at of what is going to happen - obviously creates problems in your own mind, in trying to outplay the computer, if you like, and decide what, I mean I was quite convinced there was going to be a huge punch-up in the town centre, because of the historical thing that there have been problems before, so I thought we were going to have those sort of problems, and this is why I didn't want to deploy too many resources, to try and assist Bronze 1, because I thought I am going to need all of these. At one stage I was called up because there was an incident at the Docks, and I actually said "Yes you can go but be mindful that we are low on the ground because I have lost a couple of people that were dealing with prisoners somewhere else, and I wanted them to come back, because I am thinking any minute now the world and his wife is going to hit me, and that never happened.

What you said to me also is demolish the idea in my mind of playing scenario as a separate scenario. In other words you could play scenario 2 at a different time, because in fact the artefact of scenario 1 is all your thinking in scenario 2.

One of the problems,. Is that you have got time restraints straight away, we could have actually played it out and had the whole day with de-briefing, briefing initially, etc. etc. Now whether you could have one lot coming back on the Thursday for the whole day, and then the second half coming on the Friday, but it was actually felt by me anyway, that I have gained a lot from that - that it was a bit rushed, and you went away thinking Maybe you've missed out something on this, because of the time constraints available.

That is a very common statement that I have heard from others, I think that it should be built into the next game that a) we will have one person in Silver, and b) the game will last all day. The de-brief should last as long as there is energy left to run them -

Have one person in Silver in the morning, and then the other people could be observing maybe, and then the person who is silver initially doesn't get totally, mentally drained. Someone - another Silver - could come in and the first Silver could actually observe and maybe gain from what is going on, so everyone is getting their part but not together, where you have got two people.

How quick do you think the de-brief went?.

Again I think because of the time restraints on us, it was very, very quick. And I am sure you would have liked to go into it in much more greater detail than the time allowed.

Did you feel at any time that you were being assessed?

No, it was funny, I mean the camera was there, and I noticed it, but then immediately forgot all about it, and No, I have never felt that I was personally assessed, having said that it would have been quite nice to actually look at the film from the camera, to see how you were dealing with it, but we never had that facility - all right the facility was probably there, but we never actually saw that, but it would have been quite good to have looked at that and seen how you were coping with certain things.

It should be realistic, but I mean, one would imagine, unless you are exceedingly unlucky, at any given match you might get one, maybe two, of those scenarios come in, not as many as came in, because at the end of the day you have only got limited resources available to you, now at a real football match you have only got limited resources that are available, but the chances of so many incidents happening you would be the most unluckiest person going. Here, as soon as you were dealing with one, may be dealt with a crash situation where you had some people injured, straight away an incident of an IED in the toilet which you have got to go and deal with, and it just went from one to the other, and you didn't have thinking time between the incidents.

I think maybe that could be done by putting Bronze 1 and I think more in the role of bronze than Silver, and throwing some of the incidents outside the ground, some things happened there, I think at one stage there were people who didn't have tickets, and in fact I decided yes, because there was room they could go in, the other Silver decided No they couldn't, because you are going to start to have other people turning up at all ticket matches thinking they could get in. And I agreed with his decision so they weren't let in. But maybe in the second half there were problems with them outside demonstrating, so to take a little bit of the strain off Bronze one, and give Bronze two something to do.

Another thing I think I am going to do is that if I give you lots of problems maybe you wouldn't mind dealing with all the problems, if there was a sufficient period of quiet, between them, in other words not all happening together in a short period of time which is minimal, so if I increase the scenario time, say from 40 minutes to 80 minutes, would that be better, to put almost the same number of incidents in,

Put a breathing space between, I mean, at one stage I actually felt quite sorry for Bronze 1 because he was just getting hit with everything, and as I say I was on the edge of my seat thinking "God - my time is going to happen any minute" and I thought he coped exceedingly well, he's had experience of Greenwich which helps, I mean I used to police West Ham and Tottenham, Arsenal, but being on this Division I haven't policed a football match for a long time. Things change, but I thought he did exceptionally well when - one thing I remember him saying which he said was Gold's decision, the idea being whether they stopped the game and evacuate the premises...stadium, and he said "Well that's not my decision, I reported back what I found, the decision actually is one for Silver & Gold: which is right, I mean in real life Bronze doesn't make a decision that's going to evacuate. But I think always in a similar situation, you stop the game and evacuate and it's an mistake, then there is criticism levelled on you. You decide No, we will wait, for the Silver Officer to come and assess the situation, we will let the game continue, and it goes off at that time, well again you are going to be criticised for not doing something earlier, and evacuate the stadium, so you are actually in a totally no win situation which-ever way you go.

Life is like that though, isn't it?

Yes, very much so. But I actually felt and a lot of criticism was made during the week on the Chief Superintendent that was in charge at Hillsborough, Yes, he is paid to do a job, but that stadium was not designed for those sort of crowds, you have got about five turnstiles or something, with thousands of people coming in them. I have been in a situation at - I think it was Tottenham - where I felt (and it was before Hillsborough so it wasn't as a result of that and panicking) there were people trying to get out, the place looked packed solid, and I called up asking whether they could put them to other locations, because it was absolutely crammed to capacity; they could see on the video from the Control Room that if people moved - everyone is trying to get out the tunnel - if they moved any corners they would find a bit of room, but it is quite normal, in the element that go to football matches, that once they are in a situation where they can see the pitch they don't want to spread over. I was actually over-ruled, I wanted it stopped, and I was told "No, they are still coming because there is room". From my vantage point within the terrace I couldn't see anything, but I had the benefit of the video monitor

showing all that. So you have got to go by that, you have got to have faith in the people that are there controlling it. At the end of the day what happened was tragic and everything else, but even when the disaster started, people initially were trying to climb up, they were trying to invade the pitch, even when in situ there, they don't realise that it is because of a crush situation, and I think that shows just how difficult it was from his point of view, I mean Yeah, you can criticise that he didn't make decisions not to sit, or make no decisions at all, didn't do anything, but I do think he had all the information from the

Someone was saying there that (I think it was Barry Norman) that he didn't know that the inner gate had been closed by five PC's or some stewards, the previous year because of a similar problem, he wasn't aware of that, so maybe it is down to communication problems. But personally, and I know Barry Norman goes to games every week, and deals with this, Barry is very, very hard on what he did, or that he did nothing. I actually felt quite sorry for him, because for the information that he had coming in ..... I mean it is like the Bradford scenario isn't it? I think the first thing is that when an Inspector calling up it's bound to be evacuated; now that was never done because someone's probably said "Hang on, this is - we'll get the fire brigade down" If you know what the end result is going to be you wouldn't care about stopping a football match, when there is a 30,000 crowd that's going to be up in arms because you have upset their entertainment, and everything else, and if the game could have been stopped and continued at a later time, you know, say 15 minutes. But if you know the end result, I mean a lot of times you would make a different decision to what you did make at the time.

Hindsight is a wonderful thing isn't it?

That's right.

A section has been removed here as it contained information about how the bomb threat was dealt with in the simulation. These police tactics are sensitive and therefore classified

I actually felt from our game that I couldn't see what was happening to Silver in the second half. But Mr. Crosby had taken over completely, and everything that was coming from Mr Crosby that was the impression I got, although it was Mr Hughes - the other person - he was the one who had no IT experience, and said to me that it took him the first 20 minutes to get used to just the technology that was involved and he - I don't know whether you have interviewed him, but he didn't feel he got into his role because I think he was more worried about the technological side of things.

Then he didn't want the play at all, he says "I'll leave it to you" and wouldn't be drawn in the game because he was so worried about technology. And the point being made now several times is half an hour the night before, to solve all the anxieties about the technology and enquiries about managing the game,

I think that would be the best way forward, because the day itself was excellent, but I went in there, I mean you saw me on the computer when you came, and not that I am that good on computers, but they don't scare me any more, like thinking "I have got to do this, or that", if I could have seen it and seen how simple it was

the night before, and gone away with that, then I think I would have been far more at ease than when I came on the actual Thursday, to do --

Do you have anything else that you feel would have to discuss about the day, the briefing, the de-briefing , the way the exercise was run?

No, I think that we have discussed everything, the only thing I would like to reiterate is that maybe extending from 40 to 80 minutes, but not directing it at any one individual, letting them have a little bit of breathing time, and get the second individual something to do, because you can do exactly what you want to do, I mean that device could have been outside, it could have been in a place where everyone is going to be coming out the ground, within 5 minutes, and we have got this IUD that has been found, so what do we do? We have got to get them out to bring in Bronze Two on the outside.

We could actually - thinking about it - have the grandstand as one place, and the turnstiles as another.

Yes, because normally that is something you always do when you have a secondary device, and could be found by one of the PC's or something, I mean if you find two then you are certainly going to find

More PC's going to be involved, a lot more as well in that incident,

OK thank you for that,

Thank you for letting me participate, I was very, very impressed with the whole thing.

That is very kind of you to say! And I shall pass it on to Barry and Nick,

25th October.1994.

Interview 2

All right so can you just in your own words just talk me through the sort of experience you had in the cinema.

The initial experience was trying to decide whether we were doing bronze or silver first. And from guessing from what might happen cos of the experience I have had, others no doubt have had, of sort of simulated exercises, you are looking for what you can get out for the most - some people might be trying to scare you, I don't know, I was looking for the most, I actually wanted to do Silver first in order to get the most out of it, because I had guessed the majority of the action might be in the first set of scenarios as opposed to the second - course content in the nature of why we were doing that course. So I did try and box to try and get to do Silver first. We then went into the actual sort of area that Silver was in, with a view to sorting

out who was going to do what, because we had two of us, there was the chap who had come in from the previous course, Bob I think his name was, and myself, so I could foresee there might be difficulties with having potentially two silvers, and as we were sort of sorting ourselves out the thing seemed to fall into place quite well, I think the other chap, was quite happy to get the radio, and I was quite happy for him to get the radio, 'cos I am not using radio all the time, your expertise drops off, so I was quite happy for him to take the radio if he wanted to, and also I did think at that stage there might be a difficulty with certainly introducing somebody who hadn't gone through the course, I wondered how that would affect the balance of what was going on. Because over the period of three or four days you actually get to have a feeling of what the other players would like to do. So I suppose there was an element of that sort of thing going on in my mind, once we were sorting ourselves out. As it transpired, there were two seats, and I am not sure why I deliberately ended up standing up, but by standing up it actually gave me firstly a roving commission which I prefer, for scenarios, and secondly I think probably I - more psychologically than anything - the advantage of not sitting down and looking up to somebody, position definitely, whether you like it or not you can't - it is very difficult to sitting down, so I think those are the elements of "What can I get best out of the training" and indeed how to best deal with the exercise itself.

So there is a mixture of those sorts of thoughts going on. I suppose there was also another element, as there is, whether it is for real, or whether its practice, there is always an element of adrenaline, is it 'the go', saying I don't want to make a fool of myself, because there is always an element of a mistake, a bit of nervousness, and I thought that is exhibited by everybody, it is what you would expect, But I certainly felt a little bit embarrassed, but I think to be honest in terms of performance it enhances your performance, to be a little bit on edge, anticipating for what was going to come next. It was the first time I had any experience of that type of scenario, using those types of materials, interactive video, type scenario. I had been involved in table top exercises, on other occasions, but it was the first time I was involved like that, so there was a moment of unknown there, in terms of how things would come on top, in a more realistic way perhaps, than through either the computer generated messages, type exercise I'd done before, or indeed the military type exercises, or with the operation cells where they show you video, you get asked questions, type of testing.

And then as the incident started to run I felt quite happy, quite comfortable and there comes a time when whether it is real or practice times suspended, because you are involved in it, and its perhaps at my stage of service you have done so many of them that it becomes real, because it is part of preparation for the type of responsibilities you might find yourself faced with, so I have no doubt at some stage, I couldn't tell you exactly when, in terms of making judgements, making decisions, consulting people, doing all the sorts of things you do in managing a real life incident, that the fact that it was an exercise was totally immaterial. It was a question of what type of responses were required in these sort of circumstances. And I suspect that became the case probably became more or less as soon as the real thing started to happen. I said real, I mean actual parts of the exercise was designed to make us make decisions, started to come in.

Where do you want me to go from there?

OK Let's just back chat a little big, When you said you felt it became more real, was there a point where you would suggest that you had completely forgotten you were in the simulator? Or were you always aware that this was a game?

I think it is probably fair to say there must have been parts when the fact that it was a game wasn't a factor in my mind, it was two or three senior police officers consulting about a problem, and I say, having been involved in enough training, it goes beyond a game in as much as you are testing yourself whatever the circumstances are presented, in whatever way, whether its SOS part exercise, or part of real life.

I can't give you a point where - I can say almost definitely that there would have been times when I was unaware of it being a game or being a training scenario,

Lets look at two sort of things you talked about, sort of anxiety levels, one was that it was an unknown way of training and that gave you a level of anxiety? Did that disappear, did you actually become confident that this wasn't a technology problem, it was really a management problem.

Yep,

So once things started rolling?

Everything was a new toy if you like, the game was forgotten as far as I was concerned. The only ongoing concern I have was about the hearing of the things that came through, because some of the audio stuff wasn't as clear as it might have been. The fact that someone was speaking in almost indistinguishable Scottish didn't help - particularly the Chief Steward or whoever he was, who kept sliding the glass back, making comments, I thought 'What did he say?' That was the only concern, that we could actually hear what was coming over audio.

Then the other thing is, if we look at anxiety, it is not anxiety about the game, it's anxiety about managing the game then. Your own stress levels?

Would you say that throughout the first scenario, which was where you were really playing Silver did you feel that you had levels of stress, or did you find reasonable levels that you would expect to have in a game, or again were they - how would you discuss the stress that you thought you were in there.

Yes, I would say that it was always within manageable limits, I never felt that the world was going to come in on me any moment, interestingly enough the only real stress I felt (if that is the right term) was in trying to ensure that we came to a decision the two of us, rather than just taking it myself, and saying this is what we are going to do, there was one point when I think I said 'We are going to have to delay the kick-off", I think it was me who introduced that, it was my impression I said that, and the chap who was doing the radio put it over as "We are thinking about it", and in my own mind by the time it had come to saying "Right - tell them we are going to delay the kick-off, and I'll get on to Press to let them know, the decision had been made. Now it may have been I didn't communicate it properly,

Did you find that irritating?

I did find it irritating, I found it was - I don't like making a decision with it sounding as if I am indecisive about it, if you have made a decision then you go with the decision. And in fact when I phoned the press officer, I was quite definite in saying the decision was made, we are going to delay it, and I could hear whilst I was on the phone, I could hear a message playing over the radio, and that is when I was a little irritated, yes, definite, so as soon as I put the phone down to the Press Officer I said "Look, tell them we are delaying the kick off, we are not thinking about it, we are going to do it". And that was I think the one point that I can think back on that there was any stress in terms of feeling that was I not communicating decisions well enough within the Silver control, or/and was that liable to lead to dissention within the Silver control, which was my interpretation of making a decision was different from the others. Had I been there on my own there would not have been a problem about it. But as it transpired there was never any real argument or debate about it, it carried on as it was.

Let's just go on. This problem that you had about the uncertainty of the radio message, had it been a real match, were you in fact more concerned because this could be a position where you were assessed, as a decision maker, making sort of greyish decisions, as opposed to as in a real world, you would have let that go?

No, I don't think the assessment thing came into it, because I was conscious of the briefing, where you said 'Not quite lay back and enjoy it, but there was a question of to learn from it, there wasn't any actual assessment,"

You believed that then?

Yes, I mean I wasn't

You weren't threatened?

No I wasn't threatened.

even if there had been a question of assessment,

that wouldn't have been what was exercising my mind particularly, what concerned me was the communication information and decisions, and I was thinking "Did I not make it clear enough, I thought we were going to delay the match, that was the real point, and then once you've committed yourself to something put the information out, you know. Its when you use the grey fashion, then people will not be responsive to it. You've got to be crisp. You've got to be direct, in an Operational situation you have got to say "This what I want doing" otherwise all sorts of interpretations will come around.

Let's then look at your interaction with your bronzes, how do you think that went?

Yes, I was reasonably happy, with attempting to keep them informed as to what was going on, and trying to forget about the fact that they could overhear what we were saying, because they were effectively in the same room, the screening was there, but we could hear them, so the chances were they could hear us.

What was it you could hear, you could hear them over the radio? or you could hear them talking in the same room

Well, you could actually hear within the room as it were.

Doing what within the room?

As far as what they were saying - thinking back probably the only communications that we heard were radio communications, but I could hear them not just on the radio, I could actually hear them as well, so whilst I am fairly certain they weren't talking amongst themselves, Bear in mind that we were conferring about a number of matters within Silver control, the chances are they could overhear what we were saying, but the trick was to make sure that we weren't relying on them overhearing what we were saying, but actually relying on communicated information through proper channels,

Do you think it is a good idea that we have now moved Silver Control into the de-brief room?

Yes, I think it is a good idea, to have them separate. I think that could lead to a feeling of isolation from Bronze because when I did Bronze later I did feel - "Where's my support team!"

But I think it will add to realism, it will remove the element of "Now have I told them" because you know you have got the conference going on, but just in the back of your mind, if you are aware of that they can overhear you, you can allow that to influence what you do in practice.

There were a number of times when the room was filled with football noise... did that blot out your ability to hear them?

Yes, it had two effects, yes, it had some deafening influence in terms of hearing what they may or may not be saying, both from a point of view of being in the same room, and the radio, because then other things were difficult to hear, and that was distracting, from the point of view of trying to exercise control, and I am not sure

how realistic that would be in a proper Silver control, that you would get that type of noise interference.

It certainly would be an influence on roles, because they would be out there on the ground, but a Silver Commander should and most controllers that I am aware of are sufficiently removed from the crowd as it were, and not the subject of noise levels, that we had.

But again it helped in terms of having to cope with other elements.

Lets now look at - we may well come back to some of these things - but lets now look at the de-brief. Just talk me through your feelings of the de-brief

It was too short, we haven't managed the time, and bearing in mind that during the course itself, I thought we had wasted some time, I found that a bit annoying, because obviously the de-brief was potentially the most valuable aspect of the whole course,. and we ended up with a rush. And I thought that that spoiled it. Which sort of summed up my feelings about the course itself, which we ended up with trying to do a Highbury between the CPTU course and the Mets requirements as far as football commanders are concerned. But we never really had the courage to do one or the other. And I felt that we really ought to say if we need the course to be contained entirely to the Mets needs, instead of say let's do that, and take whatever is valuable to the CPTU and use whatever format they are happy to use to our advantage; but lets tailor it to what the Met. needs are. I appreciate that it is in stage of development, so that wasn't meant to be overly critical, in fact I have spoken to Barry about that, and said that I think we need to be bold and say Let's do it. And then I think we can manage the time better. As a result I think Barry was left in a position where in the time management it became more difficult than it should have been. 'Cos if you hadn't got a set time-table, then it is difficult to move on to the next thing. And I didn't think we gave ourselves enough time on the Thursday to do justice to the exercise, and to the lessons that we could have learned. So my feelings as far as the de-brief course yes, it potentially had the most value, but we got stuck in terms of what it was, because it was a bit of a rush. Somebody had to dash off as well, ... so that tended to curtail it, as long as you are going to go on and do the second half of it, because we needed to wind up by one or one thirty. The whole thing was too cramped. As far as feelings of going into the de-brief, I felt happy that we had worked quite effectively as a silver control. There was nothing nagging me going into the debrief that I thought, like 'you've made a hash of that' sort of thing, and dealing with a professional in a management sense. - not so much as whether we had succeeded in terms of the exercise, but we succeeded in terms of managing ourselves as a team; and I felt reasonably pleased that we had done that quite well.

OK so if we - to explore that - you actually felt good, you had performed well, does that mean that you believed that the events and incidents that you had performed well in were realistic?

Yes as I said I think reality had been suspended, so the fact that we won or not didn't matter. What was important is that as a management team we had dealt with what was thrown at us, if you like, so the reality was that there were problems

thrown at us and we had to deal with them, and come up with some meaningful solutions to them. And I felt that we had done that so I am not sure that a game aspect by then really was a feature in my mind. That was in terms of how I looked at it.

The system is able to replay any incident on the screen there, that was not used during the de-brief at all.

No

What do you feel about that?

It might have been valuable had we had more time to do that, but it never came up as an option, because we were clearly constrained by time before we started, whether there might have been incidences worth dealing with I am hard pressed to think now, What I was concerned,

the only - Just thinking on that point - replay - was the only element if you like, of lack of reality. During the exercise itself was "Would we get the chance to have a replay," and so what was leading up to it - decision. I rationalise that by saying well, if you are talking to someone and you didn't hear what they were saying you would ask them to repeat what they were saying. So if you were relying on the sort of replaying of information then that was realistic, but if it was actually relying on seeing the thing happening again, then that would have been unrealistic.

But having moved from the real fast time world of playing the game, into the slow time reflections of the game, which was de-brief, would the idea that it is in fact a learning event, would it have been more valuable to have gone deeply into an incident, a specific incident, and look at the contributing factors that built that decision.

Oh yes, undoubtedly, I just brought that idea, so say that in terms of the re-play - during the exercise itself - I was thinking Is this playing by the rules, if you like. And trying to make it real. As I said during the exercise itself I tried to rationalise, so when we came to do the de-brief, if you'd replayed stuff, yes I think it could have been valuable, to discuss certain points, cos even if things haven't gone wrong you can still discuss Well, why did you do that? At this point you made that decision, what influenced you to do it? And in trying to reflect on the objective of what you had done, I would think there is value in that, so Yes.

If we take the timings, I know things took a long time to get going, I can't quite imagine why, I think there were lots of discussions going on in the room, for about an hour or so before we got going.

I think we hadn't really dealt with it properly the night before. Had we dealt with some bits the night before we could have ...

I think if you are going to do that you have the option of either saying well we finish when we finish, or if the discussion doesn't go on long, then so be it. Or you have more scenarios that you can play, so that you can keep the interest going. One of the difficulties in something like a de-brief is you can only do it as far as the energy is there, so it really depends how many points there are of value to discuss, and how willing the people are to do it, because what you have got to contend with is the ego of the individual you are dealing with. And let's be frank about it, if it has gone badly then people are going to have wounded ego's anyway, and you've got to be very careful how you deal with that, if you don't want to either end up with a reaction of "Well I don't want to play this game" so you'd better not get attacked in the act of self preservation.

Or they can take a path thinking "Oh, I've signed on to it, I'll have to" and they can walk away with a shattered confidence, which actually will do them all damage than never having done the whole exercise in the first place. It is a very difficult area to get the balance right. What I am really saying is there should have been more flexibility with the time-table, like just saying Let's give ourselves more time,

whatever it takes, and if it necessary to replay it then that satisfies one of the options, but not to necessarily say "We are going to re-play it, because we have got that option available to us".

We have had similar problems with other groups, because they felt that they were constrained at the end of the day, it loomed up.

I don't know how my colleagues felt, but ironically during the course the fact that we were finishing early ... I was actually quite annoyed that we could be losing valuable opportunities, what was actually becoming more important was finishing at a time when we said we would finish, at the end of the day, rather than saying "Was there still energy left to deal with points of issue?"

From my own point of view, the value of it would have been to say well, there are things to discuss here, and people having to stay, and we will continue and discuss that, But that's me, my time management I would rather unless I'd got something specific that I had to go to, I would rather deal with the issue there and then, get it finished with and if it takes a couple of hours more than anticipated, then so be it.

Does this course, or other courses similar to this course, do you think, warrant a residential status?

Yes, I think it is easier in a residential course, I've actually had experience of running Commando Training and Public Order, where I have experienced this sort of thing, some courses come 5.30 they are finished, they don't want any more, but with others - maybe the majority - if there is an issue to explore, then options of things to do, or see, or visit, the majority would take it up and say they are happy to do that, because once you say "I am on a course, the time is there to be best utilised,

it is difficult running what is supposed to be a residential course in the Met situation, because the expectation is that people that *** so again that is part of this problem that we have got at the moment, being half way between a CPU course and a Met course. I think really a decision has got to be made. You either do it one way, or you do it the other, and if you make it the Met's way then you got to go all the way.

Let me now ask you about the pod itself. What would you have liked it to be like?

Really the ability to look in one direction and have the information in one direction; what we had was the radio, the computer, and the screens, so we had to face in one direction, and behind us we the screens on which we placed sort of background information, like employment of serials, and what have you. In order to do it as I would like to do it in an operational, I would like that in front of me. So in other words you are facing the screens so far as the video action is concerned. And all you have to do is look up to look at your deployment. To try and look back - you don't do it that's all. So you need the information visually available to you rather than the physical effort of having to try turn round; I would think that is the major aspect that I would put. And Whiteboards rather than bits of paper.

I understand

Talking about deployments, you would normally in the control and have a whiteboard with someone writing on the deployments, would it be entirely foreign to you to have a schematic of the football grounds and units deployed on to that map so to have a graphic representation of your units?

No it wouldn't. But I think if you are going to do that you would have to have a practice first, to be fair to those who are taking part in the exercise; if you are introducing a new concept like that my feeling would be a little bit of a play beforehand just to get the feel there. Because one of the difficulties of the exercise was you are dealing with ground you are not familiar with, which was a little bit artificial. It wasn't so much a problem with the Silver, but with Bronze I did find it difficult. Because as Bronze, you should have known very well what your area is, but Silver you are making more the tactical decisions, as Bronze you are actually looking to implement things, and I found it difficult as Bronze wants to feel that I knew where I was and what I was trying to do. I came out with a couple of things.

We didn't really have a proper briefing, we went through that exercise the day before, of picking out bits and pieces of what were included and the order, but we never actually sat down and broached. So what we had was a mix match of ideas and working towards a briefing, we never actually sat down and said "Right, this is what we are doing, this is what he does".

If we had had an in depth detailed briefing of the ground, the responsibilities within the ground, demarcation areas within Bronzes, structured like I think at one point there was a problem with the burger bar. Indication of where things are so that you have got a mental log if you like, of this ground, that would be more useful to you as a bronze,

Very much more useful, and I think the ability to be able to bring that up on the screen and say, Yes, that is the location,

because what you had, again it is not a criticism it's - we are at a point of development aren't we? This is a sort of embryo stage really. Is the ability to say the Burger Bar North West Corner. And you should be able to actually get on to that, as opposed to what was as I remember rightly about four screens work finding corners of the ground, or the overall ground itself. So it was difficult to say Well where is what? So I think to clarify that what you need is to have some form of briefing which involves getting familiar with the equipment you are going to use without too much worry in terms of the exercise. But then the opportunity perhaps to build up a briefing from it, in other words to use some of the useful points from the Wednesday, in terms of getting people together and saying "What are our problems likely to be?" but also get an air of reality and say "This is the area around which the problems are likely to come" so you have got to get the balance between giving people sufficient information and familiarity in scenario but also get some of the learning points in preparing for an operation. You don't want to take away from people, there has got to be a balance,

Did you learn anything? During the simulation?

Yes, I am sure I did. I am just trying to think of any specifics, I certainly learned about the value of ensuring communication, or should I say reinforced lessons that I must have had many times before, about the value of communicating information precisely. And succinctly. Learnt how to take on board getting a new member into your team, with no pre-amble as it were, other than saying "Let's get on with it" than to sort of operate with somebody who you don't know how they are going to react. You don't know whether he is going to be a problem to you, and throwing everything out of balance, that has already been established.

What else?

I think that was useful. What else? I suppose in my particular case, it is a continual learning because there is a non Met officer just come into the organisation, and after two years I am still learning about their practises, there is value in that for me.

Was there an exchange of those practices during the feedback review?

Not as much as I would have wanted. There was a lot of exchange during the three days prior to that, so there is value in that for me, I mean in overall terms I thought the course valuable. If for what we were doing over long, I thought we could have done it in two and a half days instead of three and a half. But particularly if you make the day slightly longer, which as an individual I prefer to do, it would be easier to get people for 3 days than it would for 4. Particularly at management level.

As far as the - yes, there was a certain amount of learning and working with a new medium. Having to get to grips with working with and in that type of scenario. And that - reflecting on it afterwards - it's being able to continue being adaptable. It is very easy to get into a situation where life is predictable, where you do things in the same way, it is all very comfortable, but to be thrown into the situation where not only you are working with different people, but also different materials and tools, I think that is actually very useful from the point of view of saying Yes, I can cope with a new... it shouldn't phase me if I find myself in the situation in real life where things aren't quite so comfortable and predictable as you are used to, so there is an underlying learning there, if you like, or lesson comes through that it was useful to do that.

Can't think of anything else particular, I suppose to be fair as far as football is concerned, my experience with football is limited to really having been an Inspector at what was I think second and third division at that time, and what would be second and first division now. That is about 12 or 14 years ago I suppose, so from a football point of view apart from a few Gold's or Silvers at Wembley, it was very much a learning exercise, from the academic side of it.

That has been very useful

Good

Interview 3

Just tell me how it went.

It was a good day, a very good day, we were told it was going to be the highlight of the course, and indeed it was. Particularly for me who had already missed one day, so I am going to be more ready for the final day than most.

But dealing with the day in question, that final day, the computer based operation, this is the first time I have ever experienced anything like that, and obviously it was a real eye opener. It was also a daunting prospect with both myself and a colleague being apprehensive, because we hadn't seen the equipment mentioned, we didn't understand how it was going to work, and it was a fascinating experience, that could equally have revolved around flower arranging, by that I mean that having this interactive video, we would be fascinated for the first 30-60 minutes of flower arranging, let alone of football. So to dispel that apprehension, whilst at the same time letting us see that there was nothing to fear, would have been very, very beneficial, and if you could have spent ten minutes at some time during the preceding course, if possible, just seeing how the video works, to have a thorough understanding rather than going in there cold.

It was very intensive, for a 30-45 minute period. That is what struck me, and then we were let down, we were let down because we had to go for coffee, (we didn't have to go for coffee, but obviously one couldn't work without everything else). It was a - rather than having a heavy mind blowing experience over seven hours, and coming up after four or five hours, mentally drained, which I think it would have been far

more real, I would have far preferred that, I would have felt more satisfied, if the day was structured in that way, if it was possible to have lengthened the procedure a little bit. I think we tried to cram too much in a short period of de-briefs, and I appreciate the problems the instructors have, the de-briefs were not very effective, and would have been had we had more time.

The exercise itself was very good, in as much as it was totally unrealistic to expect to get such problems in one football match, I hope, but at the same time it was the only way to put down the pressure. I think possibly coupled with the fact that we didn't know how the computer was going to work, there was some confusion about when individuals had to take action, certainly for myself that was true, the way I react to this message now and OK, I have dealt with it, for example there was one very minor incident, which had potential, for being explosive, (pardon the pun) was the gas leak under the cafeteria. I asked that the safety officer meet me there, and all of a sudden I switch from the computer bank to the real life safety officer sitting beside me, Right, what do you want me for? I tell him what the problem is, I tell him what I want him to do, and that is the end of the matter! It was almost disjointed. There was no - I wouldn't say cohesion - but I wasn't quite sure if I had done the right thing, or whether he expected more of me.

How would you have liked the incidents to have gone?

In practical terms?

Yes?

You wouldn't, that is exactly how it would have happened in practical terms, I mean a classroom (almost a classroom) environment, in testing - I mean really tested. It was a learning process of course, but I felt we were being tested.

You felt you were being tested?

Oh, Yes. I was being tested on how I would cope.

What do you think would have happened (if you felt you were being tested) what would have happened if you had failed that test?

Nothing.

Would it be useful feedback?

I am happy that it was not an exam or a test in that context, but I felt, I suppose as we all did when under pressure, we are being tested, so we were obviously keen, if for no other reason than the rank we were, we were all keen to do this,

Would you say that that feeling would be welcome? What I am trying to explore here is how does that relate to wanting to do well today, and not cause injury, is there a difference between that and performing well on a course? I mean I am thinking about the stress that you were under?

The stress - there are different types of stress, relating to different incidents, different circumstances; there is stress to perform well on a course, but if we are going to as the expression goes, cock it up, then thank god it is on a course, and not in real life. Obviously it is more important that we perform well on the day, rather than a different environment, but does that answer your question?

Yes, I think so. You are obviously in Bronze One, you were in Silver in the second half of the game,

No

First half of the game.

How quickly did you overcome your anxieties about the equipment? At what point do you think you began to understand what was expected of you?

Very quickly, I was still fascinated by the computer, I have an interest in computers, and I was able to get hold of it very quickly and get into role.

It was disconcerting having the second chap there, it wasn't my decision, I felt in defence to him, and I think he did to me, that we should consult before making decisions. And I think that at one stage I turned round and made decisions, and told him afterwards I had made that decision, and we had just done this, and I had just done this...

He was happy?

yes

Had you been given more support staff, would you have been happier then to be on your own?

Certainly, it would have been more accurate,

But without the extra support staff you would have been overcrowded with information? Managing the phone, the radio...,

Yes, yes, I would have been able to cope, but it would have been more unrealistic. Yes, I would have been able to cope, but then decisions would have been made without back-up..

Yes, I can imagine,

Yes

Interesting, I want to go back because you made an interesting point, the transition between the game and reality, on one view you are having a game with a computer, and you turn round on your chair and talk to a human, who is a safety trainer. This transition between the game, if we could have put the safety officer on to the screen would that have kept you in the game?

Yes, I think it would have kept me in the game mode; we weren't told I don't think, live people, we were told on the telephone that we would be told that we could have every support that would reasonably be available to us, and I could see no point in the same officer turning up, real person, because to me it was apparent, it was obvious what I was going to say, I was going to say "This is what has happened, I want you to now go and make sure that you are happy, and your staff are happy, that the gas leak has been sealed.

But you did ask him top put in the safety procedures

It just shows what we have got?

Yes, I take your point. Because it wasn't at a computer, I was at the scene, and you as a computer expert could put him at the scene.

Yes, we could do something like that.

Another question earlier you said that you felt you were on test because you were in a course, and you wanted test of your own, personally, Did you ever feel sufficiently confident to explore making decisions which in fact actually you knew were not right? To find out what would happen in the system?

Yes, I think I was, and I think I .. one incident I dealt with Bronze 2 there was something there that I wouldn't normally have done.. I can't recall what it was, I know one that I didn't take, straight back, and that was the evacuation of the building. I wasn't going to evacuate them, that would have been dealt with by the Silver or Gold, I did not make the decision myself. I didn't play that game, evacuate.

There was something else, yes, I wouldn't have really done that, I can't recall what it was,

Would you have experimented?,

No reason why not, let's give it a run.

You see, that raises a question in my mind, because if you actually did something that you know that you wouldn't have done in the real world then surely, you must have felt that you weren't on test?

I was more confident, I had had just about everything thrown at me, outside and inside the ground, and I thought this is terribly silly, I'll give it a try. It became too intensive to be natural, you see I have done bronze controls at football matches, but I have never done a Silver, and that is when I was really under test, it wasn't quite the same - ** but once I got into the role in Bronze I did have a lot thrown at me, and I had the confidence then to play along, and perhaps be a little adventurous, I event tested the others a bit (laughs)

But then would it have mattered to extend the scenario so instead of being 40 minutes, it would have been perhaps a couple of hours, and things develop in a slower time?

Oh, yes, if you could have a real football match, I mean what I would like to see - the ideal - could I use a magic wand?

Yes

I appreciate you can't have Charlatan Athletic, but you could have a charlatan athletic team doing gold, silver, you could have them there. The Learning to be gained from that is - it would be unbelievable training.

You mean in real time?

Real time

That is something I wanted to do, for a long time, and one of the things that means is that we have to extend the course

I see it as being detached from the course. I think you will not get senior management to attend the courses together, but I do see - That day, that final day, could be - could run detached from, that course. Yes, we as a Divisional Team would have to put some planning into it, a few hours of planning up to the Saturday, but maybe on one day during the week we could come, meet your machines, and learning to recommence, and we could run it as a Division.

Then the next question must be, do you think it would be a good idea if I got hold of an HGV and drive to your station, how would that work?

You would be in demand.

But because - the obvious place to go is a football game, there's a few of them, but not that many, but then they'd learn to be practical exercises like that, For one thing I think the job is very poorer, to make an incident planning, and the practical side of the tape of exercises, I think we are very weak on that. And very cautious of my aptitude, with such a real life incident. The greatest thing in training that this chap would every have done, if you could have that level of reality

Tell me about the Video you saw? Tell me what were the pro's and cons about that Video that was coming at you?

Things I would discuss afterwards, it was repeated, but not everyone picked that out, but it was repeated. It was obviously a real video, it wasn't actors so - it was very good - I can't think of any way it could be improved, except perhaps virtual reality. You know a head set on you. that actually increases your scene of vision, so sitting in your chair, in that simulator, you would be standing on the touch line at a football ground,

What do you feel would enhance the video?

It would increase the pressure, because obviously I have known what to do what I do practically, because the whole of the grandstand, terrace, which is virtually one mans responsibility, would require me to concentrate my mind ... the one that keeps coming back to me was the first scene with a long grassy slope with people walking up, at the end of the loop, so ... boring that man .with the greasy hair

eating his chips from a cut open coke can, just going round and round. You need lots more video and video of London clubs.

So it would be more testing? More practical?

Yes, I think it would be.

OK. Lets now look at your relationship with - on your other Bronze Commanders, when you were playing Bronze, or was it Silver first, how did you feel the team felt from the Silver position? Did it feel like a team?

Yes, to a certain extent. As much as two individuals could develop one road, but I think again possibly because I didn't realise that either one of us could be in charge, it had to be a joint decision, also being of equal rank, whereas had I had a commander there, with me as a team, I would have sat back and thought shall they give us this, that and the other. Yes I would have felt more in a team

But did you feel as the game started going on, did you begin to feel some camaraderie, with the other commanders?

Not with the Bronzes, No,. I felt totally detached I think. From the Bronzes, partly because they had their damned speakers up too loud, yes, they were a bit of a nuisance. And what was also interesting is that they were testing me, because they were bronze - I was Silver - they were the superintendents - I was an inspector, so I was doing their job, for me at any rate, it added a little bit of pressure, they had obviously done Silver before. So there was additional pressure there.

Now how I would equate that with my own divisional management team, if that were to be arranged, I don't know if on this exercise divisional management team could let it out, I being a Bronze, I would be the Silver. So it was quite informative for me, it was a good experience, no doubt. I am not quite sure what kind of pressures that would be, so if you were to get a team together, there would have to be some guidance as to what role each should do. Should the superintendent be Silver. What should the Bronzes do? It would be quite an interesting -

Let's talk about de-briefing for a moment. The system was capable of replaying every incident, on that large screen, it was never decided to use it. Now two questions here, did you feel that was because of a pressure on time? Had you had more time, would you have wanted to review every incident?

Yes, I made more cock ups than was possible in the time, it was picked up and I didn't even think it was mentioned. Of course I would - I thought it was a cock-up, the one you mentioned, because I was being tested. But I know at one stage I sent

someone to a location North West Terrace, or West Terrace, or vice versa, and I am not sure it was picked on, How important in real life to get your locations right!

But yes, the de-brief, as I said at the beginning, it was too short, I would have made it longer.

That de-brief could have lasted hours.

Do you feel that was the same thing for the Silver command, when you were Bronze?

I don't know, I wouldn't like to say, because I don't know any of them, I don't know their experiences, I don't know how competent they are in the role of Silver. So I really wouldn't like to say.

We are asking questions on who were you training and that. To me answer the question, who is developing the training? Is it for Inspectors and Chief Inspectors, or is it for well seasoned Chief Superintendents Silvers who have done it all day long, and they come there to be penalised if you like.

That is possibly why I would not automatically assume that my chief superintendent would be Gold on the day there, it may do him good to be a Bronze and the Silver to be Gold, and we all move around. Certainly it is a good opportunity - too good an opportunity to be missed.

What things do you take away as learning? I mean have you learned anything, and if you have how do you quality that?

I can see it changed my view of management, I don't think as a Bronze enough is done, to provide experienced officer that's what matters, officers like me obviously got good experience, however you system completely changed the way I performed, that's just two hours

I was a hands on officer, you know I have been in the job long enough to remember when it was sergeants and PC's making arrests, it was how I began in the job, not a manager, not like it is now, and even now whilst they develop me in the role of manager to the rank of Inspector, individuals like me still want to be hands on. So the one thing I learned is that there aint no way I can deal with a disorder problem - totally disorder problem - and still be hands on. Very much like it was at the match yesterday.

We must really take that back step - if you can't take that back step you are only working at 50% of your capability. So it has changed, the way I manage myself, at football matches.

Was that the effect of the whole course, or simulation?

If you were one of these new town manager types, in the pinnacles of our organisation, and you wanted to provide some evaluation - is there any way you can provide a matrix, or any kind of evaluation, what you just said to me.

But you yourself feel that more confident and more that perhaps you would manage your resources?

I was always confident, perhaps that is my problem, but yes,

Has playing Silver changed any of your understanding of what needs to be provided?

Yes, I didn't quite appreciate ..It is very easy on Division to get complacent, it is very easy, if I can see there is no problem with the local football ground, but when I need to tell someone. Just what are the problems? I can't say just don't worry about it, because he does need to know. We'll worry about it. Until he gets told the result. Several things like that.

Any thoughts that you think of immediately?

No, I don't want to reiterate myself again. I am enthusiastic about doing it, and that is good, very good.

Thank you very much.

Interview 4

How long in weeks were you invited on the simulator.

Fortnight ago

What did you understand to be the overall aim of the course that you just attended or the overall objectives

It was certainly intended to, for me, to compare how I run football would be general views of policy in the Met which is obviously linked into the way of football league is operated in the system itself. It equally gave me the opportunity to compare the practical working experiences. Very little comparison between policing Leyton Orient Football Ground and at Chelsea.

What do you understand the learning objectives the simulation to be.

Practical test in real time or how personally when tested with the questions or problems how I reacted. Not only if I reacted but how I reacted and then the judgement made as to my reactions whether it came out right in that safe environment.

You mentioned tests. Did you feel it was a critical analysis of your expertise

I place myself in a critical analysis but I am not saying that the course intended to be that. Certainly I did it as a self judgement or self analysis of my abilities. You can in all things when it actually happens. You produce the 'what ifs' down to the ground and in your mind you mentally will say yes I will do this, this and this here was an alternative way with the simulator of actually saying I'm not choosing the subject to be tested on and I'm not choosing the incident, somebody else is. I judge myself on how I react on the scenario.

What positions did you play during the simulation.

Bronze 1 which was inside and then part of the silver

What differences did you find in your view to the simulator in both those locations. Was it a different experience.

Yes. First of all because we were doing the first half in the bronze one I think we were under used. I think we were under tested on the basis that most of the events were happening on approaches to the ground i.e. bronze 2 on the outside so we had very little to respond to. It was almost like forged tickets and that was about all we did. Then I think we were under tested there. Certainly when you get into silver then you were getting 2 or 3 different avenues of information coming in and decisions being made us there it didn't I still think being silver you had the opportunity to discuss and talk and come to the right conclusions.

Did you feel you were able to play a significant part in decision making.

Yes. I described what I said before about being different. There are certain bits and pieces, we had 2 Wembley bronzes i.e. somebody had never played silver mixed with myself, funnily enough it worked out that 2 Wembley bronzes who had done nothing else and 2 silvers from Fulham and Orient who were actually in command who are the branch commander and not having anybody, we don't have anybody to turn too on a normal Saturday or weekday match to be able to turn to, but that stops with myself and the Fulham man but the bronzes had already got the ability to make decisions and discuss them in detail.

Who was that Fulham guy

Again he is unique if you like. He is a silver at Fulham only and then he's a bronze at Chelsea because we have got both grounds on the map.

When you talked about the simulator you spoke about a number of things that you saw that were learning objectives. Out of all of those which do you think is the most important and why.

The opportunity to be confronted with a problem. The opportunity to be able to actively get involved in the problem and be able to come up with a solution. Back to self testing yourself analysis.

How did you find the debrief in that context

Not to any great extent. The only interesting fact was that if it hadn't been replayed that I was asked how was that problem solved on occasions that surprised me that I would have said that it had been dealt with differently to what we actually did when on the playback, if that makes sense. There was a problem how do you think you reacted. I thought the Fulham guy on the radio put it a certain way, and then actually when you played it back, we did the debrief in the class and said this is how we come to resolve the solution rather than come to guess work and it actually came out over the broadcast showed exactly what we said in the classroom. If you hadn't played it back on the debrief I would have said that we had said something completely different. The debrief is actually very useful to confirm. It could be used wrongly. I think there could be dangers in that. The fact that we had a guy from TO20 planning office was good. I think there's always the possibility in these things becoming a pat on the back old friends society. The TO20 guy, Inspector Norman, I think was his name, kept saying well "that's really interesting because that's not what it says in the book". I like that. You know you don't have to do it by the book but its good to know what the book says (laughter).

It's a very careful balance between constructive 'what ifs' exploration or a critical analysis of your actions. You know yourself, I'm sure, whether or not you've done it right or wrong.

People will be the hardest critics on themselves.

But you know whether you've done a good one or not. You don't actually need it rammed down your throat?

What was the worst thing about the simulator?

It may be that I had an expectation. Firstly having known about the Scottish Police College and that it was described as it should be used as an interactive video. I don't know whether your actually claiming that it is an interactive video. My expectations were that having made a decision the video would take on a computer programme that would take on board that decision and follow it through the consequences in a logical way i.e. that if a decision was made to let in 3 ticketless fans in accordance with the video had it been a computer programme there would be a facility to carry on with that programme, adapt the programme to show the consequences of letting 3 ticketless fans in. So there wasn't actually so much as worst moment in so much as finding out that that wasn't the outcome of making decisions like ignoring people with forged tickets. There was never a consequence the fact that there was people having bought forged tickets. I don't know whether I have to much of a high expectation of interactive video or interactive computer programmes to say that that was the case.

I think that you are right to feel disappointed however for every decision made in the simulator there is something like 6 or 7 events in the simulator. There are a number of possible out comes. Some of them actually do provide video response for instance if you put in ticket checks then it is possible that fighting could start outside the ground because of the desire to get in. There is some interactivity if you like immersed simulator response but I think that the number of possible outcomes from decision causes a real problem as far as overheads and the way that the Scottish system is going, remember that I'm working with a video with the Scottish system its all on one single laser disc and there is only 37 minutes of video on the laser disc. The system that I'm developing know is enhanced because I'm using different video sources, stuff like CD-ROM and VHS Tape so we actually have now have access to a potentially huge amount of video, I think we will be able to enhance that.

I can think of a practical example. They had an under 21 game, England vs Turkey and we do have an approach road to put with the commissioners regulations to come in off the main road down 2 side roads into the ground from the emergency access road and because it wasn't on Orients league programme Murton never picked it up so Murton never brought the signs out. We presumed here it was my colleague who was the ops man at the time he presumed TO20 had told Murton to put the signs out and the same arrangements. We come to then and there are cars

all over the place no no-waiting cones. We tried to clear one side of the road of the emergency access route that there were so many cars on the other side and if any gaps we filled them by moving cars from one side and so at least we could get enough space for a fire engine to get by. We tried to clear the other side but we had nowhere to put them. If you've got 7½ thousand crowd three's all residential streets, residential parking and there's just nowhere to put these cars. You try the traffic wardens and at the end of the day you come to a decision, the south side of the road will be given all the parking but the north side will be kept clear. If you don't die in the ditch trying to get the perfect model but know you come to an achievable and workable not compromise but a solution.

Jonathan

Now look at the simulator, if you want to plan that, what happens if your Bronze decides to clear the north side and leave the south side you can imagine for every possible decision you've got another set of videos. These are limitations of the system in the sense that its a function of how long it takes to develop a simulation. If you want to include these you can but its an overhead on development time.

That is actually very useful to me. Now I've got to ask what the best part of the simulation.

Simply that on the basis we got through to the final whistle without anybody dying or anything on those lines as a consequence of the decisions made. I think we raised it at the debrief going back to a previous question, there was never, unless we were at fault, we never knew what was the score on the pitch. A very fundamental issue was probably being discussed upstairs on the ground floor one or two days before-hand. Whether its right that you should have a footballing and a loving or whatever football commander or somebody who was totally dis-interesting or who is bored to tears by football being match commander. The argument is if your bored to tears with football and be concentrating on crowd control you couldn't care less what was happening on the green bit but balanced against the fact that somebody who likes football would see an incident on the pitch and be able to anticipate more likely the consequences of that, refereeing the decision , the outcome of the score on that goal or missing the goal as regards to how the crowd reacts. One thing that was missing from there was the fact that the end result was that the home team won 1 - 0 and they pulled through, that information was found out by the people and not from anybody else. In real simulation, in real time and real role-playing you'd be making quite an important decision. Your concentrating on resources you've got to keep the home team supporters happy there not going to be any problem then you've got to concentrate on the away stand and your taking risks.

Your team also pointed out, you know the QPR man said he wanted a crowd count and he wanted extra feedback because it was very tunnel-visioned if you like the video that he was getting needed more. Would you need more information about crowd dynamics about the stress that was being created or were you having an internal view really of how that was running?

Well you saw a lot of seats so would assume that a certain extent that we know that seating will limit the amount of crowd movement and if it did crowd movement and started to move across the stand towards the home supporters or vice versa that would be highly visible. There are plans purely on the drawing board at the moment that both goals, standing behind both goals and the council owns the grounds and release to the Orient and I think that it has been cleared now and they will renew the lease. I think the lease was either 1997 or 1999 it was due for renewal. There was a catch 22 situation at one point which has now been broken whereas the club said please could we have a new lease, the council said until you tell us your plans for the ground we can't indicate whether we want to give you a renewal of the lease. The club said we can't make any plans for the future of the club or the ground until you tell us whether we've got the lease or not. At the end of the day what they will probably do is take down the terracing behind one goal and turn that into an all seating area.

Have you been involved in any other simulations?

Nothing like that at all. That's the most high tech upgrade of bits and pieces I have done. The nearest I'm advanced on Public Order but that was a good few years ago now.

How does this compare?

Funnily enough when your talking about interactive and the consequences of the decisions the Hounslow would probably have that facility because it was simple I would guess that the opportunity would be more interactive because they would here the response I've just sent Sgt at 6 down there they've got the facility then to put the next one your Sgt at 6 is now under attack what are you going to do. Then equally if you send the whole 3 carriers to odd police men down there its an alert.

How about the level of stress between the 2?

I certainly could see that being silver especially stress could develop on that but the basis that its only there for what 20 minutes or so, it seemed like 20 minutes, time flies when your enjoying yourself, but of course your being committed all the time so you haven't really got any down time. There not over stressful but certainly stress creating.

Did you play silver the first or the second half?

Second. I felt under employed as bronze one in the first half.

What I want to do is half the numbers in the group because what's happening, I think, is that there are too many people making a decision. I'd like it to be a pair of people in there and they're with silver I'd like to have the plotting and communications to be done not by those two officers so that I can throw more decisions at them not over the more problems with them and not overwhelm them with the communications aspect. But by having 2 I'd like to run the game twice in a day if you like so even though there's a big group in the football course as a whole we run the game twice on the Wednesday. How do you feel about that.

I guess the outcome would be, it would change the emphasis to mean a more testing type scenario as distinct from a learning exercise. You could bounce ideas and learn off the group, with the 2 you'd be sold to committed to respond all the time. There was only 12 or 11 people you feel that is large.

No. To be fair to you I'm just throwing at you some suggestions from other people. I don't necessarily agree with these suggestions but that has been suggested by other people that I'd interviewed.

I thought with 2 there you could be saying right well I think this is a good idea that I have used or this could be a solution. Somebody else might say well Wembley we do it this way, never thought of it, never used it. With a group of 2 you're learning more, its forcing out good practice.

Jonathan

There are 2 areas of learning. There is learning in the general simulation also exchange of ideas during the debriefing. Its very difficult to know the balance because some people who I've interviewed have indicated that they have felt very stressed and they were perhaps junior in the rank or not very experienced, especially in Silver. Others have said no we weren't at all stressed out. I would like to have had more and also less people in there so its more down to the command officer. I'm very interested in stuff that I've have seen. Some of the decisions were made to deliberately to find out what would happen. They weren't real time solutions they were the what if I say this what's going to happen and listening to his team, his bronzes responding to him based on those decisions he found some learning from that. Anything else I can get from you?

I think that what came out of the debrief coppers being what they are as a culture would expect the worst thing to happen. Its very difficult to be brave and say yep I got it wrong. The debrief needs to be friendly and that means trust. This certainly wasn't the case. We had some high ranking officer telling us that we did it wrong. There is no wrong in this sort of thing. So, I don't know, I got very fed up with

being lectured at all the time. In the end of the day if it went ok then it went ok and maybe we could have done it better but to say we did it wrong, well I stopped listening after that.

Thanks very much for your time.

No problem I really enjoyed the training.

Interview 5

Did you have any choice in taking part in the simulation?

Well as far as the Course was concerned it was part of the course; the actual role we took in the simulation I think was an asset for us, I think as far as I was concerned I was quite keen to take a primary role I think for the experience, and certainly it didn't worry me in any way. So the choice that I took one of the primary roles was really mine.

Did you have any choice in being nominated for the course?

I asked for the course

You asked for it, so, OKs , Can you sort of identify what you felt were the key objectives of the course.

The whole course as opposed to the simulation.

Whatever your lasting impressions of both the simulation and the course.

I think the - as far as I can say - it goes back a bit further, I got quite considerable Football experience certainly in the 70's, and in a lot of the 80's I was in Training and had a Personnel function. So I was away from football for some time, the first thing that struck me I knew, or was aware, of the vast changes around , so I wanted really, although I had command of a small football ground, which I shared with Dave Stobbs, I wanted really to know the party line of the job policy, although

the day to day control of Orient seemed relatively easy once you got into a system. To me what I was looking for was firstly the objectives in my mind were really what I could and couldn't do. The second one was what I was expected to do, and thirdly I wanted to be in a position of if the wheel ever came off I knew what I was doing. Sort of confidence if you like. So I suppose they were objectives within me. Whether I actually fitted the course objectives was another thing. The course I did now six months ago. As I remember it was a .. the object of the exercise really was to em by and large give me those perimeters, of what I can remember. I remember in the first two days were an awful lot of lecturing, there was some discussion in the group - but quite a lot of lecturing. Some of which I didn't find particularly useful. I was more into the - I wanted something more practical I suppose.

Speakers were brought in?

Yes, some were better than others, I've got to be honest I can't remember much about them now and that probably says something about them.

OK, so that's the overall view of the course, then on day three after you went through some policy and legislation strategy and tactics if you like, on day three, you went into a simulation. What did you think were the objectives of that simulation exercise.?

I think really the first thing was to try and create a bit of pressure, in terms of -

The one thing I expected didn't happen. I expected a bit more pressure in

terms of time. I have to say I've had experience of these before, when I was in training. The Job started to do simulated exercises in Riot Control.

Was that a Broadway market, sort of exercise?

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I can't remember I am talking about 1983/84.

OK

When I was in management Training our Branch took on this role

I think they did do now still

Yes, 'cos. funnily enough the last thing I did before I went into training was the Brixton riots in '81 so really I was quite fortunate in that I had had experience of then. and went into Management training, and when they started setting these things up as part of my Branch, although it moved away, eventually. I had some practical knowledge and also I was able to sort of get involved in the setting up of it, although I am not computer minded myself I was writing some of the scenarios, which somebody else actually put into the computer, so what we did in those exercises was a bit more time pressure. I must admit I was expecting that, and it didn't really come, and I think my mind was really more concentrating on that than catching what was going on, so maybe I fooled myself. That's a good way to put it.

A lot of people have said this, they've said that they're waiting for the Boeing to land on the pitch, or the ground or whatever and it never happens.

No, it came out relatively simply, which quite surprised me.

Yes

Having said that the bit we mentioned before we started, about - I think if I remember rightly, I was undecided whether to delay the kick-off, and in fact I did, because I wanted in some way, not really to create controversy but if I did it because it may happen in real life. I wanted to see what the others would feel about it.

We mentioned Mrs Johnson in particular, in the days I've been there I've realised he was quite an experienced football commander, to see how he felt about it. At the end of the day I still think he was wrong,

Right...

Having said that it confirms even more because when we went back for the second part of the course, we were played a piece of tape, no it wasn't the second day of the course, it was the football commanders meeting, we were played a piece of tape where the match was delayed at Wembley, and they showed us the Commander who went on the air and made one of the best ever - gave one of the best ever interviews I have ever seen on police officers views on television, it was absolutely superb, it made me think that I was right and Mr Johnson was wrong.

Right

'Cos. the kick-off was delayed because there was traffic chaos, there had been an accident, or something like that, and he had delayed the kick off to allow supporters to get in. He was fearful of a crush. If I remember rightly that was the problem with the Stanford United one.

Well lots of things go in after problems of over crowding, there were ticket problems all over the ground, there were fans wanting to move around, and then there was a big problem on the Ring Road wasn't there? But let's just go back and explore something here because

I found what you just said very interesting, when you were making your mind up about delaying the match I heard you saying, or am I right to assume, that some of your thinking was 'shall I delay this match or not, but if I do delay this match it might be useful to talk about it with my colleagues after.

Yes, I think it - Bearing in mind I was relatively inexperienced football commander,

Yes

Having said that, I have been in this job a long while, and I have taken - what do you call them - brave decisions, and unique decisions I've had to do that once or twice in my service, it's not something I'd back away from... but if it was a real football match I feel I probably would have allowed it to have gone ahead, not delay it. Having said that, now I've done the course, and thought about it, seen the interview with the Commander, and had another chat with Doug Johnson about it, last week, I think I may well have delayed. That wouldn't be a decision that would give me a problem any more. But I deliberately, I suppose, what I am saying is on course I really, as you said, I delayed it to see what the reaction would be of the others. Also it left them in a spot as well, because I knew they had to follow what I did.

Yes, so it was a bit of 'let's see what happens'

Yes

In a nice and safe environment?

Yes

Right. And I think that a course is the best place to do that, you know, and see what happens. You know, I got benefit out of that.

Sounds interesting, what do you think you've learned from taking part in the simulation?

I think really, I'll just answer that in a lot of ways. It gave me the opportunity to explore and - eh - it gave me a bit of experience, bearing in mind, I run a relatively low sort of class ground, had a couple of 'iffy' matches this year; the guise a friendly

against as against West Ham and Arsenal. And I have to say that probably what I got from the course more than anything else was two things, firstly a bit of confidence about it, and secondly a bit of consolidation of information if you like, in the - eh - my thoughts were in many ways right. I was on the right lines. I think in this job, experience is one thing, you know, in terms of the years you've got in and maybe the years that you've got in the rank that you hold. Football has changed, like a lot of things in this job, and I think really I owe it to the football ground and to myself to remain reasonably up to date in the thinking of how things go on. And I think that is probably what I got out of the course.

A credit to your professionalism, it's a part of keeping yourself up to date, with/ and again reassurance that you were aware of the party line if you like.

Yeah, I - that's not the word, there is a word that will come to me, later on probably, it's a confirmation why I sort of feel I was on the right lines, I started to get that, perhaps after the course I thought well what did I learn from it, and I did think about it. Was it a waste of time, and the - I think if it hadn't been for the computer exercise I probably would have said yes, maybe I could have done without that. Having said that, the second part of the course last week, totally the opposite, I mean every hour, every minute I spent in there was, I thought, absolutely essential.

Right

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To get the feelings of other people, and even more interesting when I arrived at Orient last Saturday, I got one of the football licensing people there, who I'd never met before,

And you'd had some exposure during the course.

Well it was interesting, cos. I was able to develop it a bit further, in fact I was with him for about two hours so ... going through what he does, what he is looking for, and maybe how we can help each other. He was quite interesting. And it was a man I knew, would you believe, about 26 years ago.

What - used to be in the Force?

He was in the Force, he was my Instructor at Training School. Absolutely - it is a small world -

It is, of the learning points that you identified, which do you think is the most important? And why?

I think its the building of confidence really, and knowing that the decisions that you are able to take - you know - when I did football in the seventies police were there at the periphery, we basically control it, in fact we might be trying to move away from that, and that's the big subtle difference, and that's the biggest learning point. How much power I've actually got, you know, as a football commander, you've got the power to say whether the match goes ahead, basically,

Yes.,

And if you take it to a rather illogical conclusion, if there's a football pool you can almost ruin someone's football coupon. You know, by postponing or cancelling a match.

Yes -

You know, the ramifications are quite surprising.

And you can be accountable now can't you?

Well absolutely, I mean both criminally and civilly, that's not something I don't think you ever worry about consciously. It's not something I worry about cos. if you have those things at the back of your mind permanently, OKs you've got to have the consideration of those things in the back of your mind, that means you got to be a coward almost, you're never going to do anything.

Yes

But what you've got to , it comes back

You mentioned the word professional; you've got to be competent, and I think that is the other thing I took from it, it was a degree of competency if you like - in what I was doing, because I think that what we are looking to do if we go up the category of match, which Chief Inspectors command at the moment, if we get a difficult match, cup draw, that brings us Manchester United or Tottenham or somebody like that, suddenly we aren't the Commander, it goes up a rank, or maybe two ranks. And the interesting part about it is the guy that's going to come along, or lady that's going to come along, and take command, is probably less competent than you are. So he is to a great degree relying on you. And I have actually found this - already.

You've got Bradford as an example here,

Absolutely - We've got Cardiff coming this year, who've caused a problem all over the ground.

It'll make it a category A will it?

Yes

And then you won't be able to run it?..

I won't be running it, the superintendent will.

Right

But he's going to have to rely on me to a certain degree,

Does he have any exposure to the teams below you?, Normally. On a standard match does he get involved at all?

No, - having said that, if any difficulty comes along with sort things, you see. Whereas Do Johnson's carrying Chelsea is there every match, or superintendent is and they alternate it in the same way as Dave and I do. But of course if the Match gets bigger we will hand on to somebody else which is another difficulty. Having said that, for a really big match I think what would happen is that Dave and I would both be there, to make sure that the Superintendent goes along OKs

I mean you know, we work as a team. No going back, your question was, yeah, what did I learn there, wasn't it?

Yes

I think really out of all the points which was sort of eh - you know, I think it was the most important, it really was, sort of building your confidence. You know, you really want to know if you can do it. And I think that is what the course is for, to see what you can and can't do.

OK , what were the worst things about the simulation?

I think first and foremost for a simulated exercise like that, there were too many of us because some people didn't take part at all, OKs they were party to the decision, and so on and so forth, but I was conscious I wanted to do it differently. Really I didn't get the chance to

How many were in your team?

3 or 4, a big group.

What would you say would be the ideal number in a group that you would be happy with?

Oh, I mean, one to one is obviously better,

Right, you'd want to be on your own

Yeah, I mean as an experiment probably what you could do, let's go one way, and lets stop the exercise or start again, and go the other way. And see what, you know, came out. Well, that would be absolutely ideal, but its expensive.

At the moment it is a big course, but it should be at the most say 12. We could run the course say twice in one day, so we split the group in half, and maybe have - because the whole course takes about four hours, four and a half hours to run, so if we extended the day beyond 4 o clock we could do two groups in a day. What about giving you support in that control room, telephone & ... and stuff like that? Did you feel that you needed some people plotting, or were you able to deal with it on your own?

Yea, you did need people plotting, the problem I found is that they weren't prepared to plot because they were senior police officers, they all wanted to be 'boss' if you like. And that is often happens you'd be all right of course, cos. you - I've been in this for 7 years and before that I was an Inspector for 7 years you know, obviously in that 14 years I commanded all sorts of things. Or I've been part of the command structure. I've always found it certainly when I became competent in any rank or role was the frustration of someone there basically telling me what to do. And I often don't agree with what they are doing anyway. It can become difficult, I think that is probably professional jealousy and you have to put up with it. What really frustrates is that you know damned well they bugger it up. and your part of something that's gone wrong and you know damned well you wouldn't have done it that way.

But it can easily happen in the simulator

Oh yeah, cos. that's where the time pressure is, you're not, in control of that other colleagues who might have a different idea, and its already happened ? We have for instance as one team where they were thinking about delaying a match, and they thought about it, and thought about it and thought about it, but meanwhile the time moved over

and then the match began

That's right, that really didn't help the exercise

So o.k. Going back to the control room itself, because that is really where the heat's on, you played the Bronze and the Silver didn't you?

Yes, ...?

Now, let's go to the slow time, sort of position, where you were playing Bronze. What sort of perception did you have of that cell? What did you feel, did you have any value in being in that cell? Was there anything you learnt about that position?

Not particularly, no, I think the problem was it was a bit of an anticlimax, cos. we did the Silver first

Right -

If you do the bombs first, then the Silver you are warmed up a bit. We went into the Silver cold, as you would, I think and I got quite a lot out of that, but when we got into the Bronze it was a bit of an anti climax, especially as I was out of the hot seat.

Someone else went well into the hot seat, for want of a better word and really I suppose I was thinking back - I know this is a personal feeling -

very important, very important.

But as far as I was concerned I was winding down I still think about and decisions are made when I was Silver. So maybe I lost what was going on.

OK so we have a debriefing, and you explored some of the decisions made, and even then I think you broke - you still, after lunch, thinking about.

I wanted to explore what number actually, and I think we actually cut it dead because . One thing that annoys me about courses, and it always has, and it always will, I can't get into this syndrome that at four o clock we've got to go, or people are panicking or something, or have to train at half past three, I don't know how...

I think your right, you know simulation which they're building now which is Nottingham Carnival, I am hoping, we're hitting some real brick walls on this. I am hoping to run the simulator, for at least two days, and we are talking about 48 hours,

Suck it dry

when we first started running of the simulator the debriefs last 20 minutes now we are having to cut them off because there is another half of the game to run, or there is the lunch to deal with, but I do feel when its been to cook in that debriefing it seems to be almost criminal to stop it.

Oh, I agree, its You are talking about cost, it's not so bad me being the superintendent because there is not overtime to worry about. I personally never mind, the others .... anyway, but I always believe there should be give and take in this job, you know

Well that's fair enough, the overtime or off is the same hours isn't it? o.k. Now comes the bit where - I must say, some of the things you have said have been different to other things that people have said, more revealing rather, and I think that that is your training background coming out there. I hadn't heard before this issue of still working through your decisions on the first and second half, which I think is a very significant thing to think through; about how you behave in different cells. Now I think it is very important, I think it shows that the - to me it shows that the - debrief had some meaning for you.

I need to explore the 'what-ifs' and the fact that you are still exploring this after lunch means that, well I am quite self critical. I think, I mean this job, as far as I am concerned, whatever role I've done in this job, I've had a good number of roles, I want to do it well, not just being average. I have only achieved chief inspector in terms of rank, but that's no problem anyway.

The debrief that I experienced was different to the debrief that I have done before, this one was with a Chief Superintendent, coming out and analysing our decisions. What happened here was that, it got peoples well I mean it did get - really get their backs up - about being told that he didn't think that decision was right. he they also didn't explore, the possibilities of the 'what ifs', he was too uptight about whether or not they had been out of order.

What would you like to have had in that simulator that wasn't there?

Bit of time pressure, a bit more time pressure. Make it perhaps a bit more realistic.

How would I have stepped up the time pressure?

Just kept it going, maybe for 45-50 minutes, just kept it going in real time, with incidents happening.

Do you know how long you were ion that cell?

I was in there quite a while.

You were in there for nearly 45 minutes

Really!

Yes, 45 minutes you were in that cell for.

That surprises me I must admit.

Interesting that you said that you'd like to .spend some more time in there...

(laughing) I know I had a headache when I came out.

So - you'd like even longer than that?

Yes and I think its very hard to take over from somebody else, you've got to abide by somebody else's decisions, not necessarily the ones you'd have made.

Would you have liked more serious problems?

Yes, because you've always got potentials for them.

What sort of problems would you have liked having there then.

Well I think a fatality. Now interestingly enough, even last Saturday, we had a guy who we thought was going to collapse with a heart attack, and just the fact that it is a football ground makes it a little bit more difficult. Always the question of safety comes in.

So even something fairly simple, such as someone collapsing of a heart attack, there is always the suggestion perhaps that this guy was on the steps, because if he had fallen down the steps , straight away there would have been a safety factor. And because it was a football ground, it made it slightly more complex.

Just a simple question, were you happy for instance that you didn't have a pitch invasion?

It would have been useful, but I think in most football grounds and certainly ours a pitch invasion, would have had to be dealt with because we don't use mounted.

A pitch invasion would have to have been dealt with by the stewards, you know, this gradual shift I suppose, that you're going to have to take in on board with our training, a gradual shift away from police officers, towards stewards. I think there is probably two reasons for that, one of course is the cost to the club, which is in their minds of course, and the other one is our sort of continuous involvement, within football which is very costly. It's our job, you know, cos. irrespective of the people being paid for we have to deploy loads of others, it's very difficult to account say, if they're there for football. You know, traffic duties, around and outside the ground, in our case of course we got to see them on to the trains. BTP have got a cost. which is not recoverable.

That's interesting. Would you like to have seen a multi- agency, would you have liked the fire brigade to have been in there with you?

Yes, I mean there is always a danger of making it too complex. That is one thing, because - yes, I mean the Fire Brigade have always got a safety factor as well - and I think the other important one nowadays is the local authority. Because after all they are the ones that are signing the Safety Certificate. And - yes, .. an obnoxious local authority officer is quite useful, indeed I met one Saturday who I thought was quite obnoxious and difficult, who although it wasn't obvious I just thought, if there is a problem here, you are going to be an obstacle. I suppose if we can sort of put in a box is a typical bloody counselling employee if you like, who can be quite officious and wants everything in triplicate, almost.

If during a simulation lets say for instance, we had a fatality, and you dealt with it well, or you dealt with it badly, but you dealt with it, how would you feel what would be the benefit of dragging you out the scenario and putting you in front of a press interview?

Mm, that's a right little pressure point, cos. that's really what would happen. More than likely.

Is that something that you think we could include in the simulator?

Yes, cos. it was part of the promotion assessment last year, that press interview, and I didn't do it particularly well, which was stupid because I actually did a two week course on Press Interviewing at Bramshill, cos. I did a mock major incident some years ago, and I thought I handled the press badly in that. Even though I was running the exercise. And I thought that I could have made better use of the press. It's something which I have come unstuck on, a couple of times, and I would have found that quite useful. I think in this job I am realising my limitations after a while, if ever a Press interview comes my way, I will find somebody else to do it.

It's not that I am afraid of them, I know that I am not particularly good at it. Other people do it better.

That's fair enough, knowing your limitations,

I mean I think you should always use the strength of the people round you.

OK, thanks.

Interview 6

What do you understand was the overall course objectives

I think it was to basically practice in a simulated way using realistic visual aids and sounds the content matched well the things that we had learnt about during the course of the previous 1 think 2 or 3 days wasn't it. I think we had the simulator on the Thursday didn't we. It was put into practice what we'd discussed; the tailor of report recommendations together with the pre-reads obviously which we had prior to the course.

Have you been through the last stage of the course.

Yes, yes I have.

So what do you think you have learned from taking part in the simulation

I think it focused to me, if I can say my previous experience of football had only been at Norwich City other than just watching other grounds but I'd never been called on to do anything else at an area which I was unfamiliar with. The good thing from my perspective was that we were actually being asked to do things in an area to which we were unfamiliar so it actually focused your attention on what you were trying to achieve without the intimate knowledge of the ground that you had so you had to think far more about what you actually had in front of you. Where as in your own environment you are happy with certain things and you know them as a matter of course so when a question is posed many of the things don't .immediately flash up because of course your subconsciously you know the answers but of course there you didn't and so you actually ad to take for more notice so you could focus much more on what was expected.

Would you say, in that case, would you say that it would be better to always do simulated exercises on unfamiliar grounds and then when you did it on familiar grounds it would have a slightly different purpose.

Yes. Obviously by being on familiar ground you have to actually question everything and so that, in my view, better to learn from than having a ground where you know where you may not question it tricks subconsciously it perhaps goes through the back of your mind but you don't have to particularly focus on it whereas on a ground your unfamiliar with and your asked questions about it you've got to ask the questions.

In what way do you think the simulation has helped you learn these things

Well I think at the time, and it has gone back sometime now but obviously I felt at the time when we did the simulation I hadn't completed the course I'd only done matches as a Chief Inspector and that was I think 2 years before. I felt it gave me, the rapid decision making which was required of us I thought was very good and probably the lesson I'd learnt from it was the swift movement of activity and \I have to say I've obviously over the past season now been match commander at Norwich on several occasions and I think if I was asked to learn one thing from it was the rapid decision making that's required when things start to move because of course generally speaking the things that came up I haven't actually experienced in a real life situation. So I think it prepares you better for that rapid decision making and that was the part of it I found the rapid decision making together with the

realistic simulation.

What are the best things about the simulation

Well I think it's the fact that you are putting into practice things what you've learned in a realistic situation which you couldn't achieve elsewhere in my view. I mean obviously you can only achieve that style of learning if you are actually doing it and with the simulation you were hearing the sounds it was in my view very realistic you were actually seeing the scenes which is a tremendous aid to learning and that is how I felt about it.

Interviewer

What was the worst thing about the simulation

Interviewee

To be honest I didn't think there were any. I didn't think there was a worse thing about it. As you know I made the point at the time it was the first time I'd ever experienced it in fact ICC had had a similar thing although I didn't think it was the same thing but he came from Strathclyde and he said to me when I came back did you do the simulation and I said yes I did cos he said to me at the time I thought that was really good and I said well I did I thought it was really good and I have to say my Chief Superintendent here went on his match commanders course to Manchester which didn't have one and I said to him I think you missed out by not having that and he found the course very flat because basically it was all discussion and obviously as much of our course was but of course I felt the simulation presented the opportunity to actually put into practice what we discussed in a realistic fashion.

Have you been involved in any other simulations.

No. Not on that style of simulations like at Bramshill and doing new creative things but as a tabletop but never before with sound and vision

But Bramshill does have some kind of computer.

I certainly haven't done anything like we did at the Peel Centre.

Is there anything that you would have liked to have seen in addition to what happened.

No. I think when we had the debrief didn't we and I think there was one or two things weren't there on the communications side which you remedied at the time but no.

Let's talk about the debrief. The debrief when you were running it was run by trained facilitator. The way that the brief worked was bringing up various instances which occurred and then exploring how the team felt that it went. How did you the debrief.

I can't recall having any problem with, in most of the situations and that is true in real aspects of policing but of course there may well be some disagreement over issues but to be honest its the learning exercise of what is discussed that is the most important thing so really although you are getting an interpretation of how it could have been, which is fair and right because of course he is undertaking that role, nevertheless I think there was scope for discussion. There is the old thing about right or wrong answers, I know and it sounds dreadful, but often you learn more form the discussions surrounding the comment rather than the actual comment itself. I think the real problem was that there was nobody around who really new the Force policy and this was frustrating as I just wanted someone to say, well the book says da da da and then we all would have known for sure.

So you were learning more from your colleagues really

When feedback came in there were different perspectives put on it and in fairness I think that if you spoke to the gold afterwards he would have learnt something.

I think that's very fair. Tremendous exchange of ideas.

I think you do in any exercise even like on practical SU exercises you get exactly the same happens you have someone standing there whose given there view of it but then you have this free-for-all discussion on it and I think both of you then realise that there are certain things that yes you hadn't thought of and you've learnt those and I think that is invaluable and I think that I did see a problem with that and I think you do need someone there to actually put that view forward because that then generates that discussion because if it didn't you'd find it hard to generate the same discussion because you need someone to come out clearly with what they would have done so then others haven't done it because that then pulls into.....

Obviously you have got to overlay on the Force policy as well

Yes I think that's important

Appendix 9

METROPOLITAN POLICE

CHISWICK POLICE STATION
209/211 HIGH ROAD
CHISWICK, LONDON W4 2DU
Telephone 081-577 1212 Ext.

Mr. Jonathan CREGO
TBT Co-ordinator
Peel Centre
Aerodrome Road
Hendon
London
N.W.9. 5JE.

Your ref.:

Our ref.:

14th July, 1992

Dear Jonathan,

MAJOR SPORTING EVENTS COURSE

As requested I am sending you a few thoughts on the above course, which I attended in early June.

Apart from the computer simulation, I am sorry to say that this was the most disappointing course I have attended for quite a long time. During my service with the Metropolitan Police, considerable improvements have been made in the training provided, against which this course compared very unfavourably. It is misleading to describe it as a Major Sporting Events Course, when it concentrates almost entirely on policing football matches. The material provided was very basic, and the scenarios in the paperfeed exercise related more to every day policing than to decisions which would be taken by match commanders. While the experiences shared by other course members were valuable (which will not necessarily apply to other courses, should the participants be inexperienced in relation to sporting events), the attendance of visiting speakers such as those proposed on the final day would have provided some useful "nuts and bolts" input, and probably stimulated some useful discussions. (e.g. from the Football Licensing Authority; Solicitor's Branch; expert on crowd dynamics and crowd distress; etc). Although some of these will attend during Part IV they should have been included throughout Part II.

The most useful and enjoyable part of the course was the computer simulation, which appears to have considerable potential for development as a training 'tool' - and is ideally suited to the nature of much operational police work. Given that we were the 'guinea pigs' and more work is still to be done, it still provided a much more realistic test of participants' decision-making than the majority of practical exercises in which I have previously been involved. The main confusion arose from the fact that the rest of the course material related to Sandford United, and the video was made at and around Ibrox Park. Hopefully, as the project develops within the Met., the video and the course material could be based on an actual London football stadium, which participants could visit in advance to familiarise themselves with the location. Once this has been done, and thus the realism enhanced, participants can be put under greater pressure during the simulated exercises.

I hope these few lines are helpful.

Yours sincerely,

Pat Moore.

Pat MOORE - Superintendent

METROPOLITAN POLICE SERVICE
7 Area Headquarters

3 The Mall
Kenton
Harrow HA3 9TF
Telephone 081-204 3400
Extn: 44005

9th July 1992

Jonathan CREGO
TBT Co-ordinator
Metropolitan Police
Peel Centre

Dear Jonathan,

Thank you for your letter regarding the Major Sporting Events Course that I attended last month.

I will give you my comments under the headings you supply:

1) Benefits of this Type of Training - I think there are great benefits to be gained from the simulation exercises. However, they should be used to illustrate points and not necessarily to test the candidates to see if they get it right. If short exercises could be developed where the candidates make a choice and then the exercise develops along different avenues, depending on the choice made, this would reinforce the theory taught elsewhere. It is important that in most public order scenarios there are a number of 'correct' decisions as well as a number of wrong ones. The exercises could stop at critical points and the variety of next steps discussed and then illustrated by rolling the exercise on. This would be particularly good for officers new to the role who have little experience.

2) Structure of Events and Incidents - needs resetting within a London scenario. There is masses of football video available from all the major London clubs that could be used to advantage.

3) Realism - not very realistic, but I appreciate you were working under cramped conditions in the wrong location. I expect this will improve when you are properly set up at Beak Street.

/cont'd .....

4) Video Material - as per 2. I see tremendous opportunities in a variety of training modes for simulation exercises. You should choose one London Football Club and work on that; you must not be sidetracked in attempting to tackle all our needs at every Club.

5) Communication Equipment - as per 3. Great fun to use and enjoyable, but treat as a learning exercise, not as an examination.

6) Debriefing - could be improved. Our course suffered because most of us were already very experienced Sporting Event Commanders. When officers are being introduced to the subject at the debrief, they should be asked what they had learnt; then gaps can be filled in additional courses.

7) Briefing - as at 6. Difficult on our course. The participants wanted different things.

8) Paper Material - of a poor quality. Most of it not apartaining to the Metropolitan. Needs to be London orientated with the Capital's problems highlighted. Also, the paper material and the simulation exercise should dovetail one another.

9) Resources - if based on a London scenario, visits to an actual location could build realism into the course. The office facilities at Tintagel House were adequate and the facilities at Peel Centre.

10) Stress - I did not find the course at all stressful, except perhaps that it could be made so much more useful.

If I can assist further, please do not hesitate to contact me.

Yours sincerely,



Iain K. SLESSOR,
Chief Superintendent.
7 AREA H.Q.

METROPOLITAN POLICE No. 143A

MEMORANDUM

25th June, 1992.

To

Jonathan CREGO,
TBT Coordinator,
PT12.

From

Chief Inspector P. JACOBS,
'FF'

Telephone Extn. No. 42915 (Police Network)

M.P.82(E)

Re: Major Sporting Events Course

Thank you for your recent letter asking for certain observations concerning the above course. The following points emerge under the various headings suggested:-

BENEFITS OF THIS TYPE OF TRAINING.

Of tremendous potential value. The opportunity to deal with various situations in a "realistic" situation provides the opportunity to practice in a safe environment all that is learnt from the theory.

STRUCTURE OF EVENTS AND INCIDENTS.

The structure, I feel, left some of the work stations with very little to do whilst others were fully occupied. In short, I felt that I was not fully occupied for a sufficient percentage of the time.

REALISM.

Very realistic. However, could the material not be made more relevant to the written course material. I would suggest that a club within the MPD was chosen and video and ground plans were provided for that model. This would necessarily mean 'ditching' the present CPU produced material.

VIDEO MATERIAL.

In addition to the above comment, I would add that from the students point of view, the material is very repetitively sequenced and can lead to boredom and loss of concentration.

COMMUNICATION EQUIPMENT.

Excellent, save that greater realism would be achieved if each work station was out of earshot from the others.

DE-BRIEFING.

Of particular value if positive feedback of performance is freely given and received. On my course, the de-brief was more concerned with the equipment and "negative" effects deriving therefrom than with the police action contemplated to deal with the various scenario's.

BRIEFING.

Good.

PAPER MATERIAL.

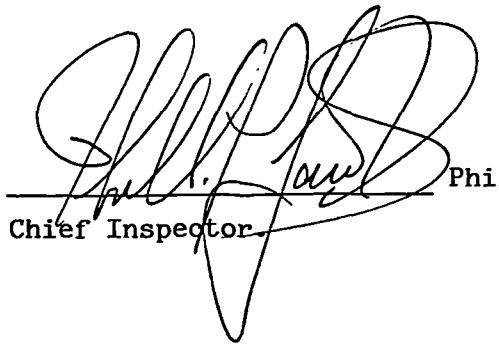
I believe this refers to the CPU produced material. This was of a high standard - but see comments under "realism".

STRESS.

Little, I'm afraid - for me! I was rather surprised that no major disorder/incident occurred to really test the operational planning and tactical deployment abilities of

the students. It all seemed rather too straight forward.

I hope the brief comments will be of use to you. If you feel that further explanation would be useful, please do not hesitate to contact me on the above number.



Phillip JACOBS.
Chief Inspector

METROPOLITAN POLICE SERVICE
7 Area Headquarters

3 The Mall
Kenton
Harrow HA3 9TF
Telephone 081-204 3400
Extn: 44005

Jonathan CREGO
TBT Co-ordinator
Metropolitan Police
Peel Centre

9th July 1992

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If I can assist further, please do not hesitate to contact me.

Yours sincerely,

Iain K. SLESSOR,
Chief Superintendent.
7 AREA H.Q.

Appendix 10

1994 TABLE TOP

SECTOR 6 QUESTIONS

1.	LOCATION :	Cambridge Gardens j/w Portobello Road
	DISTURBANCE	Large group of drunken youths. No further info.
2.	LOCATION :	16 Leamington Road Villas
	AMBULANCE MESSAGE	Female collapsed. Believed overdosed.
3.	LOCATION :	Arundel Gardens j/w Ladbroke Grove.
	EXPLOSION	Believed gas related.
4.	LOCATION :	Arundel Gardens j/w Ladbroke Grove. (House on corner)
	INFO ONLY	Large gas explosion. Part of building collapsed and several people trapped. Fire now at location.
5.	LOCATION :	Arundel Gardens j/w Ladbroke Grove
	SERIOUS FIRE	People still trapped i/s.
6.	LOCATION :	4 Wellington Close
	DISTURBANCE	Believed gatecrashers at a private party.
7.	LOCATION :	Walterton Road j/w Harrow Road
	ACCIDENT	D/O accident with allegations of drink drive. Disturbance now pending.
8.	LOCATION :	4 Wellington Close
	DISTURBANCE & FIGHT	Party guest now fighting o/s address with group of gatecrashers.

9. LOCATION : Beethoven Street j/w Dart Street

INFO ONLY Male collapsed. No further info ..... formant local resident.

10. LOCATION : St. Charles Hospital

BOMB THREAT Correct code given.

11. LOCATION : Dartmouth Close j/w Ledbury Road

DISTURBANCE Believed a small group of IC/1 youths in stolen white XR3i E123 FGH

12. LOCATION : Portobello Road (No better location)

ROBBERY Concerned large group of IC/3 males.

13. LOCATION : Portobello Road j/w Lancaster Road

ROBBERY Concerned 10+ IC/3 males.

14. LOCATION : Portobello Rd j/w Westbourne Park Road

AMBULANCE MESSAGE Female seriously stabbed in chest, victim of recent robbery. Concerned large group IC/3 males.

15. LOCATION : Portobello Rd j/w Westbourne Park Road

INFO ONLY Robbery victim now stopped breathing. Police on scene attempting to resuscitate. Bleeding heavily from knife wound.

16. LOCATION : o/s 62 Hereford Road

INFO ONLY Two males interfering with m/v. Red Audi. Informant local residents.

17. LOCATION : 2 Bosworth Road

INFO ONLY Suspects on premises. Two males seen to jemmy rear conservatory doors.

18. LOCATION : Elgin Mews

DISTURBANCE 2 drunken males annoying residents.

19. LOCATION : Notting Hill Station

INFO ONLY Fire. No further info.

20. LOCATION : Notting Hill Station

INFO ONLY Serious fire. Numerous phone calls from local residents have now been received at CCC IR.

21. LOCATION : Arundel Gardens j/w Ladbroke Grove

INFO ONLY Fire. Surveyors have declared the building now unsafe and have suggested cordoning off the junctions.

22. LOCATION : 116 Elgin Crescent

DISTURBANCE Believed domestic.

23. LOCATION : 116 Elgin Crescent

DISTURBANCE Male berserk. Armed with large knife. Young child at risk.

24. LOCATION : Westbourne Grove (Judging Platform)

P.I. ACCIDENT Serious P.I. incident. Minibus crushed into judging platform. Several persons injured.

25. LOCATION : (Judging Platform) Westbourne Grove

INFO ONLY Judging platform very badly damaged as a result of accident. Part of platform collapsed.

26. LOCATION : Ravington Road j/w Shirland Road

FIRE Vehicle on fire. No further info.

27. LOCATION : Tavistock Crescent (Opp. Frog & Firkin P/H)

DISTURBANCE Believed drugs related. No further info.

28. LOCATION : Tavistock Crescent

DISTURBANCE 2 x shots fired.

29. LOCATION : o/s 44 Tavistock Crescent

AMBULANCE MESSAGE Local known drugs dealer with very serious gunshot wound to chest. Suspects now made off.

30. LOCATION : 9 St. Lukes Road

INFO ONLY Information from witness states the two suspects for shooting ran into the above address. Concerned 2 x IC/3 males armed with handgun.

31. LOCATION : 14 Hormead Road

DISTURBANCE Fight at private party. Male with facial injuries having been glassed. Suspects still nearby.

32. LOCATION : 62 Hazelwood Crescent

INFO ONLY Suspects on premises. No further info.

33. LOCATION : o/s 3 Kilravock Street (Direction N/K)

INFO ONLY Theft of red BMW H123 XYZ. Concerned 2 IC/1 youths.

34. LOCATION : Oxford Gardens j/w St. Marks Road

ROBBERY Large private party local residents getting annoyed. Disturbance pending.

35. LOCATION : Great Western Road j/w Tavistock Road

INFO ONLY Water mains fractured. Flooding now occurring. Informant local resident.

36. LOCATION : 16 Cambridge Gardens

MALE BERSERK Informant from flat above.

37. LOCATION : Oxford Gardens j/w St. Marks Road

SERIOUS DISTURBANCE Police being attacked by large group of IC/3 o/s private party.

38. LOCATION : o/s 52 Lydford Road

AMBULANCE MESSAGE Male collapsed. No further info.

39. LOCATION : Oxford Gardens j/w St. Marks Road

AMBULANCE MESSAGE PC stabbed in neck. Fighting still occurring

40. LOCATION : Oxford Gardens j/w St. Marks Road

DISTURBANCE Several parked cars badly damaged as a result of disturbance o/s party.

Appendix 11

Trainers Handbook

Minerva Computer Project Developed by : Jonathan Crego
Carnival Training System Written by : Andrew Amery

RESTRICTED ISSUE

METROPOLITAN POLICE

The Minerva Project

1 Area Carnival Management Training System

RESTRICTED ISSUE

List of Video Clips held on Compact Discs

File	Description	Event	Wk Stn	Size	Time	Comments
M1.Avi	Ambulance	E0I6	5.3	29449	1.01	
M2	Veh Rem	E0I2	5.1	41671	1.22	
M3	Cordon	E0I3a	5.0	17859	0.35	
M4	View Down Rd	E0I3b	5.0	94186	3.03	
M5	Heavy Crowds	E3I1	5.0	163337	5.30	
M6	Amb thro' Crowd	E3I4	5.0	470863	1.20	
M7	Congested floats	E3I1	5.2	2703	0.52	
M8	Retaliation	E5I5	5.0	24133	0.48	Lousy Vid
M9	Crowd Congestion	E...I5	5.1	63187	2.05	
M10	Dissorder Lanc. Rd	E0I11	5.2	8582	0.22	
M11	Von Adams Int	E2I4	5.2	9470	0.18	
M12	LAS Video	E3I6	5.1	84789	2.39	
M13	Stage Collapse	E0I3	5.0/5.3	20634	0.45	
M14	Shipwrecked	E0I1	5.0/5.3	137227	5.00	
M15	Stage Rebuild	E0I4	5.0/5.3	99088	3.55	
M16	Stage Fixed	E0I9	5.0/5.3	76695	3.01	
M17	Control Van	E5I3	5.0	17029	0.31	
M18	Crowd O/S LTE	E5I7	5.0/5.3	94743	3.11	Train ??
M19	Cropover BG	E0...	5.0/5.3	134583	5.00	
M20	Heli-Tele	E6I3	5.0	115329	4.01	
M21	Amb Leaving	E3I7	5.1	18483	0.36	
Wlk1	Patchy Crowd			34790	1.06	Poor Sound
Wlk2	Med.Crowd, Slow			51715	1.45	
Wlk3				37065	1.10	
Wlk4	Heavy Crowd			34427	1.13	
Wlk5	Bk Street - Cordon			54508	1.41	

<u>The following are from the original prototype</u>

File	Description	Event	Wk Stn	Size	Time	Comments
E1I0	Los / Fou Tent		5.0	46260	0.09	
E4I3	Drugs arrest & Continuance		5.0	137354	4.30	
E6I4	Re Routed Proces.		5.0	71813	2.19	
E7I6	Shields kitting Up		5.0	95435	3.12	

E1I1	Walk to Fou Child		5.1	34254	1.06	
E1I2	Fou Child			12731	0.26	
E1I3	Los/Fou Tent			46260	0.09	
E2I1	Roge Float Enters			124819	4.05	
E3I1	Wlk to Injured Man			23265	0.45	
E3I2	Inj. Man + Mtd			60250	0.14	
E4I1	Walk to Drugs			34254	1.06	
E4I2	Drug Dealers			93587	3.30	
E4I3	Drugs Arrest			134135	2.00	
E6I3	Lost Serial			31155	1.00	
E6I4	Floats stopped			31419	1.02	
E7I3	Dog in Crowd			19651	0.48	
E2I1	Wlk to Ice Cream		5.2	23820	0.45	
E2I2	Ice Cream arrests			80793	2.48	
E2I3	Arrests Running			28930	0.58	
E3I1	Stopped Floats			10027	0.19	
E4I1	Illegat Sound Sys			28632	0.57	
E5I1	Lost Serial			31155	1.00	
E6I1	Walk to Stn.			35070	1.06	
E6I2	Arr. at Stn			120433	4.14	
E6I3	Stn Master			132341	0.25	
E6I4	Clearing Stn			37913	1.19	
E1I1	Complaint of Kidnap		5.3	17826	0.35	
E6I4	Trying to get float back on route			124819	4.00	
E7I1	Walk to Ragga			35070	1.06	
E7I2	Ragga / F Arm			101986	3.15	No Sound
E7I3	Ragga / F Arm			119160	3.47	No Sound
E7I4	Susp seen in Crowd			32319	1.02	No Sound
E7I5	One that got away			129683	4.10	No Sound
E3I2	Lost Serial		5.3	31155	1.00	
E5I1	Walk to Crush			23820	0.45	
E5I2	Steamers / Crush			78367	2.30	
E5I3	Steamers / Crush			101603	3.16	
E9I1	Walk to Crush			35070	1.06	
E9I2	Steamers / Crush			15960	0.30	
E9I3	Crush/Steamers / Pc's on Barriers			155537	5.06	

Sector 5 Refreshment & Deployment Schedule

Monday 32nd August 2022															
	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	M/Nit	1am
SCHOOL	Hammersmith County									Hammersmith County					
REFS	573	***564***	575	578	***567***		***569***	***570***							560A
		565 / 6	***566***		***568***		***571***	579							
		574	572		577			580							
BRIEFING	***564***	572	***565***	577	578	***567***	***570***	***569***	579					560	
	574	573				***568***		***571***	580						
		575													
PATROL	561**	561**	561**												560B/C
SECTOR	562**	562**	562**	562**											
5	563	563	563	563											
			564	***564***	***564***	***564***	***564***								
	576	576	576	576	576										
			573	573	573	573	573	573							
			574	574	574	574	574	574							
				575	575	575	575	575	575						
				565	***565***	***565***	***565***	***565***	***565***						
				566	***566***	***566***	***566***	***566***	***566***						
					572	572	572	572	572	572					
							567	***567***	***567***	***567***	***567***	***567***			
							568	***568***	***568***	***568***	***568***	***568***			
									569	***569***	***569***	***569***	***569***	***569***	
									570	***570***	***570***	***570***	***570***	***570***	
									571	***571***	***571***	***571***	***571***	***571***	
						577	577	577	577	577	577				
						578	578	578	578	578	578				
										579	579	579	579	579	579
										580	580	580	580	580	580
DUE FOR															
DISMISSAL				561	562	576		***564***		***565***		577	***567***		***569***
					563				573	***566***	572	578	***568***		***570***
									574	575					***571***

KEY - ***Bold Italics - Level 2 Serials***
** - ***Serials of 1-2-24***

Minerva '96
Work Plan



Video Indexing: Index all Metropolitan Police Videos - SO3-2 Videos and Jonathan Crego's. Additionally look at the clips Ian Jacklin noted from the CCTV last year (Details in a note book in the Minerva File).

Consider contacting SO3 Operational Video Services (Contact Ian Nichols) for video of suspicious deaths, suicides etc - he will willingly supply if you get the authority of the OIC to release the footage for training purposes.

Consider speaking with the LAS at Waterloo HQ (Contact Richard Walker) for footage of ambulance staff working at scene of RTA, Fire or suicide attempt etc.

Consider speaking with LFB for footage of a suitable fire (contact via Tony Spinks and Jonathan at Hendon Tel: 0181-200-2963)

"Story Boards" (Johnathan's name for the scenarios). Consider what aspects of senior officer public order leadership / management we are trying to test along with the video available. Ideally it would be good to have a fire and possibly a firearms incident - although this may be a bit difficult as it will take too long to 'play'. Consider a 'Jumper' off a building, amending the RTA from last year, problems of disorder at a set stage (See Video Mag 23A on 28/8/95 at 18.05)

Remember we will require about 4 EVENTS, which will then consist of a number of SCENARIOS. Ensure that during each *event* all the 'players' have something to do, even if it is only altering deployments or giving up serials to assist other sectors elsewhere at Carnival. They can be given radio messages to do things that do not require them to attend a scene such as changing deployments etc.

The whole idea is to try and keep all the players under pressure all the time.

Digitise Video

Once the required clips have been identified they need to be transferred to CD at Hendon. They all need numbering and indexing so that we know what is what. Additionally we will need to make at least 2 new 'Background videos' each being between 15 - 20 minutes long. If I am not around Jonathan or Tony will show you how to do it.

Identify Sector

Decide on where the fictional 'Sector 7' is. It should include whatever we need in the game - i.e.: A long stretch of the route, trading sites, a safety zone, some sound systems and a set stage (perhaps Portobello Green).

Do not worry about the real world too much, once we have identified the area of Carnival we are going to use, we can decide ourselves where we want to put sound systems, trading sites, a judging point etc.

Ladbroke Grove area by the real sector 2 and 3 boundary *may* be suitable as it will give us a tube station as well, however there are other areas that could be good as well. Try to keep away from too much of sector 5 as we used it exclusively last year.

Establish Personnel

Examine operation order and sector deployment sheets to see what manpower was available last year in the area we are going to use. - Speak to Kay to find out who the briefing officers were, give them a ring and ask them for the posting and deployments for 1995 and you can base it around them, adding or reducing the figures as we think fit.

Decide on the serial call signs. I would suggest that the sound system liaison, street trading and all the other 'odds & sods' remain as in reality to make the training more realistic.

Don't forget the reserves - as in the real world let the sector have them until about 6.30pm when they will be recalled to 'Kit Up' etc.

Overview Report Produce an 'Overview Report' from the Intelligence Cell. This should be based on a real one taken from a recent Carnival (See Kay if you cannot find them) A selection of info can be taken from them and information can be added as necessary to augment the 'game'. This will then test whether the players have bothered to read the thing before the day. - Perhaps we should include a few clues of useful bits of information in it that will help them play the game ??????????

Game Times Decide on the time of day for the exercise - i.e. what time it is at Carnival when the first event takes place. We can move on an hour or so for each event as necessary but ensure that you have left enough time for each event so that we don't go backwards in time.

Briefing Book Revise the briefing book. The contents should be similar, enclose 'red herrings' as necessary. - i.e. firearms policy, cordon positions and similar things. Possibly a Sector 7 contingency plan. Also, if we have a Tube station on the sector mention BTP and include a copy of the Protocol Document (Again see Kay if you can't find it)

Have a look at last years Public Safety Strategy Document and Disaster Plan and see if anything in either of them is suitable.

Write Database Hopefully we will have an idea of this before we start if it was taken into account when writing the 'storyboards'. We will need to know the details of all the locations, text messages and delays in showing the video clips as well.

Instructors Book We will at some time (probably later on) need to produce a 'tutors guide' similar to last years so that the control room operators will know what is happening.

Sector 5 Refreshment & Deployment Schedule

Monday 32nd August 2022															
	11am	Noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	M/Nit	1am
SCHOOL	Hammersmith County								Hammersmith County						
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		565 / 6	***566***		***568***		***571***	579							
		574	572		577			580							
BRIEFING	***564***	572	***565***	577	578	***567***	***570***	***569***	579					560	
	574	573				***568***		***571***	580						
		575													
PATROL	561**	561**	561**												560B/C
SECTOR	562**	562**	562**	562**											
5	563	563	563	563											
			564	***564***	***564***	***564***	***564***								
	576	576	576	576	576										
			573	573	573	573	573	573							
			574	574	574	574	574	574							
				575	575	575	575	575	575						
				565	***565***	***565***	***565***	***565***	***565***						
				566	***566***	***566***	***566***	***566***	***566***						
					572	572	572	572	572	572					
							567	***567***	***567***	***567***	***567***	***567***			
							568	***568***	***568***	***568***	***568***	***568***			
									569	***569***	***569***	***569***	***569***	***569***	
									570	***570***	***570***	***570***	***570***	***570***	
									571	***571***	***571***	***571***	***571***	***571***	
						577	577	577	577	577	577				
						578	578	578	578	578	578				
										579	579	579	579	579	579
										580	580	580	580	580	580
DUE FOR															
DISMISSAL				561	562	576		***564***		***565***		577	***567***		***569***
					563				573	***566***	572	578	***568***		***570***
									574	575					***571***

KEY - ***Bold Italics - Level 2 Serials***
** - ***Serials of 1-2-24***

The Minerva Project

1 Area
Carnival Training System

Contents

Strategy and Incident Handling	3
Allocation of Incidents	4
The Game Order	5
Event Scenarios & Considerations	6 - 17
Control Room Radio Schedules	18 - 26

The strategy employed for any given situation should be broadly based on the following:

- **Identify** - The incident
- **Evaluate** - The scale of Police response
- **Isolate** - The problem area
- **Contain** - Implement cordons as necessary
- **Evacuate** - In a suitable direction
- **Communicate** - With other sectors / GT as appropriate

When dealing with any given incident within the training program the officer dealing should consider and act where necessary on the points laid down below.

- Assess the Scene
- Inform GT
- Do not become personally involved in rescue work
- Ensure a written log is commenced
- **C - Casualties** : approximate number
- **H - Hazards :** present and potential
- **A - Access routes :** for emergency services
- **L - Location of incident :** exact
- **E - Emergency services :** present and required
- **T - Type of incident :** crash, explosion etc.

Allocation of Incidents

Event No	Bronze 5.1	Bronze 5.2	Bronze 5.3
2	Abduction	Abduction	Abduction
3	Rogue Float	Susp Death (Press)	Drugs
4		Serious Disturbance	Stage Collapse (Press)
5	Bomb Threat		Assists at LTE
6		Crush & Streaming	
7	Serious RTA		Pub Fight

Game Order

Running No	*Event No*	*Start Time*
1	7	16.00
2	1	16.05
3	2	16.30
4	4	17.10
5	6	17.45
6	5	18.30
7	3	19.30

Running No 1 Scenario

System Introduction.

This incident, of about two minutes in length has been produced to gently introduce the system to the operators. It welcomes them to the system and gives several text messages concerning deployments etc.

No action is required on the part of the player, it is purely an introduction and allows time for final testing of the radios etc.

Running No 2 Scenario

Abduction of Child

A Sergeant takes a report of an allegedly abducted child in front of Bx 5.3. The Sgt has a defective radio and asks for the Bx to circulate the description etc.

Shortly after this GT inform Bx 5 that a serial at Westbourne Pk LTE is trying to contact them but appears to have a defective radio. GT ask for the local Sub Bx to attend and liaise with the serial.

Meanwhile Ser 578 state they have found the child and arrested a suspect in relation to the abduction (however this is the wrong susp and child)

Next Bx 5.1 should see the girl (without the susp) and is informed that Ser 564 has found her but due to their def radio they could not transmit this. Hopefully the Bx's will realise what has happened and make the necessary arrangements.

Ser 578 then ask Bx 5.3 to attend and speak with the girlfriend of the male who had been arrested to resolve a possible complaint.

Considerations

Allegation of Abduction.

Serious Crime
Inform Bx Crime ??
Sgt takes report. Due to nature of allegation should victim be taken to see a CID officer ??

Incorrect Arrest

De Arrest as per PACE requirements
Inform Complaint officer for situation by phone
Allay Sense of Grievance as per IM2 16.3 etc

Found Child

Take to Lost found Children's Refuge
Ensure mother informed
Consider family problems - Ensure officer is dealing re submission of reports to Social Services etc (Form 84)

Running No 3 Scenario

Drugs Arrests / Rouge Float / Susp Death

Serial 577 have made six (6) arrests - 2 for supplying and 4 for possession of drugs. The also have an ice cream van which is evidence in this case and require it to be taken to the station. The atmosphere is slightly tense and the respective Bx is asked to attend the scene.

The resultant effect of this is that 10 officers of serial 577 are now 'out of the game' and need to be replaced from somewhere. They were due to relieve Serial 565 at the stage at 5pm but due to the arrests are now unable to do so.

Next Bx 5.1 is informed of a rouge float trying to enter the procession. He is requested to attend and should in theory ensure that the new regulations under the Road Traffic Regulation Act 1994 are complied with etc.

Following this Bx 5.2 is called to the scene of a suspicious sudden death. On arrival he will be met by the occupier of the premises who states that on arrival home he has found his wife dead in the bedroom. There are signs of a break in and her head is covered in blood.

A short while latter following requests made for the attendance of the SIO, FME etc Bx 5.2 will be called out of the room and asked to conduct a press interview.

Considerations

Loss of Ser 577

Was any attempt made to have them replaced by a level 2 reserve serial as if not the sub sector had no reserve capacity of its own from 5pm - 6pm

The Rogue Float

There is no power to prevent the float entering the route even if it is not registered
The matter should be reported to FLINT at GT who will the track the float
The float should be spoken to and told that they commit an offence under the Road Traffic Regulation Act of 1994
They should then be reported for process and the driver told that the facts will be reported to the Council for action as necessary
They should be served with a notice setting out the above by the Bronze

Suspicious Death

Inform Bx Crime - requesting a CID presence, Gold & Silver.
May consider handing over to Bronze Reserves but Bx Crime is more suitable in this instance.
Secure the scene.
Identify Reporting officer and ensure continuity etc.
Contact FME if Bx Crime is in agreement.

Running No 4
Scenario

Stage Collapse / Pay Party Urgent Assistance

This event utilises video from the 1991 Barbados Cropover Carnival where their stage collapsed. Although the pictures are clearly different from our Carnival it is hoped that this will not detract from the game.

Initially both Bx 5 and Bx 5.3 will see footage from this event in order to 'settle' them into the change of location / environment.

Bx 5.1 is informed of an obstruction in Elkstone Rd and may or may not attend the scene. This is a non contentious issue and does not require any special action. It is however, the only role Bx 5.1 has in this particular incident.

About 5 minutes into the game, following the 'firing' of Incident 3 the stage collapses in front of both Bx 5 and Bx 5.3 who are seeing the same pictures. A cordon is then put across the road in front of the stage by the serial at the location.

The Bx's are informed that 2 people have suffered leg injuries as a result of this matter and that although not serious, they will require hospital treatment.

The APPO then attends the scene and Bx 5 is then taken out of the game to liaise with the press and give an interview. On the directions of Sx he will also do the live press briefing for the whole of carnival and is provided with a copy of the latest information report to assist him.

Meanwhile Bx 5.2 is asked to deploy units to a pay party at 26 Tavistock road where there are reports of a disturbance.

Whilst this is all going on Bx 5.3 is seeing the stage slowly being re built. However the floats refuse to go round the judging platform, wishing to be properly judged on the stage.

After a short while the pay party turns into a call for urgent assistance and Bx 5.2 is directed to attend. Officers are being assaulted and refused entry.

On arrival Bx 5.2 is met by scene of disorder and he may take the game whatever way he wishes.(i.e. to full scale disorder if further units are called and the party is stopped or by some form of tactical withdrawal).

Considerations

Stage Collapse

Bronze Reserves should be called to the scene (although he will be unavailable !!)
Bronze Crime should be informed / attend
Details of extent of problem should be passed to other sectors
Reserve serials should be requested to assist
Diversionary route should be planned and implemented as necessary
Bronze Traffic should be called to the scene to assist with the above
Ensure the CHALET Pneumonic is followed within reason.
Call the Local Authority to examine the structure of the stage
liaise with PSM's and NCL etc
Refer to incident officers check list

Disorder at Pay Party

Attend and assess the situation
Inform Sector Bx, GT Sx, Bx Res. of situation
Consider cordons as necessary
Tactical withdrawal Vs Call for more units to scene
Community leaders etc to calm the situation

Running No 5 Scenario

Bomb Threat

A bomb threat has been made by a Middle Eastern sounding male from a known extremist group stating that a bomb is due to go off at a tube station within the Carnival area in one hours time. He gave a code word and this was known to SO13.

Bx 5 is directed to attend his control vehicle and liaise with Sx re RVPs, reserves, cordons and diversions and Bx 5.1 is directed to the scene.

The serial at the station inform Bx 5.1 / GT that the station has been closed by BTP and that this has lead to crushing problems due to the number of people trying to leave Carnival at this time.

Meanwhile BTP have announced that this matter is being treated as a Red incident and that the trains are not stopping at the station. Tannoy messages are being passed on the trains telling people to alight at Royal Oak / Latimer Road respectively.

Due to the above BTP request Met assistance at Royal Oak, Gx agrees and Sector 5 have to deal.

The event should follow naturally and will finally be concluded when a further call is received at GT stating that the threat is in fact no to a specific station which is outside the Carnival area.

Considerations

Bomb Threat

Evacuation : Which direction - Consider implications to other sectors

Cordon off area - What size (Inner 200m Outer 400m)
Inform Gx Sx Other Sectors. Bx Res Bx Traffic
RVP - Locate / Search / Forward Command Veh. - Sec Command post would be too close
Expo & Possibly Dogs
BTP Trains not to stop
Reserves Serials
Press
Diversion Route
Publicise - Arrange for Sound Systems / Floats to announce on PA systems

Running No 6
Scenario

Crushing & 'Steamers'

This event, is relatively short and deals with a crushing scenario.

Information is received from an NCL PSM via a serial of a crushing and steaming problem at Tavistock road J/W Great Western Road. Additionally he states that there does not appear to be any police present at the scene.

Bx 5.2 sees this on his arrival. Meanwhile Bx 5.3 comes across a lost serial who it transpires should be at the location of this incident. Bx 5.3 should duly direct them to the correct location.

Meanwhile Bx 5.2 will witness an incident where a man is robbed but he retaliates against the suspect. He is then badly assaulted by the group of robbers.

Bx 5.2 may call for additional units to the scene and if suitable this may develop into disorder, however there is no video to support this.

If the matter is left the lost serial will arrive and further video of the location is shown with the missing serial in place and the crushing resolved.

Considerations

Crushing / Steaming

Trace missing serial
Request for reserve serials to attend the scene
Filter cordons to reduce crushing
Disorder Respond / do not respond

Running No 7 Scenario

PI RTA with Float / Urgent Assistance at PH

Bx 5 receives information from GT that the procession seems to have ground to a halt. The problem would appear to be in Elkstone Rd. Consequently Bx 5.1 is requested to attend and investigate the problem.

On arrival he comes across a serious personal injury RTA where the victim has apparent head and back injuries. A mounted officer is on scene and asks that an ambulance is called

Following the initial radio messages concerning this Bx 5.3 is informed of a reported fight at The White Swan PH Chepstow Rd. Serial 565 offer to attend, being just round the corner.

This then turns into an urgent assistance call, with bottles being thrown at officers. Various serials offer to attend and after a short while the matter calms down and several arrests are made by Ser 565 and others. The resultant effect of this is of course the loss of manpower to the sector.

Following this the Ambulance turns up at the RTA and it has become apparent to Sx that the stoppage in the procession is now causing serve crushing problems further back due to the stoppage. Consequently he asks Bx 5 and Bx 5.2 to get together and formulate a diversionary route for the procession. He asks that GT are informed of the Serials posting if the diversion is to be implemented.

Finally the injured party is removed from the scene to Hosp and the route can be re opened without the need for any diversion.

Considerations

RTA

Deal as if a FATACC
Inform Bx Crime
Traffic Supervisor to scene
Inform Other sectors of delay in procession
Consider diversion of route and liaise with Sx
Photog / Video team to scene
Consider Bx Reserves

Control Room Radio Schedule

Running No 2

Abduction of a Child

Start Time : 16.02

Incident No	*Description*	*Radio Messages Req'd*
1	Bx 5.3 receives info re kidnap via Ser 573C	
2 (I)	PR message to Bx 5 from GT	*Bx 5 ^ GT please arrange for Bx covering Westbourne Pk LTE to attend that location and liaise with a unit there which has a defective PR*
2 (ii)	PR message from Ser 578 to Bx 5.2	*Bx 5.2 from Ser 578 we have found this child and the suspect. He has been arrested. Please arrange a van to come to Gt Western Rd by entrance to Brunel Est.*
3	Bx 5 .1 goes to Ser with def PR (Ser 564). There he finds the *correct* child but no father.	
4	PR Mess from Ser 578 to Bx 5.2	*Bx 5.2 from Ser 578, can you please attend Brunel Est re this arrest. The girlfriend of the susp who was arrested wishes to speak with a senior officer.*

Control Room Radio Schedule

Running No 3

Drugs Arrests / Rouge Float / Susp Death

Start Time 16.30

Incident No	*Description*	*Radio Messages Req'd*
1	Ser 577 inform Bx 5.3 re drugs arrests After about 2 minutes, when Bx 5.3 arrives at Ice Cream Van.	*Bx 5.3 from Ser 577 we are at Sutherland Pl J/W Talbot Rd and have several arrests for drug related matters and have an ice cream van to be taken to the station. The atmosphere is slightly tense, can you attend please.*
2 (or 3)	Ser 566C to Bx 5.1 re rouge float Prompt - The 'Big' Girl	*Bx 5.1 from Ser 566C, we have a rogue float trying to enter the route at Gt Western Rd / Elkstone Rd can you please attend and advise*
4	Ser 575A are dealing with a susp death and request the attendance of Bx 5.2	*Bx 5.2 from Ser 575A can you please attend 27C Aldridge Road Villas re a susp death at the locn.*

Control Room Radio Schedule

Running No 4

Stage Collapse / Private Party Disorder

Start Time : 17.10

Incident No	*Description*	*Radio Messages Req'd*
1	Ser 564 come across an obstruction in Elkstone Rd	*Bx 5.1 from Ser 564 somehow vehicles have got onto the route and are causing an obstruction in Elkstone, we will need a removal veh ASAP*
2	If Bx 5.3 does not attend, ensure that he is aware the veh has been removed	
3	The judging stage collapses in front to Bx 5 & Bx 5.3. A cordon is put in by the Ser at the locn	*If the radio is quiet then the Serial can inform GT of their cordon*
4	Bx 5 & Bx 5.3 are informed that 2 people have suffered injuries as a result of this incident, and that the APPO is on way.	*If not forthcoming...* *Bx 5 from GT update re casualties etc for Gx please.*
5	Bx 5 goes off to do press interview. Bx 5.3 asked when stage will re open. Bx 5.2 is asked to deploy units to dist. at a party.	*Bx 5.3 from GT any ETA of reopening of stage ???* *Bx 5.2 from GT please deploy units to a disturbance at a private party at 26 Tavistock Rd*
6	Ambulance attends Stage if requested	
7	Bx 5.3 is informed floats refuse to go round JP	
8	Request for assistance re crush	*Bx 5.3 from Ser 573 can we have some assistance at Westbourne Grove / Chepstow Rd as due to the hold up the crowd are spilling into the main road. we need at least one more serial here.*
9	Stage is re built and Carnival continues	

	Ensure all reserve serials are released	
10	Pay party becomes urgent assistance	*Urgent assistance at 26 Tavistock Rd ...Ser 575A over, officers being assaulted and refused entry*
11	Bx 5.2 attends scene and sees disorder	
12	If Bx 5.2 does NOT attend party	*Bx 5.2 from Ser 575A NFA Req'd 3 arrests for assault, van please*

Control Room Radio Schedule

Running No 5

Bomb Threat

Start Time : 17.45

Incident No	*Description*	*Radio Messages Req'd*
1	Details of Bomb threat passed to Bx 5	*Bx 5 from GT a bomb threat has been made to a location given as a tube station within the Carnival area by a middle eastern sounding male. He states that it is due to go off in 1 hour at (TIME) the code word is known. BTP have been informed*
2	If Bx 5 tries to go to the station	*Bx 5 from GT on the instructions of Gx please deploy Bx 5.1 and return to your command veh and liaise with Sx re diversions and RVP*
3	Ser O/S stn state that BTP have closed it	*GT / Bx 5.1 from Ser 567; BTP are intending to close the station. Crowds trying to leave the Carnival are being stopped and the crowd is getting to dangerous levels*
4	During the evacuation Bx 5.3 is informed that BTP are treating this as a Red incident. Trains are not stopping and tannoys are going out telling people to alight at other stations.	
5	Bx 5 asked to supply aid to Royal Oak	*Bx 5 from GT: BTP are requesting assistance re crowds at Royal Oak Stn due to large numbers now at the station. Gx requests that Carnival officers deal*
6	If Bx 5.3 goes to royal oak he attends and finds heavy crowds	
7	GT request update re diversion	*Bx 5 from GT please update us*

		with the suggested diversion. It also appears that a serial have put in a cordon at the bottom of Gt Western Rd
8	Cancellation message	*For the info of all Bx's a further call has been received. This matter now concerns a specific stn which is O/S the Carnival area. All units may stand down.*

Control Room Radio Schedule

Running No 6

Crush and 'Steamers'

Start Time - 18.30

Incident No	*Description*	*Radio Messages Req'd*
1	Message is passed concerning a lack of police at Gt Western / Tavistock and steaming taking place	*GT from Ser 575B we have been informed by a NCL official that there are no police at Tavistock / Gt Western and there is a steaming gang going through. We are deployed at the stn and unable to deal.*
2	Bx 5.2 makes his way to the scene	
3	Bx 5.2 is told to go if he hasn't gone already Bx 5.2 then sees crushing/steaming	*Bx 5 from GT on the instructions of Sx please arrange for Bx 5.2 to attend this incident and then make your way to your Comm Veh.*
4	Bx 5.3 meets a lost serial (who should be at Tavistock / Gt Western) Ser.574	
5	Victim retaliates following robbery.	
6	Bx 5.2 may call for additional units and this may lead to disorder etc	
7	If lost serial make their way and situation calms down. Video shows officers in position and matter resolved	

Control Room Radio Schedule

Running No 7

PI RTA with Float / Urgent Assistance at PH

Start Time : 17.45

Prior to the start of this incident Ser 577 to call up stating they have returned form the charge centre

Incident No	*Description*	*Radio Messages Req'd*
1	Mess to Bx 5 from GT re stoppage	*Bx 5 from GT the procession appears to have stopped somewhere in Elkstone Rd, can Bx 5.1 attend and investigate the problem please.*
2	Bx 5.1 attends the locn and finds the RTA with a mounted officer on scene	
3	GT inform Bx 5.3 re a fight at the White Swan PH, Chepstow Rd	*Bx 5.3 from GT we have received reports of a fight at the White Swan PH for your information.*
	Ser 565 offer to deal	*GT from Ser 565 we are close by and will deal.*
	After a suitable break - urgent assistance	*GT from Ser 565 Urgent assistance, youths throwing bottles etc...*
		Various Sector reserves to offer to attend
	After a suitable time - cancellation and request for transport etc	*GT from Insp Ser 565 matter now in hand etc.....However due to arrests we will not be able to cover our patrol*
		GT from reserve serials...likewise now off with arrests
4	Due to RTA the procession is stopped and will be for some	***SX TO RING Bx 5** advise to call*

	time. AMB arrives at scene LAS having problems getting to locn but ask that injured party is not moved	*Bx 5.2 to his locn and plan possible diversion route due to crushing problems caused further back by RTA.* *From GT to Bx 5.1 re not moving victim of RTA*
5	Bx 5.2 joins Bx 5	*GT to ask by radio or phone for serial deployments for any possible diversion*
6	AMB now at RTA and tend to victim	
7	AMB leaves cancellation of diversion plans. Bx 5.1 then gives an interview to the press.	

Appendix 12

Minerva Carnival Training

A Questionnaire

Having read each question, please underline or circle the response which most accurately reflects your view.

(1) How Realistic was the simulation ?

Highly realistic
Moderately realistic
Not very realistic
Totally unrealistic

(2) To what level did you gain a sense of actually being at Carnival ?

Deep sense of actually being there
Moderate sense of actually being there
Shallow sense of actually being there
No sense of actually being there

(3) How long did it take before you forgot you were in the driving school and began to feel that you were at Carnival ?

5 mins
10 mins
15 mins
More than 15 mins
I did not at any time feel as if I was at Carnival for real

(4) How manageable was the exercise for you personally ?

Easy to manage
Moderately manageable
Hard to manage
Impossible to manage

(5) How easy was it for you to relate what you saw and heard during the exercise to Carnival itself ?

I found it easy to relate it to carnival
I found it neither easy nor difficult to relate it to carnival
I found it difficult to relate it to carnival
I could not relate it to carnival at all

(6) What level of command do you feel Minerva is training for ?

Tactical
Strategic
Operational

(7) How prepared did the initial briefings make you feel to tackle the exercise?

Fully prepared
Mostly prepared
Poorly prepared
Not prepared at all

(8) How prepared did the initial briefing materials make you feel to tackle the exercise?

Fully prepared
Mostly prepared
Poorly prepared
Not prepared at all

(9) What were your feelings about the length of the exercise, was it:

Long enough
Too long
Not long enough

(10) What were your feelings about the time you had to solve specific problems during the exercise?

Long enough
Too long
Not long enough

(11) What was the level of Impact of the technology on your sense of actually being there ?

Invisible
Obtrusive
Noticeable

(12) What were your feelings concerning the levels of noise both in the main cinema area and in the pod itself ?

Pod

Assisted sense of realism
Neither assisted nor hindered sense of realism
Hindered sense of realism

Main cinema

Assisted sense of realism
Neither assisted nor hindered sense of realism
Hindered sense of realism

(13) What, if any, effect did the size of the screen in your pod have on your sense of actually being there, was the screen ?

Too big
About right
Too small

(14) How would you rate Minerva as a group learning exercise ?

Very effective
Moderately effective
Limited effectiveness,
Not effective at all

(15) How would you rate Minerva as a individual learning exercise?

Very effective
Moderately effective
Limited effectiveness,
Not effective at all

(16) How relevant to the carnival do you think the chosen problems were?

Very relevant
Mostly relevant
Had only limited relevance
Had no relevance at all

(17) How far did the de-brief phase assist you to consolidate learning gained within the exercise?

Greatly assisted learning
Mostly assisted learning
Did little to assist learning
Failed to assist learning

(18) After training on the Minerva system how prepared do you now feel to manage the policing at Carnival ?

Fully prepared
Mostly prepared
Poorly prepared
Unprepared

(19) How far did the press component assist the sense of realism?

Greatly assisted the sense of realism
Mostly assisted the sense of realism
Did little to assist the sense of realism
Did nothing to assist the sense of realism

(20) Please feel free to add any further comments about Minerva below such as enhancements you would like to see made to the system or to the way it is used.

Having used Minerva recently on the Football course I was perhaps more related than others. I found that by making an initial decision and sticking with it the incident tended to run its course without further intervention from me. A little more pressure might add to the realism.

I would also like the ability to meet face-to-face with the Principal Bronze where reality dictates we could meet - i.e. when he attends a scene on my sub-sector.

Rosemarie Cl

Appendix 13

Day 3 **5th July 1995** **Participant A** 

Gold

Tape Time	Comments.
00:00	Real time = 10:55am Game begins. Music starts
03:50	GT Bx0 Bx1 Bx3 Bx2 Sitrep all quiet.
04:55	(event 1) Bx3 to Bx0 and GT circulates info re abducted child
08:00	(event 1 incident 2) GT to Bx1 goto PS defective PR
09:00	Serial to Bx2 child with suspect Van required
10:00	GT to Bx0 re attacks on 2 officers CS gas Sector 2
12:39	Bx1 to GT serial located lost child. GT to Bx2 re this.
15:00	(event 1 incident 4) Bx2 attending wrong arrest complaint.
17:18	Serial cancels Bx2 as situation now sorted.
18:27	(event 2) Serial to Bx3 re drug arrests. Bx3 attending
20:10	(event 2 incident 2) Serial to Bx1 Rogue Float Bx1 attending
21:24	Bx3 to GT where take prisoners.
23:50	Bx0 to Bx1 contact float liaison.
	Bx3 to GT directing serial held over
25:11	(event 2 Incident 4) Serial to Bx2 suspicious death. Bx2 attending.
	Bx0 to Bx2 keep up informed.
27:47	Circulate to GT vehicle involved re sus death
	Radio traffic Bx1 and serial re rogue float.
30:09	Serial to Bx2 re sus death scene Crowd outside address.
31:50	Bx2 to Bx0 then Bx0 to GT by phone CID to attend sus death
34:30	Bx0 to serial at sus death put cordons in.
	Bx0 to GT requesting serials at sus death.
35:50	(event 4 Incident 1)Serial to Bx1 obstruction include sus death vehicle
42:40	Bronze crime to Bx0 vehicle can be removed.
43:02	(event 4 incident3) Serial urgent message stage collapse
43:20	Bx1to GT arrange removal of obstruction sus death vehicle.
43:44	Bx2 to Gt keep serial at ground assigned.
44:13	Serial re-iterate collapse. Require assistence. GT to Bx0 & Bx3
44:53	Bx0 to GT 15 injured LAS required. Bx0 nominates RVP inform Sector 4.
45:30	GT gold to Bx0. Bx0 vary route necessary.
46:20	Bx3 to GT Bx0 Cordons put in at scene of collapse
47:04	GT to Bx0 Gold directions re re-route.
49:15	Bx0 to Bx3 serial to location re diversion
58:51	(event 4 incident 5)Bx0 to Press Interview
50:34	GT to Bx2 deploy serial to disturbance at party
53:20	Bx0 to GT redeploy serials
1:00:52	Serial to Bx2 Tavistock Road serious GBH
1:02:15	(Event 4 incident 10) Serial to Bx2 Serial withdrawing from scene to save injuires to officers.
1:03:08	(Event 4 Incident 9) Stage re-built.
1:03:55	Serial to Bx3 Urgent message er Tavistock Road.
	Serials deployed to assist.
1:06:05	Serials re-deployed and carnival back on original route.
1:07:02	Serial fighting at Tavistock Road.
1:08:25	Bx2 to Bx0 level 1 serials requested from Silver.
1:09:05	Bx0 to Bx2 agreed. Bx2 to Silver request level 1
	Silver to Bx2 request denied and remove serials from scene
1:14:35	(event 6) GT to Bx0 Bomb Threat to LTE station
1:17:17	(event 6 incident 3) GT to Bx0 Instructions Silver deploy Bx1 to LTE station and Bx0 to Control van at RVP
	Bx0 to Bx1 re above..
1:25:03	(event 6 incident 5)Bx0 to Bx3 goto Royal Oak assist BTP
1:26:50	GT to Bx0 serial to Rotal Oak. Bx3 to GT deploy serial to.

1:27:40	Bx1 to Bx0 Cordoned off LTE station etc.
1:28:50	Bx0 to Bx2 put cordons in
1:29:12	GT to Bx0 re Westway
1:30:15	Bx0 to Bx1 put cordons in
1:30:22	Bx0 to GT Silver request to hold route and serials to assist.
	Inform nieghbouring sectors.
1:33:50	(event 6 incident 8) GT cancellation re bomb threat.
1:37:50	(event 3) Bx2 to serial procession halted 20 mins investigate.
1:38:00	GT to Bx0 Procession halted Bx1 to attend and investigate
	Bx0 to Bx1 re above.
1:41:20	Bx1 to GT RTA ambulance injured party by float.
1:42:03	GT to Bx3 fight at P.H. for info.
1:43:18	Bx1 to GT re RTA float involved. Possible fatal Traffic Investigator
1:44:45	Bx3 to GT medic to attend PH. Disturbance ended.
1:45:35	GT to Bx1 from Oscar keep RTA area sterile.
1:46:50	GT to Bx0 re halted procession
	Bx0 to Bx1 eta to clear 20 mins Divert procession around
1:50:30	Bx3 to GT serial to PH. Bx3 to Serial close PH.
1:52:06	Bx1 to Bx0 Traffic investigator close road for 1 hour Diversion route.
1:52:42	Bx1 to GT diversion route.
1:53:03	GT to Bx0 do you confirm decision
1:53:43	GT Gold to Bx0 remove float from scene to allow procession to continue.
	Bx0 to Bx1 re above.
1:56:29	Bx1 to Bx0 injured party to hospital. Vehicle will be removed.
1:57:20	Exercise ended..

Day 2 **4th July 1995** **Participant B** [redacted]

Bronze 5.0

Tape Time	Comments.
00:00	Real time = 1035am Entry into pod. Pod briefing by JC
06:10	JC leaves pod. Bronze and assistant settling in.
06:34	PS Spinks interrupts re GT
06:46	PS Spinks leaves pod.
09:05	Radio checks initiated by the control room.
09:42	Game begins. Music starts.
13:12	Radio message from sub-bronze re crowded road
14:19	Bx0 radio message to Bx3 re update. Bx3 relates info re abducted child.
15:14	Bx3 message to Bx0 and GT circulates info re abducted child.
18:06	GT message to Bx0 re Sgt defected radio.
18:51	Bx1 message to Bx3 re child and suspect
19:49	GT message to Bx0 re not attending sgt defect radio
21:39	Bx2 message to GT re child. Check out with Bx1.
	There follows radio traffic between sub bronzes, serials, and GT re child.
24:52	(event 2) Message from serial to Bx2 re drug arrests.
25:30	Bx2 message to Bx0 asking for reserve to standby
25:28	Bx1 message to Bx0 Floats stopped
26:58	Bx0 message to sub bronzes re float situation.
	There follows radio traffic re rogue float between sub-bronze ant GT.
29:29	Bx2 message to GT and Bx0 re drug arrests and serial out of play.
	There follows messages between sub-bronzes, serials and GT
32:00	Bx2 message to Bx0 Procession now moving.
32:15	Bx0 message to Bx3 re reserve serial deployed.
	There follows message between sub-bronzes and serials
33:39	Bx0 telephones Control direct re location info.
33:50	Radio traffic re suspicious death from serial
35:02	Bx2 message to GT and Bx0 re susp.death and requests reserve serial
	GT allocates serial. There follows messages between serial and sub-bronze re susp.death.
37:44	Bx0 message to Bx2 requests update of crowd at location.
	There follows further messages from GT to Bx2 re susp.death. and serials
40:08	Bx0 assistant telephones GT re allocating serial to call Bx0
41:00	Bx1 message to Bx0 update procession moving smoothly
	There follows message about rogue float between serial and Bx1
42:10	Bx0 message to Bx1 to contact float liaison to assist.
	There follows further radio traffic between sub-bronzes and serial
42:54	Bx0 telephones Control
43:33	Bx0 message to Bx2 runner Bx2 speaking to press.
	There follows message between serial and Bx1 rogue float.
45:58	Bx0 message to Bx1 to allow float in if to difficult to keep out.
	There follows message between Bx1 and serial allowing float in.
48:03	Bx0 rings GT
	Radio message re vehicle found from susp.death.
50:29	(event 4) Urgent message to Bx3 from serial stage collapse.
50:50	Bx0 at scene of stage collapse.
	Bx3 asking for procession to be re-routed.
52:15	GT message to Bx0 re route change
	Bx3 inform GT re two injuries need hospitalisation.
	Follows radio traffic between serials, sub-bronzes and GT re stage collapse
54:43	Bx0 telephones GT asks that serial be put on standby
	Further radio traffic re stage collapse.
	Bx0 concerned re procession blockage.
56:27	Bx1 message to Bx0 re cordon at Westbourne Park

56:48	Bx0 message to Bx3 update on stage position. Unsafe to proceed.
57:12	GT telephones Bx0 re the available reserve serials.
	GT messages to Bx3 re re-routing
	Noisy party.
58:58	Hand over briefing to relieving Bronze.
1:00:26	Out of Pod for **Press interview**
1:16:04	Return of Participant B to Pod as Bronze 5. Hand over briefing.
1:17:23	Takes over as Bronze 5.
1:18:00	Bronze 5 given cup of tea.
1:18:29	Bx2 message to Bx0 Pay Party now quiten down.
1:18:54	Bronze 5 queires why dealing with incident off sector.
1:19:07	(event 6) GT message to Bx0 Bomb Threat.
1:19:52	Bx1 message to Bx0. Serial Inspectors to RVP To GT BTP to liaise.
1:21:13	GT message to Bx0 to deploy Bx1 to LTE station not heard in pod due to pod discussion.
	Message picked up by Bx1 Will meet Inspectors at RVP
1:22:04	GT message to Bx0 Make way to RVP
	Bronze 5 discussing over map re actions to follow.
1:23:27	Bx2 message to Bx0. Party at Tavistock Road all quiet serials released.
1:23:44	GT informed. Bx1 to GT liaise with BTP stopped trains stopping at station Bronze 5 in discussion re action to take. Serials radio to GT further update at LTE station.
1:25:00	Bx0 message to GT re-route carnival new route described, use traffic patrol
1:25:38	Bx1 message to Bx0 requests cordon by Bx2 etc.
1:26:26	GT message to Bx0 Gold states Carnival has been re-routed at Porchester.
1:27:00	Bx0 to GT to confirm route. Asking for assurance that Cordons will be placed and that Bx1 Bx2 are informed. GT confirms.
1:27:41	Bx1 message to Bx0 Describing the clearing of station and serials used.
1:28:07	Bx0 message to Bx3 Informing that route has changed therefore no floats.
1:28:34	GT message to Bx0 request serials to assist BTP off sector Royal Oak serials released by Bx0.
	Discussion in Bronze pod. Radio traffic sub-bronzes and GT
1:30:30	Bx0 message to GT confirm re-routed carnival is in place and held 500M from Royal Oak. GT confirms
1:31:30	GT message to Bx0 request from Oscar can Westway remain open
	Further radio traffic between sub-bronze and GT re serials
1:32:47	Bx0 message to GT Be prepared to shut traffic off at Westway.
1:33:36	GT message to Bx0. This to include Ops Bx0 confirms
	Serials inform sub-bronzes that BTP are leaving stations open to allow people to exit.
1:36:04	Bx0 message to GT. Is Silver aware of BTP decision. Yes.
1:36:44	Bx1 message to Bx0 We have closed the Station.
1:37:04	GT message to all Bronzes Bomb threat not within Carnival Area All units stand down re stations.
1:38:10	Bx0 message to Bx3 re routing of procession.
1:39:10	Bx1 message to Bx0 releasing serial
1:40:42	(event 3) Bx2 message to Bx0 Procession backed up
1:41:06	GT message to Bx0 directing Bx1 to locale.
1:41:26	Bx0 message to GT asking that the other sector bronzes check if re backup.
1:43:04	Bx1 message to GT RTA with float. Cause of blockage
1:43:48	Bx0 message to GT nearer 1st aid etc.
1:44:22	Bx1 message to Bx0 requests Procession be re-routed due to congestion.
	Serial requested by Bx1 to put in cordon and re-direct.
1:45:21	Bx0 message to Bx1 hold carnival do not re-direct.
	Serial informed
	Ambulance arrived etc.
1:47:58	Bx3 message to Bx0 do you want serials kept over and not dismissed.
1:48:20	Bx0 message to Bx3 at your descretion dismiss.

1:49:10	Bx2 message to Bx0 will hold over serial.
1:49:52	Bx1 radio traffic with GT requesting Traffic, possible Fatacc etc.
1:50:19	Bx1 message to Bx0 Need to preserve scene. Procession maybe halted a considerable time. Bx0 response does the scene need preserving and size of vehicle. Bx1 vehicle HGV.
1:52:00	Bx0 message to Bx1 try move vehicle. Bx1 will liaise will Traffic at scene.
1:53:15	Bx0 message to GT Update on procession.
1:54:04	Bx1 message to Bx0 Road will need to be closed for 1 hour for evidence gathering.
1:54:32	Bx0 message to Bx1 Remove vehicle and reopen the roads for procession.
1:56:03	(event 5) Serial to Bx1 Crush
1:56:39	Bx1 message to Bx0 AccInjured removed. Not life threatening. Opening road. Bx0 response as quickly as possible.
1:57:10	Bx0 message to Bx2 did you hear this. and update from Bx3
1:58:31	Exercise ended.

Day 4 **6th July 1995** **Participant C** [redacted]

Bronze 5.0

Tape Time	Comments.
00:00	Real time = 10:48am Entry into pod. Pod briefing by JC
02:23	JC leaves pod. Bronze and assistant settling in.
06:34	Radio checks initiated by the control room
07:33	Game begins. Music starts.
07:54	Bx0 via GT to TSG units re locations
09:10	Bx0 to Bx2 re serial deployment
10:15	Bx0 to Bx1 re serial deployment
10:52	GT to Bx0 re serial deployment. Followed by deployment to Bx1
12.24	(event 1) Bx3 message to Bx0 and GT circulates info re abducted child
12:24	GT to Bx0 via phone. Bronze stand up away from computer to take call
13:44	GT to Bx0 sgt defective radio ask for sub-bronze to attend
14:11	Bx0 to Bx1 to go to sgt.
15:03	GT to Bx0 re above
16:35	Serial to sub-bronze child found suspect arrested.
	Request for van thro GT
	Bx1 message to Bx3 re child and suspect
18:40	Bx1 to GT serial located lost child
20:00	Bx0 to GT ask for details of serial
21:00	Bx2 to Bx1 discrepancy both have serial recover child
	Radio traffic between sub bronzes re above
23:29	Bx2 to Bx0 inform re de-arrest and complaint
24:35	JC at door of pod speaks to Bronze 5
	Radio traffic GT & Sub-bronzes & Serials re child
25:45	Bx2 to Bx0 now with female complainent
26:39	(event 2) Message from serial to Bx3 re drug arrests.
26:58	Bx3 to Bx0 re above Bx3 attending
27:00	GT to Bx0 by phone Bronze 5 gets out of chair and stands .
	Discuss in pod about CS gas attack and pagers??
28:57	Serial to Bx1 Rogue Float Bx1 attending
29:35	Bx2 to serial and Bx0 re deployment of serial
29:52	GT to Bx0 re deployment of tsg unit
	Discussion in pod about action re rogue float.
31:25	Bx3 to Bx0 requesting serial standby. Bx0 deploys serial via GT
	Bx3 to GT on location to deploy.
	Gold keep serial on standby
32:42	Bx3 to Bx0 refer back as Gold will not release serial
32:56	Bx0 to GT Silver releases serial to Stage for Bx3. Bx0 inform Bx3
33:27	Serial to Bx3 Suspicious Death Bx2 attends. Bx2 informs Bx0
34:00	Bx0 to GT via phone Something about pagers.
35:13	Bx0 to GT have CID informed re sus death
36:04	Bx1 to Bx0 two officers attacked with CS gas no details.
36:30	Bx0 to sub-bronzes. Info on their pagers. Not refer on air.
	There follows radio traffic re rogue float between sub-bronze ant GT.
39:34	Bx2 to GT at scene of susp.death CID FME etc requested. Deploy serials to close road preserve scene.
	Serial at scene crowd building up
42:32	Bx2 to GT re above.
42:42	Bx2 to Bx0 re above.request standby serial Request to GT.
43:28	GT to Bx0 via phone
	Serial to Bx2 and GT vehicle details involve sus death
44:24	Bx0 to Bx2 use serials re-assessment after CID attended.
	Radio traffic between GT and Bx2 re deployment
45:10	Bx0 to GT ciculate to other bronzes re vehicle.

	Radio traffic between GT and Bx2 re deployment
46:38	Serial to Bx1 Float liaison willing to do paperwork and allow into carnival
	Bx1 agrees
47:48	Bx0 to GT by phone requesting details of press interview of Bx2
48:37	Person at door of pod Bronze talks to
48:59	Pod discuss judging point
49:35	Serial to Bx1 Found sus death vehicle causing obstruction
	Pod discuss details
	Bx1 pass info to GT and Bx2, SOCO
51:44	Bx0 to Bx1 attend location of vehicle and assess. GT informed
52:44	Bronze Crime to Bx1 SOCO not attend vehicle to be removed
53:00	Pod discuss deployment of TSG units
53:33	(event 4) Urgent message to Bx3 from serial stage collapse.
	Bx3 will attend. Bx3 to Bx0 re above Bx0 at scene of stage collapse.
54:32	GT to Bx0 deployment of serials to stage.
55:10	Person at door of pod. Bronze 5 speaks to him.
	Discussion in pod re collapse
55:44	Bx3 to Bx0 Cordon being put in. two serials on route.
56:15	Serial to Bx3 due to stage collapse carnival halted.
56:50	Bx3 to GT Ambulance re 15 Injuries
	Location given
57:24	GT to Bx0 by phone
57:34	Bx3 to Bx0 asking for diversion of procession.
58:13	Bx0 to Bx3 diversion will be put in place
	Discussion in pod re diversion
59:00 - 1:01:00	GT to Bx0 by phone
59:33	Bx2 to GT directs ambulance route
	Serial to Bx3 requesting deployment. Deployed by Bx3.
	Discussion re procession diversion.
1:01:40	Bx2 to Bx0 informing of deployments
	Kevin Walsh enters pod. Bronze discusses with Kevin re GT info required
1:02:55	Bx0 to Silver by phone.
1:03:36	Bx0 to Bx3 directing diversion
1:03:55	Someone at door of pod. Kevin leaves Pod
1:04:09	Relieving Bronze enters pod. Hand over briefing to relieving Bronze.
1:04:50	Out of Pod for **Press Interview**
1:22:24	Return of Participant C to Pod as Bronze 5. Hand over briefing
1:23:45	Bx0 to GT by phone
1:24:15	Participant C takes over as Bronze 5
	Discussion in pod. re procession return to route. Suspicious death.
	Radio traffic between serials, sub-bronze and GT re deployment
1:25:34	Bx0 to GT give directions on putting carnival back onto original route.
1:26:09	Bx0 to Bx3 re above.
1:26:24	(event 6) GT to Bx0 Bomb Threat to LTE station
1:26:51	Bx0 to Bx1 re above. Bx1 attending LTE station.
1:26:53	Someone at door of pod. Cup of tea give to Bronze.
1:27:30	Bx1 to GT re serials.
1:27:41	GT to Bx0 Silver directs Bx0 to go to Control van
	Discussion as to whether leave pod.
1:28:10	Bx0 to GT by phone exercise message does she leave pod. No
1:31:20	Bx1 to Bx0 LTE station closed by BTP request two serials
1:31:41 - 1:32:50	Bx0 to GT by phone. Re route diversion.
	Discussion in pod re setting up cordons.
1:33:15	Serial to Bx2 re steamers. Bx2 to GT re serial to assist. No.
1:34:13 - 1:35:45	Bx0 to GT by phone
1:34:30	Bx0 to Bx1 direct cordons to be put in place.
	Bx1 to Bx0 station still open trains still running do you want us to search or close station.

1:35:20	GT to Bx2 serial to assist with steamers.
	Discussion in pod re diversion cordons etc.
1:36:15	Bx1 to Bx0 station now closed. trains not stopping. clearing station.
	Bx0 please use two serials on way to cordon off etc.
	Bx1 to GT call signs of serials.
1:37:26	Bx0 to Bx3 attend Royal Oak LTE
	Serial to Bx1 asking for dismissal told standby
1:37:54	Bx0 to GT by phone.
1:38:39	Bx0 to Bx1 procession backing up. Get cordon to re-route.
1:39:35	Bx0 to Bx3 BTP asked for extra serials. Use own resources.
1:40:21	Radio traffic GT and Bx1 re closing Westway. and re-direct carnival route.
1:41:35	Serial to Bx2 Arrest re steamers. request serial to assist.
	Discussion in pod re procession and Westway etc.
1:42:07 - 1:43:44	Bx0 to GT by phone
1:42:07	Bx2 to GT re serial to assist steamers
1:42:26	Bx2 to Bx0 Cordon implemented.
1:43:44	Bx3 to GT sitrep.
	Discussion in pod re carnival route cordons etc.
1:44:28 - 1:45:01	Bx0 to GT by phone
	Radioi traffic serial to Bx2 re arrests
1:44:48	Bx3 to Bx0 re serial at Royal Oak LTE
	Discussion in pod re procession and cordons
1:45:50	GT to Bx0 and sub-bronzes bomb threat not in carnival area. Stand down.
1:46:04 -1:46:40	Bx0 to GT by phone
1:46:33	Serial to Bx2 assistance required bottles being thrown two officers hit.
	Discussion in pod re removing cordons and getting procession on route.
1:47:06 - 1:47:41	Bx0 to GT by phone
	Bx2 direct further serial to assist at disturbance.
1:47:33	Bx0 to Bx2 and Bx1 remove cordon. Already done.
	Radio traffic between serials and sub-bronze re above.
1:49:11	Bx0 to TSG units No answer..
1:49:25	(event 3) Bx2 to GT. deploy serial re Procession backed up
1:50:01	GT to Bx0 Procession halted Bx1 attend and investigate.
	Bx0 to Bx1 re above.
1:50:48	Bx0 to TSG confirm now on standby.
	Radio traffic between sub-bronzes re procession halted.
1:51:25 - 1:52:38	Bx0 to GT by phone
1:52:23	Bx1 to GT RTA ambulance injured party by float.
	Bx1 inform Bx2 GT inform traffic.
1:53:11 - 1:53:48	Bx0 to GT by phone
1:53:38	Bx0 to Bx1 can you attend seen and give sitrep re diversion of carnival.
	Radio traffic Bx1and GT re ambulance and directions to.
	Discussion in pod over map re ambulance route.
1:55:22	Serial to Bx2 assistence and medical required Officer injured
	Radio traffic serial, Bx2 and GT re location and medic etc.
1:57:00	Bx1 to Bx0 suggest diversion re RTA
1:57:13 - 1:58:6	Bx0 to GT by phone
	Radio traffic serial and Bx2 sitrep.
	Discussion in pod re RTA
	Radio traffic Bx2 and GT re serial deployment.
1:59:25	Bx0 to Bx1 sitrep. Ambulance on scene.
	Radio traffic sub-bronses and serial re deployment and strengths
2:00:26 -2:01:09	Bx0 to GT by phone
2:01:03	Bx0 to Bx1 sitrep is it fatal will not re-route unless dire circumstances.
	Possible fatal Accident investigators requested and re-route carnival.
2:02:10- 2:03:17	Bx0 to GT by phone.
	Serial to Bx2. re injured officer LAS in attendence extra serial in attendence.Bx2 to GT re deployment.

	Discussion in pod re procession.
2:04:18	Bx1 to Bx0 requests divergance of procession. Bx0 requires circumstances of fatacc which are given. Bx0 to GT for info of Silver
	Discussion in pod re attendence of Bronze to RTA scene.
2:07:10	Bx3 to Bx0 requests dismissal for serial.
2:07:07	Bx1 to Bx0 RTA float be removed on advice of Investigator take 10 mins. No diversion halt carnival. Bx0 agreed.
2:08:24 - 2:09:28	Bx0 to GT by phone Radio traffic serial and sub-bronze missing child
2:09:49	Bx0 to Bx1 Agree to halt carnival. Let us know when road clear.
2:10:12	Bx0 to Bx3 Child sitrep.
	Serial to Bx3 Child found. Bx3 to GT and Bx0
2:12:23	Exercise ended..

Day 5 **7th July 1995** **Participant D** [redacted]
Bronze 5.0

Tape Time	Comments.
00:00	Real time = ?? Entry into pod. Pod briefing by JC
01:06	JC leaves pod. Bronze and assistant settling in.
	Collecting maps and papers.
02:20	Both leave pod. Pod empty
03:26	JC enters with assistant clarifying amp position
03:36	Both leave pod. Pod empty
04:00	Bronze enters pod with uniformed PC discuss Bronze strategy.
	Assistant writing on wipeboard.
05:05	Radio checks initiated by the control room
	Bronze leaves pod. Believed at door talking with others.
13:00	Bronze returns to pod. Extra assistant.
13:27	Game begins. Music starts.
15:54	Bx0 Bx1 Bx3 Bx2 Sitrep all quiet.
20:05	(event 1) Bx3 to Bx0 and GT circulates info re abducted child
21:13	Bx0 to Bx3 refer mother to lost and found.
21:40	GT to Bx0 PS defective PR send officer to meet.
21:57	Bx0 to Bx1 goto PS defective PR
22:43	Serial to Bx2 child with suspect Van required
	Bx2 to GT request van
23:24	Bx0 to Bx2 re van to go to location re crowd.
	Serial to GT re eta of van
24:32	Bx2 to GT attending location. Bx2 to serial re this matter
25:33	Bx1 to GT serial located lost child. GT to Bx1 liaise with Bx2 as appears both have found child.
	Radio traffic between serial sub-bronzes and GT re above.
27:26 - 27:59	GT to Bx0 by phone re attacks on 2 officers CS gas Sector 2
	2nd assistant leaves pod
	Discuss re above in pod.
	Radio traffic Serials and Bx1 Bx2 re lost child.
31:12	(event 2) Serial to Bx3 re drug arrests. Bx3 attending
33:11	Bx0 to GT TSG unit re above to be aware in case needed.
33:55 - 34:25	Bx0 to GT by phone re CS gas on Sector 2.
34:48	Serial to Bx1 Rogue Float Bx1 attending
35:00	Person at door of pod inform re CS gas.
	Discussion in pod re location rogue float.
	Radio traffic Bx1 and serial re rogue float.
35:38	Bx3 to serial sitrep
39:02	Bx0 to GT relay Bronze instructions to allow entry of rogue floats into procession. Bx1 to serial re-iterate this.
38:11	Serial to Bx2 suspicious death. Bx2 attending.
	Radio traffic Bx1 and GT re rogue float
39:15	Bx2 to Bx0 re-iterate above. Bx0 ask for sitrep on arrival.
	Discussion in pod re sus death.
41:01	Radio traffic between serial , Bx3 Bx1 and GT
41:53	Bx2 to GT CID to attend sus death. Bx0 informed
	Bx0 directs that Bx2 leaves matter to serial Inspector to deal
42:54	Serial at sus death circulate vehicle involved.
	Radio traffic re sus death scene Crowd outside address.
44:09	Bx2 to Bx0 asking one reserve serial to scene
45:21	Serial to Bx1 float now into procession.
	Discussion in pod re use of TSG unit at scene of sus death
46:03	Bx0 to GT re deployment of serial to scene of sus death.
47:17	Bx2 to Bx0 Bx2 now at press interview.

	Radio traffic sub-bronze and serial re sitrep.
48:06	Bx0 to Silver GT requsting serials one for Bx3. Silver agrees.
	Bx1 to serial re relieving
49:32	Bx0 to Bx3 check out status of serials. Bx3 calls each serial.
51::16	Serial Bx1 re vehicles obstruction including suspect vehicle from death.
	Radio traffic Bx1, serial and GT.re above vehicle to be removed
54:23	Bx3 to Bx0 relating status of serials.
55:05	(event 4) Urgent message to Bx3 from serial stage collapse
	Discussion in pod re collapse.
55:26	Bx3 to Bx0 and GT reiterate above.
	Radio traffic Bx3 and serial re sitrep collapse.
56:20	Bx3 to GT 15 injured LAS required. Serials required to assist. GT deploys.
	Inspector serials to make path for ambulances. GT requires RVP
	Discussion in pod access for ambulances and isolating incident.
57:45	Bx3 to GT location of RVP given
58:23	Bx0 to Bx3 have you sufficent resources to isolate incident
58:51	Out of Pod for **Press Interview**
1:13:51	Return of Participant D to Pod as Bronze 5 in company with JC.
1:13:58	JC leaves pod. Hand over briefing
1:14:30	Relief leaves pod. Bronze takes over.
1:14:30 - 1:14:55	Bx0 to GT phone re status of release of serials
1:15:19	Bx2 to Bx0 re status of serial
	Discussion in pod re status of serials
	Radio traffic sub-bronzes GT and serial re deployment.
1:16:31	(Event 4 incident 10) Serial Urgent Assistence
	Heavy Radio Traffic sub-bronzes serials and GT re above deployment etc
	Bronze monitoring and discussing situation in pod
1:22:18	Bx0 to Bx2 request size of crowd. reply 200
	Discussion in pod re where move crowd to.
	Bx3 to GT releasing serials to GT.
1:23:48	Bx0 to Bx2 requests he meet or speak on landline
	Radio traffic GT and Bx2 re disorder and withdrawel of serials from scene.
1:25:09	Bx3 to Bx0 now resolved procession return to original route. GT informed.
	Radio traffic re deployments sub-bronzes and serials.
1:27:04	(event 6) GT to Bx0 Bomb Threat to LTE station
	Bx0 requests threat level.
1:28:10	Bx0 to Bx1 Sitrep on your arrival at LTE station.
	Discussion of diversion in pod.
	Bx0 to Bx1 re number of people at location. There follows radio traffic with serial re sitrep.
	Discussion in pod re deployment and action.
	Radio traffic between serials and sub-bronzes re LTE station.
1:29:28	Bx1 to Bx0 status of crowd and deployment at scene.
	Radio traffic re procession at location.
1:30:29	GT to Bx0 message from gold.....Bx1 to scene of incident and
	Bx0 to go to command vehicle.
	Discussion in pod re whether incident or not, and RVP
	Radio traffic serial and Bx1. BTP close station
	Bx0 to Bx3 prepare to divert carnival
1:32:56 - 1:34:25	Bx0 to GT Silver by phone re diversion.
	Radio traffic Bx3 and serials and GT re diversion.
1:34:05	Bx0 to GT re LTE incident.
1:34:28	GT to Bx1 two serials to Royal Oak assist BTP
1:34:58	Bx1 to GT BTP shut line over 4 LTE stations in Carnival area.
1:35:12 - 1:35:52	Bx0 to GT by phone inform Bx3 by pager divert carnival, re-route explained.
	Radio traffic between Bx1 and serial

1:35:50	Bx0 to GT re request for serials to assist BTP at Royal Oak we have no spare serials to assist.
	Radio traffic GT, sub bronzes and serials re LTE incident
	Discusion in pod re incident and diversion..
1:37:46	Bx0 to Bx3 hold pager message until route re-assessed.
1:38:13 - 1:39:17	GT to Bx0 by phone re diversion
1:38:13	GT to Bx0 have you allocated a sub-bronze to Royal Oak station. Bx0 will not.
	Radio Traffic Bx3 GT and serial re not implementing diversion.
1:39:18	Bx0 to GT Silver by phone re diversion
1:40:00	Bx0 to GT message on pager to Bx3, Bx2 and other sectors diversion details
	Radio traffic GT Bx1 Bx2 and serials re deployments
	Discussion in pod re diversion, cordons and deployments
1:42:59 - 1:43:40	Bx0 to GT asking for intelligence update on threat level
1:43:40	Entry into pod of uniformed PC discussion re pager message and diversion
1:44:36	PC leaves pod
	Heavy radio traffic GT Bx1 Bx2 Bx3 and serials. Re LTE & disturbance.
1:45:53 - 1:46:27	Bx0 to GT message on pager to Bx3 to contact Bx0
1:46:27	Bx0 to Bx3 attend Royal Oak LTE
1:46:50	GT to Bx0 Bx3 not required at Royal Oak LTE
	Heavy radio traffic GT Bx1 Bx2 Bx3 and serials. Re disturbance
	Discussion in pod re sub bronzes actions.
1:48:46	Bx3 to Bx0 response to pager informed maybe required re Royal Oak. if situation deterioates
1:49:19	GT to Bx0 Westway has been close and CTC pictures lost.
1:50:02	GT to Bx0 and sub-bronzes bomb threat not in carnival area. Stand down.
	Radio traffic between sub-bronzes and serials GT re above.
1:52:21	Bronze leaves pod for coffee.
	Radio traffic re disturbance Serial Bx2 and GT serial to assist
1:52:57	Bronze returns to pod.
1:53:07	Bronze goes to door of pod. and then returns to seat.
	Radio traffic re disturbance Serial Bx2 and GT and van
1:54:18	Bx1 to Bx0 Bx2 gone to press interview
1:54:55	(event 3) GT to Bx1 Procession halted attend and investigate
	Bx2 to GT procession halted 20 mins.
	Discussion in pod.
1:55:33	Bx0 to Bx1 deploy serial.
1:56:05	Bx0 to GT liaise Sector 1 see if problem their end
	Radio traffic Bx1 and serial
1:57:08	GT to Bx0 no problem Sector 1
	Bronze drinking coffee.
1:57:36	Bx0 to Bx2 sitrep.
	Bx0 to Bx3 sitrep.
	All quiet. Radio traffic re dismissal of serial.
1:58:45	Bx1 to GT RTA ambulance injured party by float. Route in for ambulance.
	Discussion in pod
	Radio traffic re missing child
2:00:20	Bx0 to Bx1 confirm that carnival stooped because of RTA
	ETA for clearence. Can float be removed.
	Radio traffic Bx1 GT re eta of ambulance.
2:02:02	Bx0 to Bx1 Can procession get around RTA. Response make necessary arrangements
	Radio traffic re missing child.
2:04:00	Serial to Bx3 believed premises on fire. Bx3 to GT call fire brigade.
	Radio traffic re serials back on patrol
2:06:25	Bx3 to GT route for Fire brigade
	Radio traffic between serials and Bx3 re above.

2:07:40	GT to Bx0 RTA will be cleared by traffic.
2:07:51	Bx0 to Bx3 re fire when you arrive put cordons in
2:08:50	Bx0 to GT inform sector 1 re route LAS/LFB
	Radio traffic serial to Bx3 re fire
2:09:42	Bx0 to GT inform Sector 4 re fire.
	Sub-bronze to serial re sitrep etc.
	Bx3 to GT re cordons at fire.
2:11:40	Serial to Bx3 chip pan fire extinguished.
2:12:03	Exercise ended..

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
	NEWHAM	BX 4.	ATKINSON.	28/8.

Time	Description of incident, problem or task	Location
	SPE maker - 11-19	
	Fair time - 11-26.	
11.45	BRIEFING.	CAMDEN INST.
12.	BARRIER REMOVAL	ARUNDEL GDNS.
12.15	PATROL.	
12.30	— " —	
12.45	SNACK	COLVILLE SCHOOL.
1pm	PATROL	
1.15	— " —	CHEISTON VILLAS
1.30	— " —	
1.45	CRUSHING GLUE TO CROWD DENSITY	LADBROKE GROVE JW ARUNDEL GDNS
2pm	ROGUE FLOAT ATTEMPTS TO ENTER ROUTE A SHORT LOG IS REQUIRED TO REACH IT.	LADBROKE GROVE JW LADBROKE GDNS.
2.20pm	ABOVE PROBLEM IS RESOLVED NORMAL PATROL IS RESUMED.	

Notes

* PATROL *

THIS MEANS WALKING BETWEEN THE VARIOUS KEY POINTS ON THE SECTOR, WHILST ALSO DEALING WITH ENQS ETC FROM THE PUBLIC.

2

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date

Time	Description of incident, problem or task	Location
2.30.	STATIC AT	WESTBOURNE
	SUDGING POINT	GLOVE.
	LOUD NOISE +	
	VIBRATION	
2.45	PATROL	
3.00	— " —	
3.15	SNACK	COLVILLE SCHOOL
3.15	— " —	
3.30	— " —	
3.45	PATROL	
4.00	STATIC AT	WESTBOURNE
	3.1	GLOVE.
4.15	— " —	
4.30	TOKEN TK	KEN TK.
	12) REPORTED	12).
	CROWD CRUSHING.	
4.45	PATROL	NOTTING
		HILL GATE
5.00	— " —	— " —
5.15	STATIC	— " —
5.30	SUDGING	WESTBOURNE
	POINT —	GLOVE.
	LOUD NOISE	
	+ VIBRATION	
	HEAVY CROWD	
	DENSITY.	

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date

Time	Description of incident, problem or task	Location
5.45	SPACE	COLVILLE SCHOOL
6pm	PATROL —	
	CHANGE OF	
	FOOTWEAR!!	
6.15	PATROL	
6.30	REPORTS OF	DOG LEG
	CRUSHING	SECTION
	ETC.	OF ROUTE
6.45	" "	
7pm	" "	
7.15	STATIC VEH	KEM TE.
	LOUD FLOATS	RD.
	SOUND SYSTEMS	
	PASSING BY	
7.30pm	SPACE	COLVILLE
		SCHOOL
7.45	" "	" "
8pm	PATROL	" "
8.15	" "	" "
	REPORTS OF	
	SERIOUS INJU-	KEM. TALE
	RY SECTOR	RD.
	OFFICERS DEAL-G.	
8.30	STATIC VEH	
	LOUD FLOATS	" "
	PASSING BY.	

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date

Time	Description of incident, problem or task	Location
8.45	STATIC:	KEMPTVILLE
		RD.
	AGAIN SUB-	
	JECT TO VERY	
	LOW NOISE	
	+ VIBRATION	
9pm	"	"
9.15	SUDDEN 4	
	POINT EXTRE-	WEST-
	ENELY NOISY	BOURNE
		GROVE
9.30	STATIC AS	"
	ABOVE	
9.55	RADIO FLOAT	"
	PASSES VERY	
	LOW	
10.15	STATIC AS	
	BEFORE	"
10.30	"	"
10.45	"	"
11pm	PATROL	KEMPTVILLE
		RD, ETC.
11.15	pm DERELICT-	
	SUB-BRONZES	COLVILLE
		SCHOOL

Notes

5

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date

Time	Description of incident, problem or task	Location
11.30	ENGAGED E-BRIEF	
11.45	VEHICLE SORTED.	
12.00	MAIN DE-BRIEF	CAMDEN INSTITUTE
	END	

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
	PATERSON	Bx 5	HICKIN	28-8-95

	Time	Description of incident, problem or task	Location
		Pt. Maker - 11.01	
		Thermal - 11.00.	
11-18	11.15	Drinking Coffee	Lancaster Rd H/C.
11-37	11.30	Briefing - Sector Commanders.	" Camden La
	11.45	End of briefing	" "
	12.00	TRAVELLING TO PHEONIX SCHOOL	VARIOUS
12-16	12.15	FEEDING PHEONIX SCHOOL	PHEONIX SCHOOL
	12.30	" "	" "
	12.45	TRAVEL TO FORWARD COMMAND	VARIOUS
	13.00	FORWARD COMMAND UPDATE.	BUS GARAGE ALFRED ROAD.
3-16	13.15	" "	" "
	13.30	SECTOR BRIEFING UPDATE	" "
3-46	13.45	END OF BRIEFING	" "
	14.00	GEN PATROL SECTOR (SLOW WALK)	WESTERN ROAD.
	14.15	DIRECT STREET TRADERS	CHEPSTOW ROAD
	14.30 ST	DEAL WITH CROWD CONGESTION ON FOOTP	WESTBOURNE GROVE / LEDBURY ROAD
	14.45.	GEN PATROL (SLOW WALK)	CHEPSTOW RD.
	15.00	GEN PATROL (SLOW WALK)	WESTERN ROAD
	15.15	LIAISE BTP (DRINK CAN LIFT).	WESTBOURNE PARK LTK.
	15.30	GEN PATROL (SLOW WALK).	WESTERN RD.
	15.45.	GEN PATROL LIAISE BTP2	WESTBOURNE PARK RD
	16.00	SNACKS	ST MARY ANGEL SCHOOL
	16.15.	PATROL DENSE CROWD.	CHEPSTOW ROAD
	16.30	WESTBOURNE GROVE DEAL WITH CONGESTION ON FOOTP	WESTBOURNE GROVE.
	16.45.	MONITOR FLOW CARNIVAL TRAFFIC	WESTBOURNE PARK / CHEPSTOW RD.
	16.55	SOUND SYSTEM RATTLING BOXES.	" "

Notes

(2)

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
	SUPT RATHBONE	BX 5	Hicks	28/8/95

Time	Description of incident, problem or task	Location
17.00HRS	TACTICAL DISCUSSION	ARTHURIAN ROAD.
17.15	"	"
17.30	CHAPSTOW/[illegible] MONITOR JUNCTION	CHAPSTOW/WESTBOURNE PARK
17.45	MONITOR CARNIVAL PROGRESSION	"
18.00	~~STRATEGY BOARD~~ G. PATROL	STRAWBERRY ROAD
18.15	REFRESHMENT.	ST MARY AXE.
18.30	CONSTRUCTIVE FEEDBACK from BTP.	WESTBOURNE PARK LTE
18.45	LIAISE MTD BRANCH.	BUS GARAGE ARTHUR RD
19.00	BRONZE UPDATE	FORWARD COMMAND POST
19.15	"	"
19.30	GENERAL PATROL (SLOW WALK)	GT WESTERN RD
19.45	LIAISE BX 52	GT WESTERN RD / WESTBOURNE RD
20.00	GEN PATROL (SLOW WALK)	CHAPSTOW RD.
20.15	MONITOR CARNIVAL FLOW.	CHAPSTOW RD / WESTBOURNE GROVE
20.30	"	"
20.45	"	"
20.47	CONFRONTATION BETWEEN MEWELL CROFT	"
20.00	TO LTE STATION RE CROWD CONGESTION (FAST WALK)	WESTBOURNE PARK LTE
21.15	MONITOR WESTBOURNE PARK LTE	FORWARD COMMAND
21.30	MONITOR CROWD DENSITY W.P LTE	ROOF BUS GARAGE
21.45	"	"
22.00	"	"
22.09	REPORT OF ~~POSS~~ FATAL STABBING.	FORWARD COMMAND
22.15	MONITOR STABBING INCIDENT	FORWARD COMMAND
22.30	" NO LONGER FATAL	"
22.45	GEN PATROL	GT WESTERN RD

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
23:00	SUPT PATERSON	BX 5.	PC Hicks	

Time	Description of incident, problem or task	Location
23.00	GEN PATROL – RE: DISMISSAL.	CHELSTON ROAD
23.15	"	"
23.30	BRIEF DEBRIEF.	FORWARD COMMAND POST
23.45	"	"
0005	SOL COMMANDER DEBRIEF	LANCASTER RD – FWD CMD
0025	"	"
0030	DEBRIEF.	

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
11 am	Barrett	Bronze 2	OWEN	28.8.95

Time	Description of incident, problem or task	Location
	Pt markers – 10.38.	
	Thirteen – 10.50	
11 am	Patrol gather intelligence	Portobello etc.
11.15 am	Informal Conference sub Bronzes	Cambridge Gdns
11.30 am	Institute Lancaster Conference	Lancaster Rd.
	Senior Officers conference	"
11.45 am	"	
12 mid	Patrol – meet Bronze 2.2	Portobello
12.15 pm	" – meet Officers	Gilsonne
12.30 pm	Patrol – " "	Ladbroke G.
12.45 pm	Patrol to Bronze 2.5	HQ
	mini-briefing	"
1 pm	Lunch at	Sion Manning
1.15 pm	Informal meeting Bronze 22	Ladbroke G.
1.30	Patrol Ladbroke (heavy crowd)	"
1.45	Meet Mounted 2	Adults Educati
2.00.	Patrol Sector / update	Ladbroke G.
2.15	Informal meeting B22	Ladbroke G
2.30.	Meeting Bronze 26	Sion Manning
2.45	Pat Ladbroke	Ladbroke.
3.00	Supervise small incidents	"
3.15	Through dense crowds	"
3.30	Meeting of sub bronzes	Sion Manning
3.45	Beginning of inbound crushing?	Ladbroke
4.00.	To Thorpe Close	in Ladbroke
4.15	" " crushing	Thorpe Cl

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
11 am.	Barrett	Bronze 2	OWEN	28.8.95

Time	Description of incident, problem or task	Location
4.30	Crashing in alley	Thorpe Cl.
4.45		
5.00	Tradents at	
5.15	Radio / Sound	Thorpe Cl
5.30	Stage / Fire	Portobello
5.45	Crashing / Minor	Green.
6.00	Patrol (6)	
6.15	Intermediate debrief	Scion Manning
6.30	Dinner	" "
6.45	Patrol Goldborne	Goldborne
7.00	Assess Radio / stage	Thorpe Cl.
7.15	Supervise Close down (5)	Worrington Rd.
7.30	Meet Mounted 2	Adult Educ.
7.45	Supervise disposal	Mossington /
8.00	+ safety zones	Ladbroke.
8.15	Check float movements	"
8.30	" " "	"
8.45	" " "	"
9.00	Discuss shutdown "Ebony"	"
9.15	Move Ebony to close	"
9.30	Visit all other floats	"
9.45	De brief finishing arrials	Scion Manning.
10.00	" " " "	" "
10.15	Assist on scale down	Ladbroke.
10.30	Meet Mounted 2 Division 22.	"
10.45	Patrol 1' end	Goldborne Rd.

Notes

Standard day

Heightened Tension 4 – 6 pm.

Standard scale down 7pm →

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
11 am	Barrett	Bronze 2	OWEN	28.8.95

Time	Description of incident, problem or task	Location
11.00	Dealing with attempted murder	Bevington Rd
11.15		
11.30		
11.45	scene	
12 mid	S.O. debrief	Lancaster Rd.
—"—	HRM Removal	—"—

Notes

0

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
	ROWE	GOLD		23/2/95.

Time	Description of incident, problem or task	Location
	Pt marker 10-99	
	Their turn - 10-50	
1100	Patrol	Sec. 3 Lonsdale / Todhunter
1115	"	Corbetts Rd
1126	Conder Institute - Stat Insp.	Conder Institute
1145	Briefing ends	" "
1147	Radio missed radio	" "
1149	Radio found	" "
1200	Vehicle → V'way	in vehicle
1215	Walking on V'way to veh	West way - elevator
	security camera / security	" / "
1230	"	" "
1245	Arrive @ GT	N SY
1300	Discussion Insp & Pers Officer	GT.
1315	Back GT - viewing CCTV	GT
1334	Info to Tom for Reading	GT
	for Patrol at Todhunter.	
	Info only - local action	
1345	to 4th floor canteen	4th floor
	Lunch - Tortellini / Ice	"
	Sauce.	"
1450	Lunch	"
1415	Lunch ends return to GT	"
1430	Sitrep. no problem	GT
1445	nil.	GT.

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
	Rowe	GOLD		28/8/

Time	Description of incident, problem or task	Location
1453	Discussed arrangements	G.T.
	4/5 boundary for 96 Carnival	"
1500	? briefing	"
	Navigate PR Rd / Blenheim Rd	"
	on CCTV pan to Sec 3	"
1515	Review of all CCTV	G.T.
1530	V large Goods all over	"
	Carnival x. Kensal Rise	"
1545	Mans Ber & no Pen Officer	"
1600	Toilet - Cleared / on	Toilet & GT.
	rt disabled with wrs etc	"
	corners all the time	"
1615	Carnival Rise now very full	"
	as per CCTV. No prob	"
1621	Lge Lge Light Rle Sec 6 /	
	Macgregor	
1630	Light Fire. Ch Rd / Walterton	"
	Rise.	
1645	Slight fire Cambridge Gdns	"
1700	Spoke to Pen Officer - info	"
1715	Carnival busy - no prob	"
1730	Spoke Kastel - info only	"
1745	Carnival busy: No prob	"
1800	" "	"
1815	Incident with	Commissioner
1830	" "	" ends

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
1745	ROWE	GOLF		28/8

Time	Description of incident, problem or task	Location
1845	No change - Carnival busy	G.T.
	small nos. begin. to leave	
1850	Alteration shown to two	G.T.
	topless ladies on CCTV!!!	"
1855	Kiss close down @ Horniman	"
	Pleasance	"
1900	Radio 1. close down	"
1915	Busy - no prob. -	"
1929	" "	"
1945	Keys Turkey Sandwich/Cake	"
	& orange Lynx	"
2000	Disturbance - ASR/Busy St (Radio	"
	#3 failure)	"
2002	System restored.	"
2013	Route still busy - LT	"
	Meeting busy No problem	"
2028	" " " "	"
2051	" " , route	"
	V/busy esp Grt Ust Rd	"
2100	" " " on route	"
	no particular prob	"
2115	Sat Pen Officer & CCTV	"
2130	Sat Pen Officer & Sun	"
	Paper re- arrest of P.C. Hardy	"
2145	Paddock Tree Hunt —	"
	East side V/busy	"

Notes

Start Time	Subject's Surname	Subject's callsign	Loggist's Surname	Date
2200	ROWE	GOLD.		28/9

Time	Description of incident, problem or task	Location
2200	Viewing CCTV disposal	GT
2215	" "	"
2230	Spoke to AC Green	"
2245	Bognor Reg report with	"
	Ian Officer & ate sausage	"
	roll	"
2300	Closing quietly	"
2315	Report of Looting at	"
	Arkla Rd	"
2330	En route to RIH	
2345	All de briefed.	
2353	HRM removal	Cambden Institute

Notes

Appendix 14

EDGWARE GENERAL HOSPITAL [illegible]

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

PATIENT

Identification:-

Name:- PARTICIPANT A

Address:-

POD TAPE.

Age:-

Sex:-

PHYSICIAN

Department:-

Name:-

Address:-

Recording date:- 5/7/95

Analysis date:- 6/1/96

Technical Details:

Recorder S/N:-

Clinical Details:

Signed:-

Date:-

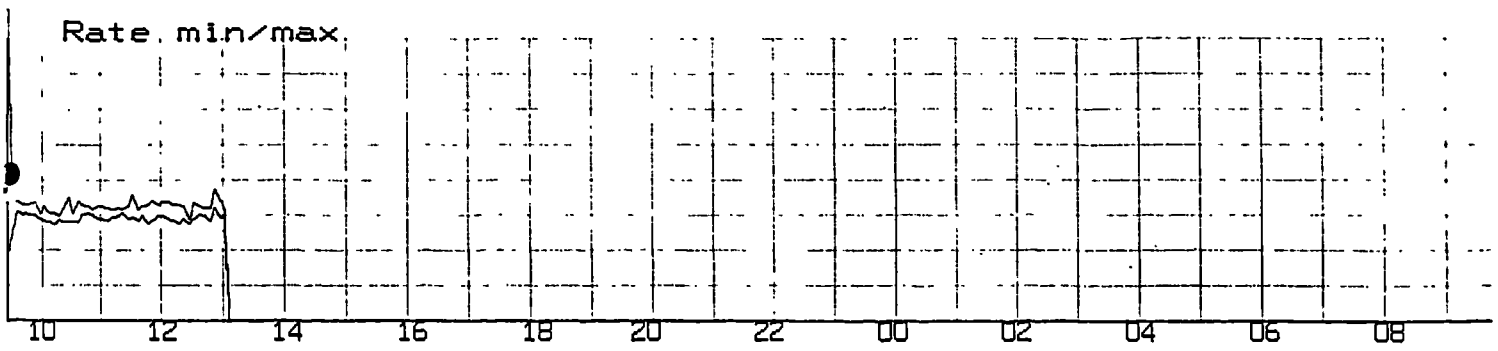
EDGWARE GENERAL HOSPITAL CARDIOLOGY

QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
75	0	0	0	0	0	0	0	0	50	226	0
387	0	0	0	0	0	0	0	0	66	86	7
397	0	0	0	0	0	0	0	0	77	84	0
394	0	0	0	0	0	0	0	0	75	82	0
394	0	0	0	0	0	1	0	0	76	82	0
383	0	0	0	0	0	0	0	0	75	83	0
397	0	0	0	0	0	0	0	0	75	84	0
370	0	0	0	0	0	0	0	0	72	76	0
371	0	0	0	0	0	0	0	0	71	81	0
359	0	0	0	0	0	0	0	0	70	76	1
350	0	0	0	0	0	0	0	0	68	76	0
353	0	0	0	0	0	0	0	0	71	74	0
369	0	0	0	0	0	0	0	0	70	79	0
378	0	0	0	0	0	0	0	0	70	87	0
371	0	0	0	0	0	0	0	0	70	76	0
371	0	0	0	0	0	0	0	0	70	84	0
384	0	0	0	0	0	0	0	0	75	82	0
381	0	0	0	0	0	0	0	0	76	81	0
387	0	0	0	0	0	0	0	0	75	79	0
377	0	0	0	0	0	0	0	0	72	81	0
383	0	0	0	0	0	0	0	0	72	81	0
378	0	0	0	0	0	0	0	0	71	80	0
385	0	0	0	0	0	0	0	0	73	79	0
377	0	0	0	0	0	0	0	0	74	80	0
388	0	0	0	0	0	0	0	0	76	79	0
389	0	0	0	0	0	0	0	0	72	81	0
389	0	0	0	0	0	0	0	0	73	89	0
369	0	0	0	0	0	0	0	0	71	79	0
399	0	0	0	0	0	0	0	0	74	81	0
360	0	0	0	0	0	0	0	0	69	82	0
393	0	0	0	0	0	1	0	0	71	85	0
384	0	0	0	0	0	0	0	0	74	82	0
374	0	0	0	0	0	0	0	0	74	84	0
369	0	0	0	0	0	0	0	0	72	84	0
377	0	0	0	0	0	0	0	0	71	82	0
382	0	0	0	0	0	0	0	0	69	82	0
370	0	0	0	0	0	0	0	0	72	81	0
357	0	0	0	0	0	0	0	0	69	72	0
391	0	0	0	0	0	0	0	0	72	83	0
384	0	0	0	0	0	0	0	0	75	81	0
390	0	0	0	0	0	0	0	0	74	80	0
374	0	0	0	0	0	0	0	0	71	80	0
427	0	0	0	0	0	0	0	0	80	93	0
388	0	0	0	0	0	0	0	0	73	85	0
373	0	0	0	0	0	0	0	0	73	79	0
289	0	0	0	0	0	0	0	0			70
17087	0	0	0	0	0	2	0	0			78

23

HOLDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.

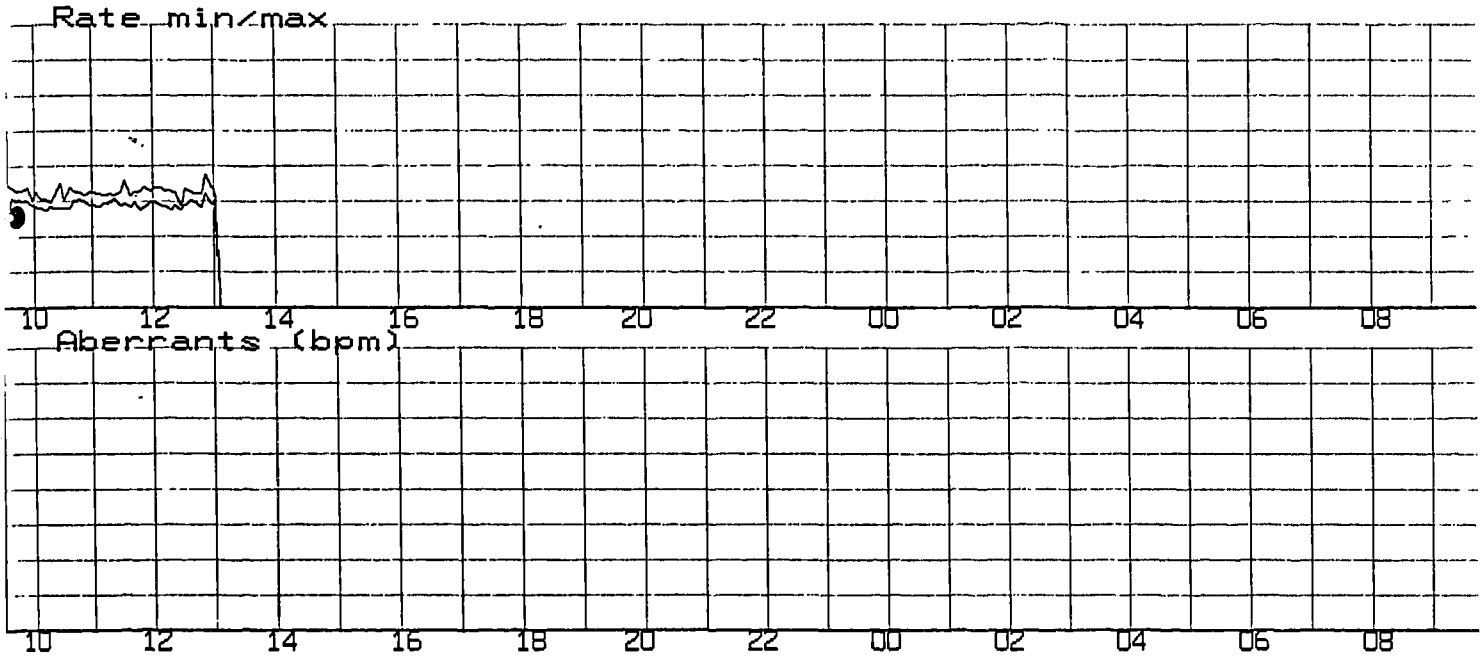
RIA: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.



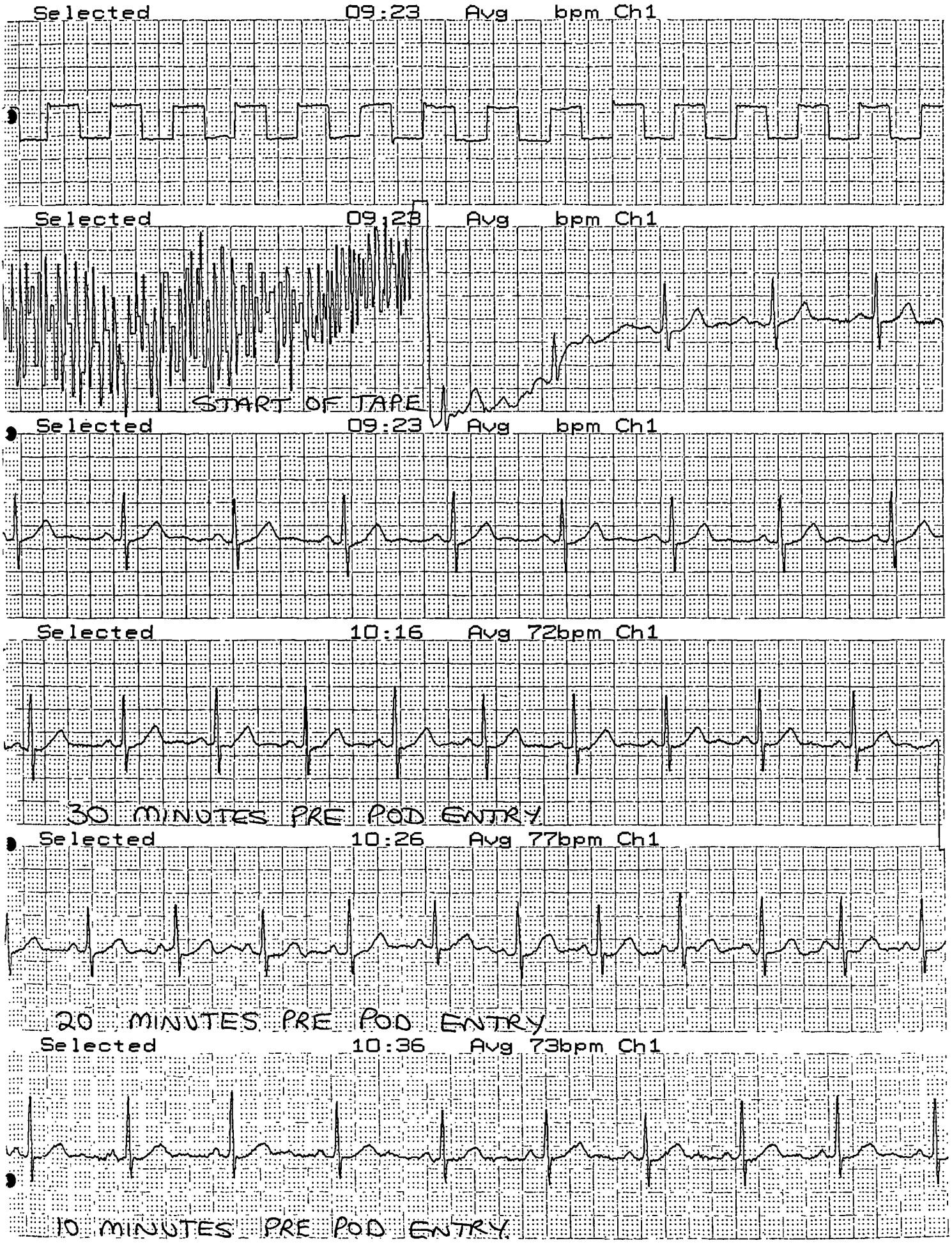
EDGWARE GENERAL HOSPITAL CARDIOLOGY

QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
2797	0	0	0	0	0	1	0	0	50	226	8
4451	0	0	0	0	0	0	0	0	68	87	1
4594	0	0	0	0	0	1	0	0	69	89	0
4583	0	0	0	0	0	0	0	0	69	93	0
662	0	0	0	0	0	0	0	0	73	79	70
17087	0	0	0	0	0	2	0	0			79

OLDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
IA: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.

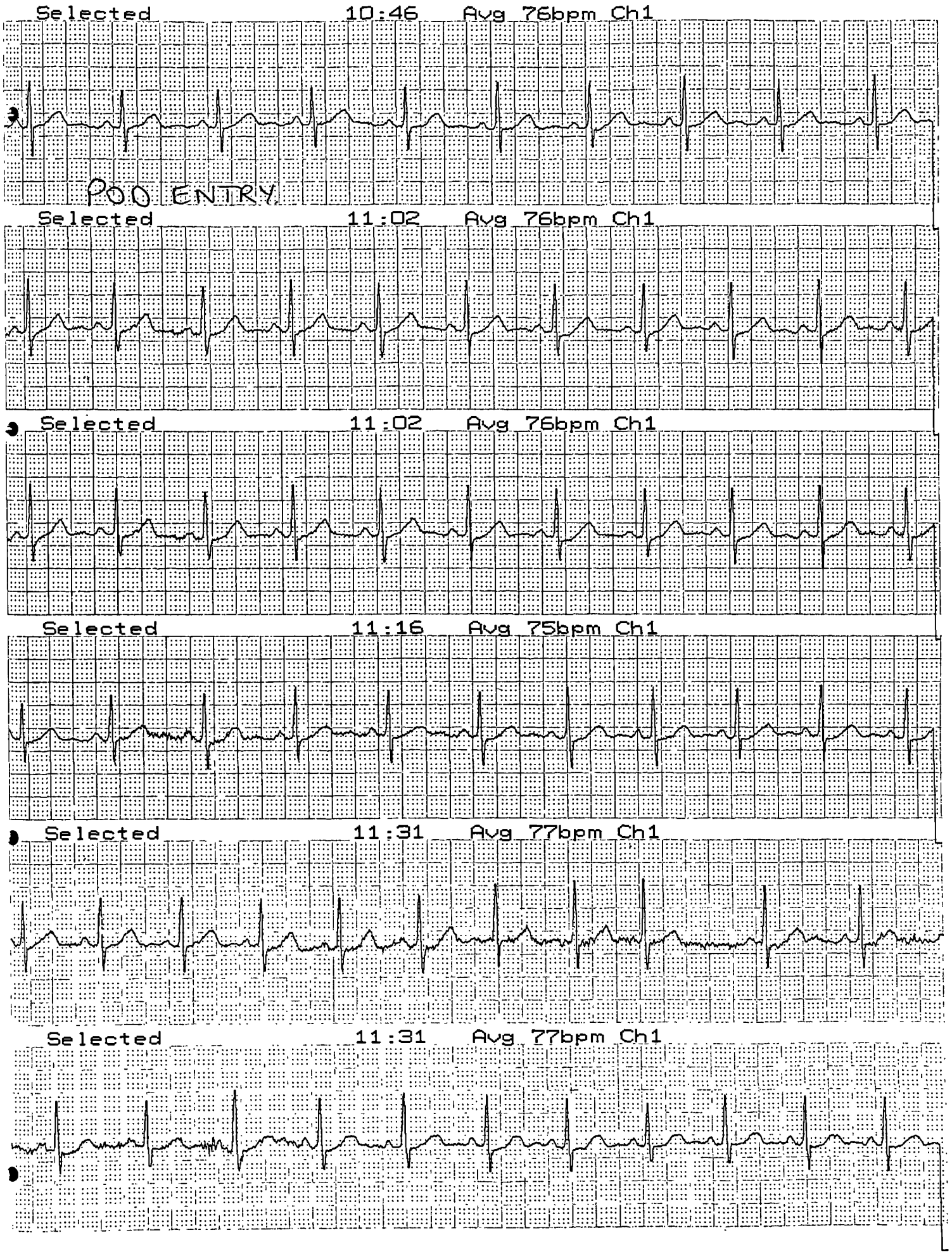


EDGWARE GENERAL HOSPITAL CARDIOLOGY



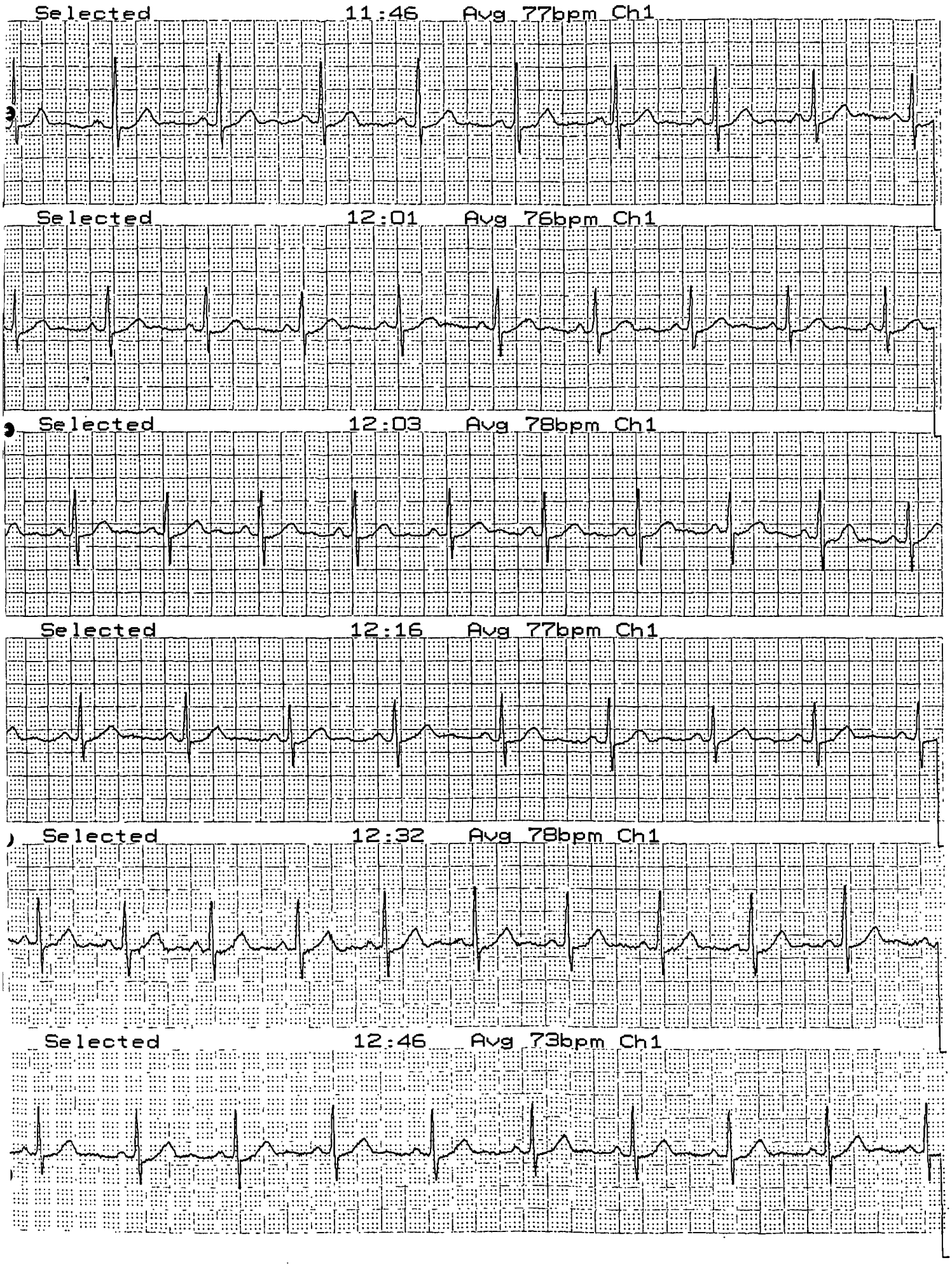
Reynolds MEDICAL

EDGWARE GENERAL HOSPITAL CARDIOLOGY



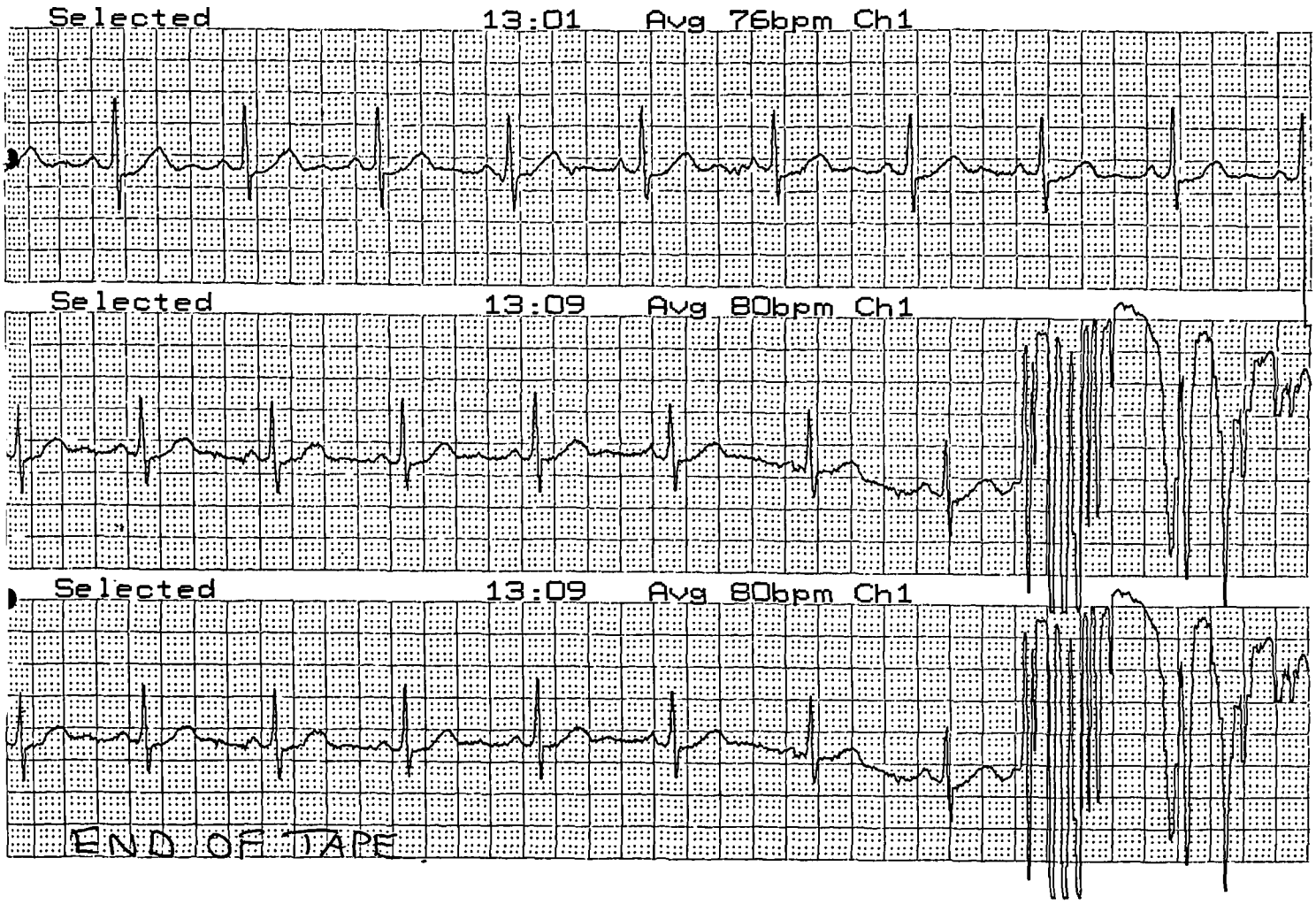
Reynolds MEDICAL

EDGWARE GENERAL HOSPITAL CARDIOLOGY



Reynolds MEDICAL

EDGWARE GENERAL HOSPITAL CARDIOLOGY



Reynolds MEDICAL

EDGWARE GENERAL HOSPITAL CARDIOLOGY

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

ATIENT

Identification:-

Name:- PARTICIPANT B

Address:- POD TAPE

PHYSICIAN

Department:-

Name:-

Address:-

Age:-

Sex:-

Recording date:- 4/7/95

Analysis date:- 6/1/96

Technical Details:

Recorder S/N:-

Clinical Details:

Signed:-

Date:-

EDGWARE GENERAL HOSPITAL CARDIOLOGY

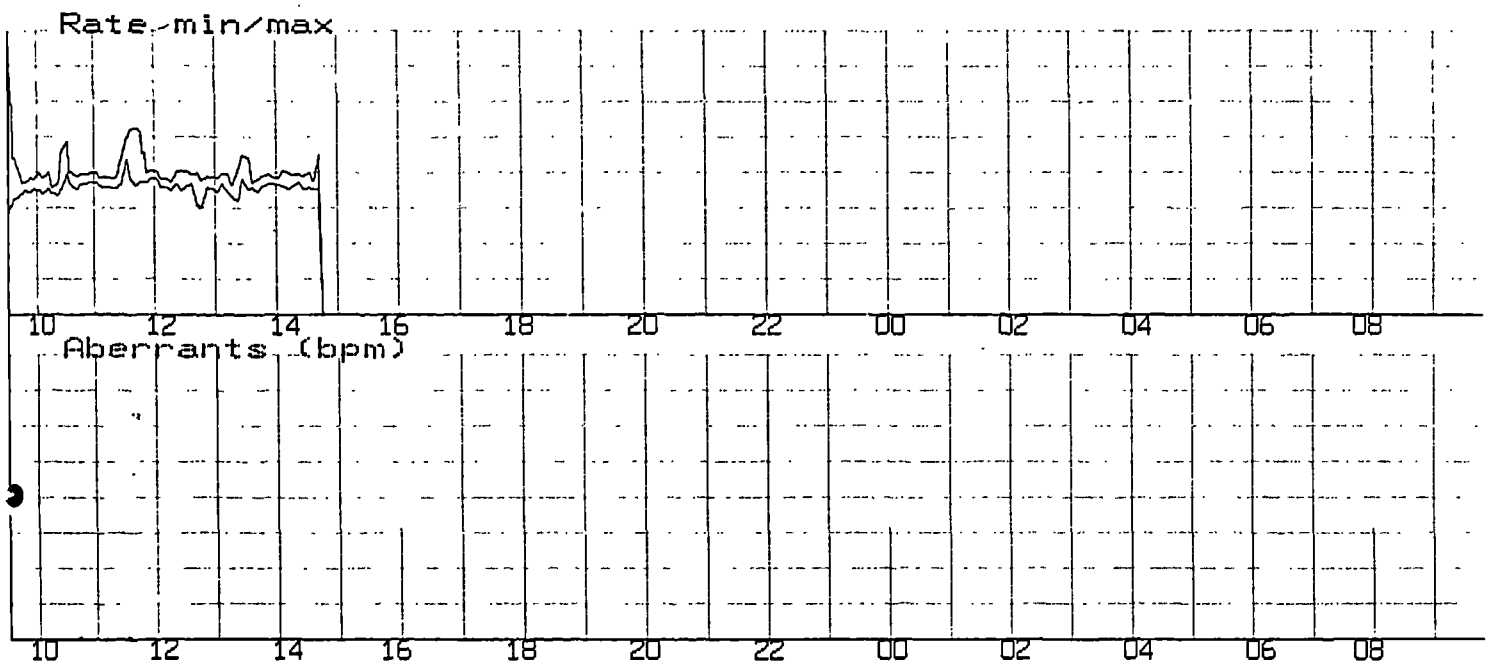
QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
142	0	0	0	0	0	0	0	0	72	187	0
457	0	0	0	0	0	0	0	0	81	110	17
452	0	0	0	0	0	0	0	0	82	103	0
446	0	0	0	0	0	0	0	0	85	93	0
443	0	0	0	0	0	0	0	0	87	93	0
457	0	0	0	0	0	0	0	0	86	96	0
452	0	0	0	0	0	0	0	0	88	95	0
453	0	0	0	0	0	0	0	0	87	99	0
452	0	0	0	0	0	0	0	0	85	96	0
455	0	0	0	0	0	0	0	0	88	99	0
549	0	0	0	0	0	0	0	0	85	89	0
441	0	0	0	0	0	0	0	0	83	91	0
519	0	0	0	0	0	0	1	0	88	115	0
514	0	0	0	0	0	0	0	0	98	121	0
480	0	0	0	0	0	0	0	0	91	100	0
452	1	0	0	0	0	0	0	0	88	97	0
466	0	0	0	0	0	0	0	0	91	98	0
474	0	0	0	0	0	0	0	0	91	98	0
485	0	0	0	0	0	0	0	0	93	99	0
475	0	0	0	0	0	0	0	0	92	99	0
464	0	0	0	0	0	0	0	0	90	96	0
459	0	0	0	0	0	0	0	0	89	96	0
460	0	0	0	0	0	0	0	0	89	96	0
464	0	0	0	0	0	0	0	0	89	97	0
493	0	0	0	0	0	0	0	0	91	109	0
576	1	0	0	0	0	0	0	0	108	125	0
534	0	0	0	0	0	0	0	0	95	130	0
510	0	0	0	0	0	0	0	0	90	130	0
504	0	0	0	0	0	1	0	0	92	128	0
476	0	0	0	0	0	0	0	0	92	99	0
489	0	0	0	0	0	0	0	0	95	101	0
472	0	0	0	0	0	0	0	0	95	100	0
458	0	0	0	0	0	0	0	0	89	95	0
461	0	0	0	0	0	0	0	0	89	95	0
453	0	0	0	0	0	0	0	0	87	93	0
467	0	0	0	0	0	0	0	0	91	100	2
455	0	0	0	0	0	0	0	0	87	101	0
464	0	0	0	0	0	0	0	0	90	100	6
471	0	0	0	0	0	0	0	0	91	98	0
437	0	0	0	0	0	0	0	0	77	99	0
418	0	0	0	0	0	0	0	0	75	94	1
467	0	0	0	0	0	0	0	0	89	97	0
460	0	0	0	0	0	0	0	0	88	96	0
463	0	0	0	0	0	0	0	0	86	96	0
474	0	0	0	0	0	0	0	0	91	98	0
450	0	0	0	0	0	0	0	0	86	96	0
423	0	0	0	0	0	0	0	0	83	91	0
456	0	0	0	0	0	0	0	0	80	102	0
514	0	0	0	0	0	0	0	0	95	112	0
458	0	0	0	0	0	0	0	0	88	110	0
455	0	0	0	0	0	0	0	0	89	93	0
448	0	0	0	0	0	0	0	0	86	95	0
464	0	0	0	0	0	0	0	0	90	97	0
472	0	0	0	0	0	0	0	0	91	98	0
461	0	0	0	0	0	0	0	0	91	96	0
465	0	0	0	0	0	0	0	0	91	96	0
467	0	0	0	0	0	0	0	0	90	101	0
466	0	0	0	0	0	0	0	0	88	99	0
470	0	0	0	0	0	0	0	0	90	98	0
479	0	0	0	0	0	0	0	0	92	98	0
452	0	0	0	0	0	0	0	0	88	97	0
462	0	0	0	0	0	0	0	0	89	99	0
454	0	0	0	0	0	0	0	0	88	94	0
396	0	0	0	0	0	0	0	0	88	112	61
0	0	0	0	0	0	0	0	0			84

EDGWARE GENERAL HOSPITAL CARDIOLOGY

29625	2	0	0	0	0	1	1	0	171

3

HOLDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
RIA: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.

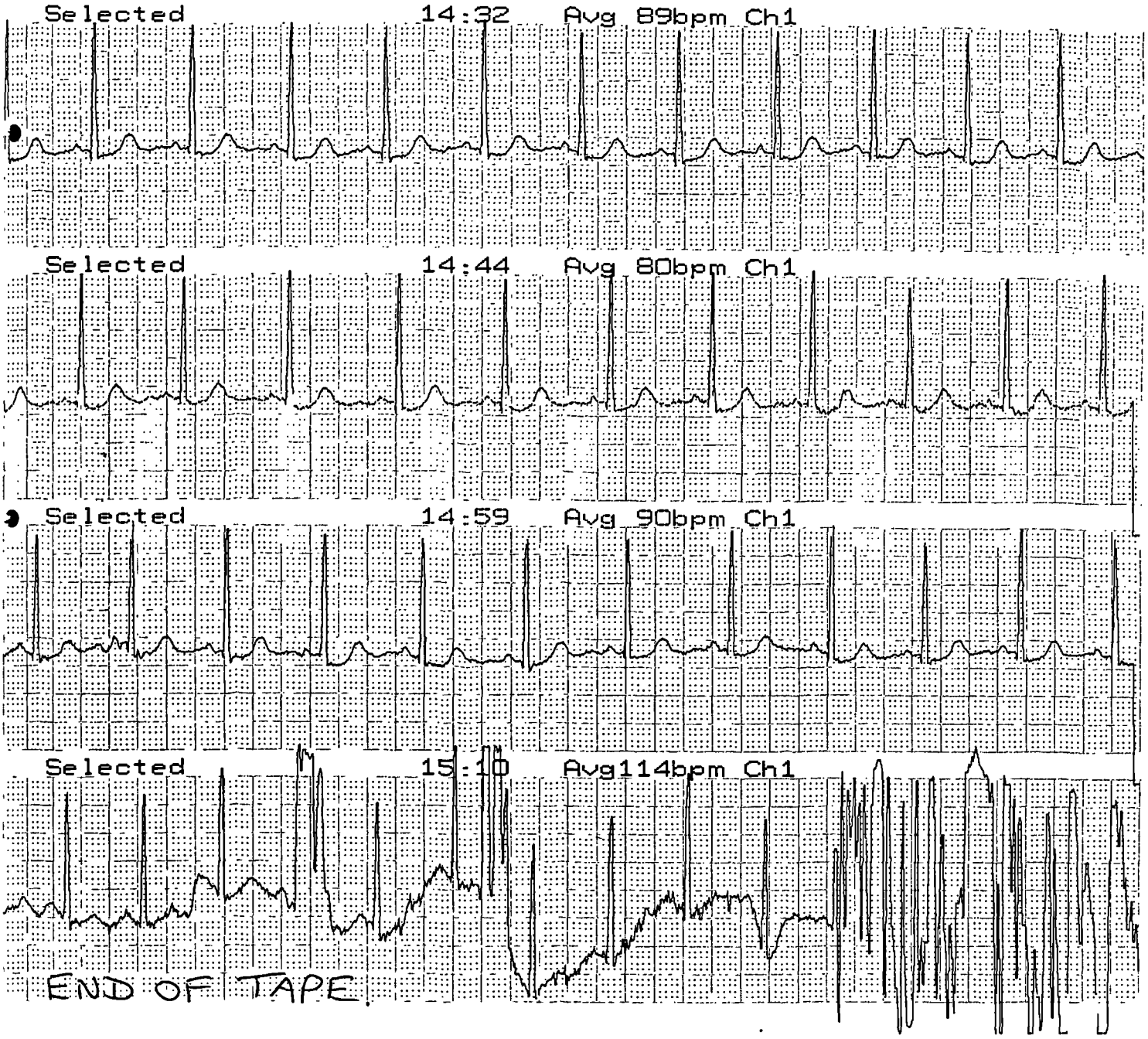


EDGWARE GENERAL HOSPITAL CARDIOLOGY



P10/009/RYN

EDGWARE GENERAL HOSPITAL CARDIOLOGY



EDGWARE GENERAL HOSPITAL CARDIOLOGY

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

ATIENT

Identification:-

Name:- PARTICIPANT C

Address:- POD TAPE.

PHYSICIAN

Department:-

Name:-

Address:-

Age:-

Sex:-

Recording date:- 6/7/95

Analysis date:- 6/1/96.

---

echnical Details:

Recorder S/N:-

Clinical Details:

Signed:-

Date:-

EDGWARE GENERAL HOSPITAL CARDIOLOGY

QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
0	0	0	0	0	0	0	0	0	80	101	0
313	0	0	0	0	0	0	0	0	76	88	56
666	0	0	0	0	0	0	0	0	78	103	0
423	0	0	0	0	0	0	0	0	77	92	0
396	0	0	0	0	0	0	0	0	74	86	0
397	0	0	0	0	0	0	0	0	76	81	0
430	0	0	0	0	0	0	0	0	77	93	0
457	0	0	0	0	0	0	0	0	87	95	0
474	0	0	0	0	0	0	0	0	90	99	0
476	0	0	0	0	0	0	0	0	93	99	0
467	0	0	0	0	0	0	0	0	89	101	0
463	0	0	0	0	0	0	0	0	90	98	0
477	0	0	0	0	0	0	0	0	91	101	0
484	0	0	0	0	0	0	0	0	90	105	0
454	0	0	0	0	0	0	0	0	88	97	0
439	0	0	0	0	0	0	0	0	81	95	0
426	0	0	0	0	0	0	0	0	84	88	0
420	0	0	0	0	0	0	0	0	82	88	0
412	0	0	0	0	0	0	0	0	79	87	0
440	0	0	0	0	0	0	0	0	82	94	0
515	1	0	0	0	0	0	0	0	94	115	0
459	1	0	0	0	0	0	0	0	88	100	0
459	0	0	0	0	0	0	0	0	86	98	0
477	0	0	0	0	0	0	0	0	94	100	1
490	0	0	0	0	0	0	0	0	96	101	0
488	2	0	0	0	0	0	0	0	96	102	0
480	0	0	0	0	0	0	0	0	92	104	1
488	0	0	0	0	0	0	0	0	94	103	0
436	0	0	0	0	0	0	0	0	87	102	0
429	0	0	0	0	0	0	0	0	84	93	0
464	0	0	0	0	0	0	0	0	85	99	0
440	0	0	0	0	0	0	0	0	86	99	0
437	0	0	0	0	0	0	0	0	82	95	0
434	0	0	0	0	0	0	0	0	83	91	0
434	0	0	0	0	0	0	0	0	82	96	0
433	0	0	0	0	0	0	0	0	83	91	0
474	0	0	0	0	0	0	0	0	89	102	0
489	2	0	0	0	0	0	0	0	94	103	0
508	1	0	0	0	0	0	0	0	97	108	0
549	0	0	0	0	0	0	0	0	103	126	0
438	1	0	0	0	0	0	0	0	81	102	0
508	0	0	0	0	0	0	0	0	87	121	1
444	0	0	0	0	0	0	0	0	82	94	0
443	0	0	0	0	0	0	0	0	84	96	0
492	0	0	0	0	0	0	0	0	92	103	0
474	0	0	0	0	0	0	0	0	91	96	0
489	0	0	0	0	0	0	0	0	94	104	0
450	0	0	0	0	0	0	0	0	88	98	0
440	0	0	0	0	0	0	0	0	84	90	0
442	0	0	0	0	0	0	0	0	86	94	0
432	0	0	0	0	0	0	0	0	80	93	0
470	0	0	0	0	0	0	0	0	87	107	0
485	0	0	0	0	0	0	0	0	92	106	0
524	0	0	0	0	0	0	0	0	102	112	0
493	0	0	0	0	0	0	0	0	91	112	0
450	0	0	0	0	0	0	0	0	87	95	0
433	0	0	0	0	0	1	0	0	84	94	0
458	0	0	0	0	0	0	0	0	80	103	0
526	0	0	0	0	0	0	0	0	103	111	0
497	0	0	0	0	0	0	0	0	97	102	0
513	0	0	0	0	0	0	0	0	100	105	0
513	0	0	0	0	0	0	0	0	102	109	1
512	0	0	0	0	0	0	0	0	101	107	0
496	0	0	0	0	0	0	0	0	98	101	0
486	0	0	0	0	0	0	0	0	95	104	0

P10/002/RYN

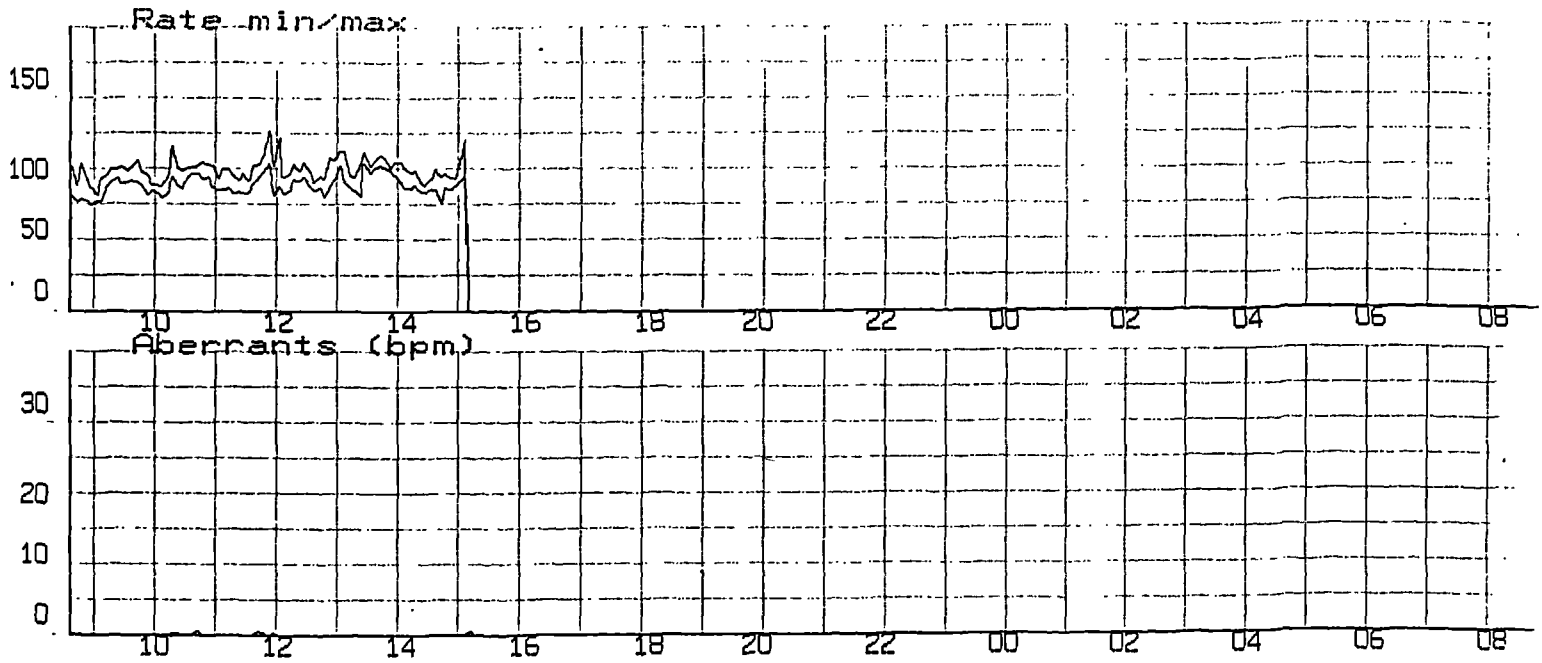
EDGWARE GENERAL HOSPITAL CARDIOLOGY

14:05	470	0	0	0	0	0	0	0	0	90	104	0
14:10	467	0	0	0	0	0	0	0	0	86	100	0
14:15	462	0	0	0	0	0	0	0	0	86	97	0
14:20	453	0	0	0	0	0	0	0	0	88	98	0
14:25	425	0	0	0	0	0	0	0	0	83	90	1
14:30	430	0	0	0	0	0	0	0	0	83	88	0
14:35	430	0	0	0	0	0	0	0	0	85	92	0
14:40	459	0	0	0	0	0	0	0	0	85	99	0
14:45	403	0	0	0	0	0	0	0	0	76	94	1
14:50	443	0	0	0	0	0	0	0	0	86	96	0
14:55	443	0	0	0	0	0	0	0	0	85	93	0
15:00	445	0	0	0	0	0	0	0	0	87	93	0
15:05	491	0	0	0	0	0	0	0	0	91	107	4
15:10	488	0	0	0	0	0	0	0	0	95	120	22
15:15	3	2	0	0	0	0	0	0	0			136
TOTAL	36117	10	0	0	0	0	1	0	0			224

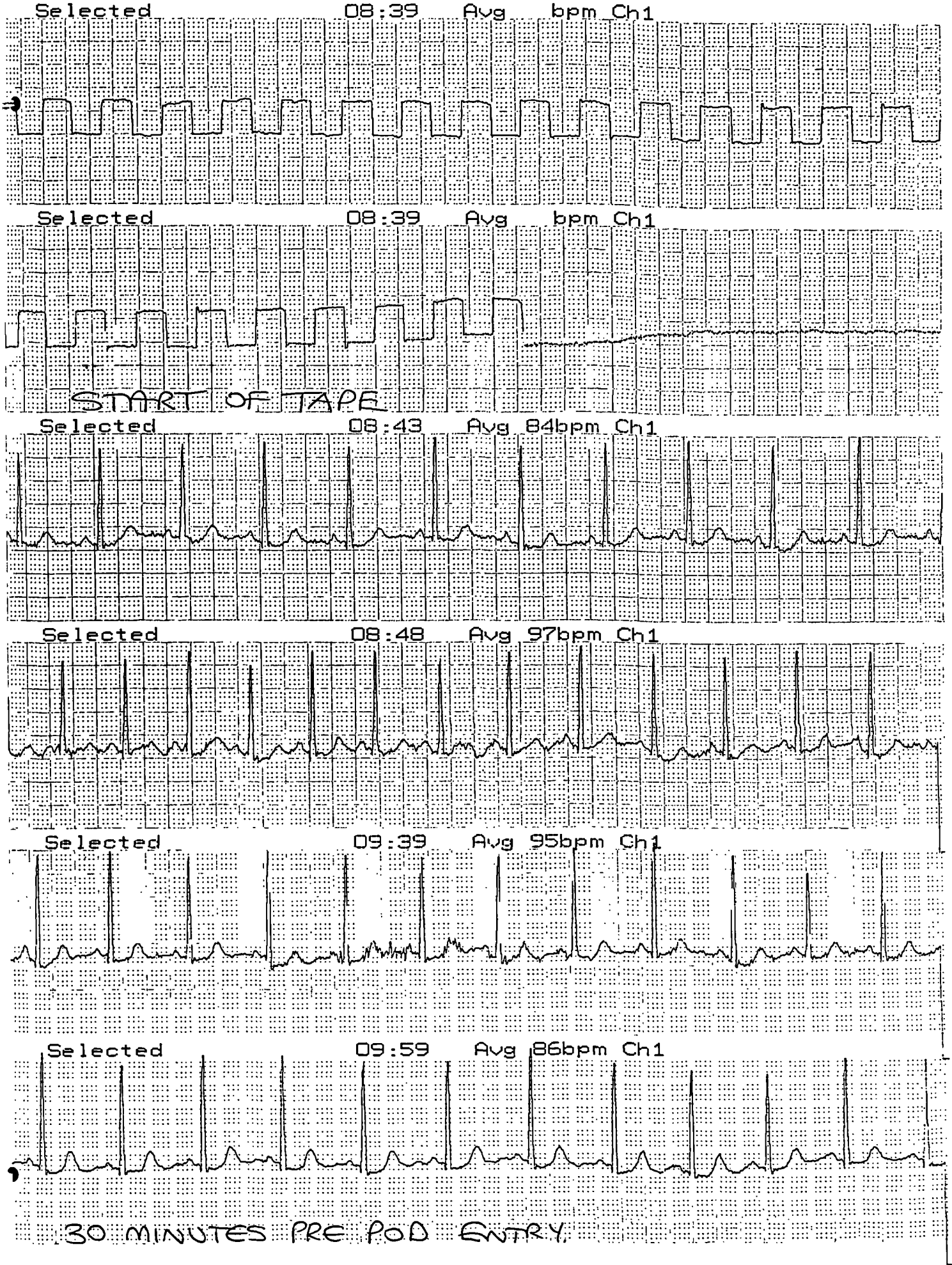
v16.23

THRESHOLDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.

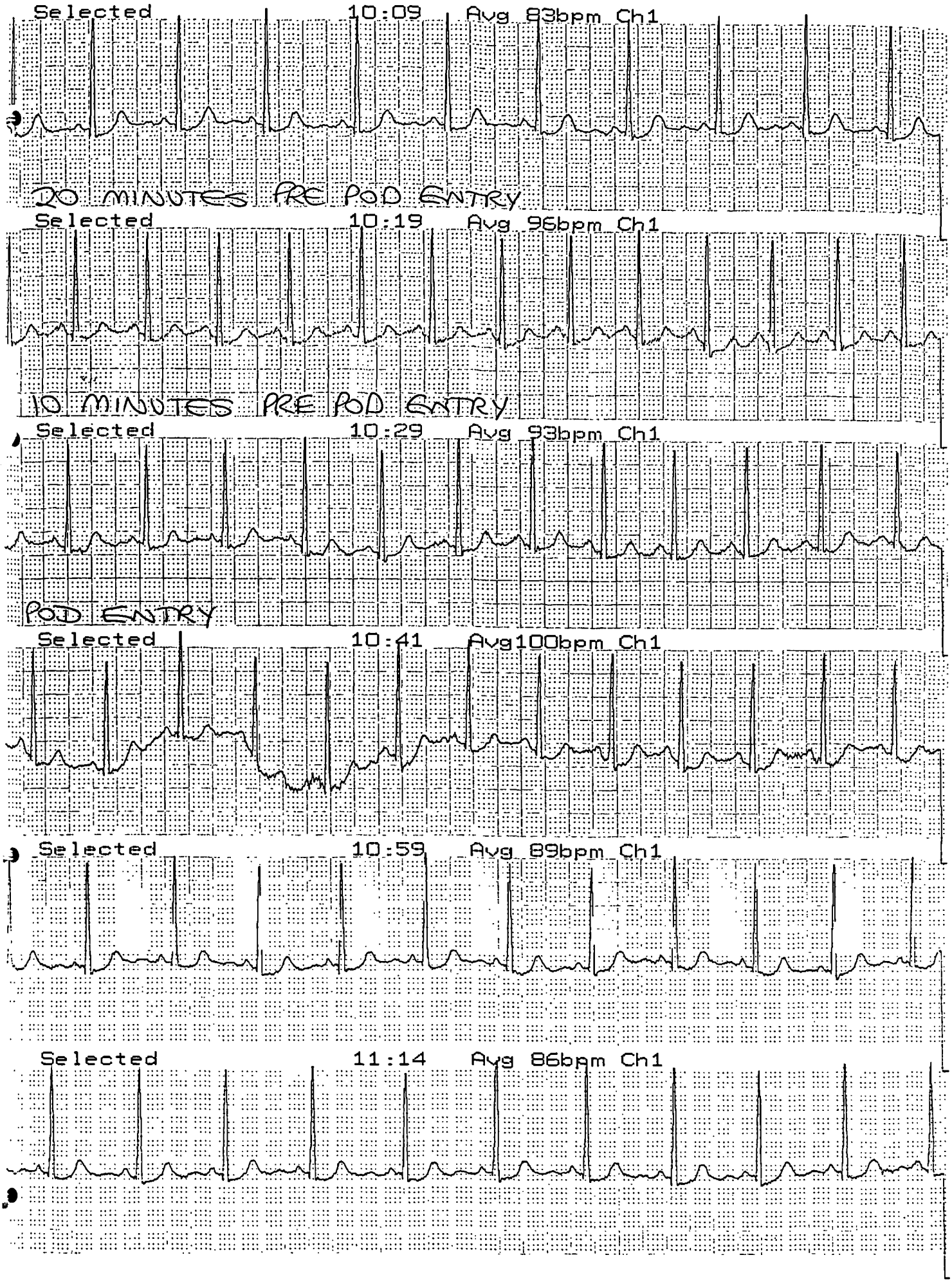
CRITERIA: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.



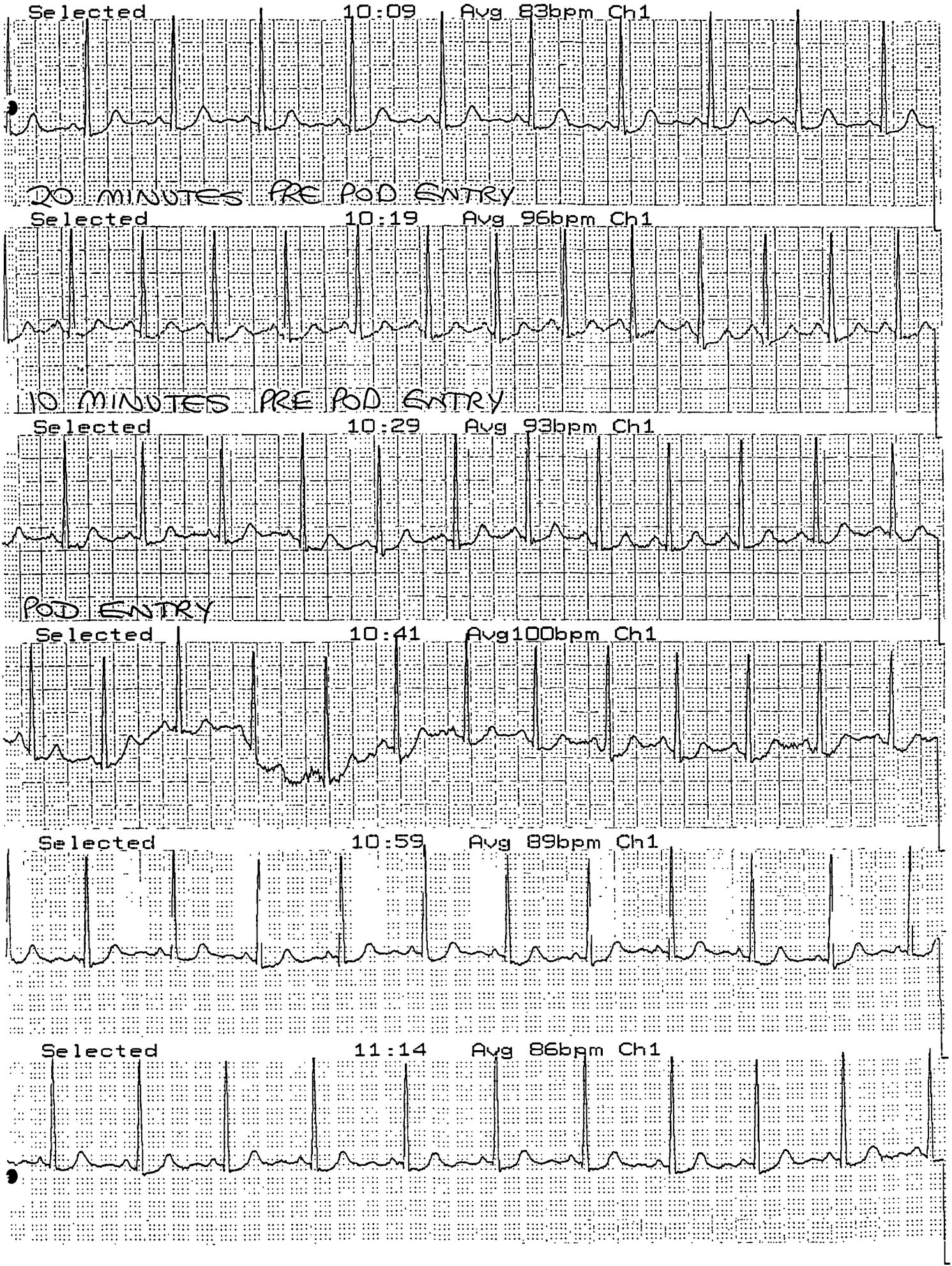
EDGWARE GENERAL HOSPITAL CARDIOLOGY



EDGWARE GENERAL HOSPITAL CARDIOLOGY



EDGWARE GENERAL HOSPITAL CARDIOLOGY



P10/009/RYN

EDGWARE GENERAL HOSPITAL CARDIOLOGY



P10/009/RYN

EDGWARE GENERAL HOSPITAL CARDIOLOGY

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

PATIENT

Identification:-

Name:- PARTICIPANT ID

Address:- POD TAPE.

Age:-

Sex:-

PHYSICIAN

Department:-

Name:-

Address:-

Recording date:- 7/7/95

Analysis date:- 6/1/96.

Technical Details:

Recorder S/N:-

Clinical Details:

Signed:-

Date:-

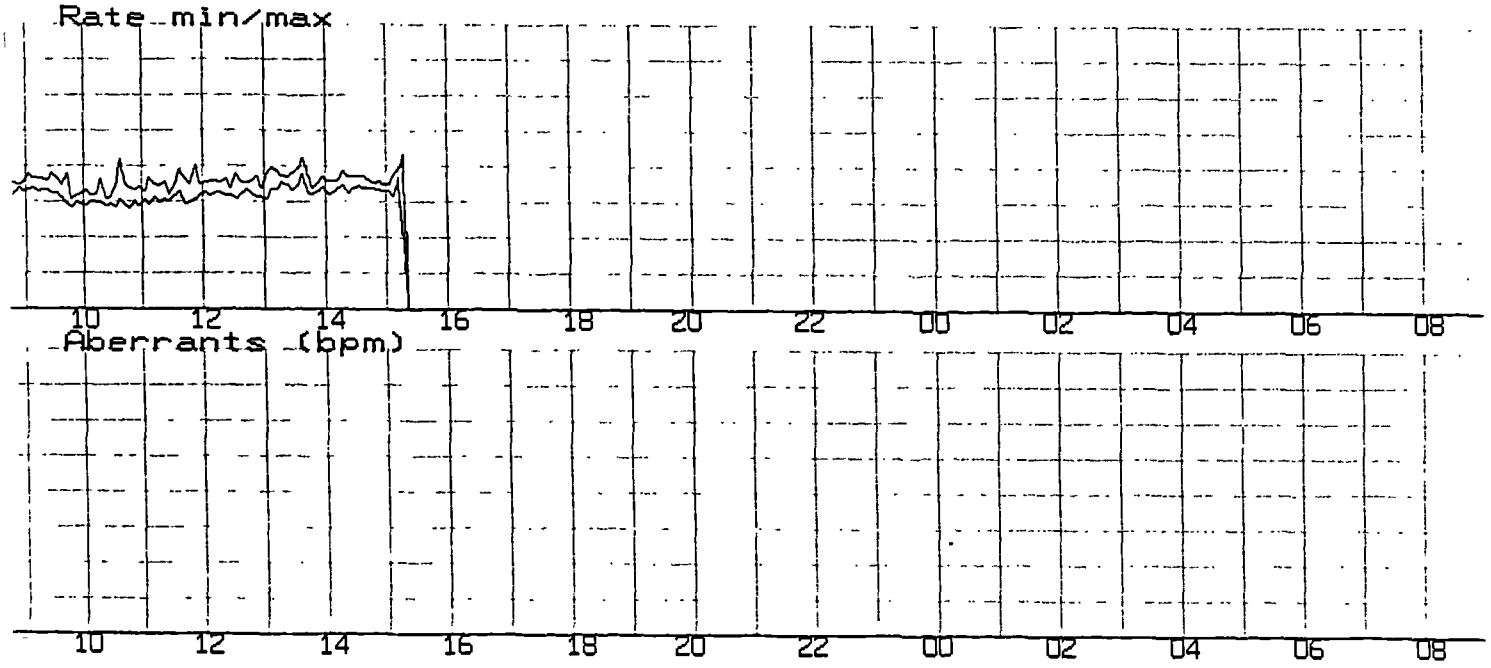
EDGWARE GENERAL HOSPITAL CARDIOLOGY

QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
0	0	0	0	0	0	0	0	0	71	77	0
345	0	0	0	0	0	0	0	0	73	153	29
650	0	0	0	0	0	0	0	0	81	88	13
419	0	0	0	0	0	0	0	0	84	87	2
409	0	0	0	0	0	0	0	0	82	88	6
430	0	0	0	0	0	0	0	0	83	94	1
429	0	0	0	0	0	0	0	0	84	91	0
434	0	0	0	0	0	0	0	0	82	91	0
419	0	0	0	0	0	0	0	0	83	91	3
419	0	0	0	0	0	0	0	0	83	90	6
425	0	0	0	0	0	0	0	0	81	95	2
404	0	0	0	0	0	0	0	0	81	91	5
413	0	0	0	0	0	0	0	0	78	87	2
403	0	0	0	0	0	0	0	0	73	94	3
370	0	0	0	0	0	0	0	0	71	77	0
383	0	0	0	0	0	0	0	0	74	79	0
387	0	0	0	0	0	0	0	0	73	80	0
380	0	0	0	0	0	0	0	0	72	82	0
384	0	0	0	0	0	0	0	0	74	79	0
382	0	0	0	0	0	0	0	0	74	80	0
368	0	0	0	0	0	0	0	0	74	90	4
376	0	0	0	0	0	0	0	0	72	77	0
372	0	0	0	0	0	0	0	0	73	78	0
377	0	0	0	0	0	0	0	0	71	86	6
401	0	0	0	0	0	0	0	0	76	104	16
382	0	0	0	0	0	0	0	0	72	87	0
379	0	0	0	0	0	0	0	0	70	84	0
385	0	0	0	0	0	0	0	0	75	83	1
392	0	0	0	0	0	0	0	0	72	85	2
393	0	0	0	0	0	0	0	0	76	82	2
393	0	0	0	0	0	0	0	0	73	91	12
407	0	0	0	0	0	0	0	0	78	87	3
397	0	0	0	0	0	0	0	0	74	86	1
402	0	0	0	0	0	0	0	0	76	88	0
388	0	0	0	0	0	0	0	0	75	80	3
405	0	0	0	0	0	0	0	0	79	87	6
429	0	0	0	0	0	0	0	0	82	97	3
420	0	0	0	0	0	0	0	0	73	90	0
381	0	0	0	0	0	0	0	0	74	87	6
430	0	0	0	0	0	0	0	0	76	99	0
413	0	0	0	0	0	0	0	0	79	87	0
419	0	0	0	0	0	0	0	0	81	88	0
402	0	0	0	0	0	0	0	0	79	89	7
423	0	0	0	0	0	0	0	0	81	89	0
412	0	0	0	0	0	0	0	0	81	88	0
410	0	0	0	0	0	0	0	0	79	90	5
416	0	0	0	0	0	0	0	0	79	84	0
421	0	0	0	0	0	0	0	0	77	94	1
409	0	0	0	0	0	0	0	0	80	89	1
424	0	0	0	0	0	0	0	0	83	88	1
419	0	0	0	0	0	0	0	0	81	89	0
402	0	0	0	0	0	0	0	0	78	92	8
414	0	0	0	0	0	0	0	0	78	84	0
426	0	0	0	0	0	0	0	0	77	95	1
448	0	0	0	0	0	0	0	0	83	98	0
442	0	0	0	0	0	0	0	0	83	96	5
436	0	0	0	0	0	0	0	0	88	93	0
450	0	0	0	0	0	0	0	0	87	92	0
443	0	0	0	0	0	0	0	0	83	95	1
461	0	0	0	0	0	0	0	0	86	98	0
494	0	0	0	0	0	0	0	0	94	105	0
435	0	0	0	0	0	0	0	0	81	93	0
403	0	0	0	0	0	0	0	0	80	84	0
429	0	0	0	0	0	0	0	0	82	88	0
438	0	0	0	0	0	0	0	0	85	92	0

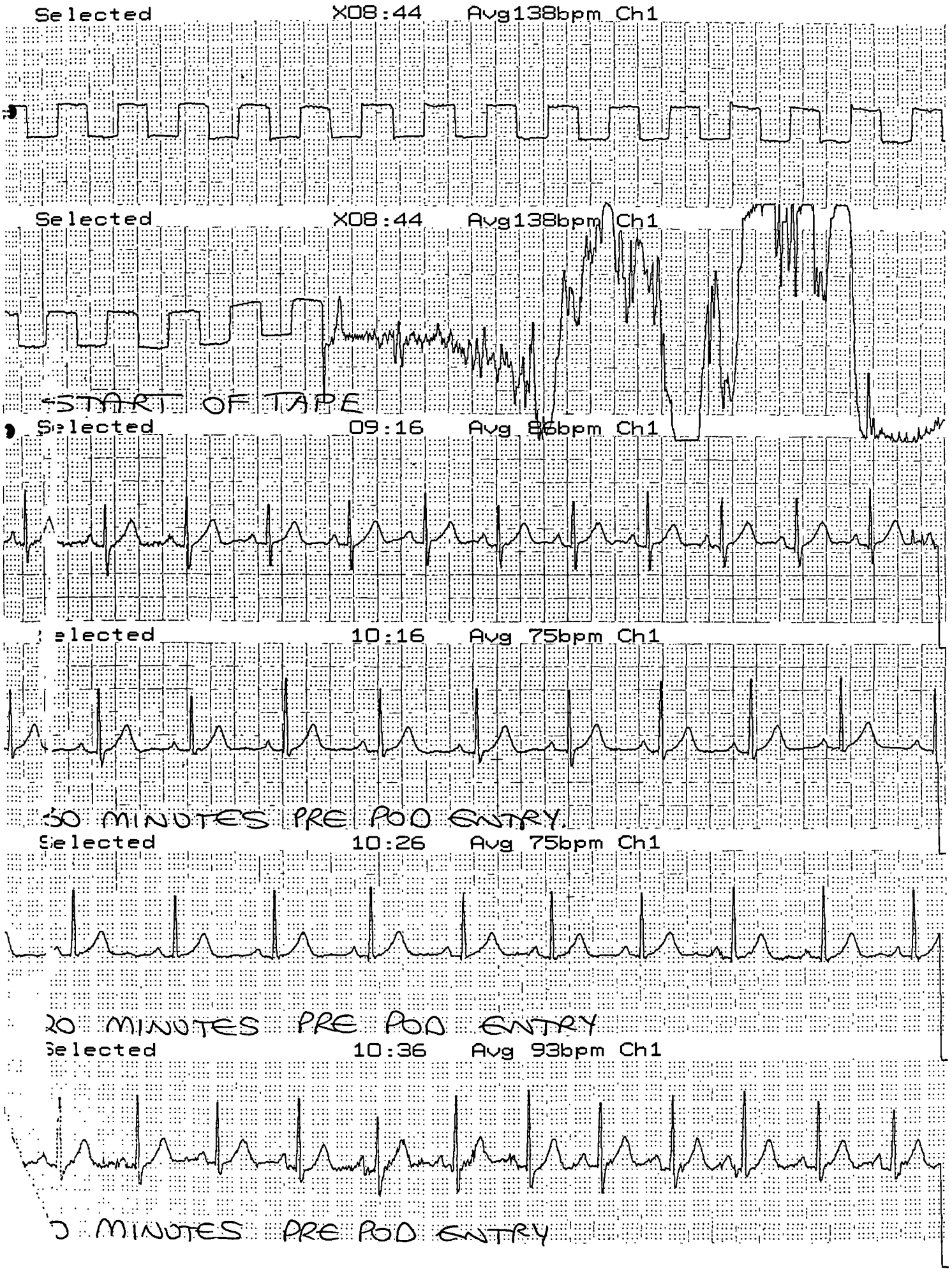
EDGWARE GENERAL HOSPITAL CARDIOLOGY

403	0	0	0	0	0	0	0	0	80	89	5
428	0	0	0	0	0	0	0	0	81	89	0
422	0	0	0	0	0	0	0	0	84	90	0
432	0	0	0	0	0	0	0	0	86	96	7
447	0	0	0	0	0	0	0	0	81	93	0
445	0	0	0	0	0	0	0	0	84	93	0
447	0	0	0	0	0	0	0	0	86	93	2
431	0	0	0	0	0	0	0	0	84	93	1
433	0	0	0	0	0	0	0	0	84	90	0
423	0	0	0	0	0	0	0	0	84	88	0
426	0	0	0	0	0	0	0	0	83	89	0
426	0	0	0	0	0	0	0	0	82	87	0
410	0	0	0	0	0	0	0	0	82	87	1
425	0	0	0	0	0	0	0	0	79	93	1
467	0	0	0	0	0	0	0	0	92	99	1
364	0	0	0	0	0	0	0	0	52	108	77
1	0	0	0	0	0	0	0	0			11
33281	0	0	0	0	0	0	0	0			273

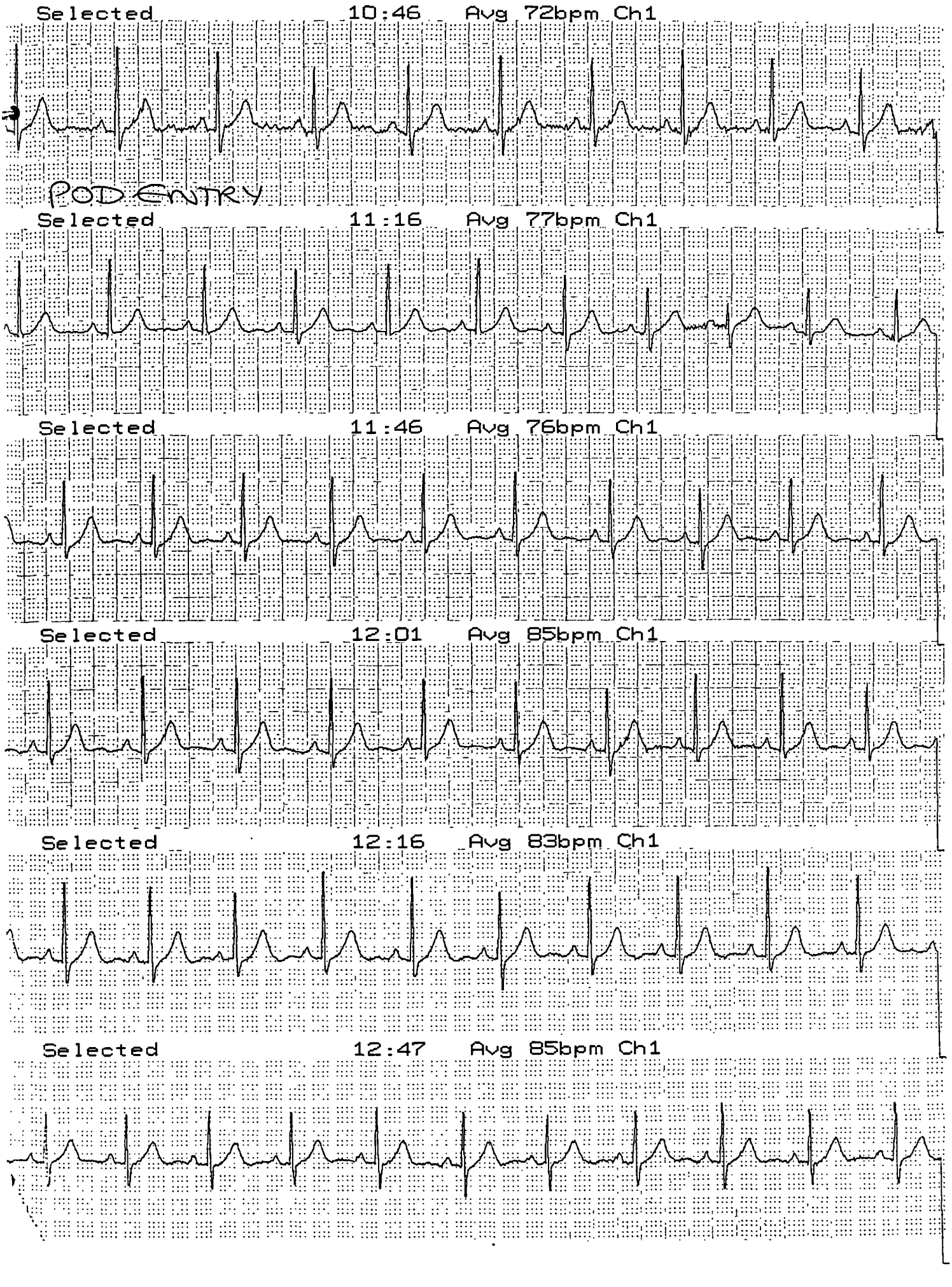
)LDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
[A: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.



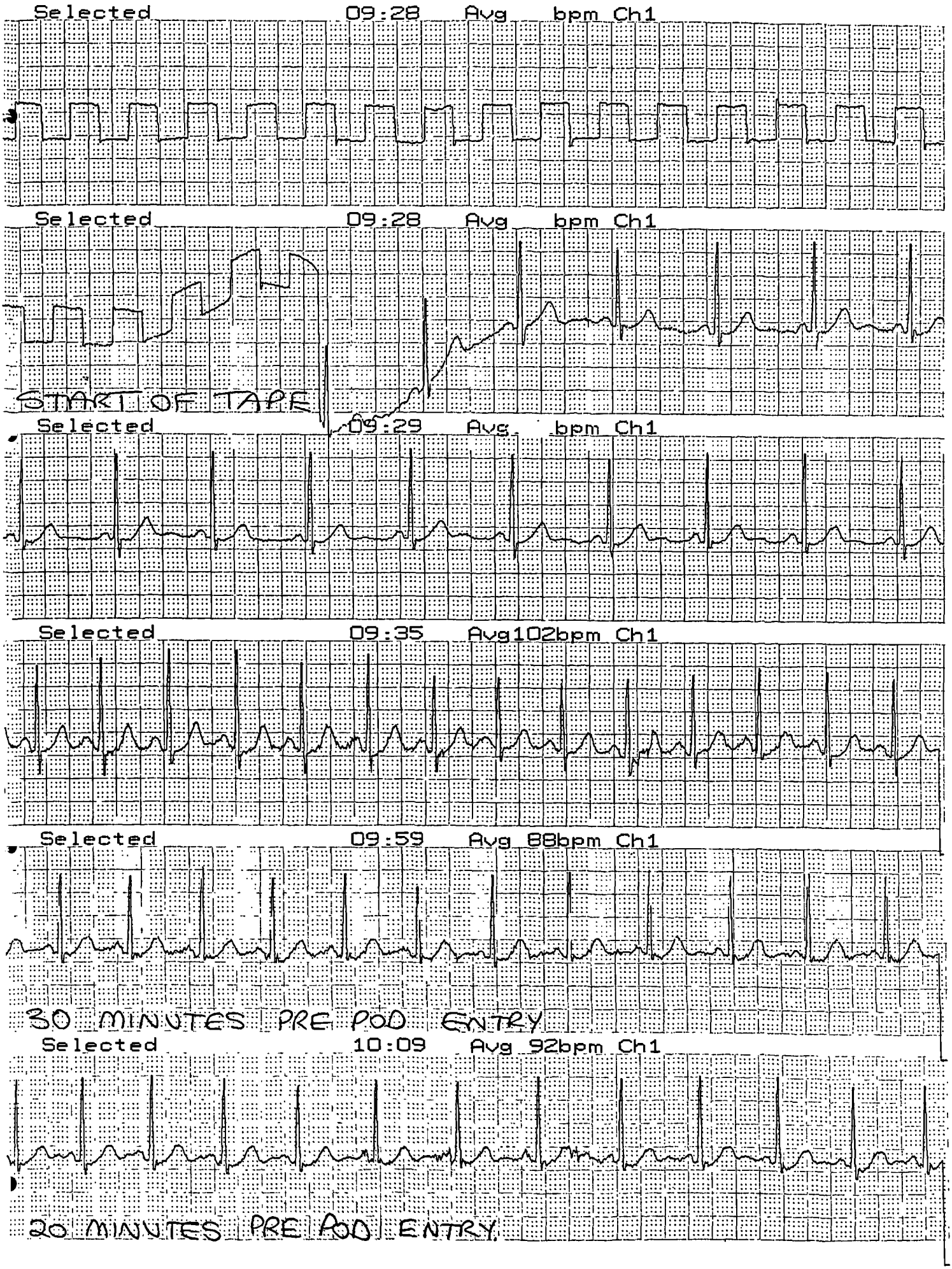
EDGWARE GENERAL HOSPITAL CARDIOLOGY



EDGWARE GENERAL HOSPITAL CARDIOLOGY

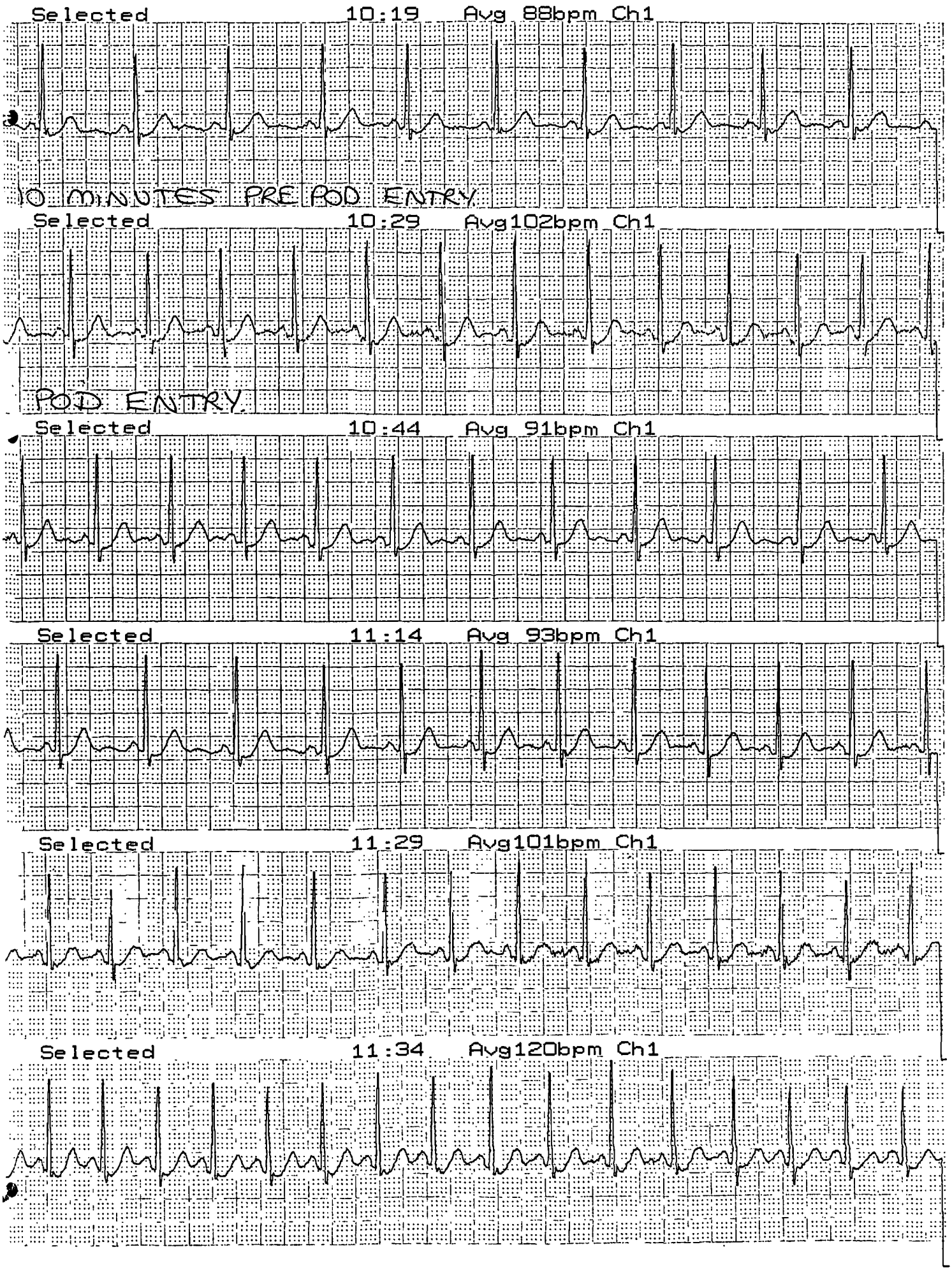


EDGWARE GENERAL HOSPITAL CARDIOLOGY

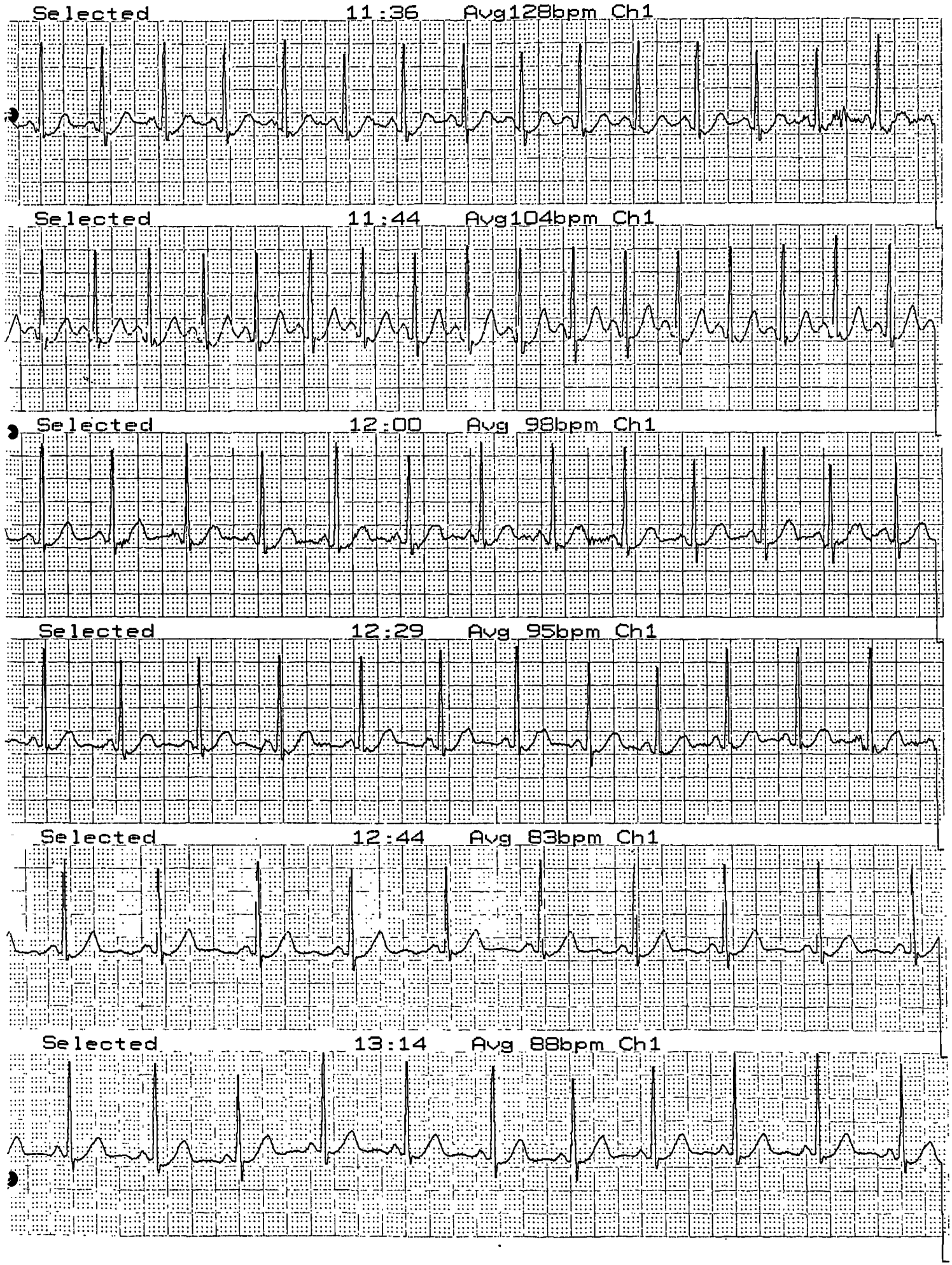


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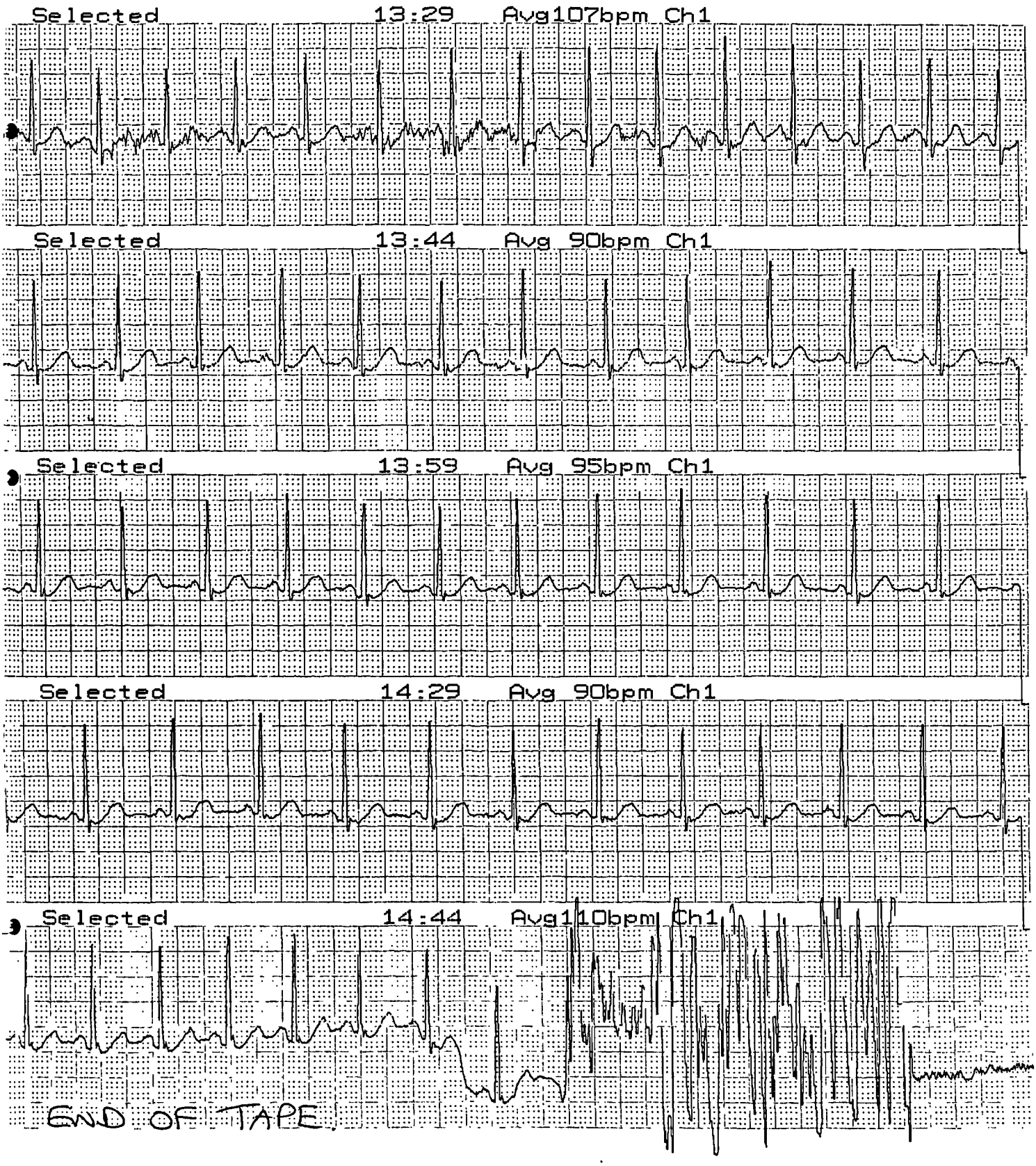


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Reynolds MEDICAL

EDGWARE GENERAL HOSPITAL CARDIOLOGY



Reynolds MEDICAL

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

:ENT

dentification:-

ame:- PARTICIPANT A

ress:- CARNIVAL TAPE

ge:-

ex:-

PHYSICIAN

Department:-

Name:-

Address:-

Recording date:-

Analysis date:- 6/1/96

echnical Details:

ecorder S/N:-

linical Details:

Signed:-

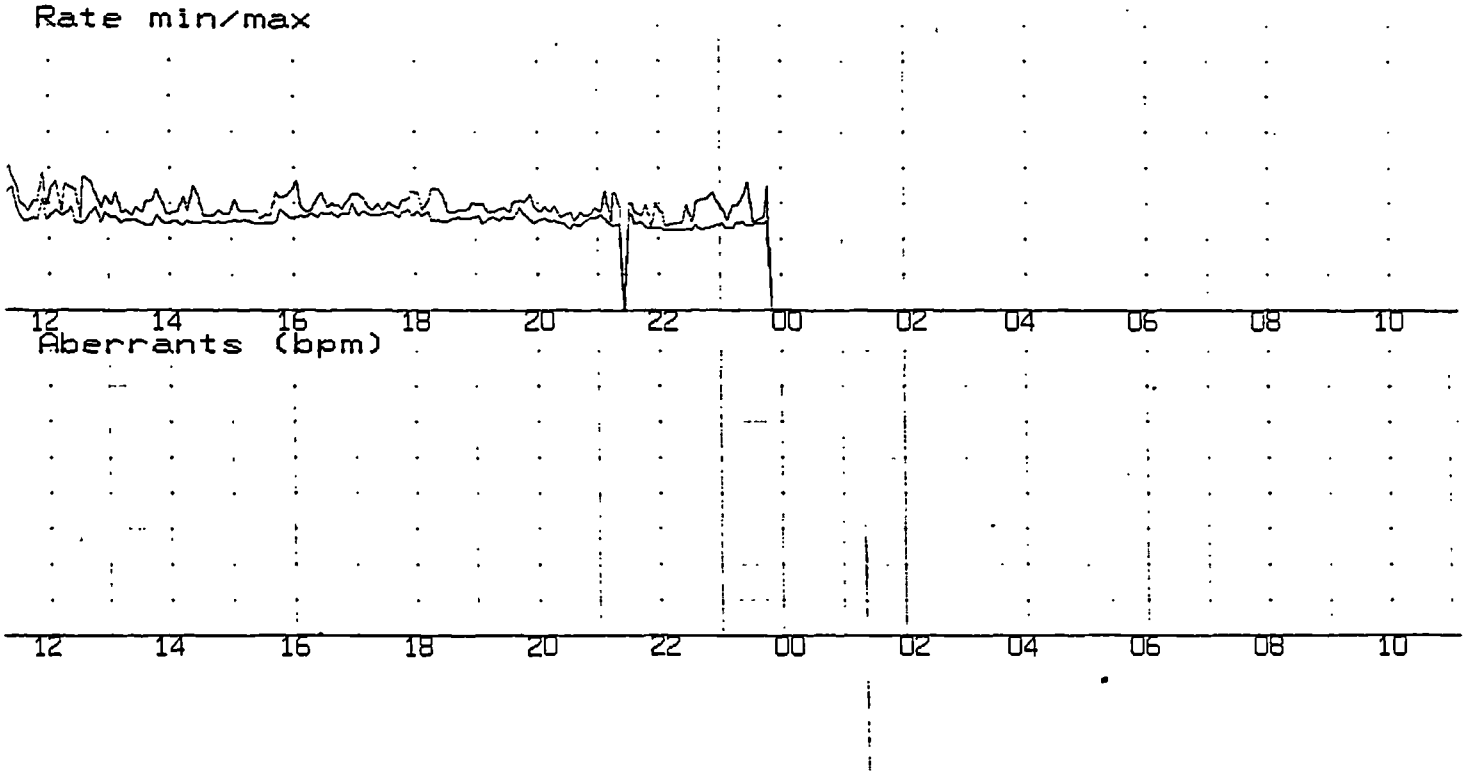
Date:-

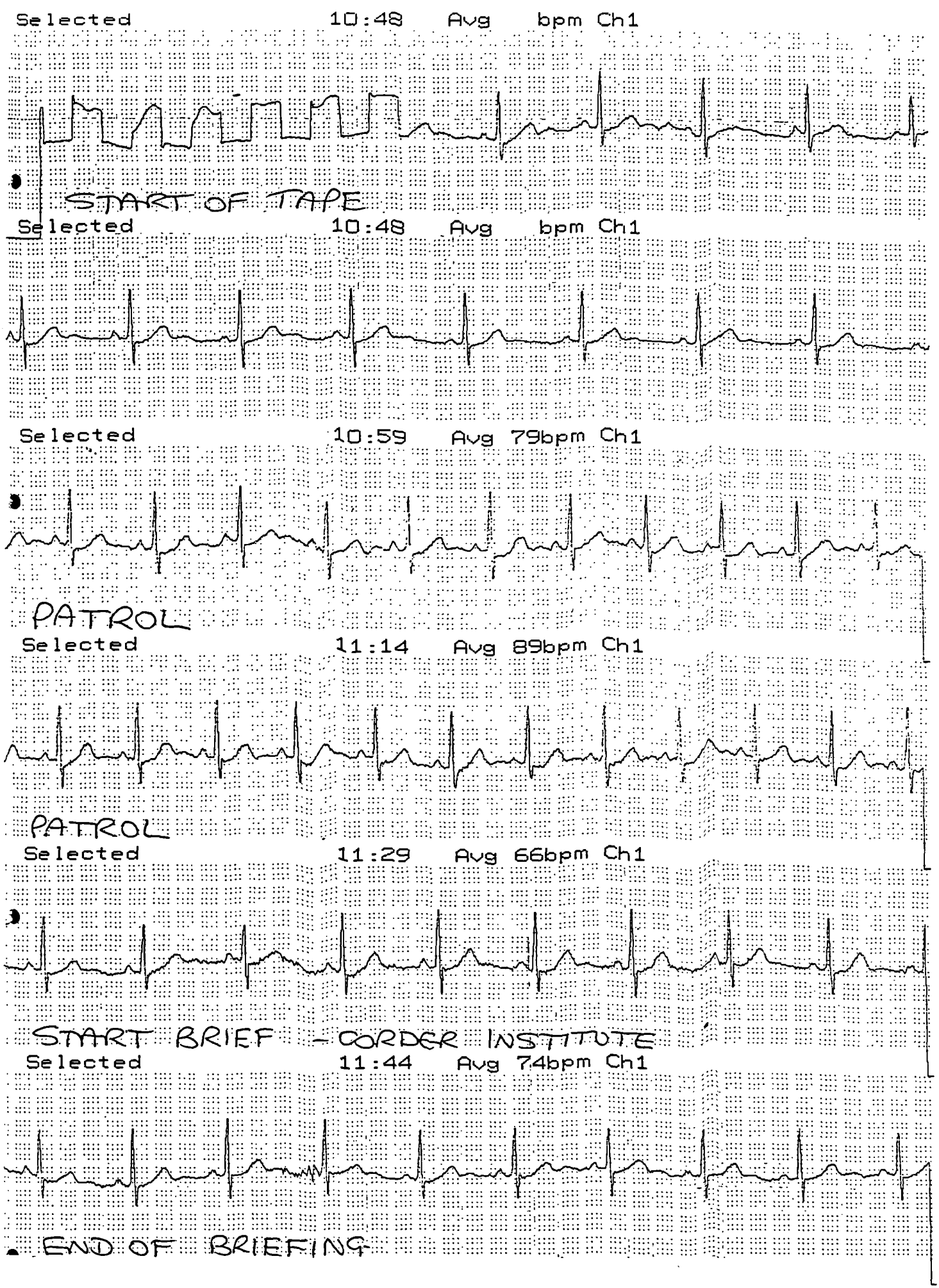
QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
57	1	0	0	0	0	0	0	0	51	96	10
384	0	0	0	0	0	0	0	0	68	88	22
402	0	0	0	0	0	0	0	0	76	90	4
399	0	0	0	0	0	0	0	0	74	90	0
452	0	0	0	0	0	0	0	0	80	95	1
443	0	0	0	0	0	0	0	0	84	101	0
444	0	0	0	0	0	0	0	0	86	94	0
385	0	0	0	0	0	0	0	0	72	87	3
340	0	0	0	0	0	0	0	0	66	75	0
330	0	0	0	0	0	0	0	0	63	73	0
333	0	0	0	0	0	0	0	0	63	70	0
330	0	0	0	0	0	0	0	0	65	77	20
361	0	0	0	0	0	0	0	0	64	77	1
403	0	0	0	0	0	1	0	0	78	96	13
318	0	0	0	0	0	1	0	0	64	74	2
337	0	0	0	0	0	0	0	0	67	87	34
383	0	0	0	0	0	0	0	0	70	90	4
341	0	0	0	0	0	0	0	0	66	70	0
388	0	0	0	0	0	0	0	0	67	88	0
399	0	0	0	0	0	0	0	0	72	86	0
337	0	0	0	0	0	0	0	0	62	84	0
314	0	0	0	0	0	0	0	0	61	64	0
377	0	0	0	0	0	0	0	0	62	93	6
353	0	0	0	0	0	0	0	0	68	90	7
369	0	0	0	0	0	0	0	0	72	82	0
326	0	0	0	0	0	0	0	0	62	72	0
364	0	0	0	0	0	0	0	0	68	80	5
328	0	0	0	0	0	0	0	0	65	74	0
347	0	0	0	0	0	0	0	0	65	82	0
323	0	0	0	0	0	0	0	0	61	68	0
322	0	0	0	0	0	0	0	0	63	70	0
323	0	0	0	0	0	0	0	0	63	66	1
324	0	0	0	0	0	0	0	0	63	72	0
316	0	0	0	0	0	0	0	0	61	69	0
316	0	0	0	0	0	0	0	0	59	76	2
335	0	0	0	0	0	0	0	0	59	77	1
366	0	0	0	0	0	0	0	0	66	84	0
337	0	0	0	0	0	0	0	0	62	75	0
311	0	0	0	0	0	0	0	0	60	67	0
322	0	0	0	0	0	0	0	0	62	68	0
329	0	0	0	0	0	0	0	0	62	69	0
318	0	0	0	0	0	0	0	0	59	79	4
311	0	0	0	0	0	0	0	0	62	70	1
361	0	0	0	0	0	0	0	0	61	87	0
318	0	0	0	0	0	1	0	0	61	81	0
322	0	0	0	0	0	0	0	0	62	66	0
317	0	0	0	0	0	0	0	0	62	66	0
316	0	0	0	0	0	0	0	0	61	66	0
326	0	0	0	0	0	1	0	0	62	70	2
316	0	0	0	0	0	0	0	0	61	67	0
319	0	0	0	0	0	0	0	0	62	67	0
340	0	0	0	0	0	0	0	0	63	77	0
322	0	0	0	0	0	0	0	0	62	70	0
324	0	0	0	0	0	0	0	0	63	69	0
331	0	0	0	0	0	0	0	0	62	69	0
310	0	0	0	0	0	0	0	0	60	70	0
312	0	0	0	0	0	0	0	0	60	64	0
319	0	0	0	0	0	0	0	0	61	67	0
314	0	0	0	0	0	0	0	0	61	66	0
348	0	0	0	0	0	0	0	0	62	82	2
359	0	0	0	0	0	0	0	0	70	79	0
364	0	0	0	0	0	0	0	0	66	80	0
355	0	0	0	0	0	0	0	0	64	83	16
359	0	0	0	0	0	1	0	0	65	90	1
345	0	0	0	0	0	0	0	0	66	72	0

336	0	0	0	0	0	0	0	0	67	70	3
340	1	0	0	0	0	1	0	0	65	78	0
362	0	0	0	0	0	1	0	0	68	82	1
347	0	0	0	0	0	0	0	0	67	72	0
350	0	0	0	0	0	0	0	0	68	74	1
338	0	0	0	0	0	0	0	0	65	73	0
341	0	0	0	0	0	0	0	0	67	71	0
364	0	0	0	0	0	0	0	0	67	77	0
383	0	0	0	0	0	0	0	0	74	81	0
349	0	0	0	0	0	0	0	0	66	81	1
360	0	0	0	0	0	0	0	0	69	79	0
349	0	0	0	0	0	0	0	0	67	72	0
336	0	0	0	0	0	0	0	0	66	70	0
351	0	0	0	0	0	0	0	0	66	74	0
343	0	0	0	0	0	0	0	0	67	70	0
353	0	0	0	0	0	0	0	0	68	75	0
352	0	0	0	0	0	0	0	0	68	73	0
336	0	0	0	0	0	0	0	0	65	71	2
370	0	0	0	0	0	0	0	0	68	77	0
371	0	0	0	0	0	0	0	0	70	78	0
367	0	0	0	0	0	0	0	0	66	83	1
362	0	0	0	0	0	0	0	0	69	82	2
343	0	0	0	0	0	0	0	0	66	71	0
452	0	0	0	0	0	0	0	0	68	76	11
332	0	0	0	0	0	0	0	0	62	85	0
362	0	0	0	0	0	1	0	0	63	85	0
346	0	0	0	0	0	0	0	0	62	81	1
326	0	0	0	0	0	0	0	0	62	69	0
332	0	0	0	0	0	0	0	0	64	68	0
334	0	0	0	0	0	0	0	0	65	70	0
329	0	0	0	0	0	0	0	0	64	70	0
330	0	0	0	0	0	0	0	0	64	71	0
344	0	0	0	0	0	0	0	0	65	75	0
343	0	0	0	0	0	0	0	0	66	74	1
329	0	0	0	0	0	0	0	0	61	74	0
330	0	0	0	0	0	0	0	0	64	68	0
333	0	0	0	0	0	0	0	0	65	69	0
337	0	0	0	0	0	0	0	0	63	71	0
333	0	0	0	0	0	0	0	0	65	72	0
329	0	0	0	0	0	0	0	0	64	69	0
352	0	0	0	0	0	0	0	0	65	76	0
374	0	0	0	0	0	0	0	0	72	77	0
352	0	0	0	0	0	0	0	0	67	76	0
344	0	0	0	0	0	0	0	0	63	81	1
329	0	0	0	0	0	0	0	0	61	72	0
325	0	0	0	0	0	0	0	0	63	69	0
336	0	0	0	0	0	0	0	0	64	72	0
324	0	0	0	0	0	0	0	0	62	69	1
325	0	0	0	0	0	0	0	0	62	72	0
311	0	0	0	0	0	0	0	0	61	65	0
313	0	0	0	0	0	0	0	0	60	66	2
304	0	0	0	0	0	0	0	0	57	68	0
304	0	0	0	0	0	0	0	0	60	63	1
315	0	0	0	0	0	1	0	0	59	68	0
309	0	0	0	0	0	0	0	0	62	66	0
324	0	0	0	0	0	0	0	0	64	67	2
336	0	0	0	0	0	0	0	0	64	71	0
330	0	0	0	0	0	0	0	0	66	69	2
337	0	0	0	0	0	0	0	0	64	83	2
306	0	0	0	0	0	0	0	0	60	63	0
327	0	0	0	0	0	0	0	0	59	82	4
317	0	0	0	0	0	0	0	0	59	71	0
337	0	0	0	0	0	0	0	0			0
337	0	0	0	0	0	1	0	0	67	75	1
317	0	0	0	0	0	0	0	0	61	69	0
317	0	0	0	0	0	0	0	0	62	66	0
309	0	0	0	0	0	0	0	0	58	73	3
290	0	0	0	0	0	0	0	0	57	59	0

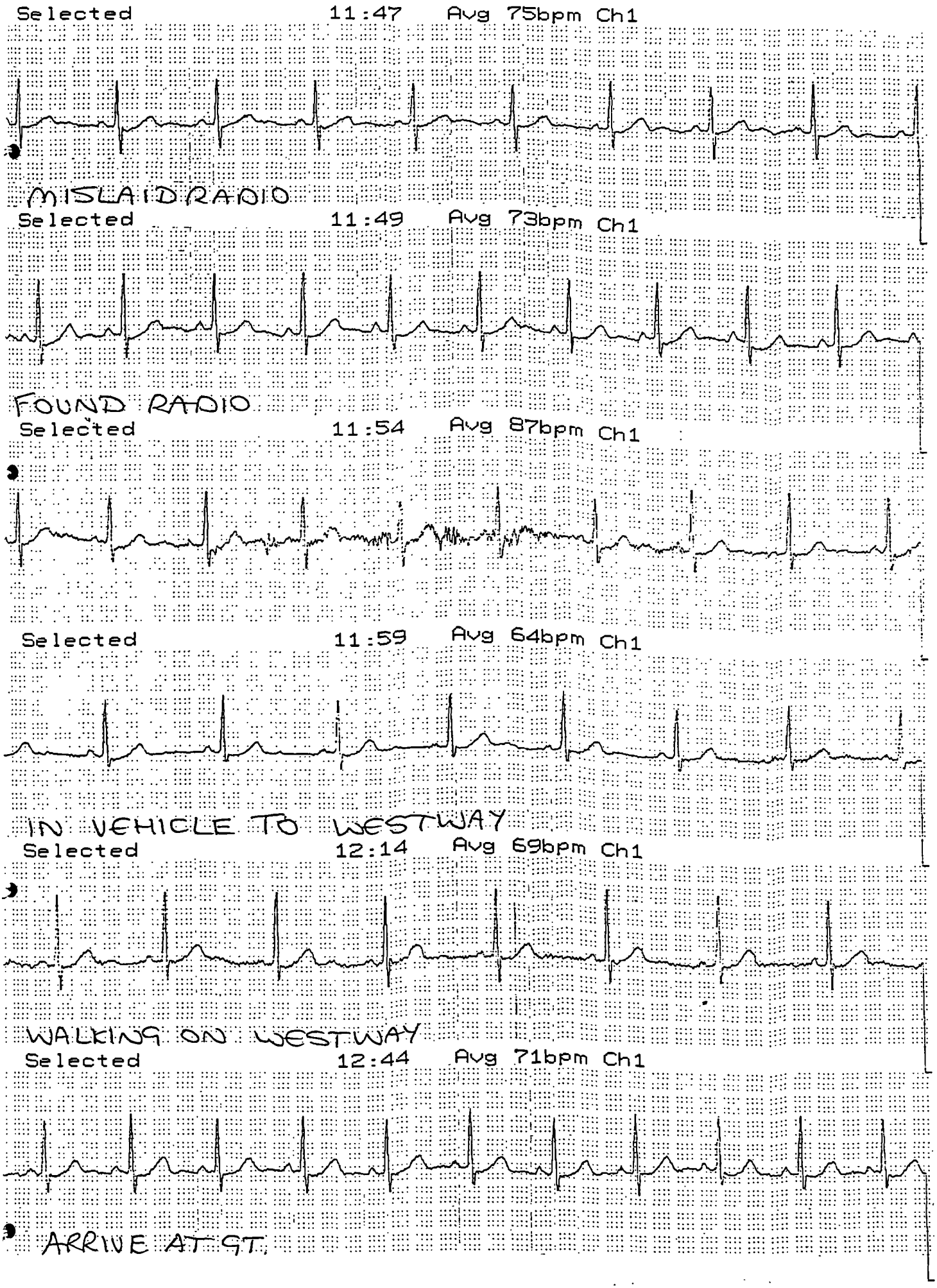
300	0	0	0	0	0	0	0	0	57	69	1
288	0	0	0	0	0	0	0	0	56	59	0
292	0	0	0	0	0	0	0	0	56	60	0
286	0	0	0	0	0	0	0	0	56	61	0
293	0	0	0	0	0	0	0	0	56	61	0
308	0	0	0	0	0	0	0	0	56	73	0
293	0	0	0	0	0	0	0	0	56	62	0
328	0	0	0	0	0	0	0	0	59	76	0
309	0	0	0	0	0	0	0	0	56	78	4
325	0	0	0	0	0	1	0	0	57	78	0
333	0	0	0	0	0	1	0	0	58	82	2
305	0	0	0	0	0	1	0	0	59	76	0
314	0	0	0	0	0	0	0	0	60	70	0
300	0	0	0	0	0	0	0	0	57	63	0
317	0	0	0	0	0	0	0	0	57	73	0
317	0	0	0	0	0	0	0	0	61	73	0
364	0	0	0	0	0	0	0	0	62	80	0
372	0	0	0	0	0	0	0	0	59	89	0
306	0	0	0	0	0	0	0	0	59	62	0
309	0	0	0	0	0	0	0	0	61	63	0
308	0	0	0	0	0	0	0	0	60	65	1
355	0	0	0	0	0	0	0	0	62	87	3
172	0	0	0	0	0	0	0	0			0
2966	2	0	0	0	0	13	0	0			216

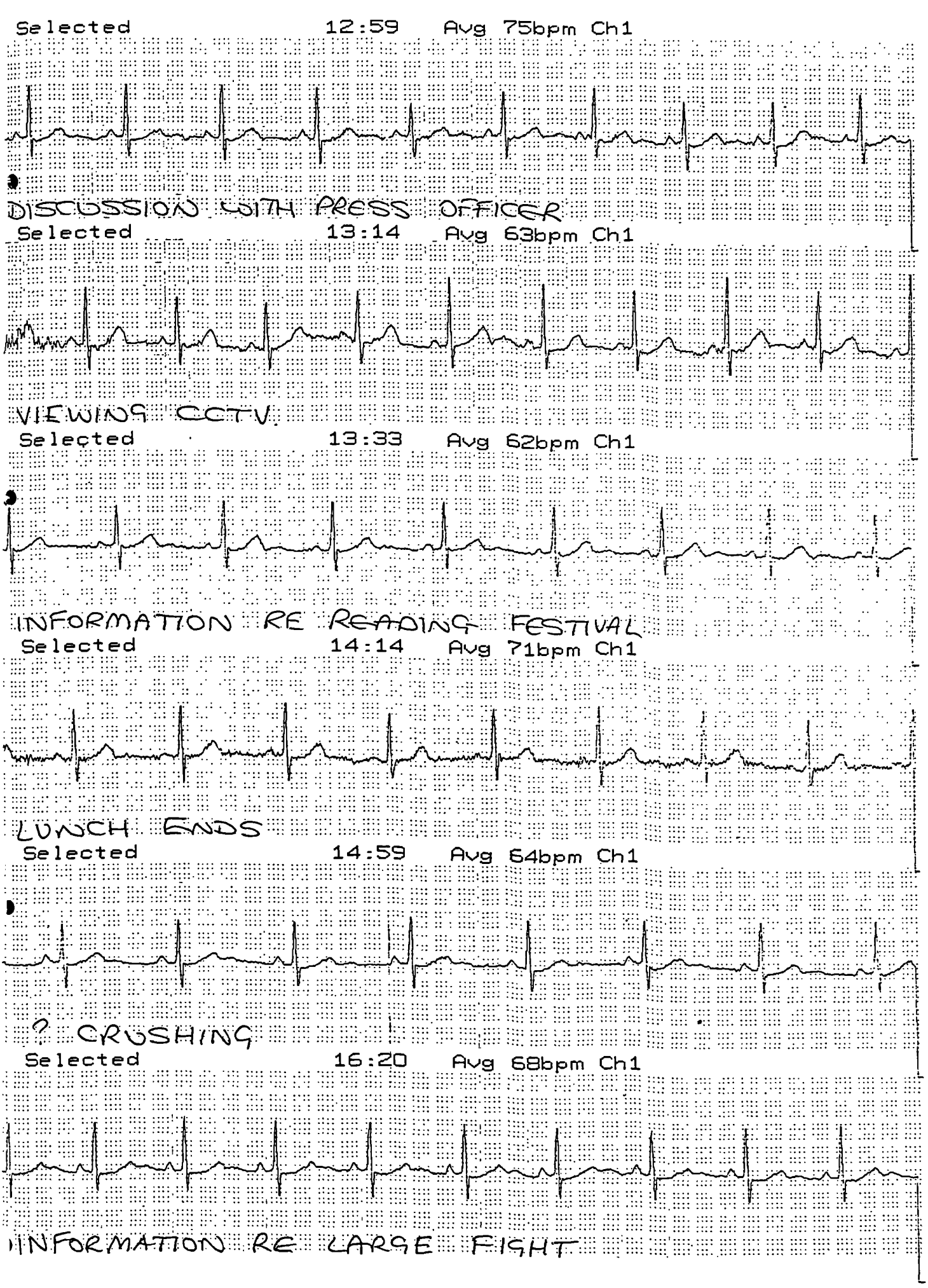
DS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.

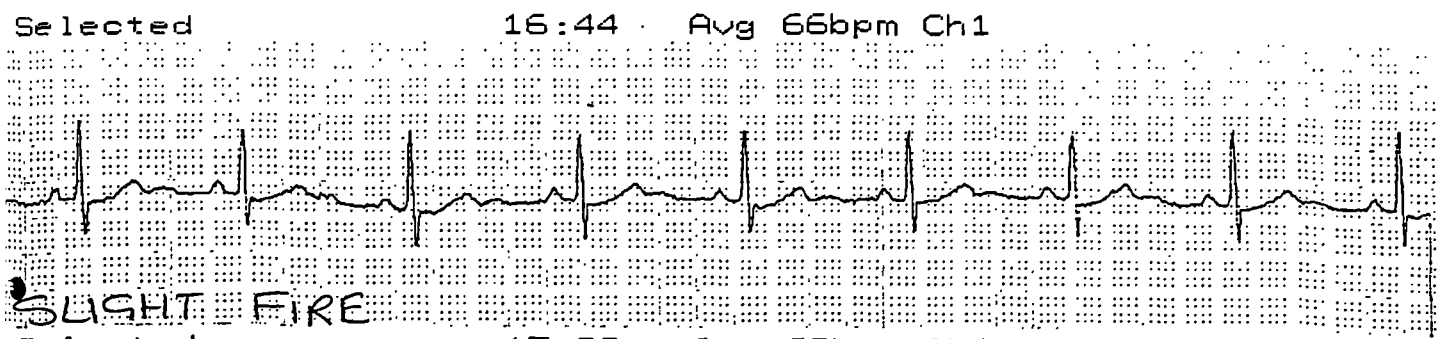



Selected 10:48 Avg bpm Ch1
START OF TAPE
Selected 10:48 Avg bpm Ch1
Selected 10:59 Avg 79bpm Ch1
PATROL
Selected 11:14 Avg 89bpm Ch1
PATROL
Selected 11:29 Avg 66bpm Ch1
START BRIEF - CORDER INSTITUTE
Selected 11:44 Avg 74bpm Ch1
END OF BRIEFING

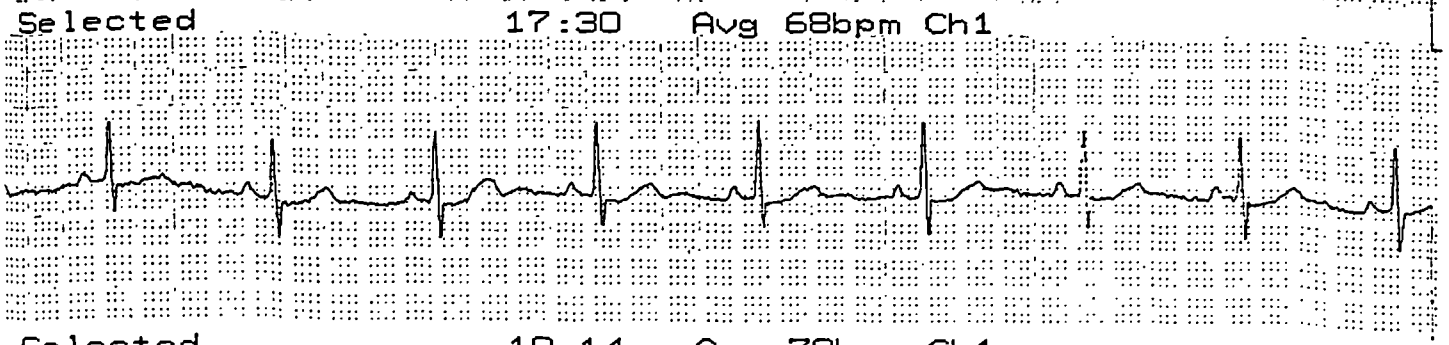
EDGWARE GENERAL HOSPITAL CARDIOLOGY

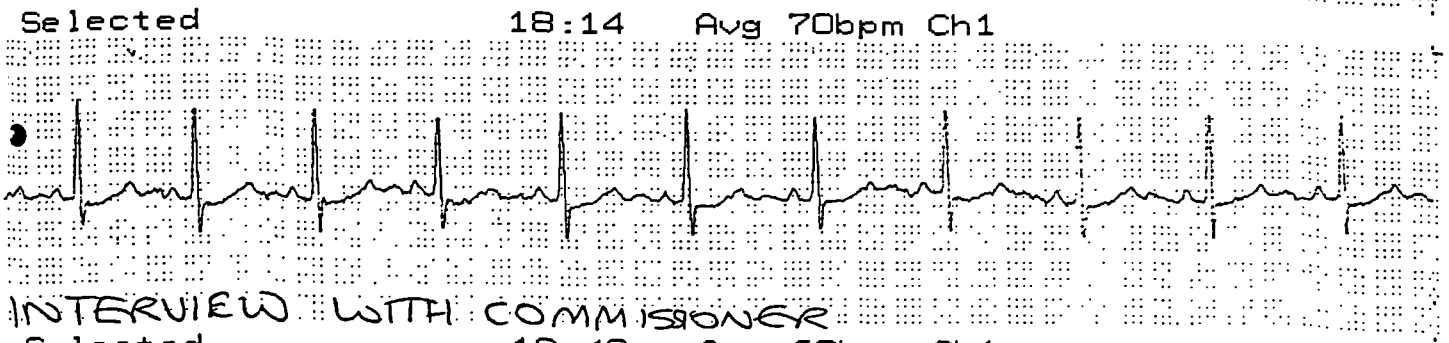



Selected 12:59 Avg 75bpm Ch1
DISCUSSION WITH PRESS OFFICER
Selected 13:14 Avg 63bpm Ch1
VIEWING CCTV
Selected 13:33 Avg 62bpm Ch1
INFORMATION RE READING FESTIVAL
Selected 14:14 Avg 71bpm Ch1
LUNCH ENDS
Selected 14:59 Avg 64bpm Ch1
? CRUSHING
Selected 16:20 Avg 68bpm Ch1
INFORMATION RE LARGE FIGHT

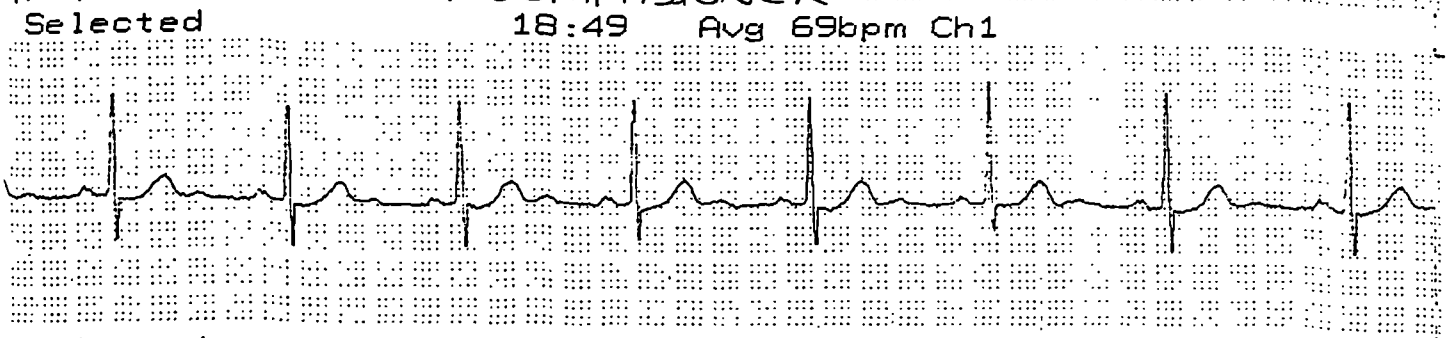


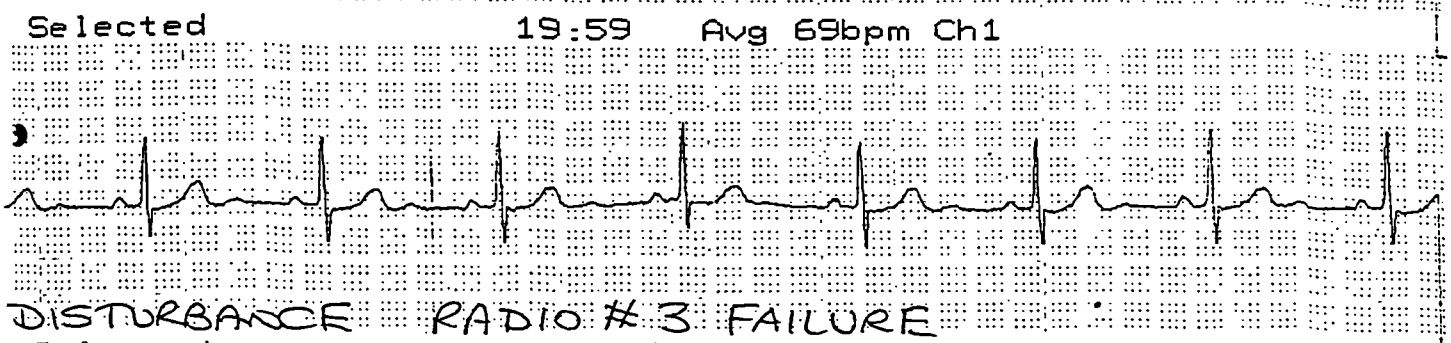
SLIGHT FIRE



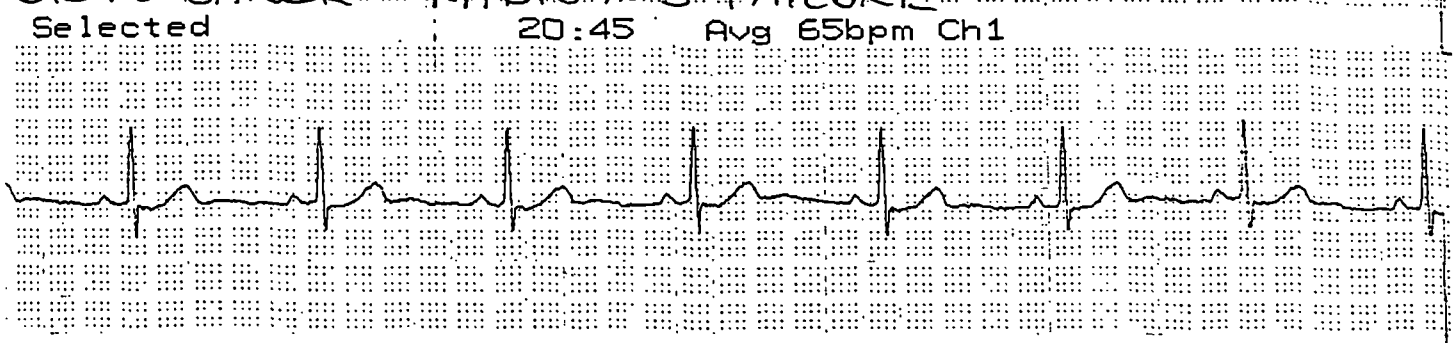


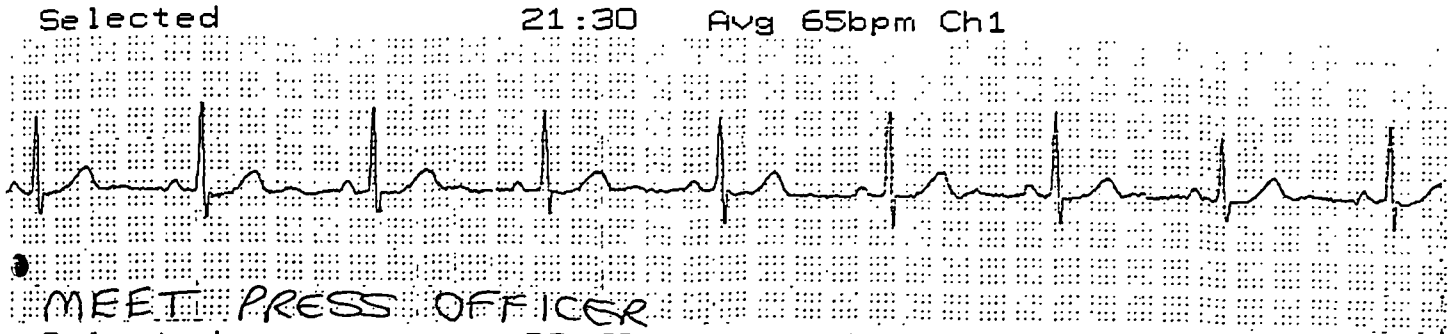
INTERVIEW WITH COMMISSIONER



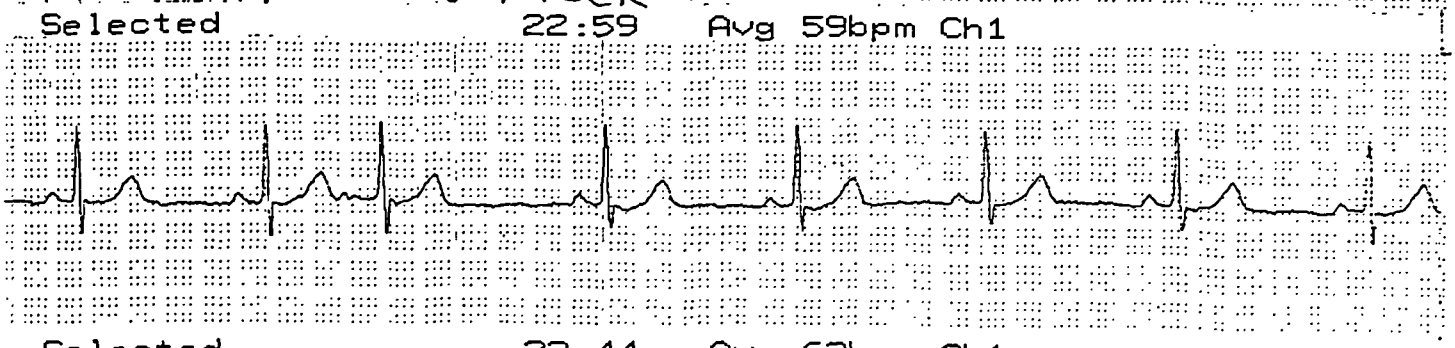


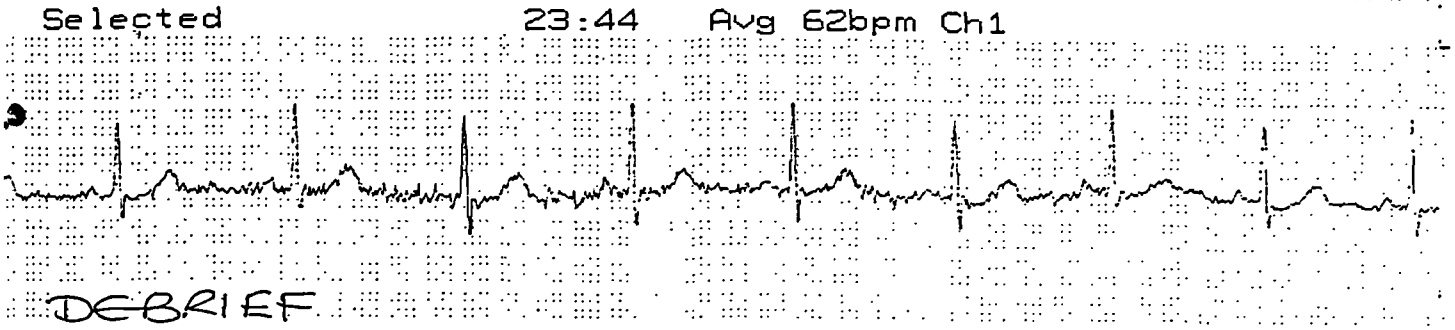
DISTURBANCE RADIO # 3 FAILURE



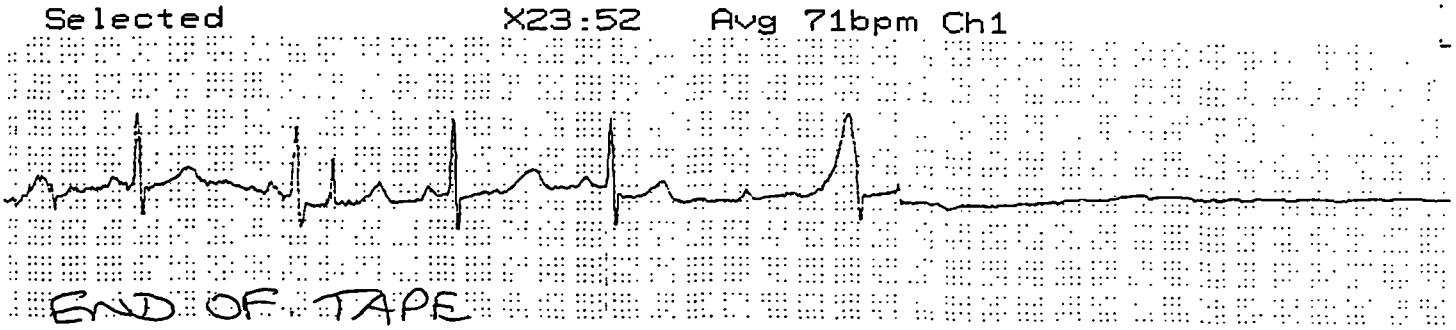


MEET PRESS OFFICER





DEBRIEF



END OF TAPE

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

IENT

dentification:-

ame:- PARTICIPANT B

ddress:- CARNIVAL TAPE

PHYSICIAN

Department:-

Name:-

Address:-

ge:-

ex:-

Recording date:-

Analysis date:- 6/1/96

echnical Details:

Recorder S/N:-

Clinical Details:

Signed:-

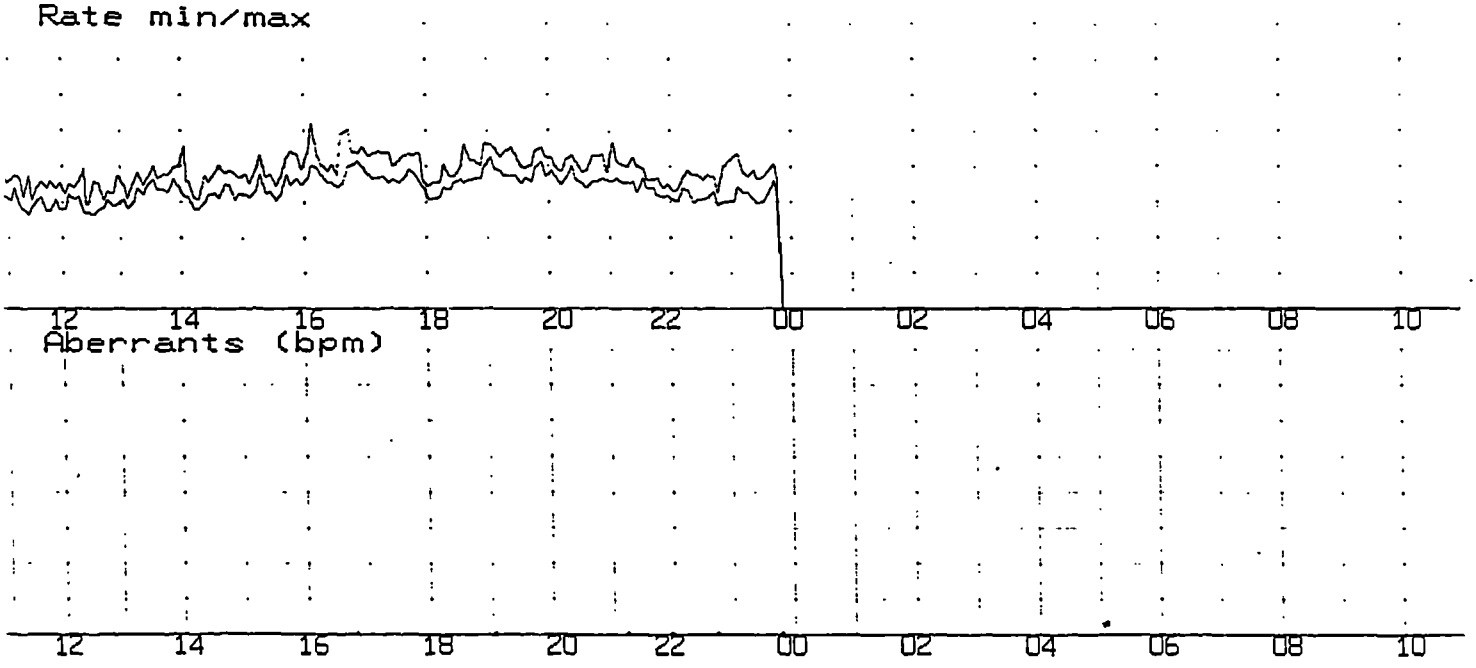
Date:-

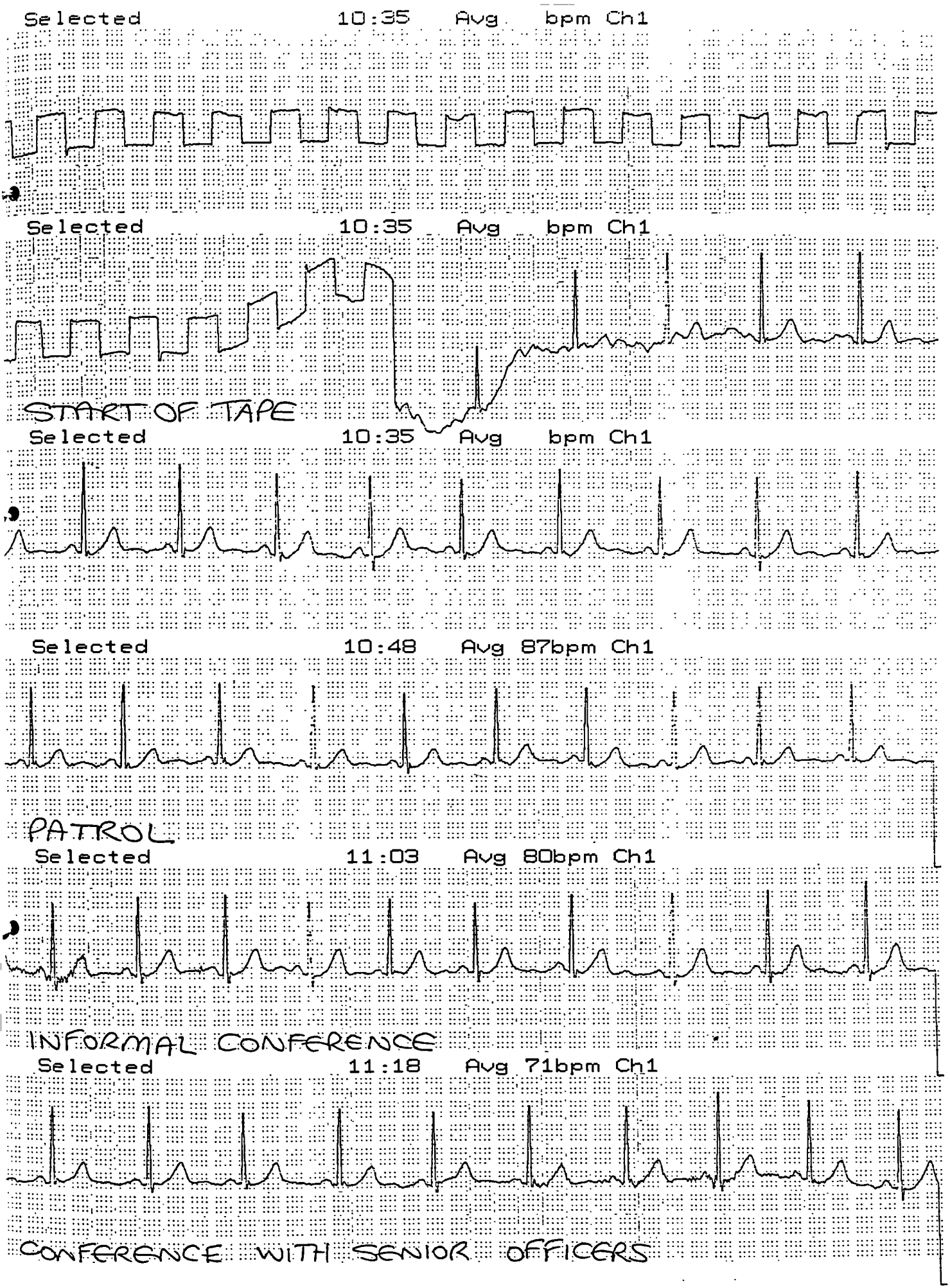
QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
294	0	0	0	0	0	0	0	0	68	231	9
429	0	0	0	0	0	0	0	0	83	100	5
406	0	0	0	0	0	0	0	0	76	92	1
467	0	0	0	0	0	0	0	0	79	100	0
400	0	0	0	0	0	0	0	0	78	88	0
414	0	0	0	0	0	0	0	0	76	90	0
436	0	0	0	0	0	0	0	0	84	93	0
417	0	0	0	0	0	0	0	0	73	91	2
363	0	0	0	0	0	0	0	0	70	79	0
377	0	0	0	0	0	0	0	0	66	92	0
378	0	0	0	0	0	0	0	0	71	77	0
410	0	0	0	0	0	0	0	0	76	86	0
420	0	0	0	0	0	0	0	0	78	89	0
376	0	0	0	0	0	0	0	0	69	85	0
385	0	0	0	0	0	0	0	0	69	89	0
408	0	0	0	0	0	0	0	0	76	85	0
374	0	0	0	0	0	0	0	0	70	88	0
380	0	0	0	0	0	0	0	0	70	81	0
416	0	0	0	0	0	0	0	0	80	87	0
390	0	0	0	0	0	0	0	0	77	85	8
415	0	0	0	0	0	0	0	0	78	89	4
381	0	0	0	0	0	0	0	0	67	98	2
349	0	0	0	0	0	0	0	0	67	73	0
386	0	0	0	0	0	0	0	0	66	89	0
372	0	0	0	0	0	0	0	0	69	88	0
378	0	0	0	0	0	0	0	0	71	77	0
390	0	0	0	0	0	0	0	0	76	82	0
377	0	0	0	0	0	0	0	0	72	81	5
410	0	0	0	0	0	0	0	0	73	93	0
410	0	0	0	0	0	0	0	0	77	87	0
372	0	0	0	0	0	0	0	0	71	78	0
413	0	0	0	0	0	1	0	0	74	88	0
430	0	0	0	0	0	0	0	0	84	95	0
419	0	0	0	0	0	0	0	0	80	87	0
446	0	0	0	0	0	0	0	0	86	91	0
465	0	0	0	0	0	0	0	0	90	99	1
438	0	0	0	0	0	0	0	0	83	91	0
434	0	0	0	0	0	0	0	0	83	94	0
432	0	0	0	0	0	0	0	0	82	94	0
472	0	0	0	0	0	0	0	0	91	99	0
474	0	0	0	0	0	0	0	0	86	100	0
443	0	0	0	0	0	0	0	0	79	113	0
410	0	0	0	0	0	0	0	0	78	89	0
364	0	0	0	0	0	0	0	0	70	78	0
368	0	0	0	0	0	0	0	0	70	77	0
398	0	0	0	0	0	0	0	0	74	93	0
410	0	0	0	0	0	0	0	0	80	89	0
439	0	0	0	0	0	0	0	0	81	95	3
430	0	0	0	0	0	0	0	0	78	100	0
460	0	0	0	0	0	0	0	0	87	95	0
443	0	0	0	0	0	0	0	0	87	97	3
425	0	0	0	0	0	0	0	0	77	95	3
419	0	0	0	0	0	0	0	0	81	92	0
402	0	0	0	0	0	0	0	0	80	94	7
418	0	0	0	0	0	0	0	0	78	88	0
476	0	0	0	0	0	0	0	0	82	97	2
481	0	0	0	0	0	0	0	0	94	107	0
427	0	0	0	0	0	0	0	0	81	92	0
435	0	0	0	0	0	0	0	0	82	94	0
406	0	0	0	0	0	0	0	0	76	86	0
424	0	0	0	0	0	0	0	0	80	92	0
503	0	0	0	0	0	0	0	0	94	106	5
491	0	0	0	0	0	0	0	0	87	110	0
503	0	0	0	0	0	0	0	0	91	108	0
455	0	0	0	0	0	0	0	0	87	98	2

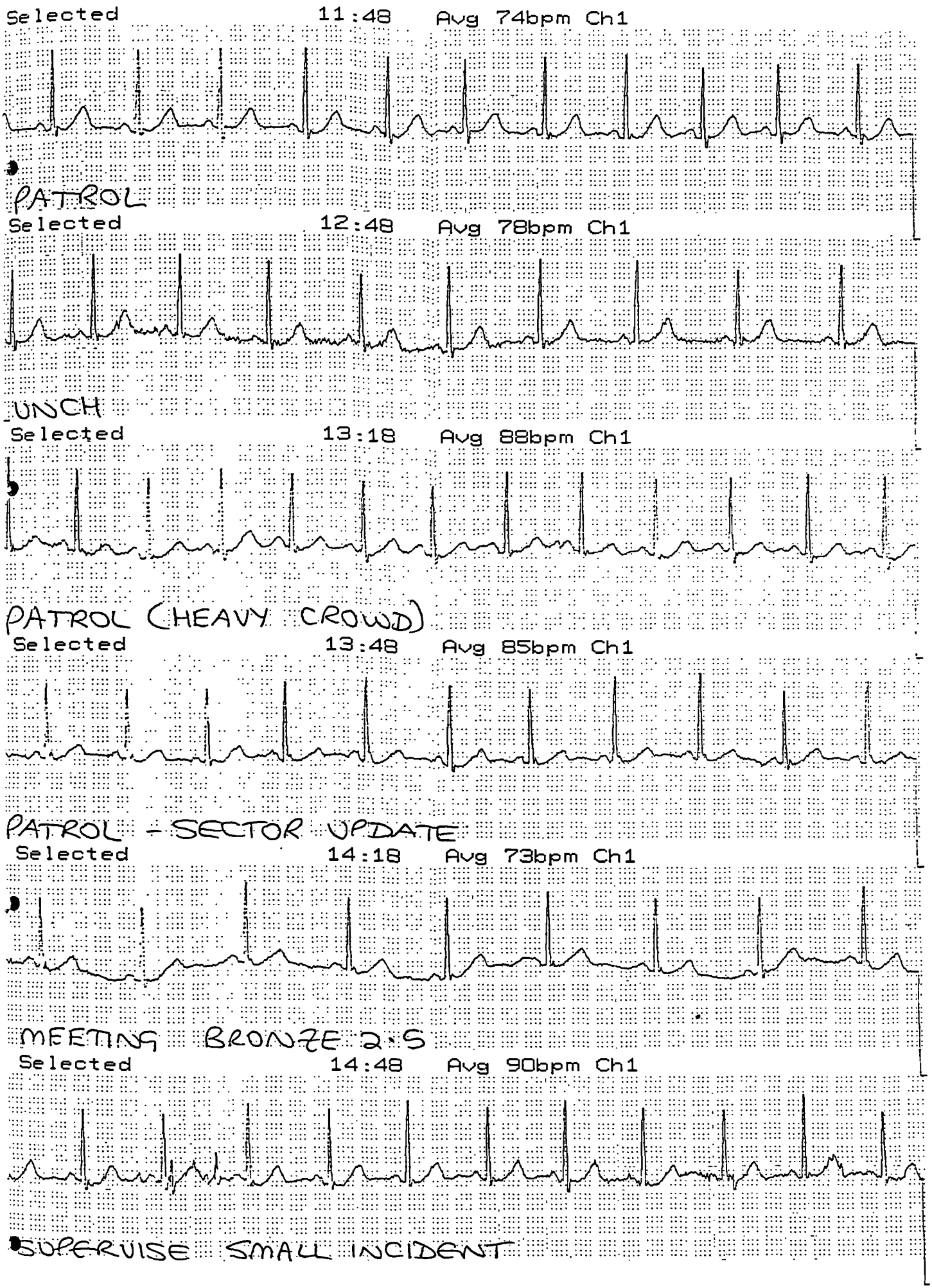
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507	0	0	0	0	0	0	0	0	98	107	0
473	0	0	0	0	0	0	0	0	93	100	0
458	0	0	0	0	0	0	0	0	88	96	0
462	0	0	0	0	0	0	0	0	88	100	0
434	0	0	0	0	0	0	0	0	85	92	1
450	0	0	0	0	0	0	0	0	87	122	38
523	0	0	0	0	0	0	0	0	99	124	10
525	1	0	0	0	0	0	0	0	100	109	0
523	0	0	0	0	0	0	0	0	103	109	2
514	0	0	0	0	0	0	0	0	99	113	3
491	0	0	0	0	0	0	0	0	94	107	0
498	0	0	0	0	0	0	0	0	91	108	0
497	0	0	0	0	0	0	0	0	91	110	0
496	0	0	0	0	0	0	0	0	92	109	1
463	0	0	0	0	0	0	0	0	88	109	0
473	0	0	0	0	0	0	0	0	90	100	0
468	0	0	0	0	0	0	0	0	88	103	0
488	0	0	0	0	0	0	0	0	90	107	0
501	0	0	0	0	0	0	0	0	97	108	0
498	0	0	0	0	0	0	0	0	95	107	2
486	0	0	0	0	0	0	0	0	89	109	0
432	0	0	0	0	0	0	0	0	85	89	0
391	0	0	0	0	0	0	0	0	76	86	0
408	0	0	0	0	0	0	0	0	77	88	0
418	0	0	0	0	0	0	0	0	78	88	0
447	0	0	0	0	0	0	0	0	84	100	0
438	0	0	0	0	0	0	0	0	83	92	0
450	0	0	0	0	0	0	0	0	88	92	0
461	0	0	0	0	0	0	0	0	90	98	0
489	0	0	0	0	0	0	0	0	88	114	1
485	0	0	0	0	0	0	0	0	90	104	4
478	0	0	0	0	0	0	0	0	91	104	0
482	0	0	0	0	0	0	0	0	91	101	0
551	0	0	0	0	0	0	0	0	101	116	0
545	1	0	0	0	0	0	0	0	106	115	0
519	0	0	0	0	0	0	0	0	98	113	0
499	0	0	0	0	0	0	0	0	96	106	0
499	0	0	0	0	0	0	0	0	93	110	1
532	0	0	0	0	0	0	0	0	93	113	0
494	0	0	0	0	0	0	0	0	93	108	0
454	0	0	0	0	0	0	0	0	88	99	0
470	0	0	0	0	0	0	0	0	91	98	0
482	0	0	0	0	0	0	0	0	89	101	0
520	0	0	0	0	0	0	0	0	99	111	0
540	0	0	0	0	0	0	0	0	103	113	0
500	0	0	0	0	0	0	0	0	93	106	0
498	0	0	0	0	0	0	0	0	96	105	0
476	0	0	0	0	0	0	0	0	92	99	0
457	0	0	0	0	0	0	0	0	87	96	0
482	0	0	0	0	0	0	0	0	91	104	0
500	0	0	0	0	0	0	0	0	99	107	5
478	0	0	0	0	0	0	0	0	90	103	0
459	0	0	0	0	0	0	0	0	88	96	1
452	0	0	0	0	0	0	0	0	85	97	0
481	0	0	0	0	0	0	0	0	89	107	0
479	0	0	0	0	0	0	0	0	89	107	0
488	0	0	0	0	0	0	0	0	91	108	0
471	0	0	0	0	0	0	0	0	90	96	0
509	0	0	0	0	0	0	0	0	89	116	0
474	0	0	0	0	0	0	0	0	91	104	0
477	1	0	0	0	0	0	0	0	88	101	2
469	0	0	0	0	0	0	0	0	88	100	0
467	0	0	0	0	0	0	0	0	89	106	6
447	0	0	0	0	0	0	0	0	82	100	1
455	0	0	0	0	0	0	0	0	91	98	0
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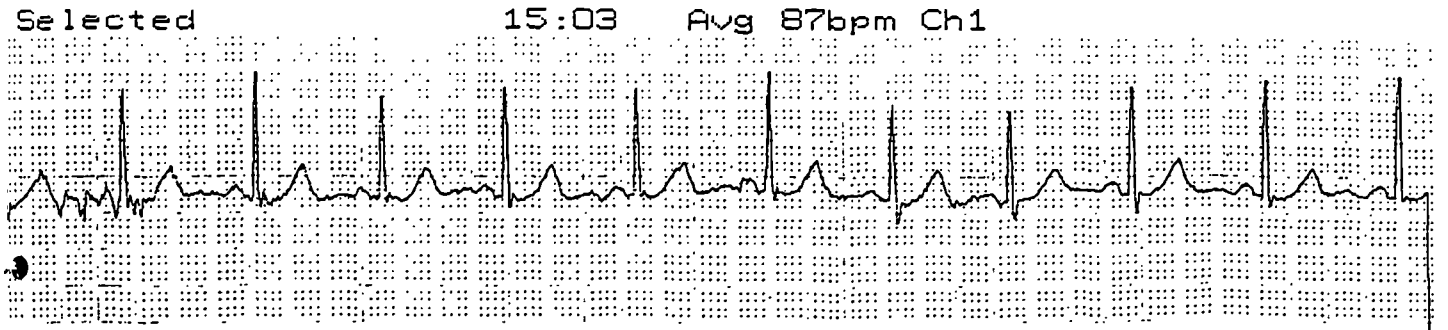
410	0	0	0	0	0	0	0	0	78	84	0
355	1	0	0	0	0	0	0	0	79	87	34
392	0	0	0	0	0	0	0	0	76	82	0
398	0	0	0	0	0	0	0	0	75	83	0
423	0	0	0	0	0	0	0	0	84	92	7
449	0	0	0	0	0	0	0	0	83	97	0
403	0	0	0	0	0	0	0	0	75	94	0
427	0	0	0	0	0	0	0	0	76	94	0
410	0	0	0	0	0	0	0	0	77	90	1
410	0	0	0	0	0	0	0	0	78	94	6
432	1	0	0	0	0	0	0	0	82	93	1
376	0	0	0	0	0	1	0	0	73	82	0
404	0	0	0	0	0	0	0	0	75	100	7
445	0	0	0	0	0	0	0	0	75	103	1
486	0	0	0	0	0	0	0	0	75	106	7
453	0	0	0	0	0	0	0	0	85	108	0
430	0	0	0	0	0	0	0	0	81	95	0
429	0	0	0	0	0	0	0	0	81	93	0
420	0	0	0	0	0	0	0	0	77	97	0
395	0	0	0	0	0	0	0	0	74	91	0
403	0	0	0	0	0	0	0	0	75	92	0
458	0	0	0	0	0	0	0	0	80	96	0
457	0	0	0	0	0	0	0	0	89	101	5
115	1	0	0	0	0	3	0	0	78	90	107
0	0	0	0	0	0	0	0	0			0
70367	6	0	0	0	0	6	0	0			322

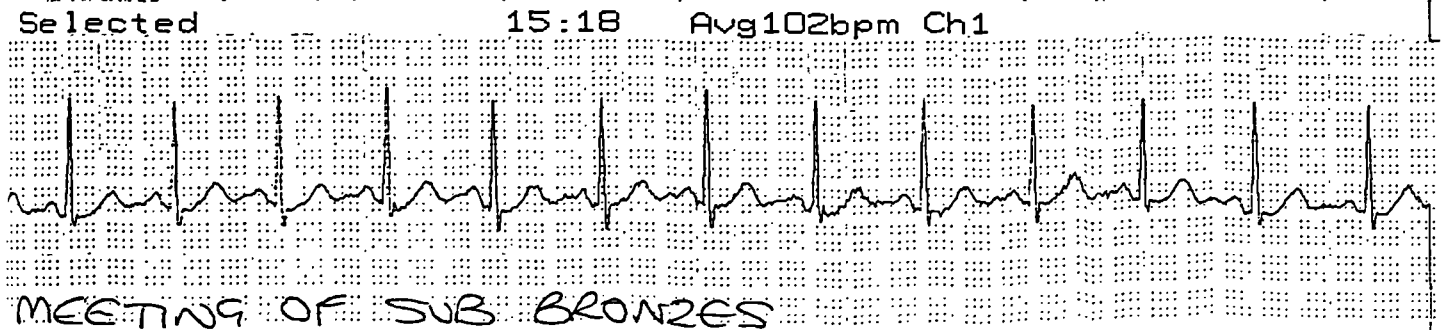
LDS: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
A: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.



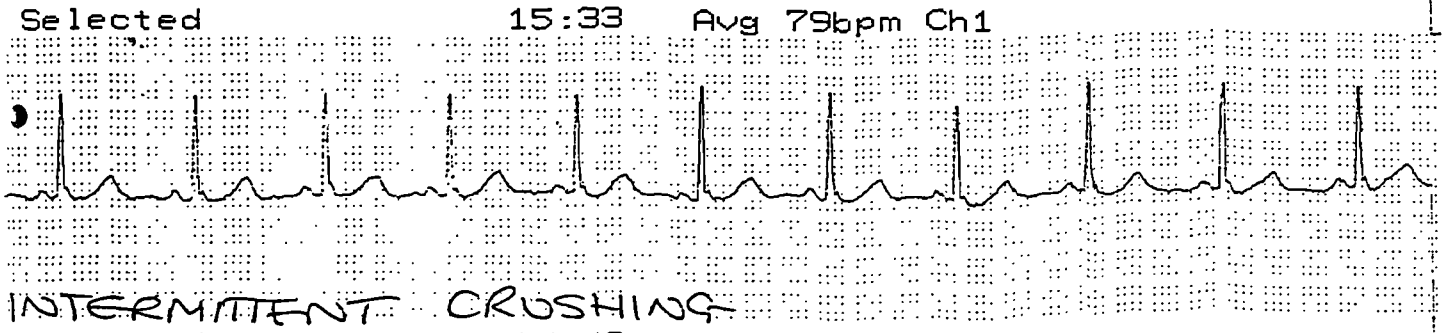

Selected 10:35 Avg bpm Ch1
Selected 10:35 Avg bpm Ch1
START OF TAPE
Selected 10:35 Avg bpm Ch1
Selected 10:48 Avg 87bpm Ch1
PATROL
Selected 11:03 Avg 80bpm Ch1
INFORMAL CONFERENCE
Selected 11:18 Avg 71bpm Ch1
CONFERENCE WITH SENIOR OFFICERS


Selected 11:48 Avg 74bpm Ch1
PATROL
Selected 12:48 Avg 78bpm Ch1
LUNCH
Selected 13:18 Avg 88bpm Ch1
PATROL (HEAVY CROWD)
Selected 13:48 Avg 85bpm Ch1
PATROL - SECTOR UPDATE
Selected 14:18 Avg 73bpm Ch1
MEETING BRONZE 2-S
Selected 14:48 Avg 90bpm Ch1
SUPERVISE SMALL INCIDENT

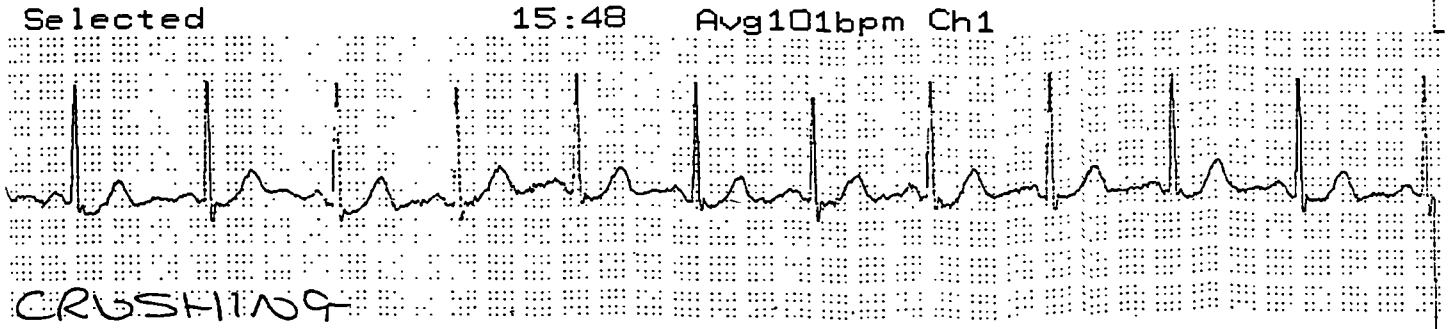




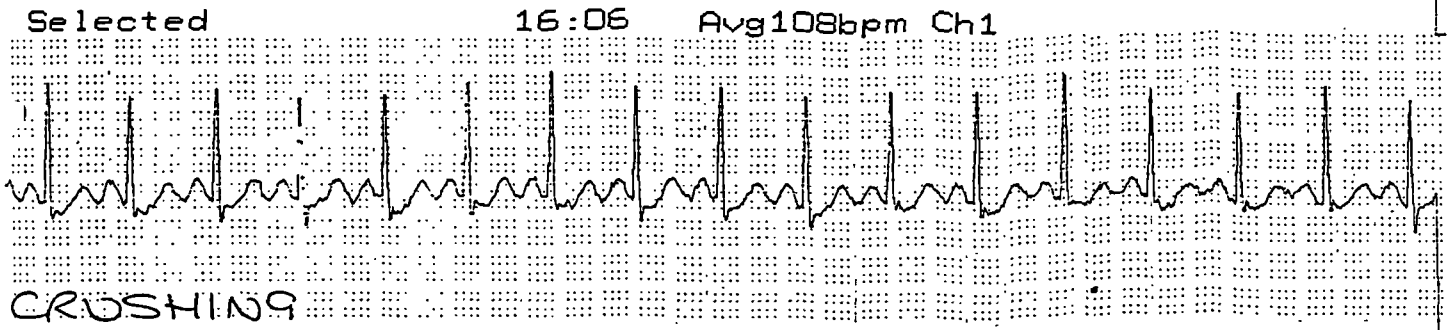
MEETING OF SUB BRONZES



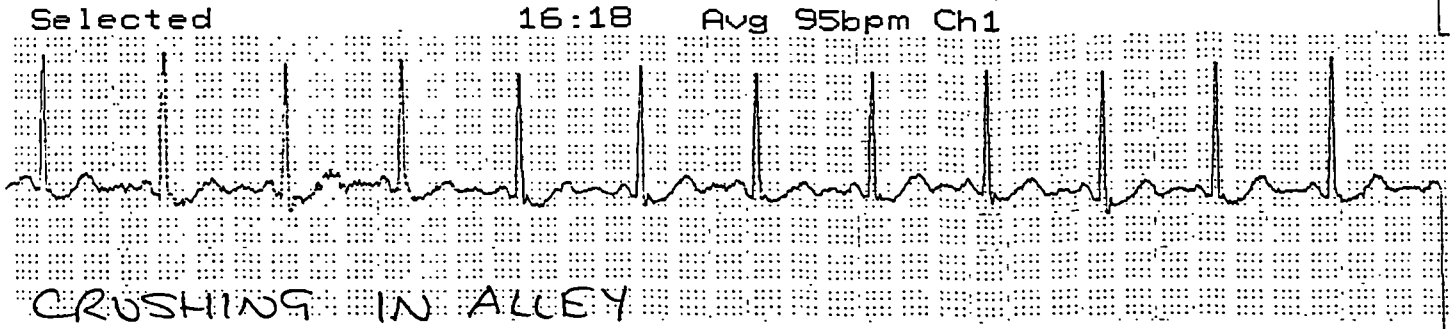
INTERMITENT CRUSHING



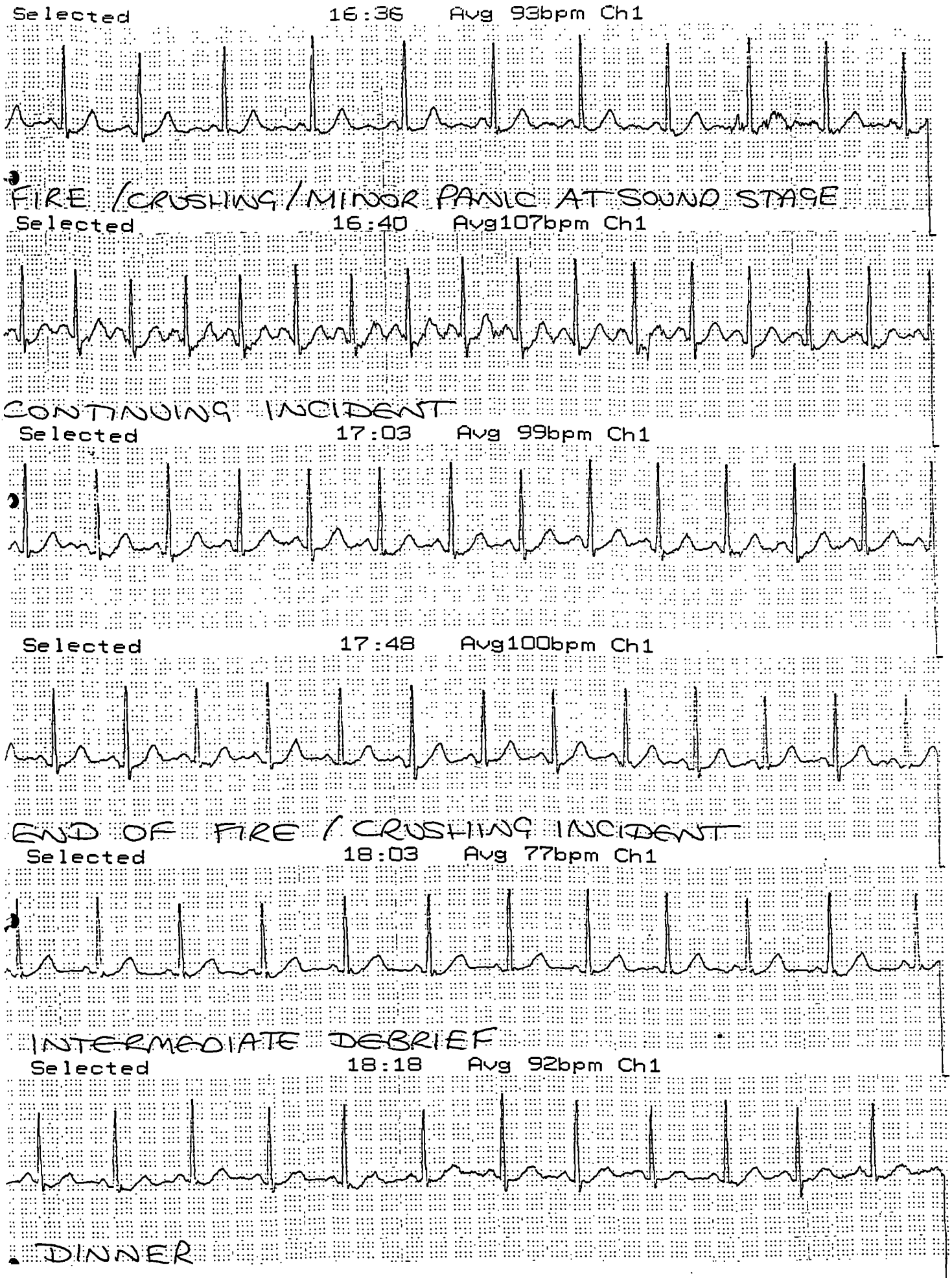
CRUSHING

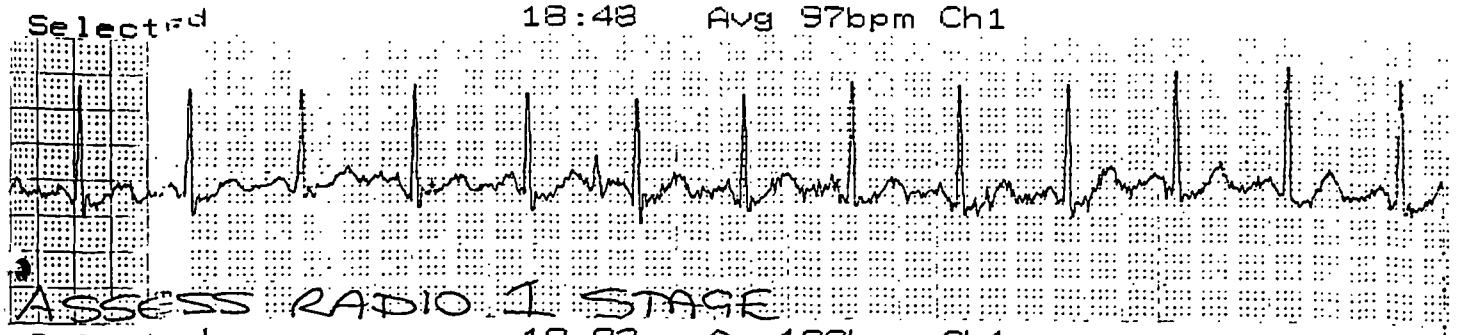


CRUSHING

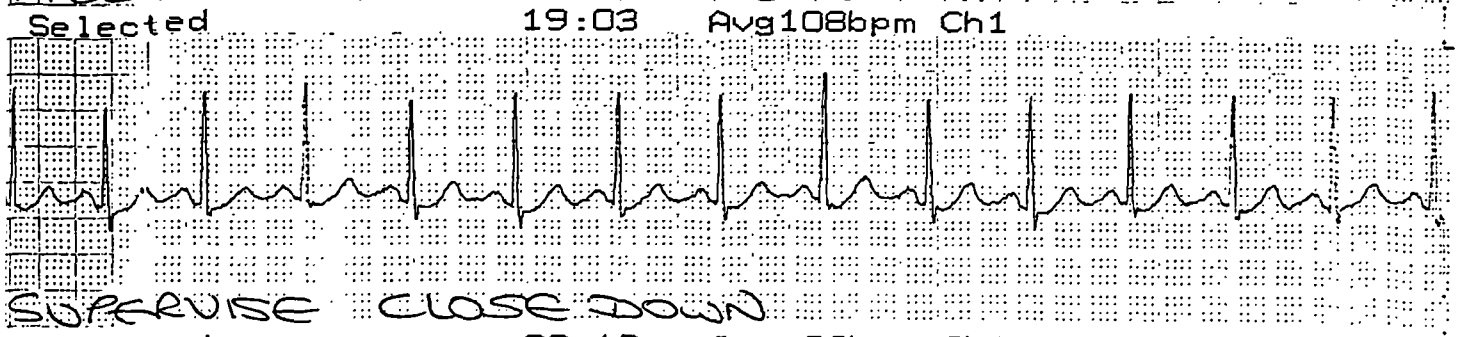


CRUSHING IN ALLEY

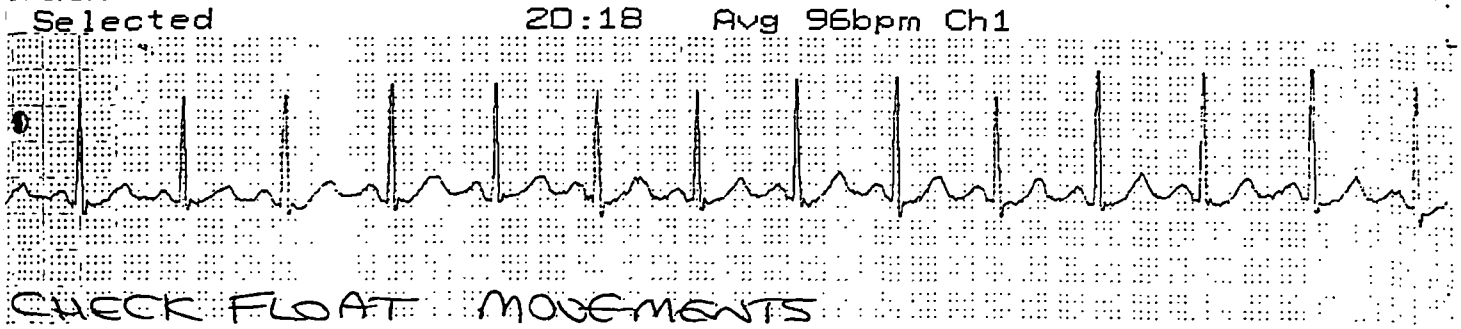

Selected 16:36 Avg 93bpm Ch1
FIRE / CRUSHING / MINOR PANIC AT SOUND STAGE
Selected 16:40 Avg107bpm Ch1
CONTINUING INCIDENT
Selected 17:03 Avg 99bpm Ch1
Selected 17:48 Avg100bpm Ch1
END OF FIRE / CRUSHING INCIDENT
Selected 18:03 Avg 77bpm Ch1
INTERMEDIATE DEBRIEF
Selected 18:18 Avg 92bpm Ch1
DINNER



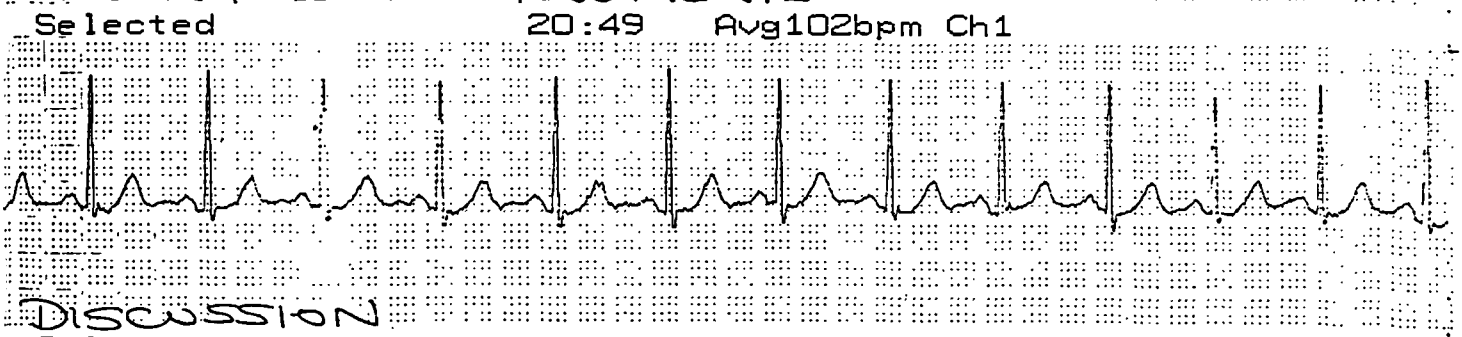
ASSESS RADIO 1 STAGE



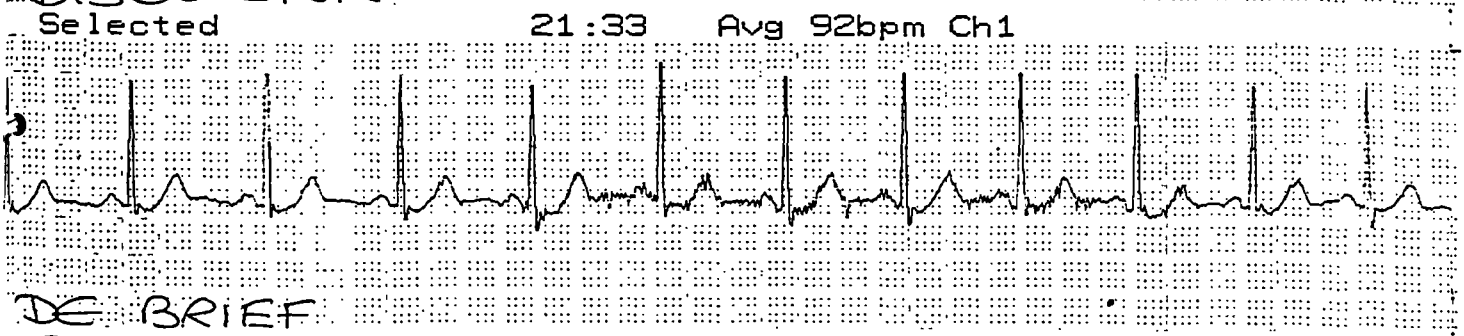
SUPERVISE CLOSE DOWN



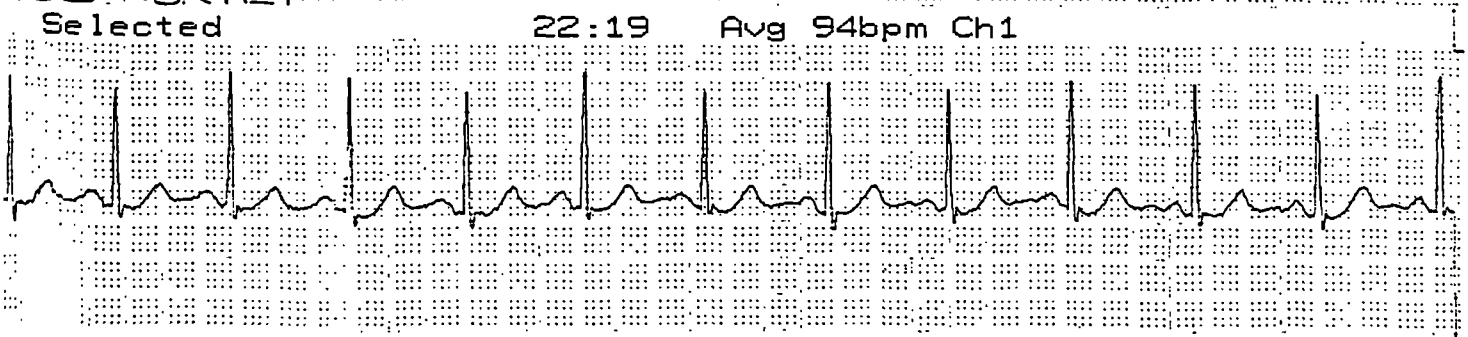
CHECK FLOAT MOVEMENTS

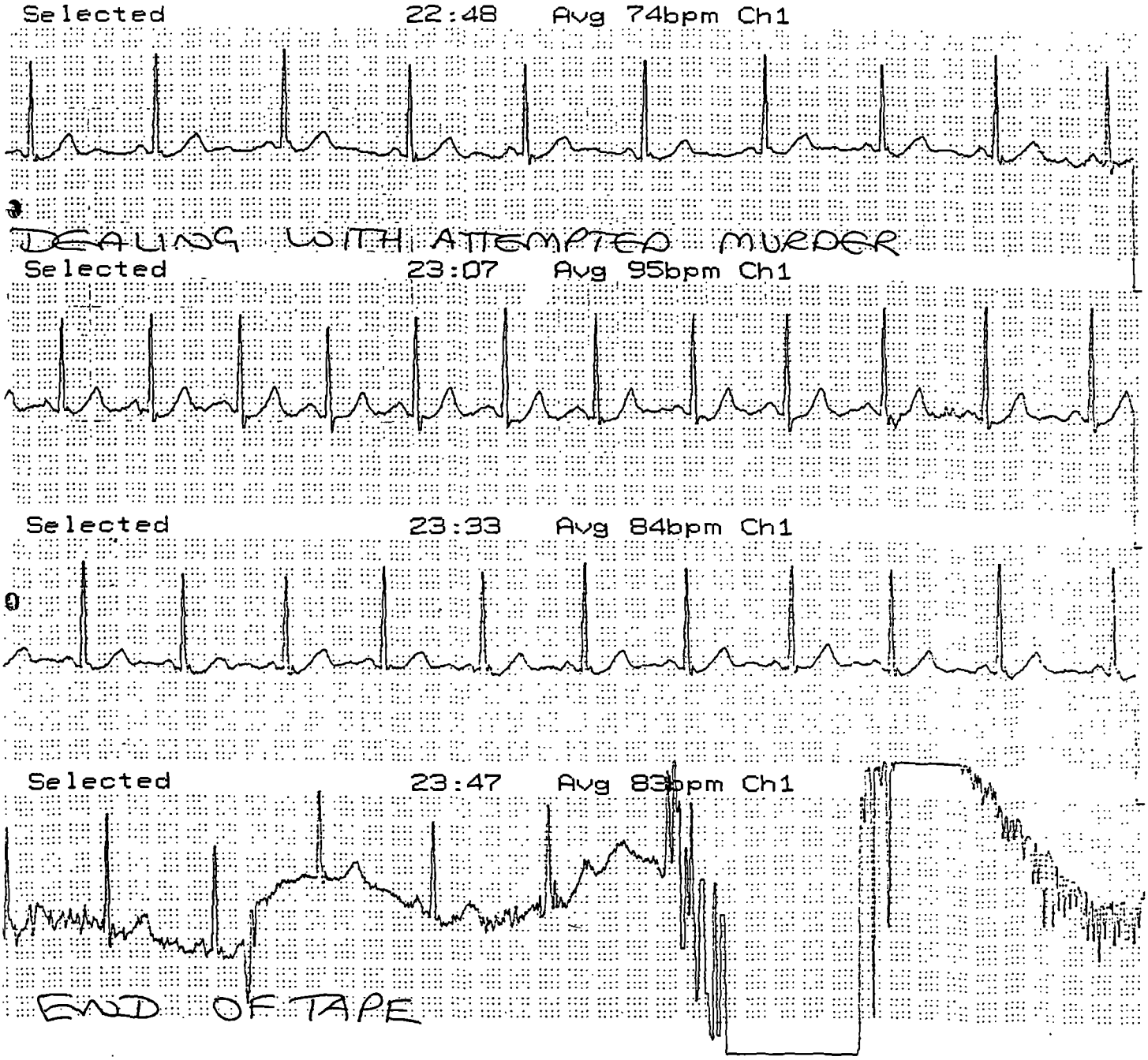


DISCUSSION



DE BRIEF




Selected 22:48 Avg 74bpm Ch1
DEALING WITH ATTEMPTED MURDER
Selected 23:07 Avg 95bpm Ch1
Selected 23:33 Avg 84bpm Ch1
Selected 23:47 Avg 83bpm Ch1
END OF TAPE

PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

TIENT

Identification:-

Name:- PARTICIPANT C

Address:- CARNIVAL TAPE

PHYSICIAN

Department:-

Name:-

Address:-

Age:-

Sex:-

Recording date:-

Analysis date:- 4/2/96

Technical Details:

Recorder S/N:-

Clinical Details:

Signed:-

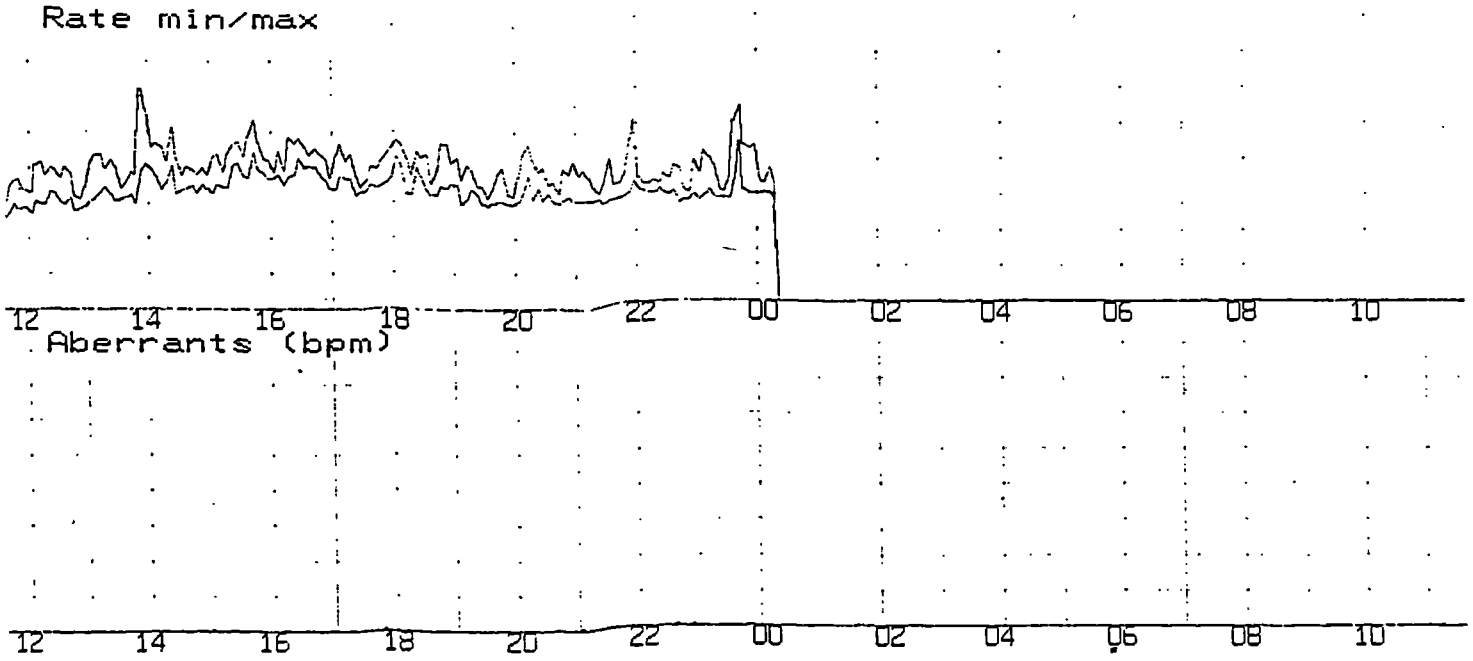
Date:-

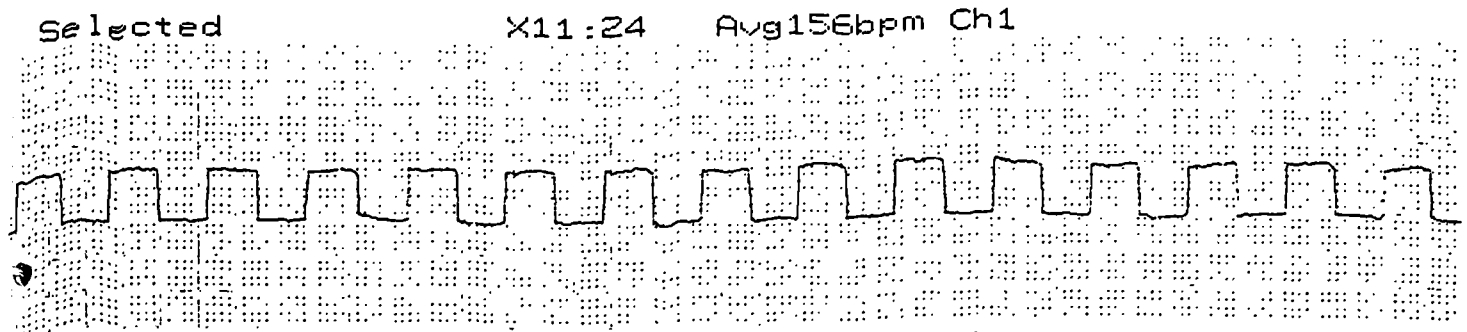
QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
0	0	0	0	0	0	0	0	0		161	0
413	273	0	0	2	0	0	0	0	74	226	0
663	0	0	0	0	0	0	0	0	71	78	0
353	0	0	0	0	0	0	0	0	65	76	0
389	0	0	0	0	0	0	0	0	68	87	0
405	0	0	0	0	0	0	0	0	74	91	0
398	0	0	0	0	0	0	0	0	71	92	0
384	0	0	0	0	0	0	0	0	72	85	0
382	0	0	0	0	0	0	0	0	72	84	0
372	0	0	0	0	0	0	0	0	68	83	0
462	0	0	0	0	0	0	0	0	76	102	1
415	0	0	0	0	0	0	0	0	74	104	0
435	0	0	0	0	0	0	0	0	74	95	0
468	0	0	0	0	0	0	0	0	83	100	0
432	0	0	0	0	0	0	0	0	82	98	0
416	0	0	0	0	0	0	0	0	76	93	0
439	0	0	0	0	0	0	0	0	74	100	0
437	0	0	0	0	0	0	0	0	79	96	0
375	0	0	0	0	0	0	0	0	70	80	0
371	0	0	0	0	0	0	0	0	71	78	0
397	0	0	0	0	0	0	0	0	72	86	0
441	0	0	0	0	0	0	0	0	77	104	0
488	0	0	0	0	0	0	0	0	78	108	0
441	0	0	0	0	0	0	0	0	82	109	0
459	0	0	0	0	0	0	0	0	86	99	0
461	0	0	0	0	0	0	0	0	81	105	0
418	0	0	0	0	0	0	0	0	77	101	0
409	0	0	0	0	0	0	0	0	78	86	0
422	0	0	0	0	0	0	0	0	79	89	0
443	0	0	0	0	0	0	0	0	80	96	0
423	0	0	0	0	0	0	0	0	75	95	0
637	0	0	0	0	0	0	0	0	97	155	0
545	0	0	0	0	0	0	0	0	102	140	0
527	0	0	0	0	0	0	0	0	98	114	0
529	0	0	0	0	0	0	0	0	94	117	0
435	0	0	0	0	0	0	0	0	85	114	0
500	0	0	0	0	0	0	0	0	89	105	0
565	0	0	0	0	0	0	0	0	101	128	0
462	0	0	0	0	0	0	0	0	82	106	0
448	0	0	0	0	0	0	0	0	84	95	0
453	0	0	0	0	0	1	0	0	85	101	0
452	0	0	0	0	0	0	0	0	87	98	0
449	0	0	0	0	0	0	0	0	82	95	0
454	0	0	0	0	0	0	0	0	88	99	0
447	1	0	0	0	0	0	0	0	85	95	0
452	0	0	0	0	0	0	0	0	82	107	0
457	0	0	0	0	0	0	0	0	88	109	0
448	0	0	0	0	0	0	0	0	86	97	0
506	0	0	0	0	0	0	0	0	86	110	0
557	0	0	0	0	0	0	0	0	102	116	0
543	0	0	0	0	0	0	0	0	103	118	0
487	0	0	0	0	0	0	0	0	94	108	0
554	0	0	0	0	0	0	0	0	93	122	0
597	0	0	0	0	0	0	1	0	110	133	0
514	0	0	0	0	0	0	0	0	99	118	0
509	0	0	0	0	0	0	0	0	96	106	0
488	0	0	0	0	0	0	0	0	92	105	0
469	0	0	0	0	0	0	0	0	93	97	0
514	0	0	0	0	0	0	0	0	95	111	0
466	0	0	0	0	0	0	0	0	88	98	0
551	0	0	0	0	0	0	0	0	93	121	0
526	0	0	0	0	0	0	0	0	95	117	0
566	0	0	0	0	0	0	0	0	106	120	0
523	0	0	0	0	0	0	0	0	100	114	0
525	0	0	0	0	0	0	0	0	101	109	0

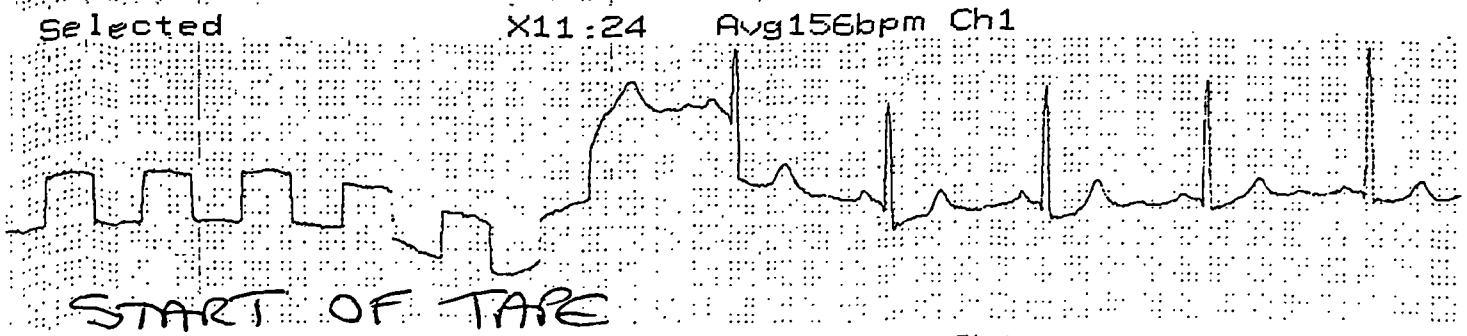
534	0	0	0	0	0	0	0	0	100	113	0
521	0	0	0	0	0	0	0	0	96	110	0
473	0	0	0	0	0	0	0	0	91	106	0
442	0	0	0	0	0	0	0	0	85	93	0
498	0	0	0	0	0	0	0	0	84	108	0
530	0	0	0	0	0	0	0	0	93	115	0
503	0	0	0	0	0	0	0	0	91	104	0
500	0	0	0	0	0	0	0	0	91	108	0
419	0	0	0	0	0	0	0	0	80	93	0
425	0	0	0	0	0	0	0	0	82	86	0
427	0	0	0	0	0	0	0	0	83	90	0
474	0	0	0	0	0	0	0	0	88	101	0
461	0	0	0	0	0	0	0	0	86	99	0
488	1	0	0	0	0	0	0	0	87	104	0
496	0	0	0	0	0	0	0	0	89	109	0
507	0	0	0	0	0	0	0	0	92	113	0
560	0	0	0	0	0	0	0	0	107	119	0
523	0	0	0	0	0	0	0	0	102	116	0
468	0	0	0	0	0	0	0	0	81	106	0
458	0	0	0	0	0	0	0	0	81	95	0
522	0	0	0	0	0	0	0	0	99	111	0
499	0	0	0	0	0	0	0	0	94	107	0
472	0	0	0	0	0	0	0	0	84	109	0
418	0	0	0	0	0	0	0	0	81	89	0
453	0	0	0	0	0	0	0	0	81	98	0
534	0	0	0	0	0	0	0	0	87	117	0
478	0	0	0	0	0	0	0	0	86	117	0
485	0	0	0	0	0	0	0	0	89	104	0
486	0	0	0	0	0	0	0	0	88	107	0
397	0	0	0	0	0	0	0	0	75	92	0
463	0	0	0	0	0	0	0	0	78	102	0
462	0	0	0	0	0	0	0	0	85	98	0
420	0	0	0	0	0	0	0	0	81	87	0
389	0	0	0	0	0	0	0	0	75	87	2
387	0	0	0	0	0	0	0	0	73	79	0
399	0	0	0	0	0	0	0	0	75	84	0
432	0	0	0	0	0	0	0	0	76	96	0
423	0	0	0	0	0	0	0	0	76	99	0
378	0	0	0	0	0	0	0	0	74	81	0
385	0	0	0	0	0	0	0	0	74	80	0
417	0	0	0	0	0	0	0	0	76	94	0
458	0	0	0	0	0	0	0	0	81	109	0
528	0	0	0	0	0	0	0	0	94	115	0
445	0	0	0	0	0	1	0	0	78	105	0
469	0	0	0	0	0	0	0	0	85	97	0
432	0	0	0	0	0	0	0	0	77	99	0
424	0	0	0	0	0	0	0	0	81	88	0
401	0	0	0	0	0	0	0	0	76	89	0
393	0	0	0	0	0	0	0	0	74	82	0
426	0	0	0	0	0	0	0	0	77	98	0
419	0	0	0	0	0	0	0	0	79	96	0
435	0	0	0	0	0	0	0	0	77	104	0
423	1	0	0	0	0	0	0	0	76	95	0
454	0	0	0	0	0	0	0	0	76	98	0
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395	0	0	0	0	0	0	0	0	73	87	0
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395	0	0	0	0	0	0	0	0	74	85	0
381	0	0	0	0	0	0	0	0	74	85	0
409	0	0	0	0	0	0	0	0	75	89	0
454	0	0	0	0	0	0	0	0	77	113	0
445	0	0	0	0	0	0	0	0	84	128	0
410	0	0	0	0	0	0	0	0	79	87	0
403	0	0	0	0	0	0	0	0	78	83	0
399	0	0	0	0	0	0	0	0	77	83	0
403	0	0	0	0	0	0	0	0	76	85	0
404	0	0	0	0	0	0	0	0	79	83	0

400	0	0	0	0	0	0	0	0	0	76	89	0
398	0	0	0	0	0	1	0	0	0	75	86	0
420	1	0	0	0	0	0	0	0	0	77	95	0
393	0	0	0	0	0	0	0	0	0	69	93	0
376	0	0	0	0	0	1	0	0	0	71	79	0
366	1	0	0	0	0	0	0	0	0	71	76	0
421	0	0	0	0	0	0	0	0	0	75	98	0
406	0	0	0	0	0	0	0	0	0	71	90	0
437	0	0	0	0	0	0	0	0	0	73	105	0
419	0	0	0	0	0	0	0	0	0	78	100	0
389	0	0	0	0	0	0	0	0	0	73	95	0
380	0	0	0	0	0	0	0	0	0	72	78	0
367	0	0	0	0	0	0	0	0	0	72	77	0
407	0	0	0	0	0	0	0	0	0	72	88	0
512	0	0	0	0	0	0	0	0	0	84	126	0
600	0	0	0	0	0	0	0	0	0	111	136	0
433	0	0	0	0	0	0	0	0	0	78	109	0
436	0	0	0	0	0	0	0	0	0	75	106	0
405	0	0	0	0	0	0	0	0	0	75	108	0
390	0	0	0	0	0	0	0	0	0	75	83	0
394	0	0	0	0	0	0	0	0	0	76	82	0
412	0	0	0	0	0	0	0	0	0	75	92	0
378	0	0	0	0	0	0	0	0	0	72	83	0
161	0	0	0	0	0	0	0	0	0			109
9506	278	0	0	2	0	4	1	0				112

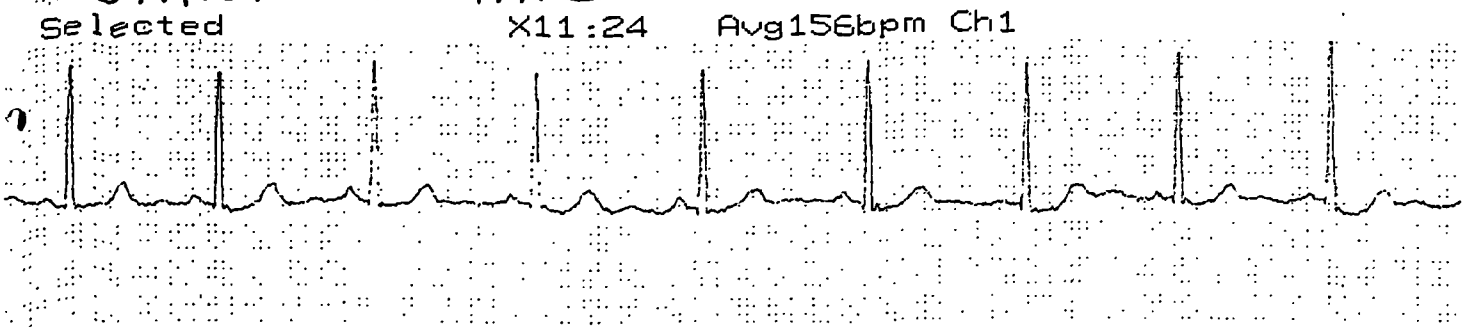
LDS: Trigger = 13%; Shape A = 50%; Aberrant A = 40%; Analysed Channel 1.
A: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.

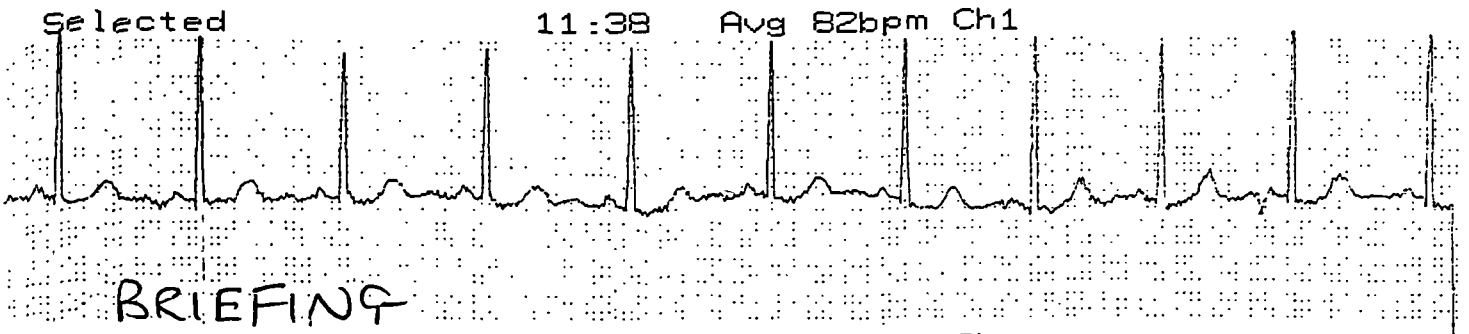




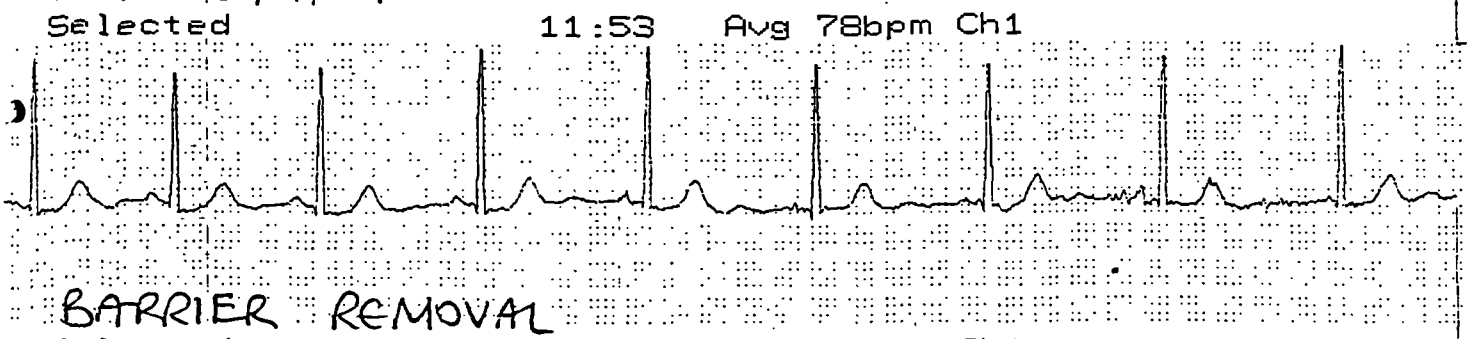


START OF TAPE

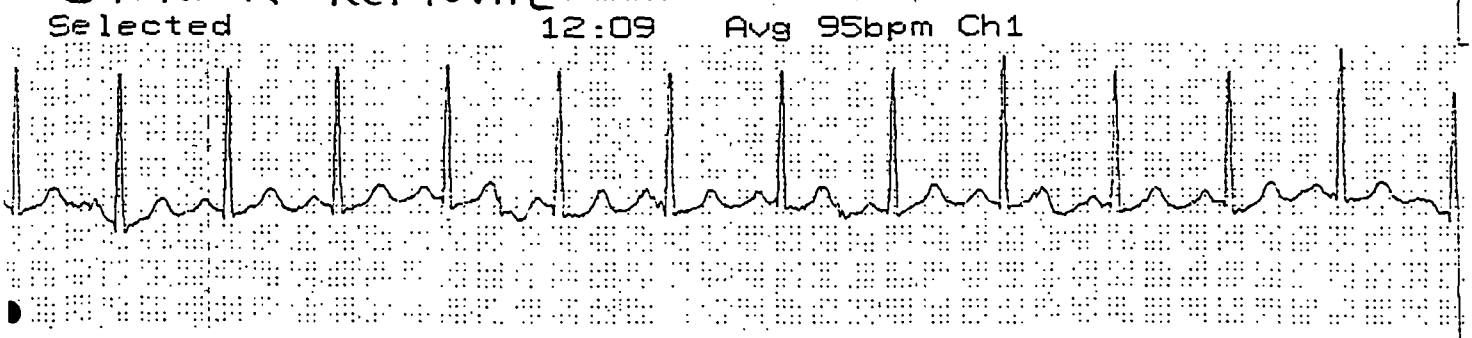


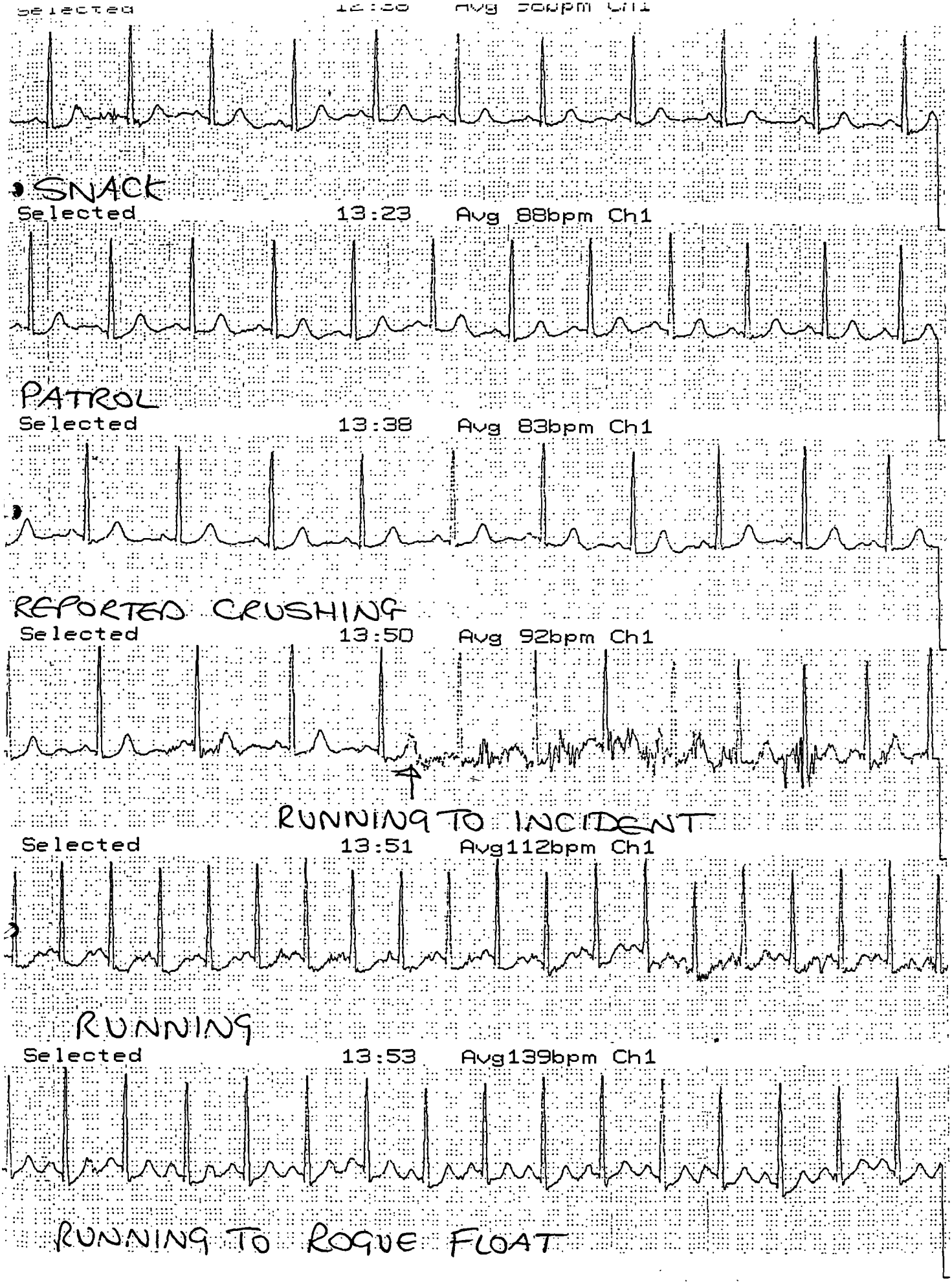


BRIEFING

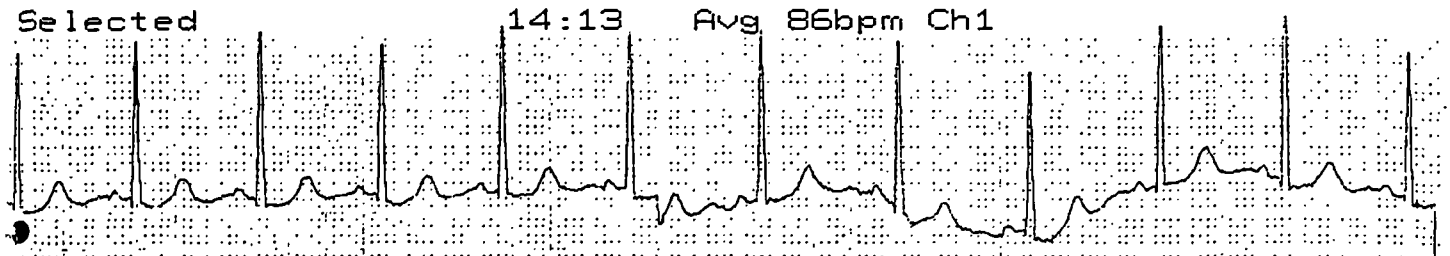


BARRIER REMOVAL




SNACK
Selected 13:23 Avg 88bpm Ch1
PATROL
Selected 13:38 Avg 83bpm Ch1
REPORTED CRUSHING
Selected 13:50 Avg 92bpm Ch1
RUNNING TO INCIDENT
Selected 13:51 Avg112bpm Ch1
RUNNING
Selected 13:53 Avg139bpm Ch1
RUNNING TO ROGUE FLOAT

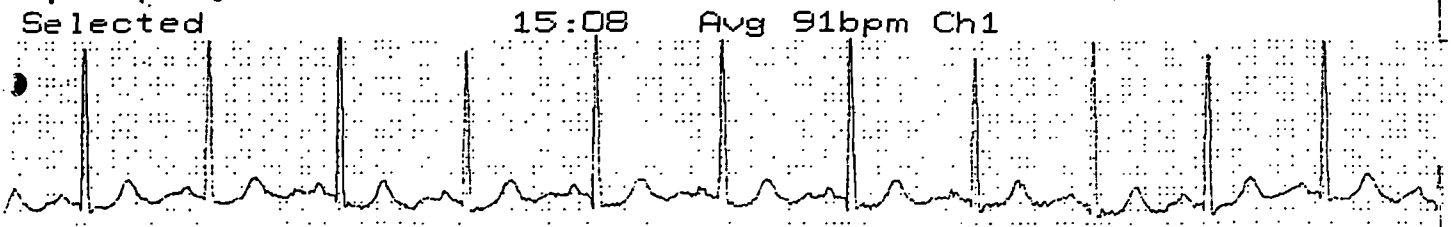
EDGWARE GENERAL HOSPITAL CARDIOLOGY

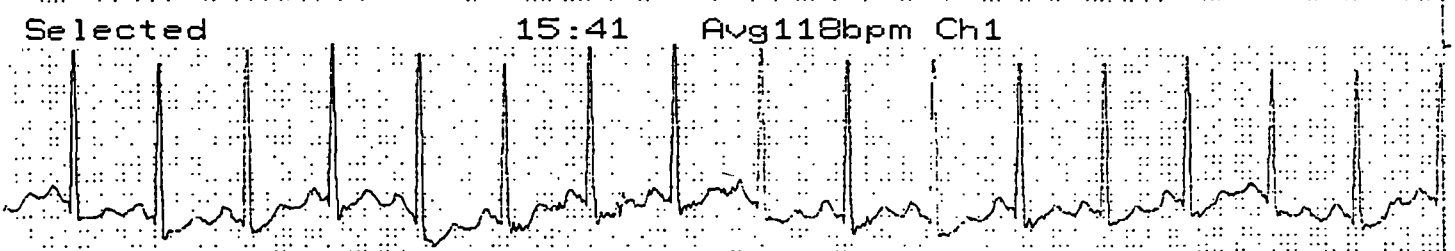


PROBLEM RESOLVED



PATROL

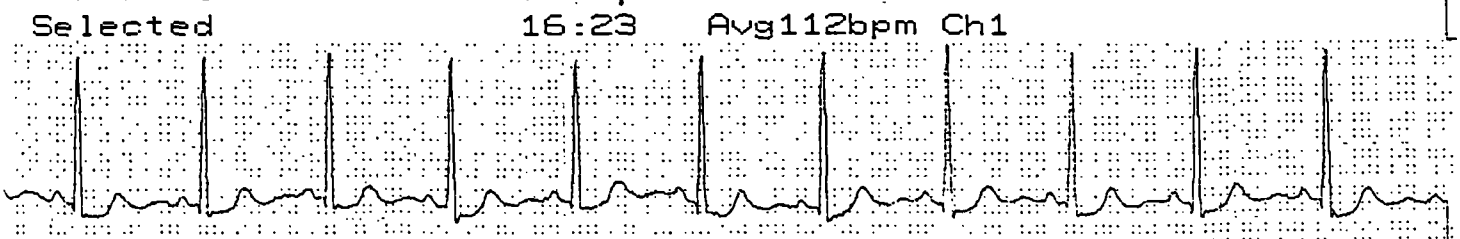




PATROL



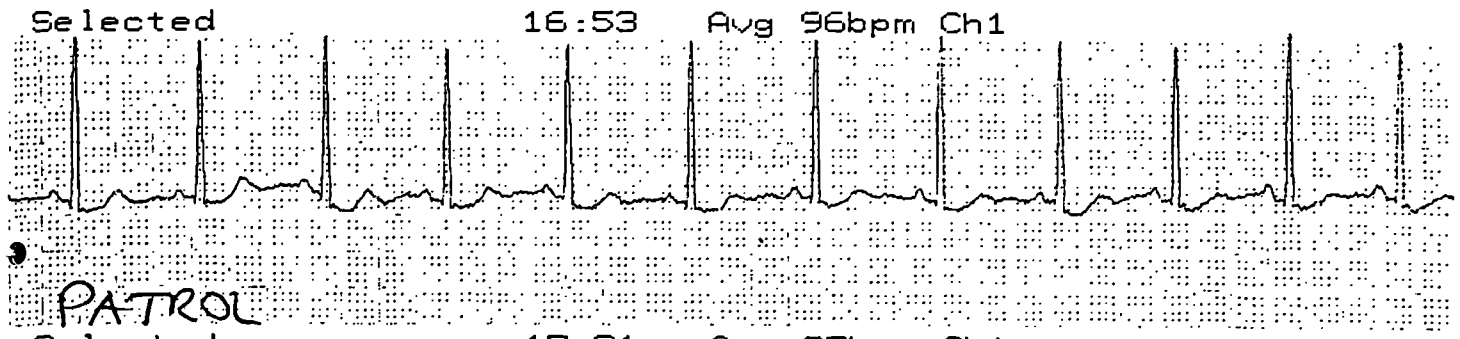
STATIC AT JUDGING POINT



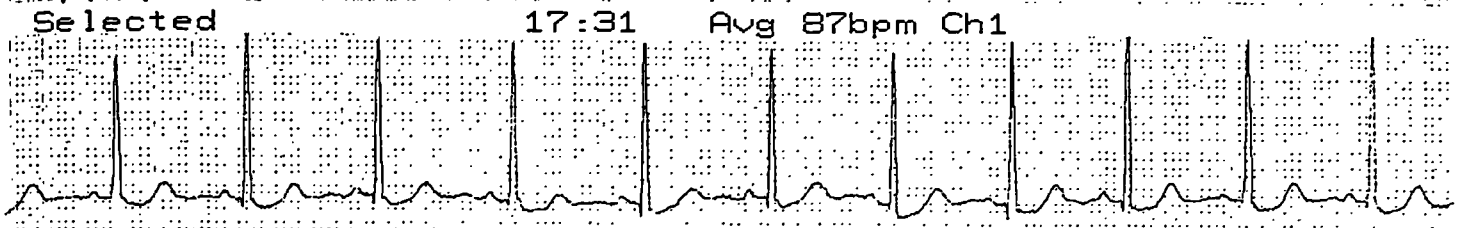
REPORTED CRUSHING

Reynolds MEDICAL

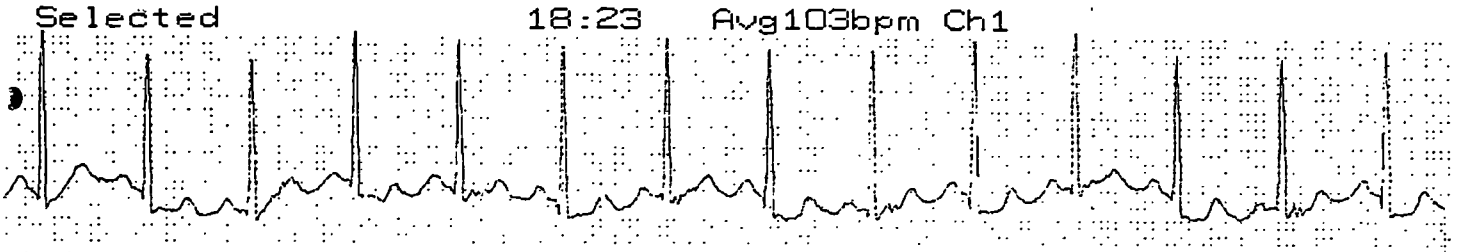
EDGWARE GENERAL HOSPITAL CARDIOLOGY



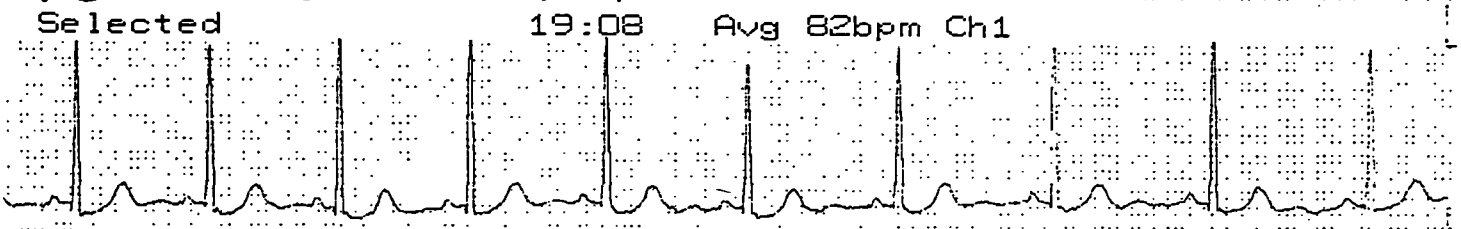
PATROL



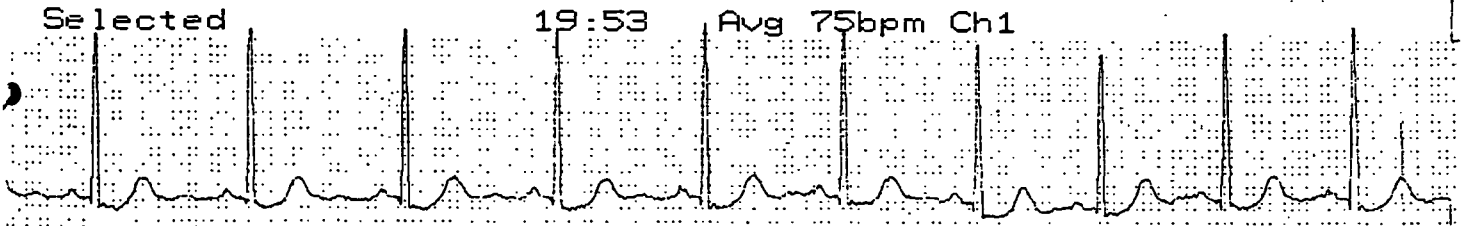
STATIC AT JUDGING POINT



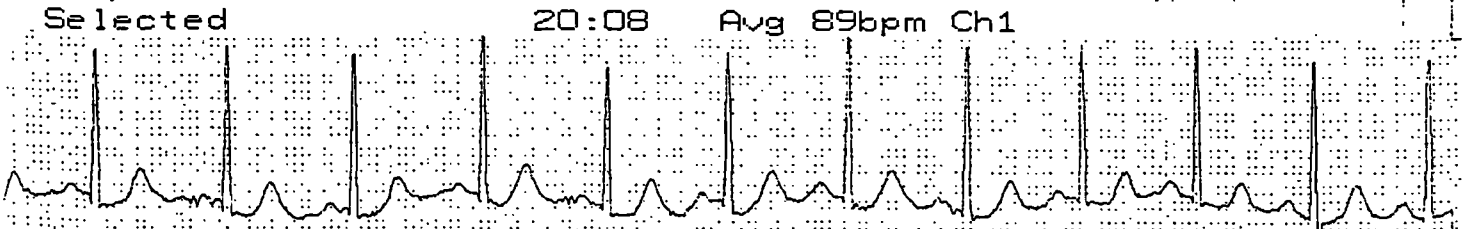
REPORTED CRUSHING



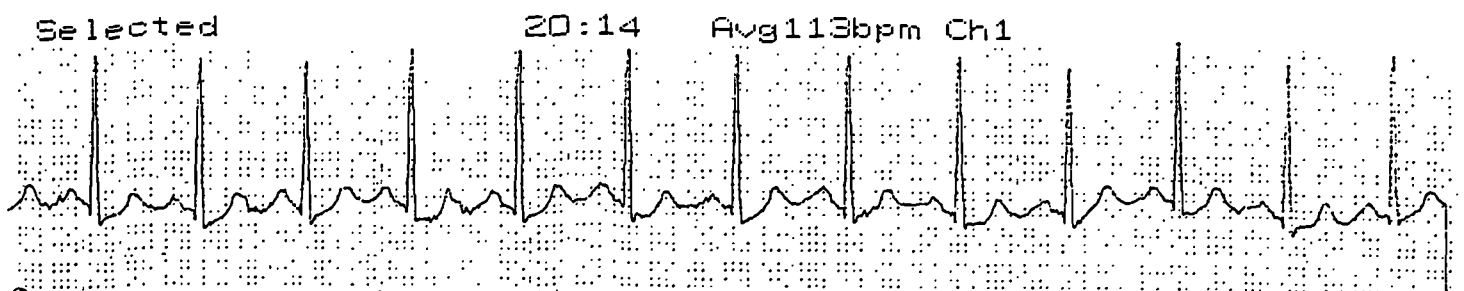
STATIC



PATROL



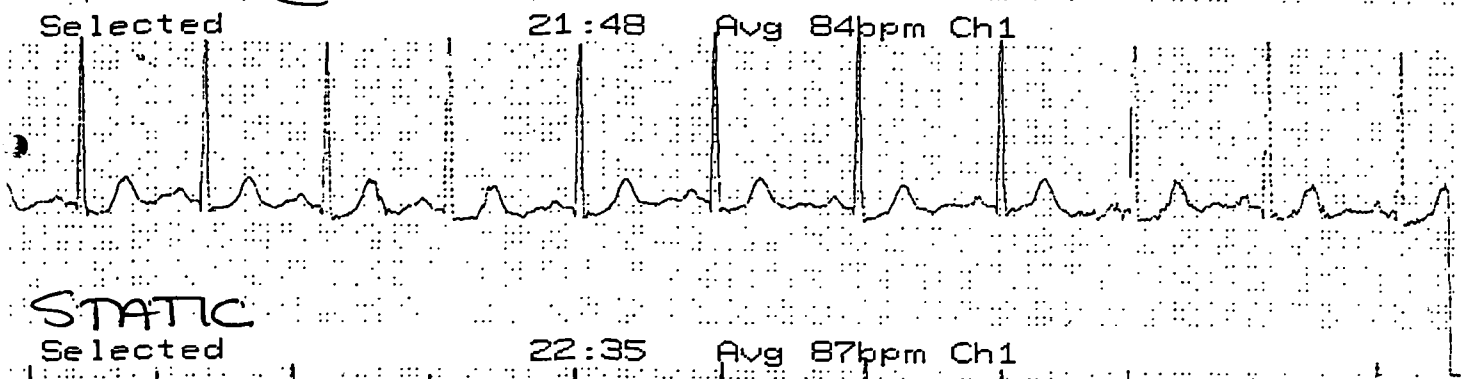
REPORT OF SERIOUS INJURY



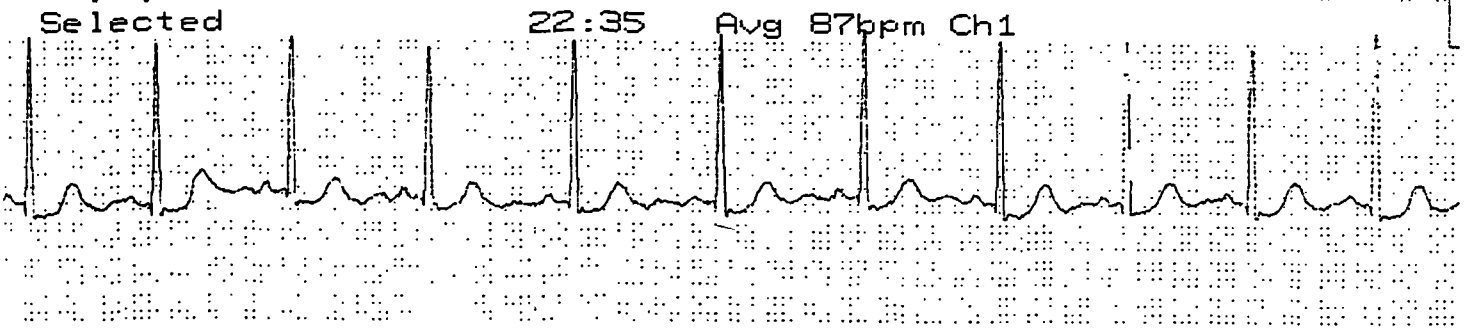
DEALING WITH SERIOUS INJURY

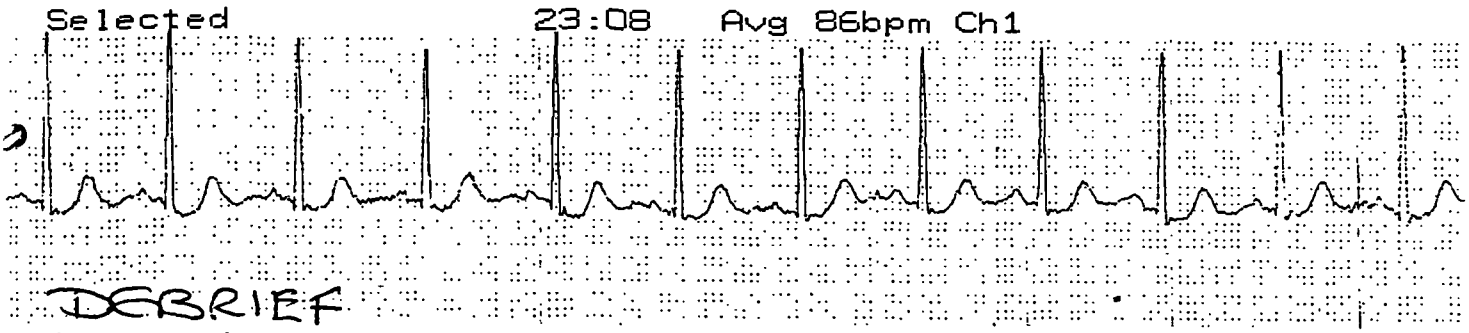


STATIC

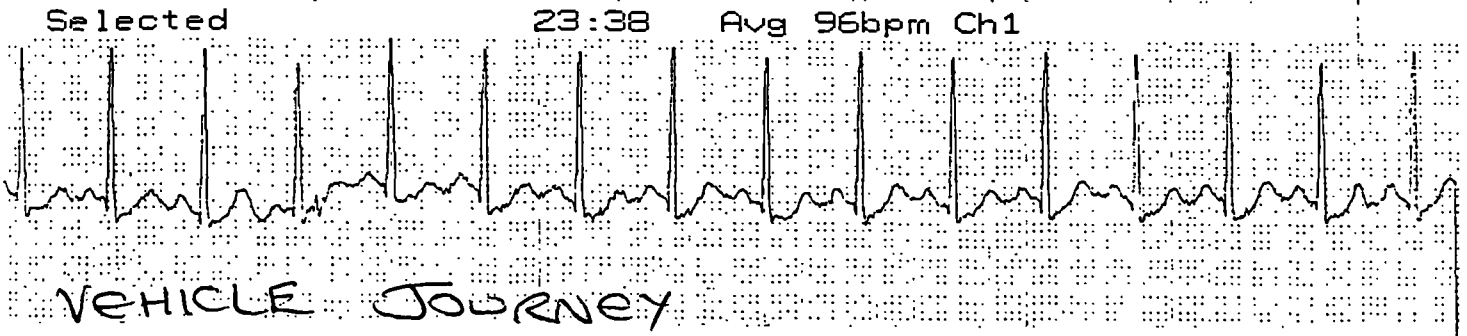


STATIC

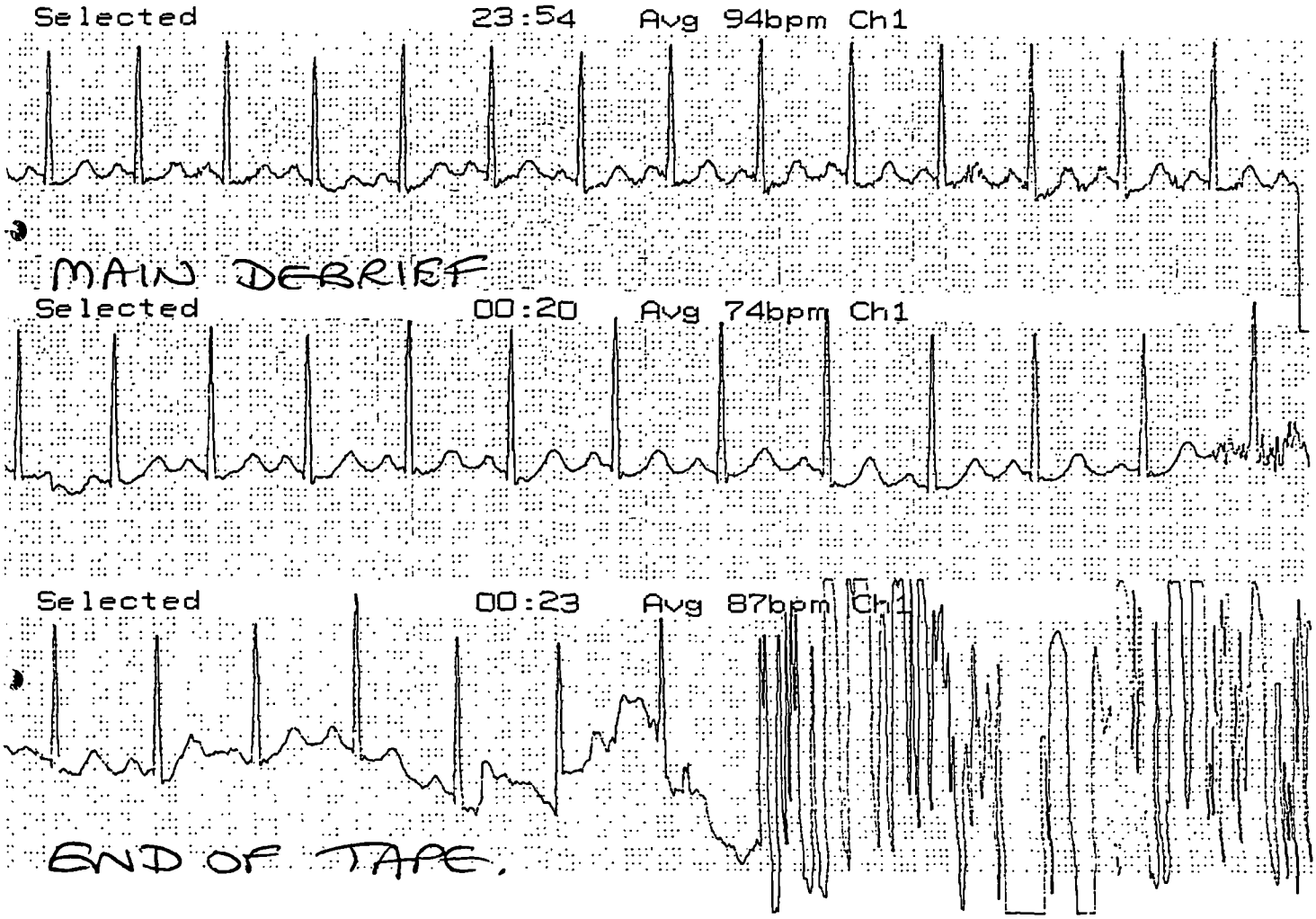




DEBRIEF

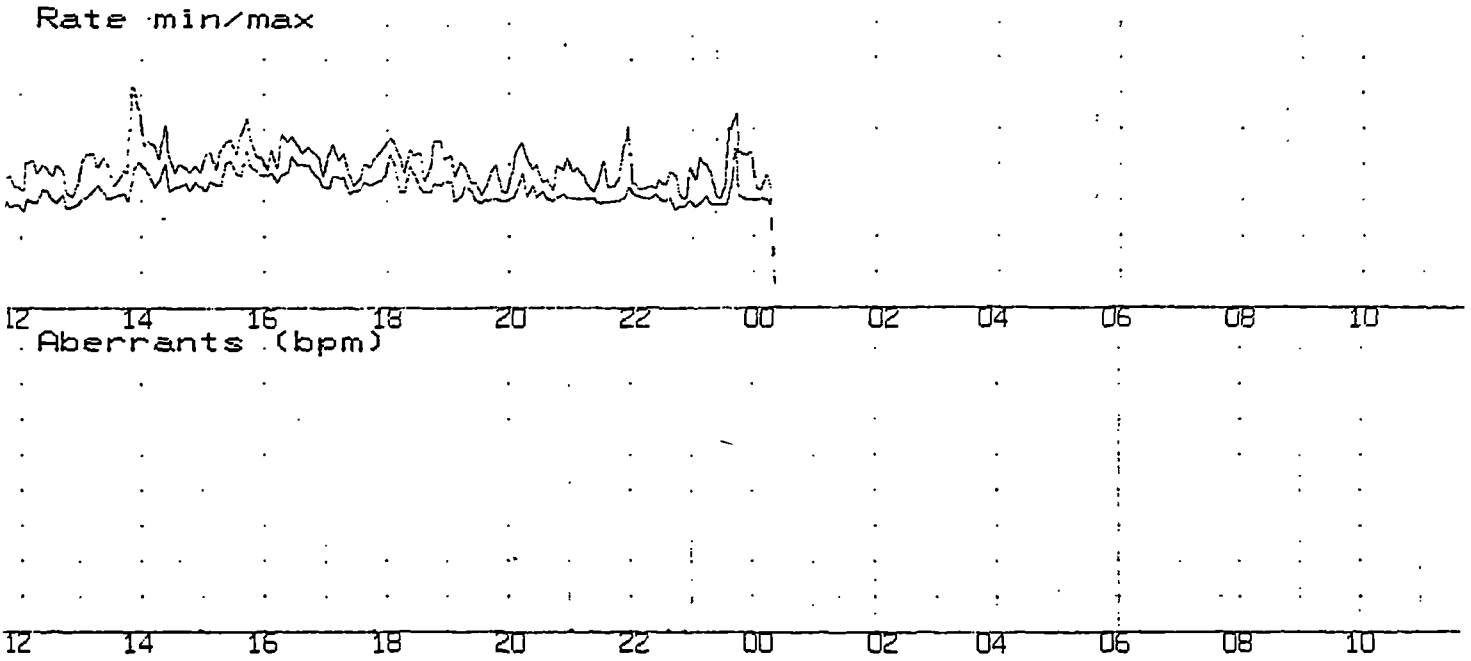


VEHICLE JOURNEY


Selected 23:54 Avg 94bpm Ch1
MAIN DEBRIEF
Selected 00:20 Avg 74bpm Ch1
Selected 00:23 Avg 87bpm Ch1
END OF TAPE.

QRS	ABER	CPLT	TRIP LET	SALVO	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
3387	273	0	0	2	0	0	0	0	65	226	0
5019	0	0	0	0	0	0	0	0	68	104	1
5587	0	0	0	0	0	0	0	0	75	155	0
5721	1	0	0	0	0	1	0	0	82	128	0
6112	0	0	0	0	0	0	1	0	82	133	0
5810	0	0	0	0	0	0	0	0	85	121	0
5728	1	0	0	0	0	0	0	0	80	115	0
5870	0	0	0	0	0	0	0	0	81	119	0
5021	0	0	0	0	0	0	0	0	73	107	2
5247	0	0	0	0	0	1	0	0	74	115	0
4985	1	0	0	0	0	0	0	0	73	128	0
4793	2	0	0	0	0	2	0	0	69	98	0
5191	0	0	0	0	0	0	0	0	71	136	0
1735	0	0	0	0	0	0	0	0	72	92	109
70506	278	0	0	2	0	4	1	0			112

DS: Trigger = 13%; Shape A = 50%; Aberrant A = 40%; Analysed Channel 1.
1: Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.



PATHFINDER 3 ANALYSIS REYNOLDS MEDICAL LTD

NT

ntification:-

e:- PARTICIPANT D

ss:- CARNIVAL TAPE

:-

::-

PHYSICIAN

Department:-

Name:-

Address:-

Recording date:-

Analysis date:- 6/1/96

hnical Details:

order S/N:-

inical Details:

gned:-

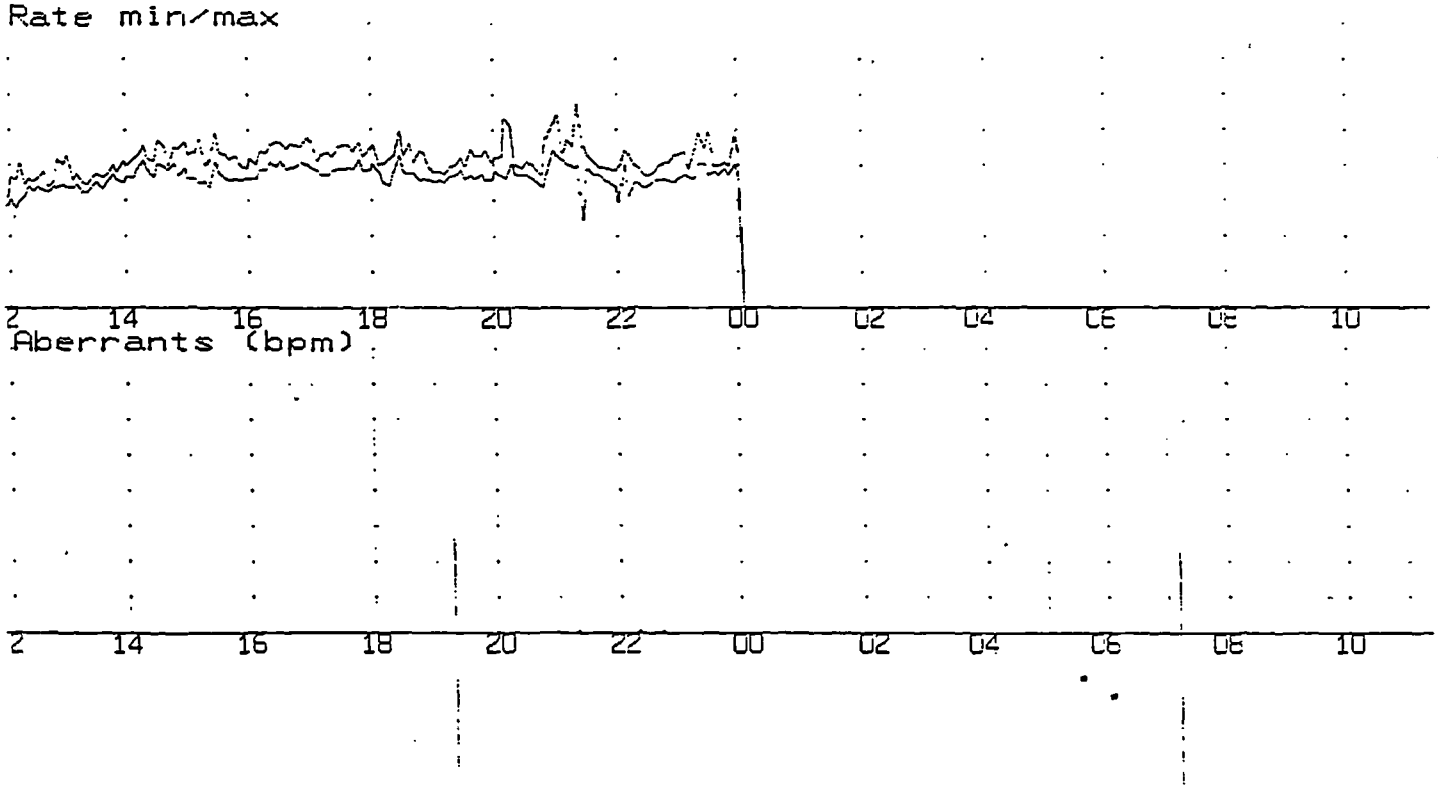
Date:-

RE	ABER	CPLT	TRIP LET	BAL/O	VT	PREM NORM	SVT	FALSE	RATE MIN	RATE MAX	ARTFCT SECS
414	0	0	0	0	0	0	0	0	75	89	54
456	0	0	0	0	0	0	0	0	77	88	22
479	0	0	0	0	0	0	0	0	65	83	0
489	0	0	0	0	0	0	0	0	76	82	0
405	0	0	0	0	0	0	0	0	76	84	0
[illegible]7	0	0	0	0	0	0	0	0	77	102	2
456	0	0	0	0	0	0	0	0	67	100	0
466	0	0	0	0	0	0	0	0	71	75	0
457	0	0	0	0	0	0	0	0	70	82	8
487	0	0	0	0	0	0	0	0	77	93	18
463	0	0	0	0	0	0	0	0	71	85	7
471	0	0	0	0	0	0	0	0	72	77	1
411	0	0	0	0	0	0	0	0	75	91	6
458	0	0	0	0	0	0	0	0	70	90	5
411	0	0	0	0	0	0	0	0	74	101	1
406	0	0	0	0	0	0	0	0	78	87	0
439	0	0	0	0	0	0	0	0	85	90	0
427	0	0	0	0	0	0	0	0	82	89	1
439	0	0	0	0	0	0	0	0	85	91	0
432	0	0	0	0	0	0	0	0	82	95	6
408	0	0	0	0	0	0	0	0	81	85	2
428	0	0	0	0	0	0	0	0	84	88	0
[illegible]7	0	0	0	0	0	0	0	0	84	104	11
457	0	0	0	0	0	0	0	0	86	101	3
439	0	0	0	0	0	0	0	0	84	106	0
437	0	0	0	0	0	0	0	0	84	90	1
433	0	0	0	0	0	0	0	0	87	94	5
420	0	0	0	0	0	0	0	0	81	88	2
408	0	0	0	0	0	0	0	0	81	87	4
427	0	0	0	0	0	0	0	0	86	92	7
445	0	0	0	0	0	0	0	0	88	94	0
436	0	0	0	0	0	0	0	0	83	91	1
432	0	0	0	0	0	0	0	0	88	93	6
448	0	0	0	0	0	0	0	0	93	99	7
444	0	0	0	0	0	0	0	0	89	95	3
474	0	0	0	0	0	0	0	0	87	102	4
463	0	0	0	0	0	0	0	0	91	100	2
494	0	0	0	0	0	0	0	0	91	104	1
512	0	0	0	0	0	0	0	0	97	106	1
516	0	0	0	0	0	0	0	0	103	113	3
455	0	0	0	0	0	0	0	0	96	104	12
468	0	0	0	0	0	0	0	0	91	103	2
475	0	0	0	0	0	0	0	0	100	117	23
[illegible]79	0	0	0	0	0	0	0	0	98	113	6
445	0	0	0	0	0	0	0	0	96	99	26
544	0	0	0	0	0	0	0	0	100	112	1
515	0	0	0	0	0	0	0	0	92	111	2
487	0	0	0	0	0	0	0	0	97	115	13
462	0	0	0	0	0	0	0	0	90	107	9
488	0	0	0	0	0	0	0	0	90	109	4
435	0	0	0	0	0	0	0	0	87	118	19
453	0	0	0	0	0	0	0	0	88	100	6
449	0	0	0	0	0	0	0	0	84	103	8
530	0	0	0	0	0	0	0	0	102	122	0
517	0	0	0	0	0	0	0	0	94	108	1
460	0	0	0	0	0	0	0	0	90	107	5
480	0	0	0	0	0	0	0	0	89	104	7
474	0	0	0	0	0	0	0	0	90	106	8
450	0	0	0	0	0	0	0	0	89	100	7
465	0	0	0	0	0	0	0	0	90	97	0
471	0	0	0	0	0	0	0	0	90	104	0
[illegible]71	0	0	0	0	0	0	0	0	90	101	3
500	0	0	0	0	0	0	0	0	96	109	5
508	0	0	0	0	0	0	0	0	96	108	0
543	0	0	0	0	0	0	0	0	102	114	2

78	0	0	0	0	0	0	0	0	97	112	9
31	0	0	0	0	0	1	0	0	98	115	1
80	0	0	0	0	0	0	0	0	99	114	14
82	0	0	0	0	0	0	0	0	102	113	20
15	0	0	0	0	0	0	0	0	100	119	13
95	0	0	0	0	0	0	0	0	98	117	7
79	0	0	0	0	0	0	0	0	96	103	5
93	0	0	0	0	0	0	0	0	93	107	0
91	0	0	0	0	0	0	0	0	93	109	7
02	0	0	0	0	0	0	0	0	96	106	1
23	0	0	0	0	0	0	0	0	97	113	3
93	0	0	0	0	0	0	0	0	97	114	3
08	0	0	0	0	0	0	0	0	98	114	8
43	0	0	0	0	0	0	0	0	97	110	40
35	0	0	0	0	0	0	0	0	104	116	5
80	0	0	0	0	0	0	0	0	96	106	8
13	0	0	0	0	0	0	0	0	96	111	1
19	0	0	0	0	0	0	0	0	99	113	0
77	0	0	0	0	0	0	0	0	94	99	5
45	0	0	0	0	0	0	0	0	87	101	13
49	0	0	0	0	0	0	0	0	85	104	8
05	0	0	0	0	0	0	0	0	95	106	0
28	0	0	0	0	0	0	0	0	106	123	8
27	0	0	0	0	0	0	0	0	95	107	22
64	0	0	0	0	0	0	0	0	94	115	1
61	0	0	0	0	0	0	0	0	94	102	4
45	0	0	0	0	0	0	0	0	89	110	12
64	0	0	0	0	0	0	0	0	90	108	5
52	0	0	0	0	0	0	0	0	89	97	4
39	0	0	0	0	0	0	0	0	88	95	5
30	0	0	0	0	0	0	0	0	89	95	14
46	0	0	0	0	0	0	0	0	88	94	4
48	0	0	0	0	0	0	0	0	92	99	14
78	0	0	0	0	0	0	0	0	93	100	0
84	0	0	0	0	0	0	0	0	96	105	7
58	0	0	0	0	0	0	0	0	90	99	9
90	0	0	0	0	0	0	0	0	92	111	6
35	0	0	0	0	0	0	0	0	90	106	17
74	0	0	0	0	0	0	0	0	93	106	11
45	0	0	0	0	0	0	0	0	89	110	12
26	0	0	0	0	0	0	0	0	89	102	22
56	0	0	0	0	0	0	0	0	95	105	1
80	0	0	0	0	0	0	0	0	92	106	2
68	0	0	0	0	0	0	0	0	90	132	16
80	0	0	0	0	0	0	0	0	100	127	17
35	0	0	0	0	0	0	0	0	92	99	24
77	0	0	0	0	0	0	0	0	92	97	0
34	0	0	0	0	0	1	0	0	92	102	24
15	0	0	0	0	0	0	0	0	90	100	28
51	0	0	0	0	0	0	0	0	88	96	2
02	0	0	0	0	0	0	0	0	84	93	17
69	0	0	0	0	0	0	0	0	94	119	26
92	0	0	0	0	0	0	0	0	110	129	9
67	0	0	0	0	0	0	1	0	106	135	16
93	0	0	0	0	0	0	0	0	103	109	14
98	0	0	0	0	0	0	0	0	100	118	15
96	1	0	0	0	0	0	0	0	98	113	10
68	0	0	0	0	0	0	1	0	99	143	45
11	0	0	0	0	0	0	0	0	62	113	49
24	0	0	0	0	0	0	0	0	97	106	25
75	0	0	0	0	0	0	0	0	93	102	3
35	0	0	0	0	0	0	0	0	93	98	18
58	0	0	0	0	0	0	0	0	89	98	0
17	0	0	0	0	0	1	0	0	88	97	22
25	0	0	0	0	0	0	0	0	85	96	8
94	0	0	0	0	0	0	0	0	73	98	33
63	0	0	0	0	0	0	0	0	99	110	36

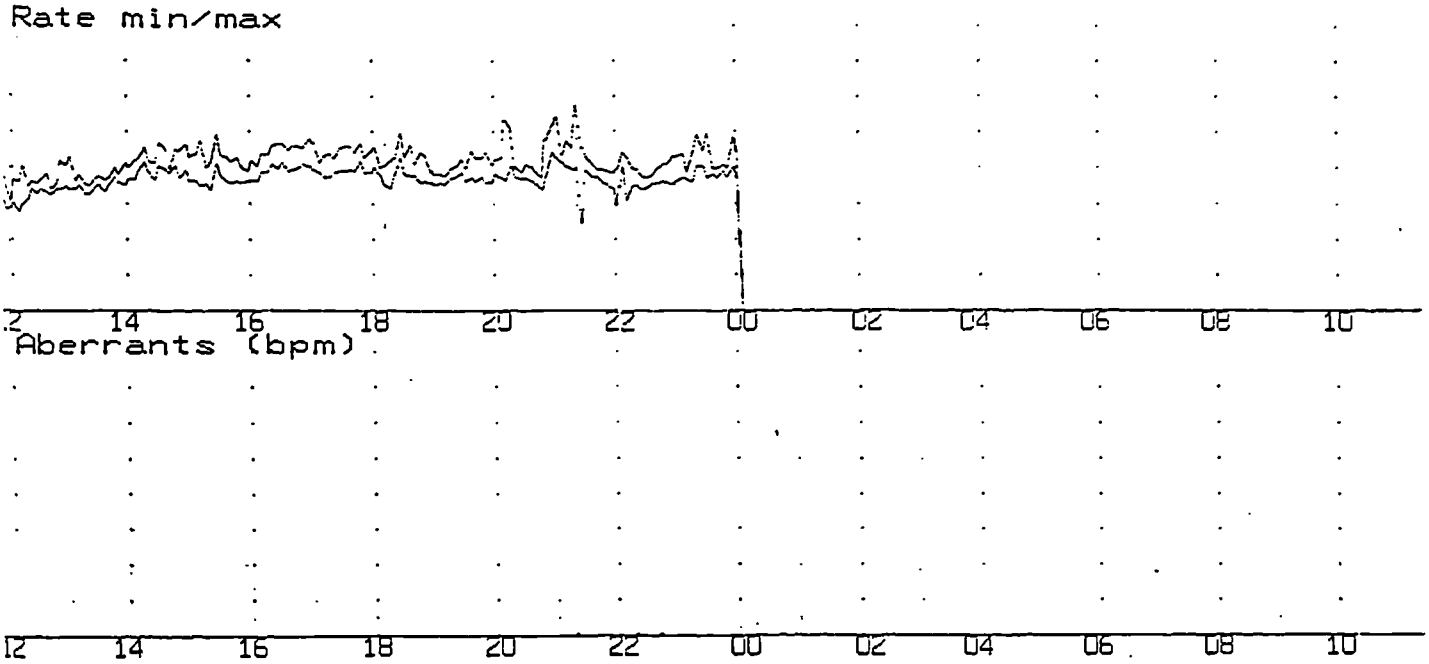
43									87	95	
41	0	0	0	0	0	0	0	0	87	98	4
44	0	0	0	0	0	0	0	0	84	93	1
36	0	0	0	0	0	0	0	0	86	93	4
52	0	0	0	0	0	0	0	0	89	95	0
59	1	0	0	0	0	0	0	0	89	99	4
67	0	0	0	0	0	0	0	0	90	102	6
78	0	0	0	0	0	0	0	0	89	102	2
77	0	0	0	0	0	0	0	0	88	107	0
71	0	0	0	0	0	0	0	0	90	107	14
175	0	0	0	0	0	0	0	0	93	109	5
151	0	0	0	0	0	0	0	0	91	97	6
512	0	0	0	0	0	0	0	0	90	110	1
556	0	0	0	0	0	0	0	0	101	122	2
189	0	0	0	0	0	0	0	0	101	112	11
158	0	0	0	0	0	0	0	0	93	123	22
177	0	0	0	0	0	0	0	0	95	99	2
162	0	0	0	0	0	0	0	0	93	99	8
180	0	0	0	0	0	0	0	0	97	102	7
165	0	0	0	0	0	0	0	0	93	99	6
513	0	0	0	0	0	0	0	0	99	120	8
150	0	0	0	0	0	0	0	0	92	110	4
135	0	0	0	0	0	0	0	0			6
423	3	0	0	0	0	3	2	0			1343

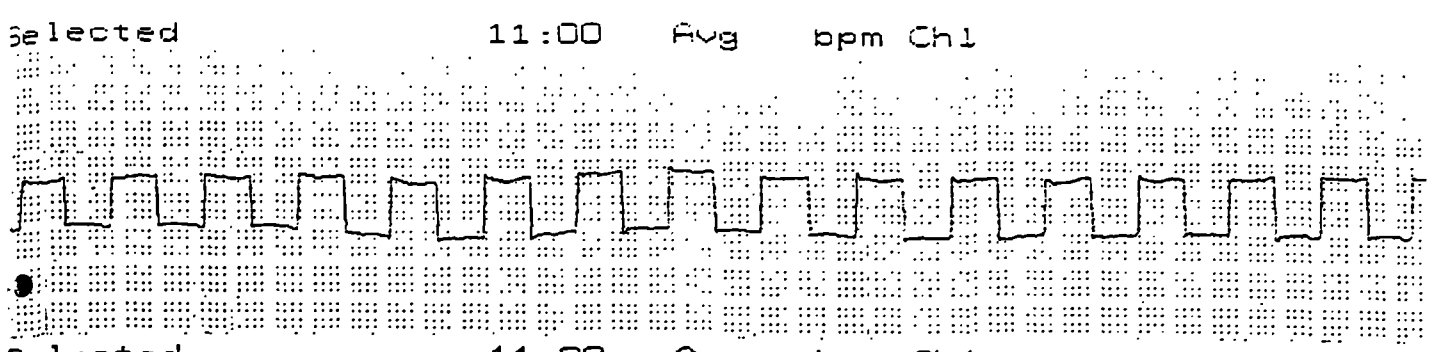
: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 64% R-R interval; RonT < 16 units.

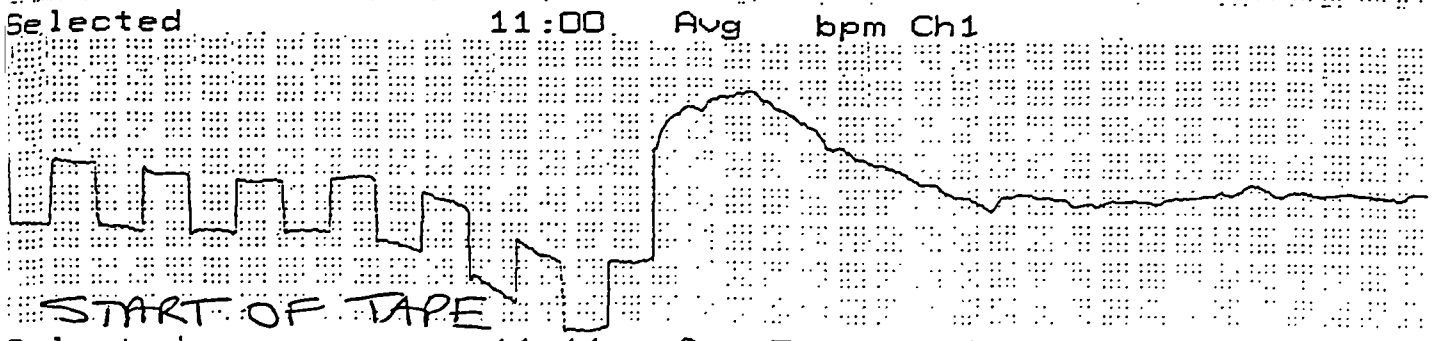


QRS	ABER	CPLT	TRIP LET	SAL/C	VT	PREM NORM	SVT	PAUSE	RATE MIN	RATE MAX	ARTFCT SECS
370	0	0	0	0	0	0	0	0	65	102	114
053	0	0	0	0	0	0	0	0	70	104	39
243	0	0	0	0	0	0	0	0	81	106	43
903	0	0	0	0	0	0	0	0	91	117	99
663	0	0	0	0	0	0	0	0	84	122	77
86	0	0	0	0	0	1	0	0	90	119	116
954	0	0	0	0	0	0	0	0	93	117	90
696	0	0	0	0	0	0	0	0	85	123	84
453	0	0	0	0	0	0	0	0	88	111	125
599	0	0	0	0	0	1	0	0	84	132	171
567	1	0	0	0	0	1	2	0	62	143	230
592	2	0	0	0	0	0	0	0	73	110	93
809	0	0	0	0	0	0	0	0	90	123	97
585	0	0	0	0	0	0	0	0	92	110	10
423	3	0	0	0	0	3	2	0			1388

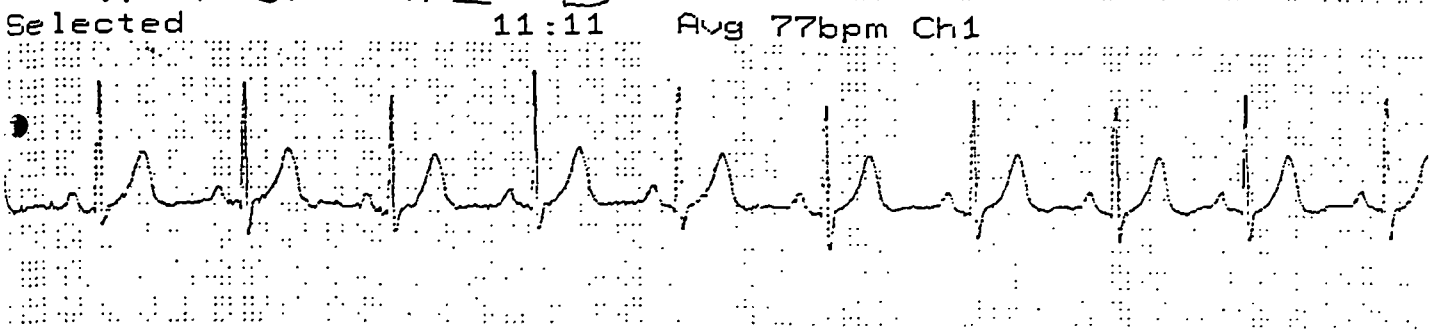
S: Trigger = 13%; Shape A = 50%; Aberrant A = 44%; Analysed Channel 1.
Salvo > 4 beats; SVT > 5 beats, > 130 bpm(459); VT > 5 beats, > 100 bpm(600);
Pause > 1.50 seconds; Prematurity < 84% R-R interval; RonT < 16 units.

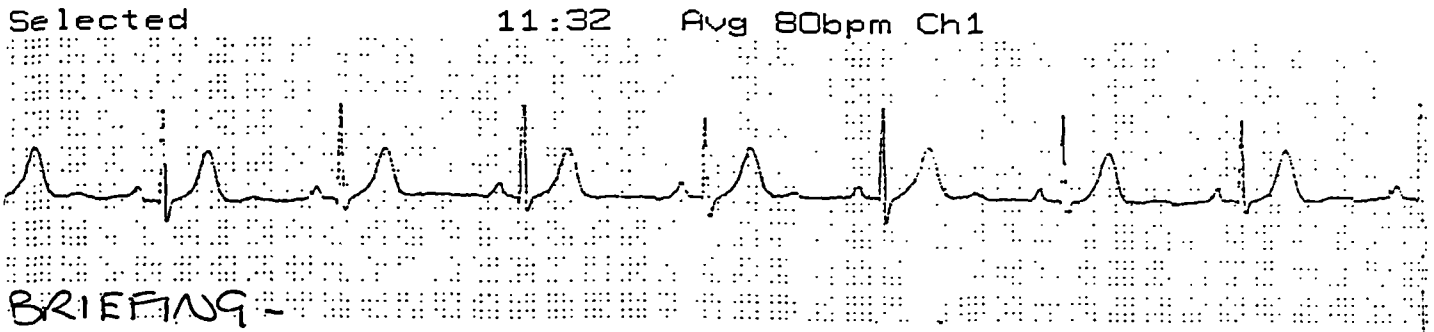




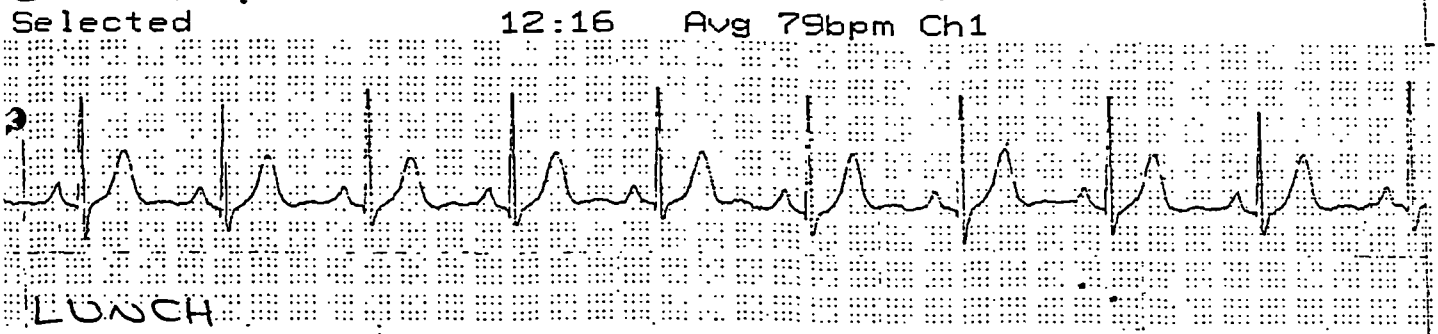


START OF TAPE

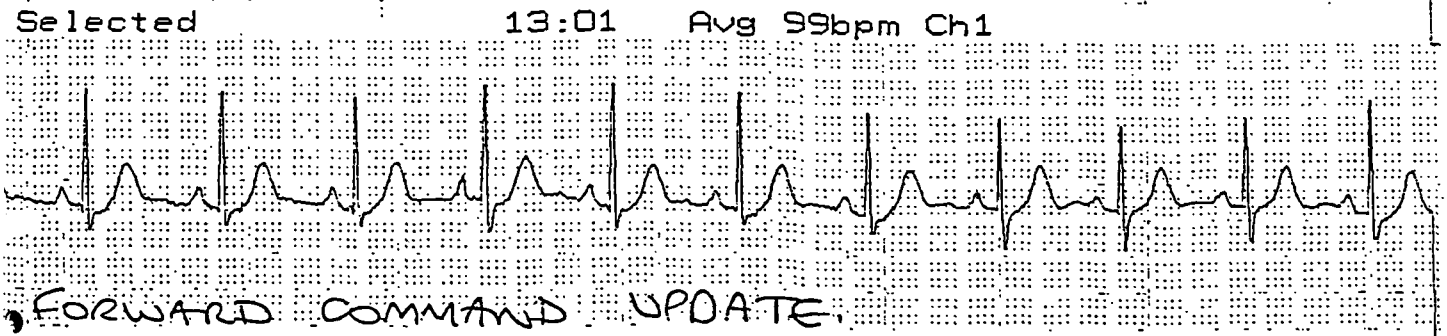




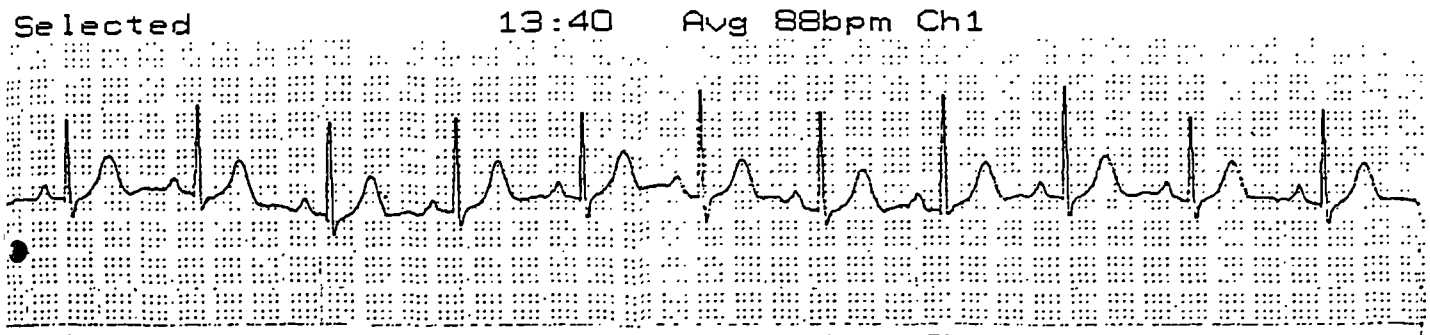
BRIEFING -

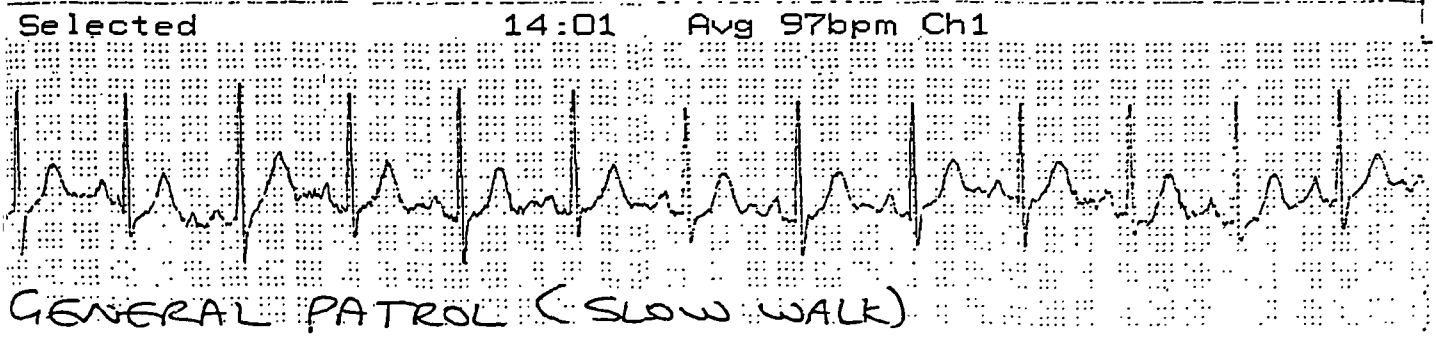


LUNCH

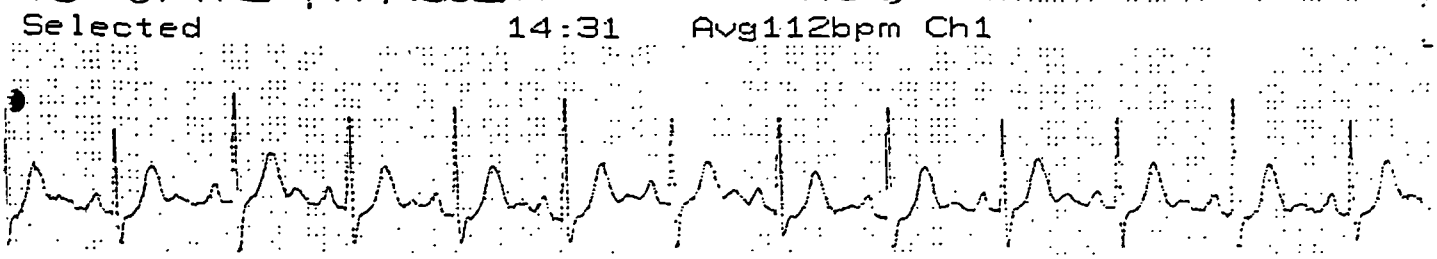


FORWARD COMMAND UPDATE.

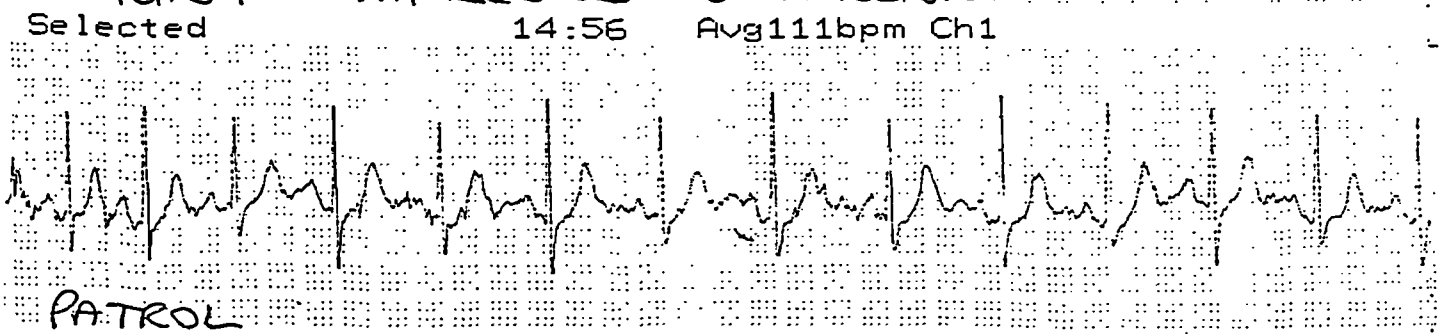




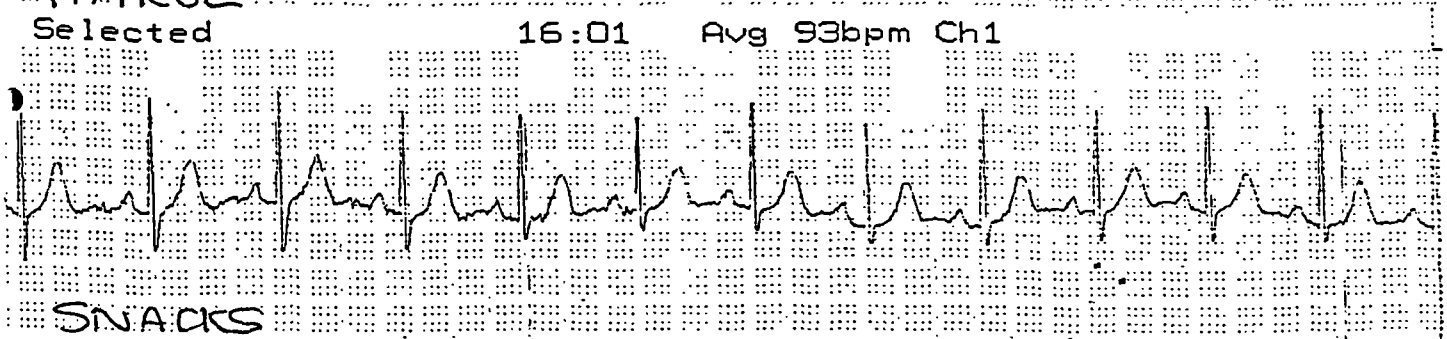
GENERAL PATROL (SLOW WALK)



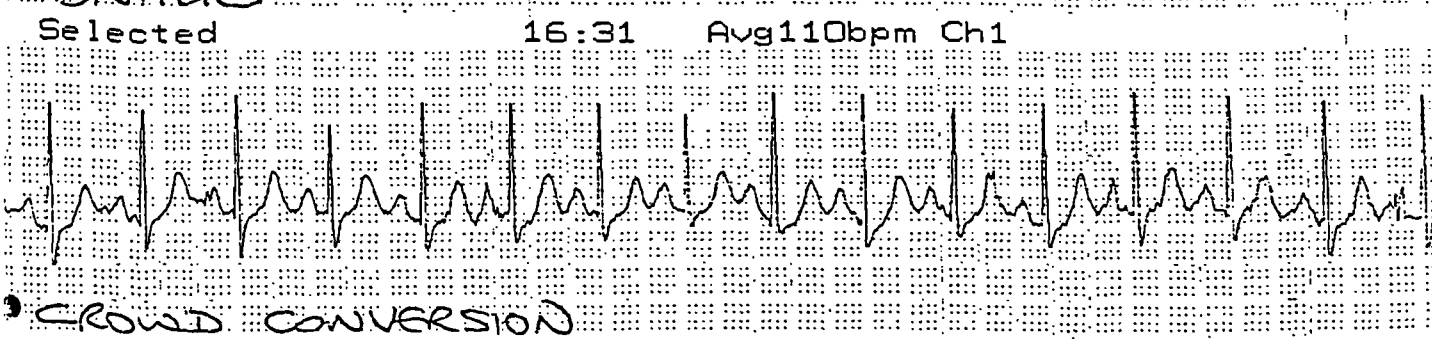
DEALING WITH CROWD CONVERSION



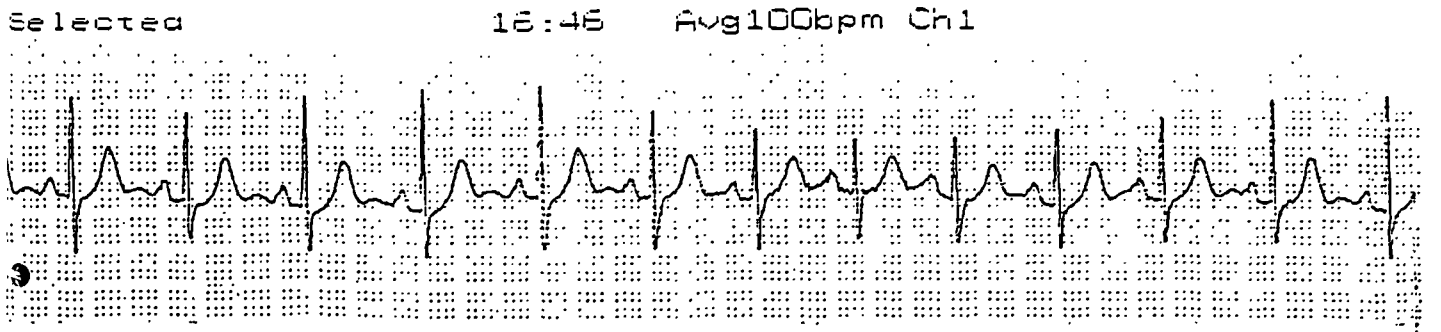
PATROL

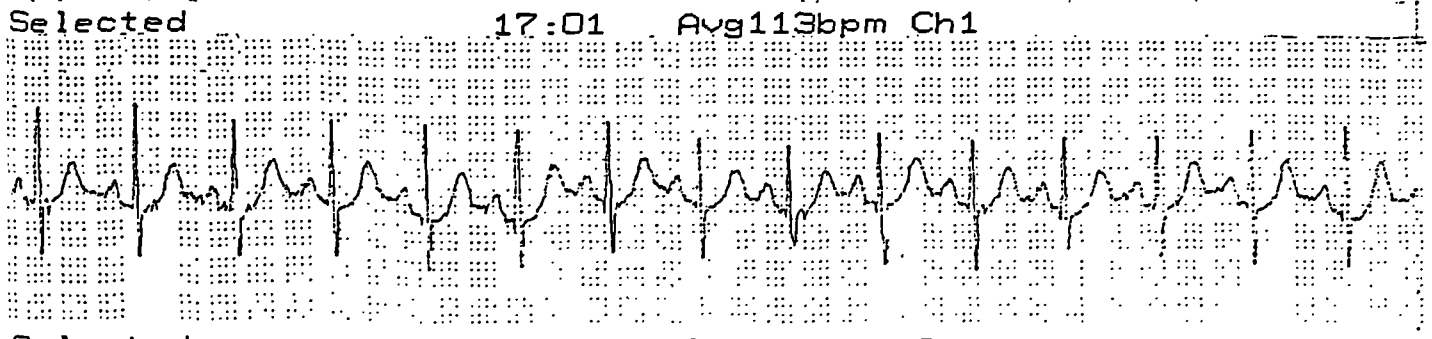


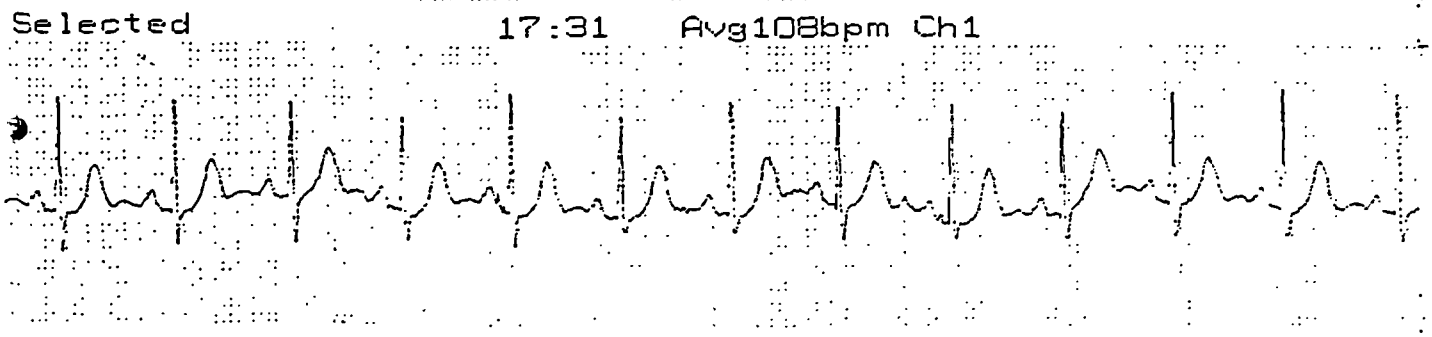
SNACKS

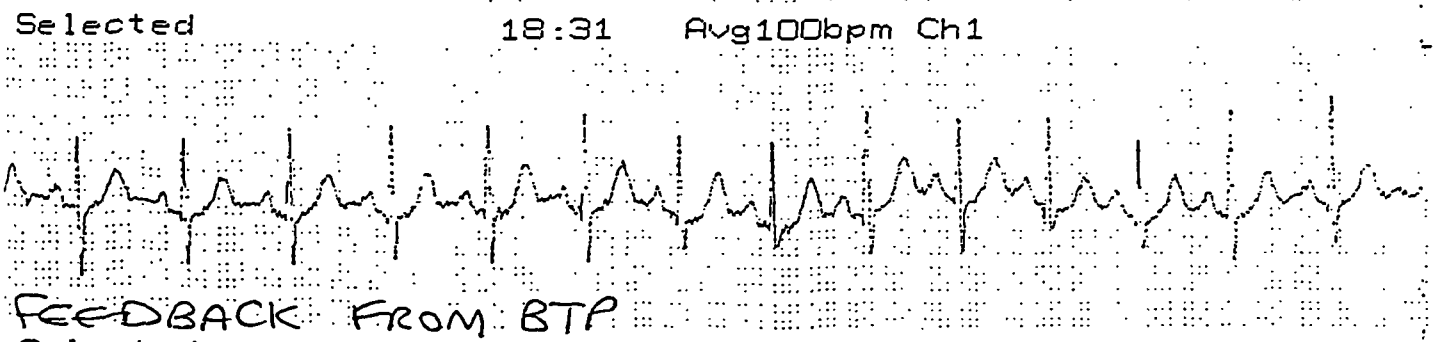


CROWD CONVERSION

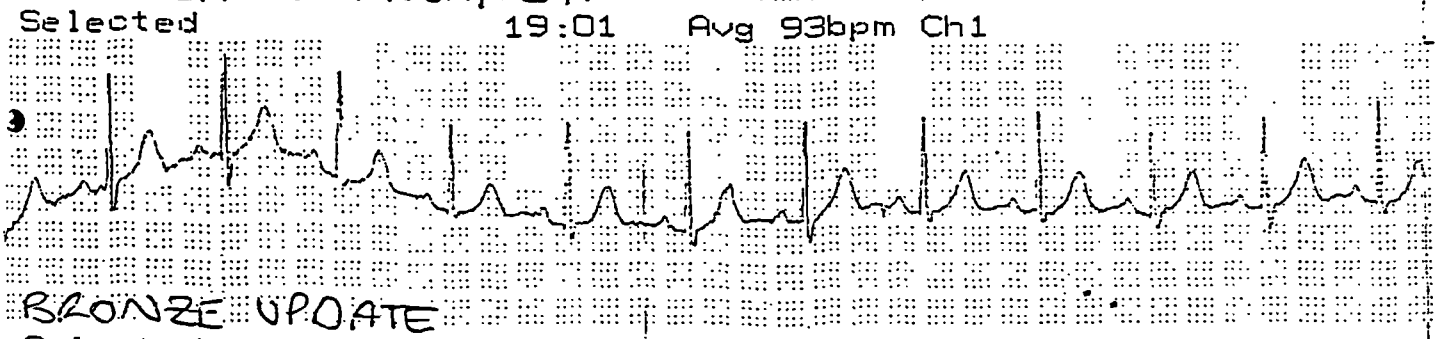




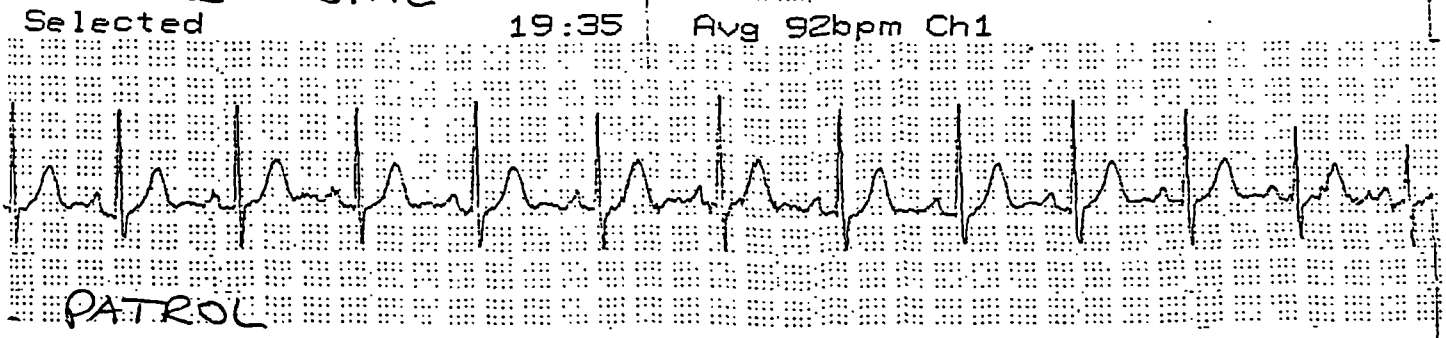




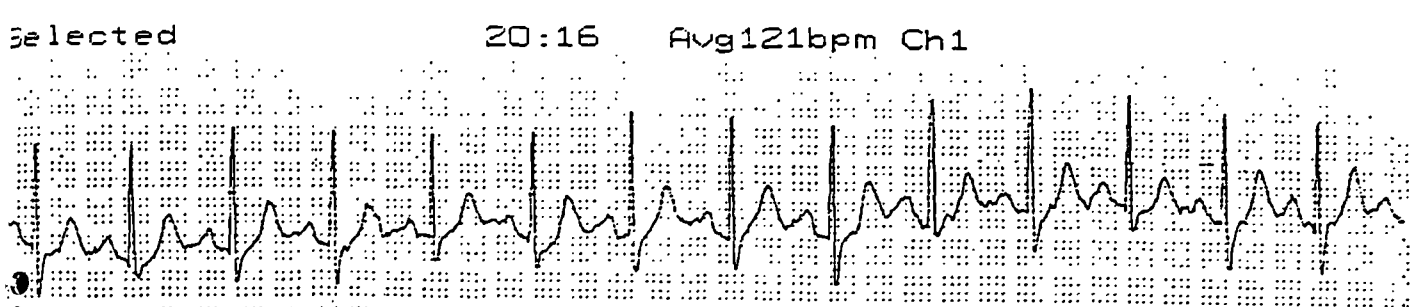
FEEDBACK FROM BTP



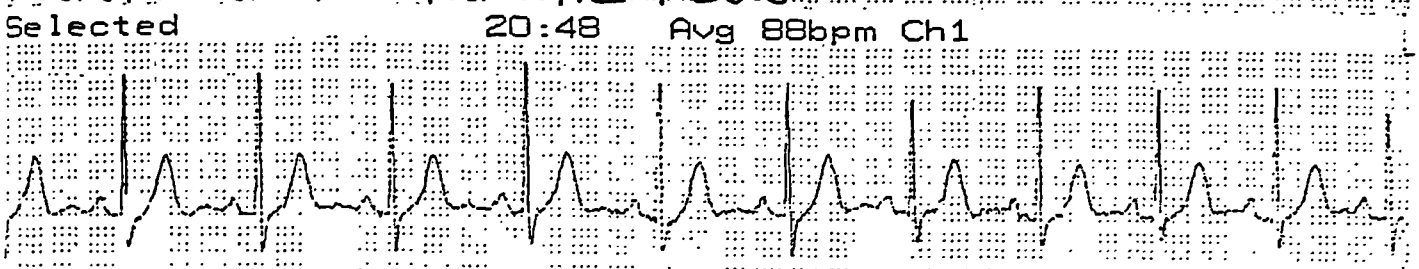
BRONZE UPDATE



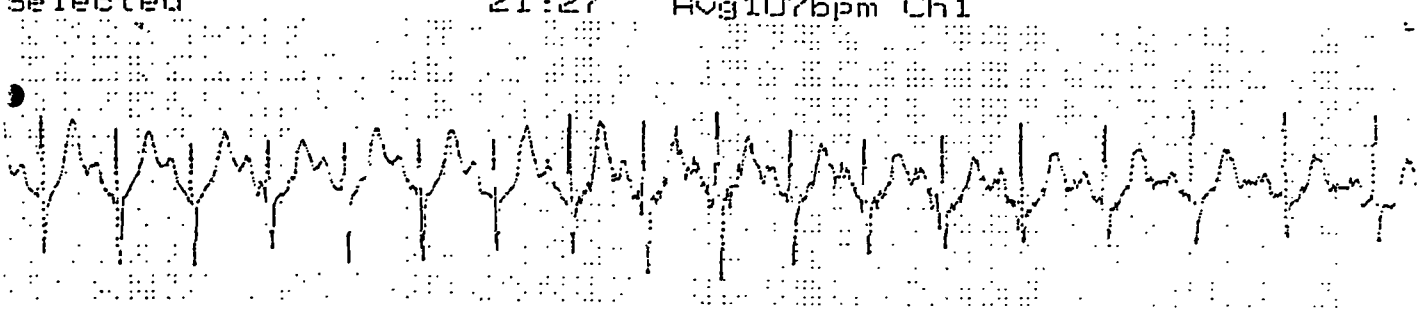
PATROL

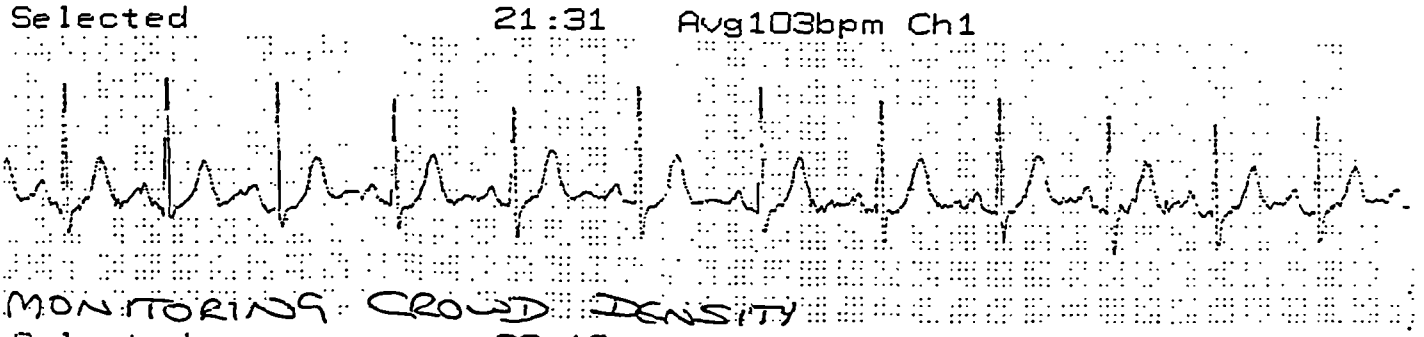


MONITORING CARNIVAL FLOW

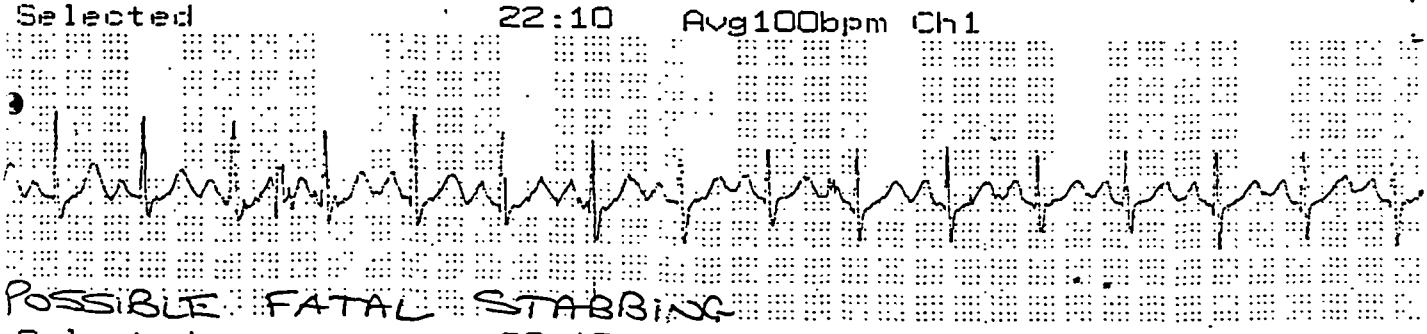


CONFRONTATION WITH MEMBER OF CROWD

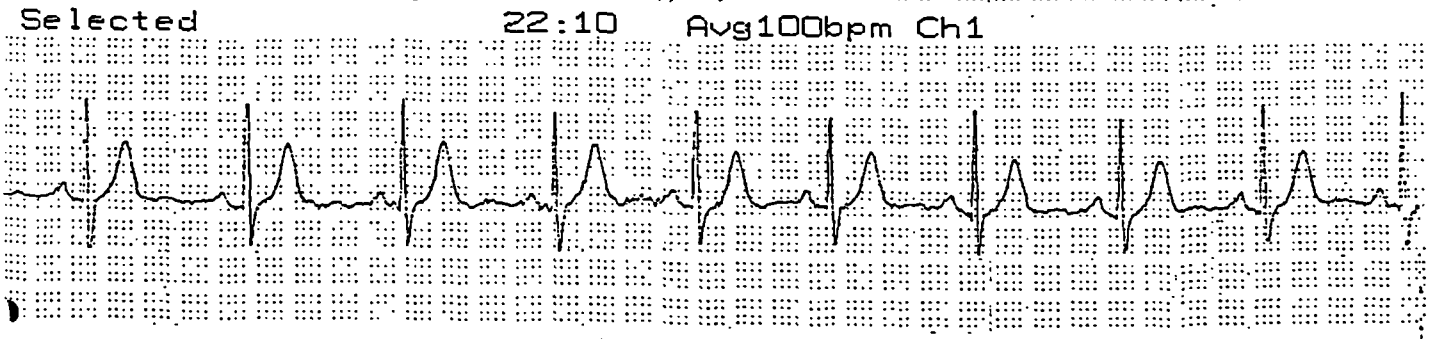




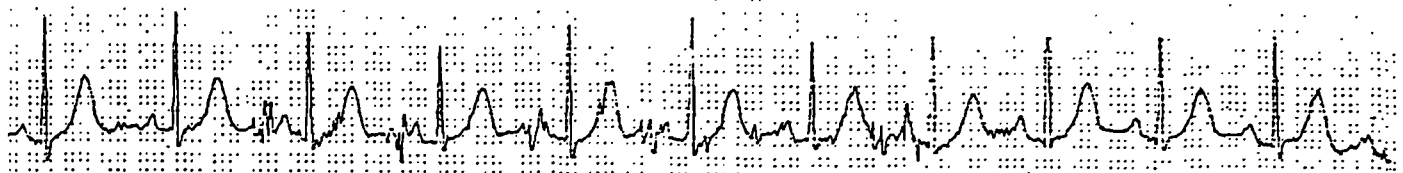
MONITORING CROWD DENSITY



POSSIBLE FATAL STABBING

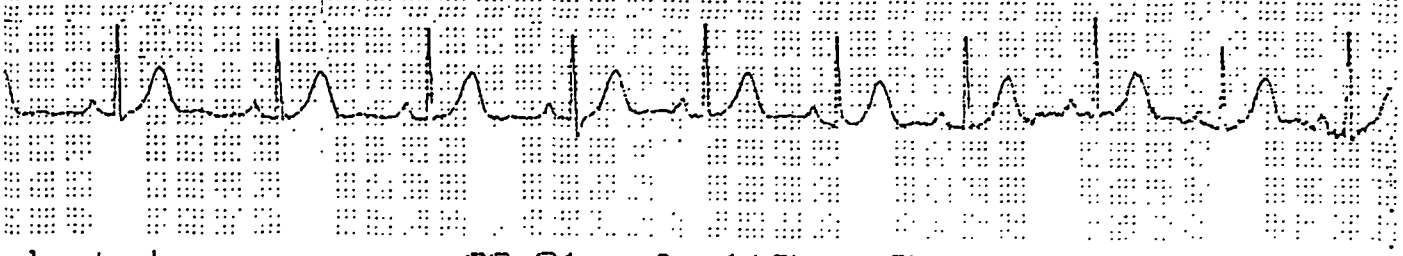


elected 22:15 Avg 85bpm Ch1

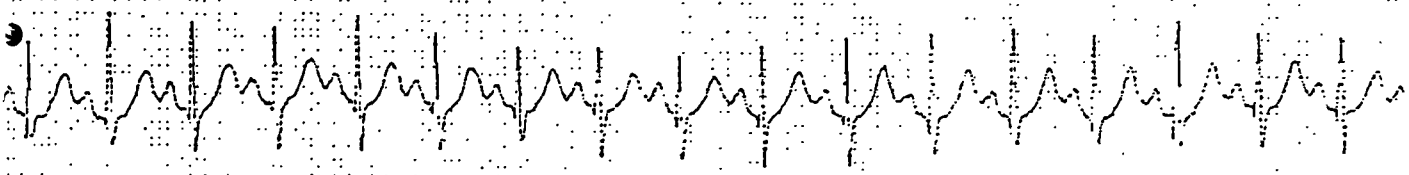


ONITORING STABBING INCIDENT

elected 22:32 Avg 89bpm Ch1

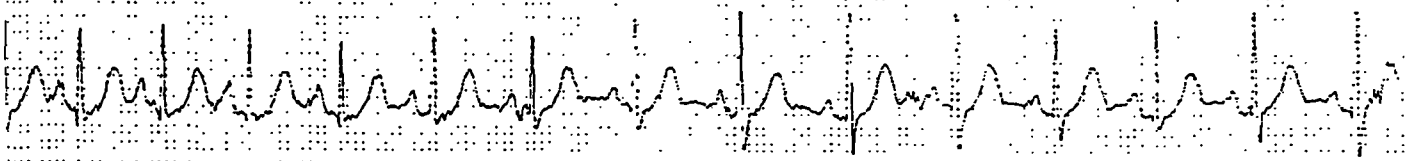


elected 23:31 Avg112bpm Ch1



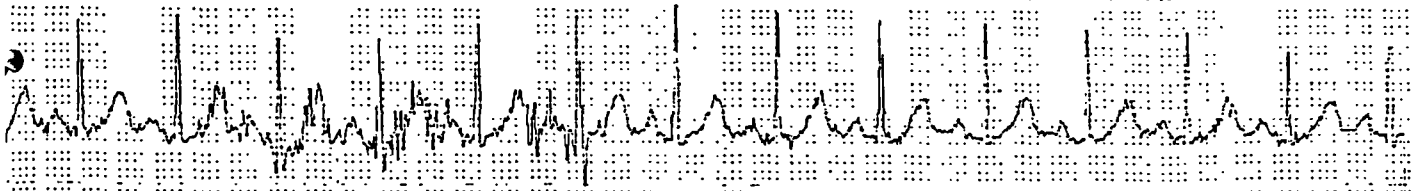
NO LONGER FATAL

elected 23:31 Avg112bpm Ch1



BRONZE DEBRIEF

elected 00:05 Avg 92bpm Ch1



SECTOR COMMAND DEBRIEF

Appendix 15

Briefing Note for Heart Rate Monitoring (H27)

Relevant Personnel:

Sector 1 - 5 Bronzes

Supt Lally
Supt Barrat
Supt Sharp
Chief Supt Newham
Supt Patterson

Commander Rowe

PURPOSE OF EXERCISE

The purpose of the exercise is to attempt to measure stress levels experienced by command officers during the management of Nottinghill Carnival. The command and control training system called Minerva is to be used for the first time on carnival ground commanders during the Nottinghill Carnival 1995. The five sector commanders and Gold for the event are to be measured during the simulation training sessions and out in the real world, ground assigned. It is hoped that the measurements will provide indications as to the fidelity and effectiveness of the simulation exercises.

Consent Forms

A consent form will need to completed by each officer. The form will state that the officer's measurements at all times will remain confidential. All participants will be referred throughout the research and at any other time as participant A, B, C etc.

The heart rate recordings will be analysed by Edgware General Hospital Cardiology Research Department. In the unlikely event that a measurement shows an abnormality, participating officers will be given the option on the consent form of having this information disclosed to them or not. This information will be only be made available to the participant.

Intended Procedure

The equipment consists of a walkman sized tape recorder located by small strap from the waist belt. Four leads are stuck to the surface of the skin in the chest area. These electrodes will be fitted by doctors from Edgware Hospital. The electrodes record the voltages produced in the chest area by the heart. The leads should not generate discomfort and are designed to be worn for anything up to 48 hours without difficulty. Of course this will not be necessary during the experiments.

Ground Assigned

The leads will need to be fitted early on the Monday of Carnival. The doctors will locate the sector commanders at pre determined times and locations and attach the recording devices. The Devices will be removed at the debriefing session probably early Tuesday morning.

Simulation Sessions

The leads will be fitted by the doctors at the training school before the simulated exercises begin and removed at the end of the day.

Activity Log

In order to provide a relationship between heart rate and subject activity, a log of activity will be required for each subject under test. During the training session this will be straightforward as the exact time problems are presented to the subjects will be known and under the direct control of the training staff.

In the field the Bronze's runner will need to be an observer logging activities during the day. A special log sheet has been prepared and is attached for your information. A short briefing will be made to the runner when his or her Bronze is being prepared.

Additional Notes

I have spoken with all concerned with this experiment and on the whole the response has been extremely good. Commander Rowe has agreed to take part along with three of the five sector bronzes with the remaining two undecided.

I have been building Minerva for two and a half years. It belongs wholly to the Met. Police and from my research there seems to be no other comparable system, this includes the Scottish System of which Minerva's early concepts were taken.
Many would have seen and participated in the football exercise and I will be the first to admit that the system has a long way to go before it can be said to be 'proven'.

Since the football exercises the system has gone through radical redesign based on lessons learnt. The new system pushes the technology and the learning philosophy further. Nottinghill Carnival is the first course to utilise this new system at its purpose built accommodation.

The next training course will be 'Armed Siege' under the sponsorship of Commander Roy Ramm. The filming for this project is now complete, the training simulation exercise will be completed later this year with the strengths and weaknesses of Carnival taken into account.

The London Fire Brigade has just completed the installation of Minerva at its Officer Development Group Centre at Lambeth with the London Ambulance Service showing keen interest.

Without continued research into its effectiveness I can have no real idea of its value or mechanism to modify its design. The measurement of heart rate is not the only indicator stress but accompanied with a log of activities and observations in the simulation exercises will provide a quantitative measure and assist me greatly in furthering Minerva's effectiveness.

What I need Now

With such a short time till the training week July 3 - 7. I require the consent form to be sent back to me by Valuables Despatch to Room 111 Peel Centre marked Staff in Confidence, to arrive on or before June 16. Please phone me on 081 200 2963 (answer phone when out) to indicate your decision as soon as possible. This is so I can arrange for staff from Edgware General to be warned of attendance dates and hire of equipment.

May I thank you time in reading through this blurb and sending me back the forms. You can contact me on 0181 200 2963/2323 at anytime for further clarification.

Jonathan Crego
Head of Learning Technology 11 June 1995

Consent Form

Having read the briefing note H27 **(I give / do not give)** permission to have my heart rate monitored during the training exercises during the week July 3 - 7 1995 and during Carnival Monday 28 August 1995.

I understand that all findings will be anonymous and will remain so. All recorded tapes will be sent for analysis at Edgware General Hospital and that these tapes identify me only as a participant, *i.e. participant A.*

My personal findings will not be made available at any time other than shown anonymously against other anonymous participants in the study.

In the unlikely event of any recording showing a medical abnormality I **(do / do not)** wish to be informed.

Signature ----------

Name ----------

Sex ----------

D.O.B. ----------

Height ----------

Weight ----------

Are you taking any medication (this may have an effect on your heart rate)
Yes / No ----------

If yes please specify ----------

Location ----------

Telephone ----------

Fax ----------

Please Send this form immediately to Jonathan Crego room 111 peel centre in valuables despatch marked staff in confidence. Telephone 0181 200 2963 and leave message

Thank you for you help.

Appendix 16

[3:VL:2877:15237]
Radio message from Serial Inspector to control that crowds are building up and he is going to investigate
[I.2]
[MT:14:30]
[RT:1:00]
[2:VL:13879:14660]
Only to be played if Bronze 2 was made aware of the last incident then play next incident
[I.3]
[MT:14:31]
[RT:1:00]
[2:VP:11236:11733|DL:10|TM:S2E7I3.TXT]
Text message to Bronze 2 explaining reason for build up.
[I.4]
[MT:14:33]
[RT:1:30]
[3:VP:806:1431|DL:26|TM:S2E7I4.TXT]
[1:VL:6670:10495]
[2:VL:8815:10662]
Written report to Division that drunken fans are heading for the ground.
[I.5]
[MT:14:34]
[RT:1:00]
[3:VP:1450:2495|DL:15|GD:WELLGATE.PCX]
Fans fighting.
[E.8]
Fans with forged tickets
[I.1]
[MT:14:35]
[RT:1:00]
[1:VP:1782:2277|DL:15|TM:S2E8I1.TXT|DL:20|GD:WESTCOVE.PCX]
[3:VL:20395:21998]
Bronze 1 sees video of fans arguing over a seat, followed by text explanation
[I.2]
[MT:14:38]

[RT:1:00]
[0:VP:0879:1213]
[1:VL:6670:10495]
[3:VL:23771:45917]
Chief Steward tells Control about forged tickets
[I.3]
[MT:14:45]
[RT:1:00]
[2:VP:1115:1596|DL:18|TM:S2E8I3.TXT]
[0:VL:11599:12977]
CID tell Bronze 2 they have arrested a tout with £2000 and some forged tickets
[I.4]
[RT:1:00]
[1:TM:S2E8I4.TXT]
Bronze 1 gets a text message that 50 supporters have gained entry on forged tickets
[I.5]
[MT:14:55]
[RT:1:00]
[2:VP:1597:2142|DL:15|TM:S2E8I5.TXT]
[1:VL:10557:15021]
[3:VL:17236:20376]
Bronze 2 sees crowd getting worried about missing the kick off, followed by text explanation
[E.9]
200 fans want to move to other side of ground
[I.1]
[MT:14:58]
[RT:1:00]
[1:TM:S2E9I1.TXT]
[2:VL:13229:15140]
[3:VL:2877:15237]
Bronze 1 gets text message that 200 fans are in the wrong terrace, and want to move. He should check with Gold
[E.10]
Kick-Off
[I.1]
[MT:15:00]

Appendix 17



The Minerva Project

1 Area
Carnival Management
Training System

Minerva Computer Project Developed by : Jonathan Crego
Carnival Training System Written by : Andrew Amery

The Minerva Project

1 Area
Carnival Training System

Contents

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Cordons	8
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Sector Map	12
Sector Deployment Sheet	13
Sub Sector Deployment Sheet(s)	14
Acknowledgements	18

The Minerva Project

1 Area
Carnival Training System

Timetable

10.00	Assemble at the Simulation Suite (Coffee Provided)
10.20	Address By Commander Rowe
10.30	Briefing
10.50	Team Preparation
11.15	Coffee
11.30	Simulation Exercise
13.30 (Approx.)	Lunch
14.15	De Brief

The Minerva Project

The Minerva System has been developed to provide an enhanced training environment whereby senior officers can participate in a form of crisis management training that is far more realistic than those available in the past. Based in The Simulation Suite at Hendon the project is being developed in order to meet several specific training needs, covering matters such as Football Stadia management, siege and hostage situations and of course Carnival training.

By the use of independent interactive video rooms called 'pods' officers can train as individuals whilst still being part of an important management team where decisions made by any one person may well affect the whole team. It allows a more realistic form of training requiring officers to make decisions in real time without the luxury of having a private discussion around a table before coming to a decision. Additionally, the results of any action taken will then unfold in front of the officer, requiring him / her to follow the matter through to its conclusion.

Communication between officers is still an important part of any decision making process but at most large scale events face to face discussion about matters is rarely available. This system fully takes this into account and as such provides a fully operational two way radio system between all Bronzes and GT. The sector commander also has access to a telephone to enable him to contact or be contacted by 'Gold', 'GT' or any other relevant agency.

The Carnival Training System

The Carnival Training System (hereafter known as 'The Game') is broadly based on Sector 5 of the Notting Hill Carnival. The sector is further divided into three sub sectors, each controlled by a Sub Bronze. The sector has been provided with manpower and the provision of the usual support serials including Sound System and Float Liaison. If required specialist units, such as firearms teams etc can be obtained upon request from the Sector Commander to 'Gold' or 'Silver'.

Enclosed in this package are the relevant deployment schedules for your sub sector, the most recent Carnival Overview Report for the 'day' (timed at 4pm) and a sector map. Additionally you have been provided with copies of all the other sub sector deployment sheets and details of available reserves should they be required. You will be provided with the relevant large scale maps needed for the Game on arrival at the Simulation Suite. Time will be provided on the training day for the Sector Commander to hold a short briefing if requested.

Like all training packages those using this system can only benefit if they are willing to enter into the spirit of the scenarios. Whilst this is the most realistic form of training available at the current time an element of role play is still required. However, this is now much easier due to the actual incidents occurring on the video screens in front of you. It must be remembered of course that no other person is witnessing the event that you see and it is important to ensure that all relevant information is communicated to others as necessary.

Rules of the Game

In order to provide a comprehensive package various alterations have been made to ensure that the Game can run relatively smoothly. The following points are for your information and it is asked that you take them into consideration at all times whilst playing the game.

- Although you may be able to identify the real life locations from the video please assume that it is in fact at the location stated in the 'Location' box on the screen.

- Not all of the video footage is taken from Carnival, however for these purposes please always assume that what you see is occurring at Carnival.

- The timings shown on the clock will change between each specific event. Ensure you pay attention to this in order that you are fully aware of what serials are deployed or available to you.

- The Judging stage is on Sector five in Chepstow Road between Talbot Road and St Stephen's Gardens. This is clearly indicated on your map.

- The Pedestrian Zone in Artesian Road does not exist.

- If a message tells you to physically do something - such as go and meet with Silver - then please do it. (It is a matter for you whether you take your runner with you or leave them at your 'pod').

- Any radio message from the 'Game Controller' does not form part of the scenarios.

- Call signs will be used as normal, if you need to speak with the control room in respect of a matter outside the realms of the Game then use the callsign of 'Game Control'.

Carnival Firearms Policy

The Priority will be

The Preservation of Life

Of Secondary importance will be

The Arrest of Offenders

Subject to

- **Public Safety**
- **Public Reassurance**
- **Likelihood of Further Offences**
- **Crowd Dynamics**
- **Communications with the Public**
- **Likelihood of Tactical Success**
- **Authority Levels**
- **Evidence Gathering**

Public Order Post - Clearance Cordon Positions

Sector 5

In the event of an option 2B (Central) clearance of Carnival, Sector 5 will be responsible for staffing three cordon positions at the following locations:

Cordon No	Location
51	St Luke's Road (East side) J/W Tavistock Crescent.
52	St Luke's Road (East side) J/W Tavistock Road.
53	Across Westbourne Park Road J/W St Luke's Road (East side)

In the event of an Option 2C (Southern) clearance, Sector 5 will be responsible for staffing two *further* cordon positions at the following locations:

Cordon No	Location
54	Across Talbot Road J/W Ledbury Road
55	Across Colville Terrace J/W Ledbury Road (West side)

All the above cordons should be one way filter cordons to prevent crowd movement onto / allow crowd movement away from the area of disorder.

It may be necessary to implement additional cordons to those shown above. However the overriding instruction is that, whenever the shield serials have passed through a junction, a cordon must be positioned to secure the ground behind them.

CARNIVAL INFORMATION CENTRE

OVERVIEW REPORT

Day/Date: Monday 32nd August **From**:15.00 **To:** 16.00

1. **Incidents of Interest:**

At 15.45 the official estimate of numbers at Carnival was 900,000 and rising

At 15.25 FLINT state that a total of 63 floats have been seen on the route. A further 56 registered floats have yet to be sighted.

Weather Forecast for Monday, issued at 14.20.

A hot and sunny afternoon with light winds. The early evening will be fine & dry however, the winds will increase. During the late evening, it will become overcast with the risk of rain before midnight.

15.10 Information has been received about a possible pay party at 26 Tavistock Road starting later this afternoon and going on into the early hours.

15.40 At Vauxhall Tube Station an IC3 male wearing a white shirt, bobble hat and black jacket attacked passengers with an axe. He is believed to be Carnival bound with the axe.

15.43 Information via DD that staff at the Kings Hotel 62 Queensborough Terr, W2 (which is vacant at the moment), are concerned that leaflets maybe distributed at Carnival today advertising a Pay Party at the location tonight. Staff have no bookings and fear a disturbance.

contd...

2. **Prisoners / Crime - Monday:**

	Reported Crime	Arrests
Off Weap	0	2
Drugs - Possession	0	4
Drugs - Supply	0	1
Robbery	1	0
Theft - Snatch	0	0
Theft - Dip	3	0
Assault - GBH	3	1
Assault - ABH	7	2
Other	18	6
TOTALS	32	16

3. **Casualties:**

Civilian - Non Acc.	4	Police - Non Acc.	4
Civilian - Acc.	0	Police - Acc.	0
Civilian - Illness	0	Police Illness	0

4. **Traffic:**

Bayswater Rd at Lancaster Gate - Westbound is closed until further notice. All diversionary serials deployed.

5. **British Transport Police:**

Underground SITREP.

Westbourne Pk:	Very heavy passenger traffic towards Carnival. Passengers on trains are being advised to alight at earlier stations but are not heeding the advice.
Notting Hill Gate	Very Heavy passenger traffic with congestion in the lower congestion in the lower circulation areas. Station ticket barriers are being left open to allow easy flow of passengers.

Latimer Road	Very Busy
Queensway	Very Busy
Bayswater	Very Busy
Royal Oak	Very Busy

5. **General:**

Sector 1:	1520 - From Ser 166 group of 12 IC3's South in Ladbroke Gro, belv'd steamers. All wearing red / black anoraks.
Sector 2	15.40 - From 220 Ladbroke Gro, top floor flat, two males throwing tin cans etc into the crowd. Numerous complaints.
Sector 3	15.20 - Group of steamers just turned right into Talbot Rd from Portobello Rd. All with crew cuts and shaved sides with one wearing a Trilby hat.
Sector 4:	1515 - From Bx 4.1. There are now major tailbacks on this sector believed due to the Judging point on Sec 5.
Sector 5:	1522 - Westbourne Park LTE Stn, 10 males all dressed in yellow and purple clothing trying to goad police.

Sector 5

Sub Sectors

1 - Northern 'Bronze 5.1'
2 - Central 'Bronze 5.2'
3 - Southern 'Bronze 5.3'

Sector 5 Map goes on this page

Deploy.doc goes on this page

Deployment Schedules

Sector 5 Specialist Serials
Bronze 5

Name	Serial No	On Ground Assigned
Street Trading	590	08.00
Sound System Liaison	591	10.00
Float Liaison	592	12 Noon
Mounted	Mtd 5	12 Noon LTE Stn

Reserves

Available until 7pm ONLY
then on Standby at St Mary of the Angel School

Ch Insp Smith - U854

U713	U733	U813	U823
U714	U734	U814	U824
U715	U735	U815	U825

Further Reserve serials are available to Sectors on Valid request to Silver.

Deployment Schedule

Sub Sector 5A (North)
Bronze 5.1

Times	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Refs.		***569***						
Briefing	***567/8***		***569***					
Tube Stn	***564***	***567***	***567***	***567***	***567***	***567***	***567***	
	566	***568***	***568***	***568***	***568***	***568***	***568***	
				569	***569***	***569***	***569***	***569***
Patrol		***564***						
		566	***566***	***566***				
Due For			***564***		***566***			***567***
Dismissal								***568***

All Serials are Level 2 Trained

Notes:

You may release 0-1-6 on short patrols or for snacks at your discretion to a maximum of 0-2-12 at any time. However, due to limitations at the feeding centre no more than 0-1-6 may be sent for snacks together.

Please ensure GT are informed of serial deployments.

Deployment Schedule

Sub Sector 5B (Central)
Bronze 5.2

Times	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Refs.		***571***	580					
Briefing			***571***	580				
Gt. West Rd /West.Pk Rd	574	574	575	575	***571***	***571***	***571***	***571***
Patrol 2	578	578	578	578	578	578		
Patrol 3	575	575	574	***571***	580	580	580	580
Due For Dismissal				574	575		578	

Key - ***Bold Italics = Level 2 Serials***

Patrol 2 = Patrol of Great Western Road

Patrol 3 = Short patrols in the vicinity of Tavistock Road, Aldridge Road Villas & Leamington Road Villas.

Notes:

You may release 0-1-6 for snacks at your discretion.

Please ensure GT are informed of serial deployments.

Deployment Schedule

Sub Sector 5C (South)
Bronze 5.3

Times	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Refs.			***570***					
Briefing		***570***						
Patrol 1	573	573	***565***	***565***	577	577	***570***	***570***
Stage	***565***	577	577	577	***570***	***570***		
& Patrol 2	577	***565***	573	***570***				
Due For				573	***565***		577	
Dismissal								

Key - ***Bold Italics = Level 2 Serials***

Notes:

You may release 0-1-6 for snacks at your discretion.

Patrol 1 = Chepstow Road - J/W Westbourne Grove
J/W Talbot Road
J/W Westbourne Park road

Patrol 2 = General Sector Patrol

Please ensure GT are informed of serial deployments.

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