The Birth and Rebirth of the Glitch

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Abstract

This investigation of the glitch in electronic media, previously disregarded as errors in the medium and therefore often begrudgingly tolerated by viewers rather than considered a form of artistic gesture, will discuss the role and function of mistakes and imperfections in the evolution of digital and analogue electronic screen media aesthetics. The formal tendencies of artists who incorporate glitch, sometimes as a side effect of their activity, in assisting the cultural acceptance of these ‘artefacts’, will be discussed. I’ll briefly discuss a history of the word glitch from its early uses in the aerospace industry in the 1960s, as a music genre in the 1990s to slang in the gaming world of the 2000s.

A discussion on the nature and differences between digital and analogue media, associated formats and glitches is undertaken from a historical perspective. Historical breakthroughs where the glitch has played a major role in the creative and scientific fields are also profiled.
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Introduction

What's in a name? That which we call a rose by any other name would smell as sweet.

*Romeo and Juliet, William Shakespeare (1594)*

Each new generation of media brings with it new modes of recording, display and dissemination and thus new potentialities for mistakes and errors. If the ‘eclectic medium’ that is the computer (Le Grice, 2001), stores audio and visuals as digital media and contains ‘previous media within it’ (McLuhan, 1967), it will also therefore contain all signs and reproductions of the mistakes and glitches common to each media generation that preceded it.

In ideal situations digital media offers the perfect copy with definitive information *to the pixel*, in contrast to the ‘debased descendent’ (Mitchell, 1992) of lower quality that unavoidably results from copying in the analogue realm. In reality the rapid pace of development in the image production world ensures that changing standards lead to problems in reading, copying and translating digital files. In addition, the quality of the image is dependent on the quality of the input device (scanners, cameras and other visual capture devices) and the prevailing capture standard of the era. The ephemeral ‘discrete nature’ (Mitchell, 1992) of the immaterial - supposedly ageless - digital file *in transit*, is counterbalanced by obsolete and decayed storage media, hardware specific codecs¹, out of date and corrupted operating system protocols and other issues that place in peril the integrity of the original data. While the inevitable decay of the physical substance of film and analogue video tape leads us, the audience, into a “spectatorship of death” (Rodowick, 2007) where each film scratch is a memento mori, each tape dropout a permanent scar, in a spiral toward complete loss of the image, the prognosis for digital media seems, perhaps surprisingly, even more grim. From an archival and storage point of view we might consider the “questionable benefits of digital media” (Cherchi Usai, 2001). While the devices such as video monitors and printers on which imagery is displayed may wear out or fail the image is still intact. However the numerical data that makes up digital media image information could, through the errors described above, become entombed and leave old stores of ones and zeroes forever encrypted. If a file thus becomes unreadable the image is lost, and to the consumer ‘trash and reformat’ would seem to be the only option. More recently however, as consumer level technology has become more sophisticated, the harsh schism of read/not read has muxed to create an uncertain territory of data recovery. This is a space colonised, inhabited and expanded by the glitch. A growing reliance on digital delivery systems such as broadband, telephone and satellite requires that built-in error correction systems attempt to prevent loss of image and sound, and software designed to rescue data will allow the opening of incomplete files. In this mechanical attempt to maintain continuity these files and data streams may be affected by this recovery and may be ‘glitched’. Images in virtual, immaterial form, digital and analogue media and their glitches are, we are told, crystallised in a precise, repeatable format. This infinitely replacable

¹ An acronym for 'compression/decompression', a codec is software that reduces file size by the use of algorithms.
form nevertheless gives the artist potential for loss less overlay, composition and collage – and in itself is also subject to ‘glitching’ through some of the events mentioned above as well as deliberate, accidental or even serendipitous occurrences during the production of visual art.

With its hitherto unsurpassed replicating capabilities, digital media allows a meeting of glitch past, present and future. All previous media and associated signs can be encased within it, and as a matter of course, are stamped with digital media’s own signs.

In his essay ‘The Abject Romance of Low resolution’ David Humphreys notes that the progressive development of moving image technology creates a hierarchy of image and equipment quality giving “lower and budget reproductions an increasing potential for affective or critical treatments by artists.”

Live video as created by VJs creates unpredictable and unrepeatable imagery. Much of this live video was, for a time (and still is) generated using analogue video devices. The VJ culture, more than any other, sees an overlap of technologies with rigs assembled from found and discarded video equipment. The freedom to create works in real time using analogue video signals often allows the real time manipulation of effects beyond the parameters of the manufacturers intentions and also avoids the need for long hours of pre-rendering video works as illustrated by this quote from VJ John Power: “I found I was able to generate material of a particular type in the space of two hours, which would not have arisen from months of using conventional desktop software. Variation of approach at all times created respite from video image production problems centered on software.”

Glitch rides on our innate need to explore and experiment with our cultural environs. It embeds itself into its originating medium and hybrids thereof in what Roland Barthes calls “contortions of technique”. If “failure in art”, as Paul Virilio says, is a “profane miracle” then the immortality that digital media promises is humanised by the act of harnessing the creative potential of the glitch. This act broadens and multiplies the contemporary visual aesthetic palette with what Sean Cubitt, with a more Zen leaning, calls “aleatoric art which drives toward the dialogue of human and machine that lies at the heart of contemporary society.”

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6 Nicky Hamlyn, (2003) Film Art Phenomena ppX,
A History of the Glitch

"Glitches — a spaceman's word for irritating disturbances." — Time Magazine July 23, 1965

Each generation of electronic visual media technology brings new modes of recording, delivery and display and each of these modes offer extensions of the language of aesthetic expression available to the artist. Media artists often experiment by modifying hardware and software, creating new combinations of technological components and often creating imagery under conditions never imagined by the designers and makers of these components through deliberate error and misuse, pushing devices and media to record, translate and playback in ways engineers and designers had never intended them to. By placing part of the creative process outside of their control artists seek to involve an element of chance and ‘the happy accident’ or ‘glitch’ in their works.

‘Glitch’, meaning malfunction or error was first used in writing in ‘Into Orbit’ (1962) by American Astronaut John Glenn to describe technical problems during space missions. In his words “a glitch is a spike or change in voltage in an electrical circuit which takes place when the circuit suddenly has a new load put on it...A glitch is such a minute change in voltage that no fuse could protect against” (OED Online) Initially a technical term, glitch then went on to being a catchall term for an error or malfunction in equipment and a hitch in processes. The OED indicates the word may also appear to have origins in the German word ‘glitschen’ (to slide or slip) and so it is possible that the large number of German scientists and technicians recruited by the U.S. military in the post war period and subsequently working at NASA introduced this word to the aerospace vernacular. The word entered the lexicon through media coverage of the American space program. Time Magazine’s need to define the word no doubt indicated that use of the word was by 1965 becoming more commonplace either in print or in television sound bites out of NASA mission control. The brief, clipped militaristic nature of NASA communications perhaps also contributed to the use of ‘glitch’ in Astronaut communications. Transmissions so often marred by dropouts in transmission strength and static used many shortened and abbreviated words that for strict clarity also avoided synonyms and homonyms. The numerals 5 and 9 were made less alike in sound by adding an ‘er’ sound to create ‘niner’, for example.

Subsequent appropriation in the early 1990’s as a title for an experimental music genre simply called ‘Glitch’ could further emphasise the distinct connection between the onomatopoeic properties of the word itself and the clipped sounds generated by digital noise and other sonic artefacts native to digital media. As a music genre, “Glitch is characterized by a preoccupation with the sonic artefacts that can result from malfunctioning digital technology, such as those produced by bugs, crashes, system errors, hardware noise, CD skipping, and digital distortion.”

In the last 15 years the term ‘glitch’ has come to mean as much a malfunction or error in proceedings, perhaps because many public services (including audio and/or visual media and

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1 Time Magazine citation initially sighted in Modra, Iman (2004) Glitch Aesthetics, University of Huddersfield
2 www.oedonline.com Oxford English Dictionary Online
communications) are provided and managed by digital hardware. In terms of the production of visual media ‘Glitch’ has come to mean “an error or undesired artefact in audio visual media arising from software or hardware manipulation”.

The practice of ‘Glitching’ in the video gaming world involves exploiting a loophole or a programming error for gain within a game world. These glitches in game construction also often allow the player to move or see beyond the structures intended for game play.

As the popularity and ubiquity of the Internet and bandwidth continues to expand the ease and economy of displaying short personal video works through visual databases of audiovisual material such as vimeo.com and youtube.com becomes increasingly familiar to more people. The revolution that Walter Benjamin recognised in the ability to reproduce artworks in print (“Artists could now contemplate and study the works of their international contemporaries at close range, in the comfort of their studios”\textsuperscript{11}) has intensified incredibly through rapidly increasing means of electronic data transfer. This global accessibility of video has made possible a vast growing online presence of people creating works through the use of filters and hardware in such a way as to deliberately manipulate and experiment with the aesthetics of the glitch. The instantaneous sharing and appreciation of these works, the “unprecedented plastic universe” that Felix Guattari in 1992 foresaw could result in a post-media reawakening through “a reappropriation and resingularisation of the use of media”\textsuperscript{12} can only serve to intensify the use of glitch by visual artists and thus the enculturation of errors as ultimately humanising effects and signs.

A search on ‘glitch’ in these online visual databases shows an appreciation in underground video culture of the glitch in digital and analogue video media. Filters, patches and plugins that emulate analogue video glitches, VJs whose work consists entirely of glitched video signal only, music videos that appropriate experimental techniques and a continued use in main stream screen media of the glitch as a signifier of the era, and even as a narrative prop are all aspects of the continuing birth and rebirth of the glitch.

\textsuperscript{11} Lovejoy, Margot (2004) \textit{Digital currents : Art in the Electronic Age} pp30
\textsuperscript{12} Guattari, Felix (1993) \textit{Chaosmosis An Ethico-aesthetic Paradigm}, pp5
Analogue to Digital: Out with the Old and in with the New.

“In the achievement of economy, we have lost the permanence of the form cut into stone, the monument; in the architecture of light, like the pillars Albert Speer erected out of searchlight beams for the Zeppelin Field at Nuremberg, the greatest virtue of high technology is the economy of means. It is too feeble a signal to maintain itself for long: archives fade into the radio snow of universal magnetic fields.” Sean Cubitt

**Faster:** Editing a student Television show in 1987 on U-matic format required the use of hulking, noisy, mechanical devices. The room is hot with heat from cathode ray tube monitors and the U-matic edit suite. A preview of each edit decision requires the machines to rewind for a 10 second tape pre-roll time, and committing to an edit is an undoable action. Less than a decade later the process of digital video editing will be silent and screen based. The editing process will be non-linear and have instant playback.

**Clearer:** It’s 1996 and I’m speaking on a mobile phone, on a network that uses analogue technology. The signal is weak and I need to shout to make myself heard. Finally the signal drops out and the call ends. Forward a decade to 2006: I’m on a digital mobile phone. The signal is again weak, and digital distortions are making me ask the caller to repeat himself. No use in shouting. I hear metallic syllables as the system digitally stretches sounds to fill gaps in transmission. The caller’s voice either takes on a robotic timbre or there are gaps of total silence. Finally, the gaps are becoming too big and the automated error correction system relinquishes the call.

**Smaller:** An international DJ of two decades experience speaks of the growing popularity of digital deejaying equipment in which the vinyl turntable and vinyl record no longer feature. “We have gone into an age where sound quality is secondary to expense, a shame, but an understandable progression.” His playing of ‘dub plates’ (very limited edition 12” record sides cut from metal instead of vinyl used in the industry as test disks) extends the dynamic range of the music into the bass frequencies. This, he says, is due to the deeper groove you can cut on a dub plate. “You can actually push the levels of any track harder when cutting into metal due to being able to cut deeper grooves, thereby getting a louder, bossier cut [than digital equipment can reproduce].”

A simple analogy for the comparison of analogue and digital technology compares a set of steps to a smooth, bell shaped hill. The analogue device uses a signal measured as a curve on a logarithmic scale. The digital signal represents the incline of the hill in fine, even steps, the smaller the step, the closer to the analogue curve that digital technology offers. The greater the resolution, or ‘sample rate’ of a digital file, the closer it is to reproducing a continuous curve. In comparison to analogue technology digital technology offers a more efficient and exact reproduction of a signal. However, while the fidelity, efficiency and the reliability of a digital signal can readily surpass that of its analogue equivalent, the market forces that govern the development of certain standards tend to limit, to a great extent the potential for quality. In the above examples relating to telephony, video and sound, where the

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13 Cubitt, Sean Videography pp148
14 Bukem, LTJ Taipei Times, February 27, 2009
envelope of digital media is stretched to its thinnest by capitalist concerns the consumer invariably shoulders the burden of a lowest-common-denominator solution as a consequential loss in quality. As noted by Sean Cubitt (1993), near the end of the VHS era,

“Capitalism does not, cannot understand the delivery of quality as a central motivation: the profit motive alone provides its drive. In consequence, most domestic playback is poor, and the sound in particular execrable. We have paid for domestic convenience with a major drop in standards from the clarity and scale of sound and image in the heyday of the cinema.”

A similar comparison of quality between television and cinema was voiced four decades earlier in 1953 when Bazin doubted that television, (its drastic effect on the movie industry closed 5,000 cinemas across the U.S. in that year alone) which was “irremediably cruder than the cinema” would ever reach the aesthetic heights of film and was perhaps more suited to the documentary form than narrative fiction. The popularity of live broadcast variety shows (which could be said to be ‘radio with pictures’) and the advertising opportunities within them gave television an undoubtable advantage over film. The relative immediacy of television suited the needs of commercialism. Though the crude technical specifications of early television could not match the cinema, market forces brought about the enculturation and acceptance of a lower quality image.

In order to maximise sales and marketability the designers and engineers of every new generation of media aim to produce media higher in quality. Higher quality means higher resolution, greater brightness, greater colour depth and more efficient means of transport and dissemination with the goal of a denser more seamless reproduction of the image and sound. Despite this relentless evolution in picture and sound quality the glitch remains a potent force that constantly asserts itself in each new media. Each time the glitch appears it is in a way that is unique to each media form or format. Such signs of error, malfunction and low quality image such as the examples given above lower the value of a product as they are seen as highly undesirable, if not totally abject by both the maker and the consumer. It could be assumed that in the formulation and development of new media developed for the marketplace and - dependent on sales through popular uptake that it is the express aim of designers and engineers to eliminate glitches altogether. The reality is that the device, at the cheaper end of the scale especially, usually delivers less than ideal performance.

Any attempt to wholly establish market control of a medium generally fosters circumstances in which the glitch may exist. Piracy and home copying has long been a concern for the motion picture industry and manufacturers of domestic video equipment – often one and the same corporation. The ability to create good quality copies at home is contrary to the marketplace exclusivity of a product and various hardware and software encryption systems have been

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15 Cubitt, Sean (1991) Timeshift on Video Culture pp8
16 Cardullo, Bert (1997) Bazin at Work pp86
devised in an attempt to prevent this practice. However, consumers and pirate marketeers invariably find ways to circumvent copy protection systems. In cracking a copy protection system, or making a copy, image quality may be noticeably degraded. At the time of writing, due to the relatively high expense of DVD media capable of holding the 6-7 GB of an average Hollywood film, pirates compress the content to suit the much cheaper 4 GB size DVD media available to the consumer. In order to view movie files over the internet – through sites such as Youtube, or to transfer whole movie files between peer to peer clients such as Bittorrent or Kazaa a compression codec (Flash codec in the case of Youtube or usually DIVx codec for peer to peer transfer) illegal copiers compress the file to suit bandwidth limitations. The resulting degradation, a glitch produced through clandestine media production, manifests as rougher texture and quality of the image and ensures the enculturation of those signs of tampering as a cursor of cheap and even clandestine media. In the Hollywood feature film ‘Syriana’ (2005) set in the present day, a Lebanese terrorist demand delivered to American government officials on VHS video is seen playing from a video tape recorder. As stated, analogue media, unlike digital media cannot produce exact copies. Professional analogue systems worked on a hierarchy that still allowed a product of high quality for the end user. However the VHS system’s main deterrent against copying was the obvious loss in quality that happened in just one copy generation. In the terrorist video message in ‘Syriana’, VHS video is represented in a de-saturated image with rolling video tape dropouts. This ‘3rd world’ context reinforces the low, shoddy value of VHS (and vice versa) and serves to reinforce Hollywood’s own domination of the media. In the words of David Humphrey “outmoded technologies linger as an abject support to the high self-esteem of “state of the art”.17

As still and motion picture technology has developed there has been a constant reference to the high quality of professional work, with the ultimate goal being the emulation of a professional product – be it Hollywood or Vanity Fair. In response to a growing sophistication among consumers, and a rise in the general level of technology a sales niche created by manufacturers for those who wish for more manual control over the medium than the ‘amateur’ has come to prominence. The so-called ‘prosumer’ product promises higher quality for budget productions yet terms such as ‘broadcast quality’ and ‘prosumer’ are a more sophisticated version of the hegemony that media corporations have held since the 1930’s. From the Box Brownie still camera (sold in its millions from 1900 through to the 1960s), and 16mm film (initially aimed at the amateur market from 1923 but gaining a foothold in education and news through its portability and economy) through to VHS Video (launched 1977) the consumer has been prevented from producing an image of an ‘industrial’ quality approaching that of the motion picture goliaths.

The history of the motion picture industry has many examples of control and suppression that outline Bazin’s description of the art and industry of film as more like an “industrial art that is likely to vanish into thin air as soon as the industry’s profits disappear.”18 The motion picture colour system, ‘Technicolor’, was an attempt by big business to monopolise the whole

18 Cardullo, Bert (1997) Bazin at Work pp85
process of motion picture production. Much like the Kodak Box Brownie era of the 1920’s (‘You push the button, we do the rest’) the studios sought to control all aspects of Technicolor film cinematography, processing and projection. Though complex and cumbersome and expensive, Technicolor persisted.

“The controlled way in which it was used constituted a very effective barrier against outsiders…this was an industry which had already totally retooled for sound. It was happy to contain the potential disruption of colour by continuing to use an antiquated and complicated technology.”

Colour film was available only on ‘amateur’ 16mm stock, for at least two decades before becoming a professional standard. The continued sale of Black and White film for 35mm motion picture format (as what could be said to be an outmoded product) Brian Winston argues, suited industry profitability. Winston’s ‘Law of Radical Suppression’ states that when a new communications technology is released, its growth is suppressed through the constrictive economic influence of already prevailing institutions and other mechanisms.

There is evidence that this suppression existed from the very early days of cinema. The unexpected surge in popularity of film as an entertainment medium ensured that economic forces held power over the destiny of the film industry from the very beginning. Edison and other individuals involved in the birth of cinema endlessly pursued control over all methods for creating cinema through the purchase of patents and through lawsuits. A stream of lawsuits and patents eventuated in the demise of many other gauges and film playback systems and finally ensured that 35mm became the standard.

Over 100 years later the situation has changed little. In 2008, the independent post-production firm ‘Company 3’, who offer all-digital post-production color correction encountered “tremendous opposition in Hollywood” to their services. Digital only processes manipulated on licensed software systems, threatened studio control over the product. The mutable nature of the ‘image as data’ and the decreasing cost of digital systems enabled an escape from the restrictive in-house systems of the large players. “There were people who literally said, 'We will never let you do this,' " Steven Sonnenfeld, founder of ‘Company 3’ says. “ 'We want to have total control, and this gives filmmakers too much flexibility.' ”

The capitalistic drive to control all aspects of media production and broadcast foregrounds the aesthetics intrinsic in the lower cost equipment that artists with limited economic means are compelled to work with. These ‘dead’ media, considered of lower quality, no longer economically viable or to have failed commercially are often the toolset and the aesthetic domain of artists generally constrained by budget and opportunity. Their creative use in unlikely combinations of media and altered technology, aided by digital media as a unifying

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20 Ibid pp51
21 Ibid pp105
medium can allow a glitch or glitches exclusively native to discarded media to return to mainstream media or even to move sideways through concurrent generations of media, and also medium. To re-deploy the technological detritus left in capitalism’s wake is to adopt a polemic stance subversive to corporate hegemony. By refusing or being economically unable to work within defined ‘industrial quality’ zones, the artist is seeking a mode of expression that is contrary to capitalist forces. To re-use and recycle the cast-off technology, the video mulch, the detritus of previous generations of media, is to adopt a stance against a commercially led culture ever seeking seamlessness and pristine beauty. As Rhodes states “low budget sound technology – referred to as ‘lo-fi’ – is seen by some as a politicised expression of limited economic resources”.23 The DIY aesthetic of the mid 1970’s punk era saw the self-production of music, magazines and film in a similarly politically motivated movement against a media environment where corporations that appeared to hold total control over those media markets. Artist’s early use of video – in the 1960’s and 1970’s – was mainly in response to the tight reign the few networks could hold on content and “in many countries artists video often deliberately took up a position critical of broadcast television and sought alternative strategies for production and distribution”24 Early video art was confined mostly to consumer level cheap systems bought by collectives and individuals. Artist Steve Partridge commented about video at the time of its introduction to the market in the mid 1960’s:

“Everything about the nature of half inch video seems to make it ideally suited to individuality and creativity. Artists are able to use video equipment either completely alone or in small groups. No specialised professional skills are needed to operate the equipment, and tape costs far less than film. All of this seems to make video a truly human sized medium”25

The ability to post-produce video art works of a professional level without the aid of a corporation however couldn’t happen until the early 1980’s when broadcast technology filtered down through the economy to the educational institutions, as a replacement for the medium of film. High band U-matic format allowed editing and copying on a par with broadcast standards of the time. The availability of such broadcast level equipment in educational institutions allowed a movement called ‘scratch video’ to flourish in Thatcher’s Britain. The ‘scratch’ label came from the frequent use of the jog shuttle function on a U-matic video deck. Video could be played forward and backward at will, and these manipulations could be recorded on to a second machine. The scratch video movement re-appropriated and re-contextualised propaganda footage from file as well as taped television broadcast footage. By creating a fast cutting repetitive montage with juxtaposed imagery a new era in video manipulation was born. MTV style broadcasting (which fore grounded production with a seemingly slip shod fast paced format) and the newly born music video would run with this

25 Ibid pp150
punk take on television. Rik Landers of legendary scratch duo ‘The Duvet Brothers’ defines the scratch aesthetic;

“Scratch was about raw critique of the meaning given to the footage we plundered. The lies on TV news were so blatant and the scratch technique enabled us to expose the lie and reveal the true meaning within by repetition and juxtaposition.”

In the early days of video art, works were referred to as ‘tapes’, as a pointed differentiation from ‘films’. Currently digital works maintain a physical presence on DVD disks and digital videotapes but the digital image, immaterial in transit, is increasingly a format-less medium, one that permanently exists doubly as an archived and directly playable file. Digital media in particular, with this format-less state and its encryption algorithms, appears especially capable of locking out creative manipulation of the ‘medium’. When John Cage said, “The methods of industrialism displace the handicrafts” he couldn’t have predicted the extent to which video, and later digital media could displace the ability of the artisan to change and manipulate media on a handcrafted level.

According to Nicky Hamlyn the ‘revenge of technocracy’ has limited creative physical intervention. True media specific deconstruction such as the workmanlike investigations of film that personified such structuralist movements as the London Film Makers Co-op and the manipulation of analogue video signals by video artists through custom electronic devices have been supplanted to a large degree by those who are able to manipulate the digital medium through code and software, those artist/scientists whom Paul Virilio hopes will fight the good fight for aesthetic control over the machine.

“Here we are in a domain which is wonderful, but only provided that we fight against it. It’s Jacobs wrestling match against the angel. We must not lie down before the machine, we have to fight…..This is an anti-idolatry fight. …I am waiting on those Jacobs who will wrestle with the machines, who will explode the software. But not in order to destroy the software”

According to Virilio these are the people who can “dismantle the system to appropriate it” in the struggle to not be dominated by what Sean Cubitt calls embedded “patterns of textural production which the medium seems to demand”. In other words a particular medium and its mode of recording and playback subjects each user to the same limitations and so defines characteristics of the imagery. Rodowick calls this stamp “a historically and culturally

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26 www.duvetbrothers.com/history
30 Cubitt, Sean(1991) Timeshift on Video Culture pp19
determined aesthetic purpose that is relatively independent of individual intentions."\(^{31}\) The digital realm threatens a total control over a medium, and the lure of glitch shows that the mistake, the error, is attractive on one level as a sign that the machine can be manipulated and coerced creatively. The wall of code and codec leaves many outside but the speed of information flow via the internet ensures that techniques and artworks are shared at a rate never before equalled or imagined. However Virilio’s utopian vision of a noble stand against the digital machine too easily glosses over the lingering traces of previous media concomitant with current technology, as well as recording devices that sacrifice image quality for convenience of portability. Second hand and aged technology considered below current standards and defined ‘industrial quality’ zones co-exist with compact personal devices capable of recording low-resolution video. A recent news report relayed how it was almost automatic for plane passengers to record any in-flight drama. The unreality of the situation, the report seemed to suggest, somehow needed reinforcement by the action of recording video, as if video itself offered some legitimacy to the experience. Jean Baudrillard notes that Benjamin, in “The Work of Art in the Mechanical Age”, already strongly pointed out this “modern revolution in the order of production (of reality, of meaning) by the precession, the anticipation of its reproduction”.\(^{32}\) In June 2005 dominant media channels displayed, in very low resolution, mobile phone video footage of the dramatic events of the London Tube Bombings. The jagged edges of the highly compressed video defined the raw immediacy of the images taken seconds after bombs exploded. This raw effect would be labelled as ‘glitch’ by video broadcast engineers, and the inability to shoot high quality video on a camera phone could be viewed as a design limitation enforced by the manufacturer. Of course, a camera phone is never intended for the shooting of video for broadcast yet the aesthetic leakage, the enculturation, of this imagery into visual cultures, especially that of broadcast news, via such dramatic events where TV audiences crave any image above none, creates an acceptance of the personal as ‘professional’ and an ownership of the ‘professional’ by the consumer.

Sean Cubitt notes that lower quality and older media gain new life in cultural institutions such as community centres and public media organizations. Conversely, Lovejoy notes the tendency for government funding agencies to support ‘new’ art created by new technologies often beyond the finances of artists without funding, noting that in this situation “Through coercion, or cooptation the art work might be used as a toll to maintain institutional values rather than as a means of questioning them.”\(^{33}\) This obviously creates a barrier to artists and art forms whose work uses recycled media - a dynamic perhaps of artist against institutional forces. These associations with grass roots community, artist-led enquiry and inflation of personal-media-as-public-broadcast contribute greatly to an appraisal of the low-resolution, lower quality image as, at some level, a currency of honesty. David Humphrey notes this

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\(^{31}\) Rodowick, D.N. (2007) Virtual Life of Film pp76  
“crudity is understood as directness”\textsuperscript{34}. Low-resolution imagery and low quality imagery – i.e. those inflected with glitch, has great currency in digital media as signifiers of the real.

Yvonne Spielmann sees the major power of digital media as one of transformation. The ability to manipulate complex imagery in realtime greater defines video as a medium and creates “an openness toward systems, co-creative interaction with machines and the convergence of media forms on a level of higher complexity”. \textsuperscript{35} The digital realm, then, doesn’t swallow whole all that has come before but exists in a symbiotic relationship – feeding and being fed by other forms of media with the glitch as mulch and saliva, where eventually the recognisable technical limits of previous media become organs in the body of digital aesthetics. The convergence of media from many eras of motion pictures are made possible by digital technology and the technical archaeology that many artists undertake whether intentionally or not, is one that is reclaiming and re-contextualising media from the relentless forces of capitalist development. The glitch certainly maintains a constant presence, a continually reminder of the power of the new, existing as a by-product and a discovery as a result of these forces.

\textsuperscript{34} Humphrey, David (1993) \textit{The Abject Romance of Low Resolution}, The Abject America pp155
\textsuperscript{35} Yvonne Spielmann (2008) \textit{Video: The Reflexive Medium} pp112
Experimenting with the material and the immaterial.

*The limits of my language mean the limits of my world. Ludwig Wittgenstein, Tractatus Logico-Philosophicus (1921)*

In 1896, when a film camera jammed mid-way through a static camera shot, Theatre owner and magician George Melies discovered ‘stop substitution’ trick photography. This discovery would go on to be a key principle of many special effects devised by Melies in his short trick films.

The photographs by war photographer Robert Capa of the Omaha beach landings of 6 June 1944 are iconic images of WWII. Capa’s gritty photographs are regarded by some as among the best war photographs of all time yet the ghostly images actually resulted from a darkroom accident. In the rush to get the images to a courier for delivery to the main office of Life Magazine a darkroom technician dried the film too quickly and the extreme heat melted the film. The emulsion was distorted beyond recovery on all but 10 of the frames from the 4 rolls processed. Those 10 frames yielded definitive images of an era of warfare.

![Figure 1](left is Robert Capa's iconic image from Omaha Beach, right is an image from Robert F. Sargeant from the same day. Compare the ghostly effect of the melted emulsion with the clarity of Sargeant's image.]

In 1963, his first year of film making, Andy Warhol fogged one frame of film in the 16mm Bolex camera he was shooting on by not closing the viewfinder, thus allowing light to leak onto the film through the reflex prism linking the viewfinder to the lens. The one frame flash between edits, a kind of full stop for each scene, was a resultant signature 'effect' that he

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36 Cardullo, Bert (1997) Bazin at Work pp76
37 Kessler, Frank (2000) On Fairies and Technologies in Moving Images: From Edison to the Webcam pp39
went on to allow to happen in many of his subsequent films of the 1960’s. The effect is still repeatedly used today, most notably as a divider between fast edits in Hollywood film trailers to add drama and excitement. In 1967 when the proof of Marshall McLuhan’s ‘The Medium is the Massage’ came back from the printer the intended title ‘The Medium is the Message’ had suffered a typographical error. McLuhan was excited by this mistake is said to have exclaimed ‘Leave it alone! It’s great, and right on target!’ Now there are possible four readings for the last word of the title, all of them accurate: Message and Mess Age, Massage and Mass Age. In 1982, DJ Grand Wizzard Theodore was practicing at home when he put his hand onto the record to stop its playing so he could hear what his mother was saying. In doing so he noticed the ‘scratching’ sound produced by moving the vinyl record backwards and forwards under the needle. His accidental discovery of ‘scratching’ would rapidly develop and become an important textural instrument in hip-hop music in the 1980’s. These examples of errors are those that were discovered as a result of a direct working and tactile relationship of humans with machines. Machines, which like their media and the consequences of their mistakes, belong firmly in the material world through their analogical nature. Machines that, in most cases, require knowledgeable co-ordinated operation in often-complex sequences virtually guarantee ‘errors’. The complexity and physicality of these processes multiply the chance for human caused error. For instance, correct exposure on the HR16mm Bolex 16mm film camera requires the film to be loaded correctly, the film gate closed, the correct aperture to be set, the correct exposure to be set, and a string of other procedures to be followed for correct exposure and shooting. Despite using a light meter to help gauge the exposure the user still has no definite indication that the exposure has been successful until the film is developed. Photographic film is a physically based analogue medium. Light streams through a lens onto an emulsion of photosensitive material on a transparent substrate which upon being chemically processed produces a physical record that can be held up to the light for viewing by one person or projected by a strong light source for viewing by many. This “isomorphic transformation” of the original image based on physics and chemistry delivers a record by using material based processes at every stage of its production. The lens, the film, the exposure, the chemical processing and the projector all offer chances for error or ‘effect’. While the machines and processes given as examples here are built for precise use, the designer and manufacturer can never fully account for human error or negligence (or the failure to read the manufacturers instructions!). It is statistical probability then that users everywhere, through the mere process of operating equipment could become the unwitting generators and possibly discoverers of new ‘special effects’. Discovery through error is, of course, not the only way in which film, or any technology or science has advanced. The experimental film genre has done much to widen the frontiers of what cinema is, and isn’t. As mentioned elsewhere in this document the materialist experimental film movement of the London Film Makers Co-operative acted on many of these
constraints as starting points to investigate the boundaries of the film medium in an experimental project that eventually became a film genre known as ‘Expanded cinema’. The aims of this experiment were to try to create some sort of language with which to discuss the medium in terms of ‘film as film’. Artists carried an awareness of the material aspects of the media in their works, and sought to make audiences experience a cinema that was fully aware of its own ‘body’. To not so much look through the frame as look at the frame itself. As Malcolm Le Grice says, to work within the medium of ‘Film as Film’ meant an alignment

“…to the modernist view that the meaning and aesthetic base of a work derives from its material rather than from an illusionist representation….Meaning is formed in and by the work as it moves dynamically from the acts of making into its passage through the world.” 41

The process of investigation involved assuming there were no limits on the path which artists could take – with projector, film and screen all being manipulated in creative ways. The deliberate abuse of the ‘principles’ of filmmaking, which Amos Vogel calls “an international canon of regulations scrupulously obeyed by filmmakers and editors, immortalised in text books and further vulgarised by film schools”42 and Sean Cubitt a willingness to include “exigencies like misty eye pieces…in contrast to the commercial cinema, where the material support is effaced so that they don’t disturb the unity of the world of the movie”43

Malcolm Le Grice, a principal artist in the London Filmmakers Co-op and author of several regarded books on Experimental film says of his own expanded cinema work, ‘Horror film’ (1971):

“I didn’t call it expanded cinema in fact I didn’t know what I was doing, I was working like a primitive. I wanted to get something that was something more to do with the condition of the work – the condition of the presence (of film), and something that I saw was working more with ideas that related much more to the contemporary world, and so in that way I wasn’t just interested in making films inside the frame, I was interested in the way they came out into the space.”44

Guy Sherwin, another prominent experimental film artist from the LFMC explains;

"there was a strong tendency to explore every part of the film equipment and that meant the structure of the grain, the film, the way it passes through the

42 Vogel, A. (1974) Film as a Subversive Art, pp89
43 Sean Cubitt (1991) Time Shift on Video Culture pp14
The materialist’s line of investigation then, could be interpreted as an extreme attempt to create glitch not only in film, but cinema, the environment in which the audience is watching the film. However a question arises as to the veracity of a glitch that is intentionally created. In other words, can an accident be deliberate? In the materialist investigations where no stone is left unturned the glitch itself is undermined. Little room is left for error - as their intent is absolutely clear – they seek to control all aspects of the illusion, to the point that there is no illusion. As mentioned, a glitch is essentially an effect in embryo and the materialists in their search for truth in representation sought to sterilize the illusory power of the medium.

In his 2006 dissertation on Glitch, Iman Moradi differentiates between intentionally produced glitches and “unpremeditated glitches” as ‘glitch-alikes’ and ‘real glitches’ “Glitch-alikes are a collection of digital artefacts that resemble visual aspects of real glitches found in their original habitat.” His clarification stands only briefly however, as he settles, for the sake of convenience, on the term “glitch” as “an all encompassing term to signify mutual qualities of both areas.” This would appear to imply a control over glitch by artists who invite the unknown element of the glitch into the texture of their visual art. However, my own definition of glitch as “an error or undesired artefact in audio visual media arising from software or hardware manipulation” implies a ‘real time’ experiment where the conditions for glitch are created yet little more than a small degree of control is achieved. The essential nature of the glitch is that it is not controllable and at the point the glitch becomes a repeatable experiment, or an operator becomes a virtuoso in the methods of production of any specific glitch it has become something else – an ‘effect’.

In the digital visual arts to apply an effect is to apply a transformation of the image. By the examples listed above – cases where the mistake has ultimately become an effect, the medium of film would appear to be capable only of analogical effects determined by physics and chemistry. This “privileged indexical relationship to prefilmic reality” enjoyed by film, ensures a direct causal relationship that is empirically definable, and so, repeatable. The generated effects and artefacts all relate indexically to their sources – the causal nature of analogue film cannot be denied.

A medium, as defined by the OED is “any raw material or mode of expression used in an artistic or creative activity.” The artist who works with film maintains that “privileged indexical relationship” however the introduction of the analogue electronic era, the age of magnetic tape media perhaps, saw a paradigm shift in the approach to experimentation with the ‘medium’. According to Spielman, the medium of analogue video is changed with each new pulse of creativity passing through its form or “as soon as it becomes the content of

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47 Ibid pp7
48 Lev Manovich, (2001) The Language of New Media pp300
something new". The medium of video exhibits metamorphic change that breaks direct links with the initial input. U.S. pioneer video artist Nam Jun Paik recognised the electromagnetic nature of video with his in situ manipulation of a pure television signal. A large magnet, placed on the top of a television set, distorted the flow of electrons within the cathode ray tube creating abstract patterns of light on the screen’s surface. ('Magnet TV’, 1965). His application of magnetic force to the television recognised the need for artists working with new media forms to select tools that were native to that media.

Figure 2 ‘Magnet TV’, 1965

Paik’s ‘Magnet TV’ marks an important transition from the physical to the electronic, or ephemeral. His work explores the real-time interactive potential of the creative manipulation of the video signal. It has been argued that film, or more precisely, cinema, is also able to present the immaterial by the use of juxtaposition in montage. According to Lev Manovich the Kuleshov effect allows film to “overcome its indexical nature through montage by presenting the viewer with objects that never existed in reality.” Those disembodied ‘objects’ are more in the realm of imagination and illusion, however, and could not be said to exist in the same way for all viewers. The disconnection of the artist from the material, of disembodiment of the artwork from a medium begins with ‘Magnet TV’. An appreciation of the aesthetics of visual glitch, its rebirth as an electronic signal, begins at this point.

Video feedback, a pure glitch produced by filming the output monitor of a camera to create a closed loop, is another example of a format-less state. Steina Vasulka, pioneer video artist said, “Feedback was the first true image not related to pinhole.” As a medium based in a processual signal video has no substance and feedback is the purest form of that signal in glitch, an abstract image folding in on itself in real time. Its organic textures ebb and pulse and allow a direct interactive manipulation of glitch. In an early 1970’s leaflet on creating video feedback artist Bill Gwin comments: “Feedback…has two necessary elements for making art – a reasonable amount of flexibility and a reasonable amount of predictability”. However the ease with which complex imagery can be produced with video feedback ultimately leaves a “falsely aesthetic oneirism” a label that Bazin applied to over effected

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52 Yvonne Spielmann (2008) Video: The Reflexive Medium pp112
53 Cardullo, Bert (1997) Bazin at Work pp74
Hollywood movies without substance, sheer ‘eye candy’. A glitch that exists solely as a glitch is a garish paint without a canvas, an effect without a context.

The feedback effect described above was created using a tube camera. Vacuum tube technology disappeared from the domestic scene in the late 1980’s. The last VHS decks were manufactured in 2003 and in 2009, the time of this writing, with analogue signal broadcast being discontinued in 2011 and the sale of analogue receivers dwindling, analogue video is a ‘dead media’. Video feedback exists as a sign that is resurrected in digital technology through digital emulation software. Programmer artists such as Vade\(^{54}\) who code emulations and filters that reproduce the analogue video glitch are conducting a kind of electronic archaeology. The effects and devices exploited early in the history of video art by pioneering video artists such as the Vasulkas\(^{55}\) are artefacts locked away in dead media. The rarity of the hardware capable of reproducing these glitches ensures the rarity of its glitches. In addition to allowing these glitches new life this nostalgia for and re-discovery of effects is a starting point for further experimentation, this time in a digital realm. The challenge to reproduce and enact image processing sees the glitch exposed to the possibility of hybrid growth – digital code enables tweaking, adjustment and recombination in a way previously unavailable in an analogue format. With this rebirth in digital form it has transcended media.

Figure 3 Illustration from William Gwin’s ‘Video Feedback; An artist’s comments on its use: A system’s approach.

Digital emulations aside, the rarity of dead media enable the visual artist to produce a unique style. If a product is only briefly available on the market, for whatever reason, the obscurity of that product in years to come is ensured. This could also mean the item will gain a ‘cult status’. The Fisher Price Pixel Vision PXL2000, produced in 1987, was a toy video camera system that recorded low-resolution black and white CCD video onto standard audio C90 cassettes. Sadie Benning’s 1989 film ‘A New Year’ (5:57, black & white video/ Pixelvision) is one of the more famous works made using the Pixelvision camera. Benning’s highly personal works, which predate Youtube video blogging by 20 years, gain credo from the gritty low resolution CCD technology that the pixelvision camera shares with surveillance cameras. Benning’s is an example of video art that carries just one; the low resolution image stamps the work with a ‘pure’ glitch.

\(^{54}\) http://vade.info/
\(^{55}\) www.vasulka.org
In his own thorough personal survey of the National Film and Sound Archive’s collection of Experimental film, during which he viewed some 400 films dating from the period 1950 – 2000 it is with some surprise and awe that Alex Gerbasz notes there is in fact an alternate parallel history of Australian Cinema. This ‘treasure trove of innovative works, the existence of which, almost by definition, the film-going public has been massively unaware’ states a case for a distinctively Australian experimental movement, which did not merely copy all that was American or British in its form.

The 1950’s saw the first beginnings of Experimental film work in Australia with artists such as Dušan Marek working in relative isolation but the social foment of the 1960’s saw the formation of collectives and organizations devoted to the making of experimental cinema – with key figures such as Albie Thoms, Paul Winkler, and Arthur and Corinne Cantrill and later Dirk de Bruyn, working in the genre as well as actively promoting it. Arthur and Corinne Cantrill published the highly informative and influential ‘Cantrill's Film Notes’ from 1971 – 2000.

Albie Thoms, leading figure in the group sums up the nature of experimental film (or ‘underground film’ as it was then known) that Sydney based group UBU were interested in:

“When the term 'experimental' was first applied to filmmaking early in the 20th century, the art form was developing and people experimented with its possibilities. These included many associated with the modernist avant-garde, who worked in a variety of media. So an 'avant-garde' filmmaking tradition began...Later people in this tradition worked outside the mainstream in what became known as the 'underground,' which for a while formed a genuine international community of ideas the material of film and handling it, running it through cameras, doing things with it, using the medium to explore ways of expressing ideas about the world I was living in. It was a pretty grim world in lots of ways.... Nothing was really capturing the experience of the world that young people were living in.”

Taking their inspiration from the European avant-garde of French surrealist films of the 20’s and 30’s yet searching for their own voice the UBU group produced non-narrative works that railed against the prevailing popular form of narrative, commercial cinema. ‘Marinetti’ (1969) being a feature work that plays with audience expectation and deconstructs some cinematic

http://archive.sensesofcinema.com/contents/03/27/albie_thoms.html
57 Gerbaz, Alex (2008) Innovations in Australian Cinema: An Historical Outline of Australian Experimental Film NFSA Journal Volume 3, No 1
conventions in a seemingly random way – it begins with several minutes of black screen before fragmented sections of dialogue and visuals flash onto the screen in increasing lengths. Thoms described the film’s approach as a “Futurist notion of minimalisation of plot and characterisation, while employing blank verses voice-over narration as part of a sound montage”

However it was the hand made film that came to make up the greater part of the output of UBU films. This was due to the relative low expense associated with producing a hand made film. Shooting mute and adding sound later became an accepted norm, as did the use of outdated stock. Also, Norman McLaren had discovered decades earlier – it was not necessary to actually own a camera to be able to produce a film. And to produce one upon which the artist has acted directly certainly was certainly an attempt at short circuiting the hold media had over society, for Thoms ‘a direct intervention in the filmmaking process’ 58 Most importantly though, for the spirit of the times, was the anti-establishment feeling imbued in the UBU happenings. Says Thoms, ‘Hand-made films broke all the rules of what was correct in filmmaking, and captured the angst, the agitation, and the openness that was at the essence of the counter-culture.’ 59 The breaking of rules, of methods of shooting, of touching the film surface of development processes could be said to be ideal conditions for the birthing of glitches. Intentional or not, the artist was seeking to create something anti to the accepted norm and in the process often discovered by accident many new visual effects, or as they could also be called, glitches.

The ability to reprint 16mm, or to get cheaper ‘work prints’ (a film print that is not colour balanced for each shot by a technician and created for editing purposes only) from an original meant that many films from the period make use of loops and repetition of filmed events yet with different direct action on the film surface. This controlled circumstance allows the glitch to stand alone – as the subject matter repeats the element of chance has a greater effect on the subject than it would otherwise. The hand made film certainly is a physical medium that does not allow the exact repetition of purposely-affected glitches. This is due to the haphazard attack that often occurred on the surface of the films. Films such as ‘A Random Walk to Classical Ruin’ (1971), produced by Aggy Read, used unrepeatable imagery by direct painting onto the frame.

‘Most of it is done by putting blobs of ink along strips of clear film … and as soon as they’re on I press another strip on top of it …. So I press them together and when they dry peel them apart, and you

get the ink sticking to both strips. They are both used, and the spaces between the ink are filled with colour.60

Expanding on this aesthetic of works in which artists highlight their direct action by repetition of film events, or events which are repetitive are Dirk de Bruyn’s films, Running (1976) and Walk (1980), which both show people walking or running down a laneway. De Bruyn describes Running (1976) it as “the victim of a series of accidents”61 and thus highlights the random nature of the physical attack by the artist on the medium.

In the late 60’s the UBU group staged ‘UBU lightshows’ in which expanded cinema techniques were employed where experimental works of hand painted and scratched film were projected over actors, musicians and even the audience. The UBU group dissolved in 1970, however experimentation with video continued as technology that was able to effect video in real time was developed. Key among these pioneering artists were Bush Video (a collective established by Mick Glasheen in the early 70s), John Hansen and Warren Burt. Many of these artists generated video imagery via audio through custom made gear and video feedback also often featured as a real time effect. Video artist Peter Callas used the Fairlight CVI video effects unit exclusively to produce multi layered (composited) video works with iconic cartoon like imagery.

Through the 80’s the introduction of home video technologies and basic video manipulation capabilities provided by real time video mixing technology such as the Fairlight CVI from the Sydney based Fairlight Corporation saw a rise in the use of video at large scale entertainment events. The Fairlight CVI, first designed and produced by Australian engineers Peter Vogel and Kim Ryrie in 1984, was a real-time analogue video effects box with 100 customizable preset effects with sliding analogue controls and a palm sized stylus/pad interface for creating matted or stencilled keying through layers of video.

While projectors were expensive and cumbersome (a mid 90’s projector the size of a large suitcase costing $25,000 had outputs of 600 lumens only in comparison to a laptop sized 2010 average standard of 1,500-3000lumens at $2000-3000) it was often the case that Matrix set ups of CRT monitors and serially connected monitors made up for the limitations of projector technologies of the day. The processes involved in amassing and deploying the large amounts of video equipment from both professional and amateur realms could be labelled electro-bricollage. In fact large amounts of cobbled together technological junk became a key design element of groups formed expressly for rave and party visuals. Groups such as ‘Don’t Shoot the Messenger’ (formed by artist Steve Middleton in the mid 1980’s) and ‘Severed Heads’ (with Tom Ellard and Stephen Jones’ visuals created by mixing live video with footage created by home made video synthesizers, modified home computers and video pattern generators) often fore grounded their apparatus and their manipulation of it as part of the performance space.

Gerbaz, Alex (2008) Innovations in Australian Cinema: An Historical Outline of Australian Experimental Film
61 Ibid
The Raves and RAT parties of Sydney in the 80’s did appear to take on a wholly less political stance than the thrust of the UBU movement in the 60’s, with more mainstream ideas of entertainment rather than sensual experience being the focus. Although such ‘VJ’ video was produced mainly for spectacle and could be labelled ‘eye candy’ there also were artists who challenged television’s strangle hold by re-cutting their own versions of news and current event footage for redeployment in the context of a rave, nightclub event or large rock festival.

One such group were Scratch Video Artists Subvertigo (Ian Andrews and John Jacobs) who brought to the edgy Sydney party scene of the 80’s and 90’s a set made up of highly effected cut up and live video. This was produced with the aid of a highly elaborate analogue video mixing set up with three Panasonic MX-10 professional video mixing desks being at the core of their gear, with controlled feedback and multiple layering with luma keyed collages being a key signature of their aesthetic. This typical 80’s and 90’s aesthetic is best summed up by Sydney video artist Stephen Johnson “The video collage became a kind of compressed evening’s TV viewing, appropriated, remodelled and recombined into a new language of visual fragments in which the partial image is re-contextualized by its neighbours.” At a Sydney Big Day Out in 1994 (a large scale one day rock music festival) Subvertigo found themselves on the same bill as Southend, a radio friendly electronic dance music band that were riding the success of their ‘Sydney’ pre-Olympics dance song. Many residents of warehouse squats and previously cheap rent areas were affected by the preparations for the 2000 Sydney Olympics and Subvertigo played their anti-Olympic video set during the Southend performance.

The Amiga computer had played a significant part in the generating of video textures throughout the 80’s but by the end of the 90’s the rising speed of computer processor power meant that complex pre-rendered effects made on desktop computer software could be introduced into the mix. Digital video firewire technology enabled digital video to be output to an analogue tape.

From 2003 to 2004, Environ, a Melbourne audio visual night featured entirely improvised sets from video artists and musicians at Loop Bar in Meyers Place, Melbourne. The nights, organized by Brendan Palmer (one of Sydney’s ‘Clan Analogue’ sound collectives founding me members) brought together live improvised audio, music and visuals in a jam situation. In each jam the artists had not previously worked together. My own work from an Environ night is featured in the works attached to this thesis.

Video VJ software has since progressed to the point where complex effects previously only available through long hours of rendering are now possible in a live situation. These effects

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62 Jones, Stephen The History of the Electronically Generated Image in Australia, Leonardo vol.36, no.2.
63 Healy, Sean www.skynoise.net/2005/01/27/a-brief-history-of-vjing-in-australia/
can also be written and created through patching software. The artist becomes free to create a signature look outside of manufacturers parameters. VJ DP Wolf\textsuperscript{64} creates custom filters using Quartz Composer, a patching software available through MacOSX\textsuperscript{65} Utility tools, and then controls the effect within VDMX\textsuperscript{66} VJ software.

At the time of writing there are nights that continue to foster the development and sharing of live manipulated video. These include Melbourne video workshop nights ‘Stutter’ at Horse Bazaar or ‘Plug and Play’ a night run by Sean Healy (www.skynoise.net) for VJs to gather and show work at Kent St Café.

\textsuperscript{64} http://dpwolf.net/
\textsuperscript{65} www.apple.com/au/macosx/
\textsuperscript{66} www.vidvox.net
Nostalgia and Kitsch

‘The History of Art is simply a history of getting rid of the ugly, by entering into it, and using it. John Cage’

Taiwan is a fast changing country, one of Asia’s so called ‘Tiger economies’. At the time of my first visit to Taiwan in 1997 there was a large problem with theft of scooters and bicycles. Many owners would resort to ‘theft proofing’ their bike with the application of an ugly polka dot paint job, hastily splashed on, that drastically reduced the attractiveness of their rides to would-be thieves. On a later trip in 2006 I noted an absence of this anti-theft device and locals confirmed that this paintwork was now in fact a rare sight. While shopping for a bicycle I saw a designer’s homage to this era of DIY protection - a 2007 model with a blotchy polka dot paint job carefully rendered in high gloss. I’m unable to definitively state what the designer’s intention was but it appeared an effect previously regarded as ugly was appropriated and recycled as a ‘cool’ design.

‘Kitsch’ had its early beginnings as a term used to describe trite and crass, mass-produced art heavy in melodrama and emotion, ‘art characterised by worthless pretentiousness’. Prominent art theorist Clement Greenberg saw kitsch as a result of the machine age and the era of mass production. Ease of production and a disconnection from cultural sources had produced an empty art form, an “ersatz culture”, one that overstates themes with nauseous superficiality and containing no profound meaning. In order for ‘kitsch’ to exist, says Greenberg there must exist a “fully matured cultural tradition” from which signs and technique can be plundered, usually in low quality mass-produced knock offs. Kitsch reproduces the most obvious signs to deliver “vicarious experience and faked sensations”.

In other words Kitsch promises cheap thrills as a hollow shell of “genuine art”. While not Greenberg’s ‘genuine art’ the original splatter paintwork, like many styles of street art and graffiti, enters public consciousness. As a signifier of a particular era in Taiwan’s history – when rustic pragmatism overruled concerns of fashion and appearance, the reproduction splatter paintwork is, like most kitsch, loaded with nostalgia.

The cultures of ‘Punk’, ‘Street’ and ‘Grunge’ are heavily imbued with a DIY aesthetic. When blended with nostalgia through marketing, they are signs that give the consumer access to cultural cache involving ‘rebellion’, ‘individualism’ and ‘risk-taking’ without having to actually engage in any such real action. The glossy splattered-painted scooter is presented as a sign (which may well trigger nostalgic associations) that the consumer is buying as well as a mode of transport.

To Celeste Olalquiaga, kitsch represents the “decayed crystallization of an imaginary experience”. As a residual aspect of cultures gone by, the experience of kitsch is one of a vicarious venture into a mythical world that nonetheless resonates in the present.

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68 OED online Oxford English Dictionary Online
69 www.sharecom.ca/greenberg/kitsch.html
70 Greenberg, Clement (1971) Art and Culture: Critical Essays, Beacon Press, USA pp 11
71 Ibid pp57
72 www.celesteolalquiaga.com/about
From the time of the French revolution until the late 19th century, ‘follies’ – elaborately constructed garden settings in which ruins were simulated – were a popular attempt to grasp onto previous greatness in the face of rapid technological and societal change. The ‘follie’ was a sign of “historical transformation at a moment when the speed of events disabled such temporal perception”73.

In terms of ‘Moore’s Law’ of computer development the 8-bit technology of the 1980’s is now ancient history for many of the artist/programmers who literally grew up with those games. Home video games produced in the 1980’s, for platforms such as the Atari 2600 or Commodore 64, operated on ‘8 bit’ graphics systems. The limited processing power of the computer chips within the games led designers to work with a low resolution and the crudity of the sprites in these early home video games was far removed from the seductive airbrushed artwork on their box covers. The 8-bit graphics memory limited palettes to a maximum of 256 on-screen colours at any time and led to a sometimes noticeably heavy stepping between tones and colours.

Aside from the more heavy handed DIY aspects of circuit bending – where hardware is rewired or permanently altered to produce a real time visual instrument, the coding knowledge within 8 bit games system, ‘as they are’ has become available to the wider community. The current level of knowledge in online communities and forums means that the technology within these games is one that is available for deconstruction and experimentation a practice also known as ‘glitching’. A virtual simulation of the process of circuit bending allows technology from the 1980’s to blend effortlessly with current day creative tendencies. 

The Blip Festival in New York, 2008;

74 http://doomlaser.com/stdbits/
“...aims to showcase emerging creative niches involving the use of legacy video game & home computer hardware as modern artistic instrumentation. Devices such as the Nintendo Entertainment System, Commodore 64, Atari ST, Nintendo Game Boy and others are repurposed into the service of original, low-res, high-impact electronic music and visuals — sidestepping game culture and instead exploring the technology's untapped potential and distinctive intrinsic character.”

The “distinctive intrinsic character” and apparent nostalgia for video games of the 1980's means that the beautiful simulated ruins of dead media are respectfully resurrected. These ‘glitchers’ engage in a playful interaction with and mastery of early consumer-level technology and control over machine language.

75 http://blipfestival.org/2008/info.php
The Glitch as readymade: Bricolage

“The street finds its own use for things, uses the manufacturers never intended” William Gibson

“A digital artwork may be part scanned photograph, part computer synthesized shaded perspective and part electronic "painting" - all smoothly melded into an apparently coherent whole. It may be fabricated from found files, disk litter and the detritus of cyberspace. Digital images give meaning and value to computational ready-mades by appropriation, transformation, reprocessing, and recombination: we have entered the age of electrobricolage” William Mitchell

In 1915 at the Armory Gallery New York exhibition Marcel Duchamp, using the pseudonym ‘R. Mutt’, anonymously entered a urinal renamed ‘fountain’, for entry into an open exhibition. Though not allowed to be a part of the show (although Duchamp, as part of the selection committee, argued for the inclusion of ‘Mutt’s’ work) the work caused a storm, many arguments arose and the definition of art was altered forever. Duchamp’s ‘ready-mades’ represented a pointed argumentative question – if a mass-produced urinal, selected but not crafted by the artist, could be art then could not art be anything, any object at anytime?

John Cage’s Avant-garde work ‘4’33’” is a work in three movements, each comprising complete silence. The piece, composed for any instrument, was first performed on piano in 1953 in Woodstock, NY. The pianist sat in silence, acknowledging the movements by opening and closing the lid of the piano. During the performance the ‘readymade’ sounds of the ambient environment, wind, rain and chatter of the Music Hall that the work was performed in


delighted Cage.\textsuperscript{78}
In the flowering of experimentation throughout the 20\textsuperscript{th} Century, Cage’s composition was as significant an event in music as was Duchamp’s ‘Urinal’ in visual art. Both artists made it clear that the traditions of art, previously limited to the gesture or singular genius of a skilled artisan, were being eroded by the noise and light of wide spread industrialization in the modern world.

If Cage’s appreciation of the minutiae of the concert hall’s ambience was a lesson in ‘sound as music’ then the hiss and pop of low ambient static native to the recording studio and the internal workings of its machines is now re-defined as an analogous but nonetheless new space inside a computer. Glitch music is a sub-genre of electro acoustic music that grew popular as the Internet became accessible to artists. The relatively small size of sound files enabled file swapping, sharing and broadcasting and assisted the “post modern inclination to mix styles and genre including historically disparate styles”\textsuperscript{79}. The ability to sample and sequence sounds means that the newly discovered glitch always has potential as an instrument – a loud induced “Pop!” as a drum sound, or a hiss of distorted static for a cymbal, for example. The advent of digital sampling has its roots partly in the manual sampling of so-called drum ‘breaks’ on vinyl records that turntablists of the late 1970s and 1980s used: isolating and repeating these short sections of a song on a turntable and simultaneously blending them with other records to create hitherto unheard tracks. Playing only certain sections of a record “Many of the ideas and methods from early vinyl sampling were reconfigured into digital sampling once that technology became available, especially at affordable prices.”\textsuperscript{80}

Born at the advent of digital sound editing, Glitch music has its cultural and theoretical roots in musique concrete; a form of music that uses sound that is abstracted from its source as a compositional resource mostly using recording and playback manipulation techniques. In common with musique concrete, source material and instrumentation used is not restricted to the sound produced by musical instruments or voices and can include manipulated recordings. Time-stretching vocals and reducing drum loops to grainy 8 bit fidelity to induce distortion were some of the first techniques used to create artefacts for their timbrel qualities.

The experiments and works of Musique Concrete composers such as Karlheinz Stockhausen, Edgar Varese, Pierre Schaeffier and John Cage made use of the electronic instruments and technologies that were available to them in their era. In addition to the idea that “noise is music” as expounded by Luigi Russolo in his ‘Art of Noises’ manifesto in 1917 (which saw the sounds of the industrial era as a new phenomena, of sound as music) was later expanded by Cage to include all sound, even the relative silence of a performance hall (4’33”). So the error, or sounds that signify error or even the intrinsic trace artifacts of media have an enormous popularity for experimentation.

\textsuperscript{79} Rhodes, W. Carl (2008) \textit{Critical Representations of Work and Organization in Popular Culture} USA pp221
\textsuperscript{80} Ibid pp222
The contemporary composer is nowadays surrounded by electronic hardware capable of manipulation of sonic nuances and characteristics on a micro level. The sounds produced by malfunctioning devices, the pops and distortions produced as sound gear is turning on, the crackle in a signal as voltage fades or fluctuates, the sound of a needle dropping into a groove, digital files corrupted by misuse or damaged storage are all sources for glitch music.

The current development of video glitch culture through direct sharing of knowledge and aesthetics can be compared to that of the Glitch music culture in the early 1990s when sound files were swapped and sampled over the Internet. The increase in bandwidth has allowed video sampling, sharing and exhibition over the last 3 years to increase rapidly. Sampling often involves the collection of media from different generations of video technology. In the process of collecting the glitched aspects of the media are able to hitch hike as an appealing texture for the palette of an artist.

‘The Gleaners and I’ (2000) is a documentary by French filmmaker Agnes Varda that covers in detail a personal view of the history and nature of gleaning. Historically, gleaning was a practice occurring in 18th century France when the poor would meticulously comb recently harvested fields for left over turnips, potatoes or stems of wheat. Varda interviews various contemporary individuals in rural and urban France as they work with discarded objects and ideas and the political and moral implications of using something considered by most as trash or discarded as out-of-date.

Her own practices as a film maker and documentary maker are revealed in the film – a sort of meta-documentation of what it means to be a bricoluer - a term given to one whose artistic practise derives mainly from tinkering, meddling and modifying available technology and discards to suit their own needs. In examining her own practise Varda brings to light the very personal nature that bricolage takes on for each bricoleur. The very act of cobbling together items of technology that are specifically available to each artist in a personal way is perhaps the first step in ensuring that each artist will create unique works. Each piece of hardware and each set of software implies a mode of production (and a specific mode of glitch) – and that effect is lessened when an eccentric array of production tools and processes are assembled, patched, cobbled together, in a variety of ways as to subvert any over arching effect on the outcome by any particular tool. Many video artists, however, do have a tendency to work with more than one item of equipment – especially those whose practice is based more in textures than in the figurative image. The practice of adding pieces of equipment and various modes of image production together, which William Mitchell, calls ‘electrobricolage’, means that the possibilities for the glitch to exist are multiplied. Electrobricolage creates a present tense in which multiple modes of technologies may co-exist and overlap in chronology. By cobbling together new image producing ‘machines’ the artist creates new combinations of uncertainty – the conditions in which glitch thrives. Creative improvisation with available objects allows what Carl Rhodes calls a “transfer across cultural domains of objects and artefacts as part of
identity formation processes" The disembodied piecemeal nature of open source software allows a greater speed of transfer of ideas. The readymade nature of the glitch - the glitch as instant art, is investigated with a sense of irony in the work of programmer/artist Sven Koenig – his instant video art P2P (peer to peer) website neatly automates the repurposing of found footage (Koenig classifies video downloaded from p2p websites as found footage). The error correction softwares built into many digital communications systems become fertile ground for many artists and Koenig recognised a trend in digital codec error – largely created by errors in motion compensated prediction systems used in mpeg video.

Motion compensated prediction uses motion estimation to predict the content of parts of the current image by attempting to find, in a reference picture the image fragments that correspond to image fragments in the picture currently being encoded. Koenig’s ‘Download-completed’ requires the user to upload a digital video file in an mpeg codec associated with video files transferred online (DivX, MPEG2, H264 and others). The video file is then processed and filtered through Koenig’s custom software to simulate the image degradation that occurs during the playback of mpeg files that are partially corrupted by incomplete or incorrect copying or download. Here Koenig is subverting the sign of glitch as communication that has been broken – a ‘lost signal’. Koenig’s technique creates a ready made temporal collage through digital automatism. By alluding to the way that double exposure created superimposition in film Koenig is reminding us of the fragile nature of the image as code. The artefacts produced by this process take on the signs attributed to nitrate film decay and the artefact itself ‘stars’ in the film, a virus-like by product of Hollywood’s obsession with copy protection.

The feature film ‘Decasia’ (2002) showcases rotting and decaying nitrate-based films from the early years of motion picture production. An unsettling mesmeric score sets the tone for a sequence of shots with no apparent binding narrative. A slow pan through a motion picture film manufacturing plant is capped with a hand dipping into a vat to touch the film. A Sufi dancer twirls in slow motion. Traffic bustles through a nameless metropolis. Soon, however, the intrusion of decay looms as a filmic element and the long dead unknown actors often seem to interact with, and be affected by, fluttering and boiling textures that make us very aware of film’s mortality. ‘Film Ist 7-12’ (2002) travels a similar aesthetic path, especially in the chapter entitled ‘Magic’ where the alchemy of nitrate film decomposition melds with trick photography. The elevation to high art of these undead artefacts from the wake of media development illustrates an appreciation for the physical nature of film-image as lost world, the image as mortal, the image as reality.

‘Film Ist 7-12’ (2002) Dir: Gustav Deutsch, Austria
Figure 5 Frames showing nitrate decomposition from 'Decasia'.
Design and Discussion of Works

"While technological failure is often controlled and suppressed - its effects buried beneath the threshold of perception...failure has become a prominent aesthetic in many of the arts in the late 20th century, reminding us that our control of technology is an illusion, and revealing digital tools to be only as perfect, precise, and efficient as the humans who build them. New techniques are often discovered by accident or by the failure of an intended technique or experiment."  

In the 1990's Sean Cubitt wondered, in relation to video specifically, if we had spent too much time building up the 'art of the present moment'. According to him, video and its fragile magnetic tape might just be the Alzheimer's disease of western consciousness. In hindsight his words are especially relevant to digital media's ability to capture, store and transmit all previous media. As Lev Manovich has said, "since the 1960s the operation of media translation has been at the core of our culture" and we could consider ourselves to be in a constant state of translation – our increasing reliance on digital media and the associated encode-decode cycles of recording, transmission and playback certainly allow error to appear in our lives in real time. Our society's fascination with personal media and online socialising – the 'auto-amputation' spoken of by McLuhan, ensures that technology capable of producing and playing moving imagery is ubiquitous. Even the artefact ridden low-resolution video common to smaller devices has assumed its own importance during its lifetime with dramatic footage of plane terrorist attacks appearing almost instantly on broadcast television. The speed of digital media allows glitch to simultaneously be the subject and the medium.

For the artist working in moving images the arrival of digital technology and budget equipment capable of digitisation of analogue video in real time has brought many ways to capture and produce video from both digital and analogue devices both in live performance and post-production.

Digital media in particular, with its format-less state and its encryption algorithms, appears especially capable of blocking creative manipulation of the medium on a physical level. However, through 'remediation' (A term coined by Bolter and Grusin to describe how new visual media attain cultural significance by paying homage to, rivaling, and refashioning earlier media such as perspective painting, photography, film, and television.) digitisation, for me, serves as glue with which to bind together analogue and digital visual media and thus, their specific glitches also.

Each piece of analogue or digital video hardware implies a mode of image production and therein lies potential for a glitch specific to that mode. Glitch may well be the result of genuine error but can also be caused deliberately. In my arts practice glitch implies a 'real time' experiment where the conditions for glitch are created yet little more than a small degree of control is achieved during the production. The essential nature of glitch is that it is not controllable and at the point a glitch becomes a repeatable experiment, or an operator

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87 Cubitt, Sean (1993) Videography , UK pp148
88 Manovich, L. (2001) The Language of New Media , USA pp330

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becomes a virtuoso in the methods of production of any specific glitch it has become something else – an ‘effect’. As an artist, intuitive creative gestures during the execution of the experiment guide the process in which glitch is forming. This creative control is the beginning of the end for a glitch, its final taming before, as an effect, it enters the lexicon of film language, reborn as a signifier that often denotes a particular form of media and the era in which it was most prominent.
Project: Loop the loop Parts 1, 2, 3 and 4

Date: August 2002

Media: Digital Video on DVD

‘Loop the loop’ is a simulated multi-angle view DVD containing a series of clips from a wireless camera mounted on a model airplane. The clips, exactly 8 seconds in length, represent 8 different camera angles.

As presented on DVD, at the end of each clip the next clip is randomly selected. The DVD represents a simulated chronological record of a flight as covered by a multi-angle DVD. In switching camera angles before repetition of any particular clip the viewer does not detect repetition and an illusion of continuity is created.

Multi-angle DVD was promoted as a feature unique to DVD but the ability to switch camera angles interactively was not actively adopted by either producers or consumers. Only a few titles championed the technique (‘The Who Live at Royal Albert Hall’ (2000) being one). The multi angle feature appeared only briefly in the history of home video and is remembered only as a button on each DVD player’s remote control. Winston’s “Law of the suppression of radical potential” states that diffusion of a particular technology is controlled by industry rather than market demand and consumers would perhaps now be enjoying multi angle technology except for the increased production costs involved for producers.

A glitch native to this bypassed technology – a glitch ‘fossil’ – is incorporated into this video work. In an apparently unavoidable playback defect (or glitch) in the course of seeking data for the new camera angle track a slight pause of about 1 sec occurs. The manufacturer’s
warning “layer change may cause a brief pause” is included on DVD packaging still, in fact. This glitch ‘fossil’ (a relic of a technological dead end in DVD media) is included in this project as it is a glitch unique to the medium of DVD.

As noted by artist Sven Koenig with his ‘Download-Finished’ Project, corruption of signal correction software built into many digital communications systems has become fertile ground for many artists working with glitch. Analogue and digital video systems transmit their signals in differing methods and glitching of either produces different results. In place of the snow and grainy image associated with a weak transmitted signal for analogue video we see, in digital video transmitted via wireless, a chaotic and frenetic random sequence of images. As the signal from the wireless camera is weakened and distorted by interference the video image breaks up into a jagged patchwork pattern of bright colours in a 25 frame per second ready-made collage. It is a process in which the immutable digital video signal is geographically plotted; glitch is determined by the architecture of the space the plane is moving within. This is a digital in-camera experimental film with the outcomes imprinted upon the image in real-time via the placement of the camera (read: image transmitter) and the subsequent effects on the signal itself. Changing the position of the wireless camera by attaching it to a flying plane thus enables new ways of glitching just as it enable new ways of seeing. Susan Sontag compared the ‘better’ looking cracked and tarnished photograph to the way in which buildings such as the Parthenon “probably look better as ruins”. If, as Sontag claims, the photographer is ‘antiquing reality’ with every photograph taken I believe the process of glitching a video signal is a process of creating a beautiful real time ruin that continuously collapses in upon itself.

In an attempt represent a repetitive event using a defined set of samples ‘Loop the loop’ invites the viewer to experience a playback from a random selection of clips as if it were a real time event. Live video coverage of sports events such as aerial coverage of a bike race would often experience breaks in transmission, manifesting as a frozen image or sequence of stilted images usually collaged with digital noise. The realism and continuity of the repeating event in ‘Loop the loop’ is enhanced by the use of footage losses in signal. Glitch has been used as ‘content’ to mask sections of the loop that were not shot at the location. Apart from the use of glitch to add realism to the image it is also a device to help create clips of exactly the same length.

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90 www.download-finished.com
91 Sontag, Susan (1977) On Photography, UK pp79
92 Ibid pp 80
Project: Environ Audiovisual Improvisation Club Video Mixing
Digital Live audio/video jam performance utilizing in-camera effects.

Figure 6. Configuration of equipment used during this set.

Date: August 2003
Media: Digital Video on DVD

For me as an artist the physics and mechanics of analogue moving image production often serve as inspiration for the construction of devices of video based technologies. In this project a practinoscope, an animation device invented in 1832, which draws upon ‘persistence of vision’ (a glitch in human perception enabling image sequences to be perceived as a continuous), was recreated in a live video work using a turntable, a strobe light and a video camera with an in-camera effect called ‘slow shutter’. A paper disk with a cycle of 24 drawings rotated underneath the strobe light. The persistence of vision effect created by the slow shutter speed and the pulsing strobe enabled the images on the spinning disk to be read as a short loop. The sequence of 24 images on the plate translated as a loop almost two seconds in length. In this case the glitch is manifested as a result of a situation that the manufacturer never imagined.

Second input came from an out-of-focus tube camera trained on a mirror ball at close range.

Any device that is capable of forming and transferring a video image is a potential tool for the VJ. As an artist I feel that the potential for glitch multiplies when an eccentric array of
production tools and processes are cobbled together in creative combinations of uncertainty –
the conditions in which glitch thrives. My own process has sought to investigate glitch through
a physical engagement with the medium, often through a physical installation of equipment,
often with found media hardware and props. For me the process of collecting objects and
media devices followed by construction and execution is as important for me, if not more so,
as the final product. The serendipitous discoveries revealed by the random nature of gleaning
from skip bins, op shops and hard rubbish could by definition only result in idiosyncratic
constructions and thus, unique imagery.

Bricolage often involves the use of items in a way not intended by the manufacturer and in
this project the combination of the strobe light with the slow shutter setting on the mini DV
camera created a persistent image effect. Apart from simple luma keying no video effects are
avoided. Digital technology acts as a carrier and facilitator and the opportunity for digital
technology to impart its own glitch has been limited.

This live performance was an opportunity to play within an abstract realm using only live
video effects created by in-camera manipulation. In eliminating software I have eliminated the
associated signs of such softwares. By externalizing the image making process there
becomes an ability to introduce a physical way of creating glitch.

When a media form becomes outmoded and consigned to the scrap heap with other dead
media, the glitches associated with it are preserved by nostalgia. Through this
electrobricolage I act as an electro-archaeologist, unearthing glitch for a process of pollination
and re-appropriation.
Project: Susurrus

Above: Four stills from ‘Susurrus’ (left) and the method of production (right).

Date: May 2008

Media: Digital Video on DVD

Shot on a 1 metre diameter rotating set in a period of 4 days, this work explores the in-camera effects (colour balance, saturation and lens distortion) and glitches specific to analogue tube video cameras. Deliberate maladjustment of macro-focus, image capture during extreme changes in lighting (resulting in overexposure), ghosting and trailing, motion blur through set movement are also used to alter the image.

Motion blur and shutter speed due to movement of the projection source simulate, for the viewer, similar digital effects and results of the experiment led me to thinking of creating a set that moves in relation to the camera in order to achieve similar blurred effects consistently.

Tube cameras of this era have an automatic exposure built into them. By holding a lens cap over the camera lens and then removing it, it is possible to create a gross overexposure. This effect and the manual white balance adjustment became a focus point for this particular project. The tube based analogue video camera represents for me a video version of Super8 film.

This work was conceived, constructed and executed during a 4 day period as part of an exhibition called 2020 curated by Ash Keating. Artists were called upon to construct works.
from industrial offcasts. In my case the media I used was rescued from Hard rubbish –
analogue video cameras that use vacuum tube technology recorded the visuals.

Extreme manipulation of the cameras parameters – exposure, focus and colour balance was
part of the process of image gathering. Informed by Glitch aesthetics from different media –
the direct action on film by greats such as Brakhage and Len Lye as well as digital video
 glitch informed this work. This work is reliant on the loop as a building block. The cylinder
offered a way in which to produce stop motion glitch simulations at a high speed, feeding into
my idea that glitch is real and present in all processes. The speed of production enabled a
visitor to the site to see animation produced in a live context.

Each of these image making constructions presented is modular – and could also assumed to
be available for remix as a part of a larger more complex machine. For me the process of
production, fore grounded in this way, has allowed me the time to express an aesthetic of
 glitch related not only to my desire to create physical sculpture but also related to a larger
picture of the world in which continual glitch plays an important role as spark for creativity and
discovery.

Despite a relentless evolution in picture and sound quality the glitch remains a potent force
that constantly asserts itself in each new media, in a way that is unique to each moving image
media form. Such signs of error, malfunction and low quality image lower the value of a
product as both the maker and the consumer see them as highly undesirable, if not totally
abject. At the same time glitch is derided as a sign of cheap and inferior technology it
reappears in new media, specifically as a signifier for previous media forms. Glitch is a stain
that won't wash out.
Project: Morphosis 1

Date: December 2002

Media: Digital Video on DVD

Method: Digital Morphing – Images of a Laotian girl's face as she undresses for the camera. The expressions gradually change from genuine smiling to less certain and nervous smiles. This is an attempt to create a figurative glitch, to synthesise the in-between expressions the camera didn't capture and explores the distortion effects (aka glitch) that occur when morphing from one image to another.
**Project : Morphosis 2**

**Date:** June 2004  
**Media:** Digital Video on DVD

**Method:** A plugin that generates in between frames based on per pixel information is used on a sequence of stills of pedestrians in a street.

In this work I looked at the possibilities enabled by intra-frame extrapolation, and the application of several iterations of software performing this function. The information available to the computer is limited – as each frame is sometimes completely different to the last the computer is often left clutching at straws and the results are unpredictable. Multiple iterations of the effect increasingly abstract the image.

In pushing a figurative image almost to abstraction there is an interesting midpoint where the imagery exists almost in the realm of algorithmic extrapolation. In this work I aimed to skirt the edge of the identifiable image while maintaining a memory connection with the original image as photographed by me.
Project: Flying Light

Date: July 2004

Media: Digital Video on DVD

Method: Mobile video Projection Project in Taipei, Taiwan. A projector mounted on a motor scooter created a moving graffiti around town in an exploration of the textures that video projected from a moving object causes, and the potential for projected imagery to appear affixed to walls in a city landscape.

The way in which light hit different textures at high speed was a revelation. Tests showed that the a cool white colour of the projection contrasted nicely with the night time ambient light of many city locations (mostly from yellow/brown sodium lamps) The brighter an image was in reference to the surroundings, the less it appeared to be an image originating from a projector.

In one sense this work is an intervention but it also is an attempt to experiment with moving the source of imagery and in relative terms the screen is moving past the camera. The documentation of the project is limited in its scope to capture the textural effects achieved by the projector over the urban landscape. Motion blur in the video documentation caused by the relationship of the shutter speed to the rapid movement of the projection source led me to experiment with a moving set, seen in the project ‘Susuruss’ where the motion blur effect could be achieved consistently through frame by frame capture. (see ‘Susuruss May 2008’).
**Project: Average Purchase Time**

**Date:** June 2005  
**Media:** Digital Video on DVD  
**Method:** Digital media has the capacity to foster our seemingly inexhaustible appetite for recording. Our lives are on screen as much as they are off it. Average Purchase Time was a project that me invert the concept of surveillance in an attempt to make a film without a specific subject in mind. By haphazardly filming while making a purchase in a convenience store I was attempting to subvert the surveillance system that is installed in every shop. This project sought to juxtapose captured footage of a seemingly trivial with its presentation in the form of a CCTV security video screen.
Project: Still/Motion Blur 1 and 2

Date: July 2005

Media: Digital Video on DVD

Method: Two experiments with motion blurring effects to simulate motion of static objects. Blur is created by two methods in these projects. Firstly the artificial blur of a still image of a motorbike rider is an attempt to use motion blur effects with Adobe After effects as a method of creating a authentic looking motion blur. The second work uses a steady camera position and allows the movement of the subject to create the blur, and was intended both as a reference for the creation of simulated blurs and to test the motion blur caused by long exposure in digital still cameras.

It is perhaps an encultured view that blur indicates motion in photography. This association is expanded in this work where still images of motor scooters in traffic, and buildings and cars in an urban setting are blurred through extreme motion – creating images of seemingly impossible speeds and implausible movement in solid objects. Directional blur in imagery is synonymous with speed and motion. A juxtaposition of clear imagery with blurred long exposure imagery highlights the role of in-camera blur in motion pictures and the link with its photographic beginnings.
Project: ‘The Magic Drum’ (effect: 3D objects that appear 2D)

Left: Puppet photographed under UV light    Right: Puppet after image processing.

Date: July 2005

Media: Digital Video on DVD

Method: Lighting and contrast experiments with painted 3D objects to simulate 2D animation. This technique creates animation with stop motion puppets to simulate self-illuminated 3D objects particular to the early years of CG models in the 1980’s and 90’s. The elimination of detail on a surface denies an appraisal of an objects scale.

Creating effects such as travel mattes and multiple printing in film long relied on the physical, material nature of film – in many cases requiring the physical layering of film. This project drew on my own knowledge of film-based processes as applied to a digital video project. Over exposure and keying effects are in the same sphere – one springing from the isolation of one particular channel. The solid link between a photographic process and digital process is defined for me by this simple effect.
Project: Ghost Trains

Date: June 2008

Media: Digital Video on DVD

Method Most digital imaging devices such as flat bed scanners and digital cameras include automatic image sharpening within them to enhance and clarify the digital image. This project presents three short narratives with a progressive effect of sharpening to the point of excess.
Project: Still de-compositing

Date: September 2008

Media: Digital Video on DVD

Method: In this project I am investigating the repurposing of software tools for uses other than the primary design. Video is taken at varying focal lengths from one position, stills from the video are then extracted from an HDV video camera and processed with Helicon Focus, a software program designed to create a single sharp image from multiple macro images. The software process masks and feathers the image in areas of unsharpness – the results are unpredictable and produce complex imagery.

Digital video compression systems such as Mpeg4 use reference frames before and after the current frame to reconstitute images. Errors arise when these reference frames are collected wrongly, or not at all. Learning how to recreate errors in digital compression is beyond my coding skills but this project, I discovered, a way of using similar processes to create, slowly, a video work that was intended to foreground an aesthetic created through misuse of a manufacturer’s product. This frame by frame approach may also be analogous to the creation of experimental films by hand on 16mm. Working directly on the image itself may not be possible in a material sense but the assemblage-like process in the creation of the image (multiple angles of the same or similar subject/textures gives me the chance to use the camera as a gathering tool to create a palette of textures.
Discussion

“All discourse is Bricolage and both the scientist and the engineer cannot pretend to get outside or beyond that – both are bricoleurs too.”

Capitalism by its nature fetishises technology – smaller more personal technology emphasises the human aspects of the interface. There is an unconscious attempt to manifest and extend digital ephemera into a physical and tactile realm. The tactile manipulation of pixels to reshape the medium that happens on an Apple iPhone touch screen (at the time of writing, a handheld device receiving popular acceptance and available for about a week’s wages), is a good example of the way screens are increasingly becoming caressed and held close to the body, occupying intimate body space. The increasingly ubiquitous nature of personal screen media also brings a new tactile presence of the screen itself to the fore, personal devices with image transmission capability, street side touch screen kiosks, cameras with instant replay and a society under surveillance mean that our ‘discourse with the real has become one of discourse with the represented image.’ Le Grice (2001). This would seem to imply that a corresponding connection with all media from history is also affected by this attachment to the image as real - media of times past, however seemingly ephemeral, are imbued with an historic sediment of meaning through signs of physicality. The digital image is internalised, a vital mirror of self. The surface is newly important and heavier with meaning, as the ability to record, broadcast and replay images in real-time makes it a more plastic part of self awareness and self image. So there is a kind of frustration here - a screen represents but doesn’t resonate in the way that physical objects can. The signs and scars of screen show a surface a ‘glitch’ that helps to humanise the technology.

Conclusion

Since the arrival of digital technology the processes involved in creating imagery have become so much more fluid; it has relieved the photographer of the burden of time and economics so tied in with the traditional chemical-based phase of film processing.

Instantaneous digital photography has merged the camera and the print together - arguably the only time a digital image is framed and looked at intensively by a group of people together would be at the moment of its creation, on the LCD screen on the back of the device. The method of exposure has also changed, rarely is an optical viewfinder used to frame an image, in fact many cameras no longer have optical viewfinders. The image is framed at arms length using the LCD screen on the rear of the camera. This allows a physical distancing from the device and constitutes an evolution of the device away from being an ‘eye’ and toward a Brakhagian sensing the world, more an extension of the will to create a two dimensional image rather than a ‘camera eye’ of ground glass bound to a “19th Century Western Compositional perspective.”

This is an example of evolution that brings media closer to the body, closer to the mind. McLuhan’s “auto-amputation” occurs much more easily with digital media, the body that we hold outside of ourselves is contained within the digital realm with binary code, as blood. Many of the interactions we have with the world now involve digital devices and screens and digital media can mutate each time it undergoes a transfer. As Lev Manovich states, “since at least the 1960s the operation of media translation has been at the core of our culture.”

Digital files are mutable in form, they are algorithmic and as data they are not limited to output in any particular form. As Mitchell says “The distinction between the causal processes of the camera and the intentional process of the artist can no longer be drawn so confidently and categorically. Potentially any digital ‘photograph’ stands at any point from the algorithmic to intentional.” In allowing technology, which has become so close to us, to be fallible and full with Virilio’s “profane miracles we are becoming what Angela Ndlianis calls a “sacred monster”

The glitch is a creative force that exists due to the innate desire to innovate and experiment. Error or unanticipated phenomena are always potential outcomes in experimentation. And if experimentation is the means through which all media comes into being then what differentiates error from success? In many cases the threads of development – previously cast aside as failed or irrelevant experiments, have served to fill in missing parts of knowledge.

94 Quoted from Film Art Phenomena pp 149 original source: Essential Brakhage, (2001) Stan Brakhage New York
95 Manovich, Lev (2001) The Language of New Media USA pp331
97 Ndlianis, Angela (2004) Neo-Baroque Aesthetics and Contemporary Entertainment, MIT, USA pp250
All processes could be regarded as artefact. However there are subjective criticisms – led by economic, cultural and social forces - on what constitutes beauty. The glitch has always been around and has always been an influence on art processes. If the medium creates the experience and the context then the glitch is one of many potential outcomes. Economic and social forces that create technologies also create conditions that facilitate the mismatching of software, hardware and thus creating conditions for a glitch to be birthed. If the medium creates the experience and the context then the glitch is a parallel alterity that is one of many potential outcomes. The glitch has appeared in many forms and continues to surface in corresponding visual media in a life cycle that feeds backward into previous generations of media.

The glitch is ever present in all forms of media and yet it is not glitch, just a form that is yet to be discovered and, eventually, appropriated by the cultural mainstream. Personal creativity brings us closer to the medium. The speed of digital technology will increase to the point where creative real-time manipulation of glitch by artists will define digital media as a creative singularity.
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