Film, video and digital: editing technologies and practice in British television production, c.1955-2000

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Abstract:

As, between 1955 and 2000, the primary medium for editing television went from film, to video, and then to digital, this thesis investigates the specificities of each medium. It takes, as its central premise, the fact that editing is an individuated practice occurring within an accumulation of factors: the preferences of the editor; media specificities; the nature of the project; genre differences; the affordances of the equipment; institutional settings; and, budgetary constraints. It asks as its central research question: how did editors respond to and negotiate the technological and industrial changes that occurred as the media changed? Four discrete, but interconnecting, histories will be given as examples of the ways in which editing and its technologies were – and are — used and described. In addressing television editing, the thesis addresses the relative lack of attention paid to it within Television and Production Studies, using both interviews and archival material to highlight the changing working lives of editors over the time period concerned.

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Preface

Before I started work on this thesis, I had worked in television production for over a decade. I started as a runner and worked my way up to a producer, working in Scotland, Sydney and London, and on shoots around the world. I worked mainly in arts documentaries and news, but also on lifestyle programmes, formatted features, and short-form work (commercials and short films), as well as in development. I worked mainly for the BBC, but also for Channel 7 in Sydney, the Discovery Channel, and various small and large independent production companies in the UK and Australia. For some of this time, I worked outside of television, but continued to identify myself as a TV person and experienced – not to mention enjoyed – the social capital that this brought. Every television job, employer, colleague, filming experience, and interviewee – indeed, every single televisual encounter – was different, refracted through my own experience and expectations and those of the person or people I was working with. Each encounter, however, had the same components: the camera and sound equipment; a director; a subject; and, however many other people and roles required to complete the piece, be it numerous crew members for a gardening show or no-one else at all for a news interview. Each encounter was framed by networks, defined by questions such as *who knew who*, *how was X to work with* etc. These networks served as a shortcut to familiarity, easing the complications of any shoot through bonds established via mutual acquaintances. Each piece of work was framed by ideas of the televisual, in terms of what it meant to be making television and how television informed the experience of the other people involved. That is, some people love television, value it and, especially in the case of the BBC, might feel invested in it, while others do not. Through my work in television, I met a lot of editors and understood their work as being informed by something similar to the above, namely the mesh of experience and expectations they brought to their editing suites. This meant that each job they worked on, each person they worked with, had different experiential qualities, informed by the particular preferences, demands, and pressures of both the person and the project. Each brought a differing weight of experience. No two were – or could be – the same. Television practice is not uniform, but it does, however, have commonalities that travel with people as they go from

project to project. This is the experiential framework that informs this thesis in its evaluation of editing practice.

Introduction

In her book, *The Invention of American Broadcasting*, Susan Douglas refers to the idea of the distinct, expressed as *distinctive*, *distinction* or *distinctiveness* numerous times. She writes that "Telegraph operators [...] considered themselves to be members of a very distinctive, cohesive, and exclusive fraternity, because they had gained command of a technology" (1989, XXII) titling Chapter Two *Competition over Wireless Technology: The Inventors' Struggle for Technical Distinction*. She describes the "distinctive demands and opportunities of the American marketplace" (ibid., 150), writing of inventors' awareness of the "distinctiveness of their apparatus" (ibid., 131) and how users, in this case navy officials, "appreciated the distinctiveness and superiority of American radio technology" (ibid., 279). It is this central idea – of how technologies are made, perceived and remembered as distinctive – that has informed this thesis.

The research questions that stem from this idea are: how did editors respond to the technological changes as the primary editing medium shifted from film, to videotape, to digital; what were the industrial changes that occurred as the media shifted, and how were these actioned and responded to on both an individual and institutional level? There is an interplay between individual workers and institutions, both large and small, at which point practice makes incremental shifts; it is therefore this interplay that this thesis attempts to reveal. However, based on the premise that editing is an individuated practice which happens within an accumulation of factors (preferences of the editor, media specificities, the nature of the project, genre differences, affordances of the equipment, institutional settings, and budgetary constraints) the route of entry this thesis takes into exploring practice is through the lens of technological distinction. As Douglas's telegraph operators considered themselves a fraternity, this thesis explores how editors, when using film, were cohered imaginatively around the celluloid medium. The degree to which videotape was made distinctive as a broadcasting medium was determined, in however oscillating a manner, by the demands and opportunities of the new independent

production market. Latterly, as digital technologies enabled the non-linear editing platforms used today, inventor/developers fought to prove the distinctiveness of their work, while users – the editors – discerned the distinctiveness of what they identified as superior equipment.

Given the range of possible technological distinction, decisions about lines of enquiry were made after interviews revealed certain preoccupations held by editors that had so far been overlooked in the literature on this subject. This enabled me to follow hitherto unexplored research directions about the changes that have impacted editing practice. These preoccupations include specificities of location, the investigation of which led to Chapter One, which examines remembered experiences of editing on film at BBC Television Film Studios in Ealing. As the provenance of the initial medium-term change – the evolution of videotape – was a mystery to interviewees, it is examined in chapters Two and Three in terms of its adoption and use in two environments, Independent Television (ITV) and the media hub found in Soho, Central London. At ITV, the importance of transnational relationships is revealed through written archival evidence. Chapter Three expounds on the research presented in Chapter Two, exploring the early advent of the pool of freelance workers as it developed in and around Soho. The change from analogue to digital platforms is investigated through the recalled intent of their developers and their incremental adoption in the British television industry. Taken together, these chapters depict the working lives of editors as they have responded to such huge technological and institutional changes.

The first chapter examines the question of if, and therefore why, there was a culture of work specific to the BBC Television Film Studios (TFS), located in Ealing, West London, and how this culture is remembered in the context of working with film. Having run out of space at their Lime Grove facility, the BBC bought Ealing Studios in 1955, which, as television became central to the BBC's mission, became the base for the Television Film Unit for the next forty years. The site was sold in 1995 and, despite there still being film edit suites within the corporation, the Film Unit effectively closed. TFS has remained at the margins in the many histories of the BBC. The chapter addresses the lack of historical record and explores, through a series of interviews, the

memories of BBC TFS film editors. It considers the heritage aspects of making television at a place so well-known for feature film production. In its exploration of a period of relative continuity, this chapter also provides context for this thesis, throwing into relief the activities of the independent facilities houses and the innovations of digital post-production that are explored in the subsequent chapters.

Chapter Two then traces the arrival of videotape to the UK and the early development of videotape editing practice, taking its cue from a quote in Denis Forman's *Persona Granada*: "one momentous day an engineer in Chelsea slit a tape diagonally with a razor blade, took out a yard of tape and joined the two ends with Sellotape. It worked. There was a jerk, to be sure but tape editing had arrived." (1997, 112) This chapter addresses the sense of marginalisation that technology has occupied in the archiving of television production documents. In a manner comparable to the absence of academic interest in 'women's' television highlighted by Wheatley and Moseley in *Is Archiving a Feminist Issue?*, archiving by the broadcasters has not been overly concerned with the specific technologies used in television production (2008). The chapter demonstrates that technological concerns and histories are revealed only through the, often tangential, involvement of senior men, be it Forman or other ITV grandees such as Sidney and Cecil Bernstein.

Using documents gathered from the ITV Document Archive, Chapter Two traces the initial adoption of Ampex videotape machines in the British television industry. It traces videotape's use as a recording technology and as an editing medium. In doing so, it reveals how the franchises engaged competitively and cooperatively in the acquisition and use of equipment, thus developing the new practice of videotape editing. Demonstrating the negotiations around recording and editing technology undertaken by the ITV franchises in their earliest years, it builds on BBC-centred scholarship and existing work on the freelance labour market, presenting evidence on its early formation.

Chapter Three adds a contextual layer to the previous work conducted on very early videotape use. It traces the evolution of the Soho facilities house throughout the

1960s and the concomitant uptake of videotape equipment up to the point in the 1970s where videotape can be said to have been fully embedded in the independent post-production milieu of Soho. It argues that the boom in videotape-based production during this time changed television editing practice, not just because of the production shift from film to video, but also because facilities houses placed continual emphasis on the renewal of equipment. These facilities houses required that editors' practice met these demands while generating this technological churn.

The context for this technological circulation is the growth of the independent television production sector. Here, the videotape boom began in the commercials production sector and then bled into television production. By including commercials within the definition of television production, this chapter revises Georgina Born's analysis of the television labour market, in which she locates the advent of Channel 4 as the catalyst for the expansion of the freelance market. She states that "in 1979 almost all employment in television was accounted for by staff jobs in the BBC and ITV, by 1989 39 percent of all employees were freelance, and by 1994 this figure had risen to 54 percent." (2005, 180) This chapter argues instead that a significant freelance market was, in fact, present from the 1960s onwards. The flow of freelance editors between independent and institutional settings – and with them differing knowledge and practices – was established far earlier than has been previously accepted.

Finally, the evolution of digital non-linear editing is traced in Chapter Four, which begins with a discussion of how, from the mid-1970s, ideas around 'digital' and what it might mean began to circulate. In so doing, it continues the history of facilities houses presented in Chapters Two and Three. It details the different digital non-linear editing (NLE) systems and how the technological shift toward their use demanded adaptations in practice and, using a similar framework to the chapter on BBS TFS, offers an oral historical analysis as editors describe their first usage of digital NLE. Through interviews with the developers, it traces the development of Avid and Lightworks, the two most-remembered editing systems of the era.

These chapters cohere around a principle of diversity. By retaining the BBC as the contextual institution (because the BBC is the primary broadcaster) and focusing on ITV and the independent sector, the ITV Document Archive is foregrounded. As the ITV Document Archive is often difficult to access, it has not been widely used in previous scholarship. Using this archive in conjunction with sources from the trade press, this chapter examines the growth of the freelance sector independent of the perspective of the institutional casualisation of salaried staff, as presented in prior research on the subject (Lee, 2008; R. Paterson, 2001; Ursell, 1998). This line of enquiry was pursued by asking questions about this technology – how it was used, and how and where it is remembered. These questions were stimulated by the innovative methodologies employed by the ADAPT Project, which used simulations to show how people felt about their work as they went about recreating how they accomplished it. In this way, this history of changing practice tries to account for the multitude of issues related to this change: working practices; technologies; TV; professions and institutions and their respective 'communities'; and, the spread of ideas within these work/social groups. Patterns emerged after detailed studies were undertaken, on the basis of which, this thesis was written.

Found throughout this thesis are key terms which are used by editors to describe their practice. The term non-linear editing (NLE) is taken from the non-linearity of film editing, wherein any section of a piece of work can be edited at will, owing to the ability to not only 'cut' the film and 'stick' it back together in any order, but also reverse that process without consequence. Digital NLE is conducted via computer. These systems provide a workflow of progressive refinement and revision. Linear editing means that the editing process is defined by the need to copy material from the rushes to an edited programme tape in the order in which they will appear in the final programme. It is associated with videotape because the tape degradation that occurs with each copy of the shots required for the edit meant minimal edits were undertaken, with linear editing the easiest way to keep the number of cuts down to a minimum. While it was not impossible to edit in a non-linear fashion using videotape, tape degradation inhibited this, and it was thus standard practice not to do so. Given the nature of the terms in common industry parlance – film editing, video editing, and

NLE editing – non-linear practice is sometimes associated solely with *digital*. However, film represented, of course, a perfectly good analogue and mechanical medium for a non-linear edit.

With the increased possibilities offered by videotape-based visual effects equipment, the terms *offline* and *online* came into use in the 1970s. Edits became delineated into *offline* work, where the piece is assembled on more basic, cheaper equipment, described by *Broadcast* magazine in 1979 as "rehearsing and modifying edits with comparatively low-cost equipment" (Griffin-Beale, 1979). The finishing touches – the final conform, along with effects, captions, stills insertion, titling and credits – is carried out using equipment with capabilities more commensurate to the task. As this latter set of equipment was more expensive to hire, the time spent using it was minimised, representing the *online* part of the process.

This thesis will describe the way in which distinction (Douglas, 1989) was achieved via editing technologies and how it was remembered and recorded as a marker of editing practice. It will additionally describe "conditioning factors" (Cottle & Ashton, 1999, 25), as opposed to determinants, that have affected editing practice over the period covered in this research. It should be acknowledged that "access to research materials is a major shaping factor in the kinds of television historiography that get undertaken" (Wheatley, 2007, 9) and that the formulation of this thesis was defined by an openness to any possible line of research (within the boundaries of editing practice). In this context, the methodology is laid out below.

Methodology

Television production is a "process of negotiation between all of the parties involved" (Bignell, 2012, 150). Factors that influence practice specific to editors, who work within this negotiation, include: the equipment they are using; their training; the project; the peculiarities of the institutional context, be it the BBC, ITV, a production house or any other (such as working at home); the people they are working with; if they are on location with a crew, using mobile editing equipment; the time-frame; and, budgetary restrictions. Therefore, an individual editor's practice can be altered depending on the what, where and why of any work they are undertaking. Additionally, while the knowledge – the technical mastery – specific to an editor is essential to the practice of editing, the working life of an editor is conditioned as much by their relationships with people as the technology they use. Locating the specificities of this practice illuminates these possibilities. These specificities have been obtained through interviews with editors and their colleagues and have cumulatively informed this thesis and, in turn, the archival work undertaken. These two data-gathering strands, the archive and the interview, are intercut to make up the whole.

Archive:

The BBC is not the only organisation involved in British television during the period under study. The excellent BBC written archive welcomes researchers, and this has, perhaps, led to an over-emphasis on the BBC in studies of British broadcasting (as addressed by Helen Wheatley when she discusses the lack of comparable work undertaken using the ITV Document Archive thereby highlighting the lack of available written archives when compiling a history of television beyond the BBC (2007)). While the BBC Written Archive was consulted for this thesis and revealed valuable information regarding the Television Film Studios at Ealing and the ongoing use of film-based freelancers at the BBC, this research deliberately sought further sources: the trade press which enlightens the role of advertising and the independent TV sectors, technical guides and training manuals to look at the quotidian practice of workers, and

the ITV Document Archive as a means of understanding the so-far neglected role of the ITV franchises in the development of video editing. Much of Chapter Two is based on material found in the ITV Document Archive. However, these documents happened to be in files pertaining to Sidney and Cecil Bernstein, who were personally involved in the decisions made around the acquisition of videotape equipment. These documents were not kept because of their relevance to histories of technology, but because of the importance of the Bernsteins themselves.[1] This policy impacts on further research, as, in this case, further information sought for this research, such as programme files, proved unavailable to my eyes; I was told that nothing relevant was held. Programme files do exist, but they are split between locations in Chatham in Kent, and Leeds (Martin, 2017) and are difficult to retrieve. The archive's central location is in the old Yorkshire TV building on Kirskstall Road in Leeds, but it is predominantly uncatalogued and largely exists, as far as I could see, loose in cardboard boxes. Catherine Johnson wrote in 2005 that "the availability and fate of this [ITV] archive at the time of writing is uncertain" and the work done for this thesis suggests that it continues to be so (Johnson & Turnock, 2005). On seeking clarification regarding the future of the archive, I was told that "previous research access to our Document Archive has been granted on an ad hoc basis as it is not open to the public. Our Document Archive exists to support the business needs of ITV and, taking various factors into consideration, we have decided to no longer offer access to the Document Archive for any further third party research." (A. Martin, 2018) The problems identified by Wheatley and Johnson will not, it seems, be solved anytime soon.

Extensive use is made of the trade journal *Television Mail* (1959-73) and its successor *Broadcast* (1973-), which serve as forums for discussions happening within the television industry and reflect its concerns. Readership numbers are impossible to gauge, as the journal sits in production offices, edit suites and all spaces of television production, and is picked up and discussed as a matter of course. One copy in a suite somewhere might be idly read by dozens of people passing through. Representative

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[1] Heirs to a cinema chain and, by the 1950s, film industry grandees, Sidney and Cecil Bernstein were the driving force behind the establishment of Granada Television and, respectively, its first Chairman and Deputy Chairman.

of "worker chatter", the journal is a conduit as much as a body of report (Stauff & Caldwell, 2015, 53), while the discursive nature of its content is often quite literal. For example, two full-page adverts placed in the journal by the commercials production company NS&H in 1970, ran with the headlines "So next time Berny give me a proper brief" and, a month later, "My name is Berny Stringle and I refuse to nobble these three men" (Advertisement, 1970i, 1970j).
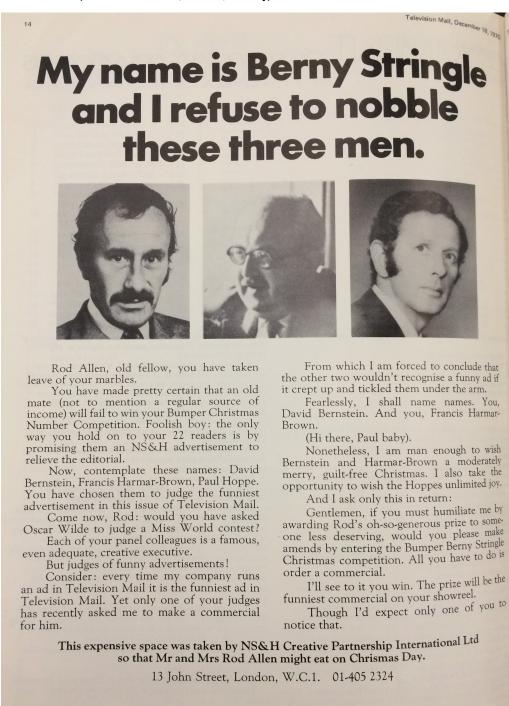

Figure 1: In-jokes as knowledge-based generative discourse, Television Mail, 18 December 1970 (Advertisement, 1970i).

Even in the knowledge that Berny Stringle was a prominent commercials director and head of NS&H, the text of the adverts, full of contemporary in-jokes, makes little sense now. Instead, their usefulness as sources is found in their indication of the intimate knowledge-based discourse of the magazine. Nevertheless, given that its use as a historical source must be qualified by its clear connection to videotape users and manufacturers through advertising revenue, potential conflicts of interest are acknowledged. However, in its editions, the magazine provides guides to production which are used here to map scales and media of production and reveal an independent production industry larger in size than had been previously thought. For all of the considerations and qualifications presented here, these guides are useful in placing people and equipment in a particular space and time.

Much of this thesis pays close attention to the advertisements placed by facilities houses, which are revealing of trends and motivations within the non-institutional post-production setting, namely the evolution of company and industry emphases. Advertisements represent how any one company wants to be seen. Within an increasingly competitive market place, companies characterise their standout feature(s) by emphasising it/them through advertisements in *Broadcast*. Through the context it creates, *Broadcast* tempers the claims and content of the adverts, often reiterating or contradicting them in its editorial reporting. The focus of the advertisements range from equipment, personnel, pricing, location and comfort and can be described as a 'conversation' between facilities houses, which takes place in front of the industry reader. Within such a small industry, the reader will understand this conversation. The extent to which this conversation is a projection undertaken for the benefit of the client must be noted, however, as well as the possibility that it has little or nothing to do with the actuality of practice. Here, adverts are used as objects revealing industrial motivations, which is in keeping with both John Caldwell (1995, 2008) and William Thomas McClain, who finds in Classical-era Hollywood budgets "a practice of sense-making that embodies and enunciates the social and technical systems through which institutional knowledge was created, transmitted, performed and manipulated." (2015) This interpretation is not unproblematic, with one

interviewee stating, when I quoted part of a particular document to which I had attached particular importance: "That sentence only lived in that one place in a business plan. It never had anything to do with anything." (*Interview with Bill Warner*, 12 March 2018). Qualifying this with the belief that all discourse, whether written or verbal, has the potential to be – or just is, because of subjectivity – illusory, gives credence to the accumulative and mixed methods model used here.

Interviews: 'Does that mean anything to you?' (*Interview with Rod Longhurst*, 10 January 2017)

As discussed, I came to this thesis with my own experiential understanding of television, which I used to arrange the initial interviews. Talking to friends and ex-colleagues, I revised the landscape of my own knowledge of British television and used what they told me to map out territories of editing across the BBC and the freelance world. I visited production companies and looked at their suites and went into the BBC to sit and observe as programmes were put together. These research activities did not feature in the final thesis but allowed me to develop a detachment from my professional work and to approach, as Caldwell phrases it, my "insider" (2009) knowledge anew. This did not, however, represent a severing with my prior professional life. Interview methods were under constant renewal and reform, dependent on who I was talking to, which mirrored the way in which television itself works, namely that I carried over TV producing practice in terms of the problem-solving skills it demands. Tom Burns describes this flexible method:

> ...of the interviews themselves [...] they followed neither the method of the professional journalist [...] nor the standardised procedures familiar in social surveys. Although I tried, by the end of the conversation, to see that I had obtained comments or facts on the points I thought relevant or interesting, I used no standard sequence or form of questions. (1977, xi)

Following Burns, I allowed the interviewees to speak as long as they wished, often barely interrupting them. I withheld, unless asked, my own work in television, allowing

them to explain the minutiae of their work as if to a layperson. I would, however, deliberately engender a level of intimacy by always offering the interviewee a gift such as biscuits, asking them questions about their childhood, or mentioning my children to prompt a discussion of their families. Often, I did this to quell any nervousness on the part of the interviewees, who were people not used to being interviewed. Always, it was an attempt to learn about and be "sensitive to unspoken assumptions and implicit forms of knowledge and belief" (Born, 2005, 14). In these exchanges, answers were obtained to unspoken questions too intimate to ask directly. This helped to find the best way to draw information out of any one person. Therefore, in trying to understand the ways in which editors worked with their respective technologies, Burns' "conversation[al]" approach was used to talk around and then directly to the subject of practice. It was also an attempt to have interviewees access their professional self, the part they leave at work.

There were 50 people interviewed for this thesis, with six of them interviewed a second time, either to complete the interview or to discuss further points made in the original exchange. Interviewees were selected through a process of reflexive investigation, whereby contacts recommended a subject because of their work at a site of relevance, or because they could provide particular context. For example, Ken Oxley oversaw the transition from film to electronic cameras at the BBC and recalled the siloed nature of 'film' vs. 'videotape' people, although his contribution did not feature in the final thesis. Elsewhere, executives such as Mike Poole or David Okuefuna shed light on institutional manoeuvrings at the BBC, again informing the thesis but not featuring directly in it. All of these contributions were valuable, but word count dictated that the analysis be kept to that directly related to the research questions of technological changes and the responses to it by the editors. Other interviewees came from informally organised networks such as BBC Film Editors or VT Old Boys, both groups of retired editors who met originally at the BBC and continue to meet for regular lunches. Most interviewees were audio recorded and then transcribed, while the rest were recorded in note form. Throughout, this was a reflexive, flexible, reactive process. Operating on a system of informed consent, each interview was prefaced by an assurance that anything could be redacted as the

interviewee wished meaning that no releases were signed. Anonymity was offered, but no one requested it. Interviews most often took place in the subject's home, sometimes on Royal Holloway university premises, sometimes at the BBC or sometimes at production company offices. While, largely, these were not ethnographic interviews, my own ethnographic knowledge remained, which I occasionally deployed. Sometimes, I would allow the interviewee to assume I was 'only' an academic and grateful for access to the world of television. Each interview was, therefore, different in that it allowed the personality of the subject to dictate how it proceeded.

The interviewees were mostly men and mostly retired. The possibility of nostalgia, the "romanticism of old men and old societies, a symptom of loss of faith and interest in the present or future" was present. (Carr, 1990, in Wheatley, 2007, 10). Helen Wheatley lends a sense of manifesto when she says it is "imperative that we do not simply produce mournful or elegiac histories of television" (ibid., 10). However, there may be a quality that it is negatively attributed to nostalgia, but which could, in fact, be a subjective truth, namely that interviewees did believe their working lives <u>were</u> better during the time of their lives they were discussing. This does not mean that television itself is qualitatively better or worse, it is simply that the characteristics of working in television production previously deemed as appealing have diminished or disappeared. This can also be explained by the idea of an elite, as Miranda J Banks states: "Though my subjects have never been part of the elite class of media professionals considered auteurs, within the hierarchies of media making they are veterans and professionals." (2009) These were professionals aware of their status within elite organisations in a glamorous industry with restricted access. Additionally, structural changes to the industry, such as Director General John Birt's Producer Choice[2] transformation of the BBC, and the ongoing industry-wide shift to a freelance model mean that there are concrete differences between the interviewees' working lives and the conditions of the television industry as it is today, which the literature

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[2] Producer Choice was the marketisation of the BBC's internal production processes, introduced in 1991 under Director General John Birt "to stimulate efficiency". (Born, 2005, 60)

amply demonstrates (Born, 2005; Caldwell, 2008; Mayer, 2011; R. Paterson, 2001). A patina of nostalgia laid over something does not preclude the possibility of that thing being true. Nonetheless, I remained aware of slipping into the hopeless idealisation of the past.

Vicki Mayer articulates the negotiations involved in gaining access to interviewees, which are recognisable in describing the complex and precarious nature that always hangs above interviews. The wrong thing can be said, leading to the denial of access either in terms of the termination of the interview or the subject subsequently declining to recommend the research to their peers, potentially cutting off a source of future interviewees (2008). Interviewing people about their specific experiences naturally weights any power differential in the interviewees favour because:

> As John W. Creswell writes in his book *Qualitative Inquiry and Research Design*: *Choosing Among Five Approaches*, an 'interview is actually a hierarchical relationship with an asymmetrical power distribution between interviewer and interviewee.' [...] Additionally, the interviewer gets to set, on the whole, the focus for the discussion. In interviewing people to discuss the job they hold, this power position changes slightly, because the interviewee becomes less a subject that can easily be replaced by another, and is instead relevant because of their specific take on the structures within which they operate. (Mills, 2008, 149-150)

Power oscillates as discourse is negotiated, and the strategy used here was to temper it with the fostering of a sense of familiarity, as explained above. While Katherine E. Smith (2006) discusses the need to understand the power differentials within the interview space in elite interviews, there was a benign form of power present in these interviews. The negotiations that apply to elite interviews feel overwrought when applied to the front room, tea-and-biscuits environment that characterised my own investigations for this thesis.

There is a long tradition, in television studies, of the "mixed methods" (Jick, 1979) used in this research (Born, 2005; Burns, 1977; Caldwell, 1995), which can also be found in the broader scope of production studies, as Mayer, Banks and Caldwell state baldly: "each essay in this collection offers its own approach to studying media production" (2009, 4). There is a sense that such a multidisciplinary subject as production studies can only be anthropological, ethnographic, sociological and historical. Narrowing its focus to television in particular (no textual analysis is undertaken here, making this a television production study), this thesis attempts to be largely historical in its use of archive material and oral history interviews.

The four detailed studies presented in this thesis have been selected for strategic reasons derived from a desire to understand the overall changes that have taken place in editing for television as it moved from analogue to digital systems. Indicative of moments that occur within that long, slow process of change, these studies examine a diversity of institutional contexts, technological deployment and changing labour structures. They are guided both by my interviewees and by the insights gained from my own experience. The use of previously unexamined archive material has revealed new perspectives on the historic cultures and practices of British television production.

Literature review

This thesis is a history of editing practice and the associated technologies in British television production during the period when the dominant editing format transitioned from film to video to digital. It examines the role of the editor, the expectations others have of the editor and how these roles and expectations are documented and remembered. Research questions include: How did editors cope with the technological change and why and by whom was this technological change implemented? How did editors resist, adapt and augment their given technologies? How did they resist, adapt and augment their roles?

This literature review is organised by first examining the role of the editor and editing history and theory. This is contextualised using prior research on production culture, histories of broadcasting and writing on technology and practice. Reference is also made to methodological issues that presented themselves in the studies discussed, alongside the use of press and trade articles that were informative of editing technologies. Cumulatively, these sources illuminate the environment in which editing takes place and reveal the ways in which editing, particularly editing for television, has been overlooked.

The role of the editor

The editor's role within a television production is to receive the footage which will comprise the programme and then arrange it into an order that meets the requirements of the chief creative member(s) of the team. The literature reviewed in this section, in its concentration on the mechanics of editing, illuminates how the editing *role* has been described over time and how these descriptions have, mostly, neglected the subtleties of the 'doing' aspects inherent in editing work, namely the variables of an editor's practice described in the introduction. The existing literature primarily situates editing practice within cinema rather than television, so, while editing is little discussed, editing for television is discussed even less. Not only did

cinema predate television, but it also sat above television in the cultural hierarchy present in the period being discussed here, meaning that editing for television is doubly marginalised.

Yuri Tsivian provides a valuable overview of early descriptions of editing, emphasising its comparison and conjunction with writing. He explains the provenance of the term *editing*: "borrowed from print media, the term (as the term *continuity* [sic]) came into use early in the 1910s when the way action came to be segmented and assembled came to be seen as the responsibility of those who write for films rather than those who staged and cut their scenes" (2015, 306). He quotes Catherine Carr from a 1914 edition of *The Art of Photoplay Writing*, who made note of editors being referred to as "reconstruction experts", employed to rectify the poor job done by the original writers. Tsivian's comparisons of Hollywood continuity versus Soviet avant-garde montage theories emphasise the theory on method – as relating to shot length and stylistic emphasis – with a constant eye on what the viewer sees on screen rather than what the editor experiences in the suite. This emphasis on the technical aspects of editing is echoed through much of the writing published on the subject, even when thrown into relief by discussions that emphasise the creative, craft or collaborative aspects of the work.

The role of the editor as technician continues in the literature, with Vsevolod Pudovkin describing, in 1926, the process of editing as a "construction" and "one of the most significant instruments of effect" that aids the "guidance of the attention of the spectator". While Pudovkin refers to editing as an "instrument" and describes the technics of sequence construction, he does not mention the editor, except as a "technician" (1926, 11). In the 1950s, Bazin continued to emphasise the definition of montage as "the creation of sense or meaning not proper to the images themselves but derived exclusively from their juxtaposition". Sound, he argued, precipitated a change in editing, as it allowed the image, rather than the ordering of the image – montage – to revolutionise the language of cinema. Montage is, therefore, situated within the development of the technics of film production. The primacy of the director is established in this "evolution of language" with Bazin stating that "in the silent days,

montage evoked what a director wanted to say; in the editing of 1938, it described it. Today we can say at last the director writes in film" (1950-55). More recently, Valerie Orpen's *Film Editing: The Art of the Expressive* continued to situate editing within textual analysis, with the editor's practice remaining unmentioned (2003). Kevin Brownlow addresses this absence in *The Parade's Gone By…* when he declares "Editing is directing for the second time", focusing on editing practice directly and discussing how "the cutter [editor] would make notes, and would take the material to the cutting room, where he would join up the shots in the order described". He describes editing as settling into "a solid professionalism around 1918" and even illustrates how the machinery of editing shapes editing practice when discussing the Moviola[3]:

> Animated viewers, particularly the celebrated Moviola silent head, which operated by foot pedal and was motor driven, appeared in the twenties. There were also some hand-cranked models, and other experimental bits of machinery. But most editors preferred to use the ordinary ground-glass screen on their bench, which had a light beneath it, enabling them to examine the frame; some of them fitted a magnifying glass on a rotating stand, which they could swing across for close examination. (1968, 280-283)

The "other experimental bits of machinery" comment illustrates what is missing in studies on editing and editing practice – what did those "experimental bits" do and how were they used? The descriptions of adaptations to the equipment demonstrate the longevity and longitudinal weight of making 'things' fit to work in film and television production. By historicising the role of the editor and editing practice, even if this example does not address television itself, these "experimental bits" can be included in this archaeology of film and television production.

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[3] The Moviola is an upright machine (as opposed to the flatbed Steenbeck or Acmade). Ernest Walter writes that it was "in wider use than any other type throughout the world in major feature and documentary production [...] although there are many manufacturers of this type of equipment it will always be known as the 'Moviola' [...] 'Let's look at it on the Moviola', is an expression heard throughout the film-making world [...] although the size of the picture image is usually considerably smaller than that produced on the viewing table, the Moviola requires far less space and is very easily moved from place to place." (1982, 51)

Barry Salt argues further for increased attention to production culture. His demolition of what he sees as unsatisfactory previous film theory in *Film style and technology*, asserting instead the need for a space for films to "be analysed in terms of their construction and their relation to their makers" (1992, 25). His is a framework that supports the primacy of the filmmaker rather than the theorist. As the cover of the book suggests, his "makers" are more likely to be the director, the director of photography (DOP) and those involved in the production rather than in the post-production process. This is not to say that he ignores editing. In fact, Salt provides useful clarification of technological terminology, changes in editing processes and the use of different platforms such as Ediflex (ibid., 336). This provides contextual information for this research as to how such systems might filter from American movie production into British television production. While Salt's description of the entry into and swift dominance of the Steenbeck in British documentary production is directly relevant (ibid., 301), there remains scant analysis of editing practice. Here, Salt is concerned with process, such as cutting rate and how that impacts on film visuals, rather than practice, even when he provides fascinating vignettes of practice, such as "it became the practice to have a Moviola handy on the set in Hollywood when difficult points had to be decided about matching a shot which was about to be taken to existing shots" (ibid., 188).

Martin Stollery addresses the lack of studies on British film editors in *Technicians of the unknown cinema: British critical discourse and the analysis of collaboration in film production*, noting that, in 1972, Alan Lovell had called for further investigation into the work of editors and others of "technical grades". Stollery argues for a reassessment of this perceived research shortfall, and, in reviewing the discourse around film technicians of the 1930s and 1940s, reveals how networks were crucial for progression. Stollery describes how, in 1927, the editor Ivor Montagu was assigned to re-cut Alfred Hitchcock's *The Lodger*, and how his success in doing so "opened the door for a number of people to come into the industry. All the people who had been working with Brunel and Montagu Ltd [the company of which Montagu was a director], all those I had been associated with at university, started to come in" (2009). Networks are a central part of the operation of television production, and an element

that will be examined further in this review; however, Stollery does not elaborate on editing practice.

John Ellis makes a more recent intervention in *Documentary: Witness and Self-revelation*, which, although framed as a book about all documentary making, addresses television as the predominant form, if only because of the volume of television documentary versus cinema documentary. A bridge here is made between the filmmaker and the editor. Ellis describes the imposition of a narrative onto the subject by filmmakers during the process of filming and the editing undertaken subsequent to this process as an interpretation of that narrative, forming it into a structure that makes sense for the viewer, and presenting it as a collaborative process. Because, he writes, the "editor is usually the first person to encounter the filmed subjects as representations on a screen rather than as concrete people", the editor is able, at this remove, to enable the process of seeing the footage as footage, an entity separate to the surrounding events of the shoot (2011, 72). He also presents, indirectly, a genre delineation, wherein such analysis is not applicable to fiction, because fiction production works to a script; moreover, the editor does not have to 'find' the fictional film in the same way as in a documentary. In presenting this genre delineation, Ellis also highlights the lack of published studies specific to drama editing. Additionally, as Karel Reisz described the changing demands of the text with the advent of sound (1953), Ellis makes note of how the introduction of digital editing platforms changed working practices. This included the expanded role of the Commissioning Editor once they were afforded swift access to early cuts of digitally filmed programmes, the new ability of filmmakers to view and rough-edit rushes on location, and how these new capabilities were used to impose stricter budgetary and time controls on production.

The invisible editor: "It could just as easily have been Jennings's idea" (Vaughan, 1983, 115)

The literature presented below discusses the aspect of the editor's role as organiser of the footage, that is, the more nebulous work that requires the editor to satisfy the

demands listed. This is, at root, a technical task - the literal organising of the footage into parts that can be accessed on demand. It swiftly becomes more than that, however, as the editor becomes essential for realising the original vision of the piece. If they receive creative direction in their work, the editor becomes a conduit for this realisation, while, sometimes, they are responsible for more, when the idea for the shape of a scene is theirs. However, given the fact of the original idea not being theirs, the editor is not readily credited for their contribution. The original idea for a filmed work is often the director or producer's, while, when it is the writer's, creative control is given to the director on delivery of the script. The original idea has primacy and is never given to the editor in the same way as it is to the director. In designating the editor as a conduit, the editor's position in the hierarchy is fixed below that of the director's. It is ironic, then, that, as the literature discussed below demonstrates, the editor is at their most creative, and most creatively essential to the realisation of the final piece, when enjoying a close relationship with the director. However, again due to provenance of the original idea, the editor's creativity always remains subservient to the director's. How editors negotiate this positioning is also explored in the literature discussed below, particularly within the notion of invisibility. As with the emphasis on the technical aspect of editing, this muddy necessity is present, but not elaborated on, in the earliest writing on editing, as Thomas Bedding wrote in *Moving Picture World*, in 1909: "Very often the success of the picture will depend on the inclusion of a greater or less amount of the narrative action. Therefore the man who examined the film after it is made, should, besides his technical knowledge, have some sense of proportion; a nice appreciation of the author's and producer's intention in the making of the film" (Tsivan, 2015, 307).

In *Portrait of an Invisible Man: The Working Life of Stewart McAllister, Film Editor*, Dai Vaughn describes his research into the life of the editor Stewart McAllister. McAllister is remembered primarily for his work with documentary maker Humphrey Jennings, and Vaughn captures the impossibility of defining McAllister's contribution to Jennings's films, stating that "it could just as easily have been Jennings's idea" (1983, 115). Amongst the traces of McAllister's life, a portrait emerges of a difficult, driven man, as does the context of his work at the General Post Office and Crown Film Unit

and the importance of the films produced there to the later Free Cinema films. McAllister's singular practice (and personality) is described in interviews with colleagues and accounts of his arguments with Jennings over the cutting of the films Jennings directed. It is McAllister's failures as a director and producer that are most directly perceived because they are directly recorded, while his work as an editor is not. Vaughn's book presents both the position of the editor as secondary to the director and the immutability of that hierarchy, despite the dependence of the latter on the former:

> As Dalrymple observed, 'without McAllister there would have been no Humphrey Jennings,' it is certainly also true that without Jennings there would have been no Stewart McAllister. It is not so very easy to find the ideal complementary talent to one's own; and for an editor, the 'secondary' character of his or her role makes it more essential than for a director. Several accounts mention McAllister's reluctance to talk about this partnership. Yet what could he have said? To the extent that he was himself a part of what questioners meant by 'Jennings', he could scarcely go along with the mythologised reality: Jennings as a personage, fons et origo, back-formed from their own experiencing of the films. Yet at the same time he could not disassemble the myth without being, within what he knew to be his questioners' terms, disloyal to Jennings's memory. At this point, I suspect, McAllister must have begun to seem invisible to himself. (1983, 194)

It is this hierarchy inherent in the mythologising of the director that, at least partly, maintains the 'invisibility' of the editor and disguises the actuality of what an editor does. Some editors consider it part of their job to remain disguised behind their work. The editor Robert Rosenblum articulates his own desire for concealment when he writes in his memoir that "no viewer should ever walk out of a film saying 'I really dug the editing'" (1986, 2). This perhaps accounts for the fact that both his book and that by the editor Jim Clark, *Dream Repairman* (Clark & Myers, 2010), both brim with the glee of being able to tell their stories. However, their evident pleasure at being heard only serves to reinforce the stereotype of the editor as someone who, to return to

Vaughn, "sits in a darkened room casting lots among shadows and falling in love with the world while it is asleep." (1983, 193)

The possibility that editors conspire in their own camouflaging by the industry is supported by fact that most writing on editing concentrates on its mechanics rather than on what editors do, focusing, that is, on the role of the editor rather than the actuality of their practice. Within this, however, are included occasional descriptions of practice and changes therein. In Karel Reisz's *The Technique of Film Editing*, attention is paid to the changes in practice that occurred with the transition to sound:

> Changes of editing technique have arisen out of the very marked change of style which followed the advent of sound. A much greater insistence on realism has been a notable feature of the past two decades of filmmaking. This is strongly reflected in contemporary editing practice. Effects which were commonly used in in the silent cinema but which now seem to detract from the realism of the presentation have fallen into disfavour […] It would be rash to say that these devices will never be used again, but they have at present fallen into disfavour because they draw attention to technique and disturb the illusion of reality. (1953, 28)

This quote illustrates the difficulty in describing practice – that which an editor does as he or she works, which extends beyond the act of cutting the film and into everything that surrounds the act to include (and this is not an exhaustive list) the edit space, the edit technology and the personnel involved. Scrutiny of technique as conducted in this way, which here can also be read as style, leads to textual analysis of the timing of the cut and its ramifications. In its focus on the ramifications of the cut, at the expense of examining its formulation, orthodox textual analysis obscures the work of the editor. Focusing on the formulation of the cut allows a more useful pattern of study which is inclusive of the television production's multiple authors and acknowledges their contribution.

The changing demands of the text brought about by the advent of sound did dictate new editing techniques: "By timing the picture in relation to the sound-track the editor can achieve a whole range of effects…With dialogue he can frequently carry the words from a shot of the speaker over to the reaction shot". In the introduction to the book, Gavin Millar notes the relationship between an editor and their assistant as being crucial to "how knowledge was passed on from editor to editor in the days of flatbed and bench editing" (Reisz, 1953, xx). Both of these points are indicators of practice at a specific time. Reisz is, however, rather summarily dismissive of the idea of the editor assuming any importance within the filmmaking process. In an appendix titled *Cutting Room Procedure*, he writes "Unlike the cameraman or sound recordist, the editor does not require a great deal of specialised knowledge to use his instruments. All his tools are simple to operate and perform purely mechanical functions" (ibid., 329). Reisz provides a close analysis of the editing in several movies which, although written before his filmmaking career, serves a guide for filmmakers on how to use their editor and, as such demonstrates the undervalued role of editors and editing practice. In his obituary of Reisz, Michel Ciment cites the book as just this – a guide for filmmakers (2003). However, Reisz does not address the specificities of editing for television. This imbalance extends elsewhere. For example, in the appendix to Don Fairservice's *Film Editing: History, theory and practice* (2001), there is a useful summary of the changes that have occurred in film editing, but which situates the analysis firmly within cinema. Similarly, while Ken Dancyger's *The Technique of Film and Video Editing* addresses the textual adaptations wrought by changes in technological affordances, going from film to videotape to digital NLE, his analysis is textual and cinematic, not televisual or practice-based (2007).

The focus on cinema rather than television, as demonstrated by the material discussed here, is echoed across much of the literature on editing and is indicative of screen studies' historic emphasis on film over television. In his memoir, *When the Shooting Stops*, Rosenblum makes this lack of regard explicit when he prefaces the chapter on his work in television with the comment "I went to work as a full-fledged editor for the medium that helped to kill the documentary film, TV" (1986, 123). That Rosenblum

hated editing for TV can be seen in his description of his time editing for a television and commercials production company in 1950s New York:

> We cut everything. Somewhere in the midst of cigarette ads and TV comedies I cut a series of documentaries for a medical advertising firm […] it was just part of the numbing quantity and diversity of material that passed through our cutting rooms during those boom years […] I would have been giddy – or in this case nauseated – if our frantic schedule hadn't pushed me completely beyond feeling. (ibid., 130)

Editor Walter Murch's *In the Blink of an Eye: A Perspective on Film Editing* is an additional contribution to the editor memoir 'mini-genre' which again serves to highlight the imbalance between the literature on editing for television and editing for cinema. This also reiterates the imbalance between the plentiful memoirs and few academic studies. As a description of one man's editing practice, Murch's book is a terrific guide, while the section on the transfer from film to digital editing is also rich in detail, specifically on the development of various digital systems. However, it is too rooted in cinema to serve as any illumination of television practice, apart from providing contrast to the work of others (Murch worked with Francis Ford Coppola and George Lucas and the directors feature heavily in his book) (2001). Justin Chang provides a fascinating series of interviews with prominent editors, which illustrates not only their dual role as technicians and interpreters, but also their negotiation of the crucial editor/director relationship. Similarly, editor Declan McGrath surveys and interviews prominent editors. However, neither author discusses the work of editors in television (Chang, 2012; McGrath, 2001). Roger Crittenden details the transfer of knowledge and practice from television and commercials to film, which happened with the advent of independent production. While he states that "television and commercials have provided a training ground for major talents who have enriched the [cinematic] form", he does not extend this to suggest the process by which those talents may have passed from media to media, instead taking the hierarchy of cinema and television as a given (1995, 31). Meraj Dhir draws lines between cinema and television when he writes that "the mobility of editors between the two media

fostered innovations in both technique and technology", detailing how the use of multicamera filming in the US in the 1970s necessitated adaptations to film editing on a Moviola. As he states, the pendulum swings both ways: "Eventually, film directors would compose films with an eye toward how they might play on the smaller television screen" (2015). Hierarchy remains implicit – editing technologies meet the demands of the filming technologies, while textual style is determined by exhibition. Thus, editors must adhere.

John Caldwell places editing within the context of the "sweatshop reputation" of film and television production when he describes the "shrinking [of] the editing task to desktop scale" and the consequences of encouraging "the user to cross all sorts of previously sacred and well-guarded trade boundaries […] This constant multitasking contrasts with the highly segregated cutting and prepping tasks that once defined a Moviola-based studio editing department" (2008, 163-4). It is unclear whether he is referring to the whole industry or one particular area, as the post-production houses featured in his analysis can, theoretically, work for any area of the industry, from the highest to lowest budget. It should be noted that his conflation of the industry denies differences in practice across genre, which can occur for creative reasons or as a budgetary consequence. Caldwell's emphasis on multitasking masks some editors' resistance to these industry trends through their refusal to use all the applications offered by certain editing platforms. While technology has developed further since Caldwell's book and new models of specialisation have emerged, within some television genres, Caldwell's analysis still applies. His later conclusion, namely that technology has broken down the traditional walls between production and post-production in allowing production workers such as DOPs and production designers to argue for in-post specifications, is primarily relevant only to high-end contemporary television production, because productions with lower budgets employ fewer staff for more minimal input. As only particularly well-funded productions can employ such tech, he highlights funding disparities between television genres and how these impact on the actuality of making different kinds of television (ibid., 182). Caldwell's analysis also suggests the possibility of film having inherited the "sweatshop" from television; Rosenblum's description of cutting television content in 1950s New York,

discussed above, has parallels with Caldwell's descriptions of 21st century film and television production in California. This problematises the hierarchical relationship described between film and television and presents a further line of enquiry in the British context.

What can be concluded from the above sources is the suggestion that editors are overlooked, self-disguising, treated as technician-mechanics, over-burdened and/or conditioned by technology. This thesis must, therefore, uncover the editor from within a system that conceals them and in which they conceal themselves. The labour of working with editing machines is recorded solely in the completed production, and not given a wider context beyond the demands of the original text. Editing work, as exhibited in the completed film or television programme, is considered most successful when it is itself unseen. Above all, "there was no tradition to draw upon, no corpus of received wisdom: simply no way of talking about films that would enable the editor's work to be mentioned" (Vaughan, 1983, 6). In other words, there is no precedent in the discourse. The sources used here present the argument that editors and editing suffer from a lack of presence in the cultural memory discourse, forming a small part of the discourse surrounding film production and a negligible part of that surrounding television production. This is most immediately apparent in the examples of 'editor biography/memoir' discussed here, which point to the prevalence of two dual-operating hierarchies placing editors below directors and editing for television below editing for cinema. These hierarchies are maintained throughout the literature that focuses specifically on editing as well as contextual work on film and television production. John Caldwell also alludes to this marginalisation when he describes the book *First Cut: Conversations with Film Editors*, by Gabriella Oldham (1992), as cultivating a sensibility that presented editing as central to filmmaking (2008, 117). The fact that such a sensibility needed to be cultivated as late as the 1990s demonstrates the longevity of the lack of cultural memory discussed above. Any attempt to address this must begin by looking at how editors operate, both with the technology needed to complete their work and the spaces in which this work is done.

Editing: technology and the "operating system" (Ellis, 2015)

What an editor *does* begins to be defined through the specificities of the technology used. In his introduction to *Film and Video Editing*, Roger Crittenden directly addresses the relationship between an editor's practice and the technology they use, stating:

> In the last few years there has been a revolution in the development of technology for the editing process. The combination of digital storage and random access to material has given the editor fingertip control in an instant. It is now possible to carry out editing decisions faster than the brain can envisage them. Never has it been more important for the prospective editor to master the craft to avoid being mastered by the machinery. (1995, x)

Crittenden guides the reader through editing history and technology, from silent movies to the 1990s and the advent of the Avid and Lightworks non-linear editing (NLE) platforms. In the course of this history, he addresses two points already highlighted in this thesis. Firstly, he discusses the relationship between editor and director, using the example of Humphrey Jennings and Stewart McAllister, noting that "*Listen to Britain*… is undoubtedly the joint achievement of Jennings and his editor Stewart McAllister. The magical quality of this film is related to the way the imagery is structured into a rhythm and line that seems inevitable and indeed derives its power from the inner dynamic." He addresses but does not elaborate on the specificity of television, which is again contextualised in relation to cinema:

> Although television makes use of and adapts different genres which already existed in the cinema, it also generates new and modified forms. Editing situation comedy, soap opera or current affairs programmes makes particular demands on the craft, although the emphasis on verbal exposition is the main difference from cinema. (ibid., 31)

He also addresses in detail editing technology, placing this in the context of the edit space as it changed "From cutting room to edit suite" (ibid., 54). He pays great

attention to the differences between editing technologies, starting with film editing by comparing the Moviola and the Steenbeck, discussing the particular characteristics of each machine using an anthropomorphic style with gender and (implied) nationality-specific attributions:

> Editing at the Moviola […] is a positive, even aggressive operation. You can sense that the editor feels an almost physical challenge as the film rattles back and forth through the gate. The editor stands in dominating fashion slapping and slamming pieces in and out of the mechanism, like a lion tamer determined to prove who is King of the editing jungle […] Indeed it's a man's world at the Moviola… Contrast this with a visit to a well established cutting room in Germany, where a Steenbeck or other flat-bed machine is holding court. You enter a world of soft lights and attentive service with coffee on tap and a vase of flowers decorating a carpeted room. The film runs silently back and forth with only the occasional click signifying a change of director […] everything calculated to prevent the director's ulcer flaring up. (ibid., 57)

Crucially, he follows this by stating that "each [space] encourages a particular mode of working". In this description, Crittenden is addressing the practice of *being* an editor and how an editor will situate him or herself in relation to the technology being used, which reveals an additional aspect of the work of editing. Technology is, therefore, the starting point for practice, but not the totality of it. It is, in fact, a "conditioning factor" (Cottle & Ashton, 1999, 25). Detailing the apparatus of a cutting room – tape joiner, trim bin, pic-sync, tape, paper clips and cloths, Crittenden details establishes the necessary layout for a film editing room, suggesting cutting rooms as places for encounters between the different components he mentions. This further suggests cutting rooms as having their own conditioned sociality, where the specifics of the space are individually composed by the editor, and, as such allowing the editor to exercise their own practice within their own particular spatial arrangement.

Crittenden then jumps from a brief discussion of videotape editing, in which he provides neither such equivalent spatial detail nor an elaboration upon video editing

practice, to a discussion of digital editing, stating that "the whole environment in which the editor has traditionally worked is reduced to a computer screen display, a keyboard and some sort of controller […] The keyboard is becoming less and less necessary, so even the manipulation of the material is as simple as the handle on a Steenbeck" (1995, 62). This implies some sort of 'handling' of the digital material which is not elaborated upon but can be assumed to suggest the mouse, which is encased within the hand of the editor and controls the editing operations on the screens of the NLE system.

Crittenden highlights two separate issues here, the first of which being space-related, while the second relates to a confluence of hand/person and mouse/machine implying a system that has, in some way, bonded the two. The edit space shall be returned to later, while the argued confluence is addressed here. John Ellis argues for a definition of this kind of working relationship, between person and machine, as an "operating system". He argues that focus should be placed on human and machine operating jointly in the skilled use of machinery, in which the two somehow work as a 'system' that exists in what lies 'between' them:

> An operating system transforms an artfully constructed assemblage of hardware into a productive mechanism. In a computer, the operating system is a piece of software that manages all the applications and prioritizes their functioning. As such, it might be said to reside within the machine and be part of it, and, in the case of a computer this is largely the case. However, even the operating system of the computer has to adapt and be adapted to its user, unless the user simply adopts all the presets wholesale. The presets tend to have been set by young Californian geeks or Google-campus dwellers. So the rest of the world's users have either to adapt to that mindset expressed in the machine, or enter into a setup process that is a negotiation which adapts the presets to the individual user.

Where does the operating system reside in the case of technologies that involve skilled users, like film and television equipment? In this case, it exists between person and machine, not within either one or the other. (2015, S26)

Descriptions of the act of unthinkingly creating – or what could be called everyday practice – within this adapted multi-elemental operating system can be found in the work of Lambros Malafouris in his discussion of the "notion of the extended self":

The idea of mind and by extension of selfhood that I want to bring forth through the notion of extended self is that of a self that is located neither inside nor outside the brain / body, but is instead constantly enacted in-between brains, bodies and things and thus irreducible to any of these three elements taken in isolation. Even though the self is by nature grounded and inextricably bound up with the body, it also escapes the natural confines of any single body or brain. The extended self I am proposing here is not simply a self embodied: it is a self enacted through the act of embodying. (2009, 96)

When a worker uses a tool, such as an editor using an editing platform, in conjunction with the machine, he or she becomes the operating system and embodies the act of editing. Malafouris goes on to deliver a unifying theory of this process:

An epistemic unification of self cannot be achieved either by adding isolated neural, bodily and material correlates of self or by reducing the one to the other. It can be achieved by attempting to discern the connections and possible causal links between these different aspects of selfhood as they interact across the skin barrier and the scales of time. (ibid., 101)

Malafouris suggests a unification of thought, act and machine that can be applied to thinking about each stroke of a practice as something learnt within the graduated, incremental process(es) of becoming an editor, which itself includes the experiential weight of varied televisual experience(s). These experiences include having watched as a viewer, from childhood to the present, having lived with the television set as the

(very likely) centre of the household, and having worked as a collaborative maker of programmes. From this experiential weight – the cultural heritage of working in television, the awareness of what has gone before by virtue of it having been experienced via the act of watching television, "these different aspects of selfhood" – practice develops, or accumulates, around, in and in between acts of working practice. However, in its totality, editing practice is not unthinking and cannot be. This is because editing technology is – and, as Brownlow demonstrates, always has been – updated so frequently that changes are continually demanded in terms of practice. However, in assimilating these changes, editors update their own operating systems and continue with their work.

Each of these updates equate to a layering of experience that forms incremental changes in practice, each carrying the weight of the individual's participatory experience. This weight is useful when attempting to understand and describe practice and is central to the way Oli Mould uses Latour's Actor-Network Theory (ANT) (Latour, 2005) to advance an understanding of feature film practice (Mould, 2009). He defines practice within this framework as:

> ANT takes scholarship past the constraints of ontologically established spatial boundaries and views the world as a construction made up of connections established by the 'doing' of actants. Practice, therefore, is essentially that 'doing' that makes up the construction. Space is hence constructed through the practices of actor-networks. Within this scheme, the 'spatial variation' is what Michael Serres and Latour talk of when they offer the analogy of the handkerchief; when spread out, you can see certain fixed distances, but when crumpled up these two distances are suddenly close, even superimposed. This 'crumpling' forms a mesh of networks (much like the production of a feature film), and the production would incorporate many actants from differing locations, whose actions constitute the timing and spacing of the network, all folded in with the others to produce not simply one time and space, but a multitude of space-time topologies. Practice is often used in conjunction with

other different yet related terms such as performance, action, behavior or doing. (ibid., 205-6)

This is useful, both for its definition of "practice" and as it enables the edit space – one of the many production spaces that can be included within the "multitude of space-time topologies" – to be seen as part of and yet separate to other production spaces. Both the literal closing of the door of an edit suite and its occupation, often by just the editor, make the space unique and its "actants" quieted. As a continually disrupted space, its changing domination causes a situation of flux; however, the space is bounded, fixed by the connection between editor and technology. While this notion is itself disrupted by portable desktop editing technologies, deliberately constructed to be carried between places and spaces, it remains a starting point from which to describe the multiple specificities of editing practice.

Edit spaces: the cutting room, the edit suite and beyond

Technologies have changed the edit space – the place where editing is done. This is most simply delineated in the naming of said space, which ranges from the cutting room (where film was cut), to the edit suite (where post-film formats are edited) to the desktop, to anywhere (as editing can now be done on mobile phones). The evolution of the editor's place of work is understood as both enabling and constraining, each with particular complications and simplicities. The space in which editing is carried out remains, however, crucial to any analysis of editing practice.

The edit space is closely analysed in Eric Laurier and Barry Brown's *The reservations of the editor: the routine work of showing and knowing in the edit suite*, which closely observes and analyses an edit in which an editor and director work together (2011). Directing their readers, Laurier and Brown compare the audio-visual editing being analysed to academics editing a piece of writing, qualifying this comparison thus: "We should be careful in our comparison to remember that the object for filmmakers is a filmic object and not a textual one" (ibid., 240). Observing an editor's practice via their interactions enabled detailed notes to be made of who leads in an edit, and whether

the hierarchy described by Dai Vaughn is potentially disrupted. The authors conclude that, because the editor knows the technology, it is they who have the "epistemic upper hand" (ibid., 249, citing Raymond and Heritage, 2006). Laurier and Brown's analysis of spatial arrangements is useful but does not go beyond the positioning of the screens and their viewers, implied as being done out of necessity. This raises the question as to for and by whom the suite was arranged. Pursuing these lines of enquiry would offer fruitful answers as to how editors negotiate 'their' space to fit their needs within the established hierarchy and how this causes potential disruption, thereby potentially augmenting the "epistemic upper hand." While Murch does address the spatial arrangement of editing technology, as described above, he focuses on editing practice for cinema and his work solely serves as a comparative source (Murch, 2001). Spatial analysis also leads to a description of how an editor develops and undertakes their own specific practice and how this might be altered depending on the technological array with which they are working. Roger Crittenden aside, there is a negligible amount of writing on editing in this context. The works discussed below apply such analysis to different television spaces.

Recent production studies work that focuses on space include Jonathan Bignell's *The Spaces of The Wednesday Play (BBC TV 1964–1970): Production, Technology and Style*. Bignell describes the manner in which the iconic Wednesday Play series was bounded and styled by restrictions and allowances in the recording and editing technology and the structure of the production staff. He describes the change from film to videotape that occurred during this period and how the equipment was a key determinant of the shape of the recording day:

> Although some editing was possible after the availability of videotape, editing two-inch magnetic tape was time consuming and difficult, so it was not used to create edits within scenes but instead to join blocks of continuously recorded as-if live material together. The video recording day ran until 10.00 pm, but demand for studio space meant that allocations of time were strictly rationed, and another production would be coming into the studio space the following day [...] Pressure of time and pressure on space were interrelated,

and put a premium on effective team-work. Film was used as a transcription medium, to telerecord the electronic studio output for subsequent editing, if the complexity of a specific studio production exceeded the capability of the team in the studio space (because of many short scenes, a large cast or complex relationships of vision to sound). (2014, 12-13)

Bignell's work does not, however, enter the edit space, which is not characterised as having its own identity in the manner of a studio. In the same way that editors take up little space in the cultural history of television, the edit space is overlooked in spatial studies of television. These privilege, instead, the set – whether studio or location filming – and the production office (Miranda J. Banks, Conor, & Mayer, 2015; Mayer et al., 2009; McNaughton, 2014), or the conceptual production environment, such as Public Service Broadcasting (Bennett, 2015b). While Mayer's own book, *Below the Line*, goes some way to addressing alternative production spaces, such as those use for casting, it does not enter the editing suite either (2011).

John Caldwell's analysis of production culture as a liminal industry provides a useful framework with which to describe television production as determined by its shape-shifting nature: "imaginative possibilities […] intersect with the power and logic of cultural geography". He further notes "the smaller empowering spatial tactics and behaviours of workers frequently counter the material, constraining spatial strategies of the industry" (2008, 108). He posits technology as a mechanism for workers to reimagine their place in the cultural geography, writing "one does not just buy a different product but also a different way of thinking: a systematically engineered theoretical perspective" (ibid., 125). In other words, technology can be used for the transfer to a differently imagined aspect of the production community. An editor can change his technology and he or she will be made anew, both in individual practice and in external perception, such as through the shift in role from film to videotape editor or from videotape editor to digital editor. Caldwell also identifies the use and display of technology as central to production practice. His analysis of "gear-based distinctions" within the category of "systems of use" (ibid., 150-151) explains the importance of "gear" as a "conditioning factor" (Cottle & Ashton, 1999) in television

production and editing practice. However, as discussed, Caldwell conflates all post-production workers into one mass stating that "The ever-increasing shrinkage of post-production and graphics workstations to a PC/desktop scale in the 1990s, for example, lowered the barriers for entry into the editing, animation and effects trades for many new workers" (2008, 157). This denies the possibility that each of these trades became more specialised and more distinct with changes in technology, which, in itself, allows for a multiplicity of communities. However, this is useful in reference to work on loyalty and identity and their relationship to practice, which will be discussed later.

In more literally topographical terms, space and cultural memory have, however, recently been considered in terms of landscape. Taking Assmann and Czaplicka's definition of cultural memory as "a collective concept that directs behavior and experience in the interactive framework of a society and one that obtains through generations in repeated societal practice and initiation" (1995, 126), Elizabeth Ellison reframes the discussion by applying this concept to landscape and using the Australian beach as a "site of cultural memory". Ellison's vision renders the beach as a site of "inherent complications […] through this simultaneous layering of the past and present as both myth and the everyday" (2016, 125). Although the edit suite does not have the grandeur of a sweeping coastal vista, it does present the same contradictions and multiplicity of uses, with its users persistently engaging differently with it. Retaining the notion of the plasticity of the space enables the space to be viewed differently as each participant brings his or her own experiential weight to it. There is a temptation here to understand the suite as a place of changing power relations, for an understanding of which we might turn to Foucault. Instead, it is a place of plasticity, with its qualities mediated by expectations and practice. The editor's role may shift depending on the other participants in the room, but as the primary operator, their power cannot be removed, no matter how elastic or mutable it might be. Each participant brings their own historical practice in the television industry to the edit suite, a practice which is shaped by the layering of their experience as a viewer and a worker with the scrutiny to which the television industry is subject in public discourse. It is at this point, therefore, that the wider context of television production studies must be considered.

Production contexts: a) the British television industry

Production studies provides frames of reference for the varying contexts in which television production is undertaken, from the broader structures of broadcasting institutions and independent production houses to production spaces, such as studios, production offices, trade fairs and highly specific situations such as the 'pitch' (in which a proposed production is pitched to a commissioner). With the studies cited above considering editing specifically, the literature cited below considers these broader and alternate contexts.

As the oldest and most influential broadcasting institution in the world, the BBC inevitably dominates British television production. It is much documented and will always be. In this way, it dominates, both conceptually and literally, producing all genres across its volume of output across its multiple channels, from the behemoth BBC1 to the minnows, such as BBC Parliament and the online-only BBC3. The BBC, therefore, presents a multiplicity of editing practices and must be central to the considerations of this thesis. The literature on the BBC, although sometimes looking at the minutiae of its programme making, more often places television production within the context of an institution subject to constant attack and, thus, change, as a result of that attack. It is, therefore, bound to and often bounded by the constantly shifting contexts of strategy and survival, as seen in licence fee negotiations and tussles with the government of the day (Born, 2003, 2005; Briggs, 1985; Burns, 1977; Carter & McKinlay, 2013; Scannell, 1989, 1991; Scannell & Cardiff, 1990; Seaton, 2015). This thesis is, instead, concerned with a very specific aspect of the BBC, namely the working culture and practice of film editors in BBC TFS before the sale of the complex in 1995. While to date, no scholarly literature has been found on this aspect, internet memoirs are available, such as former Head of Film Services David Martin's account of his time at TFS.[4]

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[4] This valuable unpublished memoir by David Martin, Head of Film Services 1966 – 1983 (not the editor interviewed for this thesis) is available at bbcfilmeditor.co.uk. This site serves to maintain the network of ex-BBC film editors. Martin provides details which are supported in this thesis, such as the way in which "directors developed preferences for cameramen and editors with whom they had worked

Various sources refer tangentially to editing in studies on news and news culture that focus on technology and practice in the context of Public Service Broadcasting (PSB), offering some useful conclusions (Allan & Thorsen, 2010; Cottle & Ashton, 1999; Saltzis & Dickinson, 2008). Cottle and Ashton view the newsroom as a place where "technological developments, then, are here incorporated and deployed [by journalists] for strategic and competitive advancement" (1999, 39). Where, in actuality, this includes desktop editing packages, it certainly impacts on editing practice. However, as typically found in the literature on news, technological change is discussed through its affective change on the production culture through its impact on journalists, rather than editors. The exception to this is Philip Schlesinger, who describes the operation of a television newsroom where editors are completing a "technical function", part of a "sub-editing process […] complicated by the fact that so much of the work has to be done by technical editors under the direction of the newsroom journalists". Editors, in this assessment, have no editorial autonomy at all (1987, 58-59), which itself provides a useful point of departure for an exploration of interim changes.

The BBC does not represent the entirety of British television production, with ITV, Channel 4 and the independent production sector also relying on differing practices that must also be considered. While this has been the subject of various studies, they overlook editing, making it is even less part of the cultural memory of independent television than that of the BBC. Bernard Sendall, Jeremy Potter, Paul Bonner and Lesley Ashton produced a six-volume official history of independent television in Britain, while Ian Potter charts major independent television production companies and Michael Darlow focuses on personalities and their particular machinations. Catherine Johnson and Rob Turnock provide varying accounts of the development of ITV, while Maggie Brown records the history of Channel 4 and Stephen Lambert details the intentions of its institution (Bonner, 2003; Brown, 2007; Darlow, 2004; Johnson &

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before and with whom they felt confident". He also frames BBC TFS in the context of its previous incarnation as Ealing Studios. (D. Martin, 2018)

Turnock, 2005; Lambert, 1982; I. Potter, 2008; J. Potter, 1989, 1990; Sendall, 1982).

All of these texts are useful as maps of the development of independent television production in Britain from the 1950s onwards, even if they do not address editing directly. They serve as useful guides for the changing structure of the independent television market and its dominant personalities and networks. Through numerous interviews, these studies also detail how production was carried out, revealing the milieu in which freelance editors operated, with the often-anecdotal recordings of Potter being especially candid.

Closer examinations of how independent production companies function are provided by Zoellner, Gray and Paterson (Gray, 2010; C. Paterson & Zoellner, 2010; Zoellner, 2009), and Ann Gray and Erin Bell's study of both the production and texts of television history programming, *History on Television* (Gray & Bell, 2013). James Bennett writes about what independence 'means' and, in so doing, provides context to the 'indies' and their shifting function for broadcasters (2015a). In all of these sources, scant consideration is given to the impact of technology on production processes.[5] John Ellis details the changing technology used in ITV programming, concluding that "production technology and hence what has been available and affordable has changed hugely in ITV's history" (2005, 47). However, he does so within the context of changing production costs and the resulting changes in structural restrictions, such as the speeding-up of production workflows due to technology, rather than specific changes in the technological affordances pertinent to editors.

The sources discussed above attend to the direct context in which editors work and provide an essential structural understanding of the television production industry. The sources discussed below attend to the affective nature of working in television. As previously mentioned, this is important, as production workers carry a peculiar cultural weight in their work: creating work that will then literally 'come home' with

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[5] While there are studies on how technology has enabled multiplatform programming, which connects technology to production processes and culture, multiplatforming itself, as a recent process in the television industry, does not fall within the scope of this thesis (Bennett & Strange, 2008; G. Doyle, 2010).

them through their television sets; being part of a cultural product – television – that they will have certainly watched and referenced throughout their lives; and, being part of institutions that are themselves part of the public discourse. The sum of these parts is identification and, sometimes, loyalty towards the television production community.

Production contexts b): issues of "loyalty and identity" (Sandon, 2007, 105)

Emma Sandon documents such communities and networks, and their presentation in self-identifying descriptions in her work on the Alexandra Palace Television Society (2007). Identification here is framed by loyalties to the BBC, the unions, a sense of professionalism, public service broadcasting, or the British state. In accounts gathered via previous interviews conducted by Dr John Stevenson, Sandon is able to revisit Stevenson's work with the interviewees. This lends a distance that allows further insights into the recordings and the identification of resistance and nostalgia. Loyalties are plastic and mutable and apt to fluctuate as "people create their sense of collective and individual identities […] In other words, all oral accounts will be highly mediated" (ibid., 101). Sandon identifies divisions that are maintained through the prisms of loyalty and identification: "some producers clearly did not wish to socialise with the engineering and technical staff […] production and technical staff did not intermingle" (ibid., 109). These accounts are useful in their reiteration of the centrality of networks across television production, while their roots in the earliest days of television illustrate their endurance. The weight of this early, original and originating production culture presses upon the contemporary, as a comparison of Sandon, Caldwell, Dover and Gray demonstrates. Furthermore, the application of Sandon's crucial notions of "loyalty and identity" are additionally complicated by the contemporary dominance of the freelance market and the parallel, arguably intertwined, shift in public service ethos. One opportunity to examine these complications can be found in social media groups, such as *Edit Suite Stories* on Facebook or Instagram feeds such as *Inside the Edit*, which provide further evidence of a sense of 'loyalty' and the creation of a 'community' of editors. It is arguable that the online space provides a far more candid measure of how editors feel about their work, with the motivations and behaviours

that Sandon observed in her Alexandra Palace veterans delivered more vividly. Mediated via a screen within the online forum, the members are networked in a way that collapses spatial and temporal limitations.

Ann Gray references Caldwell and Caroline Dover's concept of a "symbolic community" in the latter's analysis of British documentary producers (Dover, 2004), asserting that history commissioners in British TV not only inhabit a similar sense of a community but also extend it, constructing and operating their own production codes (Gray, 2010). Gray shows how differing communities within the television production community are constructed and upheld via their creation of specific codes, arguing, like Caldwell and Dover, for a "feeling of self-identification through their creative endeavours" (2010, 60). She describes the far smaller community of history commissioners, being an "everyday", "social and, to a large extent informal" group, as having a "shared ethos" and maintaining "alliances". While the much larger number of television editors across the entire industry precludes such intimacy, Gray's analysis of television production culture as informal and deregulated, where knowledge and practice are shared through friendships and alliances, portrays (even in microcosm) how to 'be in' television production. Without the right network, the production worker cannot do their job.

The interplay of networks, (imagined) communities, loyalty, personal investment and identity all present methodological difficulties which any study of the television industry must negotiate. The following section discusses examples of methodologies used in previous studies and explores why memory and testimony are peculiarly problematic in television studies.

Methodologies in television studies

Caldwell, Dover, Gray and Sandon employ interviews to gather their data, while Georgina Born and Anna Zoellner employ a more immersive ethnographic approach. Born spent years at the BBC compiling her observations and interviews, while Zoellner analyses (along with Chris Paterson) her time as a documentary producer in Germany

and then her research, latterly as an academic researcher rather than production worker, on the processes of a development team in a British independent television production company (Born, 2005; C. Paterson & Zoellner, 2010; Zoellner, 2009). All authors attempt to delve into below-the-line production activity, acknowledging the industry-wide context of changes in management structures and increased competition between the major broadcasters and independent production companies. These studies are useful for a mixture of methodological and contextual reasons, such as the gathering of interviews and the necessity of observation. In both studies, Zoellner acknowledges that, while one must both subsume professional experience for reasons of ethnographic observations and promote it to gain credibility, one must always be aware that either course of action may skew the data collected for fear of altering the behaviour of those being observed. While John Caldwell does provide a useful guide for the "scholar-practitioner", featuring sample descriptions of interviews undertaken across various areas of production studies, he does not deal with editing (2009). In their use of interviews with production staff across the BBC, Born and Burns, (Born, 2005; Burns, 1977) present recognisable realities of television which contrast with the official chronicles of Briggs and Seaton (Briggs, 1985; Seaton, 2015), neither of whom directly address production culture or practice, although it is tangentially inherent in both studies. Briggs makes this explicit in *Problems and possibilities in the writing of broadcasting history*, describing Burns' work as having "provoked argument" and defending his own omission of oral testimony, explaining that "oral testimony relating to the early years in the Corporation is often titled by later experience within the hierarchy" (1980, 11). In other words, recollections are invariably tainted by interim experience.

The unreliability of memory and testimony is particularly pertinent in any account of the television industry, which is widely described at once as a place of competing and shifting loyalties, which change further with the passing of time, and yet a place where workers remain allied to their perceived group (Born, 2005; Briggs, 1980; Burns, 1977; Gray, 2010; Sandon, 2007). This inevitably impacts on recollections, as altered by personal emphases – a different job, a different colleague and/or a notably successful or difficult project. When these aspects are amplified by the visibility of television as

an industry and a product, memories can change. Memories of television are mediated by their cultural context. Amy Holdsworth articulates the relationship between television texts and the everyday, describing how "catching one's own reflection in the television screen produces a form of resonance; the flicker of reflection, the snag of recognition which illuminates that oscillating pattern of the television experience" (2011, 15-16). How are memories altered when "one's own reflection" oscillates between what is on television and its construction? James Wertsch provides guidance on the interrogation of both individual memories and the idea of collective memory (2002). Putting aside discussions of the collective memory of events previous to a contemporary lifetime, which are not the subject of this thesis, but which occupy much of the discourse around collective memory, Wertsch's distinctions between collective memory and history are crucial checks to the use of such culturally mediated oral testimony:

> Historical accounts undergo change because the ongoing process of critical reflection reveals that one version of the past should be revised or replaced by another. In some cases, the need for change may stem from the discovery of new evidence or archives, and in others it may stem from the use of new analytical tools or theoretical perspectives. In all cases however, the basic argument for why one account should replace another will be grounded in some notion of objective accuracy, completeness and so forth. (2002, 43)

The possibility of the "replace[ment]" of accounts during the period of the transition from film to digital editing is additionally complicated by two factors. Firstly, rather than linear, this transition was stuttering, patchy and, to date, incomplete, as editing technologies still evolve. Secondly, the relative uniformity of film editing was replaced by a layered multiplicity of editing possibilities. Not only was it, to use David Morley's analysis of post-Fordist "restructuring and transformation", a process that is "complex, unruly and uncertain" (1995, 28), it was a process that depended on the context. The transformation did not happen overnight and happened within the bounds of differing institutions and organisations with some, like the BBC, inevitably imposing their own rituals and expectations, thereby individuating the process by

institution and re-individuating it by personnel. Smaller or newer television production organisations resist such strictures, while technology companies might disrupt practice not only through their products but also their way of being – they become dominant by means of their own characteristics. In any interviews recalling this process, the multiplicity of competing voices both reveal and conceal motivating emphases and preoccupations, sites of resistance and prejudicial memories.

Ben Highmore analyses de Certeau's "heteroglossia", the diversity of voices, in the context of de Certeau's use of the novel. Although interview data is not a literary artefact, it does comprise narrative - the remembered narratives of people's lives. Remembering, especially on a one-to-one basis where no other voices can interject, is neither fictive nor factual. It is a singular version of events, a narrative unencumbered by outside context, especially when it takes place in a one-on-one interview where the subject is actively invited to enjoy and recall their own version (i.e. narrative) of their history. Highmore writes that "narrative's most vital relationship with everyday life, for de Certeau, is not as an ideological persuader, but more hopefully as a space for recording forms of action and for the rehearsal of potential activities." (2006, 127) Interview subjects, in recalling events and those events' consequences, are recording their own actions in the rehearsal of their remembered – and, thus, performed – activities.

The literature on the independent sector is, possibly due to an archive less reliable than the BBC's, notably more dependent on two categories of historical sources that are treated with additional scepticism by the academic community: recollection and the 'insider' source. The word 'recollection' is used rather than the phrase 'oral history' because the sources are often presented in an 'I was there' frame, as opposed to a thorough, multiple-sourced and cross-referenced oral history study. This is because, often, in television, so much is unrecorded, such as decisions made in corridors or at dinner parties, as evidenced by Ann Gray's "codes" (2010, 59). Ian Potter's own admission of his being a book "occasionally pieced together from conflicting accounts" (2008, ix) not only demonstrates the fallibility of memory in any account, but also suggests the unreliability of memory and recollection as a research

source in an industry that developed in such a stuttering, patchwork manner (which is clear from reports by industry sources such as *Broadcast*). There are several 'insider' authors here. Michael Darlow and Stephen Lambert are both successful television producers, Paul Bonner is a former Channel 4 Programme Controller, Jeremy Potter was head of Independent Television Publications, and Bernard Sendall was a key player in the establishment of the Independent Television Authority (ITA). The difficulty with these 'insider' accounts is illustrated by a single example – Brown and Bonner's accounts of the relationship between Michael Grade and Dennis Potter in the last years of Potter's career. Bonner uses Grade's own account as the primary source, with no counterpoint given to Grade's positive self-assessment (2003, 277-281). While Brown describes Grade's centrality to the process of putting Potter's final works on screen, she provides a more impartial version of events, demonstrating the difficulty of the "very personal power exercised by strong chief executives" and highlighting then-Channel 4 executive Liz Forgan's assessment of Grade as being "obsessed with Dennis Potter's genius" (2007, 183-184). To varying degrees, these are personality-driven accounts seemingly influenced by their authors' networks and loyalties, similar to those longstanding cultural loyalties described by Emma Sandon. This again raises the question as to whether such loyalty has peculiar aspects unique to television and, if so, how they might be accounted for.

John Caldwell's book *Production Culture* (2008) offers a methodology that comprises oral history interviews, archival documents and an ethnography of production spaces (such as a trade fairs), augmented by his own industry experience. Caldwell describes a multiplicity of "spaces and rituals […] bound together by consensus building interactions", delineating an "organisational map" of "socio-professional rituals" (ibid., 106-108). In their differing forms – pitching, networking, deal-making and mentoring – all of these rituals and interactions are distilled and performed, to varying degrees, across the different areas of production, including the edit space. For example, a production can be commissioned at a viewing in an edit suite, while an assistant's learning process can comprise sitting-in on and observing the production process, during which, introductions are made, connections noted and future employment secured. How to write the history of the undocumented?

While many television production interactions go undocumented, there are numerous documented trade resources for the industry and its technologies. These manufacturers' manuals, broadcaster reports and reference guides provide guidance on editing technology and processes, and how editing technology was and is used. Some, such as 1994's unpublished *A Guide to Editing and Post Production* (Booth, 1994), reveal preoccupations at specific points in history, and are crucial for the study of the concerns that presented in the transitory times that are the focus of this thesis. These sources include: *American Cinematographer*; BBC Engineering publications; the *TV & Video Engineer's Handbook*; *FirstFrame* (the quarterly publication of the Guild of British Film and Television Editors (GBFTE); the *Journal of Film and Video*; *Television Mail*; *Broadcast*; *International TV Technical Review*; *Production Solutions*; and, the *LA Times*. [6] Clearly, these are also archival sources, providing information on the machinations of the industry – who has moved where and is making what, or who is newly important and who suddenly less so. In a world where, as discussed, networks and loyalties are crucial, such information is essential in contextualising details gleaned from interviews and by cross-referencing information. The use of trade sources is discussed in a recent dossier, *Technology and the Trade Press*, published in the film and media journal *The Velvet Light Trap*. In this dossier, K.J. Donnelly highlights how the trade press can illuminate industrial shifts and tensions that shape the industry through their provision of "an exquisitely detailed view of events because they can adopt a point of view from 'outside' the film industry and institutionalized film studies". There is danger here, too, as such sources are moved online, with Donnelly stating that "electronic delivery's economy crucially loses surrounding material that may provide a vital understanding of the wider context" or that "the fortuitous discovery of something interesting is discounted by highly focused keyword-searching" (2015). This is not to dismiss online trade resources. Websites such as guru.bafta.org/skills/editing, which contains videos of editors discussing their work, are a useful 'who's who' of 'star' editors and provide further data on genre

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[6] (Bradsher, 23 August 1987; Cohen, 1989; George & Boris, 1991; Heuring, 1993; Higgs, 1973; Robley, 1993; J. A. Stanton & Stanton, 1989; M. J. Stanton, 1987; Zone, 2002)

specificities and the illumination of (often gendered) self-analysis. As interviews, however, they are highly edited for publishing purposes and, therefore, must be treated with scepticism.

Trade and industry sources are augmented with instruction manuals and books aimed at the teaching of editing. The following two examples present differing approaches to instruction and, in turn, illuminate multiple possibilities both for practice and changing approaches to instruction over time. Both examples use a combination of text and illustration, emphasising the practical and, in so doing, demonstrating the authors' perception of practice – what an editor 'should' be doing – at the time of publication.

Originally published in 1975, John Burder's *16mm Film Cutting* attempts to "make life easier for you in those first crucial days in the cutting room". Its brief, one or two-page explanations are headlined with practical instructions, such as *Cutting Films Shot Without Sound*, and hint that film editing was not as uniform as one might expect. This is especially pertinent to television, as 16mm was, at the time of original publication in 1975, widely used in television production as a recording and editing medium, although often in conjunction with videotape (Bignell, 2014; Cooke, 2005, 2007; Ellis, 2011).[7] Under *Multi-track Equipment*, Burder writes:

> If you are cutting a film or golf tournament or a pop concert or some other event which has been simultaneously filmed by a number of cameras, a multi-plate editing machine will make the job easier and save time, but for most purposes one reel of picture and one soundtrack will probably suffice (1988).

Practice here is, therefore, determined by genre specificities and filming technologies. While Ernest Walter's work is, as with Murch, situated within the "major feature film cutting room" (1982, 16), it is very useful as an explanation of the organisation of film

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[7] Writing in the introduction to the 1988 edition of *16mm Film Cutting*, Burder highlights the longevity of film, stating that it is "based on current techniques used by the BBC and by most major television networks." (Burder, 1988, 9)

editing processes under headings such as *Assistants' Daily Routine*. It is not, however, concerned with the specific cultural weight of working in television production.

Despite being written decades later, BBC editor Chris Wadsworth's *The Editor's Toolkit* (2016) elaborates on the specificities of Burder and Walter – and demonstrates their longevity – in highly detailed descriptions of different programmes and their different demands. In describing these demands, he also illuminates the creative aspects of an editor's practice. On comedy, he writes:

> Editing funny material that eventually will be shown to an audience and guessing the right amount of time to leave between a funny line [or action] [sic] and the next funny line [or action] [sic] is an art. [...] The falling chandelier in *Only Fools and Horses* is a prime example [...] It was shot on film and designed to be played to a live audience when the rest of the episode was recorded. It was edited by Mike Jackson with director Ray Butt. Ray and Mike put in every reaction shot they could think of after the crash [...] When it came to me only a couple of tightens were required for a perfect result' (ibid., 109-110).

For Wadsworth, creativity resides within collaboration, hierarchy and the detail of the instinctive "tighten[ing]", as performed by the senior editor as a learnt act enabled by years of experience. Both of the above works are rare examples of a television editor's practice being written down. The fact that editing practice is only recorded in the context of instruction demonstrates, again, in comparison to Murch, Rosenblum and Clark, the sublimation of individual practice to the greater collaborative work of 'making television'.

All of the above sections and the considerations that they present have to be placed in context. This contextual perspective is delivered in the final section below.

Wider contexts: technological adoption and cultural production

Susan Douglas's *The Invention of American Broadcasting* offers a history of the development, launch and adoption of society-changing technologies across the United States (1989). It provides a useful analytical framework for the social construction of technologies and how they are taken up by the general public. As outlined in the introduction, Douglas' framing of technological change as bound to the perception of distinctiveness is repeated throughout this thesis. Her descriptions of the oscillations between "the technological, the corporate and the journalistic" have, additionally, informed much of what is written here (ibid., 61). In *Early Radio*, Douglas illustrates the accumulative, incremental, multi-faceted way in which a technology is adopted, a process reflected in this thesis (2011). Elsewhere, she provides frameworks on how to describe the uses of technology.

In *The Turn Within: The Irony of Technology in a Globalized World* (2006), Douglas uses McLuhan as a starting point to examine how, rather than leading us towards an outward-facing engagement with the wider world, technology has instead precipitated a "turn within", prompting a tendency to excessive self-examination. She details the patterns of adoption and resistance to technologies. She states that "insurgent uses of communications technologies have existed at least since the early days of wireless telegraphy, and historically such rebelliousness has been most pronounced (and destabilising of the status quo) when corporate control seemed most complete" (ibid., 626). This evaluation is useful when considering the competition among technology companies in the 1990s, dealt with here in the analysis of the Avid and Lightworks editing platforms in Chapter Four.

Douglas describes the "space eradicating technologies" of television that brought swift-delivered live news into the home. However, instead of allowing a deeper consideration of world events, "the speed and new mobility of news reporting technology, and the graphics in the newsroom, worked in opposition to depth, and thus in opposition to global awareness and empathy" (ibid., 627). She argues that recent communication technologies, in conjunction with the trends described in

American news reporting and the rise of reality TV ("celebrity-based entertainment and journalism"), "magnified the importance of personality, the interpersonal, surveillance of behaviour and the body, and an even more insistent consumerism". She continues, stating that the replacement in the television schedules of current affairs programming by celebrity-based journalism has enabled this "turn within" (ibid., 631). The speed and textual emphases Douglas highlights in 2006, before social media became the dominant communication technology and before the immediacy and constancy of contact and information delivery became the norm, have been amplified – we look at and comment on each other, or, more accurately, our chosen 'friends' or 'followers', all day long with careful consideration a rarity. This is crucial when thinking about social media groups as generative of a certain discourse. People gathered together by a common cause and talking about one subject and who are mediated and protected by a screen and the safety of a 'closed' group system might allow candid information to be revealed. However, this may also be revealing of the advent of hyper-microscoping to the point where layer upon layer of consensus, in the form of comments upon comments, completely eradicate any analysis. Projection is followed by agreement and further agreement, with the group often refuting possible points of resistance, either directly or via its dominant discourse. Moreover, placed side by side, these two concepts, that of powerful external marketing and the internal adoption of messages by social media groups, suggests a powerful framework for analysing the acceptance of and resistance to certain types of 'gear', as highlighted by Caldwell. Clearly, this is a social constructivist argument, but one complicated by the slipperiness of social media and the difficulties of using the internet as a historical source. Douglas concludes that "we must remember the irony of technology, and the ongoing gaps and tensions between technological capabilities on the one hand, and the not insignificant power of ideological frameworks and corporate state-interests on the other. It is at this nexus, in this struggle and mess at the middle levels, that we will find the most interesting and important stories to tell about modern life in the twenty-first century" (ibid., 637). This "middle-level" theory, which "seeks to find an intermediate level of analysis in which technology is seen as both socially constructed and society shaping" (ibid., 635), also allows a consideration of the way in which editing technology from the film industry – in its video and digital incarnations – is

never used in its totality. While flatbed film apparatus was a 'complete' system, the move to electronic, and then digital, iterations engendered such an explosion in the variety of equipment that no practice could utilise all editing possibilities. In this way, editors 'sample' technology to suit their practice, journeying in, out and across the possibilities of the 'kit' in a way that both completes the job of editing and also leaves many of the potentials of the technology unused. As Douglas says, "it is the middle level that we can best analyse the articulations between the scopic capabilities of communications technologies and the industrial decisions about when and why to zoom out and when and why to zoom in" (ibid., 635). This framing is another consideration when thinking about how the memories of editors could be mediated by social media conversations.

Returning to McLuhan (in relation to Malafouris), while he anticipated the positive repercussions of technology, in his much-adopted concept of the "global village" (through which he implied the collapse of borders and renewed cooperation across cultural differences), he feared the potential subservience of man to the technology. This determinist stance, placing technology as an "extension of ourselves" may precede, by decades, Malafouris's "extended self". However, where the Malafouris sees an act of embodying that has an abundance of uses, McLuhan fears technology as "an extension or self-amputation of our physical bodies", in which "we relate ourselves to them [technologies] as servo-mechanisms" (1964, 49-51). As such, McLuhan's perspective feels inapplicable in a contemporary context so entwined with multiple technologies, especially when attempting to unravel the specificities of editing practice and its oscillating emphases between operator and machine, in which the "operating system" (Ellis, 2015) goes to work.

Georgina Born engages with issues of cultural production, partly focusing her analysis within the BBC. She describes her ethnographic work at the BBC as an attempt to probe the "conditions for creativity [and] the causalities underlying these conditions" (2010, 173). In so doing, she provides an alternative context, momentarily apart from the technology, to examine how editors might engage creatively in their work in duality with their self-conception as technicians. This is the "invisible" part of editors'

work, the unseen creative input which, due to the hierarchy of director above editor, can be conceptualised as an additional creative input that comes only after the director's original idea(s). Born uses Bourdieu to situate her own analysis:

> Bourdieu argues trenchantly [in *Knowledge and Control* (1971)] when tracing wider social and historical determinations that they take effect only through their refraction by the properties of each specific field. Hence works of art are produced through the interaction between an artist's habitus (or socialised disposition), which reflects her social origins and personal trajectory, and the field as a structured space of competing styles and genres, themselves resulting from the evolution of the field (ibid., 177).

Born's issue with Bourdieu as a complete theory of cultural production is that he fails, she says, to analyse how production changes over time: "it is only by theorizing diachrony in cultural production that processes of stability and change can be grasped: the continuity of certain artistic codes or aesthetic formations, their evolution or bifurcation, subtle shifts or sudden ruptures in style" (ibid., 179). This thinking lends to the argument that editors do have a style that is itself comparable to more traditionally-defined 'artists' and evolves in a similar way that is "attuned to historical specificity" (ibid., 180). For editors, this specificity can be found within their technologies, which allow the duality of technology and creativity to be situated together within Ellis's operating system (2015).

The specificities of cultural production – specificities of practice and agency – are contained, for Born, within Bourdieu's concept of "habitus". She continues that "[Bourdieu] proposes a theory of practice focused on the concept of habitus [...] For Bourdieu habitus is pre-linguistic and non-discursive; it is embodied in individual actors, but it is also a collective and social phenomenon [...] Agency is understood to result from the improvisatory nature of practice as is it informed by the habitus and meets the conditions of the field". However, for Born, the gap within this conception is that "any analysis of creative practice that does not address the variable forms of invention and the diachronic vagaries of artistic systems and aesthetic formations fails

to capture the defining historical processes that constitute this specialized domain"
(Born, 2010, 180-181).

In discussing why she chooses to conduct ethnographies of institutions such as the
BBC, Born goes on to say that "if there is an overriding dimension of creative practice
that has been lamentably neglected – by Bourdieu, production of culture and cultural
studies alike – and that demands to be studied, it is the insistent, existential reality of
the historical orientation of producers by reference to the aesthetic and ethical
trajectories or coordinates of the genres in which they work, an orientation that
enables or *affords agency* [sic]" (ibid., 192). In other words, practice is not only shaped
by habitus in the sense that Bourdieu means, but is also actively enabled by the way
in which practitioners – in this case editors – orientate themselves within the context
of their work: in television, this relates to the previously discussed weight of "historical
orientation". This also enables the consideration of the expectations placed upon
practitioners/editors and how they shape editors' practice. In television, this
"historical orientation" is not limited to the boundaries of the BBC; however, while
the BBC may be a factor in this orientation across the industry, conceptually and
literally, the freelance market makes such boundaries porous.

Engaging with writing on cultural production enables the agency inherent, but mostly
overlooked, in editing to be described. This takes us beyond the role of the editor as
the receptor and organiser of footage and into an understanding of how an editor
brings their own historical orientation, allied with their technical abilities, into their
practice. Most importantly, this thesis takes Douglas' mid-level theory and her
descriptions of the multiple factors inherent in technological development and
adoption as its primary framework. Understanding and using this framework enables
the full description of how changes in technology impact on editing practice and the
continued changes that happen over time.

Conclusion

The literature reviewed above illuminates aspects of the editor's work: the tools they use; the relationships they negotiate; the expectations on them and the texts – the feature films, television programmes, commercials or music videos – of their work. There is, however, very little scholarship on the specificities of individual practice, and even less on practice in the context of British television production. It is this gap that this thesis will address.

Chapter One

Ealing Studios and the BBC Television Film Studios: memory, heritage, practice and the corporation

Introduction: the Television Film Studios and the BBC's "libertine past" (Born, 2005, 107)

This chapter evolved out of comments made by interviewees recalling working at the BBC Television Film Studios (TFS). They remembered it as being a place that was "special", "wonderful", "fascinating" and "magical".[8] It undertakes a close analysis of the memories of editors who worked at BBC TFS and looks at why they found it such a remarkable place. It frames the everyday practice of workers at this location in an additional aspect of televisual heritage conceived around the location of the studios and the practice of working on film. It argues that the specificities of the TFS production culture resulted from the peculiarities of the location and working medium. It demonstrates that, while TFS was intended by the BBC as simply another production space, the recollections of those who worked there have a transformative effect on the conceptualisation of the complex, giving it a separate history. This history has up to now been displaced by the site's historical association with cinema, in that, prior to housing the BBC, TFS was the site of Ealing Studios. Enmeshed within these memories is the idea of BBC TFS being its "own little world" (*Interview with Roy Sharman*, 10 November 2016).

This "world" is seen as having disappeared when the site was sold in 1995 as part of Director General John Birt's Producer Choice transformation of the BBC. This represented a point of change for the BBC, acting as a hinge between then and now, with these memories forming part of the time that has passed. The TFS is, therefore, seen as part of what Georgina Born has termed the BBC's "libertine past" (2005, 107).

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[8] (*Interview with Rod Longhurst*, 10 January 2017); (*Interview with Andy Kemp*, 21 May 2016; *Interview with Ed Bazelgette*, 7 July 2015); (*Interview with Tony and Hazel Heaven*, 14 November 2016); (*Interview with Mark Day*, 11 October 2017).

However, the implication of pre-Producer Choice BBC being somehow 'freer' is not completely borne out by interviewees, instead seen here as something more ambiguous. They loved BBC TFS, recalling a different set of management structures under which work was still highly regulated, just by structures they perceive as being more beneficial to editors. These regulations are remembered as being dictated by the specificities of film and the processes required by film production, as well as being enforced by managers. In contrast to the post-1995 BBC landscape, managers at TFS are remembered affectionately as people who had a connection with those working under them – a connection that was severed by Producer Choice. These recollections echo Carter and McKinley's description that "Producer Choice was geared to narrativise the past as a burden to be rejected"; however, this narrativisation was not embraced by those who did not feel any burden (2013, 1236).

Understanding the context of working life at BBC TFS demands a consideration of the role of film at the corporation. Hannah Andrews writes "The BBC Film Unit, established in 1948, was originally intended only for necessary on-location shooting. This comprised primarily documentary features, and the occasional short film insert for drama" (2014, 43). By 1961, however, it was estimated by the BBC itself (in an internal memo found at the BBC Written Archives) that the corporation was employing 40% of the national film production workforce (Spicer, 8 May 1961) – a not inconsiderable output. This figure points to the sustained dominance of film, and suggests that videotape, introduced to the BBC in the late-1950s, had not at that point eroded this dominance. Videotape was certainly present, however. In her discussion of the convergence of aesthetic and technological affordances of film and videotape that happened post-1958, the year the BBC adopted videotape recording, Andrews argues there was an "association with the film camera with the 'real' […] Deliberately employing the material and stylistic associations with realism, authenticity and veracity of the documentary camera." (2014, 43) This sense, of the veracity of film and of its heritage, present in the materiality of celluloid is detectable in the memories of the BBC workers at TFS. The sense of conceptual division inspired by film was then amplified by the sense of geographical separateness inspired by TFS' location in Ealing.

In 1955, the BBC purchased Ealing Studios, in West London, to serve the needs of its expanding television service and its increased programme production. However, the site's time as a BBC property is little-studied, not only compared to corresponding BBC production sites, but also in terms of its widely noted importance as a site of film production as Ealing Studios. There is no mention of the TFS in *The BBC: The First Fifty Years* (Briggs, 1985), while Tom Burns only mentions it in passing as one of the buildings associated with Television Centre (1977, 79). In Vol IV of his *History of Broadcasting in the United Kingdom*, Asa Briggs references the splitting of the Film Unit, of which TFS was a part, from Outside Broadcast in 1948 (1979, 229 & 238), but not at all in Vol V (Briggs, 1995). There is no mention of TFS by Jean Seaton in *Pinkoes and Traitors* (2015), while Georgina Born references "Television Film Services at Ealing" only as the site of the piloting of Producer Choice in 1991-2 (2005, 106-7). TFS has been neglected in comparison to the numerous other BBC sites that have received attention as production spaces during this period. For example, Jonathan Bignell writes:

> From 1949, BBC converted film studios at Lime Grove in Shepherd's Bush, where there were five studios, and at Riverside in Hammersmith where there were two studios in use from 1954. In 1960, Television Centre was completed at White City in London, as a purpose-built facility for making programmes as much as possible from start to finish on one site. (2014, 12-14)

Bignell does not mention the TFS except in a reference to the "film unit at Ealing Studios", suggesting a hangover from when the site was, in fact, Ealing Studios. This reference is in the context of the "persistent pressure from [Tony] Garnett, [Ken] Loach and others […] to persuade Peacock and the Ealing management to allow initial experimentation with 16mm on location" (ibid., 15), which frames the significance of the site through the prism of its star incumbents. None of these sources describe TFS as being distinct to any of the various BBC locations.

In contrast with the above, the interviews depict the TFS as a place of peculiar intimacy and ease, with this intimacy present in the recollections of its spaces – the open doors,

the corridors, the 'owned' cutting rooms, the canteen, and the *Red Lion* pub across the road from the studios. The sense of ease is present in descriptions of relatively unmanaged, unregulated working patterns. Indeed, this was a workplace that operated to, and was managed in synchronicity with, a rhythm dictated (in the main) by the specific requirements of film editing – the processing, transferring, sorting, handling and cutting of celluloid. This was the working life of film editors at BBC TFS – a working life that contrasts directly with the demands of post-Producer Choice management structures and is described by interviewees as definitively past. This notion of a different, possibly better, BBC that has now been firmly consigned to the past has been noted before. As early as 1977, Tom Burns observed his interviewees' comments as marking:

> ...the transition of broadcasting from an occupation dominated by the ethos of public service, in which the central concern is with quality in terms of the public good, and of public betterment, to one dominated by the ethos of professionalism, in which the central concern is with quality of performance in terms of standards of appraisal by fellow professionals; in brief, a shift from treating broadcasting as a means to treating broadcasting as an end. (1977, 125)

This transition culminated in Producer Choice, which Georgina Born characterises as a conceptual reframing functioning as "a new morality within the corporation [...] one that was highly critical of what was seen as the wasteful and libertine past." (2005, 107) For Born, BBC TFS, in its relative lack of regulation and appraisal, is part of the "libertine past". The working life at BBC TFS is described below.

Day-to-day work at BBC Television Film Studios: the practice of being "just about film"

Editor Anthony Coombes remembers the day-to-day practice of being an assistant at TFS, where he started in the 1980s, describing the structure and pacing of the working day as based around the processes of film:

...the dailies would come in from the labs and, as an assistant [...] you'd go and get the rushes which came in cans from despatch. [...] So, you'd say, 'Okay, we've got four rolls today, numbers 407, 408, 409, 410'. You put it in the book. That's when they arrived. You'd take them to the cutting room and then you'd get the sound, which also came to despatch but from the sound recordist, and you'd take that to transfer bay and they would transfer that sound on quarter inch tape onto magnetic tape, and then I'd have to synch it up and synch the clapperboard, picture. Now, this picture was on negative film, so the labs held the negative and we got a print and the advantage was... this is printed copy... was it didn't really matter what happened to it. It was not going to be transmitted. [...] you'd then synch up the picture to the sound and then you would get the sound copied because then you would have an offline version of the sound as well. And then you get everything numbered so that there was a match all the way across. So the picture had red numbers on it and they matched directly with the blue numbers on the master sound and the yellow numbers on the copy sound. And then you'd come back to the cutting room and you break it down then into the individual shots and then it would be put together in scenes. (*Interview with Anthony Coombes*, 20 January 2017)

After the division into scenes, the film would be broken down further and then organised as per the preferences of the editor. The assistant's working day would be regulated by the dual demands of celluloid and their boss:

...then you'd break it down into slates, let's say, from 100 to 110, 10 slates for this particular scene and you put them in a pile, perhaps beside the editor, and say, 'There's the scene with the pictures and script'. He's got to cut from that and he'd start looking at the material. Depending on who you were working with, different editors work in different ways. Some might look at the material separately. Some might say, 'No, don't do it yet. I want to watch all the material shot in one hit'. So I'd watch the scene on the Steenbeck with all the rubbish in it as well, and then he'd say, 'Okay'. So that's what happened. The editor

would look at what's called the continuity, which is the continuity person's report of how the day had gone. So, slate 100 we did four times. Take 2 is the best, but there's a good bit at the end of take 4. So, he'd look at that. 'Oh, yes.' And then he'd go, 'Oh, I'm not sure. I think actually there's a better bit at the end of Take 3', and he'd write a little note to himself (ibid.)

While the editor kept the notes and made the decisions, the assistant's job was to look after the trim bins and be alert to the specificities of the senior editor's own practice:

And there'll be a big trim bin. A trim bin is [...] a bin with little hooks on them and anything that was discarded was then hung up on this trim bin, because it might have been discarded, but he might want to come back... [to the trim] and then, at the end of the day, whatever was in the trim bin was deemed to have been finished with, so it was wrapped up in a bobbin and put into the can that related to those slate numbers. So, if it was a big scene, it would be Scene 100, which would contain, say, 15 slates all in this can. So, then tomorrow he can say, 'I'm going to go back to that scene. I wasn't happy with how it worked'. Then you'd pull it out. There they are. He'd work on them and you'd be... so, the assistant's role, apart from watching the editor if he was an involving editor, which you try to get to work with, he would explain what he was doing as he was going as much as he could. If he was a cool editor, as in not so interested in what you might contribute, then he might be quite friendly, but he might say, 'All right, yeah. I'm just going to do this. Can you just go and get two coffees?' (ibid.)

The rhythm of film, in the breaks imposed by the breaking down and studying of the footage, runs through the whole process of film as a production medium. Coombes goes on to illustrate how the processes of film, coupled with nature of TFS as a production location, dictated the working day, giving editors time to consider their work. This is a freedom delivered, it is implied, by the rhythms of film:

Because there was a process in film where [...] if you watched an hour film on a Steenbeck and said, 'Right, what are we going to do now? We'll go back to the beginning'. Now, it would take at least 10 minutes, if not quarter of an hour, to get that film back to the beginning in film terms; to rewind it properly; reload it onto the Steenbeck or the viewer thing. Obviously, digitally you go [bangs table] and press two buttons, or one button and right back at the beginning. So, that window, that stop gap, mechanical one, if you like, has been removed. That's what a number of editors would agree is called, you know, thinking time [...] And there are a number of processes that took place like that where there'll be inbuilt breaks that people would have to take because the processes were there (ibid.)

These "inbuilt breaks, depicted here as representing "thinking time", are, then, part of how the materiality of film determined practice. As recalled by Coombes, they involved getting the cans, administration ("put it in the book"), synching to sound, breaking into slates, watching the material, working against the script, and looking after the trims. Breaks came with the completion of the processes demanded by film. This is not to say, however, that these affordances are all unique to film. For example, both videotape and digital equipment have spooling facilities and could, in theory, also be used to watch footage as it is rewound; however, there are no reports of this occurring.

The day-to-day practice of working with film at TFS is further remembered as being made different by being in Ealing, in that this distance from other facilities induced a sense of separation from the rest of the BBC. The editor Rod Longhurst started at the BBC in 1965 and recalls TFS as:

…a bit more special than [...] the other areas, because you were just about film. The film cameramen were based there and the management was based there, satellited in Television Centre, and maintenance and things like that were based there, and the studios were there. So, if a drama or whatever, and mainly it would be drama, was going to be shot on film and it needed, you

know, internal filming, then it would have been done in Ealing. There was nowhere else where you would have done it. [...] So, therefore, it was a unique enclave of film only. (*Interview with Rod Longhurst*, 10 January 2017)

The notion of being "film only" runs throughout the interviewees' recollections of working at Ealing.

That TFS was such a "unique" space had implications on editors' practice in terms of the cinematic – in the context of historic film production at Ealing, the medium – in the institutional context of the BBC, and materiality – with its implications for practice. This last point represents the primary way in which interviewees describe the peculiarities of TFS – everything flowed from the primacy of the medium at the location. 'Film' itself in this historical context has various meanings. It refers to the material itself and how working with celluloid dictated the geography of the building and its cutting rooms. It has conceptual implications, with interviewees continually suggesting a hierarchy that placed film above videotape, which was being used elsewhere in the BBC. Longhurst notes the fact that "management" was based at TFS as highlighting a difference between the pre- and post-Producer Choice BBC. The idea of 'management' has several manifestations, however, and is expressed via notions of familiarity and hierarchy, often within the same quote. This notion of a working elite, and being part of one, is expressed and reiterated in the descriptions of the relative freedoms the interviewees found at TFS. The following section elaborates on these concepts of familiarity and hierarchy.

Management of the day-to-day: familiarities and hierarchies

Editor Roy Sharman makes a connection between what he perceives as a now-extinct management practice at the BBC with his career success – the sense of being "looked after":

It [the BBC] was a bit like a cross between a college and civil service and all those sorts of things. It was a nice structure within the BBC; a kind of... I

suppose it was a paternalistic organisation. You felt looked after. And then you had all your colleagues, which is what we were talking about with Ealing. You felt a real sense of identity and community, definitely. [...] The only real sense of community I ever got was working - not just in Ealing; there were other places - but working for the BBC, I found a very connecting experience, you know. I had colleagues. I had a sense of managers who cared about me. All those sorts of things that I don't think happens these days. (*Interview with Roy Sharman*, 31 July 2017)

Although Sharman qualifies that he is describing his experience across the entire corporation, he then returns to the specificities of work at TFS as a way of illuminating his point. Here, the importance of managers being able to understand, through experience, the departments they are in charge of is revealed as paramount:

...the managers at Ealing in the various departments had been... the thing that they managed, they had been that thing themselves. So, during my earlier years the editing manager was a guy called Roger Waugh who had edited some wonderful films. *The Resistible Rise of Arturo Ui*, [...] *Cathy Come Home*, famous things. He edited all of those and then he'd gone into management. So, when you went to speak to Roger, you knew that he knew what you were talking about. [...] There was a restructure and people that were managers didn't come from crafts. Maybe for other reasons they did that. But the camera, you know, the camera manager had been a cameraman, the sound manager, they all went through the system and went up into the management thing. So you always felt that that was another sense of community there [...] when you went into the canteen, there wasn't a great sense of being separate from management, necessarily. You'd see Roger sitting there chatting with some editors and then he'd be up at Television Centre discussing much bigger things with other people. (*Interview with Roy Sharman*, 31 July 2017)

The connection with Roger Waugh, as well as Waugh's operational approach of facilitating a closer relationship between management and editing personnel, is described as important to Sharman's career:

> I was working on current affairs, because that was a good place to be an assistant. Nobody wanted to do current affairs particularly, [...] working all night long over at Lime Grove. But then I went to see Roger and said I'd really like to do drama. [...] And he said, 'Okay, well, we'll see what we can do'. In those days the process was that they could actually say to production, 'Well, we've got these editors available. There's Roy Sharman. He's got a good record and we'd like him to do this', and they'd filter you into it. [...] They can't do that anymore. I mean, that doesn't happen obviously since Producer Choice came in when people would just take whoever they want. And so, it did facilitate. [...] I'm not sure I would have gone anywhere necessarily without that push, because directors weren't going to come along to me necessarily.' (*Interview with Roy Sharman*, 31 July 2017)

What Sharman describes is management through the prism of familiarity. Hierarchy, meanwhile, appears in various guises. Sharman (RS) describes the hierarchy in the TFS cutting rooms as defined and enabled by the geography – the distinction between South Block and T Block. Here, topography asserts hierarchy, with the occupation of the cutting rooms ordered by seniority:

> RS: T Block was regarded as... it was sort of elite, really. You really wanted to be in T Block.

> RA: Tell me how. What did that...

> RS: [...] T Block faces the park, Walpole Park. And 1, 2, 3, 4, 5, 6... there's about six rooms up there all overlooking the park. They weren't particularly spacious rooms, but they were kind of the place to be [...]

At the end, at the very end was Ken Pearce.[9] [...] there are people who are kind of the top-notch people. So, Tariq obviously, and people like Ken Pearce always worked on the very best dramas that were around. [...] then you had people like Clare Douglas. [...] Again, top editor. And Robin Sales. He was very good. Now, Robin Sales left the BBC at one point and his room became available: T13. So, I went to the front office and I said, 'Can I have his room?' and that was it and I moved in. I mean, it's a bit like personalised number plates. It's just the sort of, 'There you go', and you think, 'Right, I'm in T Block now [...] and it felt like an achievement. [...] And I loved it there actually, because although most of the time the blind is down because you need to be able to see the film, behind that blind was the park and you'd lift it up a bit and just look out and see this lovely park. So it was a nice place to be. It was a lovely atmosphere. [...] I felt privileged to be with them, [it] was like a little bit of an inner sanctum; that that was a nice little place to go if you were really, working on a top-notch drama.

RA: So, prestige...

RS: Yeah, prestige. When I first moved there, I was still doing... in terms of my career, I'd done all these documentaries, but when you started in drama, you had to start again more-or-less at the bottom just doing inserts, or I did anyway, to try to get established with drama. I did a few documentaries up there, but then finally, as I say, I got into the drama thing and I worked there on drama for quite a few years until... I mean, then things started to break up a bit more with people. It didn't matter

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[9] Ken Pearce was nominated for a BAFTA Craft Film Editing Award in both 1984 and 1987 (bafta.org.uk) and worked on BBC dramas such as *An Englishman Abroad* (1983, d. John Schlesinger) and *Tumbledown* (1988, d. Richard Eyre) (Listing, 2018c). Tariq Anwar, a BBC editor in the 1970s, is quoted as saying "The BBC was a great place to learn and make mistakes and not worry about being sacked." (Perkins & Stollery, 2004). He left the BBC and went on to become a prominent feature film editor. Clare Douglas worked on "*Tinker, Tailor, Soldier, Spy* (1979), Dennis Potter's... *Blackeyes* (1989), *Secret Friends* (1991), *Lipstick on Your Collar* (1993), *Karaoke* (1996) and *Cold Lazarus* (1996)" (Boardman, 2017). Robin Sales worked with Mike Leigh at the BBC on *Grown-ups* (1980) and *Mike Leigh Making Plays* (1982), before moving on to a career in feature films from the 1990s (Listing, 2018d).

so much. I'd got there, so I didn't... if I moved somewhere else, I would, you know, end up in Television Centre and things. (*Interview with Roy Sharman*, 10 November 2016)

Sharman's description is of an "elite" demarcated by the geography of TFS. He articulates his pleasure at being in the same block as the "elite" and his relief at not "ending up in Television Centre", which he implies as definitely being a place not for said "elite". Here, technology also provides the additional demarcation of film versus videotape. Later, he says of TFS that "in its own way, it was separate from the rest of the BBC. It wasn't that you didn't love the BBC, but it's just that you had your own little world and you could just ignore that lot, with all their electronics and things like that." (ibid.)[10] Hannah Andrews highlights the 'us and them' implied by Sharman, when she quotes David Hare: "Videotape lies in between theatre and film, the hopeless hybrid… which, up until now, has lacked visual finesse, against sets which have no stylistic density or texture and lit from a grid which is too high and too crude." Contrast this with "film is fast. It cuts well. You create your work like a mosaic out of tiny pieces, each one minutely examined as it's prepared, and then slipped into the stream of images you are preparing in your head." (Hare, 1982 in Andrews, 2014, 51-52) Andrews quotes Trevor Griffiths as saying "what is strong about film, as opposed to work done on videotape in the studio, is that you do it away from the institution." (T. Griffiths, 1983 in Andrews, 2014, 55) Sharman's demarcation of film as separate from the institutionally associated videotape, linked to the "rest of the BBC" with their "electronics and things like that", echoes through these quotes, suggesting that this was felt throughout the film production community at the BBC and especially so at a production location that was "just about film".

Further to demonstrating his awareness of hierarchy, Sharman shows how the editors' open-door policy conveyed familiarity, in determining how people met and interacted.

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[10] Ken Oxley, who managed the transition from film cameras to electronic at the BBC, laughed as he remembered the differentiation between the media as he recalled an engineer being sent to manage a section of TFS: 'the thought of the died in wool film unit, a lot of who had come from the real film world, being managed by a BBC engineer I just find amusing' (*Interview with Ken Oxley*, 18 October 2016).

This was dictated by the machinery of film and reiterates the idea that practice was 'managed' by the medium in a way that is now consigned to the past:

> ...because the rooms were quite small, you'd usually have to have the trim bins... [...] the trim bins with all the film in it... in the corridor [...] when you walked along the corridors in Ealing, you'd see these big old trim bins outside people's door and the assistant coming out... [...] they'd come outside to... and you'd often be looking for a trim and then someone would come along, 'Oh, hello. How you doing?' sort of thing. (*Interview with Roy Sharman*, 10 November 2016)

Familiarity, here, is engendered by geography, just as hierarchy is delineated by geography in the descriptions above – these were the specificities of working practices peculiar to TFS. The importance of longevity in the development of the network Sharman describes is also recalled by editor Anthony Coombes. He frames continuity as being important in his relationships with senior editors and describes the "incentive" of not having them "broken":

> In drama [...] it was quite common for assistants and editors who worked very well together to stay together as long as... and this was the crucial thing... there was work for them both to do. So, it was an incentive for the editor and the assistant to keep getting jobs. So they finish one job and another job would come along, because then they could stay together [but] You might get called in to any of the BBC facilities to be asked to work. If someone's sick, you'd come in to do... and there was about probably, I would say, a 50/50 chance of getting called in. [...] They would get moved onto another job and, therefore, that relationship might get broken. They'd say, 'Well, we've got a job for you. It's going to take 12 weeks'. 'But I'm supposed to be with Alan on the'... and they say, 'No, you can't do that'. So there was an incentive there. (*Interview with Anthony Coombes*, 20 January 2017)

In Sharman and Coombes' descriptions of the pre-Producer Choice management structure, relative power still lay with the non-producers. An element of nostalgia could be ascribed here, but Georgina Born describes Producer Choice as being both a process of "reframing" and one which "redescribed the corporation" in terms of a "new world view" and a "new morality". (2005, 107) She describes a real, qualitative difference between pre and post-Producer Choice BBC. While this described shift in institutional mindset is, therefore, not specific to TFS, there is an additional layer of change at TFS because Producer Choice also signalled the de facto end of film at the corporation. Therefore, for working life remembered through the different processes of work that film demanded, those differences will be especially stark. In the interviewees' accounts, a working life with film bleeds out beyond the literal working spaces of film – the syncing rooms, cutting rooms and dubbing suites. It is noted as occurring most significantly in the sense of camaraderie engendered by TFS's social spaces, the canteen and the *Red Lion* pub, and form part of the descriptions of pre-Producer Choice BBC of being "just about film".

The implied pastness of the notion that TFS was "just about film" indicates that it was a time of relative freedoms, in Georgina Born's words a "libertine past" (Born, 2005, 107). While, as discussed, elements of nostalgia may be found within this, these freedoms are seen in recollections of how editors determined their own practice via control over their equipment and editing spaces. The editor Tony Heaven highlights one aspect of this freedom when he discusses how, when he started working at BBC TFS as an assistant in 1967[11], "certain" editors had a choice over the selection of the machines they were to use:

> Well a lot of the classic thing is – certain editors had their preference over editing machines. And, an editor I worked for for three or four years – his name was Angus Newton[12] - and he loved editing on a machine called a Moviola […]

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[11] Tony Heaven worked as a BBC Film Editor from 1967-1999.
[12] Angus Newton's first BBC credit on bfi.org.uk is 1965's *One Free Man*. He edited *But the Client Loved It...* (1981, d. Tristram Powell), an Omnibus portrait of the 60s and 70s commercials production industry referenced elsewhere in this thesis (Listing, 2018b).

and I really liked that machine. It was just an ordinary synchroniser, without any picture on it [...] And I think Angus was offered this picture synchroniser which had a little picture on it and he didn't want it! Not interested [...] And I thought that was the business, really. And other cutting rooms had completely different machines – Acmes; Acmiolas… There was probably half a dozen different machines then. The Steenbeck, the old flat-bed Steenbecks that everybody knows and loves. (*Interview with Tony and Hazel Heaven*, 14 November 2016)

The implication is of an autonomy, gained via longevity, that enabled "certain editors" to define their individual practice. Heaven sees this as impressive and, by implication, to be emulated: "I thought this was the business". The use of the word *then* in reference to the editing technology contextualises this period as one characterised by freedom of choice. Editor Mike Mulliner reiterates this notion of autonomy being connected to seniority:

...the first cutting room I was attached to was a music and arts thing at Ealing, which was, it was Allan Tyrer's[13]cutting room. He was the chief editor on that particular block. He was the great God of editing at the BBC at the time, so it seemed probably quite an honour to be in his cutting room at all. And he always worked on, on a Moviola, which meant he worked in the corner of the room facing the door so that nobody could see what was actually happening on the screen, or on his Moviola or whatever. The only way you saw [...] what he'd cut was when it was taken down to the theatre and viewed. (*Interview with Mike Mulliner*, 7 January 2015)

Editors connect the TFS site with their memories of relative freedoms which they describe in terms of the working culture and in the specificities of items such as editing

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[13] Allan Tyrer's first credit is from *Will Any Gentleman...?* (1953, d. Michael Anderson), shot at Elstree for Pathe. His first BBC TV credit is *The Wire Cutters*, (1957, d. Ronald Eyre) (Listing, 2018a). Mike Mulliner worked with Tyrer in 1969, an experience where he "mostly sat at the back of the cutting room and watched" (*Interview with Mike Mulliner*, 7 January 2015).

machines. Additionally, the site-specific camaraderie of TFS is noted by several interviewees. This is not necessarily a new observation, with John Ellis showing how Balcon himself described this camaraderie. However, Ellis continues that, in fact, "Balcon's view is a little rosy: there was never a complete identity of interests" (Ellis, 1975, 106). Interests can compete, and negotiating them is learnt, as Roy Sharman describes:

> ...when I first joined the BBC and he was an assistant to an older editor who's probably dead by now, called Larry Toft. And Larry Toft was one of the old gentleman-type, sort of, for his time and everything, and his room was always closed. You always had to do that [knocks] on the door and go in there. So some people were like that, you know; some people were. But the general rule was that people were quite happy to leave their doors open; wedge something under the door and just have it open in case there was something interesting going on. (*Interview with Roy Sharman*, 10 November 2016)

While the boundaries imposed by the seniority of Larry Toft pertain to a management structure, it is just a different one to Producer Choice. However, the idea is that there is a camaraderie specific to the Ealing facility that is evident here and (as also referenced by Ellis) is present in Robert Sellers's book *The Secret Life of Ealing Studios: Britain's Favourite Film Studio.* Sellers quotes the art director Norman Dorme:

> I later worked at Pinewood and Shepperton, nice places, but they didn't have that special quality that made Ealing special. When you were at these other studios you worked with a small team, maybe only two or three other people. There were plenty of other people around, but they had nothing to do with you. At Ealing everybody was sort of connected, every department was connected. You knew everybody and everybody knew you. It was a family, a film-making community. (Sellers, 2015, 287)

While Dorme was talking about the culture of Ealing Studios, his sentiments are reiterated, firstly by David Martin in his comments on the canteen as a familial place:

Well, the canteen, it was, again, it was a great melting pot and a great place to go to... I mean, just forget the different factions. You would go there and you might be having a problem with something. You could talk about it with other people. They might be having a problem, or whatever, and you might be... they would know the person you were working with who was giving you a bad time [...] It was very important actually, and so that was in the day and then, of course, in the evening, everyone... well, not everyone, but a few... you'd go to the *Red Lion* across the road. Do you know the *Red Lion* pub? (*Interview with David Martin*, 25 October 2016)

The Red Lion and its importance as a hybrid social/working space is expounded on by Tony Heaven and his wife Hazel[14] (TH and HH respectively):

HH: And of course the great thing about – to hark back to Ealing – of course there was the wonderful pub across from the studios, *The Red Lion*, that became known – was it as Stage 5? Stage 5, I think.

TH: Mm. Or the nineteenth hole...

HH: Or nineteenth hole, yeah. [...] It - it was just a social thing. Not all of the Ealing editors but some of them would congregate in the Red Lion after a day's work, and just – you know, just let their hair down.

TH: And on the walls in the Red Lion of course there are these photos of actors, and –

HH: Yes, the sort of old Ealing Studios heritage –

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[14] Hazel Heaven worked first as a secretary in the complex and later as a Film Operations Manager in the various locations of the BBC Film Unit.

TH: The old Ealing Studios heritage.

HH: - became the BBC. Again it's all to do with – we're all in it together. It really was I think a golden age – well, for me personally was the golden age, I would think.' [...] We were just making incredible programmes. [...] we were the biggest film unit in the world at Ealing. Well, film department as it was called, which embraced all the other BBC buildings... I think at one stage we had 66 crews. I mean that's a huge number of crews, based in one location. And all – and all of the support that goes into helping that machine run. You know: all the admin people, the transport office, the FOMs [Film Operation Managers] offices… As I said, there was just a feeling that we were all working, having a great time - working hard but having a great time - proud of what the BBC stood for, and just proud of these amazing programmes. (*Interview with Tony and Hazel Heaven*, 14 November 2016)

The crucial line here, expressed jointly by the Heavens when completing each other's sentence, is "the old Ealing Studios heritage became the BBC." This sense of inheritance and continuity is central to how TFS is recalled in the context of the site's former incarnation as Ealing Studios.

Ealing Studios and cinematic heritage

The term *film heritage*, specifically in the context of TFS at Ealing, refers to the site as a place of cinematic history and heritage when it operated as Ealing Studios. Editor Ed Bazelgette remembers the explicit pleasure of working there when he started working for the BBC in the 1980s:

It was fantastic. It was lovely to be in a place where such a big slice of British film history had been created in Ealing Studios. It was a wonderful, wonderful feeling. (*Interview with Ed Bazelgette*, 7 July 2015)

Previous to the BBC's purchase of the studios, the site had been Ealing Studios,

arguably the most famous site of feature film production that Britain has ever had. Charles Barr describes Ealing Studios as being of central importance "to the cultural, social and political history of the nation since 1939" (1993, 188), while John Ellis notes that Ealing Studios' aim was "to show the Real as naturally as possible". (1975, 113) The films made there, such as *Went the Day Well?* (1942, dir. Alberto Calvancanti), *It Always Rains on Sunday* and *Kind Hearts and Coronets* (1947 & 1949, dir. Robert Hamer), *Passport to Pimlico* (1949, dir. Henry Cornelius) and *The Lavender Hill Mob* (1951, d. Charles Crichton), are, therefore, both central to British cinematic heritage and present a very singular idea of Britain. They exhibit a sense of studio head Michael Balcon's idea that the films made there "were made projecting Britain and the British character" (Barr, 1993, 7). Their continuing importance is made clear in the sustained attention Ealing Studios has received across both scholarly and popular history (Barr, 1993; Dux, 2007; Ellis, 1975; Moat, 1996; Sellers, 2015; Sweet, 2005). Sally Dux demonstrates the interest in the site from a production studies angle:

> By employing a regular production team, Ealing produced films of distinctive quality, many of which reflected a picture of British, or more often English domesticity, thus mirroring the ethos of a company that liked to see itself as a large family. (2007, 388)

Barr states the importance of the production culture at Ealing Studios when he notes that "the relation between the stories told on screen and the experience of the studio itself" (1993, 10), while Ellis remarks that "this kind of atmosphere was often remarked on by commentators." (1975, 105) The studio, the "family" with the father figure of Balcon, is therefore framed in these histories as somehow maintaining a familial or domestic ethos within its walls, an ethos projected on screen and felt by those with an interest in Ealing Studios' output. Today, the original Ealing Studios frontage has an English Heritage blue plaque reading "Sir Michael Balcon, Film Producer, worked here 1938-1956". Catching the eye on approach to the studios, the plaque and the office it commemorates, is the physical manifestation of the auratic power of events past.

Interviewees describe the importance of Michael Balcon's office, giving the clearest example of the degree to which TFS was felt by BBC employees as a heritage site. Editor Rod Longhurst makes the explicit link between the heritage status of Ealing Studios and Balcon's space:

> …you knew you were working in a place that had some heritage. You knew that the Ealing comedies had been shot there, and at one particular point in my career […] I was in the office that was Michael Balcon's office. Actually it was split in half because the head of editing was in the next half, and you looked out on a rose garden and you had this wood panelled office and I just thought, 'This is wonderful. I'm sitting in here where Michael Balcon used to sit, you know; looking out' [...] So, there was that aspect to it, without a doubt. (*Interview with Rod Longhurst*, 10 January 2017)

Longhurst's recollection is of an affective dimension of this specialised space. It is repeated by Film Operations Manager Hazel Heaven, recalling her arrival at TFS:

> For somebody like me, who was a film buff through and through, to think I was working within the Ealing film studios, and able to walk into the office that Sir Michael Balcon had, was fascinating. Obviously, I think when I joined the Beeb, in the first couple of years, the two major series the BBC was doing – one was *Colditz*, which was a huge hit, which was being shot on the sound stage at Ealing; and the other was *Elizabeth R* with Glenda Jackson. So to go into the canteen and see one day Nazis queuing for a cuppa, and then Tudor people queueing for a coffee… it was, for an eighteen year old, quite fascinating. […] I was very blessed, and absolutely loved it. (*Interview with Tony and Hazel Heaven*, 14 November 2016)

The combination of access to Balcon's hallowed workspace and what they had seen on screen as film fans gives an evident sense of pride at having been able to share a space long-since departed by such an icon. Balcon's prior inhabitation of that space – even though it had been "split in half" – left interviewees with the memory of a

"wonderful" and "loved" experience. For Heaven, the descriptions of being in Balcon's office and seeing the cast of the BBC dramas suggest a conflation of the two eras, where the sense of being an insider to the production world stretches time, meaning that Ealing Studios and BBC TFS become, for her, part of the same lived experience. Heaven describes her memory of the past pressing on the present at the time she worked at TFS, made real by the costumes of Colditz and the corridors and soundstages Balcon once walked through. Balcon's long-gone presence and the site's former output create a sense of separation often articulated by the interviewees.

Film, while shaping working patterns and practice, has the additional retrospective conceptual implication of not being about television, but about cinema. Celluloid is the medium of *the movies*. This delineation is made by interviewees most strongly when they talk about how TFS *felt* in terms of the general sense of being in the space, rather than the specificities of working practice. Mark Freeman articulates this notion, writing, in his discussion of memoirs, that "a memory and autobiographical narrative alike entail present constructions of the past […] the vantage point from which one remembers […] itself represents a kind of ending, which in turn serves to transform, and perhaps falsify, the meaning of the events of the past." (2010, 267) There, this sentiment is present throughout the interviews, where subjects continually overlay their recollections of TFS with their cultural memories of Ealing Studios and its output. Roy Sharman says:

> I remember distinctly my first day at Ealing and going in through the gates of Ealing Studios and […] it was a nice atmosphere at Ealing because it felt like a proper film studio. There was something a bit old and tattered about it, even, but it felt...you'd go in through the gates. There's the canteen and the front office on that side. Over here you've got the studios and as you walk around, you know, you see all the scenery and things being moved. So I thought, 'This is great. I'm actually in the business. (*Interview with Roy Sharman*, 10 November 2016)

Sharman's comments are typical of the way TFS is remembered. There is marked warmth in the recollection: "nice"; "great"; and, the glowing nostalgic emphasis of "something a bit old and tattered". He conflates the mechanics of television production with film, with his references to the "proper film studio", the "scenery" and the "atmosphere" suggesting that this was a special time in Sharman's life. "[O]ld and tattered" recalls the longevity of the site, while the repetition of "gates" suggests that Sharman felt that, arriving at work, he was entering some sort of exclusive club. Indeed, he says he thought "I'm actually in the business." These are multifaceted permeable sentiments that reflect the different sensory notes of how people remember the site at Ealing. These sentiments do not, however, reveal anything about how the practice of editing was different at TFS. Instead they recall difference(s) as framed by life – real or imagined – at the Ealing studio site.

When editors suggest that there was something peculiar about working at BBC TFS, they, in fact, articulate, at least in part, a sense of heritage which is attributed to the site because of its history as a film studio. These interview testimonies are, therefore, far more complex than simply relating "what happened when I worked at Ealing". They have an iterative, looping quality where the reality of what happened is interspersed within this sense of heritage. At this point, the iterative and socially constructed nature of editing must be considered: the repetition of the same physical act of cutting, which each time produces a different result. Understanding memory as itself iterative and socially constructed, where "experiences and private recollections are continuously evaluated and shaped by confrontations with collective memory" (Apfelbaum, 2010, 85), reveals more layers, which themselves loop round as memories are recalled. This is the pattern of everyday life as recalled through social memories. Amy Holdsworth connects iteration and everyday life via the work of Rita Felski, describing how "Felski acknowledges its [everyday life's] internal complexities in that it combines repetition and linearity, recurrence with forward movement", concluding that "there is a simultaneous looping and unfolding in the patterns of everyday life" (2014). This evaluative looping occurs in these interviews as memories are recalled and layered across a sense of everyday work and heritage. A sense of heritage seeps into the interviewees' cultural memories, thus doubling the affect,

where they are both viewers and fans of films made at Ealing Studios while also working at the site where they were made. This cinematic heritage is additionally informed by the fact that they were working with film, which itself is perceived as a heritage medium – it is a living thing and yet also of the past. It is, therefore, not historic and is, instead, part of the cultural and working heritage. Thus, the recalled experience is layered over the cultural memory of the Ealing Studios output along with the recollection of the heritage practice of working on film. Additionally, there is a layer of identification with the BBC as an employer of cultural significance and heritage which, in turn, informs the recollections. The looping layers of heritage sensibilities described in the editors' responses when they talk about BBC TFS are, therefore, as follows: the cultural heritage of cinema, as specifically represented by Ealing Studios; the site-specific heritage of place embodied by the studios at Ealing; the material heritage of film, which contains both of the above layers; and, the cultural heritage of the BBC. This final layer, of the BBC, can be seen in both the fact of working for the BBC and the work produced by editors, the televisual output. Because this work was on film, there is a looping back to the original cinema output of Ealing Studios, meaning that the heritage connections continually reinforce themselves via place, work and materiality.

These contextual evaluations reveal how this sense of heritage informs the memory of the everyday for workers at BBC TFS. This is what made the place both "special" and everyday and is due to the self-identification of BBC TFS staff as "film people" (*Interview with Tony and Hazel Heaven*, 14 November 2016) and the fact that the channelling of the Ealing Studios heritage was an everyday occurrence. This quotidian heritage was augmented by the sense that BBC Ealing was "just about film" (*Interview with Rod Longhurst*, 10 January 2017). It is, therefore, the heritage and materiality of film that additionally sets BBC TFS apart and colours the remembering of it into something *about* film. This emphasis on film, because of both the heritage and the actuality, lends an additional sense, aside from the geographical separation, of TFS as being *apart from*, rather than *of* television. This emphasis on film is contextualised by television as being historically lower than cinema (film) in the cultural hierarchy. Television was seen as ordinary. This hierarchy, connected by Charles Barr to the 1962

Pilkington Report and Richard Hoggart's *The Uses of Literacy* (1986, 218), is additionally crucial for another aspect, where the convergence of film and television (Andrews, 2014; Barr, 1986; Caughie, 1986, 1996) means that TFS belongs to a BBC that has disappeared. This conceptual disappearance is hinged to the sale of TFS in 1995, as part of John Birt's Producer Choice programme, making this both a literal and metaphorical disappearance. All of these ideas are conflated in the memories of the BBC TFS editors interviewed for this study, who describe how special BBC Ealing was and how it was its "own little world" (*Interview with Roy Sharman*, 10 November 2016). This "world" was an integrated environment, in which television was produced using film as a medium on one site,[15] and which had a sense of an inherited heritage dating back to when the site was Ealing Studios. While some issues are conflated by interviewees, they base their comments on the truth that they worked in a place that was, and continues to be, a heritage site and, as such, the peculiarities of that history remain.

The studio complex as a heritage site

It is clear that the Ealing Studios output can be classified as part of British cultural heritage. The enduring nature of the films has resulted in the space in which they were produced being classified as a site of cultural heritage – hence the English Heritage Blue Plaque at Balcon's former office. The cultural products that were made at the site when it was Ealing Studios continue to echo today – these movies cement the importance of the site of their production.[16] There is an overlap in the layering of heritage aspects, conflating the site with its output, which is applicable to much of the

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[15] While the developing of the film took place offsite, often at Kays in Soho Square, this was done overnight and did not impact on the operational day-to-day at TFS (*Interview with Anthony Coombes*, 20 January 2017; *Interview with David Martin*, 25 October 2016)

[16] Today, the studio complex continues as a site for film and television production and evokes its history through the use of the original Ealing Studios typeface and the addition of the phrase "Est. 1902". The studios' website states that they were taken over in 2000 by a consortium and, although no explicit links with Balcon's era are referenced, the heritage of the site is implied: "Since its inception, Ealing has retained a distinctly British identity and community feel. It has been home to many families of filmmakers over the last century, each one committed to creating work which stands the test of time and builds on Ealing's proud legacy" (Studios, 2018)

above section and, as discussed above, can be seen in the looping referential scheme of remembering.

The Ealing complex is framed as a site of memory. The concept of sites of memory in the context of memorials or public spaces is, arguably, common currency and forms part of communal rituals of remembering (Assmann & Czaplicka, 1995; Erll, 2011; Hamilton, 2010; Schwarz, 2010; Winter, 2010). These sites are ritualised by the gathering of people to remembering something specific, even if the attendees themselves remember disparate aspects of that thing, or, in the case of commemorations, are too young to have been there at all. There are of course differences within the framing of the Ealing complex as a heritage site. The hybrid private/public space of a workplace specifies the communal remembering as bounded to a group of people who worked there and disallows the presence of those who did not, as opposed to the way in which people who did not fight in a war, for example, may still commemorate it. However, people still visit sites of cultural significance to them, such as film and television locations, studios or the homes of stars. Therefore, the activities that are performed at a site transform it into a place of memory and heritage. In the case of BBC TFS, the site-specific rituals of film and television production are transformed into heritage by the end product they deliver. The 'events' being remembered become the Ealing Studios films and the repeated activities of film and television production become the commemoration. Raphael Samuel connects place, activity and ethereal unspecified culture, "unofficial knowledge and popular memory", [to] "the peculiarities of the landscape", arguing that "woods are famously the haunt of spirits; caves are smugglers' lairs. Standing stones [...] invariably have legends attaching to them, rather as castles and monastic ruins do." (Samuel, 1999, 11) A studio, alive with the attached legends of stage and screen, has the same qualities. This widens the concept of heritage into the intangible: the unofficial heritage. The definition used here is provided by Laurajane Smith and Emma Waterton: "whether we are dealing with historic houses, industrial sites and archaeological ruins, or traditional dance and the retelling of oral history and storylines, we are dealing with the same thing: and what we are dealing with – what heritage is – is the performance and negotiation of identity, values and a sense of

place." (2009, 292) This "performance", obviously, is subjective. It could be manifested in a sense of discomfort at being in a place that does not fit one's own sense of identity, one's own values, one's own heritage or, less consciously, in the manifest comfort felt when one is settled in particular surroundings. The crucial aspect is recognition, the sense of being in place where one fits and where one's heritage is apposite. This is not always something of "value" to others, and will, therefore, in a more restrictive definition, not be recorded as 'heritage' *per se*.

This idea of a sense of place has already been mentioned by editor Roy Sharman in his comment that TFS "felt like a proper film studio" and that he thought "I'm actually in the business." (*Interview with Roy Sharman*, 10 November 2016) The editor Andy Kemp (AK) echoes these sentiments when asked about his early experiences of working at BBC TFS:

RA: Can you tell me a bit about what Ealing was like, then [1986]?

AK: Wonderful. It was like [...] it's an old [...] it was the film studios and you just felt like you were in Hollywood, you know. It just felt like what you imagined the film set [or] studio to look like. That was great fun.

RA: Can you tell me a bit about the cutting rooms?

AK: Hokey pokey little, little rooms, you know, with great big bins full of film and assistants, and the dubbing theatre was nearby. It was like a rabbit warren really, but a great atmosphere about the place because, you know, you'd have a row of editors and assistants, so there was always lots of people around. So that was all good. (*Interview with Andy Kemp*, 21 May 2016)

Again, there is the sensory aspect of "felt like" and the imagined transplantation of "Hollywood" to West London, which bolsters the suggestion of TFS being felt as a site of cultural memory and heritage. It is also instructive to bring in ideas from heritage

tourism studies, given that, as mentioned, the notion that people visit, as tourists, sites that relate to those which they have viewed on film or television, or which are related to film and television, such as studios, locations or the homes of stars. This is applicable to the feelings expressed by interviewees that the site at Ealing is somehow imbued with the qualities of Ealing Studios, simply because it once was Ealing Studios. Sabine Marschall describes this type of memory as:

> …episodic memory, closely related to autobiographic or personal memory, which refers to the ability to recall events and experiences in one's own life. Memory is […] always actively reconstructed from a range of sources (i.e. mediated), influenced by multiple factors including personal and social motivations, as well as situational demands. The context and purpose of our remembering and the audience with whom we share memories influence the way we remember and narrate our own past. (2014, 337)

Episodic memory, in the context of visiting sites important to an individual's past, is relevant here for analysing the idea of an imagined transformation that is temporal, geographical and conceptual, as articulated by interviewees when describing their memories of working at TFS. For these interviewees, these conversations induce feelings of "stepping back into the past", of the site being akin to "Hollywood" and that working there made one feel as though one was "in the business".[17] This is an association echoed through their recollections. As Roy Sharman says:

> I'm always thinking of Ealing when I'm thinking of this because it's something to do with those studios that made you feel, "I'm a television editor, but actually I'm in a film studio. Isn't that nice". You feel… I think if you really love film as it was, you know, back in those days, there was something rather nice about being in a real film studio (*Interview with Roy Sharman*, 10 November 2016)

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[17] (*Interview with Ed Bazelgette*, 7 July 2015) (*Interview with Andy Kemp*, 21 May 2016) (*Interview with Roy Sharman*, 31 July 2017).

Figure 2: A working life with film: Roy Sharman in his T-Block cutting room, mid-1980s.

© Roy Sharman

With evident pleasure, Sharman remembers working with film in "a real film studio". He implies a certain peculiarity connected to the location of TFS, as the studios were housed on the site of the old Ealing Studios, describing "a real film studio" as being "rather nice". This peculiarity will be returned to later in an analysis of the importance of the history of the site in the recollections of the interviewees. "Rather nice" and "real film" also suggest nostalgia, a disappeared pleasure, associated with the medium. Dominik Schrey examines the nostalgic way in which "aspects that were once considered as disadvantages or problems of analogue media are now appreciated enthusiastically" (2014, 28). While Sharman does not articulate any "disadvantages or problems", were this phrase to be substituted for the word *differences*, the pleasures of the medium would be recalled even more enthusiastically. As the layers of implications are uncovered, the idea of the editors working in their "own little world" suggests differences in practice enabled by the separateness of BBC TFS.

Understanding the Ealing site as a place of heritage shows how BBC employees interacted with Ealing's heritage as much as seeing the site as merely a place of work. The implication that workers experienced an imaginative temporal transportation allows an additional analytical slant. Gaynor Bagnall argues that heritage sites engender a relationship between the site and the visitor that is "based as much on emotion and imagination as it is on cognition. Moreover, this emotional and imaginary relationship is engendered by the physicality of the process" (2003, 87). The editor Rod Longhurst, who started at the BBC in 1965, articulates this sense of transformation in the context of Ealing's cinematic heritage. He echoes Sharman's description of the TFS as something "special" and separate from the rest of the BBC, bounded by film and reinforced by the heritage of the Ealing Studios output. In fact, he classifies BBC TFS as more comparable with film, rather than television, studios:

> …it was a bit more special than I think the other areas, because you were just about film. [...] You knew that the Ealing comedies had been shot there […] So it's that, heritage, and, because that's all that was there was film. […] So, Ealing was Ealing. I won't say that it was any more special than APPC or EMI or MGM, you know, or Shepperton or Pinewood. So, I can't really say anything more on that. I think it's because you were all film. (*Interview with Rod Longhurst*, 10 January 2017)

There is, however, a strand of thinking that comes out in the interviews that is preoccupied with the interpersonal and professional negotiations required by working at the BBC and how not everything about film editing was quite so easy, and which will be explored in the context of what the BBC intended for the site at Ealing.

The BBC

When the BBC purchased the studios at Ealing in 1955, they became the Television Film Studios. A BBC Engineering Division monograph, *The Equipment of the BBC Television Film Studios at Ealing* describes the purpose of TFS:

The increasing volume of work and the difficulties of filming in television studios resulted in a need for the concentration of facilities and the provision of separate studios for filming purposes. To meet this demand the BBC purchased the Ealing Film Studios premises in December 1955 and moved all its film production to this centre. (Chapman, 1960, 5)

The document describes the motivation behind the switch from feature film production to television:

...feature film production for the cinema requires a small number of fairly complicated and lavish facilities whilst television film production requires a very large number of possibly more simple, but nevertheless highly flexible, units. Television film studios can be smaller than those required for feature work, but a considerable increase in editing, review and dubbing facilities are necessary to handle the greater volume of film. (ibid., 5)

In order to complete this transfer from feature to television film production:

Approximately twenty extra cutting rooms have been added, however, together with a suite of six review theatres' […] 'Sound recording facilities', 'A film titling room' […] 'and a modern block of film vaults has been built to provide additional storage space for the ever-growing film library. Finally a well-equipped area has been constructed for the maintenance of film apparatus.' (ibid., 5)

Documents at the BBC Written Archives Centre detail the background to this expansion, showing that the BBC's plan for the site aimed to make maximum use of the existing facilities. The minutes of the Ealing Studios Development Committee on 28 October 1955 record, as their first point: "1. [...] these premises should be used for film, rehearsal and storage purposes only, and that minimum work be done on what is a going concern." The BBC wanted minimal disruption, with the document going on to state that "it should be noted that a substantial move of the Film Department will

enable Children's Programmes and Talks Department to remain at the Television Studios." (Committee, 28 October 1955) Although the 1960 monograph shows that work did take place, the bill for the transfer of contents, as part of the original sale in 1955, included equipment for the 15 cutting rooms and was amounted to £93,000 (Group, 28 October 1955). That TFS made use of existing equipment was confirmed by cinematographer Brain Tufano, who stated (in an ADAPT simulation), that "we took over a lot of their equipment when the BBC bought Ealing Studios" (Murphy, 2018). The BBC wanted the site to be up and running quickly and further work, such as cosmetic adjustments to the studios that would have identified them more visibly as belonging to the BBC, would have cost money and time. Retaining the studios as they largely were meant the complex remained visibly connected to its past as Ealing Studios. Editor David Martin (DM) gives a sense of this continuity, a deliberate non-severance with the past, describing how film editing worked at TFS when he started there as a trainee film editor in 1965:

> The setup at Ealing was the studios were, I imagine, pretty much how they'd always been when Balcon ran it then. [...] Right at the back of the studios were two stages. Quite big stages. And one has got a very big tank where they shot *The Cruel Sea* [...] But it was very, very useful. I mean, you could fill it and it was like a big... a bloody big swimming pool. And they're quite big stages, and they were not bad, […] S Block, those were cutting rooms. In fact, I think, they had originally been film vaults. They were quite small rooms actually. They weren't at all big. But on 16mm... well, we could have done with a bit more room. I mean, if you got into your cutting room with an assistant, a director and then your equipment, which would be a bench... a sync bench where you'd be working, […] And then next to that you'd have a Steenbeck. [...] 16mm Steenbeck which was about that deep, I suppose, and that high. So there wasn't a lot of room, actually [...] And then you had a bin for all the trimmings as well [...] but the worst things were when you got a director who would come in and smoke. And I banned them. I'd just say, "No, go. You can't." But, of course, that was before the big anti-smoking thing and you couldn't bloody breathe in there. (*Interview with David Martin*, 25 October 2016)

Foregrounded in this recollection is the cultural heritage of Ealing Studios (referring to *The Cruel Sea*), the mechanics of which were useful for BBC productions even if the programmes themselves do not merit individual mention. Also present in his comments is the working culture of the cutting rooms, with the most prominent of his recollections relating to their size and potential smokiness. This is the dissenting voice, showing that not everyone recalls the pleasures of working at BBC TFS quite so unconditionally. Martin returns to the size of the rooms and the vagaries of allocation procedures:

> RA: Did each editor have their own cutting room?
>
> DM: Pretty much, yes; yes. You'd be allocated a room per show, but obviously... between films, you see, you might go to... for example, I might be working at Ealing on something and then that would come to an end and they'd say, 'Well, they actually need someone down at TV Centre' [...]. So you'd go there, which meant you'd lost your cutting room here temporarily. So when you came back, they'd say, "Well, we put you in" wherever, you know, and you would just sort of, "Gawd", you know. You just hope you didn't come back and get the smallest room, or whatever [...] But today they'd probably say the rooms are barely fit for purpose. (*Interview with David Martin*, 25 October 2016)

It is as if Martin is diverting from a script, as it is soon apparent that, despite his answering in the affirmative, not everyone had their own cutting room at all and to be allocated a dud room would be a disappointment. Recalling rooms that were "barely fit for purpose" and uncertain working patterns, Martin is far more ambivalent about TFS than other interviewees. He suggests that the freedoms so often described by others were entirely mutable, echoing his earlier comments when implying that such freedoms were only truly applicable to senior editors. However, working with film remains associated with a BBC of the past, which Martin echoes when comparing the practice and culture of the 'old' BBC TFS and the 'new' Television Centre:

There were about six viewing theatres and one 35mm. They were all 16mm and then there was one 35mm. The beauty of those theatres there was they had two projectors. So you could have, technically, done changeovers if you wanted to, or you could keep a nonstop projection thing going all the time. Whereas down at Television Centre, or just about anywhere else, they only had one projector per theatre, so when your roll ran out, you had to stop and then the projectionist had to load the next reel and all that stuff. Then [at TFS] there was a dubbing theatre there; a 35mm dubbing theatre, which was rather nice actually. Not used very much, because very few people… except the sequences people, you know, who were doing *Z Cars*, they were the only ones who ever did 35mm. (*Interview with David Martin*, 25 October 2016)

Martin's description reveals the relative luxuries of working at BBC TFS and the ease of space provided by having two projectors in a viewing theatre and the barely used 35mm dubbing theatre at TFS, while the newly built Television Centre was constructed on a more modest model. He places this practice definitively in the past. The memories recorded in these interviews are historicised by the subjects themselves, and framed by the mechanics, timings and specificities of film.

There are other dissenting voices, which suggest that TFS was not quite the haven or the isolated outpost that the other interviewees might, taken together, imply. Editor Anthony Coombes refutes any implication of resistance to the introduction of other technologies that may have worked with film and, as was happening concurrently with videotape, represented an adaptation of the primary medium. He removes the patina of nostalgia when he recalls his own practice of working with film and its "brick building" nature:

Someone asked me did I prefer editing now to editing on film, which is a manual process, and I said, well, it's very tempting to sort of say "Yes, I preferred the old way of working", and there are some elements of the physicality of joining stuff together that is aesthetically, sort of, gratifying, but

practically, it's a complete and utter nightmare, because your decision making is compromised all the time by the consequences of these decisions that you make, because they are so... you know, you make a decision and then 30 seconds later you see the consequence of it. And it's brick building work. So if you do something and you do something again and do something again and do something again built on this first decision, when you come to the end of a sequence and you're not happy, it may be because the first decision was not the right one. So then... in film, that is... disassemble backwards and start again, and you haven't got what you did because you've disassembled it. Now, on several shows I did at Ealing at that point, to get round that problem, people used to send the assistant with this complicated scene to the video Steenbeck and get it transferred onto a VHS tape so that they could have it again later. (*Interview with Anthony Coombes*, 20 January 2017)

David Martin talks of the mundane aspects of editing on film and how it was used in the telerecording process, in which film cameras had been used to record a live broadcast before videotape began to be used for the same task. Videotape, with no processing requirements and its facility for instantaneous playback, was a better medium for this recording job:

...on a Sunday on television there would be [...] a full-length drama that lasts for two hours, or whatever, and it was live. And because they had no means of recording it, they used to repeat it on a Thursday evening live again, you see. [...] So, they started to telerecord a lot of stuff and that would come to Ealing because it was film and there was nowhere else to physically handle it, edit it, or whatever, you know. No-one had film machines, other than here then. And so, there was a department here on the ground floor of about four cutting rooms, and the film used to arrive, monstrous cans of film, you know, loads of it, because they were big reels. They were recorded on 200ft films [...] So, telerecordings, their job was to take out the bad bits, if you see what I mean, and maybe do some edits to tighten up and to fix slack cuts, or whatever, you know, they'd review it. But, I mean, you could put through a whole show in a

day, easily. [...] So, that was telerecordings and [...] it stopped, I suppose, as soon as videotape came in. (*Interview with David Martin*, 25 October 2016)

Film, therefore, was not everything. Additionally, TFS was not the only BBC site where film editing was carried out. Rod Longhurst emphasises the networked nature of the Film Unit, geographically spread between the BBC locations:

…the film department... Television Studios was Television Studios. They had the big Television Centre and they also did have Lime Grove and they had Riverside, and they had Television Theatre. The film department had Ealing, but they also had cutting rooms in Television Centre in the East Tower, which is a building attached to Television Centre, a tall tower. They had cutting rooms in Lime Grove […] in Kensington House and Woodstock Grove. [...] So, for sound at that particular time, we had transfer suites and dubbing theatres in Ealing and in Television Centre and in Lime Grove, and we also, funnily enough, serviced Alexandra Palace only as assistant sound recordists. Alexandra Palace was news then and news had their own staff, but for some reason their dubbing theatre and transfer suite were serviced by Ealing [...] News and current affairs have always... for example, many years later I worked on *Panorama*. *Panorama* was news and current affairs, but they wanted Ealing film editors, not their own news film editors, to make their programmes, because they didn't think their news film editors [...] were quite capable of producing the longer programme. (*Interview with Rod Longhurst*, 10 January 2017)

Even though Longhurst is, in one sense, articulating the notion that TFS was simply one place of many that used film, the statement "they wanted Ealing film editors" reiterates the idea that TFS was a site apart from the rest of the corporation, in both geographical and conceptual terms. The fact that anyone was known as specifically 'Ealing' and that their reputation could be defined as such infers the "top-notch" status described previously by Roy Sharman (*Interview with Roy Sharman*, 10 November 2016). The quote also displays the fluidity of film work around the BBC and

the way in which TFS was treated by the corporation as simply another production location. Anthony Coombes goes on to describe TFS as a place of integration. He highlights the most significant aspect of all these recollections, namely that the experience of working there was one which encompassed every aspect of production and was historicised by the site's previous function as a film studio. He describes social life as being determined by the "movement of people" as they went about the work of making television via the medium of film:

> I enjoyed Ealing... there was a social element to Ealing that I miss now to a certain extent, because it had a large number of cutting rooms: four floors of cutting rooms, about eight on each floor. And so, when things were busy, there was a lot of people... inevitably an assistant and an editor per room... and so it was quite social. And because of the... as previously spoken to... there was an enforced mechanic to some of the things that had to be done. You had to take it to numbering to get the sound numbered; you had to go to the synch room to get stuff synched up. So there was a lot of movement of people and, therefore, it was quite sociable. People going to get coffee: "How are you getting on?"; "Oh, it's a bit of a day". You know, that sort of thing. (*Interview with Anthony Coombes*, 20 January 2017)

Proximity was essential to this practice, as was taking pleasure in the programmes being made to inculcate a "work effort". Whatever the ambivalence, this was a place in which people wanted to work:

> ...in the drama department, these cutting rooms were next door to the stages. So, you know, if they were making, say, *The Singing Detective*, you know, you could go and watch them film it, or stand to the side and just talk quietly with the director [...] you could just introduce yourself [...] So, there was an integration, some of which does still exist in terms of crew, depending on where you're working, but the actual general buzz of the studio was quite noticeable because, when it was busy, which was most of the time, there was a lot of toing and froing of people in and out of cutting rooms, and chat, and

you got to see a lot of people and you got involved... or felt you were involved in, you know, making television that was quite exciting at that time [...] that environment of working with lots of people that you largely get on with because they have a feeling for being... or wanting to be involved in that sort of work effort (ibid.)

The BBC Television Film Studios at Ealing were sold to the National Film School in 1995 and then sold again in 2000 to a consortium. The complex is still used for film and television production and trades again under the 'Ealing Studios' logo. The stages have been refurbished and altered to an extent that prompted the editor Mark Day to comment that "I went back there about three years ago. [...] I could not believe how much it had changed, because [...] it used to be open where the canteen used to be there and there was a kind of open area, and... it felt more spread out. But now they've built in the middle of it all [...] and it just felt really enclosed" (*Interview with Mark Day*, 11 October 2017).

Conclusion: remembering an integrated community

The material implications of film are referred to in interviews in terms specific to BBC TFS and in the more generalised practice of film editing. The qualities of working with film that editors remember as specific to TFS are, as with their implications, multiple. The sense of place was provided by aspects of the work – the materiality of the cutting room and aspects of touch and smell. Interviewees also refer to the people and the camaraderie – a physical and emotional closeness to others which was determined by practice. At TFS, this closeness was determined by the architecture of the studios in two ways: the spaces of the cutting rooms; and, the location of the site being apart from the other BBC centres. The conception of film as an additional layer of something "special" itself engenders recollections of intimacy. Film determined a slower practice because of its inherent processes, recalled in contrast to the instantaneous capacities and potentials of contemporary digital systems. This sense of the speed at which work was done is referred to in the context of BBC TFS operating in a differently regulated era of relative freedoms and working patterns dictated by quasi-familial relationships

rather than an overt management culture. This final point is made especially important when looking at how editors remember their work in the institutional context. It was an integrated world which bled out beyond work. As editor-turned-director Ed Bazelgette says:

> There was a kind of, you know, a world of work which, you know, for an awful lot of the people this was their world. Seriously. They all bought houses in Ealing. They worked at Ealing Studios. They loved it. They drank with their mates. They left college and gone and become trainee assistant film editors and, you know, their world revolved around that place really. (*Interview with Ed Bazelgette*, 7 July 2015)

The BBC Television Film Studios at Ealing are recalled by editors as a place of production that offered working practices that are not found today. It is remembered as a place that roots BBC TFS to a particular time and particular modes of behaviour. Editors do not talk of the technological affordances of film but of rhythmic ones, describing how the medium allowed a working pattern that they, for the most part, enjoyed. They do not share the textual concerns of more lauded figures who worked at TFS, such as Ken Loach or Tony Garnett (Bignell, 2014), showing little interest in the specificities of any particular project. Instead, they remember film as dictating their working rhythm, which they associate with a particular time of their careers. This working pattern is associated with TFS in the sense of it being historical and unrepeatable, doubly so when memories are contextualised in the location's previous incarnation as a film studio. BBC TFS was sold in 1992 as a part of the Producer Choice programme. Film is now a specialised production practice, although it has not died out completely – editor Andy Kemp reported working with it in 2017, saying that "it was surprisingly fast. It was really the first non-linear method after all." (Kemp, 2017)

While the BBC Television Film Studios at Ealing may not have been originally intended or subsequently regarded as a location of consequence to the BBC as a whole, a community of less-noted consequence for its parent company, or corporation in this case, is a community nonetheless. This community has a lived history and continues

to exist in the memories of its members. It is this practice that is reassembled here. The principle features of this practice are found in the specific rhythms that celluloid demanded - the organising, syncing, cutting, viewing and redoing, the paperwork and the trim bins. In this light, TFS was a film factory, where work varied according to the project, the collaborators, and the non-linearity of film itself.

Chapter Two

Tracing early videotape

Introduction

This chapter traces the arrival of videotape and videotape editing to the UK and presents evidence for its subsequent diffusion into television production over the period c.1955-1970. The first commercially available videotape equipment was made by the American company Ampex, which launched the VRX-1000 at the National Association of Broadcasters conference in Chicago in April 1956 (Abramson, 2002). The VRX-1000 could record and playback instantaneously, thereby removing the time spent processing film stock. Its drawback was that it was difficult to edit, as the frames could not be seen with the same clarity as on film.

Videotape is crucial to the history of television as it allowed programmes to be recorded. This changed the industry from a primarily live medium (telerecording, discussed in chapter one, notwithstanding) to one that could be recorded. Programme production could be scheduled, with mistakes re-recorded. Programmes could be packaged and sold. In time, videotape would allow more stylistic choices to be swiftly delivered as effects packages were developed in the 1960s. This chapter details the way in which the ITV franchises competed and cooperated to bring American videotape technology to the UK in a markedly different strategy to the undertaken by the BBC, which developed then abandoned its own technology. It also examines the communication and cooperation between the Granada ITV franchise and American broadcasters as a key element of the advance of videotape use in the UK. This chapter goes on detail the practice of videotape editing within both the independent production world and the BBC. Looking at the latter part of the period, the chapter details how the advent of videotape enabled editors to work independently as freelancers and, thus, illuminates a previously unstudied aspect of the formation of the casualised labour market. These two repercussions of videotape, as it affected

everyday production of television and the labour market of the wider industry, are enormous and are therefore described in as close detail as possible.

Leading on from the macro discussion, of the wider technological and institutional changes this chapter will also detail evidence of the working practice of television editors during this period as they responded to the evolution of the working environment. The definition of a 'television' editor here is someone editing both broadcast programming and commercials for television, with the delineation found between television and cinema production, rather than different types of work for television, although television work itself differed depending on the genre, which will be elaborated upon below. There are two distinct areas of development, with the first being the BBC in its position as the established television broadcaster. The second area, the emergent independent production world, stemmed from the birth of ITV and the need to produce programmes and adverts for it. Evidence for the use of videotape outside the BBC will be drawn primarily from the weekly broadcast industry journal *Broadcas*t (1973-), first published as *Television Mail* (1959-1973). This is supplemented by interviews undertaken for this thesis and additional literature sources. Evidence for the very early use of videotape by the BBC and the ITV franchises comes from original archive research.

The overarching question of this chapter asks why and when videotape was adopted. Given that film was a perfectly serviceable medium for television production, what were the advantages that videotape presented? The (much debated) advantages of videotape and the concomitant anxieties that surfaced with the arrival of this new technology are expressed frequently in *Television Mail*. There are two 'carriers' for the advantages and anxieties, articles and adverts, both of which will be used for the analysis undertaken here. The debate presents itself on an anxiety / reassurance axis, often framed as questions relating to the ideas of *new* and *best*, which are emblematic of how videotape, as a technology, was promoted. It also has the broadcast framing of commercial television versus the BBC, as well as a literal expression in the commercials themselves: have this new thing we are selling. It is also present in the churn of the independent production companies, formed to make the commercials:

new and different can mean precarious; it can mean a better working experience; or, in the incipient freelance life, it can mean (for some) both. The undercurrents within these debates, performed around film and videotape, ran for decades in the trade magazines (and will also feature in the subsequent chapter). Editors are at the centre of this, and the ways in which they negotiate it are the central consideration of this chapter.

It is important to clarify that videotape editing was not a uniform practice and the technical specificities of cutting videotape – often literally – were varied because of its experimental nature (often inherent to new technologies). BBC videotape editor Chris Booth gives an explanation of the very basic physical problems of early videotape editing as they were in the late 1950s / early 1960s. He identifies the problems of adapting from film practice, where the celluloid is literally cut around the pictures that can be seen on the strip, to the videotape practice where the image could not be seen on the material. This presented the following issues:

> The biggest problem with early videotape was editing. True, it could be cut with scissors and shots juxtaposed just like film, but there were two major disadvantages:
>
> Firstly, there was no way you could see the pictures on the tape [...] and you could not cut the tape just anywhere. [...] To help in this, the control track had an 'edit pulse' superimposed on it to identify where to cut. However, to see this edit pulse it was necessary to develop the tape by pouring over it a suspension of iron filings in a liquid that would evaporate quickly. In the early days, before fire safety rules became tighter, a petroleum type liquid was used. Obviously it was important not to get too much of this on the tape as not only did it stop the sticky tape used to join the edit together from sticking, but it could clog the video heads and cause picture disturbances. The edit point on the tape had first to be marked - laundry markers were used until it was discovered they dissolved the tape backing - and this depended on the reactions of the editor as individual frames could not be examined. If the edit was tight to a cut, the director [...] was asked to verify by watching the monitor

as the editor tapped the deck of the machine with his laundry marker when his edit point passed the video head.

Booth thereby highlights the physical limitations of early videotape editing and the persistent adaptation(s) needed with regards to inadequate and dangerous materials. He then elaborates on the primary technical problem of matching sound and vision and its institutional repercussion at the BBC:

> The format defined by Ampex and accepted as a standard worldwide had positioned the audio stack with the sound record and replay heads some 9. inches 'downstream' from the video heads. This meant that the audio associated with the vision was about 0.6 second ahead on the tape. So, if a straightforward Sound and Vision cut was made, the picture would change about half a second before the sound. This made dialogue editing very difficult. The way round it turned out to be to use a quarter inch audio tape machine to lay off the sound from each side of the edit, relaying it with a mix after the edit had been made [...] In this way the early videotape editors began manipulating sound to overcome a basic problem with the tape format. In the BBC it became a proud tradition that the videotape editor handled the sound as well as the picture, all the way to transmission.

Still though, even once videotape editing had developed enough to cope with a major production, there was recourse to film editing:

> The first major production that was cut edited was 'Hamlet at Elsinore', shot on location at Elsinore in 1963. The videotape editor who cut it, and who incidentally received the first ever videotape editor credit was Brian Jenkinson and he treated the project like a film edit. He firstly made a copy of all the material and used these as the working tapes to edit. Everything he did was noted down in a book, and, in fact he replaced individual frames where needed and had his own trims bin - just like a film editor would. When the fine cut was accepted, he cut the original master to match his working copy, using his

copious notes as a reference, rather as a neg cutter would in the film environment. (Booth, 1994)

Videotape editing was, by Booth's description, an unstable, semi-improvised practice. It was also a process that would require considerable electronic processing and the machines to do this were not developed until the later in the period. Booth describes early electronic editing:

...sound and pictures are copied from one tape (the master recording) to another (the edit master) and the programme assembled this way. [...] The first electronic edits were not very precise. There was no device for starting two machines together, let alone allowing them to be synchronised to each other. The editor had an assistant - the 'play-in' man - as the machines were usually some fifteen feet apart, although in line of sight, and start cues would be either a simple 'three, two, one, run' or taken off the time of day clock on the wall. (ibid.)

It was also was necessary to compensate for idiosyncrasies between the different videotape recorders, which was done with a Time Base Corrector, an early Ampex version of which, the Amtac, was described in 1965 as a machine that:

...accomplishes line-by-line compensation of timing errors in the composite video signal [...] The instantaneous time difference between the sampled and referenced machines is converted to a proportional voltage which controls the delay time of a voltage-controlled delay line in the video signal path. Amtec has unity gain with the sort of high-performance characteristics necessary to pass colour or monochrome video unaltered (Ullyett, 1965, 27)

In other words, Time Base Correctors 'ironed out' differences between the bits of videotape being used as editing practice progressed towards mechanisation. It should be held in mind the extremely irregular nature of this progress however – one interviewee for this thesis remembered cutting videotape by hand 'into the 1980s'

(*Interview with Barry Stevens*, 12 December 2017). There were, therefore, quite extreme variances in practice.

The archive bears out the improvised nature of practice evidenced and reveals that while the practice of editing videotape was an ongoing topic of discussion during this period, videotape editors themselves remain far less remarked upon. Rather than asking the editors themselves how they did things, commentators reported on what they had observed. Editing practice is, therefore, revealed by analysing the culture in which they operated. This revelation also occurs when editors are mentioned as part of production teams for commercials or as part of the uptake of videotape, as mentioned above. Videotape editors are often referred to as *engineers* or *technicians*, job titles that contrast to that of *film editor* and which stem from the different equipment used to edit videotape compared to that used to edit film. Videotape editors' work is 'sold' through adverts, through which their particular skills are highlighted or their previous work foregrounded. With editors not becoming commodities to be advertised for sale until later in this period, this chapter next deals with the arrival of videotape to the UK by tracing the development of videotape editing practice at ITV as evidenced by material from the ITV Document Archive.

Detecting videotape editing in early independent production: ITV and commercials

The first explicit evidence of videotape editing in the ITV Document Archive, which demonstrates the essential nature of the videotape editor, is from 1958. It is found in correspondence surrounding Granada's package of the coronation of the Pope[18], then broadcast by CBS in the US. The following work is a detailed analysis of the archive documents. It demonstrates the experimental use of videotape machines as broadcasters respond to the possibilities of the new technology, while editors adapt their own practice to meet the request(s) put to them. It illuminates the negotiations of television production: a broadcast idea occurs (in this case coverage of the Papal

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[18] A *package* is a self-contained piece which fits into a magazine or news show. Most often prepared by the production team, it can be prepared outside, in cases where a team is unable to produce their own item on a story and, thus, bring in a package.

Ceremony) and the practical necessities are negotiated by adapting previous workflows. It shows a responsive process, as managers respond to and negotiate the possibilities of the broadcast, the editor is doing the same, but with far smaller credit given. More broadly, the success of an adaptation – here, the use of videotape – means it is carried through into further broadcast work. This process of experimentation and confirmation is illuminated over the following pages: a micro analysis to illuminate a macro process. Specifically, the archive demonstrates transnational cooperation as essential to the experiment, as well as the way the editor is both crucial and elided from the record.

In the document *Notes of conversation between S.L.B [Bernstein] and R. Hammans 27.10.58*[19], presumably taken from Bernstein's end while they spoke on the phone because there is no note of anything Hammans says, Bernstein is noted as saying:

> I am very keen on doing Papal Coronation ceremony [...] They want to get coverage piped to Manchester [...] Want to send to Manchester Producer [sic], Tape Editor, Rome Correspondent, Roman Catholic Monsignor [...] Deal with technical side now. We won't trouble about management side yet. [...] Hammans to deal with all of this personally. (Notes, 27 October 1958)

Clearly, there is an improvised nature to the coverage, where necessity requires dealing with the technical side first and then thinking about the management implications later, Bernstein's comments show that the trust in Hammans was implicit. This is the managerial response to the possibilities of videotape. The mention of the "Tape Editor" demonstrates the existence of the job title, while the fact that it was not queried suggests confidence in its efficacy. As Hammans was in charge of the operation, the reference to the "Tape Editor" also suggest Hammans was part of any videotape editing process(es). Three days later, plans have progressed and S. Kershaw, copying in Hammans, announces that "we are video-taping for C.B.S the Coronation

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[19] Reg Hammans was Chief Engineer of Granada and had previously been Head of Planning and Installation at the BBC (Forman, 1997, 43).

of the Pope." Production plans follow: "a number of C.B.S representatives will be in Manchester [...] They are likely to be Burdett, Rome Correspondent, C.B.S; Ecclesiastical Technical Advisor; Producer; Video-tape Editor." (Kershaw, 30 October 1958) It is clear from these exchanges that the videotape editor is an essential part of the team covering the papal coronation.

The Catholic newspaper, *The Clarion Herald*, gave this account of Granada's part in the transmission and demonstrates the scale of the operation:

> This hour-long video taped show — not film, mind you — might be considered historic in that it was the first time that a program recorded abroad on tape (Queen Elizabeth's coronation was filmed-and-flown) was broadcast throughout the United States. Here's how CBS did it: The coronation ceremonies began. [...] Meanwhile, up north in Manchester, four men were busy in the studios of the Granada TV Network, Ltd. They were: the Producer (Don Hewitt), the Correspondent (Winston Burdett), and the engineers — CBS's George Zavales and Granada's Reginald Hammans. Hammans was seeing to the Americanization of the British signal (changing 405 lines to 525) on an electronic machine he had constructed. Watching on a monitor, Burdett was narrating the progress of the Papal procession into a live microphone. Three days before that, he and Producer Hewitt had, with the help of Vatican officials, acquainted themselves with the itinerary during a 'dry run' of the ceremony. Producer Hewitt faced the task of boiling down, into a one hour show, the four-and-a-half hour papal ceremony. (Fitzgerald, 7 December 1958)

While videotape enabled this ground-breaking work, the editor was already being elided from the story. The editing, the "boiling down", is both skimmed over and credited incorrectly to the producer rather than the editor, who we know was there, and is confirmed by the internal archive.

The internal ITV archive also echoes the nomenclature errors after the event. Kershaw reports cables received as stating "video tape excellent quality altogether a very

successful day [...] almost one hour ahead N B C on air first Pope footage [...] please thank all your wonderful engineers for us" (S. Kershaw, 5 November 1958). Meanwhile McNaughton and Davis from Ampex send congratulations: "Coronation videotape made terrific impact throughout United States last night. [...] Playback quality outstanding on West Coast. Congratulations on your historic televieion [sic] first made possible by your forethought and enterprise." Contained within the correspondence, from Michelson of CBS New York, almost as an aside, is the comment "editing surprisingly good" (Memo, 6 November 1958). In other words, amongst the excitement of Granada recording a package that could also be shown on the American system, the editing almost goes unnoticed – within this discourse it is of far smaller consequence, despite its essential nature to the success of the operation.

Furthermore, a few days before the Papal Coronation broadcast and in preparation for the same, Granada had worked with C.B.S on a "British television system to be compatibly taped for American showing", which would have allowed "the Opening of Parliament [to be] seen first in the United States on C.B.S because of the Granada Process [sic]". This is detailed in a letter from C.B.S London Bureau Chief Charles Collingwood, who states that the success of the process was such that "Don Hewitt, our principal Television News Producer Director, who you will shortly be meeting [suggesting Hewitt was the man going to Manchester for the Papal Coronation], was positively ecstatic about the possibilities and relayed enthusiastic comments from our engineering staff in New York who felt that Mr. Hammans and his team had done the impossible." (Collingwood, 31 October 1958) Both the Papal Coronation and the State Opening of Parliament demonstrate an enthusiasm for the possibilities of tape, as demonstrated by Granada and led internally by Bernstein and Hammans. This shows the 'echo' effect of a successful experimental broadcast, as practice is shifted due to the demonstration of new possibility.

The importance of videotape to Granada is reiterated three weeks after the Papal Coronation broadcast. An application was made at the Patent Office for an "Ampex Converter", referred to in a memo as an "invention", with the application filed in the "name of Granada TV Network Limited, and Hammans. Holt and Babbs have assigned

all their rights therein to the company." (Davison, 27 November 1958) The title of the patent was "Improvements in and relating to Television Systems" and concerned "methods and apparatus for recording and/or reproducing such signals with a conversion of standards". In other words, it was a standards converter designed to circumnavigate the long processes of conversion between countries' television broadcast signals.[20] (Reginald Hammans, Holt, & Babbs, 1958) The effort put into these broadcasts points to an investment tied to Granada's transatlantic ambitions, ambitions reflected in the concerns about exports to and compatibility with the Americans, which were solved by Hammans' team. Editing occurs as an internal process within these broadcast efforts, something that happened in this case with relative ease – a practice already effective and established within Granada Television.

This importance is discussed elsewhere in the Granada history. In his autobiography *Persona Granada*, Denis Forman[21] discusses the development of editing videotape at the franchise:

> In the autumn of 1957 I had visited the Ampex factory outside San Francisco and immediately saw the huge potential of videotape was evident. A technical team followed and the first two trial machines were shipped into Chelsea. Before they were run in, a further six were ordered for Manchester. At that time we were the only Ampex users in the UK. Then one momentous day an engineer in Chelsea slit a tape diagonally with a razor blade, took out a yard of tape and joined the two ends with Sellotape. It worked. There was a jerk, to be sure but tape editing had arrived. (Forman, 1997, 111-112)

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[20] The complications and resolutions involved in conversion in 1958 are described in the Clarion Herald report as "[The American] picture is composed of 525 lines [...] called horizontal scanning lines. [...] But the number of horizontal lines here in America are different from those on an Italian or other European receiver. With the exception of France's 819 line picture and Britain's 405 line image, all Europe watched a 625 line picture. [...] The Italian signal (625 lines) was microwaved across the channel via Eurovision network to England. There an electronic converter translated the signal to a proper British 405 line picture." (Fitzgerald, 7 December 1958)

[21] Denis Forman was a founder member of Granada, arriving from the British Film Institute in 1955. He was made Chairman in 1974 and retired in 1987.

Forman's claim, of having the foresight to see the "potential of videotape" seems straightforward in its implication that he was at least one of the first to see Ampex in action and the first to bring it to the UK. This itself illuminates a key point, as mentioned previously: videotape changed television as it allowed it to be recorded. In 1957, the BBC already had their own videotape machines, VERA (although they were abandoned in 1958) so recording the way(s) in which the ITV franchises understood videotape as crucial to their operations was important to Forman – it casts him as an 'early adopter'. Documents from the Granada archive suggest a more complex picture than Forman describes and show a detailed level of cooperation between the franchises. Forman's trip is recorded – but the memo to *S.L.B., C.G.B.* [Sidney and Cecil Bernstein] *Griffiths* [unknown forename], in which he says he "saw the AMPEX machines in operation at N.B.C and C.B.S in Hollywood, and made a point of discussing with the production Managers of these two companies, and with the chief engineer of A.B.C, the merits and demerits of this equipment", is dated 5 December 1957, some months after the "autumn" trip described in *Persona Granada*. The memo further states:

1. The AMPEX people claim that they can now provide equipment that will permit a tape to be recorded on one head and played back on another. At present the tape has a life only as long as that of its recording head, which is about 100 hours. The recorded tape it not therefore a permanent record, but merely a means of delaying the death of the programme for a week or two. A.B.C. are inclined to agree that AMPEX have beaten this problem, and say they have used tapes on different machines in Chicago. N.B.C. say that AMPEX will beat this problem but have not yet got 100% results. C.B.S. are more sceptical, say its [sic] a matter of degree, and it will be years before top quality can be achieved by playing a tape on a different head from that on which it was recorded.

2. Even if this problem is solved, programmes recorded on a British AMPEX machine will not be playable on the American machine. This means that if we wish to export any programme on an AMPEX tape, we will have to do a second

recording onto the American machine and thus lose a certain amount of quality.

3. All AMPEX tapes are backed by a kinescope in case of failure, (except by A.B.C. Chicago, who take two AMPEX tapes.) As soon as the AMPEX tape is approved for quality, the kinescope is junked.

This seems to me to add up to the fact that we must rely on kinescopes more than we had anticipated even when we have got the AMPEX machines installed. (Forman, 5 December 1957)

This trip, then, was an exploratory visit to see Ampex machines in action at the American television stations in which they were being used, and took place approximately a year after the first videotape broadcast by CBS in 1956 (Ampex, 2017). Above, Forman seems sceptical about the machinery. Conversion and broadcast quality are particular concerns about which discussion had been occurring throughout the year. In June of 1957, Reg Hammans had met "Ampex Sales Engineers" (at an undisclosed location), whose:

> ...initial queries to me concerned our feelings about the right choice of British electronics firm to undertake the conversion to British Standards. They had clearly sought the opinions of other I.T.A Contractors and the B.B.C. as to which firm would be most acceptable from the viewpoint of technical ability as well as commercial interested and connections elsewhere. [...] As far as it can be ascertained without full technical specifications and write-ups, it would appear that there is no extraordinary difficulty in converting the American equipment to British Standards; and I would say that E.M.I.s would be more than adequate for the work.
>
> If we still require our order to remain with them, we could be offered delivery to England by the end of May next year [1958] and, allowing three or four weeks for modification over here, this could mean that we would have it in service by about this time next year. (Reg Hammans, 1 July 1957)

The reply to Hammans' memo came three days later, copied to both Bernsteins and which stated:

> We still require our order to remains with Ampex. Will you make sure that this is properly registered and there is no question we have ordered what we need?', with a handwritten note from 'D.B.' underneath saying 'phoned Hammans says everything is in order. (Memo, 3 July 1957)

So, from just three documents, an entirely different picture of the introduction of Ampex emerges, where machines were ordered before concerns over quality and American/British conversions were allayed, that Hammans was at the centre of the engineering questions, and that editing was not a concern at this point.

Further contemporary reference is made to editing videotape in a book titled *Television Techniques*, originally written in 1947 then revised by Sol Cornberg of NBC and republished in 1957. In the chapter *Video Techniques* and under the heading *Editing the Picture*, the book states that "Operations vary in different station but the usual procedure is for the technical operations manager to do the switching, working either from the script or from verbal cues from the producer" (Bettinger & Cornberg, 1957, 67). While, of course, this would have been true for some places, the book's American origin cannot be discounted considering the close links to American technologies and practice demonstrated in the archive detailed here. Here, the title "technical operations manager" is key, in that, clearly, it was changed to "videotape editor", from which fact alone it can be inferred that it entailed something greater than the job of a switcher.

The events leading up to Granada's decision to purchase the Ampex equipment further reveal the close relationship between Granada and the American broadcasters, suggesting its instrumental value being far greater than Forman records.

In a letter to Sidney Bernstein dated 20 April 1956, Sol Cornberg, the "technical genius borrowed from NBC"[22] (Moorehead, 1984, 235), writes:

> I thought the enclosed might be of more than superficial interest to you, particularly the tape which has come of age what with CBS and NBS having purchased three for delivery in the fall at $75,000 per. Orders were being taken in Chicago in Wednesday with delivery dates backed up into next April at a production figure not to exceed $50,000. Quality and operation of this piece of equipment is absolutely fine and again points the way to the very definite need of automation in television production well-being. (20 April 1956)

Although "the enclosed" is not contained in the archive, the Chicago event to which the letter refers is the demonstration of the "Ampex VRX-1000 (later renamed the Mark IV) videotape recorder… introduced on April 14, 1956, at the National Association of Radio and Television Broadcasters in Chicago. This is the first practical videotape recorder and is hailed as a major technological breakthrough."[23] (Ampex, 2017) Such was Cornberg's excitement about the event that he was moved to write to Bernstein within the space of a week. The warmth of their relationship is clear from further documents, with Cornberg writing, to Bernstein on 2 May 1956, the day before Granada starts broadcasting, that "Television the science functions as an art it may flourish only through men of good will, our heartfelt good wishes are with you that television may flourish and become an art, greetings, Cathy and Sol Cornberg" (Cornberg, 2 May 1956). They were both theatre men who had gone into television,[24]

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[22] Cornberg also wrote, in 1963, an article titled *Educational Television Program Production Center and Random Access Audio-Video System*, which describes facility he was working on for the New York Board of Education. This was the earliest version of a non-film-based non-linear editing system found in this research (Cornberg, September 1963).

[23] The keyword here is "practical", as the February 1955 SMPTE Journal reports: "The electronic motion picture using neither film cameras nor motion-picture film is an actuality. The television camera and the magnetic video recorder will allow the motion picture a perfection and flexibility that has never before been attained." (Abramson, 1967) However, no further mentions of this have been found until April 1956.

[24] A Sydney Morning Herald obituary of Cornberg's wife, the novelist Catherine Gaskin, describes him as "Sol Cornberg [...] an American who was working in TV after a career in theatre" (Obituary, 18 September 2009). There is no reference to Cornberg in either Forman's *Persona Granada* (1997) or

a shared background which, perhaps, cemented their relationship. The point remains that their relationship served the double purpose of the easy informal enabling of the transatlantic exchange of such information, which, in turn, reinforced their professional connection. Michele Hilmes shows how transatlantic activities were a crucial "productive force" in the development of both radio and television broadcasting, as well as advancing specific careers from the 1920s onwards. Therefore, the Cornberg/Bernstein relationship was not an unusual phenomenon (Hilmes, 2012a, 2012b). Nonetheless, it was crucial for the adoption of videotape in the institutional context of ITV.[25]

Certainly, videotape, at this point, was further investigated by Granada. In a memo dated 21 November 1956, almost a year before Forman's reported trip to San Francisco, Granada engineer Reg Hammans wrote to Sidney Bernstein that "I took the opportunity on Monday morning, on the occasion of my visit to the Kinsgway Studios of [Associated-]Rediffusion, to discuss the Ampex magnetic video tape recorder with Cheevers." (Reg Hammans, 21 November 1956) "Cheevers" is presumably a reference to Bill Cheevers, who became Chief Engineer and Managing Director at Westward, the ITV franchise for the South-West (Sendall, 1982, 40). Kingsway Studios were Associated-Rediffusion's (A-R) studios in Holborn, London. How Cheevers was there is not elaborated on.[26] Hammans goes on to report in the memo that "Cheevers has promised to let me know as soon as he has any further information on these points". This prompts the question as to how Cheevers was the source of knowledge on videotape, with the memo suggesting that Cheevers was at least in touch with Ampex regarding technical developments in these very new machines. With the dating of the memo predating, by nine days, the first transmission from videotape, which took place on CBS in Los Angeles on 30 November 1956, discussion of the impending broadcast

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Sendall's *Independent Television in Britain, Vol.1.* (1982). Caroline Moorehead surveys Berstein's theatre career in *Sidney Bernstein* (1984).

[25] Transatlantic communication was also a feature from its earliest issues of *Television Mail* onwards, an example of which can be found in the *My American Notebook* column from November 1959, which ran a report with the headline "Production Company with Videotape." (Rick, 1959).

[26] No further details on Cheevers' career at that time were found in the ITV Written Archive or the BFI National Archive holdings.

can be reasonably expected. This presents the possibility that it was Cheevers at A-R, rather than Forman or Hammans at Granada, who was the Ampex man in the UK.

There is contextual evidence from the BBC archive to show that Ampex cultivated relationships such as the one it is suggested that it enjoyed with Cheevers. In a series of three letters written from 1953-4, Kevin Mallen of Ampex and Philip Hanson of the BBC exchange "warm personal regards to the family" and discuss "a whisper that we may be seeing something of you before long. I hope it is true", as well as the purchase of "two Ampex tape recorders for test here" (Manson, 2 September 1953 - 27 April 1954). In a later, less intimately-toned letter to "Holland Bennet Esq, Television Booking Manager at BBC Television, Wood Lane", on 13 September 1955, the same Mallen writes, "Dear Sir, We would like to advise you of our new London address [...] to which all further correspondence should be addressed" (Mallen, 13 September 1955). The phrasing of the letter is not as intimate as that shared by Mallen and Hanson or Cornberg and Bernstein and is, instead, informative. This in itself suggests the letter is part of a commercial strategy in which Ampex would have written to all the television companies to advise of its new address. It is a cultivation of broadcast clients, which Cheevers certainly was.

It is also possible that Hammans had gone to see Cheevers because, at that time, he was preparing the conversion of Granada's London base at the Chelsea Palace Theatre, which was used from 1957-1960 to broadcast the weekly variety show *Chelsea at Nine*. In a document from Forman to Sidney Bernstein titled *Notes on Meeting Held at Granada House on the 28th February 1957: Conversion of Chelsea Palace*, Forman details how "Hammans has already listed engineering requirements in a memo of 30th January 1957 [...point] D: Telerecording room (Ampex)" (Forman, undated). No details are given as to which Ampex machines were required. A pattern of collaboration across companies is also shown by further Granada documents from 1956. As SLB (as Sidney Bernstein was known) wrote to RHH (presumably Reg Hammans) on 6 February:

After a discussion Mr Heller and I had on Friday night with Val Parnell and Lew Grade, we considered the possibility of having joint telerecording equipment fixed in one of their London buildings [...] The point is that, although the present telerecording machines are not 100% satisfactory, if we were to share one with another company, it might pay us to install jointly a machine now available, and replace when something better comes on the market. (SLB, 2 February 1956)

This cost-saving collaboration tallies with Julia Hallam's description of both the financial uncertainty that Granada operated under at this time and its solution, which was to network and share costs. She writes "Sidney Bernstein made a secret pact with Associated-Rediffusion [...] in return for a high percentage of the net income from advertising in the north, A-R would pay Granada the costs of producing all the programmes that were networked between them [thus] the Granada group was protected from the threat of external control." (Hallam, 2003, 16)

Additionally, cooperation between the franchises – as a survival technique – runs through the early period of ITV. Bernard Sendall writes of the franchises' preparation for broadcast: "all had studios to provide and equip, all needed outside broadcast resources, all had staff to find and recruit and all had programmes to plan and film to acquire. And they had to learn how to work together, not only in dealings with the ITA but in order to make a reality of the concept of a competitive optional network." (Sendall, 1982, 115) Here, there is also the question of genre, in that ITV stole a march on the BBC in Light Entertainment, with Peter Goddard stating that "from the start, ITV showed well over twice as much Light Entertainment [with] British variety shows such as *Val Parnell's Sunday Night at the London Palladium*" (Goddard, 1991, 77), which was broadcast by ATV from 1955-1967, while the aforementioned *Chelsea at Nine* was broadcast by Granada from 1957-1960. Being able to pre-record and edit variety allowed edited close-ups of both performer and audience, making the shows instantly more televisual – cutaway wide shots of a theatre from a live, unmoveable camera are unwatchable on a 1950s television set. The advantages of recording and

editing on videotape echo through programming, networking and the possibilities of television as a medium.

Peter Black further suggests that Associated-Rediffusion bought Ampex machines in 1956, writing of the acquisition of videotape equipment:

> Paul Adorian, appointed A-R's managing director in June [1956], took care to fix a cheerful smile on his face when he walked into Television House, and boosted staff morale by ordering two of the new £30,000 Ampex video-tape recorders, the device that was to overturn existing ideas about television scheduling. (Black, 1972, 98-99).

The above, however, is an uncited reference. Black, a TV critic for the Daily Mail, thanks Paul Adorian in his Acknowledgements, suggesting that this information comes from Adorian himself, making it potentially as unreliable as Forman's recollection. Back at Granada, also in 1956, discussions were held over Ampex contracts. On 14 December, Bernstein writes to Hammans "Would like to discuss Ampex with you next week" (Bernstein, 14 December 1956), which is followed on 20 December by Bernstein again writing to Hammans, under the heading "Attached contract from AMPEX Corpn.", that "I'm not sure that we are going to get involved in this contract, but I do think it would be a good idea if you went through the agreement to see if there is anything to which you would object." (Bernstein, 20 December 1956) Although the contract is not found in the archive, Bernstein is, it can plausibly be assumed, asking for Hammans's technical advice, and that Ampex is clearly at the centre of Granada's still-developing broadcast techniques.

Forman frames the advent of videotape in terms of a dispute over editing, writing, subsequent to his account of his visit to Ampex (partly quoted above but continued further here):

> Reg Hammans had been wholly in favour of importing the machines because tape was a great improvement on the old kinescope, a film made from the

electronic monitor [...] But now he was looking into a bottomless pit. He could envisage no greater disaster than that tape editing should be allowed be become a general practice. And indeed in the early days, a tape-stop to re-record a mistake was not allowed. Tape existed for the sole purpose of recording live transmission, and that was that. Every producer and every director could see that tape editing could transform our methods of making a show, but the engineers stood firm. (1997, 111-112)

In an uncited reference, Forman then quotes Hammans as saying:

We succumbed to this very destructive philosophy of being able to stop tape whenever we wanted for editing or for re-takes. It's destructive because it results in a perfectionist approach to television and pushed television towards a film approach. Tape had a two-fold effect on television: it destroyed its immediacy, and it put up the cost per minute of production enormously because it took so much longer; everybody knew they could force a re-take, and editing tape is less efficient than editing film in terms of the consumption of equipment hours and man-hours. (ibid., 112)

Hammans is allowed no redress in Forman's account, with no evidence given by Forman for either this "mighty battle" (ibid., 112) or Hammans' aversion to videotape, which is contradicted by the archival documents presented here.

In the notes of a meeting held after the 24 September 1957 transmission of *Chelsea at Nine*, among thirteen items covering expected discussion points arising from a live variety show, such as lighting, the positioning of monitors and props, Line 8 reads "Tape reproduction facilities to be available at Post Production Meeting."[27] (Kershaw, 25 September 1957) Already classified as part of "Post Production", tape reproduction facilities were of little note. While it is possible that the notes refer to audio tapes, it

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[27] Kershaw is Simon Kershaw, the General Manager of Granada in Manchester, not Harry Kershaw, later script editor on Coronation Street. Finch, Cox, and Giles (2003)

seems unlikely that a close analysis of sound would have been possible in such a meeting, which the document suggests was devoted to general issues. The next summer, an 'Inter-departmental' memo, dated 24 July 1958, addressed to sufficient recipients[28] to suggest that it was sent organisation-wide, stated that "with the introduction of Ampex or Video-Tape Equipment, we shall all be asked questions from time to time and the following note is sent to you so that you may be able to answer these questions from a company point of view." The party line continues (reproduced in full):

1. Granada did not purchase any recording equipment to enable its live programmes to be recorded because on the advice of engineers as the result of observations of other companies' products, both here and in the States, we felt that normal telerecording equipment was not the right answer and that developments in the engineering world would inevitably find some form of recording which would be a great advance.

2. This equipment now seems to have been found in Ampex and the Company has purchased several machines because we now feel that we need to have the best possible record of some of our important programmes and because, also, we want to take advantage of every worthwhile improvement in television methods or equipment.

3. The machine will permit the Company to arrange its schedules in such a way that programmes can be prepared at reasonable times for subsequent transmission.

4. This in turn should eliminate, or, at least greatly reduce, overtime which in the past has been incurred of necessity.

5. It is difficult to be definite about the future but we intend to use our existing staff to operate Ampex and to apply the experience which we are now obtaining in tests to work out a sensible pattern of manning the machines. (Peers/PVS, 24 July 1958)

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[28] The names are "Griffiths, [Denis] Forman, Pols, [Philip] Mackie, Howat, Cave, Heeds, Martin, [Simon] Kershaw, [Reg] Hammans, Wendy Toye, Price", plus another illegible name, cc. 'S.L.B [Sidney Bernstein], C.G.B [Cecil Bernstein], [Joe] Warton, Brierley." (Finch et al., 2003)

The implications of this document are many. Firstly, the actual date of purchase of the first Ampex VTRs will remain unknown – what is known is that they were bought in the time between the contract advice sought from Hammans in 1956 and the above document from 1958. The above document presents videotape as a solution to the problems of telerecording (the process of recording on film from a monitor as a way of preserving a programme for later transmission), which it undoubtedly was, and is, another factor not presented by Forman. A supplementary document, the Capital Expenditure Statement from 1959, (Accounts, 24 August 1959) shows that £52,500 of spending on Ampex was brought forward from 1958, the date of the above interdepartmental memo. The accounts show Granada's heavy investment in an exclusive association with Ampex (there are no other references to money owed to a videotape vendor). Thirdly, Granada's explicit intention to use its own staff to operate the new equipment suggests both the need for internal training and that Granada were reassuring their employees that no new specialist Ampex machine operators were going to be brought in. Ampex was being embedded at Granada, into its existing staff structure. That Granada intended to prerecord programmes to allow preparation and flexibility in its schedules is also clear, thus implying the need for an editing facility, as an innate quality of something "prepared at reasonable times for subsequent transmission" is the ability to change it. The method by which to make these changes is not elaborated on, however. The entirety of the text declares that Ampex is a permanent fixture, as does a further document detailing the procedure for keeping or wiping videotape recordings held at the production office and library, issued a month later in September 1958 (Manual, 21 September 1958). Therefore, it is clear that Ampex videotape systems were fully embedded at Granada by September 1958, although the exact nature of the editing practice remains unclear.

The ITV and Granada archives suggest the operation of technical departments driven by cost and the need to network and innovate. These activities, as they enveloped videotape into their production workflow, changed the shape of television: its internal operations and its external broadcasts. References to the uses and development of videotape, specifically Ampex, as a recording medium are numerous and detailed.

While, within these mentions are references to and hints about editing, it is not made clear *how* that editing was carried out. While it is evident from the above discussed documents that it was being carried out, it is in the trade press that more detail on the actuality of editing videotape can be found.

Television Mail: **details on editing videotape**

The above section suggests that videotape use and editing were embedded firmly enough in the production processes of the ITV franchises of the 1950s so as to form part of internal communications. This section will present evidence from the trade press as to the presence of videotape and videotape editing in the independent production world. As Ian Potter points out, the word 'independent' shifts in meaning (I. Potter, 2008). While the term was originally used to describe the ITV companies, there were in fact independent production companies in the 1940s, initially making radio programmes for the BBC and overseas companies (ibid., 2). However, the need to produce adverts for ITV after it was launched in 1955 meant there was soon an independent television production industry big enough, by 1959, to merit its own industry magazine: *Television Mail*. It is in this magazine that the evolution of videotape and videotape editing is evidenced. While it is important not to conflate the existence of the production houses which used videotape for playback and mixing with the advent of videotape as a production medium that could be edited, the scale of references to videotape point to an evolving technology that was both useful and frustrating because of the editing difficulties it presented. These sources provide a means of tracing the working practice of the videotape editor in this evolving, developing world outside of the main broadcasters: the 'independent' production world.

The debate around videotape as detailed in the trade press does not always refer to the equipment at that point used in Britain. Similarly to the ITV Document Archive – as would be expected given that Ampex was an American company – close attention was paid by the ITV franchises to developments in the United States. One such reference occurs in 1959 and details the problematic nature of editing videotape.

Under the headline *New Method of Editing Video Tape*, it reports on an American "process of editing "vidpix""[29]. It states:

> First the sound track on the tape is transferred to a magnetic track, and the original recording is erased. In its place is recorded a coding track which consists of a beep every second with vocal announcements of minutes and seconds. The picture is then transferred to 16mm film, with the coding appearing as an optical track and therefore visible. The film is edited in the usual manner, and the coding is amplified to include frames of cut film. The master tape can then be cut to suit, the edge coding being erased and replaced by the edited sound. [...] The process is obviously laborious as compared with film editing. No mention is made of part of the operation which is not without difficulty – the making of precision cuts. (Report, 1959a)

The report is scathing of the new technologies and favours the retention of film as a medium, which was an increasingly less viable option, as the production advantages of videotape became swiftly clear, as we will see below. Editors, as passive absorbers of changes elsewhere in the production workflow, had no say in how their work environment might fundamentally change.

Trade magazines demonstrate more explicitly than the ITV archive papers that videotape was initially used in parallel to film – there was no videotape revolution. John Battison wrote in *Television Mail* in October 1959 that "tape recording has been employed by the programme contractors in England for over a year". This was enough time for the equipment to have already been updated: "Just being introduced into this country is the Ampex VR-1000B". This was the newer version of the Ampex videotape recorder (VTR) that superseded the "first models installed here". On editing, Battison writes:

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[29] "Vidpix" is, it would seem from the context, an abbreviation of videotape pictures.

It is the policy of practically all the tape users in the UK to frown on the practice of editing tape recordings by cutting the tape. There are two valid reasons for this: first, cutting a tape mars its pristine condition and makes it less suitable for a top-importance production; second and equally important from a production cost point of view, once producers get their hands onto a variation of film editing and taking practice, the same inefficient and expensive system of retakes as made films so costly, will prevail.' An experimental technique 'of editing videotape developed in the US is to make a 16mm recording on film from the original tape and then play back the two programmes simultaneously, viewing them side by side on monitors. It is claimed that editing in this manner makes for greater accuracy in cutting since the film being visible gives an exact point for cutting. (Battison, 1959a)

Battison also predicts the Edit Decision List (EDL), when he describes a technique used for recording edits: "…there will be many occasions where production instructions, either for dubbing, or actual physical editing by cutting, will be necessary. And the provision of a **cue** [sic] track makes this possible very simply. If desired the actual orders from the studio director can be recorded on this track thus providing a working cue sheet from which the editor can make his cuts." (ibid.) It was precisely because editors did not always cut the actual videotape that this method was needed, although the criticism of cutting videotape presented by Battinson demonstrates that this was happening. Douglas McNaughton, discussing using video in conjunction with film at the BBC in the 1960s, describes how video was used to assist an edit, providing a different early version of an EDL.[30] He quotes Peter Ward who states that "film from all the cameras were then edited against the 'non-broadcast' video master." (McNaughton, 2014, 399). These incremental technical advances would have a significant impact on practice once the EDL was mechanised.

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[30] EDL stands for Edit Decision List, which is quite literally a list of the decisions made in editing a piece of work, compiled during the rough cut and then the fine cut.

Looking at the wider context, adverts placed in *Television Mail* illustrate the nature of the post-production industry. While these adverts, from the early to mid-1960s, show that this industry was still primarily film-based, with roots in the time before television began, videotape was, however, creeping in. Photographic Electrical advertise their range of "Moviolas, Editolas, Cineolas" from an operational base in Dean St in Soho. The tagline "Est. Over 30 Years" indicates that this was a post-production house that began servicing the film industry at a time before television was available (Advertisement, 1964c). "Post Production Services" then began to be advertised, such as the advert for Campbell Film Ltd, from January 1964, which offered a "16-35mm film editing" service for "Documentaries, Features, Commercials, Industrial, Educational, Films", from a base in London's Strand. (Advertisement, 1964b) The Campbell advert is an indicator of a film house touting for television work, already representing the new fluidity in the industry. While Roy Perkins and Martin Stollery partly elaborated on the antecedents of these houses, exploring the improvisatory nature of feature film post-production (Perkins & Stollery, 2004; Stollery, 2009, 2015), these histories relate primarily to film editing for cinema. However, in his essay on Dai Vaughan's *Portrait of an Invisible Man*, Stollery makes a direct reference to McAllister's freelance television editing work for Granada via David Naden Associates, a facilities and production house which Stollery describes as "an initially semi-cooperative, commercially independent firm, providing editing services to clients such as Granada". (Stollery, 2015, 278) While Vaughan was a film editor and Stollery does not elaborate as to whether David Naden Associates had videotape facilities, this reference is indicative of a new economy that grew up around independent television production. A company named InterTel [sic] placed a classified advert in 1962 that stated "Videotape? use our VIDEOTAPE CRUISER for all videotape services" which included "videotape editing" (Advertisement, 1962a). While this is suggestive of a 'pure', non-hybridised videotape editing, even when this is stated explicitly as occurring, the advert does not elaborate on how this process was completed. Instead, it suggests the language of editing was changing and that the concept of videotape editing was, at least, becoming familiar. Videotape was an, albeit tiny, part of the post-production economy.

Other articles describe the considerable practical barriers to be overcome by videotape production, barriers that were being addressed. In 1961's *Are You Still Fighting Tape?*, John Dickson, writing under the authoritative by-line *Data Sheet: News of TV Technical Trends and Developments*, analyses the previous discussion of videotape that had been undertaken on the pages of the magazine. He critiques the prior criticism of the unions as preventing the adoption of videotape, and instead asserts that the technical difficulties of the medium were paramount. He pinpoints the problem as being with:

> ...as every British and other station using tape knows, service. So far as Great Britain networks are concerned, the brunt was born by major chains like Associated-Rediffusion, who pioneered through all the early days of using Videotaping, who had some of their experts trained under the Rank Cintel scheme and who learned to cope with day-to-day video servicing. The distributors [of the VTRs] ran one-week servicing courses, but the whole pattern of video tape servicing has been put under a new footing under D. de Coster, Ampex Great Britain's Service Manager. (Dickson, 1961)

As Ampex machines were used at the BBC and the ITV franchises, this statement represents evidence of service networking that suggests a uniformity of practice in videotape production. Dickson's use of the phrase "early days" is also suggestive of the advances made by this videotape technology since its first demonstration five years previously.

The commercial imperative in Ampex's promotion of its machines is implicit within the presentation of the company in *Television Mail*. In May 1960, under the headline *Beware of Tape*, Hugo Dunn-Meynell, billed as "Executive Producer with Osborne-Peacock"[31] writes "as we saw at those excellent demonstrations held in London during April, Ampex tape equipment can produce almost any effect that can be put on

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[31] Dunn-Meynell ran the television department at the Osborne-Peacock advertising agency from 1957 to 1961. (Obituary, 2013)

to film." (Dunn-Meynell, 1960). In the instructively titled "Don't Save Money by Using Tape – spend it on improved production", Harry McMahan reported on the Commercial Television Circle's Ampex Symposium, "held after the Circle's dinner last week at the Park Lane Hotel." McMahan elaborates on the functions of videotape, stating that "another great advantage is that tape gives instant playback. This was demonstrated by pictures on the monitors of the guests arriving for the dinner." The cycle of dinners, awards and presentations is foregrounded in *Television Mail*, for example, in its reports on the annual Advertising Awards and advertising festivals at Cannes and also in Cork. The promotional presentations of technology and products held at these events is regularly featured. In *New Techniques Shown at 3-Day Festival*, the Mail reports on the "lectures and films on colour television, travelling matte, videotape and sound dubbing" that formed part of the Television Mail Awards Festival. The report details how "Mr Webster of the Ampex Corporation used slides to illustrate the theory and practice of videotaping, and a machine was available for inspection on one of the exhibition stands in the main theatre." (Report, 1961) Glamour and technology are blended here as part of the lifestyle of being in television advertising – videotape is being sold as much as reported upon.

Videotape offered the commercials production industry the chance to instantly show work and collapsed the film editing workflow, which was presented as advantageous to the agency. In *Film Is On The Way Out*, Peter Langford, Director of Hausman Advertising Limited, describes the advantages of a using videotape system in fast-turnaround production, writing that "the opportunity of seeing a scene played back immediately after recording gives agency and client the opportunity of okaying a take there and then. There's no need to return the next day after a sleepless night to view the rushes." This statement suggests a production set-up of studio filming with the VTR on site. Langford also describes the effects on editors: "As titles and effects can be approved prior to videotape recording, and editing and opticals on the actual day, a little careful planning can ensure that the end of the shooting day sees the end of production worries on the commercial." The appeal of the acceleration in production techniques enabled by videotape is plain. Swift turnaround is paramount in this production culture. Meanwhile, Langford elaborates further on the barriers to

adoption by production companies who remained invested in film, stating that "the film production companies who install this [videotape] equipment will obviously have to make a very substantial investment. They should, however, be able to recoup this investment fairly rapidly, as in due course taped commercials will undercut filmed commercials every time. Even today it is possible to make a taped commercial for under £100 (this includes synch-sound, use of studio and videotape facilities: artists and sets are extra). What is more, production companies will no longer be subject to the delays and inefficiencies of certain laboratories." Langford goes on to say "let me say right now that there will still be some room for commercials on film. For instance, for spots using extensive exterior shots (although mobile videotape for the production of TV commercials is already in use in the United States); animated and diagram cartoons (a scant ten percent of today's total output); certain stop-motion effects; and puppets (although, I think, the less we have of that the better)." Langford's preferences are clear, and the changes proposed by the use of videotape are framed as a challenge: "Fast production will demand clear brains on the part of the agency people at the shooting. Executives will have to make decisions on the spot, and writers will have to think on their feet." (Langford, 1961, 29) This is not a framing in which film and videotape are able to co-exist, but a clear delineation of the promises of videotape, framed as a challenge that agencies must rise to. Editors are key to the successful completion of such a competitive technological challenge.

Videotape had enough momentum by 1966 to merit a 14-page review of its history and qualities in *Television Mail*. After explaining the merits of the system for recording and playback, the piece describes early videotape editing as follows:

> Once video tape was used to record programmes for reasons of economy rather than of simple time delay then it became necessary to edit the recorded material to produce a satisfactory final programme, a process which historically had been done on film, and which was very easy using film material, where the individual frames are visible, and where a splice can be made simply by cutting out the unwanted portion and joining the two ends. It was this technique which was also initially tried with video tape, with the added

difficulties that it was not possible to observe the recorded tracks in order to cut to provide a disturbance free join when replayed. The latter objection was overcome by producing a mechanical jog allowing a razorblade or guillotine type cutter to cut the tape at the correct angle and using information recorded on the control track of the video tape. By applying very fine grain iron particles to make the magnetic pattern visible it was possible to cut at exactly the right place in order to avoid picture disturbance at the splices. However, there still remained the problem of deciding exactly where along the length of the tape was the optimum place to make this programme edit, and although this could be fairly accurately determined by using marks on the tape or recorded cur [cue] tones, it was still necessary to actually make the splices before seeing what sort of subjective impact the splice created. At a later date, with the development by Ampex of electronic methods for editing, the way was open to preview splices before they were actually carried out, offering even greater production flexibility and approaching the flexibility of film. Using the Ampex Editec time controller it is possible now for splices to be made to an accuracy of a single frame, and to be previewed any number of times and moved by predetermined amounts in order to achieve the best visual effect; only when producer and technician are entirely satisfied with the splice is it actually made. (Mountjoy, 1966, 14)

While this excerpt reiterates the already detailed difficulties with editing videotape for which solutions had not, at this point, been found, it also highlights the use of Editec, a device which controlled the tape closely enough for it to be cut "to an accuracy of a single frame". Editec is one of the solutions described throughout this period as vital to enabling the ease of videotape editing. In 1964, *Television Mail* had reported on "the Editec system, which provides means for marking the edit points [on videotape] with cue tones, moving these tones by any number of frames, either forward or backward, rehearsing the splice position without damaging the tape and the programming the Electronic Editor to perform the splicing automatically." (Report, 1964b, 25) Beyond the demonstration witnessed by the reporter, it remains unclear who was using this system. However, by 1965, Ampex were advertising the Electronic

Editor and Editec as accessories to its new video recorder (Advertisement, 1965a, 9), suggesting their appeal to users of videotape and their commercial viability. It is also representative of a second generation of videotape practice. While the introduction of updated equipment points to the redundancy of old equipment, Ampex are careful to maintain compatibility. Inserted in the 1966 *Television Mail* review is a double-page advert for the "best VTR... Ampex VR-2000", with accessories also presented. While this includes the higher-spec Editec ("perfection"), the Electronic Editor is also displayed, described as "easily adapted to the VR-1000", and providing "virtually unlimited production possibilities for the imaginative producer!" (Advertisement, 1966a) What the various descriptions of Editec imply is that the editing undertaken on videotape during this period was both worthwhile enough to persistently seek to remedy its difficulties, and that Ampex was presenting editing solutions to all of its users, both old and new.

Videotape's speed and simplicity – no processing required and the tidiness of the reel in comparison to the unwieldy trims of film – suggested great potential for fast-turnaround production genres such as advertising or news. Retrospectively, this has been discussed elsewhere, with BBC videotape editor Geoff Higgs explaining in 1973 that "with the advent of the magnetic-tape video recorder a new degree of freedom was available to the television director, who was able to see an immediate replay of his programme" (Higgs, 1973, 2) and Roger Crittenden summing up the appeal of videotape thus: "By its very nature, film requires a number of procedures that are unnecessary with video" (Crittenden, 1995, 65). George Elliot, of commercials company VTR, made the case in the 1966 *Television Mail* special:

> ...one of the finest advantages [of tape] over film is the ability to provide big production values, special effect and opticals at low cost, fast. In making a filmed commercial one must take into account studio time, director and artists' fees, processing charges and, not least, the time incurred from the first day's shooting to the film's completion, probably a matter of several weeks, with time delays for rushes, re-shoots and opticals. With a pre-planned and properly handled video-tape commercial several weeks are cut to a single day.

In fact, it is possible to make several commercials on tape. During this time client and agency can see their commercial shot, changed and improved, if necessary, with on-the-spot playback, including complicated opticals and special effects approve it and have it shown on the network the same night.' In case anyone is in doubt as to the advertising imperative of this piece, Elliot of VTR goes on to say 'But a warning: to produce a 'par excellence' taped commercial any producer worth his salt must use the services of a production company specialising in video-tape production. (Elliot, 1966, 16)

Videotape, for Elliot, is a production imperative. While he sees no need to elaborate on this function beyond it being one of ease, he refers to the "properly handled video-tape commercial" which can be shot, played back and shot again until it is perfect. There is a clear commercial motivation to present the production flow as simple and clarified, although specialists are required to make it so. There is an implied cultural split, delineated by the technologies, between film editing and videotape editing. However, the working practice of small, independent companies, where bespoke project-by-project work was undertaken, was one that would soon be taken up by videotape editors branching out on their own.

Freelancers: evidence of the changing labour market

The above analysis can be summarised as evidence of the presence and use of videotape in the worlds of ITV and independent production. The following work attempts to identify the effect that this work was having on production culture, specifically in the shift to a culture of small companies within which freelance workers would complete single jobs and then move on. Martin Stollery makes mention of an early freelance world in his work on Dai Vaughn's *Portrait of an Invisible Man*. Stollery classifies Stewart McAllister's freelance television editing work for Granada via David Naden Associates during the 1960s and 1970s, as "in some respects, ahead of the curve […] in that his career straddled in-house production and the vagaries of outsourcing" (Stollery, 2015, 278). In this way, Stollery suggests the peculiarity of such work in an, as then, largely non-freelance world. John Hill mentions the departure of

the producer and presenter Josephine Douglas from the BBC show *Six-Five Special* in order "to go freelance" (Hill, 1991, 96) in November 1957.[32] Additional evidence of the burgeoning freelance culture evidenced here can been seen in classified ads. Cameraman Reg Johnson advertises himself in the trade press on three counts, as "Director/Cameraman – documentaries, Cameraman – TV Commercials and Programmes Features, Special Effects – Travelling Matt", stating that "EXPEREINCE COUNTS [sic]" and that "if you require experience gained with leading companies in these fields… REG JOHNSON is now FREELANCE" (Classified, 1961a). Meanwhile, that "John Haggarty, Writer/Director" advertises himself as "available as free-lance" and "represented by Lom (Management) of Maddox St" (Classified, 1962b) suggests further cohesion around behind-the-scenes production talent – employers seek talent. A 1962 classified ad states that "FREELANCE (and sparetime) TV COPYWRITERS and VISUALISERS [sic], capable of creating original selling ideas, are invited to send details of credits, terms and availability" and lists a post box address at *Television Mail* (Classified, 1962a). The central characteristic of the freelance market, comprising the pool of individuals advertising for work and employers looking for specifically freelance workers, is set. All this evidence is indicative of a changing labour market, in which individuals can move from employer to employer as specialists in their own fields and jobs are "discrete and distinctive pieces of work" undertaken by "the specialist in short supply" (Storey, Salaman, & Platman, 2005). These examples of independent contracting suggest that there had always been a degree of freelance work in the industry. The growth of videotape coincided with the growth in freelancing, with the videotape editor becoming such a "specialist" as more and more locations were equipped with videotape equipment. This was a slow-growing, but major, industrial change in itself.

Indeed, a report on the videotape editor Johnny Fielder published in July 1966 stands as a declarative indicator of something new – an established freelance videotape editor announced in an editorial rather than an advert. The text states:

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[32] The BFI listing for Douglas tells of a subsequent successful career as a director and producer (Listing, 2017).

Johnny Fielder, who was formerly with ATV and, from last September, with TVR, Windmill Street, broke away last week to go free-lance [sic] as a video-tape [sic] editor and television advisor to advertising agencies. During his time with ATV, Fielder edited such shows as 'The Royal Command Performance' (ATV); 'Midsummer Night's Dream' (Rediffision); the award winning 'Crime and Punishment' (Rediffusion); 'Planemakers' (ATV) and many others. He joined TVR as the tape editor and managing director of tape commercials. (Report, 1966a, 34).

A later reference to *Planemakers* in *Television Mail* states "Some interesting experiments in programme techniques were possible with VTR. ATV for instance included a mobile VTR unit in their outside broadcast department, and several scenes from the 'Planemakers' series were shot on location using an outside broadcast unit and Video tape rather than film." (Laking, 1967) Fielder had taken the practice learnt within the ITV franchises and the independent production company Television Recordings (TVR) and was offering his services to anyone who would pay him. This is the freelance model as it is known today. The reciprocal nature of advertising in *Television Mail* can be seen in an earlier advert, placed some three months earlier for TVR, highlighting its ownership of Editec as being an efficient tool for fast turnaround production: "Time and Money Saved is remarkable, because Editec and Videotape short-cut the conventional production sequence (you can even insert wipes and opticals during actual production)." The advert follows this with "Only Television Recordings Ltd offer Editec", suggesting that they are the only company in London to have the technology. The closing line reads "...for a demonstration of the Editec technique, please contact John Fielder." (Advertisement, 1966b) Fielder was a hub of new technological knowledge and new practice possibilities, the centre of a network. The next year, Fielder would form his own company, Air-time Productions, which had took out its own *Television Mail* cover ads in August and November 1967:
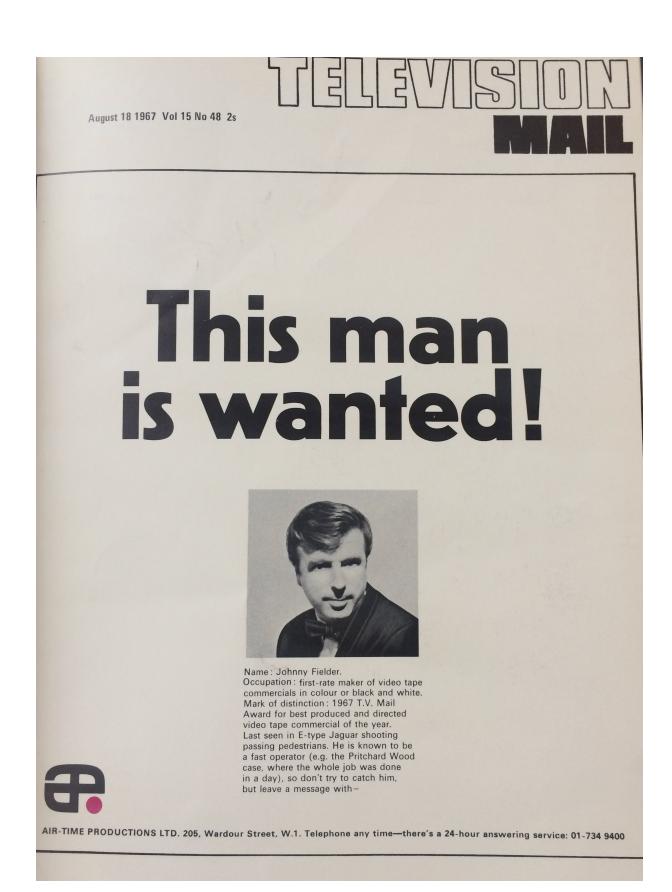
Figure 3: 18 August 1967, Television Mail: Johnny Fielder as a new enterprising model of employee. First, he is introduced... (Advertisement, 1967b).
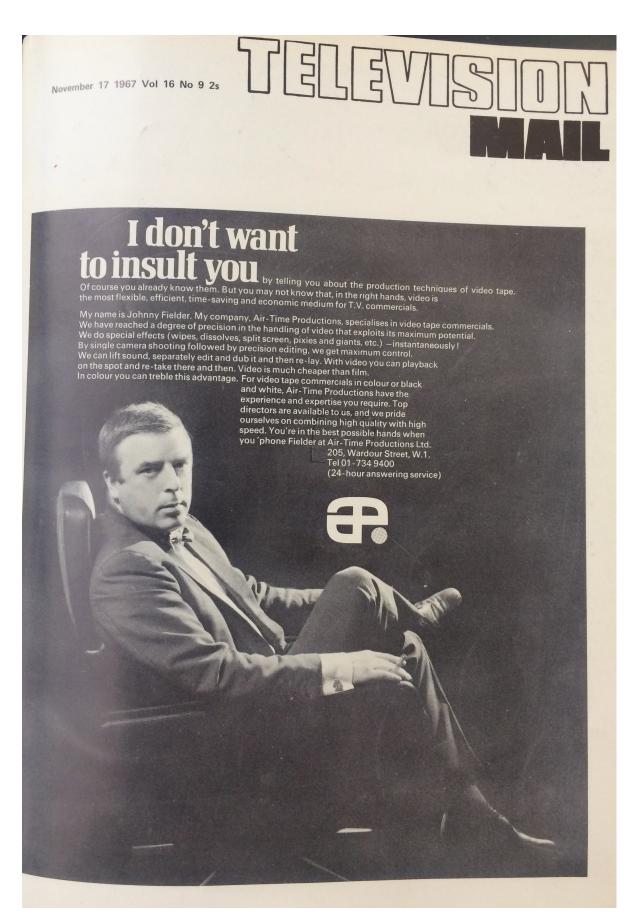
Figure 4: ...and then presents himself again, later the same year (17 November 1967) (Advertisement, 1967a).

Fielder's covers present what has been identified by Storey, Salaman and Platman as the "new employee", with qualities of "initiative, energy, self-reliance, boldness, willingness to take responsibility for one's actions" in a "move away from bureaucratic to enterprising organisational forms" (Storey et al., 2005). As they explain, enterprise is key here:

> Enterprise at the individual level is inherently associated with, and requires and is legitimated by, changes at the organizational level. It is also linked to the pervasive and dominant critique of bureaucracy at the institutional and societal levels. Bureaucracy is framed in an opposition with virtuous, enterprising organization that permits only one outcome. Bureaucracy is defined in terms of a moralized polarity in which enterprise at the individual and organization levels is regarded as necessary and virtuous. Enterprising forms of organizations are virtuous because they require and unleash enterprising individuals. (ibid., 1035)

The above photographic portraits shift focus to Fielder as a new enterprising face of the industry (more usually represented by models, illustrations or logos). It is, therefore, an *engagement with* those who *do*, rather than a *representation of* those who *do*. Fielder sells himself alongside the technology, offering videotape as "the most flexible, efficient, time-saving and economic medium for T.V. commercials", including "special effects [...] precision editing [...] maximum control", and states that "video is much cheaper than film". The November advertisement concludes that "you're in the best possible hands when you 'phone Fielder'", situating him as an "enterprising subject" who can "secure their sense of purpose and reality by formulating, evaluating and conducting strategy" (Knights & Morgan, 1991 in Storey et. al, 1036). That Fielder conducted himself and his practice in this way decades before the analysis described above was undertaken suggests the level of his innovation, conflating himself as he does with his ability to use the new technology.

Videotape editor Barry Stevens recalls working with Fielder and confirms the qualities listed above:

BS: Johnny Fielder, he was a bit of a barrow boy, actually, a bit sort of self-opinionated. Perfect for working in television, I guess [...] He had an arrangement with TVR to use their machines. If he got a client who wanted a commercial cut, he would probably record it from the studio to their machines anyway, or he'd get some film footage, telecine to 2". So, a Daily Mirror commercial or any commercial like that, if they had a film clip in it, he'd get it telecined, come in with that, or run it through the studio; book the studio for a couple of hours, put a caption on the end or even have a presenter or whoever [...]

RA: So why did he set up Airtime then? If he was at TVR working...

BS: Oh, well, he didn't want, he couldn't survive on TVR. He didn't want to be on staff. He was on staff at one stage, I think, because he started the company with them, but he wanted to make more money than all the ordinary people and he wanted to control things. (*Interview with Barry Stevens*, 12 December 2017)

Evidence for the independent market for editors is also present. Studio Lambert[33] advertised in the same year for a Senior Editor, the requirements for which were as follows:

…experience on TV and Cinema advertising films in all techniques. […] organising and executive ability, a respect for schedules, and a creative flair which will be required in the early stages of production. The successful applicant will take full control of all editorial work, delegating occasional productions when under pressure to free-lance [sic] editors, from whom applications are also invited. (Classified, 1961b)

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[33] Studio Lambert was a commercials production house whose adverts appear in *Television Mail* from the earliest issues in 1959. Its first production was a 'sponsored' documentary, *The Service behind Cellotape* (1953) (Listing, 2018f).

What is specified above is more exacting than the practice described by editors working within the broadcasting environment of the BBC, who had managers to schedule them and do not describe an expectation on them to be involved from the "early stages" of production. There is also, in this classified advert, a demand for "all techniques", suggesting the need for both film and videotape practice. The scale of the freelance pool of editors can also be seen in the demand for "at least two years experience" (ibid.). At this time, adverts such as the *Mail* cover advert placed by Pathe in May 1962 also begin to suggest the importance of the editor. In this advert, two editors, John Blair and Ron Fowler, are placed in a triptych alongside Production Executive John Parsons, with the description "Three more familiar faces (to those who know what they want and where to get it in TV commercials) from the Pathe parade of top TV talent." (Advertisement, 1962c) Fowler is pictured looking through a frame of celluloid, which he holds carefully up in front of him, with the caption "Entered film industry in 1942 with Universal News. Has worked in the laboratories and cutting rooms of most of the big studios. Joined Pathe in 1956 in Newsreel Division and transferred to TV Commercials Division in 1958." (ibid.) These examples suggest a freelance pool big enough to sustain the commercials market, but which was still primarily based in film and which still used personnel from the feature film and cinema advertising pools of staff. However, these adverts are specific to film practice, suggesting that videotape editing was still not a developed enough role to merit its own pool of staff.

The magazine gives other examples evidencing a culture in which editors move between film and television in a way again recognisable as a freelance working pattern, unattached to a broadcaster or company. In *The Age of the Independent Producer is Dawning*, the *Mail* reports that "there is a noticeable advance of a handful of lone-wolf producers. Following APF's[34] clear example that it can be done if the idea's right, - witness the success of 'Supercar,' 'Fireball XL5' and, earlier, 'Four Feather Falls' – certain talent agencies are entering the production arena." The editor on these

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[34] APF was Gerry Anderson's (of Thunderbirds fame) production company (I. Potter, 2008).

Gerry Anderson television productions was Gordon Davie, who also worked on feature films such as *Born Free* (dir. James Hill, 1966). There is evidence from the BBC that the corporation was farming out editing work. Joanna Spicer, the Managing Director of Television and the woman who essentially ran operations under David Attenborough and Hugh Carleton Green (Miall, 1994), oversaw a review of "outside cutting rooms" in early 1968, explaining that "as a result of recent A.C.T. increases we are having to renegotiate outside hire rates [...] We are at present hiring an average of 30 cutting rooms, and beyond this figure the balance of internal/external hire comes into question. We need to maintain an outside market, but not to be in its grip" (Spicer, 7 March 1968). Although Spicer's comments are from a later period and refer to film cutting rooms, it is clear that the worlds of broadcast and independent facilities were mixing to the extent of facilitating the maintenance and negotiation of working relationships. As such, the cross-pollination of practice was inevitable, however incremental. These were not siloed worlds with their own ways of doing things. Other asides appear. In a review of the book *How TV Works*, published by Granada Television in 1960 and described by the *Television Mail* reviewer as "excellent prestige publicity material for Granada", cross-pollination is notable in the book's failing in the eyes of the reviewer, in that it gives "no credit here for the work of the BBC in at least giving the Independent engineers some experience to go on." (Review, 1960) That the advent of freelancers was being discussed in industry literature is additional evidence of their importance.

The expectations on editors are expressed tangentially in *Television Mail*, with little reference to editors directly, who are obscured from the frontline of production. They exist, nonetheless, in adverts that make claims such as "many miles of film have passed through Wallace Centre [...] Entertainment or instruction – prestige or sales – filmlet or commercial 'Wallace can make it' and make it well!" (Advertisement, 1959d) The text of this advert does not reveal the mechanics of production but is instead laid over a gouache illustration of a market (Wallace was located on Brewer St in Soho, the site of a street market), thus implying the industrious nature of the place. This was a site where editors worked, but the client did not need to see them. Some years later, the *Production House Close-Up* column closes with an admission of the necessity of

the "technician". Discussing the making of a commercial, the piece ends: "Once the original idea has been started off the final result will most surely be achieved through the sympathetic collaboration of the film-maker. The technician is someone you cannot get rid of altogether" (Mountjoy, 1964, 8).

Other indicators of the expectations placed upon editors and associated technical staff are expressed in the magazine. Prince Littler prepared ATV's annual report in 1961. He summarised it in the *Mail*, where his emphasis on new trainees is explained:

> ...three factors condition our attitude towards trainees in the production and technical fields. The need to keep pace with a medium which is hungry for new blood, new ideas, new techniques. The need to train enough talent to provide a 'bank' upon which we can draw in replacement. The need to look to the future and provide for the time when works will inevitably result in a serious drain upon the existing talent and experience. (Littler, 1961)

Littler makes explicit the need for this "bank" to be different to previous technician resources, stating that "television has had to breed a new body – the engineer with a creative and artistic flair and the creative artist with technical know-how, and the ability to be aware of and use the facilities available to maximum effect." (ibid.). The interest here is in Littler's assumption that the reader would understand what he meant by "new techniques", which would be used in conjunction with "creative and artistic flair". This description also mirrors, yet precedes, the attitude expressed by Fielder in 1966, but, as Fielder was at ATV when Littler write this report, the question emerges as to how much Fielder was influenced by the circulation of such ideas.[35]

As independent production developed and organised itself into a coherent industry, it remained contextualised by the established broadcasting body of the BBC.

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[35] Attempts to locate Fielder were undertaken but unsuccessful. A card sent to the address for his company Air-time, located on the Companies House website, was returned in the post, while Barry Stevens thought him unlikely to still be alive, given his age and lifestyle.

Therefore, the sources and evidence discussed above will now themselves be contextualised by literature and sources that have examined the BBC.

The BBC

This section will discuss literature which illuminates the multiple ways that videotape was used at the BBC, exploring how videotape was used in an improvised manner, often in a hybrid approach alongside film, a practice that lacked uniformity across the corporation. While the BBC attempted to enforce a coherent set of processes for its videotape editors, the evidence suggests that it was unable to do so. There was no clear and consistent set of videotape editing standards, as evidenced below by existing literature, BBC training manuals and interviews undertaken for this thesis.

Under the title *The March of Video Tape*, G.R. Higgs, BBC "Video Tape Editor, Television Recording Department" gave a summary of the advent and development of videotape and its use at the BBC. Ignoring the BBC's VERA[36] system, he starts his history thus: "In 1956 the American firm of Ampex announced their invention of the so-called quadruplex video tape recorder". On editing, Higgs writes:

> The editing of video tape […] is a field in which there is at present perhaps more technical activity than in any other part of the recording system. In the early days the only method of editing a video tape was by exactly the same method as is used for audio tapes, that is to cut the tape and rejoin it to another tape; with the additional complication that the video and sound points are widely separated. Despite the expertise in editing acquired by a number of video tape engineers, this was clearly a drawback of the magnetic recording system. The so-called electronic editor unit 'Editec', enabled edits between different tapes to be rehearsed and then executed without physical splicing

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[36] BBC videotape editor and convener of the BBC VT Old Boys network Chris Booth explains: "At the same time [as Ampex was launching its VTR in 1956] the BBC had been developing its own system, VERA (Vision Electronic Recording Apparatus) [...] but by the Autumn of that year [1958] the BBC had bought its first Ampex Videotape recorder and VERA disappeared into history." (Booth, 1994)

but it was still a time-consuming operation. The arrival of time code editing enabled edits to be made at predetermined frames, and to be rehearsed without erasing any material. Additional facilities, such as vision faders and the ability to control a number of other machines external to the cubicle, have given the (human) [sic] editor the nearest approach to a comprehensive editing suite yet. (Higgs, 1973, 2-3)

Higgs's reticence to describe the uniformity of videotape editing practice stands in contrast to the claims of ease and rapidity made by the articles and adverts in *Television Mail* already cited above. This reserve is reiterated elsewhere. In May 1966, the Television Recording Department at the BBC released an internal document titled *Principles and Practice of Video Tape Editing*, in which its front page sets out the limitations:

It is issued in this temporary form to meet the immediate need for information on this subject but a later version will be in a printed, loose-leaf form so that it may be amended and kept up to date as the editing techniques evolve and change. (Watkins & Palmer, 1966)

Clearly, the changing landscape of videotape equipment is foregrounded in the above document, the introduction of which states that it was "prepared mainly for the information of Programme Production departments [...] to give a general picture of the principles of video tape recording and reproduction." It is, therefore, an explanatory document, which reveals the technics of videotape editing at the corporation stating that "nearly all programme editing carried out on videotape so far has used the 'cut-and-splice' method [...] The alternative 'electronic' methods of editing which avoid physical cutting of the tape are explained below." This is despite the fact that the equipment was, in 1966, "not yet available in the BBC". (ibid.) The year before, *Television Mail* had announced the availability of such equipment at the Soho post-production house TVR (Ullyett, 1965), suggesting an element of call-and-response in the BBC's internal communique. On electronic editing, the BBC document

describes the impact of electronic editing on the editor in the changing of the workflow:

> One way in which this facility [electronic editing] may be used, is known as 'assemble' editing. Consider two sequences in a studio production to be recorded with a break in between them for, say, a costume change. The first section is recorded and then the recorder is stopped and the studio prepared for the next sequence. The recording of the first sequence is rewound some way and then replayed, the output picture being observed by the director in the studio production control room. When the preproduction reaches the appropriate point the director presses the changeover button. This stops the reproduction of the first recording and erases all subsequent material on the tape, whilst at the same time commencing the recording of the output from the studio. Obviously the director must have cued the start of the studio action prior to this point. Thus the end of the first sequence and the beginning of the second have been joined together by purely electronic means, the editing has been performed at the time of the production and no subsequent work on the tape is necessary. (Watkins & Palmer, 1966)

The onus placed on the director to complete the technical tasks of videotape editing can be considered foreshadowing, considering that this equipment was not even at the BBC at that point. The document's value is found in its explanatory nature, in that it points to confusion, in production terms, over the purpose and operation of videotape. This sits in contrast to the purposeful descriptions of the benefits of videotape seen in *Television Mail*.

While these BBC documents are valuable for delivering a factual overview of what happened, and where and when it happened, it does not explain the culture, expressed by the trade magazines, in which videotape had a momentum of its own, existing in opposition to and in conjunction with film. This is typical of BBC-centred studies, which discuss characteristics peculiar to the corporation and do not broaden their frame of reference. This is despite the fact that, as Jason Jacobs points out,

videotape recording engendered a huge shift in the expectations of television from a live medium to one which could be scheduled around a "canned" programme (Jacobs, 2000, 13). How, then, did videotape develop as a medium within the corporation?

Literature specific to the BBC demonstrates the multiple ways that videotape was used, leading to the sense of improvisation depending on production demands and the willingness – or need – to experiment with the new medium. What is clearly articulated is that the simple practical barrier to the 'full' adoption of videotape is the challenges posed by editing it, so much so that, where videotape was in use, most practitioners did not edit it, instead using it for swift playback. Echoing Higgs, Roger Crittenden explains:

> In 1960, when I first entered the cutting rooms[37], video did not function as an editing medium. Engineers took up to ten minutes to make a physical cut in 2-inch video masters. The result was not something an editor would be proud of. Even recognising the video equivalent of a frame was difficult, and in any case picture and sound were not parallel on the tape. For some time, certainly in the BBC, if serious editing was required a 'film recording' would be made and the sound transferred to 35mm magnetic film. To be fair, video recording was originally developed to allow the transmission of 'live' performances to be time shifted for different areas or, in the case of the USA, to accommodate different time zones in the same country. (Crittenden, 1995)

Peter Goddard, however, describes how videotape was being edited prior to the period in which Crittenden was working. This was motivated by Tony Hancock's performance needs when filming the series *Hancock's Half-Hour* (BBC, 1956-60) and the desire to compete with snappier paced US imports, such as *I Love Lucy*, which were shown on ITV from 1956 onwards. Hancock is described as being so strained by the demands of live performance that a 1957 episode had to be postponed and replaced

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[37] In an interview with Paul Sutton in 2010, Crittenden summarised his career during this period as: "In the 1960s, he worked as a film editor for television, mainly at the BBC." This suggests that his expertise and recollections can be applied primarily to the corporation. (Sutton, 2015)

by "a telerecorded repeat", while mistakes made by the actors during a later live broadcast led to Hancock being unable to perform in a subsequent episode, the slot for which was again covered by a repeat. Producer Duncan Wood was moved to both pre-record as a salve to Hancock's anxieties and to attempt to edit the recording. His experiments are described by Goddard: "He spent a day cutting up a recording of *On the Bright Side* [...] and found it was possible to make cuts without disturbing the synchronising pulses which stopped the picture rolling. From a 45-minute show he made a twenty-five minute collection of continuous sketches which retained the picture quality of the original." However, while the BBC "considered Wood's system of recording to be 'costly and unprecedented", they were eventually forced to give their permission by Hancock "refusing to sign a contract for another series unless it was recorded in this way." The first videotape episode of Hancock's Half-Hour, for which Wood "edited together two takes of one sequence in order to use six camera positions without any cameras appearing in shot", was aired on 25 September 1959. The impact of this discontinuous recording and editing is described by Goddard as increasing "the scope of situation comedy." He continues:

> The pace indeed quickened as bridging dialogue to cover costume changes and camera movements between scenes could now be omitted and principals could now spend more time on screen. As cameras no longer needed to move in mid-scene to be in position to cover the opening of a subsequent scene, more cameras and more close-ups could now be used. [...] by 1961 it was a common method for recording other shows, especially at the BBC. (Goddard, 1991, 85)

Douglas McNaughton describes techniques developed in the context of cost-related editing problems, which resulted in the above-described hybridised practice:

> Videotape was extremely difficult to edit, and cut tapes costing £50 could not be re-used and were charged to programme budgets. As a consequence, many television practitioners favoured producing their programmes as telerecording films, which could be edited later. For example, Rudolph Cartier's studio

production of *Mother Courage* (BBC 1959) was telerecorded in several sections, leading to a major row with Equity over the use of 'filmic' discontinuous production techniques. In 1961 Leslie Page, the Establishment Officer, Television, warned that 'it is now quite common practice, where programmes are pre-recorded on video tape, for those tape recordings subsequently to be transferred to film in order to obtain the most polished result possible.' Filmed telerecordings of studio material were edited to incorporate retakes or to allow constructions of dramatic space and time impossible in 'as-live' studio recording.' (McNaughton, 2014, 395)

Jonathan Bignell, Jason Jacobs and Lez Cooke all detail the technique of telerecording video to film for subsequent editing (Bignell, 2014; Cooke, 2005; Jacobs, 2000). Jacobs explains it simply as "recording images on 16mm or 35mm film" (Jacobs, 2000, 10), while Cooke quotes the director Christopher Morahan in a more fulsome explanation: "I decided to shoot in a conventional studio style but not record on tape, it went straight onto 35mm telerecording, the quality of telerecording being very high by that time. Instead of video editing, the final cut was on a Steenbeck editing table normally used for film and we were able to lay all the complex sound tracks as if we were making a film, culminating in a mix and dub just like a movie. I was also able to finesse the editing more successfully, taking more time, tightening sequences and so forth." (Morahan quoted in Cooke, 2005, 89-90).

This was an uneasy coexistence between film and videotape, in which (as Morahan also says), despite the fact that "video editing had reached some sophistication", sound editing on videotape was not reliable enough to facilitate a complete videotape editing process. McNaughton reiterates this in his description of the Videofilm experiment in the 1960s. The impetus behind this experiment was to develop a "multi-camera filming system [that] would utilise the existing vision mixing technique of studio multi-camera to capture continuous action, but output direct to film, requiring minimal post-production editing and resulting in a high-resolution programme in an internationally portable format". Editing was assisted by the fact that "the output of all available cameras was recorded on film in its entirety for subsequent editing, with

the separate off-monitor telerecording providing a record of the shots selected for broadcast and used as a template for the editing of the filmed output of individual cameras". (McNaughton, 2014, 394) The different methods detailed above suggest a period in which videotape and film were used together, which was characterised by an inefficient hybridity. McNaughton discusses how telerecording had little effect on editing practice: "Telerecording—outputting video camera feeds to a monitor which was filmed for subsequent editing—was introduced at the BBC in 1947 and videotape was introduced in 1958, but these advances did not result in an immediate move to 'filmic' shot-by-shot production and post-production fine-cut editing in television drama." (McNaughton, 2014, 391). In other words, the drama genre, in which programmes were characterised by their "liveness" (Jacobs, 2000), required minimal editing, a practice that remained even after the introduction of the technological capacity to record them.

The messiness and improvised nature of these methods is borne out by interviews conducted for this thesis. The editor Rod Longhurst, who joined the BBC in 1965, provides more detail about the mechanics of editing videotape at the corporation during the 1960s. He starts by emphasising the separation between the "film department", which was based at Ealing, and the newer mechanics of videotape studio production at Television Centre:

> Film department was film department and up in the Television Centre there was... I'm not sure what the official title was. Telerecordings? A funny word. We used to commonly know them as VT, but telerecordings was the generic name because that included film, telecine and... of course, telecine was for taking a film, playing it out to air, but also they could record onto film because that's how we used to do it before VT came in. When I first started working in the studios you'd telerecord the stuff. And you'd have videotape machines, because they obviously came in on my time. They were around when I first joined. Now, very strange this... when I first joined, VT editing was... there was only one or two people could do it because you had to cut the tape. They were 2-inch. You had to cut it. [...] I'm going right back to '65/'66, the 2-inch

machines. You had to cut it. And if you anticipated that you were going to need to do editing... and it would only be chunk editing. It wouldn't be cutting individual shots. Tony Makepeace, I think was the editor's name I knew of, would have to sit in the gallery and watch. (*Interview with Rod Longhurst*, 10 January 2017)

Longhurst recalls the experimental nature of a department still developing, sparsely staffed, and still unsure of its place in the production workflow, due to videotape's unwieldy and expensive nature, as described by McNaughton. That the editor was required to sit in the gallery and watch the recording, as well as undertake "chunk editing", both demonstrate the linearity of videotape editing. He recalls the resolution obtained by electronic editing on 1":

> ...when it came to the recording at the end of all your rehearsals, the last day and the last evening, you'd try and do it as much as you can in one go and move from scene to scene. [...] For the reason of paying actors, and also for the reason of the fact that you're recording onto videotape. It was a bit of a drama too, right at the beginning. You had to cut it, and obviously expenses... tape ruined, and whatever. So, then, I'm not sure whether electronic editing came in with 2" or not. I don't know enough about that side then. And then the 1" tape came in, but then we got to the situation where obviously they could electronically edit. (ibid.)

This, then, is also the period in which videotape editing was a newly enabled technology, which saw the change from physically cutting the tape on 2" to using electronic editing on 1". The later development Longhurst describes is tape-to-tape linear recording, which he calls "chunk editing", or the practice of dubbing "across from one machine to another to make the edited version" on "two vast tape machines" described by Morahan in Cooke (2005, 89-90). The BBC had its own innovatory role in this progress, developing and adapting its own equipment from the introduction of its own VERA VTR onwards, as described by BBC videotape editor Chris Booth:

> We could say we would like things done and people would do them for us, like,

you know, building mixers and modifying things and they didn't say this was what you were going to have. I remember, on a weekend, RCA dumped a whole load of 1" machines on them and said, 'That's what you're having', you see. But BBC built their own more-or-less, all their own bolt-on stuff. (*Interview with Chris Booth*, 17 November 2017)

On the internal development and adaptation of equipment, Booth further elaborates:

Then the BBC in its wisdom went and designed its own edit control system called Electra, which could work with 1" machines, worked with 2" machines and worked pretty well. The interfaces with the machines were sometimes a bit sluggish, but they were good and they did us proud because, basically, the actual panel was a button for every function, unlike things like the Sony 900 and Sony 9000 where each button does a million and one things. They lasted us until about well, it's after I became an edit manager and we got involved in the 9000 development because the equipment department offered to build this son of Electra. It was a good system because you could have the sort of diminished version; a sort of cut down one, which did two machine editing, which worked really well. (ibid.)

While Booth does not recall the results of these experiments, he does elaborate on the place of videotape editors within the production cultures of the BBC, framing his thoughts within the efficiency of videotape, the limited creative possibilities of editing it and limitations associated with its cost:

...it was a very efficient way of doing it because we used to turn around 50 minuters like *Warships*, *Softly Softy*, *Z-Cars*, that sort of thing, in - well, the editing bit would be the morning. You just edit from 9 o'clock till lunchtime, go off to lunch and review it after lunch, which is, you do a 50-minute drama today in 4 hours. [...] But then all the cutting was done in the studio by a highly paid visual mixer who knew what they were doing and they'd rehearsed it. So you're really being a sort of repair service more than anything. I mean, it did get to niggle you a bit that you weren't really being creative. [...] It was more like the

AA of television in a way that we would repair - because it was so expensive. Time on a VT machine was - and even in the latter days, I can remember cutting a thing about the anniversary of the moon landing. I forget when it was. 21 years since or something. And it was in two parts. There was a 50-minute documentary followed by a 30-minute documentary, which was on film, and the film guys had eight weeks to cut theirs and we had one day. And it was pretty damn good, actually. (ibid.)

The date range of Booth's recollections, from Z-Cars in the 1960s to the 21st anniversary of the moon landing in 1990, point to an unchanging culture where videotape editing, although a practice characterised by innovation and speed, did not have the craft status of film editing. Rod Longhurst further describes the cultural differences between editing videotape and editing film:

...here we are with these two separate departments - film editors, who, for the most part, didn't understand a thing about the technical chemistry of film. They weren't interested. All they wanted was to see the pictures and hearing sounds and cutting with bits of sellotape. That's it. And you had telerecordings, who, if you needed someone to do, you'd hire an engineer. You'd take someone with an engineering degree and give them six months training at Evesham and later some more training at Evesham. So, you're a different person that would be doing VT editing. You would be very specific. You were told in those days where to cut by a director. (*Interview with Rod Longhurst*, 10 January 2017)

It is this cultural difference between the practice of videotape and film editors that resonates throughout the entire discussion of editing practice. Film editors were perceived as craft workers, people interested in "see[ing] the pictures and hearing the sounds", while videotape editors were people "with an engineering degree". The lines of this history run along these dual cultures of television editing practice, which existed contemporaneously, occasionally overlapped, but were persistently separated by conceptual and practical divisions.

Conclusion: How was videotape made "distinctive" (Douglas, 1989)?

Videotape was, most obviously, made distinctive by its qualities of immediacy, which collapsed the processing necessities of film. In terms of practice, it remained an ongoing process of development that resisted the idea that a "consensus emerges [when] a problem arising during the development of technology has been solved" (Bijker, Hughes, & Pinch, 2012, 12). Instead, what emerges from videotape is the complex set of practices that are evidenced here, developed incrementally in response to the limitations of the technology or the context in which it was being used. There was no 'consensus', and, while this may be the most difficult problem in writing the history of videotape, it is, for users, part of the joy of it: the multiplicity of possibilities. These possibilities continued to advance and evolve to the point in the 1990s when videotape was, largely, replaced by digital non-linear editing. It is, therefore, this lack of uniformity that makes videotape "distinctive" (Douglas, 1989). What is present throughout these accounts of videotape practice, whether taken from the archives or interviews, is a sense of urgency not found in material which discusses film. This urgency is manifested in the instinctive knowledge of videotape's advantages presented in the ITV Document Archive, immediately perceived advantages of reproduction and preservation over the processes inherent to film. As videotape advanced, so too did editing techniques, which, themselves, comprised a further point of continued improvement and adaptation. Although videotape editing practice in this period was never stable, this should not be seen as necessarily a bad thing. The next chapter, chronicling the embedding of videotape into the burgeoning commercials production industry, centred in Soho, illustrates the way in which this continues to be the case.

Chapter Three

Soho, facilities houses and videotape editing: "You name it and we've got it."[38]

The discussion in the previous chapter of early videotape and its hybridity with film argued that editing practice during this period was not stable, and not dependent on editors. It was instead dependent on a host of "conditioning factors" (Cottle & Ashton, 1999), which included technological change (the advent of videotape itself), differing institutional contexts (the BBC, ITV or the burgeoning independent companies), and the associated changing employment context (the different expectations of freelance life). The premise of this chapter is that the equipment churn that dictated editing practice in the facilities houses during the 1970s and 1980s depended on a dual notion: that a choice of equipment was inherently beneficial, and the secondary idea (expressed in advertisements) that new equipment was, somehow, best in that it could engender new textual possibilities for the work, such as graphics. The *choice* of new equipment and technologies can be seen to stimulate a sense of *need*, both of which ideas form part of the ethos of *service*. This was an individualised practice that was mirrored by a major industrial change: the advent of a freelance practice. Away from the integrated management structures of a workplace such as the BBC Television Studios (of chapter one), the new entrepreneurs such as Johnny Fielder (of chapter two) flourished with a minutely calibrated offering to the industry. Stemming from commercials production – ideal because its fast turnaround nature allowed innovation and experimentation at no great cost – the freelance environment allowed and demanded that people and companies be seen and employed with specific offerings. In the case of MPC, they boasted they could offer anything; for other companies, the offer might be more modest, but also more tailored. The following work describes the interplay between the facilities houses and individuals, as both companies and people

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[38] Graham Wade quotes Mike Luckwell, owner of the Moving Picture Company (MPC), a major Soho facilities house (Wade, 1985, 53). Founded in 1970, MPC was initially a commercials production company, expanding into post-production then television and film production. MPC was bought by Carlton Communications in 1983 and is now a global company specialising in film and advertising VFX.

negotiated the differing needs and wants of the clients who paid them. In this way, it is shown how editors responded to and negotiated the technological changes of videotape and incipient digital equipment and the concomitant industrial changes enabled and advanced by the Soho post-production milieu.

The term *churn* is used to describe a persistent renewal of equipment that was as much about demonstrating to the Soho community which houses had which equipment as it was enabling videotape editors' practice. This agenda resulted in such a multiplicity of configurations within edit suites that no-one could have fully known every piece of kit available, thus making videotape editing practice inevitably individuated. This churn and its consequences were seen during this period in the industry magazine *Broadcast*, which presented both the equipment and its users, be they editors, manufacturers or facility house purchasers, through features and adverts. The roots of this culture can be detected in the very earliest issues of *Broadcast*'s predecessor, *Television Mail*, often framed in the presentation of choice as manifested more broadly with the advent of ITV. Choice, newness and possibility were paramount. Therefore, the analysis of the incipient 'churn' culture shall be traced in the archives of this magazine. Throughout this chapter, the terms *facilities house* and *post-production house* are used, with the former describing a site where facilities are available to produce work from start to finish, including a studio space (indeed, facilities houses grew out of studios, as will be shown). A post-production house is a site where specialist post-production processes are performed, including editing but also grading and visual effects. However, the terms are used interchangeably in the industry and its magazines. This interchange is either conceptual (delineating/conflating production spaces and processes with post-production) or literal (as facilities houses will often use their edit suites for a production to complete its post-production only). The porous nature of these terms is important to understand as another indicator of an industry without clear definitions

which holds its very elasticity as both a valued characteristic and a reflection of the evolution of broadcast media itself.[39]

From the earliest issues of *Television Mail*, choice is presented as being between formats: film (old) and video (new). Videotape is persistently framed as new (which, obviously, in the 1950s and 60s it literally was, and remains so next to film) both in terms of its invention and its possibilities. Discussion of the newness around videotape eventually segues into discussions of the newness around digital. These differentiating qualities of film/videotape media and their ramifications for production, in terms of speed, playback, recording and editing, are much debated, and the debates, as they appear in the magazine, are reviewed below. In terms of its use in advertising, the success of a format is framed in commercial terms and expressed in two ways: whether the budget of a commercial increases or decreases depending on the recording medium; and, the success of the commercial in either winning awards or in selling its subject. This success is subsequently discussed in terms of the success of the medium itself, forming a self-perpetuating cycle. Choice was also present in terms of the choice of where and by whom productions can be made. This choice ranged from studios that serve as complete production houses (a model exemplified by BBC TFS) where a piece could be made from inception to broadcast-readiness, to more specialist sites that either completed part of the process or offered equipment related to one medium or the other - film labs or videotape specialists. The incremental increase in choice was paralleled by an increase in independent producers, evidenced by the 'guides' for producers that began to be published in the magazine. All these potential choices were expressed in adverts for varying aspects of the industry.

Adverts and production guides placed in *Television Mail* and *Broadcast* reveal trends and motivations in the non-institutional post-production setting, which give insight into the evolution of company and industry emphases. These documents represent how the companies evolved and how they wanted to be seen. In an increasingly

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[39] Unless otherwise specified, the term houses will refer throughout to the facilities and/or post-production house, given that the term is used interchangeably by industry and can therefore mean either or both.

competitive market place, companies characterised their standout feature(s) by emphasising it/them in the editorials of *Television Mail* and *Broadcast*. The context of the magazines lends both credibility and doubt to the claims and emphases of the adverts, as they are often reiterated or contradicted by the editorial reporting. The emphases range from equipment, personnel, pricing, location and comfort. This archive material represents a 'conversation' between the facilities houses, which takes place in front of the industry reader and within such a small industry that the reader will understand it. Ever present is the dual presentation of information for the client and information for the industry, between which lines information about practice can be found. The adverts – the conversation – are also the most visible demonstration of the emphasis on newness that this chapter posits. Therefore, they play a crucial part in illuminating the difference between the projected activity of editing and the actuality of the work.

"You name it and we've got it": got what, exactly?

Writing in 1985, Graham Wade quotes Mike Luckwell as saying "You name it and we've got it." (1985, 53) Luckwell was a founder member of the Moving Picture Company (MPC), which, founded in 1970, was initially a commercials production company and then expanded into post-production then television and film production. He is ostensibly talking about having the latest post-production equipment and the staff to operate it, with the quote coming after he listed both staff numbers and the "pieces of advanced equipment for the creation of computerised effects" (ibid.) at the company. This notion of 'it' drove the renewal of equipment, as manufacturers and users – editors in the context of this thesis – operated in a cycle of technological contestation. This created a post-production culture characterised by an excess of money and an excess of equipment, described by editor Neil Roberts as:

> Very few production companies could afford to own their own editing equipment. So that's why you had, you know, the era of, you know, the Soho post house. You had Rushes, Molinare, you know, all these companies, and they invested huge amounts of money in the equipment. So you had these

fantastic edit suites, and there was always this sort of battle of who has the latest technology and, you know, who had the latest toy. (*Interview with Neil Roberts*, 2 November 2016)

However, Luckwell's maxim goes beyond 'it' being simply about equipment, as behind the equipment lies the working culture. Nicky Sargent, co-founder of The Farm post-production group, frames this culture as heavily masculine and describes it in terms of the dominant men who were present when she started working at post-production house Molinare:

> ...in the days of sort of Brian Wiseman and Andrew Lee and people like that, there were quite a lot of gardeners, cooks, wives, secretaries and mistresses on the payroll. My first day at Molinare, Colin Brown sent me to look around the various buildings, including the lockup in Brixton where there was the speedboat that had been confiscated by Andrew Lee. [...] women were seen as girls, and they were assistants. They were mistresses. It was a bit 1970s.[40] (*Interview with Nicky Sargent*, 18 September 2017).

While this thesis does not address in detail the specificities of the gendered culture of the facilities and post-production world, the fact it was a world that was run by dominant men is present throughout.[41] This culture is viewed differently from inside the BBC. Hazel Heaven, former Operations Manager, perceived a sense of luxury in the post-production culture outside the corporation:

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[40] Wiseman, Lee and Brown are all prominent names in the history of Soho post-production: Brian Wiseman was a videotape editor who went on to manage Visions and Molinare and now runs Dancing Aardvarks, a "Direct Response TV Ad Agency" (source: Brain Wiseman's LinkedIn page and http://www.dancingaardvarks.co.uk); Andrew Lee was described by Broadcast in 2002 as a "well-known industry figure" in an article describing the closure of his post-production venture Laughing Buddha (Marshall, 2002); and, Colin Brown was MD of Molinare when Sargent started there in 1990, described in 2015 as "[his] most recent role was general manager at Lucasfilm Animation. He has also held the role of chief executive of Cinesite Global and managing director at Molinare." (Wood, 2015)

[41] The ascendency of women in the industry did not occur until the late-1990s, of which Nicky Sargent was a leading light. She attributes the change to an attitudinal shift in the management of post houses: "We weren't engineers and couldn't actually do anything but had always been able to talk from a business point of view. We weren't trying to run companies just to give ourselves a living and greater lifestyle. It was always about business." (*Interview with Nicky Sargent*, 18 September 2017)

...you'd say to producers, you know, 'Why are you so hell bent on editing outside?' They'd say 'Well a) it's a change of scene; b) a lot of these post-production houses outside have got runners and they'll pop out and get you a Panini or anything else, food, and it's just a breath of fresh air. It's just a change. It's just nice'. (*Interview with Hazel Heaven*, 14 November 2016)

Neil Roberts, meanwhile, sees the idea of luxury becoming a dominant force in this culture as an evolution that occurred after equipment became more uniform:

...it became less and less about the equipment and the capabilities, because everybody started getting the same sort of stuff, and more about how well you were treated – so, how comfortable the rooms were, constant runners, in-house chefs and bars and cocktails at five and whatever. And that, then it's all about the environment. Why would somebody go and work at one post house rather than another? Only because of how they'd get treated when they were there. (*Interview with Neil Roberts*, 2 November 2016)

All of these elements – competition, institutional differentiation and both the display and reception of luxury – are expressed by Mike Luckwell in his snappy "you name it and we've got it" maxim. These elements correspond to the Moving Picture Company's promotional and commercial details, such as the following: the glamorous Soho location, announced in *Broadcast* in 1970, with a stark black-on-white address as "16 Ingestre Place, London, 01-734 9151" (Advertisement, 1970h); the technological affordances cited in the 1985 profile – "ADO's, Mirage, Quantel with Autoflex, Motion Control, Bosch FGs-4000 and Paint Box" (Wade, 1985, 53), all of which are pieces of VFX equipment; and, their output across film, television and commercials (ibid.). As industry contemporary Keith Ewart is quoted as saying "Mike Luckwell has measured the pulse of the advertizing industry's fantasies so well that they are willing to pay him £400 an hour for what they'll pay any other facility only £200 an hour." (ibid., 57). It is within this culture that editors sat as operators of the

machinery, but it was the machinery that represented such multifaceted meanings as the facilities houses competed for business.

Within this culture, editing practice was reactive. Different 'families' of equipment developed around videotape-based equipment, as occurred with equipment used for editing and associated activities, such as visual effects (VFX). Editing equipment segmented practice further into 'the offline' and 'the online', with the former relating to the editing of the work and the latter to the adding of effects, captions and titles. Editors were 'sold' as a quality of a particular facilities house in the same way as the kit, which suggests their lack of agency, although, as editor Neil Roberts says, "you had some editors being paid enormous amounts of money to move from one suite to another" (*Interview with Neil Roberts*, 2 November 2016), depending on their particular talents or client network. It is, in effect, a 'call and response' industry, with constant negotiations around client need, client choice and client service, with potentially enormous benefits. This triumvirate of need, choice and service can be located in the earliest issues of *Television Mail*.

Need, choice and service: the world of independent production as seen by *Television Mail* and *Broadcast*.

From the very earliest days of *Television Mail*'s publication, which began in September 1959, ideas of need, choice and service drove the contents of the magazine. Despite its cover byline (the *Weekly Magazine for the Television Industry*), it was primarily concerned with independent production and largely ignored the BBC. It sought to include commercials production in the classification of television, thereby widening the definition of "the Television Industry". While the contents page of the first issue lists *Programme News* and *Advertising News* to indicate a delineation, the latter receives more coverage (one single page versus six pages). *Production company news* makes no differentiation between television and commercials production. Each weekly edition includes both the *Monday Newcomers* list (a listing of new adverts, the products they advertise, the agency, production company, and director) and the *TAM Index* (the Television Audience Measurement, which noted the success and reach of

the programmes broadcast in the previous week). By virtue of their proximity, the two lists are given equal prominence, therefore skewing the editorial bent towards commercials on television and commercial television itself. A 1959 cover advert for the London-based ITV franchise, Associated-Rediffusion, reads:

> The programmes transmitted by Associated-Rediffusion, London's own weekday television station, reach into the homes of 7 million people – people who are served by 27% of the stores and shops in Britain and on whom television advertising has an inescapable impact. To ensure your sales message is received, understood and acted upon by the right people at the right time, Associated-Rediffusion commissions regular intelligence reports that provide an accurate picture of the living, viewing and buying habits of its vast audience. (Advertisement, 1959a)

The franchise advert above presents the structural basis for the industry of selling via the placing of commercials. Commercial production companies vie for business and develop their own personas via their adverts in the trade press , such as the grandly italicised "Shaw Films", which advertised "Film production ltd & Television Services" and "for all filmed commercials" (Advertisement, 1959b). This employs, as its dominant image, the picture of a besuited middle-aged man in an office giving the *thumbs-up* on the top half of the page, whose image is then replicated on the bottom half, but this time projected onto a cinema screen. Shaw is explicitly orientated towards cinema advertising. A contrasting series of advertisements comes from Studio Lambert. These are drawn in the style of a comic strip and follow the travails of "Agency Producer John Toogood" in the world of television advertising. Toogood finds success at Studio Lambert, directly paralleling the possible struggles of the new advertising agencies as they orient to the new medium of television. (Advertisement, 1959c) An industry is organising itself, talking to its constituents, through the pages of the magazine. This can be contrasted with the self-contained integrated world of the BBC Television Film Studios at Ealing. There, the dialogue was direct, either through the open doors of the edit suite or during the 'after-work work' of the *Red Lion* and canteen.

During the same period, editors began to market themselves. In *The Bespoke Man*, film editor John Sealey describes his job. Framed as an explanatory piece, it is nonetheless an advert for his skills. He illustrates the generalities between jobs and his own specific take on them, "for me editing begins with the first pre-production meeting", interspersed with pronouncements such as "the Editor should then make a close study of the shooting script so he is familiar with the action of the film." The use of the word "film" rather than "commercial" elevates the action of making a commercial to the equivalent of a feature, simultaneously flattering any potential employer and suggesting Sealey is familiar with cinema production. It also denotes the history of commercials as a medium that has its origins in cinema, where commercials played long before they hit television.[42] He details the need for editors to be familiar with laboratory processes and the different practices of animation, concluding "There are many more facets of the job, including knowledge of equipment, new techniques, and a sense of humour [...] I prefer to think of an Editor's job as being most like that of a bespoke tailor - for well cut and assembled, a suit of good material looks wonderful – badly done, it looks like nothing on earth." (Sealey, 1960)

While Sealey is selling himself, there is a similar advert a few months later that emphasises the skills of the editor, but which uses them to sell the company of which they form part. Ewart Films ran an advert in June 1960 that shows a woman, heavily shaded, sitting on a stool holding a length of 35mm celluloid in front of her. Although she is impassive and partially obscured by the shading, the image delivers a sense of authority. She is, it is implied, a film editor who can handle film, both literally and metaphorically. The text is as follows:

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[42] *Film* is another term used interchangeably in television. In news production, producers will use *piece* for a short item, and *film* for a longer item. Documentary makers will refer to their *film* and never to *programme*. In drama, a work can be a *single* or *series*, which is itself broken down into *eps*, meaning episodes. A catch-all term is *project*. Film is a lexical term of its own, used to convey knowledge of the industry and subtle inferences of experience. It was used by the advertising industry as a form of approbation. The TVM Awards, which awarded prizes for commercials (and in 1962 was subtitled "This Is Television"), have, as their first requirement, that "entry is confined to films made for United Kingdom television". (Supplement, 1962)

OUR PRIME CUTTER. [sic] Marianne Temple cuts and edits (with her assistant) practically non-stop. We've been known to shoot 7000 feet of film for a 30 second commercial – 46 feet 14 frames long. Which shows you. Every snip an example of our faith that you need good people to make good commercials. (Marianne is also a non-stop gambler and the non-stop Union Shop Steward – hence, on all three counts, our attitude of respect). Come and see the girl; and our library of commercials. (Advertisement, 1960a)

The culture of Ewart Films is present in its implied modernity of having a woman foregrounded (despite the fact that film editing had long been a job open to women), and a gambling woman active in the unions no less. It explicitly connects itself, in words and imagery, to a film culture, displaying the material as an implied demarcation from videotape. It also sits in opposition to the budget-conscious implications of the descriptions of videotape productions. Here, 7000 feet to make less than 50 is still money well spent. The Ewart advert also demonstrates that production companies had their own in-house post-production facilities. The following section explores the provenance of the independent post-production houses, which were unattached to a company such as Ewart Films. While there is some evidence of a post-production industry as described in the previous chapter's tracing of a freelance culture, these are smaller companies. They develop, however, into larger bodies, namely the type of post-production house described by Graham Wade in his profile of Mike Luckwell.

It is from the *facilities* that the post-production house emerges. The word *facilities* is used early on in *Television Mail* editions, in reference to sites that could be hired, in whole or part, to make a screen product. In the first of a regular feature that listed the facilities available to filmmakers, the six-page feature *Facilities and the Studios* (Supplement, 1960) details what each studio offered: under the categories of *Accessibility*, *Sound*, *Editing*, *Viewing facilities*, and *Special Effects*; whether or not they had their own cameras; details relating to dressing rooms and stage size; and, a category of *General Remarks*, which details additional services such as transport or additional sound ("for recording audience reactions") or optical facilities. Under

"Shaw Film Productions", whose advert is described above, the accessibility of being in central London is emphasised, along with the two sound stages, two edit rooms, a wide screen, and cinemascope viewing facilities. The purpose is to let potential clients see the ease with which their advert might be made. The existence of the listing demonstrates that, by 1960, an independent production industry is cohering around these facilities houses.

Videotape is present in the earliest editions of the magazine, in which it is framed in terms of its newness. The *Technical Gleanings* discussion page reports on new Ampex videotape technologies (Battison, 1959a, 21-22) and new videotape standards (Battison, 1959b, 18). Christmas 1959's *Technical Survey* pages declare a *New Method of Editing Video Tape* (Report, 1959a, 12), *Have Tape Will Travel* (Cricks, 1959, 18) and *RCA Tape Has Many Advantages* (Report, 1959b, 17). Videotape is present in the *My American Notebook* column under the headline *Production Company with Videotape* (Rick, 1959, 11). While many of the reports can be seen as commentary on a developing technology, potentially identified with the US (in light of the transatlantic communication happening simultaneously at Granada), the *Have Tape Will Travel* column makes a British claim in this area, describing, a mobile Ampex unit recently developed by ATV, making it a homegrown adaptation to videotape technology. The article declares "a new world for television", where "Britain is in fact becoming the centre for international TV, which already is a valuable dollar earner." (Cricks, 1959, 18). Videotape can, therefore, be seen as a prominent, if not dominant medium within the independent production world by 1959, sufficiently prominent that the lines of demarcating film production were notable by their absence. Videotape is framed as commercially valuable.

The independent producer is in the ascendance throughout this time, moving between the fixed points of the companies, taking knowledge, practice and preferred editors with them. To recall Neil Roberts talking about the lending of agency to editors through the favour they enjoyed, "editors would be poached from one post house to another because they knew that if they had that editor, they'd get that editor's clients come to them." (*Interview with Neil Roberts*, 2 November 2016). In a 1962 *Trend Spot*

column titled "The Age of the Independent Producer is Dawning", *Television Mail* records "the noticeable advance of a handful of lone-wolf producers." It goes on:

> Following APF's clear example that it can be done if the idea's right – witness the success of 'Supercar,' 'Fireball XL5 and, earlier, 'Four Feather Falls' – certain talent agencies are entering the production arena. Probably the most notable of those outside the Grade and Delfont Organisations is the Harry Forster set-up. Agent [sic] is in the programme 'packaging' business supplying shows to both Associated-Rediffusion and ABC. [...] Smaller agencies, too, are getting in on the production act. For instance the Bob Monkhouse-Denis Goodwin company has plans for a series of TV quiz shows and is preparing a TV-destined film in the 'silent picture' style. The two independent mobile TV units owned by Intertel (VTR) Services and Trans-Europe TV are ready to move into programme production, with the latter already committed to make a series for US exposure involving variety from the capitals of Europe. (Column, 1962, 12)

The column ends with the proviso: "But, to a man, the independent producers have found that they must think in terms of world markets if they wish to recover anything like production costs, let alone siphon off some profit. The highly successful dollar-earner 'Supercar' was designed for the US for example – at least, produced from the point of view that American children must be able to understand it." (ibid.) This article highlights the interplay among access to talent through agents, transnational markets and the ability to employ available videotape technology.

The post-production culture described by Mike Luckwell in 1985 is, therefore, evidenced as incipient from the 1950s. It is a culture where technology, fixed but evolving at the facilities and post-production houses, made money for the production professionals moving between them, be they editors or producers. The producers, the facilities staff, and the equipment all combine to produce commercials, from which mix the industry evolves. The idea of *need* is central to the churn of equipment and can be found early in the magazine, as film asserts its claim to territory being ceded

to the advance of videotape. This thesis will not attempt to detail every single instance of a claim or counter claim, it will, instead, detail incidences where need, choice and service intersect through the adverts placed in the magazines. These adverts constitute a conversation held in front of an industry audience of colleagues, rivals and clients. In the same way that Lynn Spigel describes the adverts that she uses as sources in her research as constituting evidence of what people "read, watch and say" (Spigel, 2001), these adverts, specific to the industry audience, are evidence of what readers use, covet and display their knowledge of, namely equipment as social and cultural capital. This thesis will also show how the intense competition among houses resulted in them often being known for certain specialties and the character of their services. A primary signifier of these specialties and characters is the way in which they advertised themselves.

Adverts often display the problem-solving properties of certain pieces of equipment. A Rank Cintel ad from 1960 speaks to the new international market:

> With the ever increasing interchange of programme material between Television networks operating on different line standards, the need for a multi-standard studio is now fully appreciated. Rank Cintel Limited can offer the three major requirements for such a studio [...] Ampex Interswitch Videotape Magnetic recorder for operation on all three international standards [...] Cintel 17' General Purpose Studio Monitor, immediately switchable to any T.V. standard [...] To complete the picture, Cintel multi-standard 16 and 35 mm. [sic] Flying-spot telecine equipment. (Advertisement, 1960b).

The advert implies the need for a television studio from which to broadcast on both film and videotape and that *this* is the equipment to invest in, due to international broadcast being an "ever increasing" market. However, none of the studios listed in the previously referenced and contemporaneous *Facilities at the Studios* (Supplement, 1960) list contained telecine or broadcasting equipment, prompting the question as to whether the Rank Cintel advert was, therefore, aimed at broadcast institutions only. Certainly, the rapidly expanding ITV network, which had eleven

stations operating by the date of the advert and would open a further eleven over the next three years (Sendall, 1983, 2), was an extremely present target for the marketing of this equipment.

An advert placed for Ampex in 1964 highlights the flexibility that some equipment provided. Under the title "What's new in broadcast VTRs? VR-650", it reads: "Now, Ampex has a low-cost, portable VTR with full broadcast stability [...] the complete price is less than half as much as other Ampex video recorders. It weighs less than 100 pounds and is small enough to fit in a station wagon for a mobile unit. It's ideal for recording special events, local sports and news. It has signal compatibility with all other VTRs. And, when played through your station's processing amplifier, its signal meets broadcast specifications." (Advertisement, 1964a) While the location specifications of this videotape recorder are clear (it appeared in a magazine supplement listing *Location Services and Supplies*), it speaks more significantly to the idea of equipment renewal that was to become so crucial to the later post-production culture. While the advert does not offer anything new, the 650 being lightweight and cheap does offer something qualitatively better. Although it requires the "processing amplifier" to complete its work, its appeal is in the implied ease it could add to television production. However, this ease is not for the understanding of the uninitiated. The final line of the advert discusses how it "records at 4.1 ips – or more than two and one half hours on a single 10 ½" reel. (60 cps versions travel at 3.7 and can handle up to five hours of tape.)" (ibid.) This is a direct appeal to engineers and specialists who understand the capacities of the specific models, differentiating between the sites of knowledge that operate within television production, of those who do understand – videotape editors being one group – and those who do not. The directness of this address is clear when placed next to the language used elsewhere to describe the capacities of Ampex equipment. A news column published under the headline *Ampex Offer*, the month before the advert ran, explains that "slow motion playback for observation and analysis of motion in detail is now being offered as an optional feature with Ampex portable Videotape recorders. Ampex VR-1550 closed circuit recorders and VR-650 broadcast models previously offered stop motion playback permitting sustained viewing of a single frame. The new feature permits

playback at any degree of speed from half-speed to full stop motion with a single front panel control. It is available as an optional feature with new recorders and in kit form for recorders now in use." (Report, 1964a) The column reports the features with simplicity, addressing the general reader, while the advert assumes the specialty of its potential user. In sum, the two sources imply a delineation between two groups, those who knew about the equipment and those who both knew about it and actually used it. The independent producer, an example of the former who knew of the equipment but who employed other people to use it, had arrived.

The above described delineation can, additionally, be seen in the 27-page guide published by *Television Mail* in 1965, titled "The film producer's guide to production equipment and services" (Supplement, 1965). In the three years since the *Mail* had noted "the noticeable advance of a handful of lone-wolf producers" (Column, 1962), this sector of the industry had developed enough to require a guide for the independent producer that comprised 178 listings under the headings "Film and VTR studios, Sound recording studios, Film editing, Viewing Theatres, Laboratory Services". Crucially for the uninitiated, the guide then included an "Equipment Guide – Introduction, Product Guide" and a "Glossary of trade names". The explanatory aspect of the document is as important as its demonstration of what was available. By explaining the language of production, it is telling the reader how to *be* a producer as much as what they can *do* within the realms of producing.

The advent of the post-production house was also evident in 1965. The term *post-production house* refers to a site where a production can be taken from the end of the shooting period to the point where it is ready for broadcast. Not every post-production house would be able to complete all the post-production stages, where, for instance, a piece on film would often have any optical effects completed by a different laboratory. This was also the case with the services offered by freelance editors, as editor Barry Stevens said in the previous chapter of early freelance VT editor Johnny Fielder, "he had an arrangement with TVR to use their machines.", namely that he did not have his own equipment (*Interview with Barry Stevens*, 12 December 2017). However, by 1965, TVR – the post-production house from which

Fielder emerged – showed that companies were investing in videotape equipment and offering post-production services on a single site. "COMING SOON" reads the banner, declaring "Centralised Videotape & Telerecording Service":

> Welcome news for people at the end of the queue for videotape and tele-recording facilities. Starting next August Television Recordings Ltd [...] will provide complete recording and replay services in central London linked with the G.P.O. nationwide telecommunications network. [They offered] Multi-standard videotape recorders (with provision for colour), Slow motion and stop-frame helical scan recorders, Telerecording and telecine machines, Standards converter – 405/625 and reverse, Videotape editing facilities, Appropriate ancillary equipment [...] Additionally the company will retain the exclusive services of a top-flight videotape Editor. Full facilities for programme compilation will be provided. [...] Already leading broadcasting organisations, production companies and advertising agencies welcome the new service as a way out of the bottleneck created by demand which is rapidly outstripping supply. (Advertisement, 1965b)

While TVR, as it had become known by the time it opened in September 1965, had retained studio space and could, therefore, be classified as a facilities rather than post-production house, the studio space is not what is emphasised by the latter announcement. Instead, it is the comprehensive nature of the technology on offer which stands out: "AMPEX VR 2000 Multi-Standard Video Tape Recorders complete with electronic editing complete with electronic editing, animation faculties and colour capability (three machines available)"; and, "The facilities provided by the new TVR CENTRE are available to all Television Companies, Advertising Agencies, Independent Production Companies, Education Authorities, commercial, industrial and public organisations and all user of closed circuit systems." (Advertisement, 1965e) Not only is it the comprehensive nature of the technology on offer and the absolute investment in videotape that makes this advertisement stand out, but also its sense of newness – a newness that resonates throughout future adverts and contrasts with those in the past.

Adverts placed prior to TVR's launch focus on incremental adjustments they will be making to their trade and how they are adapting to a rapidly changing industrial environment, namely the changing medium of broadcasting and the growth of independent productions. The film servicing company Kay opened a new sound studio at its Soho Square location, "a building which for many years has contributed to film trade history", but which had been "completely reconstructed and reequipped to offer a specialised sound recording service" including a "same-day service for T.V. commercials". As with the Ewart advert and its emphasis on film, Kay makes great note of its "nearly half a century of service to the film industry" (Advertisement, 1962b), thereby emphasising its longevity rather than its forward momentum. Kays is also mentioned by film editor David Martin: "the main one [lab] was Kays at the time. They used to be based in Soho Square. And I'd use them when I was working outside [the BBC]. They were used a lot." He concludes that Kays "faded away." (*Interview with David Martin*, 25 October 2016).

The comprehensive modernity of TVR is described in the feature article titled "For London, A New Self Contained TV Tape Centre". Foregrounded is the financial imperative linked to the technology, with the article opening with the words of Russ Baker, Ampex Stations Relations Manager: "To make money with TV tape [...] you must use it to eliminate chronic overtime and make it possible to reschedule certain personnel into periods where their productivity will be increased.'' Videotape technology, central to the headline, runs throughout the article, referring to videotape as a solution for "production groups who simply have not the staff, equipment or the know-how" to complete their productions. This solution was to be found in a central London environment, in contrast to the "monopolistic mattamores [...] usually to be found in Wood Lane, Elstree, Wembley, Teddington or Granadaland" and features "the very latest in Amtec and Editec [...] so new most other TV centres have not yet installed them!" Broadcast credibility is lent by the hiring of former ATV technical executives, which networked the centre both technically and personally to the existing television structure. It presents a sense of luxury in which technology is embedded: "On the ground floor of the Nos 9-11 Windmill Street are the reception suite,

presentation studio, Ampex VTR booths, caption scanner, telecine and sound dubbing suites, together with a VIP viewing room, equipped with a 23-in. Murphy monitor, multi-line standard and hi-fi sound. A similar monitor is the centre piece [sic] of a larger VIP viewing room on the fourth floor, in a sound-lagged, double-glazed penthouse suite." Comfort, luxury, machines, modernity, and ease are amassed in an exhibition-space of objects made for television post-production. The article emphasises, however, that the production executive need not understand the capacities of the technology:

> Executives can watch interim stages of production on these monitors,' explains [Deputy Managing Director of TVR] Russ Compton 'It goes without saying that some do not wish to be bothered with electronic technicalities and are concerned only with the end product. It is for us to provide the technical expertise. On the other hand there is a growing body of programme specialists who care more deeply about technical fundamentals. (Ullyett, 1965)

There then follows a discussion of the architecture of the building and how it was designed to control noise and air flow so that work would not be "jeopardised through any ambient temperature instability in technical zones". Mention is made of the "Ampex VR 2000's, new to UK television since their introduction at the NAB Convention in Washington last March", while the Ampex machines work in conjunction with the array of "all-transistor WG60 and WG70 series", "a generator [...] available in which the choice of line standard is merely a matter of operating the appropriate push-buttons", "auxiliary pulse outputs for colour gate operation, field interval test signal insertion, and field identification". This section closes with the statement that "functionally it is the most advanced equipment of its kind in the world" and a long discussion of the Editec electronic editing system (more of which below), while the article concludes with the following direct address:

> So why not see for yourself? MUS-eum 3521. This TV Centre never closes, but it is NOT repeat NOT in that other Windmill Street, off Piccadilly Circus, where once was a great little theatre which 'Never Closed' but now has. Head up

Tottenham Court Road for the GPO Tower, and this TV Centre is in an ultra-modern, sound-proofed block on the left. (ibid.)

This multifaceted appeal to potential clients complies with the argument that modern facilities houses demonstrate the motivating ideals of need, comfort and service. The need here is a response to the "bottleneck" of clients referred to in TVR's original "coming soon" announcement (Advertisement, 1965b). The concept of comfort is found in the conception of the executive as requiring luxurious surroundings but not requiring the ability to use the machines. Finally, service can be seen in the description of the technical abilities of both the staff and equipment. TVR, therefore, stands as a model for the facilities and post-production houses that were to come.

In the article, heavy emphasis is placed on the Ampex VR-2000 and the Editec as being central to TVR's asserted efficacy. While editors are not mentioned, the technological appraisal contains several references to how these technological affordances impacted on practice. In praise of the luxurious ease of the new Ampex, Ullyett writes that "to book 'TR' facilities and be given the run of the Ampex VR-2000 is rather like ringing up a car-hire firm and finding they send round a brand-new Rolls-Royce [...] and one reason Russ Compton and Dennis Henstridge chose the 2000 is that the retractable erase head is the type that will permit the addition of the Electronic Editor and/or the Editec programme unit." Noting the foregrounding of the founders Compton and Henstridge as faces of the facility (which echoes the description 20 years later of Luckwell), the article continues: "From viewpoint of productions one of the most time-saving facilities offered by Television Recordings is the Editec facility on the VR-2000. Ampex users will appreciate that the Editec system, used in conjunction with the electronic editor (which TVR have available at Windmill Street) permits advanced and accurate editing, in either monochrome or colour, with electronic splices positioned to one-frame accuracy." (Ullyett, 1965) Editec is described elsewhere as being an edit controller which "enabled edits between different tapes to be rehearsed and then executed without physical splicing" (Higgs, 1973). Its advantages are described in the *TV Mail* article as a "unique facility", making it possible to:

…preview and rehearse editing functions without damaging the master tape, to position and adjust edit points on a calibrated frame-by-frame basis, and to control remote cueing operations [...] Technically it is a boon to have the Editec facility, since a programme may be assembled on a scene-by-scene basis, into a first-generation master edited tape. Scenes can be recorded in any order which is convenient to scheduling of personnel and artists. Beginning and ending of each scene is precisely located by Editec to a one-frame accuracy, and each scene can be lengthened or shortened as required, by one or more frames, merely by turning a calibrated dial. Further, the effect of any splice can be previewed on the monitor before the splice is made. Secondly, a scene may be inserted into an existing tape for correction, or for any other reason. The beginning and ending of the new scene will be precisely located on a single-frame basis. Third, in the event that a performer fluffs a line, or some other production error arises, the corrected action may be shot again as frequently as desired. Using the Editec guarantees that the new scene will be electronically spliced in at exactly the same frame on every take. (Ullyett, 1965)

Most immediately striking about this excerpt is the way in which the writer could be describing non-linear editing when discussing inserting and recording scenes "in any order", wherein the Editec is described as being able to overcome the sequential necessities of videotape editing by just the turning of a dial. Ullyett's ethnographic observations touch further on the automation of the system when he writes: "In the Television Recordings studio I noted how Editec automatically activates remote lights to cue artists, and that in editing by tape or film transfer, the second VTR [...] is automatically started on cue by the Editec circuitry. Of course audio splicing is accomplished in time sync with video splicing." (ibid.,) The videotape editor is completely obscured in these descriptions, as if the equipment operated itself.

The fanfare around TVR suggested both something new and something established, in that an operation of the scale suggested required momentum to succeed. This meld of newly established practice is evidenced the next year in TV Mail's *Using video tape* special edition (Various, 1966), the cover of which announced another specialist

videotape company, VTR Productions Ltd, based in York St, W1, some distance from TVR in Windmill St. The edition featured a series of page headings: "Video tape means technical efficiency"; "Video tape means broadcast commercials"; "Video tape means test commercials"; "Video tape means many applications"; "Video tape means speed"; and, "Video tape means taking a fresh look". These headings were listed alongside a directory of videotape studios, confusingly titled "VTR studios". Even a cursory look through the material suggests the comprehensive and comprehensively promotional nature of the features. The list of "VTR studios" comprises the following companies: ABC Television; Audio and Visual Rentals; Granville Television Studios; Intertel (VTR Services); KP Productions; Television Recordings; and, VTR Productions. This list reveals a paucity of editing facilities, however, with only TVR listed as having "Tape editing: electronic, manual and animation", which confirms the details given in the previous year's article. While the videotape facilities house was not as yet proliferating, despite the gathering momentum of the medium, it was not disappearing either. Instead, these years can be seen as a period of consolidation, evidenced by an attempt at structural organisation by the burgeoning sector, to which TVR remained central. As a column from April 1966, headlined "Video Producers Unite to Form Association", details:

> Following a meeting of independent videotape producers and members of ancillary companies in London [...] it was decided to form an association to further the use of videotape and its allied trades and deal with individual company's problems on a collective basis. The unnamed association's first chairman is Ian Abrahams, chairman of Television Recordings. Meetings are to be held at TVR. (Report, 1966b)

Although the list of attendees and their companies reveals the scale of the industry around videotape production to still be small, the article lists some studios that do not appear on list detailed in the previous chapter: Taped Commercials; Facilities (Screen and Television); Closed Circuit TV; Autocue; George Elliot Facilities; and, TV 2000

(although George Elliot also appears as pertaining to VTR[43] – whether or not this is the same man is unknown, but given the relatively small size of the industry, it seems likely). These self-identified producers uniting to solve each other's "problems" is again indicative of a momentum around the emerging capabilities of videotape.

This is further evidenced by the way in which other houses were emerging as either singularly based around videotape or adapting their businesses to accommodate videotape. Tape Commercials Limited opens at Windmill Street, offering "Tape Animation, Electronic Editing, Storyboard to Transmission" (Advertisement, 1967o).[44]

In an explanatory and plain text cover advert (see figure 5, page 176), West One details its newness as a post-production house by stating that "first we found 'West One' premises then we installed our equipment", central to which were the "Ampex VTRs" (Advertisement, 1967p). West One is placed in contrast to the graphic abstractions of concurrent adverts for the film-based houses, such as Ocelot Films (Advertisement, 1967m), which, with its cover of a paw print, office address and listing of "Offices, Cutting Rooms, Studios", relies on client familiarity and a sense of exclusivity (see figure 6, page 177).

Other older houses began to adopt videotape. A cover advert taken out by National Interest Picture Productions[45], titled "What is Nippon-Video?" elaborates on "the new video tape department set up by Douglass Niell [...] probably the most experienced Producer of video tape commercials in the country." (Advertisement, 1967k, cover). National Interest added the videotape equipment to their office at "the top of 21 Soho Square" (NIPP's location from at least 1949, as shown by Spotlight's September edition that year (Directory, 1949)), adding helpfully that "there is a lift' (Advertisement, 1967k, cover). What is apparent from these differentiations is that the industry is cohering around its chosen technology, while the early fragmentation

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[43] George Elliot had several concerns, as detailed in the 1968 *Agency Producer's Guide to Production Companies* (Supplement, 1968a) and elaborated on below.
[44] Tape Commercials Limited was based at 9/11 Windmill Street, the same building as TVR. This advert is therefore for a department of TVR (they share the same phone number, Museum 3521).
[45] National Interest was a long-time producer of commercials. Established in 1925 as Publicity Pictures, it changed its name post-World War Two (Fryer, 2016, 45).

TELEVISION MAIL

FIRST WE FOUND 'WEST ONE' PREMISES THEN WE INSTALLED OUR EQUIPMENT

Plumbicon Cameras

Studio Vidicon Cameras

Ampex VTRs

Telecine

Comprehensive Control Facilities

8 Vision Channels

8 Sound Channels

& A Production Team

THEN WE EMPLOYED A FULL CREW AND PUT IN A TELEPHONE DO YOU WANT MORE DETAILS? THEN GIVE US A RING THE NUMBER IS MAYFAIR 2921

Figure 5: The new textual, explanatory advertisement (Television Mail, 25 August 1967), versus...(Advertisement, 1967p)

Figure 6:...the graphical representation of the established house (Television Mail, 19 May 1967) (Advertisement, 1967m).

that occurred around technological specialisation, a feature of today's post-production industry, is detectable.

Part of this specialisation relates to mobility. Back in 1961, C.R. Webster of the Ampex Corporation had declared "I think the future trend will obviously be for the production companies to use tape in their own studios and perhaps fit out mobile studios, so that they can go to customers' premises and record on the spot […] there's tremendous scope for it." (Webster, 1961) InterTel, the company referenced earlier in this thesis for its advertisement of the "Videotape Cruiser" (Advertisement, 1962a), advertises, in 1967, its ability to be "always in all ways the first and best in TV", "for anything in television", with the "most up-to-date Television Equipment" and "largest and most modern Independent Television Studio", alongside an image of trucks in a mountain landscape showing "InterTel working at 12000 ft recording winter sports for American Broadcasting Co." (Advertisement, 1967j). International clientele and international recording, such were the possibilities of VTR. It was not that videotape's mobility or its use for outside broadcast was new (as shown in Chapter 2), and it was already being used for industrial purposes. Another report from 1967 tells of it being "used for the first time in the training of salesmen, at a recent conference in Newmarket" where "groups of salesmen reproduced a sales situation which was recorded, played back and analysed by members of the course" (Report, 1967). The next year, KP Productions list, in a production guide, their ability to transfer film to videotape for the purposes of "videotape location playbacks for client presentations or research sessions." (Supplement, 1968a, 14) It is ease and expertise that is being sold here by InterTel, as described by the subsequent documents. While demonstrating its uses, this evidence also demonstrates that videotape remained a medium that needed to prove its abilities.

Indeed, a continuing reluctance around videotape is present in these sources. Film-based companies still heavily outweighed videotape in 1967. *Television Mail* covers advertising film production in this year included the following companies: bvw;

Eyeline; Film House; Natural Breaks; Ocelot; and, Royalty House. [46] A cover for Malcolm Craddock and Gerry Poulson does not mention a company, instead inserting their images into frames of celluloid (Advertisement, 1967e). Others are ambiguous, such as Guild Television Service, which emphasises "the most up-to-date equipment" but does not specify what that comprises (Advertisement, 1967i). Definitively – defiantly even – Airtime, West One and Nippon Video were featured on covers with videotape content.[47] Douglas Niell, of the National Interest videotape department, appealed for peaceful co-existence, stating:

> The bitter battle that has raged between video tape and film has reached proportions verging on the absurd [...] we have formed a video tape servicing unit where we are marrying film and tape. The use of telecine married to tape is something at once obvious, and yet not in my view as widely used as it should be [...] There are at least three first class independent video tape companies in London, with the latest equipment [...] I am happy to know that one in particular is holding a series of 'Come and See it working' so that younger members of our industry can watch the pitfalls, but also see the wonder of the live video tape commercial. (Neill, 1967)

Videotape may have been present, but it was far from dominant. There was, as yet, little indication that editing practice was changing. In the 'Video Tape '68' supplement, Johnny Fielder, clearly still a dominant presence in videotape circles in Soho, describes practice in 1968 as largely unchanging since the introduction of Editec in the years preceding, as well as emphasising the advantages of videotape editing for animation, a key form of advertising:

> Since the start of video-tape editing (a block, razor blade and magnifying glass), a very hit and miss game, progress on the method of splicing has reached a

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[46] (Advertisement, 1967d, 1967f, 1967g, 1967l, 1967n)
[47] (Advertisement, 1967a, 1967b, 1967k, 1967p)

very high degree of accuracy. We now have microscopes, electronic splicers for manual editing, plus electronic editing.

Electronic editing is a method of synchronously switching the video-tape recorder from Play to Record, and vice-versa. Giving a disturbance-free transition from one picture to another. [...] The need for more precise control of the edit point leads to yet another piece of equipment, a computer-type control system allowing, if necessary, editing in single-frame increments – that is, animation.

Fielder goes on to state that razor-blade cutting for videotape was not a defunct practice:

Another method is the A&B roll technique, playing off two machines on to the edit machine. If played through a vision mixer, captions and so forth can be added. If, however, there is one little fluff in the middle of a show it is rather pointless to plough down both sides, enabling us to cut the fluff out electronically, so, therefore, a manual splice would keep us in our first generation tape, and would save time and manpower. (Fielder, 1968)

This point is reiterated by editor Barry Stevens, who stated that the practice of cutting videotape with a guillotine continued:

…well into the 80s... The guillotine would cut. [...] the guillotine wouldn't lose any frame because it would just cut [...] not with scissors - with a proper guillotine. So, the idea of a match frame edit that came later in software and timeline technology, we could do it with 2-inch tape if we wanted to. (*Interview with Barry Stevens*, 12 December 2017).[48]

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[48] Barry Stevens describes the splicer as "a German EMT. Electro Messe Teknik splicing machine. It had a rotating head which displayed the control track pulse on an oscilloscope. Very accurate. The machine cost about £2000 in 1970!" (Stevens, 2018) He was also the editor for the video for Queen's *Bohemian*

Stevens' point, about the affordances of videotape pre-empting those of digital NLE, is ignored by many editors, who often connect film editing with digital NLE and skip over videotape. It also speaks to the discursive history of videotape that is illuminated by the *Television Mail* archives, where videotape is persistently 'proven' to be as effective for broadcast as film.

This point is made repeatedly on the pages of *Television Mail*. In a two-page article (also in the *'68 Videotape* supplement) titled "How we Used VT – and lived!", the byline runs "Creative consultants Terry Hodges and Michael Shallis describe their first, somewhat trepidatious, encounter with video tape. They went in sceptical, came out pretty well convinced. Agency producers please copy." (Shallis & Hodges, 1968) The promotional aspect of these articles, as seen in their obvious endorsement of videotape as a medium, is explained in the supplement's masthead, where the *Index to Advertisers* reads "Airtime, Ampex, Audio and Video Rentals, Memorex, National Interest Pictures, Peto Scott, Television Recording, VTR" (Supplement, 1968b), all users or manufacturers of videotape. However, other articles are more impartial and more suggestive of a division in the post-production world, which either embraced the use of videotape or continued to favour film. An article titled "2 New Agency TV Facilities" (Fawn-Meade, 1968), details two agencies, Bensons and Lintas, which have installed production facilities, one film-based and one videotape based. Over a two-page spread, with photos to illustrate the differences, images of banks of machines next to studio spaces suggest that the reality of any differences between the mediums would be negligible to the client, underlining how similar they look. Other information about the use of editors in the independent production world can be gleaned from these listings. Notable mentions include Augusta Productions' listing of their "Editing, re-recording" as Roger Cherrill Ltd, suggesting that Cherrill's was an editing house (be that a one-man operation or not) that had an agreement with Augusta. This was an

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Rhapsody, cut in a few hours on videotape with the FX created in camera (https://vimeo.com/146580268).

outsourced post-production model that would become standard. BHM Productions list their "Editor on staff" as a selling point. BVM Film Producers list the "Services of Vic Vine", suggesting that the inclusion of Vine could add capital to BVM by association. [49]

Videotape persisted. In 1968, the launch of a new Memorex tape indicated the choice of videotape equipment that was becoming available, the advert for which states that "introducing our superior 79 Series video tape, made *specifically* [sic] for your recorder. (Whichever one that may be.) [...] it doesn't matter if your equipment is Philips or Ampex or Sony or Whatever." (Advertisement, 1968a). Although there is no indication which companies held what equipment, the inference is that, because videotape was being used, the Memorex tape could be sold to them. In 1968's "Agency Producer's Guide to Production Companies", mentions of videotape are in the minority, where, of the 224 companies listed, 94 have an "Editing, re-recording" listing, while the others leave it blank. Of these 94 listings, 86 refer to 16 or 35mm film, or can be inferred as using film by phrases such as "cutting rooms", with only eight references to videotape. (Supplement, 1968a). However, companies that are known to have been using videotape, such as Air-time Productions (Johnny Fielder's company), do not have a listing under "Editing", - but as Barry Stevens' pointed out about Fielder, "he had an arrangement with TVR to use their machines" and, therefore, had no burden of investment in equipment in order to launch his own operation. (*Interview with Barry Stevens*, 12 December 2017). Neither George Elliot's VTR nor George Elliot Facilities list any videotape facilities, although Elliot is also associated with Colour Commercials (Supplement, 1968a, 24) with his name listed under the "index to film directors" section of the directory against both VTR and Colour (ibid., 26). All three of Elliot's companies are listed at 14 York St, London W1H 1FA. Colour Commercials, meanwhile, list their tape facilities as "colour editing of tape" (ibid., 10), suggesting that Elliot's work, all undertaken in the same premises,

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[49] Roger Cherrill's bfi.org listing shows he cut advertisements for Augusta (*Timonox-says No to a Flame*, 1966 and *Meat Cookery on a Budget* (1968)) and also for features such as John Schlesinger's *A Kind of Loving* (1962) and *Billy Liar* (1963) (Listing, 2018e). Vic Vine's listing is not as extensive, but shows he worked on advertisements (*Cashmere is Scottish*, 1973) and television (*Jim'll Fix It*, 1984) (Listing, 2018g).

would be edited at Colour Commercials. Putting aside possible tax benefits, this listing suggests two trends: an industry still developing, with new post-production houses opening all the time; and, the communitarian post-production practice of Soho, run on shared knowledge and favours.

Both of these notions are recalled in the 1981 BBC *Omnibus* documentary "But the Client Loved it" (Powell, 1981), which focuses on the commercials production world of Soho in the 1950s and 1960s. The concentration of companies in Soho by the late 1960s was remarkable, where, of the 224 companies listed in the 1968 directory, 138 are found within the Soho area (defined as having a W1 or WC2 postcode, covering a walkable area centring on Shaftesbury Avenue, stretching out towards Mayfair and including Covent Garden). Bob Godfrey, of Bob Godfrey Film.[50] describes the community as having "the people that were doing the commercials in those days... mostly from a film industry that was declining anyway, they were coming from newsreel or the film industry proper" (Powell, 1981). Director Berny Stringle[51] describes an early production company receiving a commission and not knowing how to complete it, saying "so, they hadn't got a clue how to make this, so they were phoning round all their competitors, describing what they gotta do, and sort of bit by bit, with people to help 'em out, actually got to make this commercial, which got them off the ground doing other work, but it was all done by phoning mates and saying 'ah, Christ you know, how do we make these cigarettes dance''' (ibid.). Contained within these quotes are ideas of an industry initially dominated by workers whose medium was film, run on favours and networking, and stumbling along co-dependently. It was an environment where practice was quickly changed and changing. Both of these elements tally with the evidence that videotape was developing incrementally, with practitioners sharing equipment – whether through a system of favours or through a commercial decision to alleviate investment costs – and, in so doing, sharing their knowledge of practice informally.

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[50] Bob Godfrey was himself based on Wardour St in Soho and a *Television Mail* cover star numerous times (Advertisement, 1965c, 1965d, 1967c).

[51] Stringle directed commercials throughout the 1960s and 70s, including many of the PG Tips *Chimps* series, as featured in the *Omnibus* documentary (Powell, 1981).

By 1968, videotape had been in use at the broadcasters for a decade (Bignell, 2014; Forman, 1997; McNaughton, 2014) and, as this thesis has already shown, was receiving disproportionate attention on the pages of *Television Mail*. This attention was prescient, however, given that, in another ten years, videotape would have overtaken film as the primary medium of both commercial and broadcast television production. Further evidence of the extent to which videotape had become embedded in the industry can be found in TVR's listing in the 1968 directory as having "manual or electronic (Editec) editing facilities available for videotape" and being the "only independent broadcasting company in Europe – offers transmission facilities to worldwide locations." (Supplement, 1968a, 23) On his website *An incomplete history of London's television studios*, Martin Kempston says the following about TVR's facilities:

> They were used by the BBC and ITV companies to record and edit programmes. This was at a time when videotape machines were very expensive indeed and the main TV companies could not afford to buy many for themselves. Occasionally they would find themselves short so they rented time on the machines owned by TVR. The programme was thus sent from the studio down the line to Windmill Street in Soho where it was recorded remotely.

> However, as it was generally easier for the TV companies to use their own in house VTRs for production and editing work, the TVR videotape machines were often used to put the programmes to air. Chris Patten [...] has written to me and tells me that he can remember on more than one evening walking down the corridor and watching three adjacent VTRs transmit the network programmes to air for BBC1, BBC2 and ITV. At that moment the whole of UK television was originating from a small facility in Windmill Street. (Kempston, 2018)

Additionally, in 1969, TV Mail reports that "the American Broadcasting Company used the Whitfield Street Studios of Television Recordings recently for its first taping in the U.K. of their long running discussion programme 'Directions'." (Report, 1969). The Whitfield Street facilities were TVR's new colour videotape studios, opened in January 1968 and announced in *Television Mail* the month before (Advertisement, 1968b). Not everyone who invested in videotape was so successful. The 1968 directory shows that National Interest moved from Soho Square to Hampstead but makes no mention of videotape, indicating only "16mm and 35mm cutting rooms" (Supplement, 1968a, 16). This comes just a year after investing in videotape, as described above, begging the question as to what happened to their equipment. Was it sold to someone else or hired out in an arrangement such as the one Johnny Fielder had with TVR? Perhaps the videotape equipment had been taken to Hampstead but had not been included in the directory listing? These possibilities, movements hinted at in these directories but not revealed conclusively, indicate the fluidity indicative of the vagaries of production that is the precise reason why it is so difficult to map – unrecorded events, the consequences of which leave only traces and hints, but state definitely that something happened. There is also the question of what constitutes a production company, as many of the addresses listed are simply a name and an address with no indication of what they produce. They form part of the group of "mates" described by Berny Stringle, comprising those with enough of a network to put camera, sound, location and post together to form an agency. There is evidence of the industry cohering into a form recognisable today, with Studio Lambert, an iteration of which is still operating (their current major show is Channel 4's *Gogglebox*), providing a description of their set-up that could be of a contemporary production company: "All production facilities in one building, cutting room, offices, studios, viewing theatre and two fully equipped kitchens." (Supplement, 1968a, 21) [52] Cumulatively, these sources of information found in *Television Mail*, whether promotional, within reporting or the guides as

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[52] Studio Lambert had cut in-house for some time. It placed an advert in 1961 for a 'Senior Editor', additionally suggesting a large operation, given the layers of seniority (Classified, 1961b). Also, there is evidence of integrated production companies from earlier than this – in 1959, Guild Television Service promote the fact of their being 'the production company with the equipment of a major film studio', listing 'cameras, lighting, studios, technicians, dubbing theatres, cutting rooms' (Feature, 1959). This set up was based on film however, not videotape.

evidence of use, suggest that videotape was a minor yet everyday aspect of commercials production – as well as a continued editorial direction of a magazine that was dependent on money from videotape advertisers. It should, therefore, be noted that, while *Television Mail* very likely amplified the affordances of videotape, it can also be read as an accurate barometer of everything associated with videotape in commercial production, because it suited the editorial bent of the magazine to have every aspect of the medium covered within its pages.

Videotape editors were not shaken by the advent of colour, which ripples throughout the pages of *Television Mail*, to which adverts respond with an emphasis on knowledge and ability. The adverts for Johnny Fielder's Air-Time, the success of which could be seen when it added a stable of directors in 1969[53] (Advertisement, 1969a), present its dependability, knowledge and credibility with bylines such as "Isn't that what you want from a production house? Know-how!" and the announcement that it was to join the global Videotape Production Association (Advertisement, 1970a). Ampex refined their VTRs, advertising them with lines such as "represents important gains in agency efficiency and economy" and also emphasising the new affordances of the medium in its ability to provide "every special effect in the book" (Advertisement, 1969c). Meanwhile, TVR mounted a campaign to demonstrate the efficacy and ability of videotape to deliver colour commercials more cheaply and quickly than film, and as effectively, and it is in these six *Television Mail* covers from late-1969 that a distinct anxiety around the new televisual demands is detectable. Each advert speaks to a different aspect of videotape through a large text headline. Taking the adverts sequentially, "Sure, video-tape will blow over, just like the talkies" presents a historical narrative around videotape, comparing it to the initial scepticism at the arrival of sound in feature films (Advertisement, 1969h). There is a persistent comparison to film in terms of cost, processing and ease, in which "Say goodbye to rushes, rough cuts, out takes and washouts" presents videotape as fundamentally quicker and cleaner than film (Advertisement, 1969g). The third cover, "Knocking holes in TVR's

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[53] A stable which included James MacTaggart, who went from Kestrel films to be on Johnny Fielder's books (Advertisement, 1969b).

case", goes on the defensive stating that "if you're a film production company, here's how to fight back" (Advertisement, 1969f). This is akin to the taunt from the football terraces "come and have a go if you think you're hard enough". It subsequently addresses colour directly with the headline "What a child could teach you about colour commercials" (Advertisement, 1969i), while focusing on televisual compatibility under the headline "Do not adjust your set. Adjust your commercial instead", claiming that "the colours [on videotape] are more natural, because tape doesn't use emulsion [...] your commercial will have a realistic, more human look. The reason is that tape is an electronic medium, entirely compatible with TV." (Advertisement, 1969e) Finally, there is a direct appeal to the ego of the agency producer in "You're not a client. You're a great director." (Advertisement, 1969j) There are three mentions of the £2,000,000 spent on the videotape equipment at TVR in these adverts, in an equation of cost with capability that would later become a common trope of facilities house adverts.

Colour did not present a significant change to editing in terms of cutting, but it did add grading, the process of balancing the colours on the tape, to the editor's job. In an article from November 1969 that describes the new Intertel (VTR Services) company, now operating as Intertel Colour Television, *Television Mail* reports the continuing use of Editec as "incorporated in the system we use today". The practice described, in which Editec "enables the editor to view the tape and press the button when he decides to cut, and the computer stores the information. It is then a simple task to run back through the tape and adjust frame by frame until the precise editing position is found." (English, 1969) This suggests no significant change in videotape editing practice from four years before, when TVR's Editec was reported as being able to make "electronic splices positioned to one-frame accuracy." (Ullyett, 1965) Grading is mentioned incidentally, in terms of its immediacy, "immediate replay, immediate opticals, immediate grading", while the opticals process is also elaborated on: "To produce opticals two VTR machines are normally used through an electronic mixing desk and recorded on a third machine." This article is an early indicator of the way in which what was appearing on screen – colour and effects – was absorbed by the editor. Additionally, the article describes a videotape broadcast transmission in the context of editing:

An example of electronic editing used to full advantage is in the production of London Weekend's 'Big Match' programme. On Saturday afternoons three football matches are televised and transmitted via landline to Intertel's studio in Dean Street for recording on video tapes. The main match, probably two hours of tape, is edited the same evening to produce a 30 minute recording of the game's highlights. The following morning a 20 minute studio sequence is produced to compare the main game with extracts from previously recorded football matches and other topics of current interest already on tape. In addition commentators in the studio see sections of the tape and make live comments which are also recorded. The new sequences are the electronically edited to the Saturday evening's highlights. The whole programme is in the can by lunch time. (English, 1969)

As well as presenting a description of independent broadcast television production practice, the model for which is still used today, the above quote also suggests that the employment of independent production houses by broadcasters was significant by the end of the 1960s. Georgina Born notes that "in 1979 almost all employment in television was accounted for by staff jobs in the BBC and ITV, by 1989 39 percent of all employees were freelance, and by 1994 this figure had risen to 54 percent." (Born, 2005, 180) Examples such as this and the inclusion of commercials production in the definition of "employment in television" – after all, the videotape editor cutting commercials at Intertel (its *Showreel* listing in 1970's Production Guide includes Crown Paints, Carlsberg and Coronation Milk (Supplement, 1970, 30) was also likely to be cutting ITV's *Big Match*. Taken in conjunction with the analysis in Chapter 2 of the incipient freelance culture of the very early 1960s as evidenced by Television Mail, of which Johnny Fielder is a prime example (and whose work is elaborated on further below), an accumulation of practitioners can be seen. This points to the prominence of freelance workers in television as occurring much earlier than Born states.

By the end of the 1960s, therefore, videotape can be seen as still needing to prove itself in comparison to film, but nevertheless embedded within both the independent

production industry and the broadcasters. This had become a proposition used to characterise and sell the services of particular facilities houses. At this point, the particularities of need, choice and service were still sold around the affordances of the technology and the editor remains hidden. However, over the following years, investment in videotape increased, and a delineation between houses was made through their equipment. This was the era of specialisation, as the emphasis shifted from a sense of specialisation in the medium of videotape alone to the combination of particular pieces of videotape equipment resulting in particular affordances. This was a shift from a sense of *look what videotape does* to *look what we can do by adopting videotape that is better than everyone else*. As this competition between videotape houses increased, the editor began to be depicted as a selling point, revealing the peculiarities of individual practice and practice individuated by the particular combination of equipment.

The early 1970s: videotape maturation

In the early 1970s, videotape production and post-production expanded to a point where videotape technologies and editing achieved a discernible maturity in the scope of both their use and possibilities. There was an increase in videotape-based production companies and a replication of the precedent set by TVR. Companies invested heavily in equipment and publicised it, making it a part of their identity. As this occurred and equipment became more specialised, processes were added to the post-production workflow, most notably around the offline/online split. It was both a process of fragmentation that was intermittent in its nature, as companies adopted new equipment and practices at different times, and a process of integration, as companies attempted to cater to all aspects of television production. In retrospect, these tendencies appear to be competing, but at the time the process was a mutable one, in which organisations tested their capabilities and moulded themselves accordingly. As the decade advanced, companies began to merge, as the conjunction of technological specifications was recognised as useful to the industry.

At the beginning of the decade, however, there was a relative stasis, most visible in the ways in which videotape was still framed in opposition to film: it was new, growing and risky. In his Page Three column in *Television Mail*, editor Rod Allen highlights various ongoing issues. In February, Allen complains of the "low standard of videotaped commercials [which] come not from any inherent weakness of the medium but from the attitude people take to it. [...] Unfortunately, tape is still such a 'new' medium (despite the time it's been around) that people haven't had enough experience of it. Let alone of working with it, to disassociate weak advertising material from the medium itself." (Allen, 1970b) By November, in "VTR: start the clock", Allen suggests that "most [commercial production] people have now had at least one experience with video tape, and at least they know what it basically does, and you can edit it, and things like that. Production companies are still distrustful of the whole thing, but that's changing all over town quite fast, too." He concludes his column by saying "as 1970 starts drawing to a close, we're going to stick our necks out once again, and say that this time we really do believe that the tape business is going to get into a growth situation of some proportions next year." (Allen, 1970c) Allen's frustration (perhaps revealing *Television Mail*'s dependency on advertising money from videotape houses) is that production houses are still somehow unconvinced by videotape. He appears concerned that they will not understand its potential until accumulated use provides videotape with a momentum of its own; however, he feels that this momentum cannot gather pace unless videotape adheres to standards he perceives as slipping. The continuing film vs. videotape split in the industry is evidenced elsewhere. When LWT hosted a demonstration of videotape production techniques, delivered by the Advertising Creative Circle but using LWT technicians, to film-based members of the ACC, the consensus was one of regret "expressed by many attending that there was still a 'battle' situation between film and tape advocates." (Report, 1970a) Furthermore, 1970 is noted by *Television Mail* as a difficult year for film-based companies. Rod Allen reports in November on the financial pressures placed on production houses and the closure of several notable film-based production names: Augusta, Runnymede and Aspect productions. (Allen, 1970a) Leon Clore, in a

defence of his company Film Contracts,[54] laments the proliferation of new film-based production companies, which he views as "window-dressing", indicative of "under-capitalisation" and, of course, taking business away from the older outfits (Clore, 1970). While this does not demonstrate any drastic decline in film-based production, it does hint at the shift to videotape dominance to come.

Videotape began to be discussed within new frameworks. In the 1971 article "The Image" (the leading piece in an Animation and Visual FX supplement), Barry Day, creative director of the McCann-Erickson advertising agency, discusses the history of editing with reference to Griffiths and Pudovkin, covering dissolves, superimpositions and the optical possibilities of film. He ends the article with his thoughts on videotape, saying "I don't doubt that we shall also see that cactus flower called videotape bloom before long after its long hibernation. You can do so much with tape besides copy film techniques and so far genuine experimentation has been left to obscure orientals in New York underground workshops – and I'm not counting Andy Warhol's commercial for Schrafft's!"[55] (Day, 1971) Day is allowing the possibility of videotape being seen as creatively credible, incidentally responding to Allen's above-described concerns (or, perhaps, purposely, given that Allen's position as editor meant he would have seen the article). Videotape was also being taught in institutions outside the BBC and the ITV franchises. *Television Mail* reported on the Royal Television Society *Weekend Course* on VTR production techniques, which looked at the "drama aspects [...] covered by Miss Naomi Capon who produced and directed the successful BBC2 series of plays *The Wives of Henry VIII*". Although the course name implied the use of videotape, it is not specified: "Light Entertainment was covered by the production department of London Weekend Television [and] a commercial was specially written and made on the all-important subject of 'Pollution' [...] to show that production

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[54] Film Contracts features heavily in *Television Mail* adverts from the early 1960s, which take a tone underscored by its credible industry presence. For example, the cover headline from May 1963 reads "Film Contracts: for Commercials that Convince" and describes how "Mai Zetterling directs commercials exclusively for Film Contracts" and continues that her "growing reputation as a director comes from the series of documentaries she has made for the BBC." (Advertisement, 1963)

[55] Day is probably referring to South Korean artist Nam June Pak's *Video Film Concert*, made in collaboration with Jud Yalkut, which showed at the Millennium Film Workshop in New York in 1971 (Gagosian, 2018). Video already had credibility as an artistic medium, with a section at that year's New American Filmmakers show at New York's Whitney Museum, which included Pak (Report, 1971).

techniques and equipment used for programme making can equally well be used in a cost-effective manner for the making of commercials." The report concluded that "courses of this nature offered by the Royal Television Society are tremendously important in that they inspire interest and enthusiasm for television production, which is developing at a tremendously brisk pace." (V.G., 1970) Accumulated use and experience of – and exposure to – videotape lends a sense of inevitability to the medium that pervades these reports, as the momentum of videotape continues to build.

Companies newly investing in or basing themselves on videotape in the early 1970s include ITN, which, in 1970, through the ITN House Colour Television Centre, offered services catering to the transfer between film and videotape. In a bridging of the mediums, the service offers "short notice [...] facilities for transferring colour film to VTR for colour correction and or/add captions, opticals, voice-overs, etc." and "VTR or Film commercials played out to the Network." (Advertisement, 1970b) While the particularities that this advert speaks to are found in the skills of the technicians operating this networked system, it makes no appeal to creativity and is, instead, offering an operational service only. Yet, the skills of the ITN technicians are noted, with Jackie Harrison quoting Andrew Crissell in stating that "independent television's greatest contribution to the history of broadcasting was to make TV news into something truly telegenic" (Harrison, 2005, 126). Moreover, ITN needed the money as its "economics were absurd" (ibid.). Therefore, the commercial use of the ITN network is unsurprising. While the advert does not say how long ITN's facilities have been employed in this way, this is the first advertisement for the services. The emphasis on "captions, opticals, voice-overs" suggests that ITN House Colour Television Centre had been created to solve issues at the very last stage of post-production that, if wrong, would disrupt the network's output. It can be seen, therefore, as evidence that the videotape/film convergence was both common and disruptive enough to require a systematic resolution in a national networked manner.

Established videotape companies continue to dominate the pages of *Television Mail* throughout 1970. TVR appears on the cover of the magazine seven times, with

monthly or bi-monthly regularity, covers which, in each instance, reiterate the differing qualities of videotape but in an increasingly reflexive mode of address. Additionally, each advertisement reiterates the image of a deadline, illustration and text, making them easily recognisable as having been made by TVR, placing the company as central to the magazine and the community it is addressing. In April, "any special effect imaginable – immediately... [yet] effects don't mean a thing unless you have talented people to make effective use of them. We have." (Advertisement, 1970o). The following month, accompanied by a picture of a smiling open-faced man, the headline reads "TVR gets friendly. We can afford to." The text reads "video-tape is moving into its rightful place [as] success breeds success". (Advertisement, 1970p) In July, TVR present Nat Eisenberg with the headline "Other production companies would give their eye teeth to get him. We offered more." Eisenberg is introduced as "one of the best directors they've got in New York", listing his awards and how he was attracted to London by TVR's "£2,000,000 studios and equipment". The advertisement continues that Eisenberg only agreed to work with TVR after he'd "met our technical wizards [and] asked questions around town" (Advertisement, 1970n). The mention of "technical wizards" is another instance of the videotape editor being both foregrounded as essential and disguised within the mass of operators, despite them playing a crucial part in both the practice of videotape production and the currency of client approval. The word "more" in the headline refers to the totality of TVR's facilities, its success underpinned by its videotape operation. In August, modernity is summoned up by an image of a videotape control console against text which promotes, slyly, the creative freedom of videotape with the line "video-tape is a medium which creates ideas. That control panel up there can make a man step out of himself, turn into a box of Daz, and work hundreds of other memorable transformations." (Advertisement, 1970m) In September, TVR announce their production truck, "an extraordinary vehicle that should end forever the myth that producing in video-tape means studio presentations", at a cost of "£250,000" for its development and production, thus bringing TVR's stated investment to £2.25m. (Advertisement, 1970l) In October, TVR's output, other than commercials, is stated as: *Philby The Third Man* for BBC2; *The Novello Awards Show* "beamed live to a closed-circuit TV hook-up in America"; and, *Portrait of...*, a profile of Judy Garland, "the first

of a series of unique 15 minute programmes produced by TVR." (Advertisement, 1970r) Finally, these elements are combined in a November ad which invites readers to "use our time/studios/cameras/ videotape equipment/technicians/creative staff", while the reader only need bring their "imagination" and "directing skill" (Advertisement, 1970q). The advert offered directors a free trial of TVR's services, in a seeming appeal to the film-based directors they felt that they had to win over. All of these adverts are a direct address to the independent broadcast community, emphasising TVR's videotape capabilities in terms of both equipment and personnel, the comfort the company offered ("TVR gets friendly"), its breadth of output and financial security. In short, they cover everything employees might discuss when having a drink after work. The series of advertisements have a cumulative effect, indicating centrality, leadership and a rootedness within the community.

The notion of speaking to a professional community that worked across both commercials and television is articulated by the videotape editor Barry Stevens, who left the BBC to pursue a career in Soho in 1969. Speaking on his departure from the corporation, he additionally reveals the informal transfer of personnel that is a key indicator of the freelance market:

> ...the phone rang one day and a friend of mine, Rod Waldron, who had already left BBC to go to TVi as an assistant [...] He said, 'Now, Brian Wiseman[56] [...] is leaving TVi - or TVR it was in those days. It became TVi later. Brian was leaving to join Intertel, which was the OB truck setting up almost in competition, and they all got together in the end anyway and that's the end of that story. But Rod said to me, 'Get your arse down here. They need an editor as soon as possible', and, you know, 'Just name your price', effectively. (*Interview with Barry Stevens*, 12 December 2017)

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[56] This is the same Brian Wiseman already referenced in this thesis by Nicky Sargent on page 151. TVi was the company that was formed when InterTel and TVR merged in 1971 and announced on the cover of *Television Mail* (Advertisement, 1971d). Known initially as Television International, it is also known as TVi.

On the importance of the community of ex-BBC editors, in that it conveyed an unspoken degree of cachet that was acknowledged across the ITV franchises, Stevens says, "We were friends because we'd worked together at the BBC", continuing:

> The attitude was, if you advertised a job that you need an editor or an assistant, if they had worked at the BBC, they'll get an interview automatically, in my book, because you know that they're trained to a certain standard. It was BBC snobbery, but it was very practical. An ATV person like Johnny [Fielder] that had come from ATV, if they'd known people at ATV, or of somebody got trained at ATV Birmingham, they say, 'He knows what he's doing', because those were the standards. People remember people that they've worked with successfully and unsuccessfully, and the unsuccessful relationships will not be continued because people don't forget. (ibid.)

This reiterates the idea, previously discussed and articulated by Bob Godfrey and Berny Stringle in the 1981 documentary *But the Client Loved It* (Powell, 1981), of collegiate relationships creating a professional and social network. Stevens goes on to articulate how the layered nature of this network enabled people to advance in their careers:

> If you draw up all the companies that started up in the ten years, there would be people who worked at TVi. [...] Roger Hoare who started the Moving Picture Company and Rushes and Commercials [...] He was at TVi as well. Nearly everybody worked in TVi at one time. John Beadle worked for TVi and went to Moving Picture Company. TVi is the mothership. (ibid.)

From the BBC to Soho, from the first sharing of equipment and the doing of favours, to companies then investing in their own equipment, to the increasing fragmentation of the community, networks still had to be maintained as employees moved from one company to another. These operational networks are referenced explicitly in *Television Mail* in 1971 when editor Rod Allen scolds the community after a spate of company closures, implicitly blaming the community for not supporting one another,

as he writes "Enough people saying the same thing about a particular production company *will actually cause it to come true* [sic] [...] So next time you're in a Wardour Street pub, and someone tells you quite confidentially and confidently that XYZ productions is for the chop, ask him to show you their balance sheet." (Allen, 1971) Throughout these descriptions of working in Soho, both knowledge of practice and knowing people remain central to successfully negotiating this field.

In its understanding of the industry as running on shared knowledge, TVR's 1970 campaign may have also been an attempt to pre-empt a new competitor. What the next set of ads certainly demonstrate is the 'call and response' rhetoric that would come to characterise advertising within the magazine. Based at Shepperton Studios, Lion Television appears in *Television Mail* in late-1970, adopting a similar advertising strategy as TVR did in 1969, comprising multiple cover ads over several weeks. They present themselves as being able to cater for all television production, with the five Lion Television covers depicting a band performance, a cricket match, the advertising executive David Bernstein, a blank space with the byline "Don't come to us for your next video tape commercial" and, finally, the text "A message to the 200 film production companies in London: We love you." (Advertisement, 1970c, 1970d, 1970e, 1970f, 1970g). The tagline for all these adverts is "Lion Television. Let's get together." The adverts describe a "mobile, flexible, professional video tape service" (Advertisement, 1970c) which will rival "any film facility house in town" (Advertisement, 1970d), offering "a whole service, a whole attitude, a whole approach to the production of commercials on video tape. It's a freedom, a creativity you'll enjoy using – all the more because we won't confuse you with technical jargon about electronics, because at Lion Television we think that people get on best if they all talk the same language." (Advertisement, 1970f). The gap in the market which is being addressed by Lion, and by ITN previously, is the perceived lack of coherence, with Lion offering the technical capabilities to ease the producer through a confusing technical process. This becomes an essential part of how editors came to be foregrounded: people who can make life easier for the less technically able.

Advertisements by other houses foreground their personnel, again emphasising the sense of community but also signalling a shift from discussing their technical capabilities, with personnel then becoming both the capability and the capital. There is a reflexive loop, where personnel are key to demonstrating quality, while knowing who these personalities are is key to decoding the adverts and proving the membership of the community. By including a 'name' and making the reader feel like an insider for recognising that 'name', the adverts advance the conversation around videotape by familiar association. This sense of insider precedence can be seen in adverts taken out by film-based companies in which they list the directors either already working in or new to their stable. For example, Guild Television Service's 1967 ad states that "Ken Loach has Talent, GTS has Ken Loach", which was accompanied by a picture of Ken Loach directing a commercial for the British Egg Marketing Board (Advertisement, 1967h). The affordances of film are of no concern, it is the person handling the film that is the attraction. However, the difference remains that videotape was still, in the early 1970s, a scarce and complicated enough medium for it to be the 'other' in relation to film. A *Television Mail* editorial in 1970 estimated that only 4% of "London production money" was spent on videotape (Allen, 1970c). Therefore, the personnel-based adverts retain ITN and Lion's selling point – an ease of operation. When Televideo, a new iteration of the Craddock Marsh company[57], takes out a cover advert in 1971, there is no mention of its technological capabilities or track record. Instead, under the headline "Call us Big-hearted" the text reads:

> Bighearted? When Jim Marsh gives up Woodbines for a fat American cigar that's bighearted. When Johnnie Buxton forsakes the Arsenal for the Houston Oilers that's bighearted. When we gave up the name Craddock Marsh to combine the talents of our London directors with those of America's top award-winning production company that's big news. Call us Televideo. (Advertisement, 1971c)

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[57] Craddock Marsh appear in the 1968 production directory but do not reference any videotape equipment (Supplement, 1968a, 10). Malcom Craddock was a prominent director in Soho, appearing in 1967 alongside the also-prominent director Gerry Poulson on a shared *Television Mail* cover (Advertisement, 1967e).

Understanding who Jim Marsh and Johnnie Buxton are is crucial for this advert's efficacy. Indeed, it is only the title of the company that suggests anything related to videotape, nor does Televideo feel the need to reference its technology in the 1971 production directory (Supplement, 1971, 48). These adverts recall the style of those for Johnny Fielder's Air-time, in which he is central to the viability of the company. This suggests a cohered, rather than still cohering, commercials production community, from which point, the next step was consolidation.

TVR and Intertel merged in 1971 to form Television International (or TVi, as it would become known and as Barry Stevens refers to it above), announced with a cover ad as "now the biggest videotape company in Britain [with] four OB units. Three Studios. A dozen videotape machines [and] experience to match". It is the reference to "experience" that is somewhat confusing, as it is only "through our associate companies we can provide a complete creative production consultancy service" (Advertisement, 1971d), while, the associate companies are not named. However, in the *Television Mail 1971 Review*,[58] Rod Allen clarifies this somewhat, when he describes the merger:

> The TVR/Intertel merger took the industry (and the two companies' staffs) by surprise, and only now have many people been able to sort out exactly what happened. The merger stemmed from a decided oversupply in the facilities business, and it is true to say that this is a situation which has not altogether been solved. The new company still seems somewhat unwieldy to an outside observer, and still needs to consolidate its approach to the market. Partly as a result of this and partly because of agency reluctance, the use of video tape for commercials has not significantly progressed this year, though there is a slight upturn in the number of national clients using tape (or tape-to-film), and some interesting work has been done. Another factor militating against the facilities companies has been a tendency for more tape-orientated companies

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[58] The retrospective review of the year, which came out in January 1972.

to take advantage of the low rates offered by a number of programme contractors for video tape production. (1972b p.5)

From these two sources, it would seem that a number of videotape companies were working together as a way of mitigating against oversupply. 1971 is reported as a good year for Lion, however, which, Allen states, had "continued to work consistently, and picked up two plum jobs this year apart from routine programme and commercial work – the shooting of '200 Motels', Frank Zappa's feature film, on tape for transfer to film for United Artists, and the Knightsbridge Theatrical Productions 'Hamlet', shot at Pinewood in a few days, which aroused considerable critical acclaim." (ibid.) Despite Allen's asserted "oversupply" and the anxieties expressed on *Page Three* about the progression of videotape (which can also be interpreted as warnings to the magazine's readership regarding potential precarities), shifts in company structures and the seeking of new work in new places meant that videotape could, and did, hold firm.

This holding firm is evidenced in numerous ways. In June of 1972, *Television Mail* ran a news report with the headline "Tape Director Bierman joins Harling", describing "Robert Bierman, 23 year old VTR director and consultant [...] formerly of Thames Television [whose job] lies in imposing on tape the standards common to most filmed commercials." (Report, 1972) This statement echoes, but allays, the anxieties expressed by Allen in its highlighting of applied standards. It is also evidential of Barry Stevens' cohort, the young VTR editors coming out of the broadcasters to work in the independent sector.[59] Bierman's contemporaries followed the path set by Johnny Fielder and his company Air-time, which itself, in 1972, expanded and opened its own videotape studio on the top floor of 50 Frith Street, billed as "London's newest video studio [...] cameras, vision mixer, sound equipment, lighting, editing facilities – everything you need for producing a pilot on tape. Plus, if you need it, the expertise of Johnny Fielder and the team." (Advertisement, 1972a) There are two points about this byline. Firstly, the mention of "pilot", suggests swift cheap production of the sort

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[59] Bierman appears as a success in future issues of the magazine. In 1974, a cover ad for Framework appears with the quote "I think Bob Bierman is such a talented director I've built a company around him." (Advertisement, 1974c)

Rod Allen had not long ago complained about, and, secondly, the use of the word "if" in the offer of expertise suggests that producers were using videotape equipment to make their own content. This in turn indicates a bypassing of expertise and an accumulation of videotape 'people' who could operate the equipment well enough to complete their own work.

New videotape advertisers appear. David Chapman Associates, describing itself as "The Company for High Quality V.T.R. Commercials", placed a cover ad in November (Advertisement, 1972d), although it is unclear when it was launched. There is evidence of the adoption of videotape without this being explicitly stated. Ridley Scott Associates (RSA) was first advertised in 1969 under the byline "Ridley Scott moved" (Advertisement, 1969d).[60] By 1972, RSA had videotape listed in their entry in that year's *Production Guide* – they invested in videotape without advertising the fact (Supplement, 1972, 38). Elsewhere, Crown International Productions boast of their "specialists in both videotape and film production [having] combined the techniques of each medium to bring a completely new dimension to commercial production". It lays claim to being "the only company specialising in this type of production", with "special new techniques that really do give you the best of both worlds – creatively and economically" (Advertisement, 1972c). Crown, however, was in fact part of the Crown Group, alongside TVi, with its listing in the 1973 Production Directory sending readers to the TVi listing for all information on facilities and staff, while the two listings reveal that the companies were located side-by-side on Windmill Street in W1, London, with TVi at 9-11 and Crown at 12-14[61] (Supplement, 1972, 12&43). The companies co-existed, sharing staff and facilities as the practice of using videotape continued to evolve – indeed, there are no details on what Crown's "special new techniques" were. However, such close proximity allowed these two companies, socialites of the Soho production world, to publicise each other's practice and grow together.

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[60] Scott was previously listed as a director on contract with Natural Breaks production company (Supplement, 1968a, 29)
[61] Much of this space continues to exist as a post-production facility, with the multi-national post house The Mill now occupying the five floors of 11-14 Windmill Street. Number 9 is a barbershop.

Older companies associated with film began an association with videotape. Visnews, described in a 20-year anniversary advert in 1977 as a producer of "comprehensive, impartial and unbiased service of international news" (Advertisement, 1977b), started advertising Visnews Facilities in 1972, emphasising that "16 mm. is our business" but also offering "Videotape, Engineering Services" as part of their package (Advertisement, 1972f). Meanwhile, Rank, which, in 1970 and 1971, had been using film strips in their adverts, associating itself explicitly with celluloid (Advertisement, 1970k, 1971b), launched the Rank Video Laboratory in 1972. Rank heralds, as Crown had done, a "big new breakthrough in production technology", targeted at "the film man who's fast becoming a tape expert". The advert offers "all brand new [...] advanced facilities", including CMX electronic editing (Advertisement, 1972e). These commercial and promotional developments can be taken as evidence of videotape becoming a part of production life in Soho, and that this was no longer unusual. The fact that editors or their equipment are not often directly referenced makes the Rank advert significant.

Rank's advert in the September 1972 *Video Supplement* is the first instance of CMX editing equipment being advertised in the pages of *Television Mail*. CMX editing was a progression from the dual-media film/videotape processes offered by companies which billed themselves as especially innovative in their combining of the media (as detailed above). Rank's advert is found on page two of the supplement. In another example of the reflexive nature of the magazine, Rank's acquisition of the system is obliquely – as there is no direct mention of Rank – corroborated by Rod Allen in an article some pages later, in which he states:

> Last year, there was just one way of editing video tape available to the London industry. This was the good old-fashioned 'see-and-cut' method, in which the editor worked with technicians and a minutes-and-seconds log running video tape backwards and forwards on two or three machines and visually selecting cuts. For many applications, this method of 'manual' electronic editing will suffice perfectly well, and for this who don't mind sitting surrounded by

equipment and technicians there is no need for any other method. (Allen, 1972a, 30)

Ever partisan, Allen goes on to detail the "revolutionary" way in which "CMX is the only video editing system which does not employ standard VTR machines rolling backwards and forwards to find edit points", describing how "original master VTR is re-recorded in 20-minute chunks onto storage disk packs [which] means every frame of the 20 minute or so of the master material stored in the disc pack is available to the editor instantly". He goes on to describe how the editor has:

> ...two video monitor screens and a light pen. The computer system displays to him a list of all the scenes stored in the discs – in other words, a verbally identified description of the master material' [...] With the light pen, which actually reads the words displayed on the monitor, he can call up the first scene he wants to work with by touching the monitor screen at the appropriate word. The first frame of the scene is displayed on the left hand monitor, and he can now run it through fast or normally – or frame by frame, until he has found his 'out' – the point at which he wants to cut to the next picture. He can then select the next picture from the list of scenes still displayed on the right hand monitor (known as the scene 'menu'), and the first frame of the second scene appears under the word-display on the right hand monitor. He can then run back frame by frame on scene 2 until he finds his 'in' point, and then touch the word 'splice' on his monitor, and the cut is made and memorised; the first frame of the second scene now jumps to the left hand monitor and becomes the scene to which he can cut the third scene [...] The computer memorises all his cuts and special instructions, and after he goes home it prints out a digital magnetic tape which is applied to a master recording VTR and to one or more playback VTRs containing the original material. By comparing the time codes on the disc information with the with the time codes on the master tape, these VTRs roll backwards and forwards automatically and use the standard Editec system, computer-controlled, to produce a master edited tape. (ibid.)

In emphasising the way in which the footage can be accessed, Allen is hinting at the creative possibilities of film editing due to its non-linearity. He is, of course, hamstrung in making a positive comparison, given his long-term promotion of videotape – and its linearity – in the magazine. The similarities with film editing are clear nonetheless, as seen in the way in which the footage can be accessed immediately and reviewed in a manner akin to spooling on a flatbed table. Limitations do remain, however. CMX is an early instance of electronic random access technology. As discussed in the introduction, film editing, where strips of film could be grabbed in any order, is the original random access, while digital NLE is the most recent manifestation. CMX, as described by Allen, is recognisably computerised, with its monitor display and ability to find footage at random through a system of displayed lists. However, twenty minutes of footage on one disc is still very little storage and would not represent a system quick enough to replace videotape editing, where physically spooling through already logged footage would still be swifter than having to change and load discs. So, although CMX presents an early iteration of digital non-linear editing (NLE), the systems used from the 1990s (20 years after CMX appeared) would be made possible by advances in compression technology and storage. Bill Warner, the engineer entrepreneur who oversaw the development of the Avid digital NLE system, said of its development process that the "jpeg compression chip changed everything [and] took us [Avid] from quitting halfway through the marathon to making it across the finish line and sitting and having a beer." (*Interview with Bill Warner*, 12 March 2018) While the full story of Avid's development will be explored in the next chapter of this thesis, Allen's article both provides a rare explanation of the exact way that early CMX worked and demonstrates that the developmental timeframe of random access digital editing – as it would become – was decades long. Allen shows that, although conceptually rooted in celluloid, its history also encompasses electronic media.

Allen also references timecode editing, "described elsewhere in this publication by a BBC executive who has been developing it." (1972a, 30) That BBC executive was Head of Engineering (Television Recordings) Leslie Griffiths. Griffiths's article uses film editing as its point of reference for the so-called 'painless' nature of this practice,

describing timecode editing as using a "sort of electronic edge numbering process".[62] With specific reference to timecode editing, she gives the following description:

> For 2-machine electronic editing, each machine is fitted with an editing programmer. This decodes and displays the time recorded on the tape and it also includes a memory and logic system which allows it to sense coincidence between the time code read out from the VTR which it is controlling and the time code read out by the second VTR or a pre-set time. [...] During recording, the approximate time for the edits will have been noted in the studio. These timings can be fed into the programmer through a keyboard and this will cause the VTR to run rapidly through to the required point on the tape. The proposed edit can be rehearsed, re-timed and re-rehearsed as necessary before the final edit is made. (L. Griffiths, 1972, 27)

For studio productions, whether for commercials or programmes, timecode made an already established practice easier in terms of the level of control enabled by timecode referencing.

Timecode, therefore, lent an air of film to videotape editing, in terms of the ease with which footage could be found, even if it did not lead to an editing practice akin to that used for film. Online and offline editing would widen the spectrum of possibilities in the videotape editing that was to come, of which the timecode/CMX differentiation made by *Television Mail* is indicative. It would also provide the technological context to the expansion of videotape-based production that occurred in 1972/3. This context, as well as the potential for more complex videotape configurations, is elaborated upon in Rod Allen's "Time code comes to Wardour Street", the title of which re-emphasises the communitarian aspect of Soho. He writes of the specificities of timecode editing practice that he encountered in a new suite at CTC:

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[62] "Edge numbering" refers to the numbers found on the edges of a film strip.

This week, Colour Television Consultants new time code editing suite formally opens, and a £30,000 investment starts earning revenue. [...] CTC's time code editing suite basically consists of three RCA TR-702 2" video tape recorders with time code generation and reading equipment. In keeping with recent thinking in the design of this kind of facility, the engine-room and the bridge have been kept strictly separate. Control of the editing process is effected from a console placed in a separate room from the VTR machines and the processing equipment – on another floor at 112 Wardour Street, in fact. Remote stop, start and shuttle of the VTRs is carried out from the console, together with time-code read out and the actual editing itself. The equipment can 'find' any frame if the associated time-code is punched in – automatically. A supervising engineer remains in the VTR room, of course, to look after the engines, and to change reels when necessary. Further input can be taken from the two telecine suites (a further telecine machine has been purchased from Thames TV, bringing CTC's complement up to two), from a caption scanner and from a live studio camera for inserts, packshots,[63] etc. Conrac[64] monitors at the console display the various inputs, and allow the editor to rehearse and execute cuts, fades, dissolves and all the other special effects in the video pantheon.

In itself, the system is simply a sophistication of the familiar shuttle-and-cut 'manual' video editing technique. The most important new point is the hands-off aspect, and the fact that the time-code 'edge-numbering' on the tapes enables more accurate – and automatic – frame location. (1973b)

Allen goes on to describe the associated split, as videotape becomes more complicated, between offline and online editing:

...the extension of this [timecode] approach to off-line editing is more important still. However you go about it [...] real-time video editing is still a

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[63] "Packshot" refers to a shot of the product in a commercial.

[64] *Conrac* was a brand of monitor, not an assembly or arrangement as the word might infer.

very expensive operation. While the director or editor makes creative decisions – and frequently unmakes and remakes them as well – two or three highly costly VTR machines are idly standing by, as well as the processing equipment and the personnel needed to run them. Clearly the most efficient use of high-cost capital equipment is the most intensive one: and this means only using it to execute decisions which have already been made, as well as freeing it for other tasks, such as dubbing or production work [...] Frequently, creative work can suffer from the pressures generated by the knowledge that every minute of hanging about can cost four or five pounds, and every hour can cost £250. [...] So CTC offers the opportunity of carrying out the creative work 'off-line'. This term, borrowed (like an increasing amount of TV jargon) from the computer industry, simply means that you do the cutting away from the expensive machine on a cheap, efficient, half-inch video tape recorder. What makes this possible is the fact that the time-codes recorded on the master 2" tape are transferred, in sync, to the ½" helical copies, and can be read out during the half inch editing process. After the final creative decisions can be made, all the CTC technicians need are the time code readouts from the ½" tape which enables them to go straight ahead and edit the master tapes exactly as specified by the creative people on the half inch. The resulting 2" tape is 'analagous' to the ½" rough cut (except it's not really a rough-cut, because you can be precise to a single frame), so it's called 'analogue' editing as well as 'off-line' editing. Confused? You needn't be – just think of it as neg cutting. (ibid.)

The recourse to a comparison with film editing is repeated here, as Allen did with his description of CMX. Additionally, the budgetary implications of videotape in terms of its costliness, previously ignored by Allen in his championing of the medium, are now discussed as they diminish with the use of offline practice. Emphasising offline as being the "creative" part of editing, he addresses the division between offline and online in terms of the former being creative and the latter being a job for machine operators, a space in which to complete effects, titling and credits. Later in the article, Allen

highlights the use of videotape outside the realm of commercials and the fact that CTC's new facility was built after the success of Rank's:

> Two years ago, the programme contractors themselves were publicly complaining that their own facilities were not being used enough. Today, with daytime programming and the increasing use of video as a production medium, the situation is reversed [...] programme work will account for a substantial majority of the volume in the new facility. ITV contractors, overseas broadcasters and, interestingly, the BBC will fill the new capacity [...] Rank Video, up the road, is well on its way to reaching its capacity [...] although the two outfits are competitors they will not be eating each other's turnover: rather, the total market will continue to expand. [...] Video tape is still in its infancy as a creative production medium [...] VTR *can* [sic] be a cheap and nasty medium; it can also be an efficient, economical and creative medium. (ibid.)

As ever with Allen, the article functions as an advert for videotape as much as a description of its capabilities; however, it also highlights the shift towards the new creative possibilities for video afforded by new equipment and practices. He is also demonstrating the diminishing risk of the medium as experience in using it accumulates, becoming a medium with longevity in the independent industry – the simple fact of it becoming usual as opposed to unusual.

With diminishing risk – increasingly stable machines and more commissions – came increased use, and companies began to differentiate themselves on the basis of technological, cost or service qualities. An advert for Ted Bilsdon Film and Videotape Productions highlights the perceived excesses of other companies in the line "If you want rubber plants, beautiful girls and monumental glasses of whisky, Ted will show you exactly where to go." (Advertisement, 1973a). Concomitantly, throughout

1973/4, heavy investment was noted by two established companies, Ewart and MPC.[65] MPC's investment is recalled by Graham Wade in 1985, when he writes:

> ...the first major watershed in MPC's development came in 1974, when it decided to invest in its first batch of video equipment, comprising an edit suite and camera. 'It was a mega-investment of £300,000, worth [sic] getting on for £3 million in today's money,' Luckwell comments, 'A tremendous amount of research showed it was a financially crazy thing to do from every conceivable angle, but gut-feeling said it was a good idea. Video had a slow start and it was subsidized by film commercials for the first 18 months or so.' (Wade, 1985, 51)

It is worth noting, as an aside, that Luckwell's description of his investment puts TVR's 1966 £2 million investment into perspective. Wade does not elaborate on the research cited by Luckwell, instead continuing:

> There were two technological factors which helped Luckwell make the positive decision. The first was the arrival of computerized video editing techniques, and the second was the introduction of much smaller and more flexible electronic cameras than those that had gone before. For commercials producers used to working with film, video-tape could only prove itself a viable alternative medium if complex editing could be undertaken as a post-production activity. (ibid.)

Although not detailed, this "complex editing" was, therefore, incipient as MPC invested in videotape in 1974, thus rewarding Luckwell's foresight.

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[65] Ewart's July 1989 obituary reads: "In 1954, the year before commercial television went on the air, he set up what was an experimental studio making pilot television commercials with the advertising agency J. Walter Thompson in preparation for the launch of ITV. [...] In 1967 he moved to his own purpose-built studio complex in Wandsworth, transferring from film to video in the 1970s. He became less involved with production and more concerned with keeping the facilities up-to-date with fast-changing technology for both commercials and light entertainment programme makers. [...] The Wandsworth complex was sold only last month for over £7m." (Obituary, 1989).

Ewart's investment is more closely detailed in the pages of *Broadcast*. On 19 October 1973, as a full-page ad for Ewart's new videotape studio appeared on Page Five, Rod Allen detailed the venture across pages 16-17. In "Inventing a new way of doing VT", Allen provides a picture of the culture surrounding commercials production, revealing a cult of personality, the transfer of labour, production practices and the emphasis on equipment renewal. He sums up the most obvious barrier to a fuller adoption of videotape: "Lots of people think video tape is the future so far as TV commercials are concerned; not very many of them have been able to gamble half a million quid on that belief." The bald fact that it was expensive to set up a videotape venture is not often expressed. Ewart's motivation for moving into videotape is framed in terms of his career, rather than financial acuity, as Wade asserts it was for Luckwell and MPC. Furthermore, Allen places Ewart's decision in the context of the discourse explored on the pages of *Broadcast* magazine. After reviewing Ewart's rise and recent decline, Allen says:

> Last year it all came to a head. 'I felt I was becoming the old hack of the industry,' says Keith, 'and I was ready to pack it in and go fishing.' Curiously enough, it was an article in Television Mail, BROADCAST's [sic] predecessor, which helped save Keith for the industry. Last year, Ian Fawn-Meade, creative director of Lintas, wrote a piece for the old Television Mail which said that tomorrow's production companies are going to have to be able to produce video tape commercials [...] Keith Ewart saw this as a challenge which fitted in with some ideas that had been floating around in his head ever since he started building the Wandsworth studio [in 1967]. When the studio was first constructed, he made sure that embedded in the walls were video cables, and each studio had a TV-style gallery. Almost from the beginning, some video work was done there, and when the Granville Studios in Fulham were closed down and demolished, Ewart took over the Gemini TV/film equipment and the COI 'London Line'[66] contract from Granville, which fitted very nicely into the

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[66] From the BUFVC website: "In 1966 production started on a weekly series of thirteen colour magazine programmes, London Line (Colour series 1). This was designed as an experiment in colour production

basic video capability his studio already had. Keith had for a long time thought that the future of the industry lay in video tape, and the gradual recognition of this by the industry itself, as expressed by Fawn-Meades in his TV Mail article, coupled with the gradual acquisition by the programme companies of ACR-25 and TCR-100[67] video cart equipment, confirmed his views. (Allen, 1973a)

That *Television Mail* and then *Broadcast* were focal points of technological discourse in the commercials production industry is manifest, while the association between Ewart's personal renewal and his technological renewal is clear. In the vernacular, he was old and past it but was invigorated by the new kit. This is important, as there is a palpable revulsion for the aged, whether human or technological, that runs throughout later issues of *Broadcast* and which shall be discussed later below. Allen's illumination of the multiple layers of networks inherent in broadcast production is forensic, running from the flow of information through the magazine to how the securing of the Granville contract allowed the experimentation that led Ewart to establish its new video-based practice. The article goes on to discuss points regarding labour transfer when it explains that Ewart "hired engineers and technicians from the television industry to advise him on the equipment", echoing Barry Stevens' recollection about the transfer of editors from the broadcasters to the independents. Allen goes on, saying that "visits were made all over the world, especially to the US, to evaluate similar operations and the growing numbers of facilities houses supplying VT services to the commercials industry", recalling the way in which videotape itself arrived in the UK fifteen years earlier. He highlights that the facts inherent to videotape editing continued to be a barrier to the medium's uptake: "Agency hostility

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and distribution to meet existing demand from the United States and potentially from Canada, which was experimenting with colour transmissions in September 1966. Although there is no record of release or broadcast dates for this series, some of the existing production documents indicate when the programmes were made. The first issue was filmed in November 1966 so it is likely that it was broadcast the following month. The series was essentially a colour successor to the 'Old Commonwealth' version of London Line. The format virtually remained unchanged with presenter Mike Smee joined by Howard Williams, Carol Binstead and occasionally Molly Parkin, founder and fashion editor of the magazine Nova. The content was mainly cultural with regular stories on fashion and 'live' studio performances by bands such as Gerry and the Pacemakers." (Listing)

[67] The Ampex ACR-25 and RCA TCR-100 were both video-cart systems which automated the playing out of commercials by broadcasters, allowing for a greater number of videotape commercials to be used.

has been breaking down slowly over the past few years [...] Ewart confesses himself to be angry and frustrated at the prejudice (and perhaps more important, the ignorance) that's shown by agency people who have been to see him. 'But you can't edit it' is still heard often". Allen describes the specificities of editing practice:

> For recording and editing, the team selected RCA TR-70C 2" quadruplex VTRs [...] Three machines have been installed. Editing is carried out on-line by a computer system [...] all three VTRs are controlled by a simple keyboard in production control [...] To save generational losses, the CDL system can be used to recreate edits from masters every time a dub is made: so bulks can be produced direct from master tapes rather than from a master dub: computer instructions are stored on punched paper tape which is simply fed into the machine every time a dub is needed. (Allen, 1973a)

The acronym "CDL" refers to the Colour Decision List, which functioned in a similar manner to an EDL (Edit Decision List) in that it told of the slight changes in colour balance that would ensure that the copy looked correct. The article also makes another early mention of "on-line", as Rod Allen had obliquely referred to in his description of "off-line" in "Time Code Comes to Wardour Street" (Allen, 1973b) some months earlier, but had not elaborated upon. The practice of offline and online ("on-line") editing was introduced to get around the problem, inherent in linear editing, that any decision to trim or to add would mean shifting the following material either up or down, which could only be done by copying the remaining material onto a new tape and then reassembling the whole thing. This is the "generational losses", the degradation of the image quality, referred to by Allen in his article about Ewart. Offline work could be more flexible in that it did not matter how many generations, within reason, you went down, as this was only ever a working draft. It was also introduced because the online equipment was so expensive to buy or hire that it was impractical to try out ideas out at that stage. Allen also uses the additional meaning of the term to refer to *being* online, that is, working on a computer to carry out the processes – such as titling and grading – required to finalise a project.

A difficulty around this terminology is one of the reasons that the distinctions between editing and post-production practices are blurred: the language does not explain these relatively simple processes. The adverts for production houses ignore the technics of editing, which leads to this inadvertent blurring in an effort to attract clients. It is evidenced in the emphasis on luxurious surroundings replacing technological capabilities, as seen in Rank Video's full-page advert for its Wardour St viewing room, with "air conditioning, refreshment facilities and 12 very comfortable seats", which features a photograph of telephones embedded in the armrests (Advertisement, 1974d). Efficiency is another determining factor, with Air-time running an advert with a picture of a gun, suggesting that the choice is between its services or suicide when faced with a particularly onerous videotape situation (Advertisement, 1974a). Both of these adverts distract from the increasingly confusing possibilities of videotape post-production, characterised by the multiple pieces of machinery that would come into play depending on the particular requirements of any project. *Broadcast* had a dedicated section describing such set-ups under the heading *Facilities/Engineering*, in which reports would frequently describe such set-ups. On 25 November 1974, the page reports the following (also highlighting the importance of CTC to the industry):

> The long-planned move of the video tape post-production facilities of the Colour Television Consultants/Trilion to the company's new Brewer Street premises will take place on the weekend of 7 and 8 December. [...] Dismantling will take place on the Saturday [...] Basic record and replay services should be available by the following Wednesday, 11 December, but the full range of services including flying-spot telecine and time code editing is not expected until Monday 16 December. The three RCA TR70Cs being moved out of Wardour Street will be joined by a fourth TR70C [...] Trilion is planning further expansion in the New Year: among the plans are one of more minimobiles, for which Trilion has already ordered at least one Ampex AVR-2 modular quadruplex VTR and two or more Ampex VR-3000 portable quad machines [...] opening up further fields for flexible location VTR work by programme contractors and independent producers. (Report, 1974)

The complexity of the set-up is suggested by the days in which it took to assemble. The back story to the Colour Television Consultants/Trilion merger is traceable through the magazines' editions. On 1 January 1971, Tim Emanuel and colleagues had announced on the cover of *Television Mail* the opening of The Television Department:

> The first 'big agency' TV set-up to operate outside the big agency. [...] an outfit offering the experience, the imagination, the professionalism and the contacts that you might find behind the best TV campaigns in one of the more successful London agencies [...] a heavyweight television department at your disposal – without having to pay heavyweight television department overheads. (Advertisement, 1971a)

The Television Department was based at 112-114 Wardour Street, in the centre of Soho and, as it did not take out a listing in 1971's annual production listings (Supplement, 1971), it is unclear how long it operated at that address. In July 1972, Colour Television Consultants, of 112 Wardour Street, advertise on *Television Mail's* cover, emphasising their reliability in checking film prints, stating that "[f]ilm companies [...] normally check only one print in five [...] at CTC we check every print in the bulk order." (Advertisement, 1972b). Tim Emanuel's Television Department was, therefore, in very close proximity, possibly sharing a space with CTC. Trilion, meanwhile, was originally a mobile videotape operation based at Shepperton which announced itself on Broadcast's cover in 1973 with "Trilion are going places" (Advertisement, 1973b).

Editor Barry Stevens provides more location information:

> I was at TVi from '69 to '73, so I left TVi to start Trilion. [...] It was Tim Emanuel and - who else. Tim Emanuel [...] was the very well-spoken managing director of CTC, which was a telecine house next to The Ship in Windmill Street. (*Interview with Barry Stevens*, 12 December 2017)

Windmill Street was the site of TVi, where Barry had been working which he recalls as being a CTC site, owned by Tim Emanuel, who then opened The Television Department in Wardour Street, presumably taking CTC with him. Barry continues:

> They [CTC] used to get commercial first rushes, or prints, first prints from the finished commercial and put them through telecine to show the clients what it would look like on TV, which was pretty important in those days because colour was only - '73 - only about seven years old in terms of British television, and it was important. Colour in commercials is more important than the content almost. You get the wrong colour, you're in big trouble. So, he [Emanuel] had this nice little telecine with viewing seats and theatre, but he didn't have any post-production. (ibid.)

Stevens implies that it was CTC and Emanuel's expertise with colour that garnered him the reputation and enabled his further success. That Barry was the only editor interviewed to emphasise the importance of colour suggests concerns specific to the time and on account of its relative newness. However, compared to the continuous discussion in *Television Mail* around the relative qualities of videotape versus film, very little is said about this major development. There are articles, such as "Who's ready for colour?" (Kerrigan, 1969), while, in January 1968, TVR places a advert reassuring clients as to the capabilities of both colour and videotape, simultaneously announcing its new colour studios (Advertisement, 1968b). George Elliot of VTR announces the opening of an "associate company", Colour Commercials Ltd, in 1969 (Advertisement, 1969k) and, later, prompts the only hint of concern around colour and videotape found in the magazine, which appeared on the *The Trade* page in January 1970, ' under the title "Video Tape Colour":

> Last week the writer of our Comment column called a Daily Mail VTR colour commercial 'garish.' George Elliot, who directed it, thought this may have been because of the way our writer's set was lined up rather than because of any technical fault in the commercial, though in fact it had appeared somewhat heavy in the red end on TV Mail's office set, too.

So George invited TV Mail down to Intertel Colour Television's Dean Street facility to have another look at the spot [...] we're happy to be able to report that the colour on the commercial is by no means garish; in fact, we thought it was rather pleasing. [...] Intertel has very kindly offered to send its most stringently perfectionist engineer down to give our set a thorough going-over. Which we have promptly accepted. (Report, 1970b)

This article confirms the magazine's editorial position as well as pacifying a major advertiser and notable name in the local industry. It also suggests that the blame for any potential issues with colour could be – and were – shifted from the original production technologies onto the television sets themselves. That being said, as old analogue televisions did vary in colour balance and framing, Elliot's point was most likely true; however, the illustration of a power-play remains. Barry Stevens completes the story of the formation of Trilion:

Then he [Emanuel] got in with the Sheffield Brothers, who owned Trident Sound Studios, St Anne's Court, and Lion TV down at Shepperton. [...] And so, Trilion became born. [...] the chair was never cold. We designed the edit suite to work next to CTC and then the Sheffield Brothers, Barry and Norman [...] and Tim Emanuel and Bill Hope[68] [...] raised money to build a studio at Brewer Street. A complete studio. They dug the road up. It caused chaos. The corner of Brewer Street and Lexington Street. There is probably still a studio down

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[68] Norman Sheffield was Queen's first manager – the music video for Bohemian Rhapsody was cut at Trilion by Barry himself (*Interview with Barry Stevens*, 12 December 2017). Sheffield's obituary lists the luminaries who recorded at Trident, who would have brought with them considerable social capital to the new project: "some of the world's best known singles of all time were recorded, including David Bowie's *Space Oddity*, The Beatles' *Hey Jude* and Elton John's *Candle in the Wind*." (Grant, 2014) Norman's brother Barry was an engineer and Howard Massey writes: "Trident Studios, which opened in 1968 [...] became one of the most successful recording facilities in the U.K. Trident's fate was sealed on July 30, 1968, when The Beatles, reportedly unhappy with both the vibe at Abbey Road and the studio's inability to provide anything more than 4-Track recording, arrived at St Anne's Court to lay down Paul McCartney's composition, 'Hey Jude,' with Barry Sheffield behind the board." (2015) Barry Stevens refers to Bill Hope as a "chief accountant" (*Interview with Barry Stevens*, 12 December 2017).

there. [...] That became Trilion's main building. That's where we did all the pop

promos and everything. (*Interview with Barry Stevens*, 12 December 2017)

Trident therefore supplied the *Tri* in Trilion, while the *lion* came from Lion TV, the

Shepperton-located, videotape-based mobile truck company discussed above. The

'chaos' at Brewer Street described by both Barry and the November 1974 article above

– which of course served as an announcement as much as a report (Report, 1974) –

was a reference to the site of the new Trilion studio, publicised in a final cover advert

of December 1974, which told the community:

CTC is finally joining big-brother at Brewer Street, and becomes Trilion Video.

Call Tim Emanuel on 439 4177. Trilion Video: for anything and everything in

videotape. (Advertisement, 1974b)

Trilion was, therefore, an amalgamation of CTC's post-production facilities and colour

expertise, Lion TV's mobile videotape equipment, Trident's money and history of

sound-work, and the personnel networks of all the key players. It is into this mix that

the editor's work would be subsumed. Trilion lasted until December 1992 (Amoore,

1993). An article from *Broadcast* in 1989 tells of Trilion's iterations as a global media

corporation, incidentally suggesting an alternative history by stating that it was

started in 1983 by Bill Hope and Barry Sheffield (Feature, 1989). Returning to 1974,

Broadcast's annual production guide gives an idea of early-1970's growth in Soho,

where, of the 262 companies listed, 161 are in Soho, with 48 of which offering "VTR"

as part of their service and 17 additional companies, such as Ewart's, listed as using

videotape, but outside of Soho. The specificities of "VTR" or "VTR production

available" are difficult to ascertain and suggest that the sharing of equipment may

have been more relied on than actual investment. It should, however, be noted that

the use by MPC of the phrase "VTR production available" points to a company that

definitely had videotape editing equipment and yet remained vague on the matter in

the listings (Supplement, 1974). Nonetheless, taking *Production '75* as an indicator

rather than an exact measurement of growth, in which Ewart is indicative of the old,

established companies, MPC the new wave and Trilion an entity of consolidation,

videotape has, in the period 1972-74, conclusively, been established as a medium alongside rather than subservient to film.

The difference in the media remained, of course, and the way(s) in which videotape was used determined the configuration of the equipment, leading to enormous banks of machines in the effects suites, and simple two-machine rooms for the simplest and swiftest editing. As editor Neil Roberts comments:

> ...the stupid thing about videotape is, with two machines, you could do cuts only. If you wanted to do anything more than a cut - if you wanted to do a dissolve - you had to have three machines: one to do the recording, one to play the shot that you were going to be starting from, and one to play the shot that you were going to be dissolving to. [...] And that meant that you also had to have an edit controller, which was a computer that talked to all these different machines and cued them up to the right timecode and then got them to roll; and then you also had to have a vision mixer, which would do the dissolve, which would do keying. You'd have to have a character generator for doing texts and captions (*Interview with Neil Roberts*, 2 November 2016)

To ameliorate such pains, advances were made to mechanise parts of the practice, such as the EDL process. These were adjuncts to videotape practice, which delivered aspects of digital technology and were precursors to digital-NLE in their non-linearity. Shotlister was a system for automating EDL, with editor Renee Edwards recalling using it at Nats post-production house in Soho, contextualising it as important to her practice 'before' digital NLE, saying:

> Shotlister was like the normal U-Matic editing, but the Shotlister would record the timecodes, so you'd end up with an edit decision list at the end of the edit. So it would just make the conform, the online and everything much quicker. So that was a transition that was quite momentous, in terms of saving money and time, and meaning that you didn't have to worry about the quality going down anymore. (*Interview with Renee Edwards*, 1 August 2016)

Neil Roberts describes its non-linearity:

> We bought one of these systems, and it was basically a computer that monitored what was being – what was happening on the tapes, and built an EDL… Shotlister. [...] you could edit one version, and then use that as a source tape to make another version, and then use that as a source tape to make another version. So you're losing picture quality but you're tracking all the events. And it could track back to the original tapes [...] and then it would give you an EDL, which you took into the online. And it was about 90% accurate. [...] so you'd spend your time in the cheaper suite making decisions, and then go into the online suite just to do the conform. (*Interview with Neil Roberts*, 2 November 2016)

Shotlister improved the EDL component of offline editing, which eased the transition from offline to online work. It edges towards a non-linear capability in that it makes it easier for shots to be 'dropped in' within a videotape edit. This would have previously meant a loss of quality, but both editors describe the usefulness of Shotlister because it bypassed the problem of generational degradation by tracking the edit decisions "back to the original tapes". This is similar to the way a film cutting copy would then be used to make a final edit from master rolls of film. This part of the system was a way in which editing practice edged towards digital NLE.

Nonetheless, the multitude of configurations for videotape editing could, and often did, become extremely complex for the very highest end of suites, with the resulting practice determined by everything suggested by Mike Luckwell's maxim "you name it and we've got it". Editors were at the mercy of their employers, who were, as we have seen, often nebulous in their approach to employee development and reactive in their personal views. Editing on videotape was a practice determined by the specificities of the situation in a way that went beyond that of film editing, because of the myriad configurations of the equipment. In this way, videotape editing, in fact, mirrored the creative complexities of film editing – knowing and understanding the possibilities of

the machinery was an additional, and ever changing, step to the successful completion of a project.

Conclusion

The establishment of videotape in the independent production world of 1950s Soho was a process driven by an interaction of factors, in which "individuals, institutions, ideas and technology [which] all interact to spin a fabric of meanings within which this technology [videotape] would be wrapped." (Douglas, 1989, xvi-xvii) These meanings were expressed through the continual churn of the ideas of need, choice and service, as facilities competed to provide what they thought would make them distinct. Within this churn, videotape became embedded.

The environs of Soho were fertile ground for the embedding of video. Taking the different components of Douglas's analysis, "individuals" came in the form of the "film people" (Powell, 1981) looking for work as the post-war film industry hit the doldrums, while "institutions" changed, as independent production widened in step with ITV. "Ideas" realised as commercials presented new possibilities for short-form television and "technology" is represented by videotape, which, in its immediacy, wraps round these components. Soho, with its history of film production, with labs and cutting rooms, in place in production houses, sitting on the grid formed by its streets that enabled people to meet, talk and work, was itself a generative force. All of these factors propelled the commercials industry, while the speed of projects – some commercials were produced and broadcast in a day – contributed to a freelance culture. This freelance culture, evidenced here as occurring far earlier than is commonly accepted, was part of the enterprising, experimental, fast turnaround production culture; yet, figures such as Johnny Fielder could not have emerged without the generative momentum described by editors such as Barry Stevens, written about by industry leaders such as Rod Allen and actioned by creative entrepreneurs such as Keith Ewart. The archival material here demonstrates the many parts that make the whole: the interplay between individuals and institutions that progresses videotape editing practice. Videotape editors, who acquired the

technological capabilities to support the new production workflow (and longer form productions, as television programmes were made alongside commercials), played an integral, if obscured, role in the new mechanics of television production that developed from the advent of commercials on TV onwards.

The next stage of technological development that occurred in editing practice was digital NLE. As discussed above, this was a process that began to evolve long before useable machines appeared, as seen in the random access adaptations Sol Cornberg made to AV systems in 1963 and the CMX system bought by Rank a decade later. The next chapter tells the history of the development of two major, more contemporaneous, digital NLE systems, Lightworks and Avid.

Chapter Four

Digital Non-Linear Editing

Introduction

Digital NLE is an amalgam. It is a computerised editing system which works in a non-linear fashion, made possible by advances in compression technology. Its earliest iterations occur decades before digital NLE systems were widely available to editors from the early 1990s. Ideas about 'digital' began to surface, from the 1970s onwards, in the discourse around editing technologies, in a way to be expected of an industry so given over to embracing the new. This period, over which the possibility of digital hung, overlapped with continued advances in random access technologies, themselves based on a non-linearity rooted in film editing which would come to be expressed in digital NLE. It was a period of hybridity, as the ability of equipment to store and compress information advanced to the point where digital NLE became possible. This chapter tells the history of this development.

News of digital NLE platforms first appears in *Broadcast* as early as 1990. In December of 1990, Cameron Balbirnie reported on 'Light Works' (so new that the name was yet to be settled as *Lightworks*), a new platform comparable to other available platforms such as Avid and the CMX-600. Balbirnie writes that Lightworks was designed against the backdrop of these platforms, "both of which have made huge advances towards random access editing but have yet to capture mainstream editing work." (Balbirnie, 1990) In August 1991, Stefan Sargent, owner of Spitfire facilities house, took out a full-page ad in the magazine, announcing his ownership of the "first Avid in London" and declaring its ability to "free you from 'one shot after another' linear editing" (Sargent, 1991). Reports on the uptake of the new non-linear systems are frequent, but by no means uniform, throughout the 1990s, and digital continued to mean different things. In September 1991, a month after Sargent's advert/article, Chris Dickinson reports that "UK manufacturer the OLE Partnership, which manufactures a rival [to Avid] non-linear off-line [sic] system called the Lightworks Editor, has sold its first unit in the UK.

Soho-based facility Rushes will take delivery of the Lightworks system this month."[69] (Dickinson, 1991a) At the same time, The Bureau post-production house was announcing "All singing, all dancing! The Bureau presents its new digital edit suites" with the list of editing equipment as follows: "Abekas A84 / A53 / A64 / A60 / A72, Sony 9000 / DI / Beta SP" describing its effects and online array as "Harry / Paintbox / Encore HUD, Harry Track / Rank Cintel MKIII Telecine, SOFTIMAGE 3D computer animation, Computer controlled rostrum" (Advertisement, 1991). These systems were an endpoint, where, prior to their released, there was a period of hybridity in which digital objects existed within the post-production workflow but, during which, editing itself cannot be described as digital. This is the period with which this chapter is first concerned.

Stage 1: hybridity

As shown in previous chapters, the development of digital non-linear editing (NLE) was a decades-long process. Sol Cornberg developed his random-access system for schools in 1963 (Cornberg, September 1963), while the CMX system was described in terms of film editing due to its inherent non-linearity (Allen, 1973a). There were undoubtedly many other unrecorded attempts to marry the film and video systems. As video, for all of its qualities, was cumbersome in its linearity, the aim of combining the primary advantage of videotape's instantaneity with the flexibility and creative ease of film is continually present in *Television Mail* and, then, *Broadcast*. The ongoing debate around which medium is 'better' is itself evidence of this impulse, as seen by the headlines alone: "Have Tape Will Travel" (Cricks, 1959); "The Developing Art of Using Tape" (Giddins, 1960); "Are You Still Fighting Tape?" (Dickson, 1961); "VTR - Its Problems and Possibilities" (Fanthorpe, 1966); "Anything Film Can Do Tape Can Do Better" (Abrahams, 1968); and, "Video Appeal for Film Palates" (Report, 1985b). While this was a continual preoccupation, it was not until machines had enough memory to store footage digitally that digital NLE was fully enabled. The achievement of a viable digital NLE system was, therefore, an endpoint in as much as it was the beginning of a

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[69] Rushes opened in 1978. It closed in December 2017.

new practice. Paul Bamborough, the man who developed the Lightworks digital NLE system (discussed in much more detail below), describes seeing, in 1984, "this thing [...] done on the optical discs, which was a nonlinear editing system. [It] was the EditDroid" (*Interview with Paul Bamborough*, 12 December 2017). Taking the mid-1980s as the point at which digital NLE was enabled, this chapter will first trace this hybrid period, which was instrumental in enabling the digital NLE systems that would dominate editing practice in the 1990s – Lightworks and Avid.

This hybrid period was characterised by digital objects forming part of videotape-based editing practice, which involved the mixed use of videotape and digital kit, separate to the online/offline delineation, in order to achieve the desired end of any single project. The idea of digital is used to imply something better. A promotional Quantel headline from 1977 proclaims a "Breakthrough in Digital Television" (Advertisement, 1977a), announcing its "new generation of framestore equipment". Framestore technology enabled 'picture-in-picture', an effect commonplace in news coverage where a story illustration hovers over the shoulder of the newsreader. In the BBC book, *Television in the Eighties: The Total Equation*, Rex Moorfoot[70] surveys digital transmission technologies. Discussing radio, he states that the "emphasis has now shifted to 'digital' sound which can be carried over great distances" (Moorfoot, 1982, 51), and discusses "high-definition television [based on] digital transmission" (ibid., 112) and the BBC's "licence [awarded in the 1981 Charter] to operate the first two DBS [direct broadcasting satellite] television channels in the United Kingdom." (ibid., 120) Moorfoot continues, saying "Everything in this book is here with us in 1982" (ibid., 11), with the clear implication that these are not merely nascent technologies. Likewise, the paper *Digital decoding of PAL and NTSC signals using field delay comb filters and line-locked sampling*, given by the BBC's C.K.P Clarke at the 15th Annual SMPTE [Society of Motion Picture and Television Engineers] conference (itself titled *Production & Post Production in the Eighties*) records the assimilation of digital technologies into the existing analogue system. He describes "the introduction of

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[70] Rex Moorfoot (1921-1994) was a BBC producer, later the corporation's Head of Presentation and, on retirement in 1977, a consultant on communication technologies. (Maill, 1994)

studio areas using digital component signal processing […] However some composite signals will continue to be used in studios for many years. Therefore, high quality decoding at the interface between composite and component signals is important to allow the two systems to co-exist." (1981, 32) Clarke briefly refers to editing when he says that "all the editing facilities of an analog [sic] VTR are mandatory for a DVTR [digital VTR]." (1981, 14) As with the way in which reporting on videotape editing practice was sublimated to discussions of videotape transmission technologies, editing is framed again as a part of the wider goal of improving transmission standards.

In May 1983, Robin Shenfield reported on NAB '83, the annual Las Vegas-based broadcast technology convention held by the National Association of Broadcasters. This trade fair is reported upon every year by *Broadcast* and has the status of a 'need-to-know' event. Headlined "Dazzling new at NAB", his article proclaimed "A one-inch component analogue VTR – confusingly described as 'digital compatible' – was the key exhibit." The overwhelming nature of technological developments is expressed when Shenfield quotes an exhibitor as saying "The industry is saturated with new developments. Everyone is still trying to digest the developments we came up with two years ago." (Shenfield, 1983) On 2 September, *Broadcast* ran the headline "BBC GOES DIGITAL", reporting that the corporation was "fieldtesting [sic] digital transmission of both radio and television signals", a "costly" exercise justified on the grounds that "by the end of the century, analogue will be completely out of date.[71] (MW, 1983) All these reports detail an awareness of the need to keep up with technological change, an anticipation of the technological change ahead, and confusion over the implications of digital and its consequences for the status quo. While the above statements, framed around 'digital', all indicate changes in the production, content, transmission and reception of television, they pinpoint nothing concrete. Instead, the word is used to indicate newness, possibility and inevitability: digital is coming.

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[71] Digital television was activated, on 1 October 1998, ushering in the multi-channel era. The analogue signal was deactivated on 24 October 2012.

There is no stability of practice in editing because, as editor Neil Roberts points out, machinery proliferated for each affordance brought by a particular digital object. This in turn generated additional parts for any system:

> Ampex made VTRs, they made edit controllers and they made this box called ADO, which was [...] Ampex Digital Optics. And this was the first machine that could sort of, fly pictures around on screen [...] If you look back at the '80s, and video, the classic thing that came about was the page turn, you know, the idea of one image peeling off of another one. [...] And there you had all these technical issues that, once you'd got all these different machines, then they all had to be time-base corrected - they all had to be synchronised. You had to have engineers monitoring the sub-carrier to chroma phase, and God knows what else – the eight-field sequence. [...] So then you had machines that dealt with all that [...] if you put down fifteen minutes of your programme, and then realised that one of your cuts wasn't correct in the eight-field sequence, you'd basically have to redo every one after that. [...] In order to correct that one, and then correct all the others, because it was a chain. [...] Then you had an edit controller, and you had EDLs, and you could hopefully just go back, tweak that one, and then ask the machine to do it all again. (*Interview with Neil Roberts*, 2 November 2016)

As well as illuminating the problems of multi-machine linear editing, Roberts references an "ADO", which was a machine used for 'spot' effects, such as flying pictures around the screen or page-turning. As reported in *Broadcast*, it launched in 1981, "under the name Merlyn, appropriate enough for its magical powers, but now [it] has strangely changed its name to the more prosaic and far less memorable ADO." (Griffin-Beale, 1981a, 21). ADO was described as being able to "rotate an image in all three dimensions, around any axis inside or outside the frame [...] two-dimensional zoom, compression and repositioning and the ability to preset a complex sequence of such effects." (Griffin-Beale, 1981b, 13) The rival to Ampex in this arena, Quantel, advertised the similar qualities of its effects machines the same year, in an advert which showed rotations, multi-layering and the spherical bending of the image

(Advertisement, 1981). These effects machines were available a decade prior to any digital NLE systems because the memory capacity to enable them was not as great as was required for long stretches of video. Quantel's Harry, launched in 1985, is the archetypal hybrid machine. It was reported in *New Scientist* in 1985 as allowing "editors to work with video tapes [sic] exactly as they would with film" (Fox, 1985), suggesting an early digital NLE system. However, John Caldwell describes the Harry as a "digital effects device" (1995, 150), while a 1985 *Broadcast* article reports on the "digital store system called Harry" soon to be launched at NAB (Report, 1985a). Harry can be understood, therefore, as a hybrid system which had advanced beyond the capabilities of old framestore equipment and dangled the possibility of full digital NLE editing in its swift non-linear retrieval of graphics. In practice, this meant that, if a complicated effect was required, this could be achieved digitally and then laid onto an analogue tape, becoming just another shot to insert during the final edit. These machines had an effect on editing practice but did not represent the profound change in practice in the way that either the shift from film to videotape or from videotape to digital NLE had.

Other systems from the mid-late 1980s worked towards non-linearity, as Michael Stanton, writing in *American Cinematographer* in 1987, describes:

> ...systems designed for the film community. They include Montage Computer Corporation with Montage Picture Processor, Lucasfilms' Droid Works division with the EditDroid, Spectra Image/Laser Edit with its laser disc system, Bell and Howell Products (BHP) with the TouchVision and Cindeco with the Ediflex. (M. J. Stanton, 1987, 101)

Stanton describes the vagaries and arbitrary nature of attempts to gain a hold in the post-production market, which would again come into play with the uptake of the Lightworks and Avid digital NLE systems of the 1990s:

> Montage entered into bankruptcy proceedings in 1986 but has returned to the marketplace with new financial backing. After several years of effort, the Droid

Works voluntarily withdrew from the marker in early 1986. The laser disc editing system from Spectra Image/Laser Edit represents part of a larger video post-production and transfer company. As such, it is difficult to evaluate the editing system as separate from the total company package. TouchVision has seen limited release thus far, largely because BHP is based in Chicago, away from the largest potential markets of Los Angeles and New York. (ibid.)

Of the two, Stanton deems Ediflex the most successful, with the "single largest penetration into the film industry marketplace by any electronic system", stating that "Ediflex encompasses the human engineering of film editing while drawing on the speed and flexibility of electronics." It does this, he says, by using a "script mimic" technique, where "material can be entered as clips but is normally separated into even more refined divisions; that is, by individual lines of dialogue or action." The system, therefore, mimics non-linear editing, enabling the editor to take chunks of footage as and when they wish, in the same way as a film editor would have reached for a film trim.

Broadcast had previously reported on the Montage and EditDroid systems, "both aimed at making electronic editing palatable to editors who have always worked in film" (Report, 1985b). EditDroid achieved this via "operational controls [which are] designed to mimic those of a flatbed film editor", while Montage is described as working "by creating digital 'picture labels' representing the beginning and end of the clip […] organised into any of seven storage 'bins' from which edit decisions can be made." Between them, these systems replicate both the control provided by film editing and the process itself, with the labelling of footage and the use of digital bins equivalent to trim and trim bins. While neither of these systems would gain currency in the British television industry (*Broadcast* does not report on EditDroid's "debut in Europe" until 1991 (Report, 1991a)), they are indicative of the British editing industry attempting to solve the dissatisfaction with video editing by using newer technologies – embracing the new to enjoy the satisfactions of the old.

Hybridity, in practice, is described in this report as "making electronic editing palatable to editors who have always worked in film." (Report, 1985b) The bins of the Montage system recall the satisfaction of *old* film editing practice, through its facility of being able to randomly access the footage required for the next shot in the piece. In film, this meant simply reaching for the next trim, or asking an assistant to get it, while in computerised random access systems, the footage is placed in virtual bins instead of physical ones. Random access is elaborated on in *Broadcast*'s 1986 report on that year's NAB, at which broadcast technology manufacturers Ampex and CMX both unveiled systems that utilised:

> ...fast acting disc technology that permits edits to be assembled and previewed instantly and endlessly opening the way to a non-linear editing style more akin to film than video. Because nothing is ever recorded – the source material is simply accessed in as many different ways as needed prior to the creation of a video edit list or film-cutter's copy – the usual hardware concerns of video are eliminated. (Shenfield, 1986)

This is non-linear editing and is a key element in the delineation of videotape and digital editing. Digital editing came to be defined by the software capability to access footage randomly, enabling an editor to edit footage non-linearly. This does not mean that such a practice did not occur previous to what we now recognise as digital editing, with Michael Stanton in fact classing both Ediflex, discussed above, and Montage as "non-linear random access". (M. J. Stanton, 1987, 102) Also key is the ability to edit without the generation loss (as previously described) associated with non-linear editing videotape. Digital non-linear editing also recalls many of the characteristics of film editing practice, which will be described in more detail later in the thesis. All of these comments illustrate the hybrid nature of editing technology and practice as it hovered between videotape and digital practices. This can be seen as mimetic behaviour, with technological developers mimicking aspects of what has come before in order to create something new. This mimetic behaviour is described by Letizia Bollini:

...when introduced in the mass market [...] operative systems or software have adopted a *mimetic* approach to existing material references and/or physical patterns already familiar to the users. Even for *early adopter* [...] the experience should be supported by a recognizable mental model based on the memories and previous interactions with similar artefact already embedded in people's minds. (Bollini, 2017)

This notion of the mimetic would be crucial to two developers, Paul Bamborough in the UK and Bill Warner in the United States, who began working on Lightworks and Avid, respectively, in the late 1980s. These digital NLE systems would dominate throughout the 1990s, sharing a 1995 Academy Award for Scientific and Engineering Achievement. The following section details the development of the systems, as told in two interviews with the developers themselves. The following section intercuts these interviews to form a chronology of events from each perspective.

Stage 2: the development processes of Lightworks and Avid

Paul Bamborough was a filmmaker and technologist (he had already designed audio systems for Solid State Logic before developing Lightworks), who first saw a digital NLE system at the 1984 National Association of Broadcasters (NAB) conference. He frames the development of Lightworks within his ongoing frustration at the system he was using – film editing – and his identification of the flaws in the new digital NLE system, EditDroid:

> ...there was a bunch of guys with this thing they'd done on the optical discs, which was a nonlinear editing system. [...] which was the EditDroid. Now, it was ill-thought-through in a number of respects and something that nobody would ever really be able to do much with because it required you to have six copies of your dailies on optical discs, which only be done on specialist facilities and were quite expensive. It was not a model that was going to scale to other than rather big enterprises. [...] I thought, you know, this is really nice because when I'd been working with my editor [and] I would get terribly, terribly bored

[...]. You were spending all of your time unpicking tape: taking a frame off; putting a frame on; putting it back on again; hanging it up. It was 10 minutes every time you wanted to see if the cut worked a little bit better, if it was four frames longer. And, of course, you can't do that all that much because you end up with great nests of tape. [...] literally guillotining it, sticking on tape and then... so as time goes on, if you messed with a cut very much at all, you are... I've got a big lump of tape and it stops running through the machine properly. Then you have to send off to the lab for a new print and, you know, it's just a complete pain in the butt. So, I was looking at ways of making that better. (*Interview with Paul Bamborough*, 12 December 2017)

Having graduated from MIT with an engineering degree, Bill Warner was working, by 1985, at a post-production house in Boston, and remembers being similarly frustrated by the limitations of the editing system he was using:

I was editing [using videotape] and I was so frustrated by how linear editing worked [...] I really truly hated how difficult linear editing was in that you just could not make any changes to your edits. You had to assemble a shot at a time and if you ever wanted to make a change in the edited programme, you could maybe change the last thing that you did, but if you wanted to go back and chose and edit other things, you'd have to recreate all the edits that were after that point. (B. Warner, 11 March 2018)

Both men, therefore, approached the development of technology as practitioners, frustrated with the limitations of the equipment they were using. Bamborough elaborates on the finance and expertise required "to design an editing machine based around the basic principles of editing" (*Interview with Paul Bamborough*, 12 December 2017), enabled financially by his previous work:

I'd made a little bit of money out of Solid State Logic, so I could afford to start a company [...] I had worked with this guy at Solid State Logic. I asked him to join me, along with a person he worked with who helped found a company

called the Computer Film Company, [...] a film company which was the first company that could do cinema grade effects. So, we set up our partnership, the three of us [...] Avid was much better financed than Lightworks was. It wasn't a big company by any means, but they were a year and a half / two years ahead of us and they had a lot more money. And we were six people in a room with limited resources. I mean, I spent about - I don't know - a million and a half quid on Lightworks, and that's not [a lot of] money in the context. But it got us, you know, to the trade shows and I hooked up with a guy who used to work for Solid State Logic who wanted to be our representative in Los Angeles in America, and another bloke I knew in Australia. We sold early to Australia. And you know, people like what you're doing, then they buy them and you make more of them and they buy more of them. (*Interview with Paul Bamborough*, 12 December 2017)

Warner was financing Avid not with his own money, but with the financial backing of venture capitalists and was, as Bamborough points out, far better financed than Lightworks. The backing and support provided to Avid was also formalised, rather than being "six people in a room". Warner says:

I went for venture capital very early on [...] Bill Kaiser, who I'd worked with and he worked at one of the top VC firms really in the world, which is called Greylock Management. I showed him our very early demos and he was really impressed. He came with us in April of 1988 to the NAB Show and saw all of those people come through our suite and try out the product and give us their feedback and that convinced him to invest. The investment itself was finalised in August of 1988, but that meant that we had $500,000 which was small even in those days, but it meant that we were venture backed right from the beginning [...] Through Greylock we got Bill Sahlman, who was a so-called angel investor in the Boston area and was a professor at the Harvard Business School and, more important than that, he knew everyone and especially in the press. So we ended up getting a lot of important press because of Bill. After we had announced our product, we ended up on the front page of the New York Times

business section with a big picture of me with the Avid talking about going global, and that was about our foray into Europe, which was really just beginning. That venture capital and a great board of directors was important [and] led to getting Bob Halperin to be on our board. [...] Bob provided a sort of ethos at the board of 'we can do anything, and we need to focus on being the best; always the best; always looking for the upside; always looking for the positive; not really focusing on the problems'. He would always say to us - and he had this sort of gravelly voice and he was a really small man but with a big persona - and he would say to us, 'You know, you really should be focusing on what can go right'. He said, 'Don't worry so much about what can go wrong. You need to focus on what can go right and be ready for that'. And we did and we were. (B. Warner, 11 March 2018)

This quote from Warner presents several aspects of Avid's early success, in that the financial network backing the project was connected both to press coverage and, thus, further associations with other multi-million dollar companies. Avid was embedded in a corporate network very early on and supported as such. While Warner does not elaborate on how liable he might have been had Avid failed, it is clear he was working in a very different way to Bamborough and his friends. Warner goes on to describe the initial technological development phase of Avid:

The original Avid prototype was a filmstrip model. [...] It was much like laying out pieces of film horizontally and being able to, sort of, stretch them or compress them so that you could see more-or-less of time in a given strip. So, you could see every frame. [...] And the idea was that you would have some sort of viewer that let you see each film frame a little bigger and you could cut and paste film. So, this was similar to [...] the Steenbeck horizontal editors, although I hadn't ever really seen those. This was just what I thought was an obvious way to do it, you know. Instead of videotape, which you can't see the pictures, let's be able to see the pictures and let's edit with that. So, we had a prototype. (*Interview with Bill Warner*, 12 March 2018)

The origination of Lightworks was similarly film-oriented, but more determinedly so:

> I wanted to make certain was that it was familiar to film editors, because film editors were the people who were in power to do interesting editing. Video editors might be talented editors, but the technology was stopping them from being as flexible with their storytelling as they would want to be, because this process of linearly laying down things is intrinsically wrong. It's the work of the devil, because you are building something up sequentially, as you were on videotape in those days, the cost of going back is enormous, so you don't. So, you were working it bit by bit by bit; finishing a sequence; moving on to the next sequence; and if, when you look at them together, the balance isn't quite right and you really should have held this for a bit longer [...] you can't because it's going to take you 15 minutes to get that put together and you're just not going to do it, so you didn't. (*Interview with Paul Bamborough*, 12 December 2017)

Warner, in contrast, integrated both film and videotape editing elements in Avid's source and record modelling. This skeuomorphic interface proved immediately popular:

> ...Peter Fasciano[72] came in and looked at that and right away basically said, 'Hey, you really should make it like the edit suite as today so people will understand it and that means you have a source monitor and you have a record monitor. And no, I don't think we really need these filmstrips'. So, he also had some ideas about an editing system that was predicting your next move [...] and I think he called it 'Oz'. And he created this giant specification for that and gave it to us and we actually made a version of Avid that had

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[72] Peter Faciano's biography from the SMPTE website reads: "Peter Fasciano designed, built, and managed television stations and teleproduction studios throughout the 1970s and in the 1980s founded a successful film and video production company. He then worked with Bill Warner to launch Avid in 1987 and design the interface for Avid's first product, the Media Composer nonlinear editor." (SMPTE, 2015)

source monitor, record monitor and some of the sort of predictive modes that Peter had requested. So, when we showed the product privately in 1988, a year before we actually launched the product, we showed two prototypes: the film based prototype that you saw on the videos and the source and record version with Peter's predictive system as well. People didn't really like the predictive system but they did like the source and record layout, as Peter predicted. Overall what people said was, 'You really should combine these two prototypes into one product', because they liked the visual aspect of the filmstrip editor. And that's what we did. We combined the two and the filmstrip element became the timeline, which had a timeline mode and also did have a filmstrip mode and it established the idea of mixing the sort of old style of editing, source and record monitor with a new style of having a timeline. (B. Warner, 11 March 2018)

Warner further reports that, within the development process, Avid was both responsive to feedback and confident in its innovations:

...most video editors when they saw the timeline they asked, you know, 'What's this for?' and we said, 'Well, it's so you can envision your programme and keep track of where everything is'. And they would say, 'Well, I already do that. I do that in my head. I don't need this', and we basically would just sort of say, 'Well, just wait'. (B. Warner, 11 March 2018)

Warner shows how the timeline, Avid's "filmstrip" so disliked by the videotape editors who originally tested the project, was proven a success by its longevity:

Over time the timeline became the most crucial element of the Avid and, in fact, if you look at the design of editing systems today, they are more and more focused on the timeline itself. For example, iMovie and Final Cut do not have source and record now. They have a timeline and one monitor. So, it all started way back in 1987 with the beginning of a timeline and it's moved more

and more towards the timeline being the most crucial element. (B. Warner, 11 March 2018)

Both systems depended on advances in compression technology to enable the storage of the footage required. Bamborough remembers:

> …the reason it was done when it was, was because, until 1989, you couldn't get very good pictures onto a computer. And then in 1989, [...] an American company, called C-Cube, made a chip that actually could do still images and we hijacked and modified the circuitry around that chip in such a way that we could do it 25 times a second and make movies. And so, we were the first people to actually be able to do quality pictures. So, at that moment, Avid or anybody else - except for the EditDroid, of course, which was working to full video quality - couldn't make pictures that you really wanted to look at [...] what we were trying to do then is, firstly, provide something that was your friend and did things the way you did it; secondly, that had good picture quality, and thirdly, it could play two tracks at once, because you do dissolves a lot and computers were very slow in those days and you couldn't play two tracks at once. So what you had to do, if you wanted to try a dissolve, you had to render it off, which was much slower than real time, and then play it and see if it worked, and if it didn't, do it again a different length. [...] So, we built our thing to have two of these engines and to be fast enough to play two at once. And it was a while till anyone else could do that. In fact, someone told me quite recently that - who was working for Avid - that at the very first show we went to, which was in Switzerland, Avid people... somebody came back to the Avid booth and said, 'There are these guys who've come from nowhere and they're playing two pictures at once'. And Avid said, 'No, no, no. That's impossible. It can't be done. They're faking it'. (*Interview with Paul Bamborough*, 12 December 2017)

Warner also credits the C-Cube chip with enabling Avid, saying "the C-Cube chip – the JPEG compression chip. Well, that JPEG compression chip changed everything. [...]

That took us from, you know, quitting halfway through the marathon to making it across the finish line and sitting and having a beer." (*Interview with Bill Warner*, 12 March 2018)

Both Bamborough and Warner credit the ability to compress data as being key to their systems' development. Warner gave a description, in layman's terms, of the process of compression, saying:

> So we had to reduce the size, so what we did is we 'compressed it'. What we really did is we took the image and threw away most of it. It's called - it's a nice name - it's called sub-sampling. You just take the image and you go, you know, you take the first five pixels and go, 'Forget them', and then take the sixth one. Then you take the next five pixels and you say, 'Forget them'. (*Interview with Bill Warner*, 12 March 2018)

The microchip both Warner and Bamborough remember as instrumental in the development of their systems was manufactured by a company called C-Cube. This company is mentioned in a June 1990 issue of PC Magazine with excitement: "insiders are flocking to a company called C-Cubed [sic], which has developed a real-time compression scheme that does what DVI [Digital Visual Interface] does, only cheaper and better." (Dvorak, 1990) A review of the relevant patents for both C-Cube and Avid reveal very similar properties. The patent description for the C-Cube "Data Compression and Decompression System", which has the Priority Date of March 1990, describes its uses for compressing moving image data:

> The present invention provides a data compression/decompression system capable of significant data compression of video or still images such that the compressed images may be stored in the mass storage media commonly found in conventional computers.

> The present invention also provides:

(i) a data compression/decompression system which will operate at real time speed, i.e. able to compress at least thirty frames of true color video per second, and to compress a full-color standard still frame (8.5" x 11" at 300 dpi) within one second;

(ii) a system adhering to an external standard so as to allow compatibility with other computation or video equipment;

(iii) a data compression/decompression system capable of being implemented in an integrated circuit chip so as to achieve the economic and portability advantages of such implementation.' (Balkanski, Purcell, & Jr, 1990)

The patent Avid took out, with the Priority Date of April 1989, states:

Previously, manipulating video data, e.g., compressing, storing, decompressing, and displaying, and achieving high quality images required specialized hardware and a good deal of time. [...] Accordingly, one object of the invention is to provide fast compression and decompression of video data. (W. Warner, Peters, Cockcroft, & Bedell, 1989)

The fact that Avid's patent filing predates C-Cube's by a year suggests that they were already working on a compression chip, which was then surpassed in its abilities by C-Cube's own. What is clear is the ability of both inventions to compress and decompress moving images in order that they could be digitised into then retrieved from a digital NLE system. Additionally, *Broadcast* reports that, by 1992, C-Cube and Avid are working together "on the development of a new M-PEG chip in order to increase the storage capacity and picture quality of its systems." (Dickinson, 1992) Collaboration and consolidation can, therefore, be seen as a key part of Avid's strategy at the time.

There are great similarities in Bamborough and Warner's accounts of the initial phase of building their digital NLE editing systems: a practitioner's sense of frustration; fortuitous relationships; financial backing; and, the C-Cube compression chip. They did, however, take markedly different approaches to overcoming these problems,

with their stories diverging in the delivery of their products to the market, and the strategies they used to sell them. Warner had marketing in mind, if not from the inception of Avid onward, but certainly early on:

> ...there was a lot of listening that changed what we did in fairly significant ways from what I was imagining the product would be. The first of these was that I originally was thinking about a low cost editing system [...] Carl Calabria, who later became VP of Engineering at Avid, but before that actually ended up making the board called the vista board from TrueVision that was the core of our video playback. But I met him at a conference and I talked to him about the system and about making a low-end system and he strongly recommended that I not do that. He said that they had made a $500 board and they found that the customers wanted tremendous amounts of support and they found it was hard to make money on that low-end product, but later they made a $5,000 [...] and the customers of that product needed less support and yet they paid ten times as much money. I took Carl's thoughts to heart and when we actually showed a prototype in 1988 of two versions of the Avid [...] we also proposed three different prices points for the Avid: one at about 20,000; one at about 45,000; and one at about 85,000. The predictions had been that people would want a high-end product, but I wanted to see if that was true. So, we had about 50 people come through our suite in Las Vegas and look at the product and then fill out the survey forms, and overwhelmingly they did agree that they wanted the high-end product. (B. Warner, 11 March 2018)

Warner, therefore, continues the story of a reactive development, of continually refining the Avid in response to feedback. Bamborough relates a different account of the progression from making Lightworks to selling it:

> RA: ...how did you go from these ideas and this development to, firstly, the show in Switzerland [referenced above] that you've just described; and secondly, to LA? What were the...

PB: Well, yeah, I mean, there were three people in a room and then Arthur, the hardware guy and then a fifth... or maybe there was six of us. Eighteen months' work. Made it work. Built the hardware. Built the software. Sold them. I mean, that's it. It's not more complicated than that. It's all you ever do. So, yeah, it took about a year and a half. [...]

RA: Who was your first customer?

PB: Probably Rushes, which were post, post house. [...] It was certainly one of the very first... or two or three post houses who got it very quickly. We sold to the Beeb pretty quickly too, but it took a little longer. Oh, it's a long time ago. I don't really remember and I didn't have time to think anyway. My memory's not that good for... my memory's pretty good for what we were doing, but my memory of everything around it is less good partly because we were under intolerable stress. [...] I think before we sold to the BBC, we sold to Granada to work on *Coronation Street*, because it was really good for them to be able to bat out the stuff and they were going up from once a week to twice a week and then three times. [...] it was really good for them because they could edit really fast. (*Interview with Paul Bamborough*, 12 December 2017)

Warner recalls selling the Avid through the NAB show as crucial to the sales strategy: "every year we ran on the cycle of NAB. NAB was the guiding principle. What were you going to have for NAB? What was going to happen in NAB? What was your goal?" (*Interview with Bill Warner*, 12 March 2018) He goes into more detail on the process of selling at the NAB show in 1989 and how it was integral to demonstrating the product:

I think it's an important reason why we did become dominant, and that was the idea of sell. 'Sell. Sell. Sell. Sell hard. Sell. Don't be shy. Go for the order.' Now, in my view the product we brought to NAB [in 1989] was not ready to sell. I thought it was ready to test. I did not think it was ready to sell. [but]

People loved it. They loved it. And the lack of complexity and the lack of features turned out to be a benefit. They looked at it and they said, 'I get it. I can do that. That's for me. I can run that'. And that was a big deal. It was not overwhelming. It was clear and simple. [...] We've announced, we were at the show and we were having this party that Apple sponsored and Curt[73] said to me, 'Let's bring order forms to the party'. I'm like, 'Are you kidding? Order forms? We've just announced this. Who's going to buy this?' And Curt was a football player for Duke. He was a defensive and he was a sort of menacing, you know, big guy and he sort of, like, gave me that beady eyed look and said, 'Do it', you know. So, I was like, 'Okay. Okay. All right. We'll have order forms'. So, at the party people came up to us and they said, 'I want to order one'. I'm like, 'What?' And they said, 'Yeah, I want to order one'. I said, 'Well, it's really not ready'. And Curt said to me, he said, 'Okay, we can let them order beta units. We'll admit it's not ready, it's a beta unit, but they can order it'. He figured out a pricing scheme for the beta units. We had the order forms and at this little event that was in a suite at a hotel - it had a big room and then it had a bedroom - people would want to order and we would go into the bedroom with our order forms and we would take their deposit cheque. We got five orders for the Avid at the announcement of the Avid in April of 1989. (ibid.)

Warner remembers a space in which people were channelled through the two rooms in order that they could order a product that he and his colleagues admitted was not ready. Reflecting on the post-NAB period, Warner elaborates on Avid's continuing dependency on the customers cultivated at the trade show. This notion of the insider-purchaser exemplifies Caldwell's analysis of technological exclusivity within the television world and the idea of equipment being able to purchase a different televisual identity (Caldwell, 2008):

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[73] Curt Rawley was an Executive at Avid from early on in the company. Warner describes him as "my right hand man in the company and was the main executive, even from the beginning when he was a consultant." (B. Warner, 11 March 2018)

So, now onto what happened after the announcement. [...] the first thing that happened was Curt was aggressively selling the beta machines. We sold about 30 machines that were beta test machines. They were really not ready to do real work, but people were so excited about them and wanted to be involved with us, that they were willing to pay for that privilege.

Now, it was a very long way from demonstrating a system at the NAB Show, which, by the way, could not digitise video, I think, at that time. There's a long way between demonstrating something versus shipping something that could be used routinely in editing work. Now, Curt and I had put together the financial plan for the company and Curt was very focused on us making the numbers that we had projected, and he made a decision which I went along with, which was at the end of 1989 we were going to convert beta machines into sales; into a complete sale. That meant calling the software 'Release 1' and we did that and we took a million dollars of revenue in 1989, which was a part of our plan. But the reality was that the software still really needed work.

What happened was there were a tremendous number of bugs that got in the way of doing real work, but because we had such a friendly customer group and because we had worked so closely with them, they were willing and they were patient. We went forward and generated our 'Release 2', which came out in some time in 1990, and Release 2 really worked. You could do a full project. It worked. There weren't too many bugs. You could count on it. And that turned our early adopters and early enthusiasts into real believers and we could then begin really selling the product. The question was really, 'who do you sell it to?' [...] What we found was that the Avid was great for making TV commercials. One of things Curt did that played a big role in our success was sort of using his sales team to really figure out that TV commercial market and then aggressively go after it. (B. Warner, 11 March 2018)

The contrast between Lightworks and Avid is clear. Lightworks sold directly to broadcasters and edit houses on a small, sale-by-sale basis, whereas Avid used the

trade shows to sell in bulk, even when the product was not completed. Avid built a customer base by letting people pay to try Avid and then selling them another machine once it been developed enough to be able to handle full projects. Additionally, Avid was thinking early on about fitting the system to the freelance market, a foresight which Warner attributes to Curt Rawley:

[Curt] said, 'We should offer customers removable hard drives because customers want to change jobs. They want to have one set of jobs in one set of hard drives and then swap it out for another'. I said, 'Curt, are you telling me that you think customers will buy seven $5,000 hard drives and then buy another seven $5,000 hard drives and swap between them?' and he said, 'Yes, that's exactly what I'm saying. That's what they need, that's what they want and this is the way to do it'. [...] we look at it and, you know, computers in those days were really not ever thinking that their hard drive would be removed. It was not something that was built into the OS [operating system] or anything like that. [...] I thought, 'Okay, well, look, Curt's out there selling. He knows what people want'. So we went ahead and contacted this company. It was called MDB Systems. We bought some of these things and we put hard drives in them and we made a system where you could just, you know, pull out the hard drives and swap them. And sure enough, customers loved it. [...] We sold tons and tons and tons of them and eventually actually Avid made its own removable hard drives. (B. Warner, 11 March 2018)

Both Avid's "aggressive" sales strategy and its integrative qualities differentiate it from Lightworks, as Bamborough remembers:

Avid spent a very great deal of time - and I know this for a fact; I just don't know the details - spent a great deal of time telling people how terrible their competition was. So, they were very much in the American aggressive mould and we weren't good at dealing with that kind of thing. We were a bunch of chaps, you know. (*Interview with Paul Bamborough*, 12 December 2017)

While Warner does not detail any such tactics, he describes employing a sales executive who helped the company build a territorial sales strategy (again this contrasts with Lightworks, with Bamborough not describing a comparable corporate structure):

Curt [Rawley] said, 'I want you to interview a sales guy', and I was like, 'We don't need a sales guy. The product's not even ready'. And he's, like, 'No, we need a sales guy and this guy - Rick Kramer - is the guy'. He said, 'You're not going to like him. He's brash and he's aggressive. You won't like him, but we need to hire him'. [...] So I interviewed him. He was incredibly brash and incredibly, you know, just super energetic and difficult, but really strong guy. We did hire him and he was phenomenal and Rick was one of the reasons we figured out this selling to the post houses for TV commercials. Rick then was instrumental in figuring out how to go and conquer city by city. So, we started with New York; then we went to Chicago; then we went to LA; then we did Dallas. We just took city after city until we had, essentially, taken the whole country for TV commercial editing. Then we did it in Europe and we did it in Japan. (B. Warner, 11 March 2018)

Warner further discusses the jump from commercials to other media, an incremental step which was also dependent on the advance of compression capabilities enabling editors to store more footage in order to be able to produce longer-form work:

...we're killing it with commercials and then one of our sales guys would go to WBZ TV here and sell them an Avid for making their promos. He'd go in and say, 'Look, you know, how many promos do you make a day? How are they? How good are they? What do you use for editing them?' 'Oh, we use a linear editor.' He's like, 'You know, why don't you buy an Avid to do your promos? It's amazing at commercials, you know, an ad promo is a commercial'. So we got a foot in the door at a broadcaster. In Hollywood we went to people making movie trailers. [Concurrently] Storage got cheaper and now the storage length got longer. And now you can start to do television shows and now we start

going after people making TV shows. [...] We're out in Hollywood promoting the Avid for TV shows. (*Interview with Bill Warner*, 12 March 2018)

The way in which Warner characterises the proliferation of Avid as viral is borne out by its sales: "Avid went from a million [dollars] in 1989, seven million in 1990 to 21 million in 1991 and I think after that it was like 54, then 113, then 240, then 400-something. So those are explosive sales." (B. Warner, 11 March 2018). In *Televisuality*, John Caldwell offers a parallel analysis of the benefits of the CMX-6000 digital NLE system for Hollywood studios, describing how it "promised to be more cost effective – something the old-guard studios have always understood better than anybody else. Significantly, the new tools were tied directly to specific crafts people and to off-the-lot, third party post-production houses". (1995, 77) The strategy that Avid took in understanding the importance of post-production houses and the practice of editors taking their work with them was vital.

In Europe, Paul Basson was in charge of selling Avid. He describes employing a door-to-door sales strategy in London enabled by the close proximity of companies in Soho. The demonstration of the equipment by the film editor, Tom Poederbach, made the Avid *feel* like film editing:

> ...the first thing I did was go out and get a film editor. And Tom [Poederbach] had connections in the marketplace. We were focused initially on advertising. So, London was a really hot market for us and it's easy to get all the post-production houses in London and we went and knocked on their door. I called them up and said, you know, 'Non-linear editing'. 'Oh, yeah, we heard about that.' 'I'd like to come and show you.' I go in with a film editor. He sits down and works magic in front of them. [...] He goes in the edit room. We've set it up. He's talking to five editors and the businessman and I sitting at the back and they're going, 'Oh!' Their jaws are dropping. It's unbelievable the reaction you got from them, particularly the video editors because they weren't so used to non-linear editing, whereas the film editors were. So, the video editors could not believe what they were looking at because you were going to create

the cut list that would be applied to the first shooting, so you wouldn't get all the degradation you get when you run a copy from tape to tape. If they go back to the original tape, run it against this list that you'd created from the edit, and bingo...

In this quote, Basson also reveals the hybridity of the Avid, where its non-linearity, which mimicked film editing, was married to the mechanised EDL, which was a feature of videotape editing. Basson goes on to discuss Lightworks:

Lightworks came out with this fancy controller, which was a copy of the controller that editors were used to. And they did a pretty good job, but, you know, they were underfunded; they were in London, which is a good market, but it's not America, which is the biggest market in the world for technology. So they didn't really stand a chance. We could out-market them, we could out-sell them and actually our product worked better than theirs [...] I think the quality of the development, it [Lightworks] was constantly being updated and it wasn't stable and I don't think that they had the support they needed. They just didn't have the resources. They were stretched as thin as could be because they wanted to be in LA where the film industry was. They wanted to be in New York. Paul [Bamborough] was rushing around the world and they just didn't have the resources to take it forward. But what they did do, they forced us to build a controller in order to make sure that we had a good competitive product against them, so that we could tell clients, 'Yes, we have a film-style controller', and we hardly sold one because people looked at it and they tried it and then they used the keyboard and the mouse pad and they found that much faster. So, as it happened, the controller was a bit of a red herring, but we had to develop one just to make sure we got through the door in some cases. 'Oh, don't you have a controller?' (*Interview with Paul Basson*, 13 October 2017)

The controller was the key differentiating feature between Avid and Lightworks. It was developed to make the Lightworks system feel reminiscent of the film editing tools,

the Moviola and the Steenbeck, a physical manifestation of the sense of film editing that both platforms were attempting to recreate. As Bamborough put it, "anything we model in software is real". He describes its evolution:

> ...the thinking that was informing what we were doing is that editing in particular, and storytelling in general, involve manipulation, conceptually, of things, but I'm choosing the word 'manipulation' deliberately [...] because if you ever watch anybody telling a story, or talking about editing, they move their hands all the time. [...] So, I wanted to make certain that that was reflected in the thinking of how you interacted with the machine [because] you've got a bunch of people [film editors] who are doing things with their hands a lot and also are doing a lot of things with timing, the way a film editor would work, most particularly on a [...] Moviola. Now, a Moviola has a brake. [...] And what people would do is that they would run it until they felt the cut, hit the brake and then run it backwards and it would brake again and see if you came out where you started. Because if a cut is going to work, it's going to work backwards as well as forwards, so it's a very large amount about rhythm. So, you've got people who were telling stories partly with their hands, because they were manipulating real objects and, of course, what the film editor does is they're holding the footage. [...] we stole the layout of the console direction from the Steenbeck because it was a nice handle. Plus we made certain that there was the equivalent of the Moviola brake. So, the big red button that you hit and it stopped right now, and the fact you could go backwards as easily as forward. (*Interview with Paul Bamborough*, 12 December 2017)

Bill Warner, meanwhile, has a different take to Paul Basson about Avid's version of the Lightworks controller, remembering it as an adjunct that was swiftly discarded:

> we did try to design one and I was not involved at all. I was early out. Curt [Rawley] put a fortune into this thing and we hired, like, really big industrial design companies and stuff and people got it and basically said, 'Why should I use this over a mouse? [because] Avid was based on Apple and Apple had a

mouse. And also, we did a lot with key work. We made it very easy for you to get muscle memory going with the keyboard. [...] So, the controller, yeah, we did make a controller and it was a complete failure. (*Interview with Bill Warner*, 12 March 2018)

The story of Lightworks and Avid, as told by their primary developers, is one of contrasts. While the money backing Avid was crucial in its success, its approach was integrative, as Warner says:

Avid was built on third party hardware. We bought an Apple computer. We bought monitors. We bought the vista card from TrueVision. [...] We bought the audio card from Digidesign. We bought other things to control tape decks. We bought everything and we put it together. (*Interview with Bill Warner*, 12 March 2018)

While the console was the chief delineation between the systems, the internal structure of the two companies was the definitive factor in their comparative successes. Although Lightworks did not fold, Bamborough sold it to technology manufacturer Tektronix after the release of an online iteration of Lightworks, Heavyworks, in 1993. The way Bamborough and Warner tell their histories, Lightworks is presented as a videotape editing solution, whereas Warner presents Avid as an attempt to integrate existing systems in order to advance editing practice in general. In that way, Avid was the more 'complete' system. Additionally, Avid's strategic vision was key, with Bamborough not describing any such plan. The adoption of the two systems in British television production is told in the following section.

Stage 3: digital-NLE embeds, consolidates and proliferates in British television production

Digital NLE eventually became the standard mode of editing for television, within which standardisation there continued to be a delineation between online and offline work. This is evidenced in the way operators used digital NLE for offline, but linear

equipment for online, after digital NLE had become the standard for offline. At the same time, it should be noted that editors do become known as specialists in the use of particular software and are valued for this, but also risk becoming obsolete if their specialty is on a platform that is superseded or overshadowed by another. To trace these distinct but interconnected narratives, the section below is split into further subsections: evidence for the embedding, proliferation and consolidation of digital NLE systems, including a section on why editors liked digital NLE; and evidence of standardisation, with additional questions on the convergence of offline and offline work and the occurrence of the 'integrated environment' implied by this convergence. Throughout, the dominance of Lightworks and Avid in the industry is noted.

The appearance of digital NLE among the hybrid arrays of post-production systems was discussed in the previous section. Here, reports in *Broadcast* of specifically digital NLE equipment are highlighted as a means of demonstrating the increasing number of products available. Chris Dickinson notes, in July 1991, "a number of non-linear editing systems launched in the UK over the last few months." These include the focus of Dickinson's report, Instant Image, which differed "from most others in that it has no on-screen computer display, only an edit list management system" (Dickinson, 1991b). Also available at that time was Video Toaster, the budget system described as so easy "every programme maker can become his or her own editor" (Balbirnie, 1991), while Ediflex was reported as being used to "post-produce I Ain't No Dummy" by "The Garfield Kennedy Company for ITV series Human Factor." (Report, 1991b) The headline "Non-linear gathers pace" referred to its use by "[n]on-linear editors and computer-based desktop video systems" (Croft, 1991), with the article detailing the increasing number of these systems as a technological development of which the reader should be aware. For context, it also specifically references Lightworks and Avid, thus suggesting their place as market leaders even at this early point. The descriptions in *Broadcast* demonstrate variances in the quality of the systems, which were also being tested at the BBC.

Rod Longhurst, a BBC editor employed to carry out these tests, evaluates the systems in the context of Avid as the industry standard: "Premier was rubbish. I won't go into

that. D-Vision, EMC², Speed Razor, Edit Star, later on Fast... a German company called Fast and I don't know what their editing system was called. It was quite... not bad. But the main one [rival to Avid] was Lightworks and then eventually Final Cut Pro." (*Interview with Rod Longhurst*, 10 January 2017) Montage and Editdroid are further compared in *Broadcast*:

The two systems [Montage and Editdroid], very different in hardware and approach, are both aimed at making electronic editing palatable to editors who have always worked in film.' [...] Montage describes itself as the only picture editing system which provides the ability to change editorial decisions at random and to instantly view the results in real time without recording or dubbing. It works by creating digital 'picture labels' representing the beginning and end of a clip, taking, as its source, a bank of seven to 20 domestic Beta tape transports containing transferred film rushes. These clips can be organised into any of seven storage 'bins' from which edit decisions can be made. It can wipe, dissolve, fade and cut to any length finishing up with a clean edit decision list. The one limitation is the speed of the Beta transports, which on a series of rapid, short edits can't keep up. The answer, say Montage, comes in software to auto-assemble a work tape on to another, perhaps U-matic, machine. [...] The Droid, which can access source material on either tape or videodisc, is described by DroidWorks general manager Bob Doris as 'a completely integrated post-production system for film and tape.' The operational controls are designed to mimic those of a flatbed film editor – for example, a speed control button with jog and quick/pause buttons – but at its heart is a powerful Motorola 68010 computer with 2 Mbytes [sic] of main memory. [...] the principal application is the offline editing of TV commercials, programming or full-length feature films. Lucasfilm itself, is an early customer. Film rushes are first transferred onto tape or, for faster access, disc. At the same time, a mass of scene and take number, timecode and other information is fed into the Droid. The final result, is a neg cutting list. (Report, 1985b)

Broadcast also reported, throughout the 1990s, on various digital NLE systems, such as the Instant Image "lap-top editor" (Dickinson, 1991b) or 1994's "EMC², a digital non-linear editing system which has so far failed to make a significant impact in Europe" (S. Doyle, 1994). When Discreet Logic announced the possibility of "an entry-level non-linear editing system" in 1997, it made headline news (Franklin, 1997), while the Speed Razor, as mentioned by Rod Longhurst, is only reported when its parent company closes in 2001: "In-Sync, responsible for the Speed Razor editing system, also closed its UK operations last week, resulting in the loss of further jobs" (Strauss, 2001). The brevity of these references is indicative that the systems did not gain any momentum or significant uptake in the UK, which is evidential of the churn of products over the period in question. Additionally, this list does not demonstrate the many iterations of the various platforms, as systems were updated in response to their own failures or the successes of others. Given that many of these systems did not achieve longevity in the industry, further analysis as to why some became more dominant than others will not be undertaken.

The discussion below elaborates on the establishment of digital NLE in post-production and the eventual dominance of Avid. Articles in *Broadcast* will be included, alongside excerpts from interviews with editors working at the time who recall their encounters with this new platform. As has been discussed above, early approximations of digital NLE were introduced into the post-production world as early as 1985 and described as combining the flexibilities of film with the efficiencies and ease of new digital technology. It was not until 1991 that an advert for "the first Avid in London" laid out in detail the qualities of digital NLE through a description of a system that came to have a huge impact on the practice of TV editors. This description comes from Stefan Sargent of Spitfire Facilities and will be elaborated upon below, as part of the evidence for the uptake of particular systems.

The uptake of digital NLE systems in British television production

The uptake of digital NLE systems occurred throughout the 1990s, as shown by adverts and reports in *Broadcast*. Editors also remember using the systems at this time, as is

shown in the interview excerpts found below, which enhance the argument that there was a sense of inevitability in the ascension of digital technology across the post-production process, which encompassed the industry shift from videotape to digital and, thus, digital NLE editing. This did not mean, however, that the transfer occurred overnight or even in a linear fashion. This was an evolution that occurred incrementally and its endgame was the digital NLE suite. Editors recall using the two dominant systems available at that time, Lightworks and Avid, illustrating the way in which Avid was able to achieve market dominance, despite the fact that Lightworks is often remembered as being the better system.

Editor Alan Briggs remembers first using Avid:

> I was made redundant in 1991 or '92 [...] I started on the brave new world of Avid. [...] So I went and paid myself, because I'd been given a handsome payoff to leave Yorkshire, and I used some of the money to go to the Avid... well, they had a training school, so I went to them in London and took a week's course on how to work the thing. [...] I did the course on Avid at Avid HQ in London and started after that to pick up some small jobs... again, small corporate jobs for Chevron Communications. Little pieces that were now being edited on Avid, which at that point was very much an offline system. So you'd produce a cut which was approved, and then you'd put an EDL, an edit decision list, onto a floppy disk which was then taken to an edit suite and it was conformed to that, which was great, because, you know, it listed all the sound edits as well, so it was, sort of, complete. [...] The online suite by this time would be either... well, it would be digital... Digibeta. Digibeta had come in. So that was the format that was then used. (*Interview with Alan Briggs*, 8 January 2015)

Briggs recalls Avid in terms of it being "new", which, in '1991 or '92', it still was. However, the fact that Avid already had a training school in the capital demonstrates its dominance. As Peter Bridgman, who taught editors the rival system, Lightworks, recalls: "Avid was the competition. Avid had more money and more... more development money and more programmers." (*Interview with Peter Bridgman*, 16

June 2015) That Briggs in Yorkshire had chosen to learn about Avid and corporate video production companies such as Chevron Communications were buying Avid systems suggests that Avid could, by the early 90s, already be seen as the dominant system. Briggs also describes Avid, in its offline iteration, being used with online digital linear suites. That he says that Avid was "at that point very much an offline system" speaks to the fact that Avid would swiftly introduce online systems, tailored for specific market users such as high-end broadcast systems or cheaper laptop software. While Alan settled at Avid quickly, he was aware of Lightworks, asking "what was the other one with the shark? Oh, God. I can't remember. It was another digital system that came in." (*Interview with Alan Briggs*, 8 January 2015) (the shark was the Lightworks logo).

As well as offering training, Avid was strategic about making sure its system was compatible across the multiplicity of systems and formats available. In 1992, *Broadcast* reports Avid as spearheading the Open Media Framework, to "allow Avid's Media Composer offline non-linear editing system to interface with other desktop systems". The article argues that Avid's intention is to lead "the introduction of a common software platform", going on to say that "Avid's European head Paul Basson said as many manufacturers as possible would be invited to join the OMF, including rivals such as the OLE Partnership, which makes the Lightworks system." The inference of Avid and Lightworks as the main rivals in the digital NLE field is clear, as is the implication that Avid, strategically, has the upper hand. The report has an addendum stating that "OLE Partnership has set up a marketing agreement with Toshiba to sell the Lightworks in Japan. Toshiba will also work with OLE on the development of other products." (Dickinson, 1992) Compared to the dynamism implied in the description of Avid's strategy, Lightworks seems pedestrian. This report echoes the interviews of Bill Warner and Paul Bamborough and their own recollections of the differing marketing strategies employed by Avid and Lightworks.

Avid also benefited from the ideological positioning of one of its early adopters, Stefan Sargent of Spitfire Facilities. It is important to contextualise Sargent himself at this point, as his persona and reputation are central to the advert's efficacy. As a founder

member of the post-production house Molinare[74], Sargent's status as an innovator in the post-production world was documented and cemented long before the Avid advert. He appears frequently in *Broadcast*, often smiling, standing in doorways, projecting the image of a sunny, optimistic individual. Sargent's website[75] attests to the creation of the persona shown in *Broadcast*. Images of his work as a cameraman, from the 1950s, in his home country of Australia at once assert that his place in production was established before leaving Australia and demonstrates his longevity. Once in London, he directed *The Australian Londoners* (1965), a documentary made for Australian TV on the 'cultural exodus' of artists and intellectuals leaving Australia for London in the 1960s and described on the website as "having created such an outcry it was repeated twice the following week" (Sargent). It is still available on Sargent's vimeo page.[76] Although mixed feelings were expressed about members of this exodus (Alomes, 1999), their prominence commanded broadcast documentation. Sargent's connection with the group is proven by the intimacy with which he films the subjects, which include Rolf Harris (who also presents), the artist Brett Whiteley, actor and comedian Barry Humphries and the opera singer Dame Joan Sutherland. The programme suggests both Sargent's exteriority to the British cultural elite and his membership of a newer, innovative group with its own sense of elitism, defined by the transplantation of the subjects' exotic Australian identity to the UK ("the old country"). This non-foreigner/foreigner status invests the images of Sargent in *Broadcast*: ever-smiling, always looking openly towards the camera as if embracing the new opportunities emanating from wherever he is looking. As an industry leader occupying this particular place of originality and innovation, he asks the viewer to trust him in the manner of a politician. Michelle Amazeen elaborates on the ideological emphases found in adverts in her analysis of American political advertising (2012). She describes how "meaning is produced through particular expressive forms", including "appeals to emotion", and how "framing highlights particular issues and obscures

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[74] Molinare was founded in 1973 and has an unuslally stong presence in Television Mail and Broadcast, with Sargent adopting a publicity strategy of taking out columns in the classifieds section on a semi-weekly basis to inform readers about the company. Sargent was sacked from the company in 1983, but it remains a Soho stalwart.

[75] www.stefansargent.com

[76] https://vimeo.com/61402540

others", while adverts "elicit strategic emotional responses from viewers that can in turn influence political behaviour." Below, using Sargent's 1991 piece, further attention is paid to the specificities of digital NLE, and Avid as a political and ideological choice.

Figure 7: Broadcast, 2 August 1991, Stefan Sargent's new frontier (Sargent, 1991)[77]

On 2 August 1991, Sargent heralded NLE in an essay-advert published in *Broadcast*. Titled "The Un-Edit Suite", the text surrounds an image of the editor Renee Edwards who, in conjunction with the new technology, is offered as a solution to all linear editing difficulties. While the difficulties of linear editing and Sargent's position as a major personality in the London post-production world have both been described, it is important to see them in conjunction. Sargent, with his status and longevity, is offering a system that will "free you from the confines of 'one shot after another linear editing AND can speed your edit by a factor of five." Here, Sargent is asserting a division between outdated and efficient new practice, a technique which Amazeen identifies as relating to how "the implicit message of the advert packages the world into a dichotomy of believers

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[77] See appendix (page 274) for full-page reproduction of the advert and transcription of Sargent's text.

and non-believers." In his claim to be purchaser of the first Avid in London, Sargent was seeking believers in his vision. A leader in his field, he was asking readers to have faith in his ability to free them from previous professional confines.

The piece does, however, occupy a peculiar space. It is an advert for a facilities house, yet also an explanatory text. It uses its prose address to its audience to imitate a newspaper article, while relying on the reader's knowledge of its author, it becomes more like a newspaper opinion piece, gambling that the audience will be interested enough in its author to read beyond the headline. The advert opens by recalling film editing, "When a film editor wants…", and the ease of splicing and cutting film, which it compares to the limitations of videotape ("You can't cut videotape like this"). Videotape is described using the words "impossible", "clumsy", "plod" and "trying". As, by this early date, NLE was still not an established platform, the piece is supremely confident in its assertion that NLE will be a success, a confidence that radiates from images of Sargent himself. It is perhaps surprising, then, that Sargent disconnects himself from digital NLE by situating the editor Renee Edwards as the bridge between the old linear world and the new Avid-enlightened frontier. Throughout the advert Sargent puts Renee in charge ("Renee starts editing" and "Renee can"), although her picture is carefully labelled "Renee Edwards – Spitfire's Avid Editor", emphatically identifying her as pertaining to both Spitfire and Avid.

When asked what she thought of the advert, Renee Edwards herself was reticent, saying:

> Yeah. Well, I don't know, I mean… I guess he thought I was a selling point (laughs). I don't know, I mean – I guess he was trying to sell the editor rather than the machine, because at the end of the day, that's what it comes down to, [...] it's pretty boring looking at a picture of a machine. (*Interview with Renee Edwards*, 1 August 2016)

Acknowledging the clear differentiation between the image of a young attractive woman in the centre of an advert and the "picture of a machine", Edwards' response

illustrates the unease around the unproven qualities of both Avid and digital NLE, as shown by the need for an editor to guide the client through the workings of the machine. What the advert does not reveal is Edwards' own ease with the system, even though its claims are clearly grounded in it. Recalling her early use of Avid at Spitfire, Edwards says:

I worked quite a lot at Spitfire, and I think I was still doing quite a lot of corporate type work. It was starting to get a bit more varied. Then one day when I went in there, Stefan who owned it said to me did I want to look at this machine that they had; they were beta-testing it. And so I went and had a look at it and a play with it, and I just loved it, because it combined the film editing that I knew about and the tape editing that by then I'd been doing for a while, and I could instantly see it - that it was liberating, because you could just make the changes. And I think I was there on my own - there was a distributor who had the machines, and he would come and he installed it, and came and went along the way - so I can't remember whether he showed me it, or whether I was there on my own. I do remember spending time with him around that time as well… Anyway I instantly, I just kind of got the machine, as it were, and I just said to him that I loved it. He offered me a job working full time on it. (ibid.)

Edwards reveals how Sargent felt able to trust in her ability to meet the promises he would make of Avid's capabilities and place her at the centre of his operation. What is clear from the above is that she enjoyed Avid so much that she felt liberated, and both "loved" and "got" it "instantly". This demands an exploration of what editors liked about digital NLE.

When editors recall the specificities of what they enjoyed about digital NLE, they note how the systems echoed film – they recognised the mechanics and felt familiar with their features. Editor Richard Moss makes this connection explicit when he says "with digital non-linear ways to work, we're coming back to some of the original editing techniques of film. Film was the original non-linear platform." (*Interview with Richard Moss*, 20 September 2016) Elements of relief are expressed at the sense of regained

control over the material enabled by the new systems, with editor Alan Briggs stating that "Avid that was coming in. So I thought that, as a system, now makes sense to me, because it was more like a film approach to editing than any of this [video] nonsense, because you could have it all in front of you." Briggs is made comfortable by his access to the material:

> I looked at Avid and thought, yeah, this is right. It looks right to me. The way it's set up reminds me of editing film, so I can kind of get my head round that. It was understanding the basics of it; the basic principle and that's why I'd stuck with it. […] I recognised the idea of putting things into bins and things, which is what you would do in a film cutting room. You would put things in certain places and retrieve them in a certain way. So it was quite easy for me to transfer that basic understanding. (*Interview with Alan Briggs*, 8 January 2015)

While digital NLE's similarities to film editing are clear, Lightworks trainer Peter Bridgman goes further in ascribing the success of digital NLE to a previous fear of technology when he says "they [editors] were scared of computers, and when they sat down, they went, 'Oh, it's like film editing', they were immediately relieved." (*Interview with Peter Bridgman*, 16 June 2015)

Bridgman directly compares Lightworks to Avid: "Lightworks was closer than the competition to film editing. It was closer than Avid. People who had seen both, editors who had... film editors who had seen both found the Avid inflexible and they didn't like editing on a keyboard." (ibid.) This is echoed by editor Andy Kemp, who recalls affectionately this aspect of the Lightworks interface:

> I remember there was a system called Lightworks, which I loved, which was the first non-linear system I worked on. It was one that was made here in the UK, and it had a Steenbeck control which was a way of driving the pictures using a little handle that was really familiar to film editors. And I loved that system. (*Interview with Andy Kemp*, 21 May 2016)

Bridgman's recollection that editors did not like the Avid interface is not supported either by Kemp or in interviews with other editors; however, the Steenbeck control is remembered fondly. Bridgman describes how this affection influenced the development of the console:

> ...those editors who had used the flatbed machine, you couldn't ask them to cut a film on a keyboard. They would just say, 'Well, I can't do it'. So what Paul developed was this brilliant thing, the Lightworks console, which had a Steenbeck control for playing shots forward and backwards. Forward; backwards; stop. (*Interview with Peter Bridgman*, 16 June 2015)

Editor Mike Mulliner remembers the success of the console and the joy of using Lightworks, framing his memory in terms of film editing: "it [Lightworks] was actually, it was really nice to work on. It was almost like working on film because the interface had been carefully designed to resemble what you were used to. It was much nicer to handle than Avid, for instance, which is more computer-ee than film edit-ee." (*Interview with Mike Mulliner*, 7 January 2015). This is reiterated by editor Dawn Trotman when she says:

> Lightworks, that was the first non-linear computerised system I did […] and that was operated with a Steenbeck controller, I remember it had a big button at the side, it was trying to make you feel like you were still in the film world really and I thought that I was really gonna hate it but because you couldn't touch it, you know you could touch film and film is so visceral […] and I thought 'this is gonna be really weird' but actually I loved it. I really loved it. (*Interview with Dawn Trotman*, 28 August 2014)

Rod Longhurst recalls Avid's unsuccessful attempt to copy the Lightworks controller: "[Lightworks] designed it like a Steenbeck. It had a Steenbeck controller and it responded like a Steenbeck. Avid desperately tried to make one to match, and when it came in it was about three and a half thousand, and we got one in and it was rubbish. You'd go like that and it didn't move. They gave up." (*Interview with Rod Longhurst*,

10 January 2017) Andy Kemp makes an additional point on the efficacy of the Lightworks interface that echoes the differences in the development processes for video editing compared to film editing described by Bill Warner and Paul Bamborough:

> The main thing is that in Avid you... when you want to make an edit, you have an in-point and an out-point, and you can do that and it's made the edit. So, that's perfectly logical. It makes perfect sense. You have an in-point and an out-point, or you can get rid of all of that stuff there. So that's, essentially, it. With Lightworks they had a really intuitive way of working for film people, and that is they had this handle and they had something called 'mark and park'. So you only ever had one thing to... you would identify an in-point and then you'd play and where you'd stop would be an out-point. So you wouldn't have to identify an out-point. It's where you stopped. [...] You would arrive at it through looking at it, and it would be telling the machine to stop, would be your out-point, which is exactly how film editors worked. So that was pretty cool really and they got that. (*Interview with Andy Kemp*, 21 May 2016)

The popularity of Lightworks is clear from the sources presented here. While Avid delivered a new computerised interface with its keyboard, Lightworks presented an intuitive interaction, a replication of the film-editing model where the sense of *digital* was once removed. How, then, did Avid become the dominant system? As editor Tony Heaven says, "Avid really won the day in the end" (*Interview with Tony and Hazel Heaven*, 14 November 2016). Andy Kemp continues:

> And then Avid came along and it was ferociously marketed, and it had... it was really trying to take over, and it did. [...] it's substantially different from Lightworks, but I knew that I was going to have to learn. I'd just learned Lightworks. I was very happy with it, and then Avid came along. And I remember taking a 12-week booking and they said, 'Can you use Avid?' and I said, 'Yes', which was a lie. And I just booked an Avid editor and an Avid [...] I remember, the weekend before my edit started [...] I spoke to the editor and I said, 'Look, just talk to me as you would an editor', you know. There are lots of

people who can demo stuff and tell you 90% of the things you don't need to know, but I just got this editor to tell me in a day what to do and how to switch it on and how to start, how to cut on it. And then the second day, the Sunday, we played around and he watched me work and gave me a few tips and on the Monday I started the job. [...] I learned as I went on. And this thing has become so much more sophisticated now from the first version I used, which I think was version 2. I still reckon I know about 10% of what this thing can do, and I know, you know... and that's a lot. But there's tons of this machine that I haven't a clue about. (*Interview with Andy Kemp*, 21 May 2016)

The compulsion, that Kemp recalls, to "learn" the "ferociously marketed" NLE system when he was "very happy" with Lightworks, suggests a response to Avid that goes beyond wanting to stay up to date. He realised that to be a continuing success as an editor he would have to learn. He did not, as Alan Briggs did, go to Avid for tuition, instead choosing to learn in a collaborative manner from a fellow editor as they "played around", meaning that he "learned as [he] went on." The fact that Kemp admits to knowing "about 10% of what this thing [Avid] can do" presents a contradiction in the compulsion he felt to learn how to use Avid specifically. The unique properties of the system are deemed unnecessary, even though it is essential to be familiar with them in order to be able to use the system on any job. Renee Edwards reiterates this when she goes on to discuss the appeal of digital NLE compared to videotape (while she uses Avid to refer to digital NLE, this could have been any system):

When you were working on tape, you had to remember literally which tape everything was on and where it was on those tapes; and if you were lucky somebody would have logged it all, or if you were lucky you'd have had time to log it all and look through it. But basically as soon as you were on Avid, you could take the tapes in and subclip them, so you could make clips of all your shots; and obviously you could just stream the mouse straight through the whole tape and find things much quicker, put marks on them and things. Can't quite remember if you could do that then - but anyway, you could definitely

make subclips. But even just the editing, and being able to trim, and just the simple things that you literally couldn't do on tape - you had to just make that decision and go with it, which I think was a good discipline to come from, but it meant that you couldn't quickly assemble a programme and then go back and trim it and craft it. You had to craft it as you were working. So you do a lot more work in your mind before you actually committed it, in a way; whereas on the Avid, you could just like throw all the shots down that you thought you wanted to use in that scene, and just keep going forward; and then go back and craft it. And you didn't have to rely upon wading through lots of paper. (*Interview with Renee Edwards*, 1 August 2016)

Nothing unique to Avid is mentioned here. Instead, Edwards' conflation of digital NLE and "the Avid" suggests that they are, for her, one and the same. This, in turn, suggest that Avid's "ferocious marketing", as Andy Kemp describes it, eclipsed the other systems, both at the time and in the interviewees' memories. After all, while Edwards did use Lightworks, she only mentioned it in passing: "And then of course there was Lightworks as well." (ibid.)

Throughout this passage, the statements given by editors demonstrate the tendency to reflect on digital NLE and videotape editing in comparison to that which came before, namely film editing. Film editing, although definitely manual and with its potential to be cumbersome – containing as it does reels and reels of flimsy celluloid and mechanical editing machinery – has appeared throughout the quoted interviews as a kind of master template for editing. This is problematic when attempting to discuss the move into digital NLE, because the tendency to contextualise via a time period previous to the one being discussed adds a historicising layer extra to that being reported, with the former having the potential to cloud the latter. This does not mean, however, that no credence should be given to the comparison. For example, editor Tony Heaven commented on the increase in shooting ratios by looking back to his editing practice when working with film:

I fear that these days, things – 'oh, shoot everything, it'll be fine; we'll sort it out in the cutting room'. Therefore you're having silly shooting ratios of fifty to one or more; and you never get - an editor never gets to know the material – sit down, and – you don't know – you can't - you haven't physically got time to view all the rushes, as we used to on film. (*Interview with Tony and Hazel Heaven*, 14 November 2016)

The changes in practice across the different aspects of production that digital technology brought about and the implications they had for editing practice are present and largely able to avoid being tainted by nostalgia. In fact, the editors remain explicit as to the ease of operation afforded by digital NLE, while the swiftly improving iterations and increased capability of the systems (as noted by Andy Kemp above) are also made clear. Renee Edwards remembers her early experiences of digital NLE in terms of flexibility and stylistic creative potentials:

I think in terms of making things, just being able to cut to music and being able to do so much more in the time; again, I think that was really a big difference. And I think you could make your own style of editing [...] You could play around with different styles, especially doing something like that, magazine programmes. And the other brilliant thing was because you worked with lots of different directors at the time, and producers, and some of them were really talented - together you could come up with something brilliant. And if you were willing to spend extra time in the edit suite, you could take something way beyond what you probably could have got away with delivering. You could go way beyond people's expectations, if you were willing to put the time in, just because of the technology. (*Interview with Renee Edwards*, 1 August 2016)

Digital NLE therefore presents possibilities for collaboration and great creative potential at a software level, even if that potential can go unexplored. The adoption of digital NLE was not immediate – editor Richard Moss recalled using videotape editing at the BBC in 2003 (*Interview with Richard Moss*, 20 September 2016) – but, as the 1990s continued, the iterations of the platforms became standardised and, with

offline and online converging as single systems, became capable of handling both parts of the edit.

Standardisation: the convergence of offline and online work in digital NLE in the 'integrated environment'

Digital NLE would become the standard editing platform, a standardisation that is implied throughout the interviews discussed above and can be seen in the fact that digital NLE is the way in which the vast majority of television programmes, feature films, commercials and short form media is edited today. This standardisation was also influenced by the developments in digital camera technology that led to much more footage being filmed, leading to increased shooting ratios (as noted by Tony Heaven above). This meant that the storage capacity of digital NLE became essential, at the offline editing stage at least, because it was easier to store the footage digitally and access it via digital NLE systems. Digital NLE also offered independence for the editor as laptop systems delivered portability. This equipment was used particularly in news production, where more portable editing systems were a significant benefit – and a threat as producers were, potentially, able to perform the role of editors (elaborated upon later in the thesis). The fitful uptake of digital NLE in the 1990s is indicative of the anxiety felt by facilities houses about the new technology, which is elaborated on in the exploration, set out below, of how digital NLE was used for offline work while linear editing remained the norm for online work.

In a 1997 article in *Broadcast*, in the regular *Suite Talk* column, a space for industry luminaries to give the inside story on a particular topic, David Cadle of Blue Post Production, a Soho based facilities house, expresses anxiety about the capacities of digital NLE during both online and offline work. However, it seems that this article is an unsuccessful attempt to mask the evident anxiety about the possibility of digital NLE taking work away from businesses such as his own. It also implies the capacity of digital NLE to threaten the dominance of what he calls "conventional" edit suites, as digital NLE equipment offered comparable affordances at reduced costs. In the opening paragraph, he casts doubt on the promises of the manufacturers, writing

"There's a lot of buzz about non-linear being the route for all post-production – I've no doubt you've seen all the ads and proclaimers from the manufacturers." He adds, as a (somewhat defensive) proviso, "I am a huge fan of non-linear!" He writes "For the client these options on editing systems (and they are numerous options) must be a minefield", implying that the client is offered a better service if that decision is taken away from them. After clarifying that the "majority of work we're doing here at Blue on our [digital NLE] Editbox is in commercials and music jobs" and praising the system's "big advantages", he states that "we recently edited *Rebecca* for the ITV network, a four-hour drama, in one of our conventional edit suites. This could have been done on Editbox, but to us it was a job for traditional online editing", continuing:

> I think too many people look at traditional edit suites and don't fully appreciate that – while they're built using conventional technology – they are different rooms than they were five years ago. Edit controllers have advanced hugely controlling multiple disc recorders while Digi Beta has made these rooms extremely fast and, more importantly, they are places that the clients can understand. (Cadle, 1997)

Bound up in this deliberately drawn distinction between old and new is an emphasis on the 'look' of the suite as a space recognisable to the client, in order to reassure them that their project is not being used to trial experimental technology. However, Blue had completed an expansion of its Soho facility in 1995, installing both an Avid and an unspecified "top-end non-linear editing system" that was "more luxuriously fitted out than the typical offline suite" at a reported cost of £400,000. (Report, 1995) Despite the significant investment in offline digital NLE, there seemed to be a lack of confidence in online NLE. Cadle comments further stating that "Blue has invested an obscene amount of money in both technologies and recently opened a third digital online suite much to the amusement of certain players in Soho." (Cadle, 1997) The use of the word "both" implies a distinction between the digital NLE offline and the digital linear online capabilities available at Blue, and also suggests a lack of consensus amongst post-production houses as to the permanence of digital NLE online equipment. Some had confidence in the technology, while some did not. A month

later in the same column, Andrew Vere, MD of facilities house SVC Television, commented tangentially on industry fears around obsolescence, while writing about media production courses: "Given that most of the courses on offer are at least two years, what on earth is the point in training people for yesterday's equipment?" (Vere, 1997) It is in this context of equipment churn and uncertainty that editors had to navigate.

By 1997, reports suggest that digital NLE was indeed becoming the standard, with Avid reported as being the standard to which editing houses adhered. On 23 May, *Broadcast* reports on an edit house upgrading its systems "to the AVR77 picture quality standard approved for broadcast quality programmes." (Report, 1997) As with Avid's previously discussed networked sales strategy, applied throughout the industry, to both ensure compatibility between the machines and adherence to its own standards, the company is here dictating standards via picture quality. This reinforces the idea of Avid already being the standard editing platform, the standard by which others judged the acceptability and efficacy of the editing platform they used. Meanwhile, other adverts imply that digital linear editing had also become the budget option. On 23 July, Frontline advertises its Digital Betacam Editing with "Great Suite, Great Value, Great Editors, Great Company" that used linear equipment including a "Sony 9100 edit controller and Abekas 8100 vision mixer". Tellingly, the equipment list is in very fine print, as if the house is slightly ashamed of it. (Advertisement, 1997b)

What was the "integrated environment"?

An April 1997 advert for Discreet Logic's Flint states: "Discreet Logic's Flint is a real-time solution for special effects creation and image manipulation. With online, nonlinear production capabilities like multi-layer compositing, editing, paint, and graphics, all in an integrated environment, inspiration never has to wait." (Advertisement, 1997a) Although Flint was, in fact, an effects package, rather than an editing system, the text demonstrates how language was used fluidly in an attempt to imply possibilities that perhaps were not there (Flint's editing capabilities were found

solely in its ability to edit the effects it created). The "integrated environment" refers to the fact that a single suite could be used for the entire post-production process, due to a system that could process content from raw footage to online completion. Despite the existence of systems with this capability from the late 90s onwards, it was not something that editors seemed to want. Renee Edwards discusses Avid's effects capacity and her feelings of ambiguity towards using those effects, which also echo Andy Kemp's comments about not using the system to its full capability:

> 'And the more effects that came in, the more I found that I didn't really… I still don't play much with the effects. If I got an idea in my mind that I wanted something to look a certain way, I might ask someone to show me how to do it, an onliner to show me how to do it; or I might try and play around and work out how to do it - but I always like to play more with the pacing first anyway, and then see if we can collaborate with the online or whatever to maybe take it to another level.' (*Interview with Renee Edwards*, 1 August 2016)

Collaboration remains key, in that no matter how 'complete' a system is, the input of other people remains invaluable to practice. While the editors interviewed for this thesis concur with Renee Edwards, in that they all preferred collaboration and specialising within their own, self-identified boundaries, the strategy for Avid was to enable editors to become "integrated", should they wish. A *Broadcast* article from 1996 reports that Hollywood "special effects giant Industrial Light and Magic has bought more than 50 Avid Media Illusion digital effects software packages." (Report, 1996) As well as being strategically important and financially prudent on the part of an industry giant, such a major purchase also confirms Avid's consolidation as an indispensable component of another sector of the industry, in this case effects. The software itself also gave Avid operators the opportunity to add the software to their existing systems in order to widen their editing skillset. Avid thus became ubiquitous throughout the post-production workflow. In 1997, Avid released a software package for online work, obviating the need for online processes to be carried out on videotape. Videotape did not disappear overnight, but it was no longer a required part of the editing process.

Conclusion:

This thesis has, throughout, examined the idea of finding the aspects of a technology that make it "distinctive" (Douglas, 1989). The distinctiveness of film editing was found in its existence rather than its capabilities – there was no other mass medium with which to edit. Videotape distinguished itself from film in its immediacy and aesthetic qualities, which, for users, were points of either preference or dismissal. Digital NLE technologies had the qualities of both film and videotape, namely flexibility, rapidity and effects. Douglas also explores the idea of distinctiveness in the context of why particular versions of a technology win out, the notion of technical distinction. The story of Avid and Lightworks is not, however, really about the technology, but about the corporate body behind the technology. Of the editors interviewed here, all practicing in the context of British television, most preferred Lightworks, but Avid overwhelmed the market.

Conclusion

This thesis shows that there were no drastic changes in editing technologies as they shifted from film to videotape, and then to digital. There was, instead, a slow, evolutionary set of processes that were determined on a macro level by institutional contexts and agendas, and on a micro level by individual practices and preferences. Technologies were incrementally adopted and used as described by Ellis in his conception of the "operating system" (2015), that is, each encounters a complex set of practices contingent on multiple factors. Editors had to continually respond to and negotiate the technological and industrial changes that occurred as the media changed and did so in a reflexive, oscillating manner that dictated myriad individual practices.

Film editing is shown here as boundaried by its physical limitations as a medium. The time taken to process, duplicate, cut, organise and store film meant that practice had its own specific micro-geography, with spools, trims, bins, tables, splicers and reels dictating the layout of the editing space. Editors had their own ways of dominating their workspace in the same way celluloid did, by turning their backs to doors or requiring specific equipment. Not only did the adoption of such positions sometimes signal seniority but also interiority – one's own way of doing things. Film editing is also shown here as being remembered as bound to the context of its surrounds – its materiality conflated, in the recollections of interviewees, with its use in cinema. Film becomes romantic, taking on meanings beyond its literal use as a medium of record. Memories of the specificities of film editing for the BBC and, specifically, at its Television Film Studios also provide a history of a place, undoubtedly disappeared but fondly remembered, coloured by the historical and institutional contexts of the work that had been carried out there before. Cutting at the TFS is not remembered as just editing, but as editing for the BBC, at the old Ealing Studios, as something qualitatively more than just work.

Videotape editing is defined here by its continual advancement – as the technology progressed, editing practice changed, an ever-mutable form discussed continually by the industry. Unlike film, it was a technology that never 'settled', but instead took on different forms as new possibilities opened up. The previously unseen archive documents from ITV reveals the way in which the franchises communicated both with Ampex and the American broadcasters to bring this new technology to the UK, alert to and experimenting with its possibilities in covering events such as the Papal Coronation of November 1958. That the archive reveals the existence of a 'tape editor' as part of the team for this broadcast shows how early on in its evolution videotape was being edited. The acquisition of videotape equipment by the ITV before the BBC overturns the commonly held assumption of the BBC being, consistently, the broadcast industry leader: in this case, it was not. The documents also reveal how swiftly videotape was embedded into the production processes of ITV, serving as a training ground for figures such as Johnny Fielder, who then used his experience to launch his own independent editing career in Soho. This second stage of Fielder's career was itself facilitated by the independent production of commercials, in a cyclical process instigated by the advent of ITV itself. New videotape production workflows and the production of commercials, made swifter by the use of videotape, required new practice, which, in Fielder's case, originated at ITV itself.

The information found for this thesis in the ITV Document Archive can only lead to a frustration that, it seems, ITV has "decided to no longer offer access to the Document Archive for any further third party research" (A. Martin, 2018). The enthusiasm, experimentation and innovation that Granada showed in the early videotape broadcasts evidenced here are unlikely to have existed in a vacuum, so there is much more to be learnt. The evidenced embedded presence at Granada of personalities such as Wendy Toye[78] indicates an intersecting of film, stage and television which

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[78] Wendy Toye was an award-winning "Dancer who became a choreographer, actor and director for stage and screen" (Obituary, 2010). She was a recipient of a memo regarding the use of videotape in Granada 1958, suggesting she had a previously unrecorded notable presence at the franchise (Peers/PVS, 24 July 1958). For example, both the referenced obituary or the survey of her career by Caroline Merz make no mention of Granada, ITV or television at all (Merz, 1994). However, in an interview in the same book, Toye discusses making *The Stranger Left No Card* on videotape in 1981,

merits further investigation. Details such as these offer evidential layers to the central theme of this thesis of shifting institutional boundaries at a time when broadcasting was, in technological and programming senses, open to the new.

These shifting institutional boundaries were, however, also slow and continued across decades – there was no sudden change to editors' work structures and practices. The integrated environment of BBC TFS was in stark contrast to the many small companies that operated in Soho. The opportunities of the new independent production sector were those of the entrepreneur, whether this be Barry Stevens and his instinctive embracing of freelance life or Johnny Fielder and his self-promotion. As videotape advanced, film faded. Yet it took until the 1990s, by which time digital NLE platforms were emerging and slowly rendering videotape residual, for film to be displaced from its central institutional context at the BBC – and, even then, it did not disappear altogether. As evidenced here, what occurred was a slow process of incremental change, where the newer industry of television commercials production, with its corresponding institutions, formed around a production gap, itself opened up by the advent of ITV. A fuller history of the new industrial economy of independent television production as generated by the needs of ITV and its franchises is yet to be written.

The work conducted here on digital NLE shows how the idea of digital, and the hybridised machines which implemented digital effects, crept into editing practice long before digital NLE systems were in use. These systems themselves are revealed, through the recollections of the two primary developers, as a melding of the two previous media. This is in contrast to the idea that digital NLE, because of its non-linearity, was a 'return' to film editing. Instead, it is a technology that calls upon the preferred affordances of what came before: the immediacy of videotape and the non-linearity of film. While both are essential, what is interesting is that only one of the developers, Bill Warner of Avid, recognised – or recalls recognising – the need for both affordances. In contrast, Paul Bamborough of Lightworks remembers his work as

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saying "in a funny sort of way, it's much more practical – tape. [...] and the editing seems to go easier" (Dixon, 1994, 141).

being a repudiation of videotape. The comments by editors that they preferred Lightworks equipment but were compelled to use Avid reveals the corporate drive behind the promotion of Avid. This is shown here as a coherent strategy which, after being tested on the American market, took the system directly to the Soho production companies – which then themselves boasted about the possibilities of digital NLE in the pages of *Broadcast* as a means of self-promotion. Again, this shows a cyclical process of adoption dependent on multiple factors and, in the case of Avid and Lightworks, competing factions.

The notion of multiple interactions, among institutions, the press, individuals with unusual agency (such as Stefan Sargent) and the technologists, is revealed by the use of *Television Mail* and *Broadcast*, sources thus far unused in academic work. Capturing and examining, as Caldwell phrases it, this "worker chatter" (Stauff & Caldwell, 2015), even though mediated by the pages of a magazine, is a step towards obtaining a new understanding of how technology is used to advance television production practices. The use of these sources shows how technology, in the case of videotape, was used to advance interests in a way that fragmented the previous institutional structures. It was key to the advance of the independent production house, as shown in the case of MPC. The magazines further show that this advance was slow and unsure, taking almost two decades to fully become embedded. Film, in contrast, is recalled here as keeping the old institutional structures in place, evidenced by the fact that the specific work environment and practices of BBC TFS could only be expunged with a radical corporate policy such as Producer Choice, which required the buildings to be sold. Each industry parlay is recorded by these sources, the call-and-response of the adverts as they proclaim the abilities, allegiances and successes of the companies and products they promote. These exchanges are testament to the where and when of what happened.

Editing practice, meanwhile, is shown here to be always contingent on the editor's relationship with the machinery and the people working on the project. It is a dual conception of expectation and ability, with the lines of technological advancement and institutional evolution converging in the body of the editor. There are no crises or

controversies on which to hang a history of editing practice and technologies. Instead, there are waves and layers of use. While the participatory weight of an editor's experience is essential in defining individual practice, it is always tempered by the demands of the project. This is not to say that the work of editors goes unrecognised, or that they work entirely without agency – as early as 1960, John Sealey was promoting himself on the pages of *Television Mail* (Sealey, 1960). The title of the feature "The Bespoke Man", speaks to the individuated practice of editors and their ability to alter their practice to fit specific needs: to be bespoke.

Each of the steps described above – whether in the development, the acquisition or the selling of editing technology – can be characterised as filling a gap. There was a gap opened up by ITV which impacted on editing for television, as new technologies were adopted and adapted to ameliorate what the old technology (film) lacked. With videotape, this meant the medium's immediacy of playback and review was recognised as enabling the swift production of commercials, which itself exploded out into the developing industry of independent commercials production. Decades later, developers used their knowledge of previous editing systems to produce platforms for digital NLE. This, in itself, was completed by a specific technology – data compression – that was adapted for use in editing systems, not developed for it. A gap was filled. In telling this history, consideration must be made of sources, and attention must also be paid to the possible revision of memories as they are mediated by contemporary communication methods such as social media. To return to Douglas, the history of editing technologies and practice is one of a "contestation between technological affordances (including cognitive ones), institutional structures, and technological insurgencies" (Douglas, 2010, 304). In unpacking some of the contestations around the shifts from film to videotape to digital technologies, the forces which have impacted on editors' working lives are shown, as are the ways in which editors adapted to the demands which, across the period considered, never stopped changing.

Appendix:

Stefan Sargent addresses his audience (*Broadcast*, 2 August 1991)

Transcription of advert's text:

The Un-Edit Suite

Or

The Joys of Non-Linear Editing

By Stefan Sargent

When a film editor wants to add a shot to a cutting copy, the editor simply removes the transparent sticky tape holding the holding the existing shots together and pops in the new shot. If the new shot is too long, the splice is opened up again, the excess is trimmed off and the film re-taped together again.

You can't cut videotape like this. For a start you can't see the pictures and it's impossible to cut and splice the tape.

To add, or re-arrange, videotape shots you have to copy everything already edited and make the changes on a second generation tape. The next time you decide to make changes, you have to go down to a third generation copy, and so on.

Videotape editors are straight-jacketed by this clumsy editing technique. Simple changes that they might have made, crazy experiments that would have been fun to play around with, are bypassed as they plod on putting down one shot after another – and always trying to get it right the first time.

By the way this piece was written on a word processor. The opening paragraph was originally the sixth. The sixth is no more. When I've finished writing if this para. seems out of place, I can simply delete it. Bing! Try deleting a single shot once you've finished editing a one hour tape documentary.

Non-linear picture editing is like using a word processor. However it is much more valuable because imagery, both visual and aural, is less formalised than words which have to follow a language pattern. "Pattern flow language to" doesn't make sense but if the words were pictures the new order could be an improvement.

Spitfire Television was first with Avid, the best-selling non-linear, random access, digital editing machine in the world. And Spitfire has Renee Edwards, who has years of off-line editing experience and four months using Avid.

How does Avid work?

The heart of the Avid is a Macintosh computer. Unlike other computers, which have disk drives inside them, our Mac has two external magnetic drives and two external optical drives.

Before Renee starts editing, she plays your master tapes into the Mac, which turns the video signals into computer digits which are recorded onto one of the four external drives. This process is called "digitizing" and is done in real- time – it takes an hour to digitize one hour of rushes.

Using our existing set up, she can digitize four hours of rushes, to be reading, waiting, "on line" during the editing session. Because the optical drives have removable cartridges, which each hold one hour of rushes, the system's overall capacity is unlimited. If you want more than four hour's on-line, Renee simply swaps optical cartridges.

Nest, voice-over sound tracks, music and sound effects are digitized to a Macintosh disk just like the images.

Finally, all the shots and sound clips need to be logged. I used to do the same when I was an assistant film editor at the BBC. It was a pain to do but invaluable when you are hunting for some elusive, missing shot. However, unlike my BBC writing pad, the Avid logging system is a Mac computer database. You can add notes to every shot. Say you note all the really good shots as "VG" – to see them, you just tell Avid to find "VG" and, hey presto, there are all the good shots.

You're looking for the "cat near door" shot... no riffling through coffee stained paper notes, no spooling through tapes, the Avid finds the right shot instantly! And another bonus is that you never need be aware of time codes, Avid logs them automatically.

If you want to add loads of notes yourself, we can hire you a cheap take-away Mac computer with the software to log your shots and create sequence "bins" for shots that are going to be part of the same sequence.

Now it's time to start cutting pictures.

The Avid's Mac has two large colour monitors. On one screen are a collection of small images – each one representing a shot. You (or Renee) can preview each shot on the second monitor. During the preview, you can "mark in" the start of the shot and "mark out" its end.

Now the fun really starts as all you have to do is link up the shots in the order that seems to be the best. Unlike video**tape** [sic] editing where we all try to get it right first time, with Avid it doesn't really matter. **Do what you like.** [sic] Then re-arrange, lengthen, shorten, add and delete shots – whatever – it's all child's play. Avid remembers the last 32 moves. So if you've made say five changes and decided that it was better the way it was simply un-edit five times.

When you run a sequence, you can follow what's happening within a window showing time-line display. You can go into this time-line and use it [as] a[n] editing tool. Want shot 34 to be shot 12? Simply use the mouse to pick up shot 34 and drop it in after shot 11. Avid picture and sound editing is, of course, frame accurate. In fact, audio editing can be done using a of the soundwave form to give you super-precise cuts.

Editing does not involve re-recording anything. Everything on the computer discs stays just where it landed in the digitizing process. All that you are doing is making an edit decision list that says go to this area on that computer disc, now go to this bit on another disc, now go somewhere else, etc… The edit decision list (EDL) hardly takes up any disc space so making a second, third or 20 different versions of your edit is easy.

Adding dissolves and super titles can be done during the Avid off-line.

Renee can then make a VHS or a U-Matic of the Avid edit for client approval. Once everyone is happy, she sends your EDL upstairs to one of our on-line suites. We've 16 BetaSP machines, 3 ADOs, 2 one inch and one D1 and a Harry, so we should be able to handle the on-line.

Your list is now inside one of our Ampex Ace editors which control our Grass Valley vision mixers. The list tells the on-lone editor which of your master tapes to load up and it also tells us where you need titles and digital effects.

But this isn't the full Avid story. I haven't the space to tell you about how there are 24 audio tracks with better than CD quality. I haven't mentioned how you can combine standard Macintosh graphics into your Avid edit.

Avid will free you from the confines of "one shot after the other" linear editing AND can speed your edit by a factor of five. This is why Avid houses in the States are booked out editing commercials, pop promos and documentaries. This is why Queen's latest pop video was cut on the Avid.

And there's more – our Avid is linked into Harry, which means that commercials can be off-lined on Avid and then on-lined on Harry.

But the only way to really appreciate the joys of non-linear editing is a Test Drive with Renee.

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