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The integrated image: an investigation into the merging of video and computer graphics techniques incorporating the production of a video as a practical element in the investigation.
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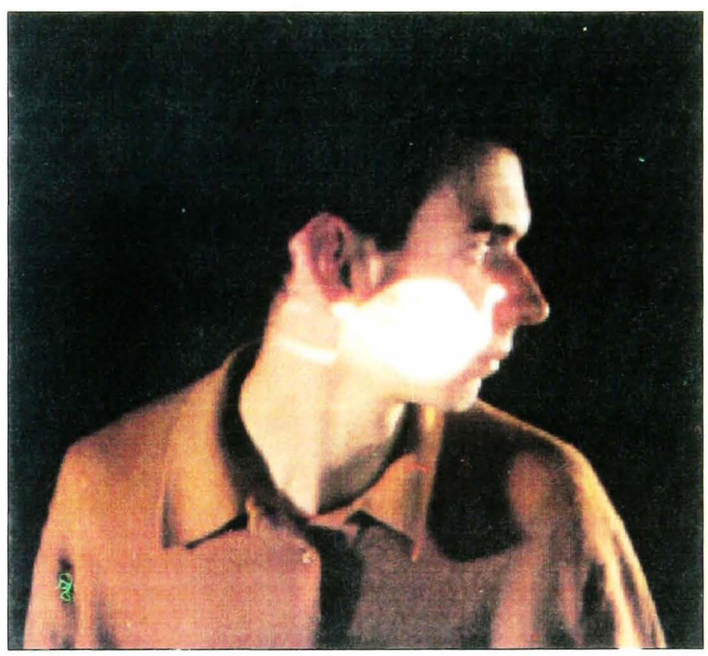
THE INTEGRATED IMAGE

An investigation into the merging of video and computer graphics techniques incorporating the production of a video as a practical element in the investigation



Thesis submitted by Marcia Clare Kuperberg
in partial fulfilment of the requirements of the degree of Master of Philosophy (MPhil).
Collaborating Establishment: Phoenix Video.

Middlesex University. April 1994

ABSTRACT

To a large extent computer animation has been technology-led and has progressed independently of both conventional animation and live action film and video production. It has thus not benefited from the substantial body of knowledge built up by these more traditional methods. This applies particularly to characterisation within 3D computer animation.

Computer animation, however, no longer exists in isolation. It can be used to convey narrative in its own right and increasingly it is being used together with live action film, television, and/or video in the search for visual and audio effects not possible through the use of a single technology. The experimental activity has been focused on integrating sound and image from video and computer to produce a personal piece of video art in the form of a narrative fantasy. Issues which spring from this are discussed and critically analysed: the level of technology required, and the creative issues of audience perception, narrative and characterisation when applied to such varied models as actor and computer generated object.

The research is presented in two parts: the video narrative with integrated imagery and this thesis which reflects upon the issues outlined above.

CONTENTS

SECTION ONE
COMPUTER GRAPHICS: HISTORICAL CONTEXT

1.1 Introduction

The media referenced in this project—film, television, video and computer—are all systems of representation, capable of creating and presenting a series of linked images which convey movement as well as the continuity of a story or series of events.

Film, television and video are distinctly separate technologies, each born some thirty years apart, yet each having in common the fact that it springs in part from the photographic image. Computer imaging, on the other hand, is a relatively recent by-product of the computer's original purpose, that of providing man with a mechanical means to speed calculation. However, as proposed in **Section One**, to a large extent computer animation has been technology-led and has progressed independently of both conventional animation and live action film and video production.

Many of the digital visual effects seen in television commercials, or in films such as Jurassic Park and Terminator II are only possible with the type of extensive studio facilities beyond the scope of the individual artist, but with the advent of increasingly more powerful PCs and ever more sophisticated software for this platform, the gap is decreasing. This begs the question: what level of creative and innovative activity can be accomplished by the individual without the use of such high level equipment? This question is addressed by the experimental production itself, The Creator, which aims at broadcast quality. This work is detailed in **Section Two**, with conclusions drawn in **Section Four.**

The all-encompassing progress of computerisation and the aesthetic demands of image integration mean that artists and filmmakers now require a broad-based knowledge of all these media. This must include an understanding of the creative issues of perception, narrative structures and characterisation—issues of importance to all story-tellers—if the creative opportunities presented through the merging of the technologies are to be maximised. These issues in relationship to The Creator are examined in **Section Three**.

Section Four draws general conclusions and includes the Bibliography. The Appendices give added background detail of the production work of The Creator.

1.2 Computer Graphics: Historical Context

Unlike film, television and video, computer technology did not spring from the desire to make photographic images move. The computer springs from our need for mechanical assistance in calculation, a need which can be traced back to as early as 9000 BC when a form of abacus using pebbles in grooves of sand may have existed (Campbell-Kelly, 1978:23). It has taken about 5,000 years for us to progress from abacus to the desk calculator and from there to the first electronic digital computer. Men such as Leibniz, Babbage, Pascal, Turing and von Neumann all played an important part, as did advances in the field of precision engineering, electricity, electronics and microelectronics.

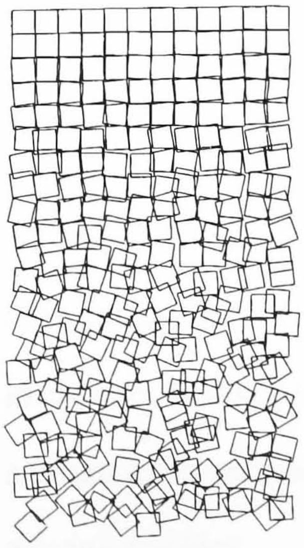
The modern digital computer is a post-war development, with the nuclear arms race as its spur (Pratt, 1987:211). During the 1950s, computers were enormously expensive valved machines largely engaged in military service. Nobody seemed interested in fully exploiting these devices by making them smaller and cheaper. "For the first two decades of the existence of the high speed computer, machines were so scarce and so expensive that man approached the computer the way an ancient Greek approached an oracle" (in Winston, 1986:209).

Generally thought of as a purely number crunching machine, the SAGE air defence system, introduced by the US government in the mid 1950s, gives an early example of a production system that relied on the use of 'interactive' computer graphics. Missiles and aircraft were detected by radar and their positions displayed on screens. Operators examined these images to decide which targets were interesting. These were then indicated to the computer by pointing at them with a light pen. The computer then performed tracking and interception calculations and relayed them to command stations elsewhere (Jankel and Morton, 1984:19).

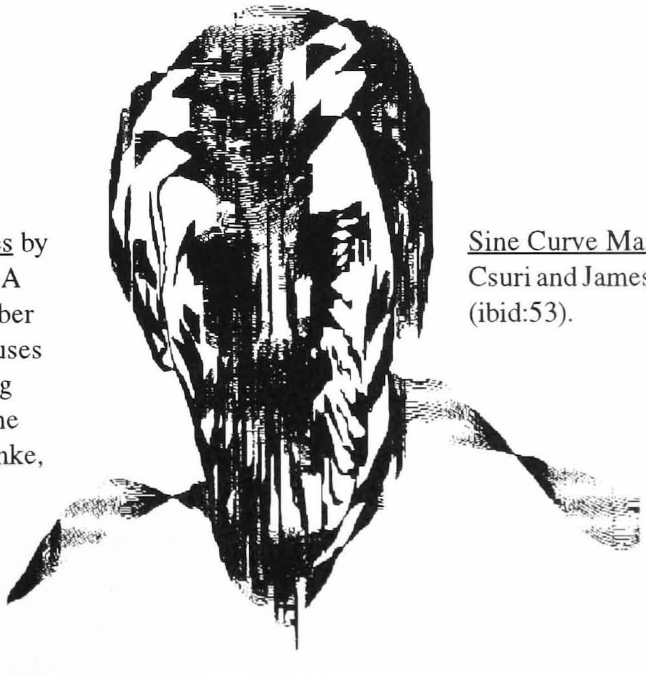
By the end of the 1960s, computer graphics had influenced some areas of the scientific community, but it had not reached the general public — there were no commercially available video games, no computer graphics on television and no awareness of computer animation.

The first video game, called 'Pong' (a simulated ping-pong game), was marketed by the newly formed Atari company and consisted of a black and white microprocessor-driven toy which attached to a television set. 'Space Invaders', a game developed in Japan and sold worldwide by Atari, became so popular that the word for a video game machine in Japan and France was a 'space invader' (Jankel and Morton, 1984:29). As Jankel and Morton point out, video games are an example of how computer graphics have progressed from being a tool for doing something else such as visualising scientific data to being an end in their own right.

Even a cursory examination of the computer graphics and computer animation literature makes it clear that most of the early developments in the field were by technologists rather than artists or animators. This is understandable as only mathematicians and scientists possessed the necessary technical knowledge to create graphic forms via a computer (Franke, 1971:72). Examples can be seen in works by the mathematician, Georg Nees, who created interesting patterns by random number generation; Frieder Nake, who experimented with the visualisation of mathematical processes and Peter Struycken, who created a series of patterns by distributing elements over a grid field following a program with 'weighted' chance.



Gravel Stones by Georg Nees. A random number generator causes the increasing swaying of the squares (Franke, 1971:30).



Sine Curve Man by Charles Csuri and James Shaffer (ibid:53).

The fact that computer art has, for the most part, been led by technologists —programmers, mathematicians, scientists—rather than by artists has led to a restricted view of its capabilities, thus hampering its development and slowing its dispersal as an artistic medium. These barriers are only now beginning to break down as more artists and animators gain access to equipment and begin to realise its potential. The difference in the approach of the artist to that of the technologist, is summed up by Chris Walker, an animator who wants to use computer animation to tell stories: "I'm trying to get computer animation out of the precious world of five-second animated logos, where everyone just salivates over every single surface. I want to tell stories with this stuff" (Vasilopoulos, 1990: 77). This difference in approach is possibly that artists tend to want to use the computer as a tool to visualise their own internal concepts, whereas programmers and mathematicians wish to extend the range of particular effects which the computer is able to offer. They are less concerned with how these effects are eventually used.

There were, of course, exceptions to this generalisation. Among them were Charles Csuri, Professor of Art, Ohio State University, and James Shaffer, a programmer of the same institution, who combined their talents to produce computer graphics with purely artistic purposes—Max Bense of Stuttgart University, who together with Jasia Reichardt, organised an exhibition called *Cybernetic Serendipity* in London (1968)—the Computer Arts Society, founded in London in the mid 1960s by Alan Sutcliffe and John Lansdown, which organised exhibitions of computer art such as *Event One* (1969), and individuals such as John Whitney who studied composition and photography in the USA and in Europe, and experimented with analogue mechanical systems for creating animated film effects, later (1966) working with IBM to explore creative tasks in moving graphics.

The impact of computer graphics on the image based media of television and video has been dramatic but very recent, as mentioned by Patricia Portela, a senior graphic artist working for Quantel in the US. She believes that due to the Paintbox, the first computer system dedicated to graphics for television (introduced in 1981), the demand for television graphics became much greater — to the extent that today practically every commercial, promo or TV programme has some sort of graphic incorporated (Beebe, 1991:10). The impact of computer graphics techniques on the film medium has been even more recent.

The development of 3D computer animation lagged still further behind the development of computer graphics as a general design tool. Although expensive stand-alone systems such as Quantel offered 3D animation facilities by the mid 1980s, these were too expensive to be installed for general use of students. The increasing power of the micro, together with related innovative software, has only just begun to challenge the expensive stand-alone systems such as the Quantel Paintbox. For example, it was only toward the end of 1991 that the first comprehensive 3D animation software for the PC platform (Autodesk 3DStudio, the software used for The Creator) was introduced — software which carried sufficient educational discount to enable its widespread use in educational establishments.

Computer graphics no longer exists in isolation. It is increasingly being integrated with live action film, television and video in the need to convey visual effects which are not possible through the use of a single technology. As more and more artists gain the opportunity to experiment with this exciting medium, we should see a rapid expansion of innovative, truly creative image making and animation.

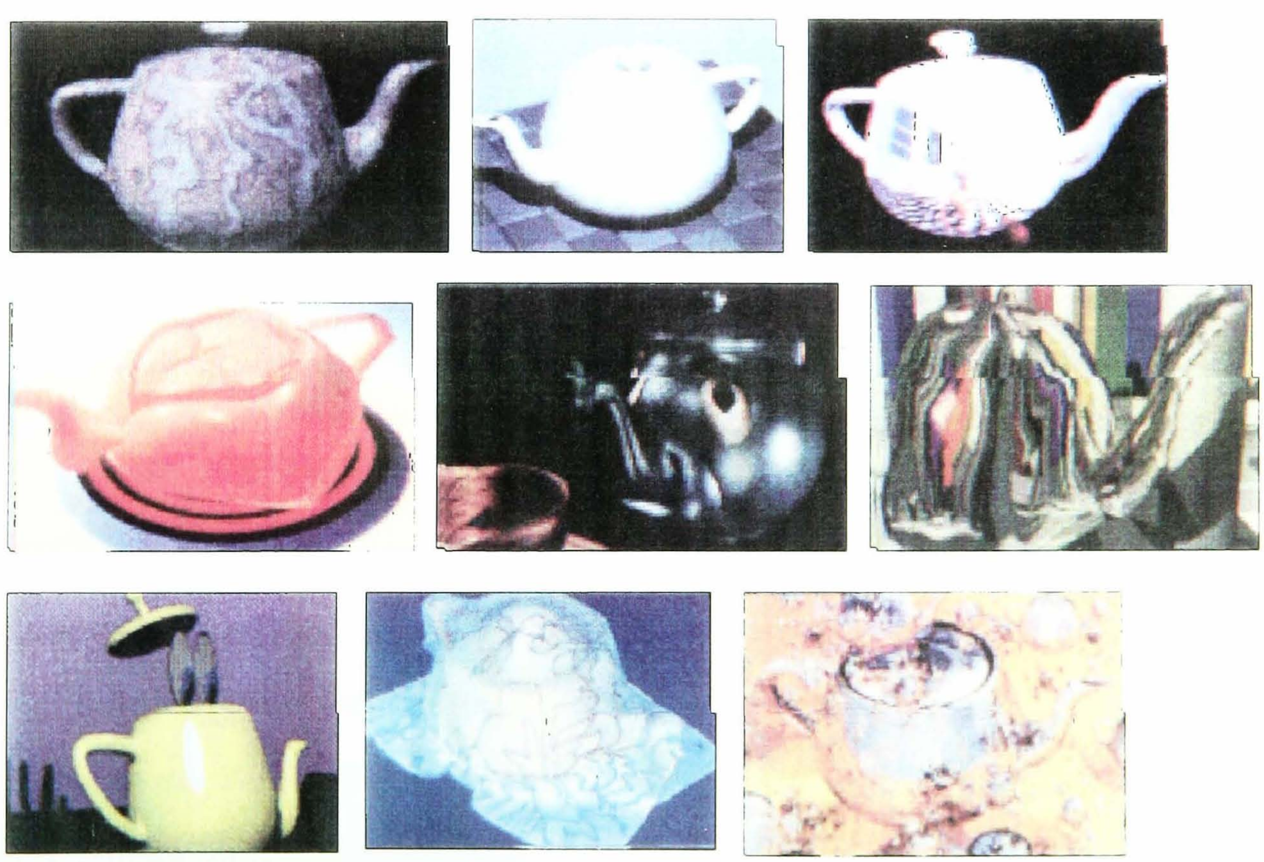
SECTION TWO

DESCRIPTION AND DEFINITION OF PRACTICE

2.1 Preproduction

The practical investigation involved the creative process of making a video in which the nature of image was examined, with specific emphasis on how images originating from computer and live action camera could be effectively integrated to further a narrative fantasy.

The narrative focuses on the problems and frustrations of a teapot designer using the computer as a design tool. A teapot was chosen as the object because it has acquired a special significance as a modelling icon since seminal test work was carried out by Martin Newell in 1975 (Vince, 1990). Simple, everyday objects, teapots can demonstrate the ingenuity and imagination of the computer graphics designer, as shown below:



Left to right: **1986** F. Crow, Xerox/ **1987** Arvo Kirk, Apollo/ **1988** Dean Gonzalez, USAF/ **1988** R. Skinner, U CSC/ **1989** K. Waters, Io Research/ **1989** D. Breen, RPI/ / **1990** Pixel Kitchen Inc./**1989** J. Thingold, University of Utah/ **1990** F.K. Musgrove & B.Mandelbrot.('Teapots through Time' in Computer Graphics World, Dec.1992.)

The plot finally used evolved through a series of ideas and image experiments. In each case, once a synopsis had been written and script or storyboard drawn up, the deciding factors on whether to proceed depended on:

1 How well the script lent itself to creativity in image/sound production.

2 The feasibility and degree of challenge in solving the technical and production problems posed by the script. The final idea was set out as follows:

SYNOPSIS: THE CREATOR

A designer of teapots has his latest design scornfully rejected by his boss. He is told to go back to his computer to create ''something different''. Resuming work at his computer, he expresses his frustration and anger (to the world in general and teapots in particular) whereupon the teapot jumps from the screen, and taunts him as he tries to recapture it. It finally triumphs by trapping him inside its own world -- behind the colour bars of the monitor.

It was intended that the environment and the human characters be camera generated in the normal mode of live action filming, but that the designer's teapot be modelled and animated via computer, to be integrated into the video at the post-production stage. Though an 'object', the pot is also a character in a very real sense, in that it has a life of its own and interacts with its creator and environment, thus offering a challenge both in image integration and in characterisation.

A storyboard was drawn up, showing shot (long, mid or close-up) and camera angle (see Appendix). The storyboard includes sections where computer animation integrates with the live action, as well as sections where the computer animation occupies full screen. Also included are notes as to possible ways to achieve various visual effects such as the digital video effects (DVE) available at Phoenix Video, the Collaborating Establishment.

At one point in the narrative, the actor is required to grab the teapot's handle and pull the pot out of the monitor screen. This posed a real problem of image integration but was important in blurring reality and making the scene more believable. It would have been virtually impossible to achieve this with a computer-generated pot without the use of prohibitively expensive digital compositing equipment. The solution was to use a real teapot during this part of the live action shooting (pic.1 below), but also to make a computer replica, which could then 'come to life' (pic.2 below) and be manipulated as demanded by the narrative.

1

2

The creative ideas, deliberately originated without particular hardware or software limitations in mind, demanded that the computer-generated pot be:

1 virtually indistinguishable on screen from the real teapot.

2 able to wave its spout and/or handle in 3D space and to simulate human arm movements such as beckoning.

3 able to transform itself into an object with female form.

4 able to create lifelike shadows and reflections which matched the colour and lighting of the live action.

5 able to emerge from shadow to lighted areas - e.g. from within the deep recesses of the monitor, to the front of its screen and beyond.

6 of broadcast television quality of image.

At the beginning of the project, and even six months later, at the time of creating the storyboard of The Creator, there was no software/hardware available for the PC (the only platform available for long term continuous use at times to suit) which could cope with these demands. Toward the end of 1991, Autodesk introduced the first comprehensive 3D animation software for the PC, called '3D Studio', and an early copy was obtained for 'beta testing' in the UK. There were still problems of image storage and means of output, although it appeared that most of the model making and animation requirements could now be met.

Computer animation sections shown in the storyboard were then studied to find ways to achieve closer visual integration with the live action. For example, when the teapot first transforms from a two dimensional wireframe representation lying flat on the monitor screen (pic.1 below) into a three dimensional wireframe pot (pic.2 below), the designer must react appropriately (pic.3 below), even though, at this stage, he will be reacting to an imaginary teapot which has not yet been created.

1

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Later, the teapot zooms out from the monitor and passes close by the designer's face (4 and 5 above). To achieve this effect, a 35mm slide of the real pot was created prior to shooting and during the shoot, was projected across the actor's face (6 above).

Where post-production DVE work was to be combined with computer animation and live action, it was essential that the camera, both in live action filming, *and* in the computer animation, be 'locked off'-- i.e. remain totally static. Otherwise matching of varied camera movements from one medium to another would have been virtually impossible. This was planned at storyboard stage.

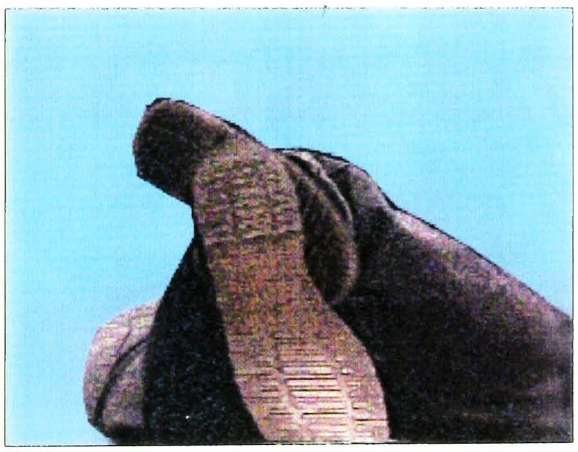
CASTING: The two actors were cast after viewing stage shows and videos produced by the University's BA Performance Arts drama students. The part of Steve, the computer artist (played by Damien O'Keeffe) was a difficult one, as he had to react to an imaginary character/situation while undergoing such physical duress as having to stare at close quarters into a brightly coloured monitor, or having slides projected onto his face.

Damien O'Keeffe played the part of Steve, 'The Creator', here shown gazing into his monitor.

Hilary Shearing played the part of Steve's boss. She had to establish an officious, unlikable character in relatively little screen time. Here, she is shown in the opening and closing scenes.

2.2 Production

SHOOTING: This was carried out over a total of four and one-half days in two locations: the University's video studio (three days), for the scene in Steve's computer graphics office, and a lecturer's office at the University (one day), for the Steve/Boss office scene. An additional shot of Steve crawling into the monitor, front viewpoint, was shot a year later in the studio. This was added for dramatic effect. It was shot against a blue background (pic.1 below) and was chroma-keyed during post-production onto a still computer graphics frame which showed the interior of the monitor with the teapot in the distance (pic.2 below). A DVE effect of the colourbars slamming shut was also added at this stage.



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2

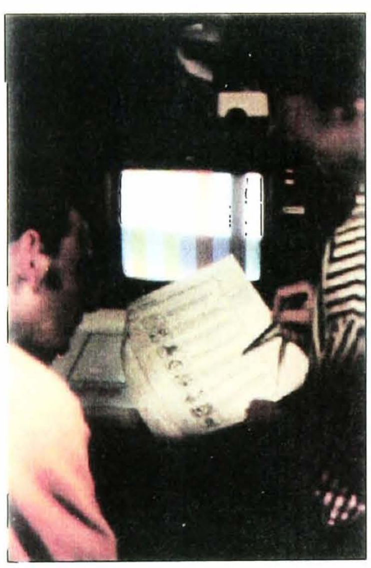
One day of shooting in the studio was devoted to scenes which depicted a battle between Steve and the teapot inside the monitor. As these shots were intended for chroma-keying onto computer generated interiors, the studio floor was painted blue and the blue background curtains were evenly lit for this purpose.

Damien, who played the part of Steve, sitting on the blue painted floor of the set, between shot set-ups. These scenes were well acted but eventually ended up 'on the cutting-room floor' as they slowed the pace of the narrative.

3

Crew members were obtained on a job rotation basis from the University's MA Video course. The video format used was Sony Betacam except for the chroma-key shot of Steve crawling into the monitor which was shot on the updated format of SP Betacam. The video was prestriped with timecode to aid the post-production stage of off-line and on-line editing.

The storyboard and shot list were closely followed and shown to the actors as a guide to the narrative (pic.1 below), and an aid in imagining the third character of the teapot. The real teapot was hand-held in a few test shots (pic.2 below) to be matched later with a computer-generated pot.



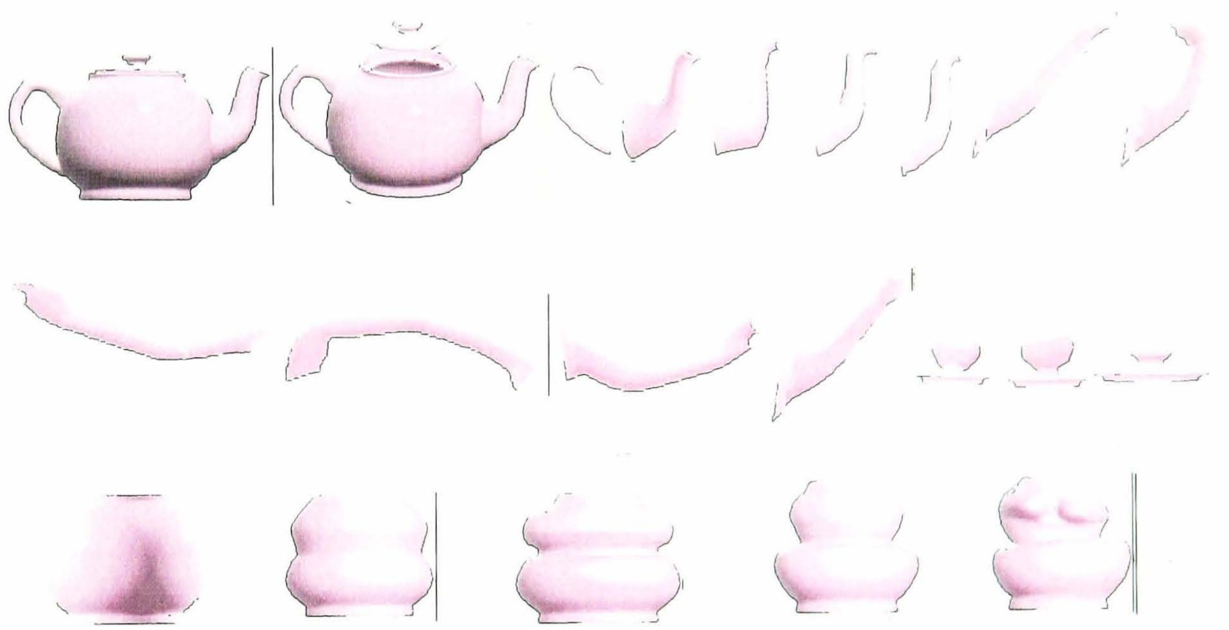
1

2

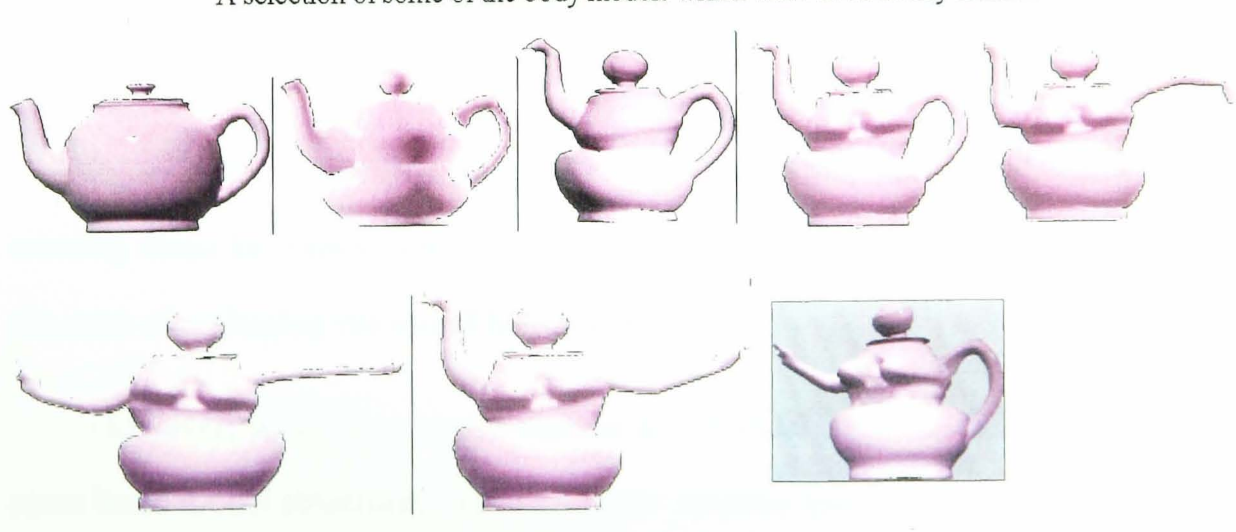
A rough cut, using low band U-matic tape, was done as a guide to sequence length of animation. The main work of the production stage was the computer model making and animation.

COMPUTER MODEL CREATION: The real pot was measured and its dimensions translated into the computer to ensure that the basic shape and proportions were accurate. Difficulties lay not in this, but in matching the subtleties of the slight irregularities of the spout and handle curves. Eventually, this was done by manipulating vertices either singly or in selected groups, while hiding unwanted back faces and vertices. Generally, this had to be judged by eye, rather than measured in order to create a good match. The process of 3D 'morphing' was used as a means of shape transformation both for model creation and movement.

The various parts of the teapot (spout, handle, lid and main body) were copied, so that the number of faces and vertices remained identical to the original (necessary for the morphing process). The new files were then edited into new 'key' shapes by bending, skewing, rotating or moving selected sets of vertices, while hiding those which required no change. This painstaking process was necessary for both shape and key position changes of the model -- e.g. from round pot to female torso-pot as well as from say, normal spout to mid-position, bent-spout to elongated spout. The program then calculated the in-between positions, always at twenty-five frames per second of screen time.



A selection of some of the body models which were used as key frames.



When testing a section of slow moving animation which had been rendered and output frame by frame to a Sony High Band U-matic VTR, there was noticeable jerkiness in the movement which had not been obvious from looking at the previous low resolution previews. On consultation with Phoenix Video, it was found that this was caused by the fact that the program rendered frames only --suitable for computer viewing -- as opposed to field rendering which is necessary for video or television (two fields per frame, each field rendering the alternate scan lines which make up a full television frame). Autodesk explained that Release 2 of the program would allow users to select field or frame rendering depending on their output requirements. Release 2 of 3D Studio, when it came to the U.K. in mid 1992, solved this problem, as well as helping with another concern, speed of rendering.

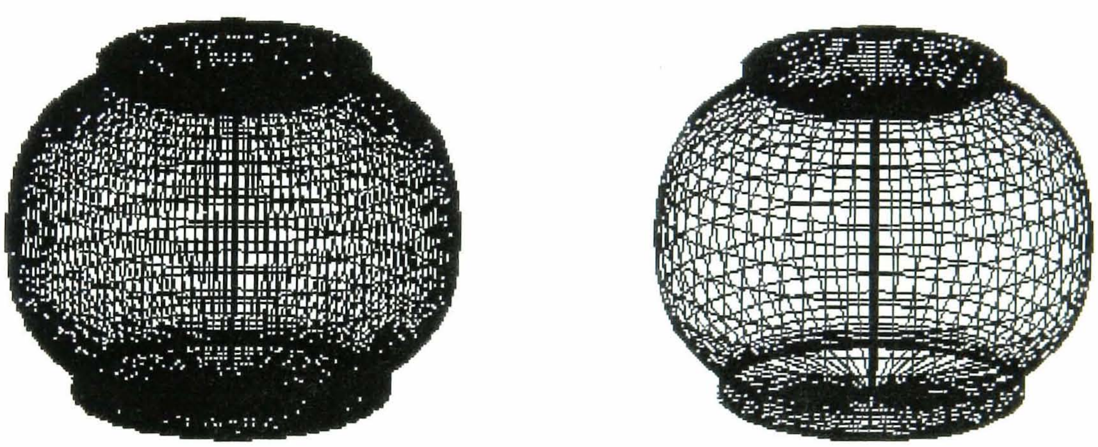
CHEATING WITH GEOMETRY -- RENDERING SPEED VERSUS SMOOTH CURVES: The smaller the model file, in terms of numbers of faces and vertices, the faster the computer was able to render the picture. As slow rendering speed was a major 'hold-up' factor in checking scenes for modelling and lighting effects as well as for final rendering in a higher resolution, it was very important to try to keep the model files as small as possible. However, this proved very difficult due to the multiplication of varied parts of the model for the morphing purposes outlined above and also because:

1 the model was often seen in close-up where fewer faces around the circumference would have shown on screen as a faceted rather than a smooth curved edge and

2 only by creating sufficiently large numbers of vertices and faces could the existing shape be 'remoulded' to new shapes and positions. This was particularly so in the case of reshaping the round body of the pot to the shape of the female torso-pot.

However, when the pot was viewed at a distance, it was possible to use the same basic model structures, but with fewer sections around the circumference or path, thus creating fewer faces and vertices. Where the lid remained in place, or where the pot was tilted so its inside was not seen, a solid rather than a hollow pot was used in the effort to speed up rendering by reducing the complexity of the geometry. During the model creation process, it was vital to keep track of the multitude of spouts, handles, arms, heads and bodies with their corresponding multiple morphs.

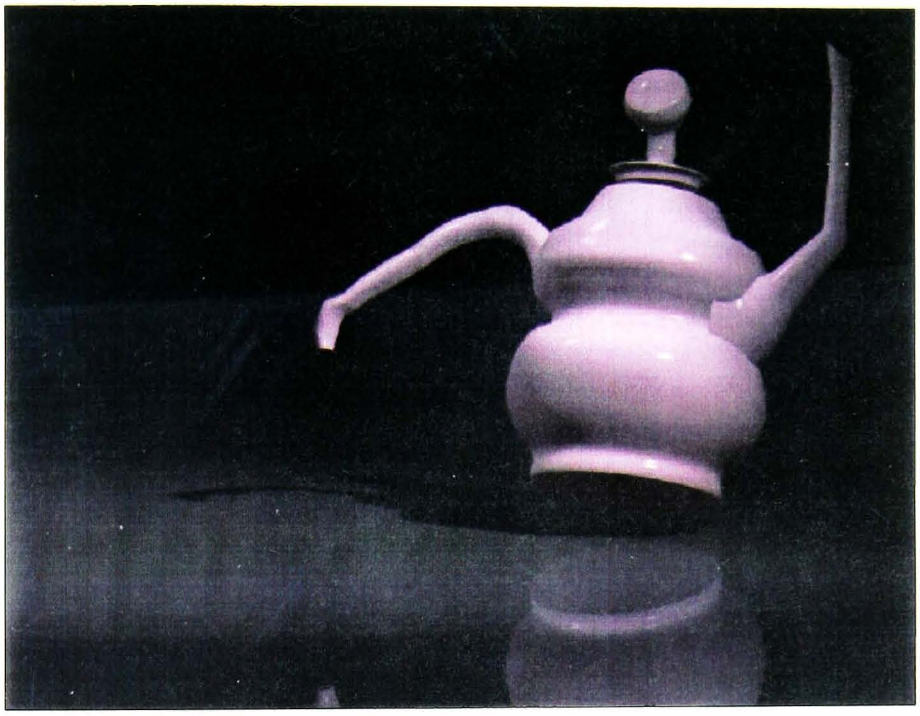
Above: samples of hollow and solid pots. **Below**: basic pots with varied numbers of faces and vertices.



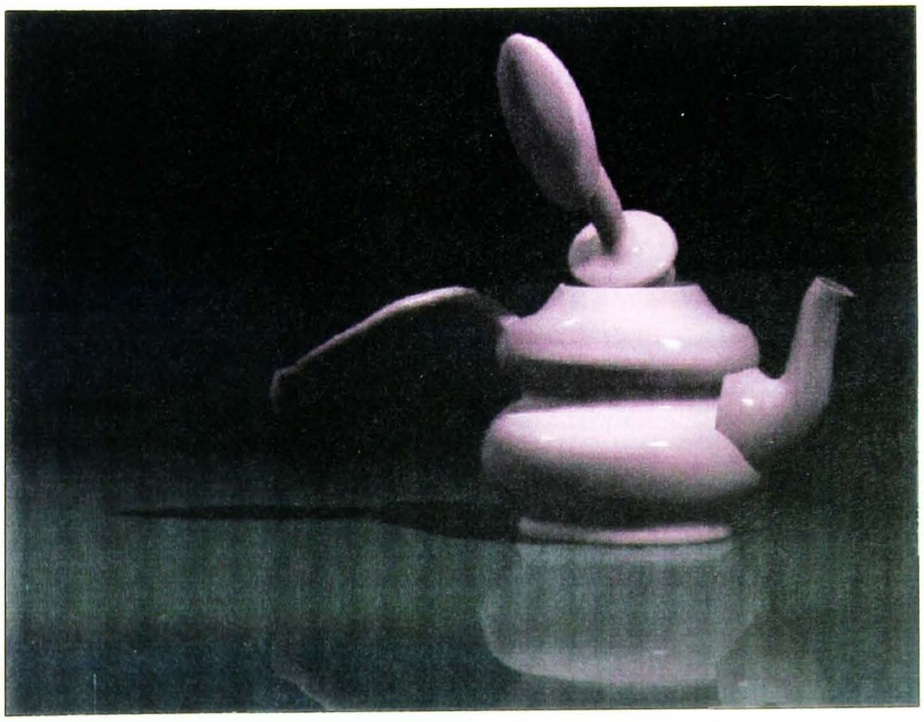
ANIMATION. Part of the pleasure of animation for the independent artist is the scene control which lies in his or her hands. Whereas the director of a live action scene is often forced to filter ideas through producers, actors and crew members, the animator can fill the roles of director, actor, camera operator and lighting cameraman.

After initial model creation, it was easy to become embroiled solely with the problems of animation and to lose sight of the live action into which the animation sequences were to be integrated, particularly as the live action had been shot several

Teapot dancing on the monitor 'stage' lit by spot light.



Teapot swings around in surprise, on hearing Steve pull back the colourbars.



months previously.

In creating computer animation, the designer/operator has easy control of camera movement. To pan, tilt, zoom, dolly, roll or track the program's 'camera' is a far easier process than to do likewise with a real camera setup in a studio or on location. The consequence of this has been over use of this facility in most computer graphics animation sequences. Viewers are often subjected to irritating non-stop camera movement. In this project, the computer camera has generally been kept still, letting the action take place before it, unless its movement contributed to the narrative.

The main guide as to the acceptability of particular movements, lay in the software's real-time preview facility. After creating the key frame position changes for all the separate parts of the character within a scene, the system could be set up to build and play a real-time (as opposed to stop-frame for final output in high resolution) preview in either low resolution mono or colour. It was essential to use this process for every sequence, as slight changes at key frames, or stretching/ condensing the overall timing could make a dramatic difference to the final impact. The mono preview, much the faster of the two processes, was utilised until the movement appeared satisfactory. Then selected frames were rendered in low resolution colour, before the complete sequence was rendered as a low resolution colour preview to check, for example, movement of character between lighted and shaded areas, and the effects of spotlights and shadows.

2.3 Post-production

Post-production processes involved the following stages:

1 Final high resolution rendering to optical disk and lay-off frame by frame to tape (SP Betacam). Each frame was rendered in both high resolution colour and as a black and white mask (i.e. white object on black background), which allowed the

computer images to be smoothly anti-aliased into the live action background.

2 Off-line edit on computer (Eidos/Optima) non-linear edit system.

3 On-line edit at Phoenix Video including keying and insertion of animation using the specially created masks.

4 Music and sound creation, mastered onto DAT, using synthesizer and sequencer, together with separate 'live' recording of various sounds.

5 Dubbing (sound mix onto edited tape) at Paul Miller Post Production, a dubbing studio with fully digital equipment.

RENDERING AND LAY-OFF TO TAPE: After all the individual sequences had been tested and faults remedied, they were rendered to 600Mb rewritable optical disks.

Rendering time depended on a number of factors: available hardware (generally a '386 DX 33Mh machine with maths co-processor and 8Mb ram, or a '486 DX 33Mh with 16Mb ram), the complexity of the geometry within the scene, the degree of anti-aliasing used and use of shadows and/or reflections.

The disks were then transferred to Phoenix's MO drive interfaced to its own '486 PC with a Vista 24/32 bit Graphics card for lay off frame by frame to SP Betacam. Phoenix then supplied a VHS copy for reference and another Betacam copy which had to be sent to Eidos for redigitising -- again onto an MO cartridge but differently formatted to run on an Acorn RISC computer. This was then used as 'rushes' for the purpose of non-linear off-line editing.

FIELD V FRAME RENDERING: Field rendering was found to be essential when an object moved slowly from screen left to right or vice versa, or when the particular animation sequence had to be keyed over a piece of live action. However, field rendering had two major disadvantages in that a) it doubled both the rendering time and the image file size. With many thousands of frames to render, and having insufficient machines and/or disk space readily available, frame rendering was considered where:

1 the sequence was long

2 the picture was complex, taking more than 30 minutes per frame, thus one hour if field rendering.

3 the action was reasonably fast and moving forward or back, rather than from side to side

4 the action was discrete, not keyed over live action or edited adjacent to a field rendered sequence.

THE NON-LINEAR OFF-LINE EDIT PROCESS: The purpose of any off-line edit is to allow time for experimental, time consuming work to be done on less expensive equipment, so that the expensive on-line edit can be accomplished as speedily as possible. The traditional linear method of editing involves shot selection on the source VTR before copying to the edit VTR in linear selected order. In this process it follows that if one wants to change the already edited sequence, by swopping the order of certain shots, for example, the sequence must either be re-done, shot by shot, from the point of change, or one will lose a generation and thus, picture quality.

The advantages of non-linear editing, a process done entirely on computer, are:

a) Size. A computer occupies part of a desk-top whereas an edit suite normally occupies a small room.

b) Economy. This becomes a marginal factor with the advent of low priced pro SVHS edit suites. The Eidos /Optima system (hardware and software) costs about £15,000.

c) Speed. This is a major advantage. Non-linear means instant access to digital material stored on disk; there is no time wasted on rewinding: the scenes are not recopied with each edit, their timecode numbers are merely rearranged into a different order.

d) Flexibility. The editor can try out any number of scene or shot orders and view many alternative arrangements before deciding on the final edit. Once this has been decided, the system creates an edit decision list (EDL) based on the time code reading at the start of each shot. This list is saved onto a floppy disk and can be read by the computer at the on-line suite, thus automating much of the on-line process. This is known as 'auto-conforming'.

The Optima/Eidos system also allowed DVE effects between scenes, such as dissolves or wipes which were also read into the EDL. Sound could be manipulated by splitting, adjusting or copying sound waves visually and/or by ear from track to track and playing back the results with edited picture on the computer screen.

3 ON-LINE EDIT. This took a 10 hour day at Phoenix. The EDL on floppy disk enabled the on-line editor to auto-conform many sections. Despite all the forethought and planning, there were still inevitably certain sections which required careful adjustment, as it was only at this final stage that animation and live action came together to be viewed as one.

4 MUSIC AND SOUND. Live sound (recorded during filming) was intended to be subsidiary to music and sound effects which could only be created after viewing the on-line edit with its integrated imagery. The music was composed, arranged and recorded by Danny Kuperberg, an ex-student of Middlesex University. Music and effects were electronically composed on a synthesizer and mastered onto digital audio tape (DAT) for playing back and mixing at the dubbing studio. The composer's task was extremely difficult as there was no means of accurately synchronising picture with tape (rocking and rolling)

during composition at the sound studio, although some of the effects virtually required frame accuracy. It was also important to the drama that the music matched accurately with the picture. Music was created in short carefully timed sequences while playing back a VHS copy of the tape with burnt-in timecode. Each effect was also created separately so that the whole could be brought together at the dub. See Appendix for list of sound effects and dubbing guide.

SECTION THREE
THE CREATIVE ISSUES

3.1 Perception

Lansdown explains the physical aspects of 'seeing' by drawing an analogy with a camera. He describes the eye as being a ''more or less light-tight, roughly spherical chamber with a lens system at the front and a light-sensitive surface, the retina, at the back'' (1985:1006). The lens system of the eye focuses an image onto the retina in the same way that a camera lens focuses an image onto photographic film. With a camera, focusing is achieved by moving the position of the lens relative to the film, whereas the eye focuses by changing the shape of its lens. Each eye contains about 130 million rods and cones, so named because of their shapes. These are light sensitive cells. The rods deal with low light conditions and the cones with normal light and colour. Both types of cells are connected in bundles to the optic nerve which channels the signals they produce to the brain for interpretation.

The interpretation of what we see, the process of perception, allows us to deal with objects and events in the environment. Lansdown describes two perceptual mechanisms which enable this to happen:

1 Perceptual Constancy. This mechanism recognises that a particular object is the same one despite being seen from different distances, angles and lighting conditions.

2 Pattern Recognition. This recognises that a perceived object is a particular example of a more general class of objects (ibid:1,015).

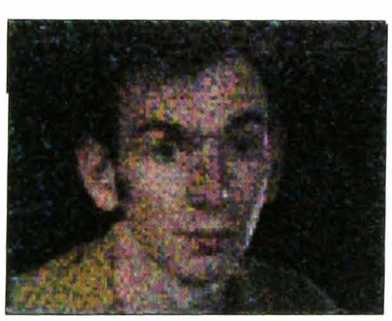
Perception is an interesting phenomenon in that it goes far beyond seeing and interpreting objects in the physical world around us. No object can be in two places at the same time -- yet our perception accommodates the fact that the image of a picture is both flat and three dimensional. On the cinema screen a figure is shown vastly larger than life, on the television screen, considerably smaller than life. Objects can be a certain size and yet another size. They are therefore, literally impossible. R. L. Gregory refers to such pictures as having a double identity in that they are seen as both themselves and as something else -- i.e. what they represent (1970:33). 'Reading' a photographic image is therefore a complex feat of interpretation and understanding which goes beyond the normal reading of reality

Before the advent of photography, film or video, the discovery of perspective in the 15th century enabled us to represent reality in a more believable manner. There appears to be a fundamental human need to find means of representing reality (Armes, 1988:191). It is only within the last few decades that this need has been met in a new medium, that of computer graphics. 3D model making and animation via computer allow the artist to 'recreate' three dimensional objects and then view them at will from any angle on a 2D screen.

In watching an image, we pay attention and make inferences, performing both voluntary and involuntary perceptual activities. Similarly, in following a narrative, we make assumptions, drawing on schemata and routines in order to arrive at conclusions about the world of the story. Tudor thinks that a film such as Resnais's L'Année Dernière à Marienbad is deliberately obscure; he calls it a "crossword" of a film and finds it very atypical, maintaining that the large majority of fiction films rely on the audience's participation within their narrative, a communication process in which the spectator 'receives the message' (1974:116). Bordwell, on the other hand, argues that we need not adopt the communication model of sender-message-receiver or what has been called the 'conduit' metaphor. He proposes a different model, an inferential model whereby the perceiver uses cues in the film to execute determinable operations, of which the construction of all sorts of meaning will be a part (1989:269). Asa and Berger concur when they say that "What a person sees in a film is determined to a certain extent by what he or she brings to the film. Perception is frequently selective and also, to a certain degree, ideological" (1980:11).

Filmmakers use the fact that we not only believe what we see, but as mentioned by Gregory (1970:33), to some extent we see what we believe. Eisenstein was one of the first to exploit this concept in his theories and practice of 'montage'. He showed that particular combinations of the elements of film can communicate meanings above and beyond those understood on the narrative and literal levels. This was also forcefully demonstrated in experiments by Kuleshov (Tudor, 1989:120) and can be noted in The Creator, where the actor had to be filmed in close-up reacting to an imaginary teapot which was to be keyed over the live action at the post-production stage.

At the time of filming, none of the animation had been created, and there was still some doubt as to what antics the teapot could actually perform. The actor therefore had no way of knowing what facial expressions to portray. He was directed merely to keep to wide-eyed neutral expressions (see below) as the viewer could then be relied upon to read into these shots an appropriate emotion. In other words, we interpret what we see according to its context; we do not literally 'read and translate' an image.

It is not always possible to shoot in ideal or real environments. In these cases filmmakers and audiences together comply in perceptual understanding of imagery. In Spielberg's Jurassic Park, for example, many exterior jungle scenes were shot on location in Hawaiian forests, but some were simulated on one of the cavernous stages at

Universal Studios in Hollywood with trees made of wood and foam, supplemented with real vegetation (pic.1 below). A combination of clever editing and 'set dressing' helps to further the illusion (Shay & Duncan, 1993:95).

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The Creator simulated an office environment (pic.2 above). The designer's work area was intended to be an office/computer graphics studio, and as is common in such an environment, the 'room' was darkened to facilitate viewing of the design on screen, with the desk being lit by an anglepoise lamp. This 'office' had no real walls and was situated in the middle of a large video studio with plenty of room around the desk/chair setup for movement of the usual paraphernalia of a video production -- camera, tripods, camera dollies, lights and crew. Extra props such as floor carpet, plant, suitable hanging pictures were strategically placed to further the illusion. Shadows of a simulated venetian blind were directed at a 'wall' (actually a stretched curtain) behind the desk, to give the impression of a windowed wall opposite.

The fact that this passes for a real office relies as much on the process of internalising previous experience of the world around us, as it is to do with purely seeing. This experience encompasses not only the physical world but also draws upon our experience of the cinematic world -- e.g. the darkened room lit by a single light, and the slatted shadows on the wall are features of film noir and set the scene for the drama. Dudley Andrew contends that there is, in fact, little that is pure perception, and that most of what we perceive through vision is an unconscious interrelation of various skills and previously learned ideas. He suggests that perception, as distinct from sensation, is coded and is culturally based -- giving as an example that of Eskimos who have some 17 terms for snow, presumably because they are able to distinguish between these varied snow types. Belonging to a different cultural world, these gradations are invisible to the rest of us. Perception, he argues, no matter how defined, is related to cognition and language (1984:29).

Perceptual processes are dynamic -- an example being that of figure-ground reversal. The Danish psychologist, Edgar Rubin, used simple line drawings to illustrate this phenomenon, drawings which shared a common borderline. When joined, one is relegated by the eye as mere background while the other dominates, and then the viewer feels the strange process as the eye readjusts its perception and changes the order of dominance (Gregory, 1970:38). Perception is thus an active process. Nicholls states that the figure/ground relationships are a function of the punctuation we provide -- that the boundary between figure and ground does not belong to either; it is not in reality at all but in our perception, our punctuation of it (1981:15). He states that representational images, like other texts, rely upon culturally determined codes and not to know the perceptual codes maintained by a given culture would be tantamount to being an "illiterate infant wandering through an unintelligible world" (ibid:26). Tudor defines 'culture' as something which consists of people's beliefs, their ideas, their values, their very conceptions of reality (1974:135).

Certain perceptual skills relate specifically to the moving imagery associated with films and animation. The human eye cannot distinguish individual pictures as such, if they move past the eye at a certain rate (10-12 frames or pictures per second, depending on the person concerned). These individual pictures with slight changes from one to the next, trick the eye into the perception of continuous all animation and movie photography. The illusion of movement is equally real for all of us, even if we fully understand the mechanism by which it is achieved. Video artist, Bill Viola, explains:

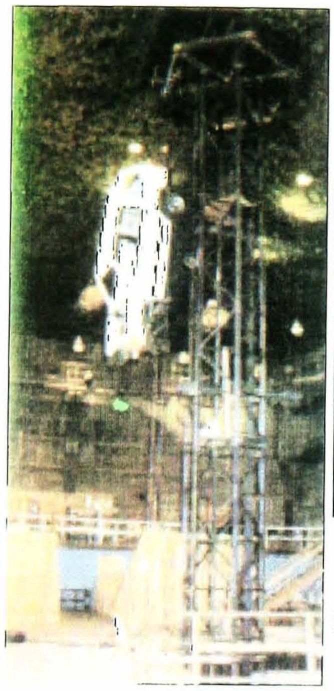
> A camera, as blunt and passive a device as it is, basically records the light that comes into it in a mechanical way. But when you turn that instrument on and the wind blows through the grass, what you capture is more than just a visual image. If you lay the film strip out it front of you, you see a series of still shots of grass. But when you project it, all of a sudden these blades of grass are moving! I still share an almost medieval fascination with the magic of these things (1994:28).

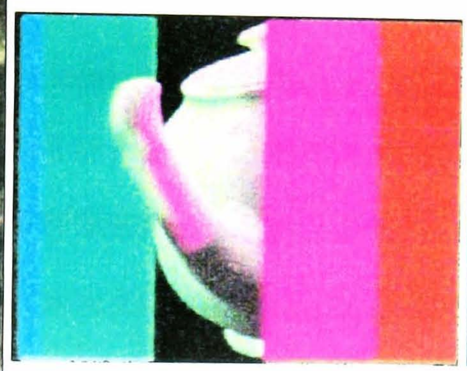
Eisenstein discusses our willing suspension of belief in an essay about the 3D illusion offered by stereoscopic cinema:

> . . . and this illusion is completely convincing, as free from the slightest shadow of doubt, as is the fact in ordinary cinematography that the objects depicted on the screen are actually moving. And the illusion of space in one instance and of movement in the other is as unfailing for those who know perfectly well that, in one case, we are looking at a rapid succession of separate, motionless phases which represent a complete process of movement, and in the other, at nothing more than a cunningly devised process of superimposing one upon the other of two normal flat photographic records of the same object, which were taken simultaneously at two slightly different, independent angles (1949:35).

We have constructed our own special percepts as regards the moving imagery of film and video. The process, not of individual frames, but of shots from various camera angles, cut together to form scenes, greatly affect our understanding and perception of the film/video as a whole.

We have come to understand the conventions of film editing, and thus comply with the filmmaker in accepting the illusions thus created. For example, there is a scene in Jurassic Park featuring a car which appears to drop 150 ft., crashing through tree branches, narrowly missing the humans below. In reality a fifty-foot artificial tree was created which was 'dressed' differently on three sides. Positioned at the top of one side, the car was dropped the available fifty feet (with hidden mechanical aid: pic.1 below), then repositioned at the top of a second differently dressed side and dropped again, and again for a third time, giving the impression of a continuous drop (Shay and Duncan, 1993:96).





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1 (Shay and Duncan, 1993:97)

There is also a learned cinematic perception that a close-up of an object which has been seen in an earlier shot at a wider angle (a medium or long shot) is that same object, merely given more emphasis. The Creator relies particularly on this perceptual convention in the illusions created through image integration of live action and computer generated inserts. For example, there is a close-up shot of the teapot beckoning from behind the colourbars (pic.2 above), which snap shut as Steve, the designer, reaches forward. Filmmaker and viewer comply in the assumption that this is actually the real monitor screen as seen in succeeding shot (pic. 3 above).

To some extent, the filmmaker, being also a perceiver, can construct the film in such a way that certain cues are more clearly marked even if he or she cannot control all the semantic fields which the perceiver may bring to bear on a film.

Understanding production techniques has always been an important aspect of film and video studies, particularly for those engaged in the art of image integration, but perhaps we should pay more attention to Bordwell when he suggests that we study not only the practices of production, but also of reception (1989:270).

3.2 Narrative

Linguists and film theorists have struggled to define and explain the concept of narrative -- an early example being that of Vladimir Propp's Morphology of the Folktale (first published in Russia in 1928) which gives us an excellent example of a formalist method of structural analysis of the (Russian) fairy tale, abstracting the compositional pattern which underlies the narrative structure of this genre.

Narrative is considered to be more than a mere description of place or time, and more than a list of events in a causal sequence. Most would agree that narrative is 'storytelling' in its literary format or 'storymaking' in the film or video format. McConnell argues that stories matter deeply to us all, so much so that they are "the best way to save our lives" (1979:1). He believes that we are the heroes of our own life stories and thus the type of stories we tell have considerable bearing on the kind of people we are or could become. He claims, therefore, that all forms of storytelling are didactic and draws parallels between the twin narrative arts of literature and film, looking for elementary forms ('archetypes') which are common to both. He maintains that a narrative is always the story of an individual in some sort of relationship to his or her social, political or cultural environment. This hero/heroine can found that environment, civilise it, find it confusing, hate it -- but the basic terms of a story are, like the basic terms of any human being's relationship to his or her world, one of four versions which he defines as "Epic", "Romance", "Melodrama" and "Satire" (1979:6). Acknowledging that film can do what a written narrative cannot and vice versa, McConnell believes that film has already recapitulated the entire 5,000 year history of Western narrative forms of narrative material (print, theatre, optical amusements, comics, engraving, lithography, photography, painting) surfaced in the medium of film (1974:xv).

Branigan understands narrative as an experience which draws together many aspects of our spatial, temporal and causal perception and although commonly thought of as an end product (the 'narrative'), it could refer to either the product of storytelling/comprehending or its process of construction. He sees it as a way of experiencing a group of sentences (or pictures, gestures or movements) which together attribute a beginning, middle and end to something (1992:4). He gives the following format for a narrative schema which he asserts would be in broad agreement with most other researchers on the subject (1992:14):

1 Introduction of setting and characters.

2 Explanation of a state of affairs.

3 Initiating event.

4 Emotional response or statement of a goal by the protagonist.

5 Complicating actions.

6 Outcome.

7 Reactions to the outcome.

Todorov suggests that narrative in its basic form is a causal 'transformation' of a situation through the following 5 stages (1971:39):

1 A state of equilibrium at the outset.

2 A disruption of the equilibrium by some action.

3 A recognition that there has been a disruption.

4 An attempt to repair the disruption.

5 A reinstatement of the initial equilibrium.

Both these lists can be 'tested' by relating them to any given narrative or section of narrative, and this has been done with The Creator:

Branigan:

1 INTRODUCTION OF SETTING AND CHARACTERS: There are only three characters: the designer, the boss and the teapot. All are introduced in the opening two scenes as are the settings.

2 EXPLANATION OF A STATE OF AFFAIRS: The original design proffered by the designer has been deemed too conventional by the boss, so the designer must return to his computer for a new attempt.

3 INITIATING EVENT: This is obviously the point when the teapot, recalled to the screen as the expected inanimate image suddenly leaps from the screen.

4 EMOTIONAL RESPONSE OR STATEMENT OF GOAL: This can be shown by i) The designer's shock when the pot comes to life and ii) his intention and action to recapture it.

5 COMPLICATING ACTIONS: This occurs when the pot changes shape and entices the designer into the monitor.

6 THE OUTCOME: The designer is trapped inside the monitor; he has been outwitted by his own design, the teapot.

7 REACTIONS TO THE OUTCOME: The original version of the narrative showed the boss back in her office, trying to contact the designer in order to see his re-design of the teapot. When informed by telephone that he "hadn't been out of his office all day" (for the obvious reason that he was now trapped inside his monitor) she misunderstood the significance of this and assumed that the reason for his non appearance was that he was "probably immersed in his work".

The re-cut of the video deleted this scene and ended with the designer shown trapped behind the monitor bars battling to escape. The reaction to the outcome has therefore been taken away from one of the characters within the drama and been placed back with the perceiver.

Todorov:

1 STATE OF EQUILIBRIUM: The designer is going about the task of adapting a design for a new teapot using his computer (albeit with some frustration).

2 DISRUPTION OF THIS STATE: The wireframe design on screen suddenly comes to life and leaps off the screen.

3 RECOGNITION OF THIS DISRUPTION: This is shown by the designer's reaction of shock and disbelief.

4 AN ATTEMPT TO REPAIR THE DISRUPTION: The designer tries to recapture the errant teapot.

5 A REINSTATEMENT OF THE INITIAL EQUILIBRIUM: The designer has disappeared into the monitor and has been trapped when the bars closed. In the beginning, the designer (the creator) was outside and the teapot was inside; now the designer is also inside with the teapot, but to the outside perceiver of the scene, a state of equilibrium has been restored.

Theories of narrative are intricately bound to theories of perception. What then are the goals and processes which drive narration? One such process can be called the 'communication model' exemplified by Roland Barthes in his theories of linguistic communication: "*I* and *you* are presupposed by each other; similarly, a narrative cannot take place without a narrator and a listener (or reader)" (1966:260). Dudley Andrew similarly states that a narrative is a discourse wherein a teller relates an event containing both actions and agents. He contends then that every narrative is a "mélange of four basic components: speaker, speech event, agents and narrated event . . ." (1984:81).

Seymour Chatman supports this view when he states that a narrative is a communication -- hence, it presupposes two parties, a sender and a receiver (1978:28).

Other theorists are much more sceptical about the communication model. Bordwell suggests that narration is better understood as the organisation of a set of cues for the construction of a story, which presupposes a perceiver, but not necessarily any sender of a message. This scheme allows for the possibility that the narrational process may sometimes mimic the communication process of sender (storyteller/maker) and receiver (reader/viewer) but he thinks that it is better to give the narrational process the power to signal under certain circumstances that the spectator should construct his or her own narrator. This narrator then is the product of specific organizational principles, historical factors and viewers' mental sets and is thus contrary to what the communication model implies (1985:62). Italo Calvino goes so far as to propose the elimination of writers altogether. Given the rules of mythical paradigms and archetypes of form such as those indicated by Propp, Todorov, McConnell and others, a computer could generate countless stories (1970:93). Wallace Martin believes that most theorists of narrative today attempt to find a position somewhere along this spectrum of accepting or rejecting the communication model and incorporate elements of both strands in their theories -- i.e. that narrative texts contain places for a reader's personal involvement beyond what may have been directly communicated; that narrative is a cooperative exercise whereby both reader and writer contribute in varying proportions (1986:156).

Narrative in film and video rests on our ability to recreate a three-dimensional world out of a series of two-dimensional pictures which consist of varying degrees of light and dark. The shapes and colours seen on screen must be translated by the viewer into the realism of solid objects and people. Light, image and sound are experienced in two ways: unshaped images on screen as well as apparently real objects and people moving within the screen space and beyond (Branigan, 1992:33). Gregory made this point when referring to the photographic image (1970:33), and Arnheim asserts that one of the most important formal qualities of film is that every object which is reproduced appears simultaneously in two entirely different frames of reference, i.e. the two-dimensional and the three-dimensional, and that such an object fulfils two different functions in two contexts (1957:59). Branigan believes that one of the tasks of narrative is to reconcile these systems (1992:34).

Another paradox of the process of perception is that of the temporal aspect of film. The actual projection of a feature film may take about ninety minutes, but the narrative portrayed may cover a period of several hours, years or decades.

When referring to the perceiver's understanding of a film narrative, or 'story-world', Branigan draws our attention to two parts of this world: the diegetic and the nondiegetic (1992:35). The diegetic world extends beyond what is seen in a given shot, or even in the entire film, for we realise that a character in a film may see and hear other than what we observe him or her seeing and hearing. A sound in a film is therefore diegetic if the spectator judges that it has been, or could have been heard by a character. It follows that the nondiegetic elements of a screenplay are addressed only to the spectator, and are not accessible to any of the screen characters. A diegetic element in The Creator would be the natural sounds created by the designer as he taps his keyboard or moves his chair whereas a nondiegetic element would be the 'mood' music on the soundtrack.

There are many ways to show characters perceiving and consequently we may have many relationships to the perceptions shown on screen. Some of these can be thought of as 'first-person' and 'third-person' modes of perception

(Branigan, 1992:51). This can be illustrated by scenes from The Creator. The video opens with Steve sitting morosely at his desk facing his computer. In his mind's eye he reviews the humiliating interview with his boss. We understand this through the cinematic device of various forms of 'flashback' to that interview: shot 1 shows the Boss/Steve encounter in the Boss' office partly superimposed over a shot of Steve sitting at his computer, shot 2 shows us part of the actual encounter the Boss' office and shot 3 shows Steve about to thump his knee as he recalls his Boss's words.

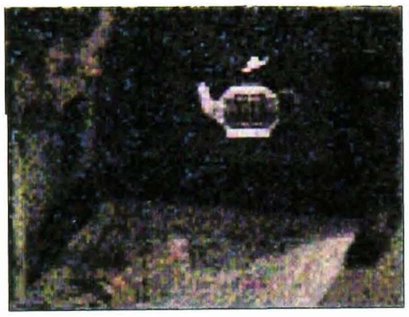
Shot 1

Shot 2

Shot 3

Shot 1 would qualify as a first-person account of space and time, as it renders the 'author' of the fiction invisible behind the character's experience. In shot 2 we observe Steve and his boss as a third-person account and in shot 3 we become, in effect, Steve, as he remembers (and we hear as a voice-over on the soundtrack) his boss's words. This is a first-person account. The position of the camera will affect our involvement and understanding of the narrative. For example, an eyeline match differs from a point-of-view shot -- the former being objective (third-person narrative) whereas the POV shot shows us what a character sees and when the character sees it, and is thus subjective (first-person narrative).

As in most film narrative, The Creator shifts constantly between first and third-person narrative. This can be illustrated by the scene when the teapot first comes to life. We see a medium close-up of the designer working with his light pen on his tablet and then cut to a close-up of his face as he expresses his anger. The wireframe pot is on the monitor screen (pic.1 below). Suddenly it leaps forward, no longer a flat image on the screen (pic.2 below). This is third-person narrative style. We then cut to a big close-up of the pot as it leaps toward camera (pic.3 below), i.e. the designer's POV, which is first person narrative, as we now experience what is happening from the designer's viewpoint. We next cut to a close-up of the designer's startled face, the reverse POV (actually the teapot's POV) and we are now, in effect, the teapot. Thus we are thrust back in first-person narrative style, experiencing what is happening from the teapot's viewpoint.



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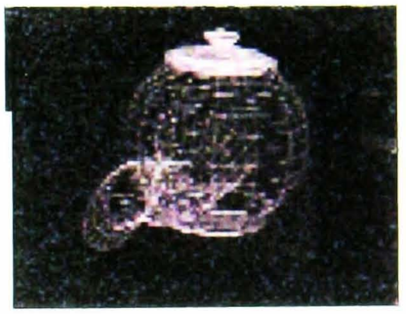

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The purpose of these POV shots in a narrative is to help the film or video spectator identify with the character in his or her filmic situation. The position of the camera and the nature of the editing are therefore crucial factors in placing the spectator in relation to the characters and their story-world. Occasionally, the combination of camera angles and editing is deliberately disjointed to indicate a change of mood or action within the narrative. This can be seen in The Creator when the designer becomes confused, as the teapot, having escaped from the screen, darts about his face and beyond. The edits are a series of 'jump cuts' i.e.

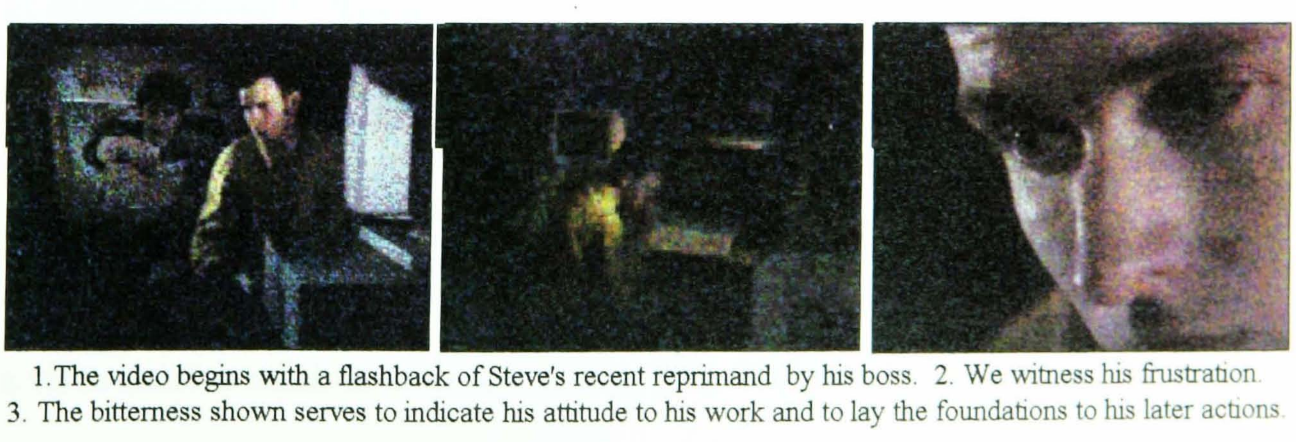
unmatched eyeline shots, of close-ups of the designer's face as he fights to regain the pot and his self control. These short, unmatched close-ups parallel the character's confusion and give a change of pace from the previous shot of the designer's face shown slowly turning as the pot's reflection comes to rest menacingly on his cheek.

3.3 Characterisation

Writers of film scripting manuals often offer new perspectives on characterisation as well as advice to would-be scriptwriters. In Linda Seger's view, most film stories are relatively simple and can be summarised in a few words, e.g. "E.T. gets caught on earth and then goes home". Stories become complex through the influence of character. She draws parallels between the structures of *narrative*: beginning/ middle/ end -- or set-up/ central question/ climax, and *characterisation*: motivation/action/ goal, (1989: 110). When these elements are not clearly defined, there is a general lack of direction, which, Seger thinks, often causes the viewer to lose interest.

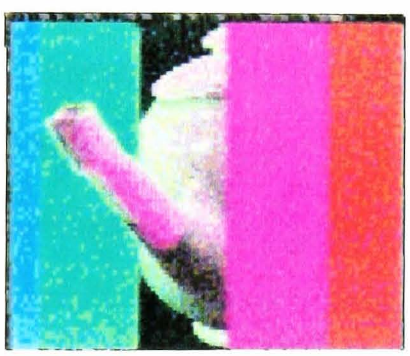
Wells Root believes that in very many cases, the leading character, the protagonist, is, in fact, the true architect of the narrative, not the writer: that the protagonist "*does what he does* throughout the story *because of what he is*." In other words, the plot is this character in action (1979:15).

The plot of The Creator can be summarised: 'Steve uses his computer to make a teapot which escapes and traps its creator.'

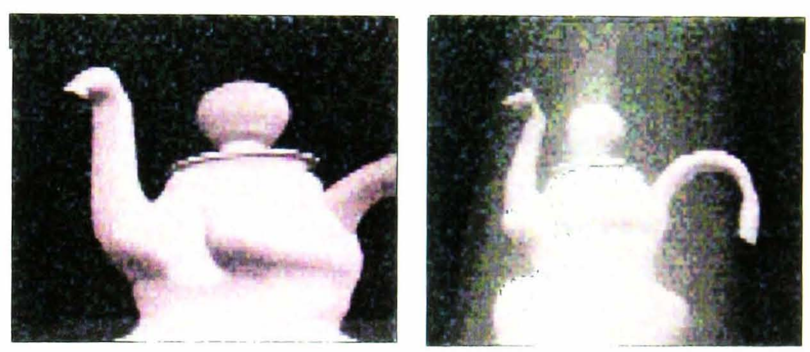


1. The video begins with a flashback of Steve's recent reprimand by his boss. 2. We witness his frustration. 3. The bitterness shown serves to indicate his attitude to his work and to lay the foundations to his later actions.

His *motivation* to catch the pot once it has left its position on screen is caused mainly by the pot, itself, which continually beckons, entices and teases him. His earlier attitude leaves us in no doubt as to what he will do to the pot upon capturing it. Steve's *action* consists of clutching at the moving pot and finally following it by forcing his way into the monitor, his *goal* being to capture and destroy the pot. The teapot, in turn, has been given *its* motivation: it was on the screen when Steve uttered his intentions toward teapots and it will now exact its revenge. Its *action* is to tantalise and confuse Steve by changing shape and moving back and forth from within the interior of the monitor and its *goal* is to trap its creator behind the colourbars from which it emerged.



The teapot beckons to Steve



The teapot 'dancing on stage' to attract Steve

Steve (teapot's POV) pulling back colour bars

Steve crawls into the monitor after the pot

When writing or directing a video, film or theatrical production, the main objective is always to hold the attention and interest of the viewer. This fact applies to a video short as much as to an epic feature film. Well structured narrative and good characterisation are the key elements to the achievement of this goal. John Fernald, theatrical director and an ex Principal of RADA, believes that every action, everything that a performer does to portray a character must be due to a reason ''rooted in truth'' -- a truth based on human character. To make an audience experience the truth of a feeling, that feeling must be related to the context -- i.e. the reason for it must be shown, as well as the true feeling itself (1968:170).

As in theatrical production, correct casting for the media of film and video, is an important consideration in effective characterisation. Pudovkin thinks that unlike a stage actor, a film actor cannot just 'play a part'. The film actor or actress must already 'possess' a sum of qualities which are externally expressed to achieve a given effect on the viewer. This he applies not just to the selection of the main characters but also to the supporting cast. Such characters may only be featured for a few seconds, but in that time they must make a clear and vivid impression on an audience (1958:141). Steve's boss in The Creator is only shown on screen very briefly but in that time she must convey to the audience a character who is sufficiently officious to justify Steve's resentment.

Mass Hollywood film production has given us stereotypes of main movie characters. These are usually active, energetic and attractive -- the sort of people who triumph in a variety of conflicting situations, and thus have ready appeal to an audience. Ken Dancyger and Jeff Rush challenge such script formulae by offering a range of alternative main characters who may be reactive, reticent, passive or ambivalent -- tentative and all too human. Steve, the main character of The Creator is just such a person. Steve is shown as a reactive, tentative character. He does not stand up for himself or his ideas when confronted by his boss about his lack of originality, and his anger and frustration are shown to us as he recalls his humiliating interview with her. Steve is an unhappy character, who is doomed to an unhappy ending.

Syd Field lists film examples of 'up' endings (Heaven Can Wait, Rocky, Star Wars, The Turning Point -- 'ambiguous' endings (Five Easy Pieces, An Unmarried Woman, F.I.S.T.) and 'down' endings where the main characters die (The Wild Bunch, Butch Cassidy and the Sundance Kid, Bonnie and Clyde, The Sugarland Express). The Creator would fall within the latter category. Different types of endings, as with much else, tend to run in fashions -- 'down' endings being more fashionable in the 1960s. Field recommends 'up' endings to today's would-be screenplay writers, particularly if they aspire to sell their work in Hollywood (1982:53).

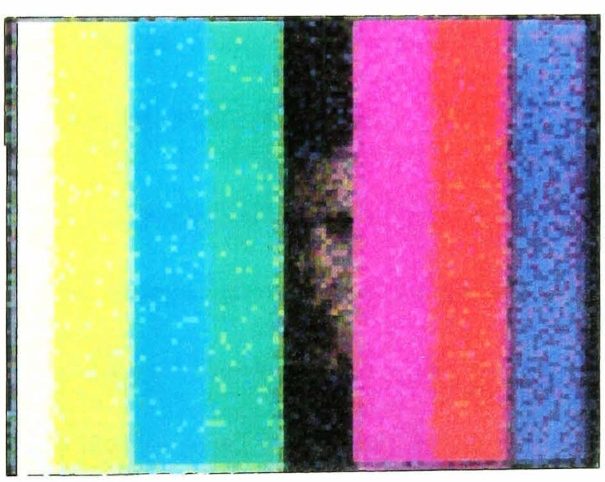
Dancyger and Rush suggest that to make the 'alternative style' main characters they describe succeed dramatically, memorable secondary characters are necessary. Examples given include Regina (played by Bette Davis), the evil antagonist mother of Alexandra (her angelic offspring), in Lillian Hellman's The Little Foxes, and Jerry, the active friend of Rory in Inside Moves (1991:83). Under these criteria, the teapot, as the antagonist, should be one such memorable secondary character. This poses difficulties for the animator, as it is extremely difficult to inject personality or 'character' into a computer generated object. One film which achieved this was John Lassiter's award winning Luxo Junior, a short animation film depicting 'mother' and 'junior' anglepoise lamps. When Junior lamp jumps enthusiastically on the ball which Mother has rolled playfully toward it, the ball is deflated much to Junior's astonishment and chagrin. One of Lassiter's major contributions to the world of 3D computer animation (1987), has been to show that everyday objects could be computer animated to exhibit subtle human emotions.

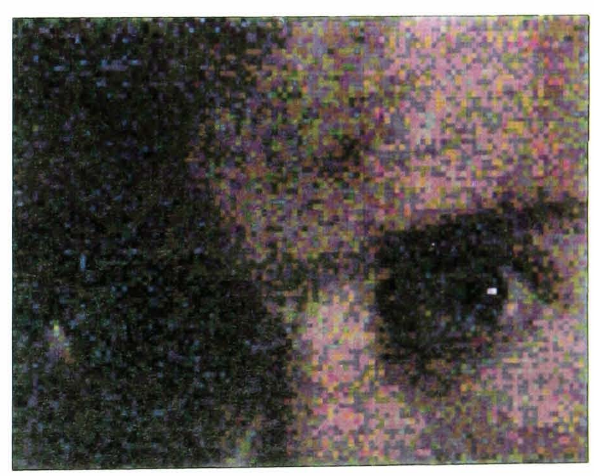
How is this achieved? Field tells us that before we put words on paper, and characters on screen, we should know our characters. Film, being a visual medium, can be made to reveal our characters' conflicts -- but not unless we thoroughly understand the characters first. He suggests sorting a character's life into two components, the 'unrevealed' and the 'revealed', the former taking place from birth until the moment the film begins and the latter from the beginning of the film to the conclusion of the story (1982:23). Michael Hauge agrees, stating that the scriptwriter should know his or her main characters at least as well "as you know your best friends", even though much of this background will never be revealed in the screenplay itself. In this way the characters will function much more realistically and effectively (1989:39).

Novelists generally give their readers a great deal of background information which, although not necessarily directly relevant to the plot, helps readers flesh out and understand the characters in the story. This is one of the key differences between a novel and a screenplay. A novel may easily run to 400 pages or more, whereas a screenplay is likely to be around 120 pages for 2 hours in length -- one page equalling one minute of screentime. The novelist therefore has much more time to explore a character's history. When adapting a novel to a screenplay, the writer has to be extremely selective and only include background information which advances and maintains the tension of the story. Kenneth Portnoy gives the example of Kramer versus Kramer, where the first 100 pages of the novel are devoted to background information on Ted and Joanna: how they met, trips to Fire Island, the single scene, first date, their single friends. The screenplay, however, only begins after they have been married for several years and have had their child (1991:26).

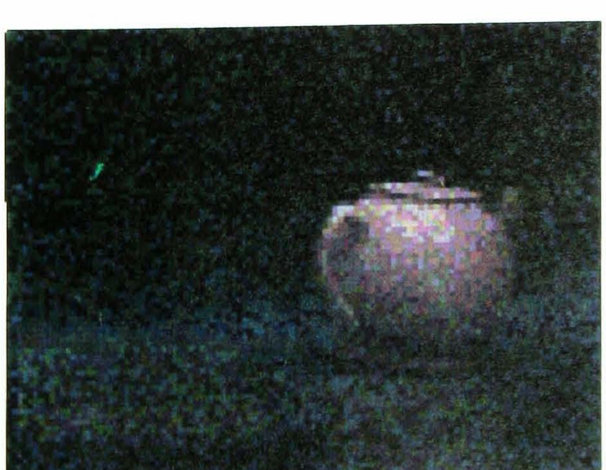
As far as The Creator is concerned, developing a background is not a particularly difficult process in the case of Steve and his boss who are human beings, and with whom we can easily identify. The background life of the animated teapot is rather different. For example, it lives inside the monitor. Does it have family (other teapots) or friends (other computer generated objects)? Perhaps these kind of background details are superfluous in the case of most animated objects but upon reflection, had the same amount of thought been given to the teapot's background life, as was given to the live action characters, it might have assumed a more interesting and believable personality.

A key factor in the animation of the computer generated teapot was the realisation of the importance of character interaction. On stage, or on a film set, this 'interaction' happens normally when actors and actresses appear together in a scene. This could not be the case in The Creator, because the computer-generated teapot was partly created before the filming of the live action performance, and partly done later. The two characters only come together on screen in the final post-production process of on-line editing, when it is too late to make changes. When struggling with the technical problems of making the teapot assume the shape of a woman, or beckon with its spout, it is easy to lose sight of the fact that not only must it 'act', but also 'react'. Bruce Steele, Head of 3D, Complete Video (1991) emphasises this point when referring to characters reacting to their environment. An example of the 'reaction' of the teapot can be seen in The Creator in the scene where Steve finally opens the colourbars of the monitor and peers inside (see below).

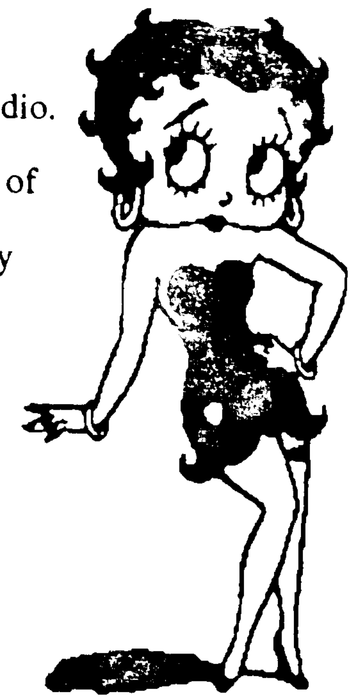




1. Steve pulls open the colourbars (teapot's POV).
2. He peers into the monitor.
3. The teapot hops into the monitor depths.
4. It swings round in surprise on hearing Steve.



The computer animator who chooses to animate everyday objects does not have the benefit of using facial expression as an aid to characterisation. He or she must rely largely on 'body language'. John Halas discusses some famous, traditionally created, Hollywood cartoon characters, one of which was Betty Boop, a character originally developed by teams of young designers from the Fleischer Brothers Studio. She emerged in 1932 as a cartoon version of the Hollywood sex symbol. Betty was sexy and meant to appeal to an older audience. She had an innocence and vulnerability which was lacking in most real life actresses. The essence of these aspects of her character was shown by her oversized eyes and delicate gestures (1987:23). In the silent film era, Betty maintained her appeal without the aid of a synchronised soundtrack and a voice.

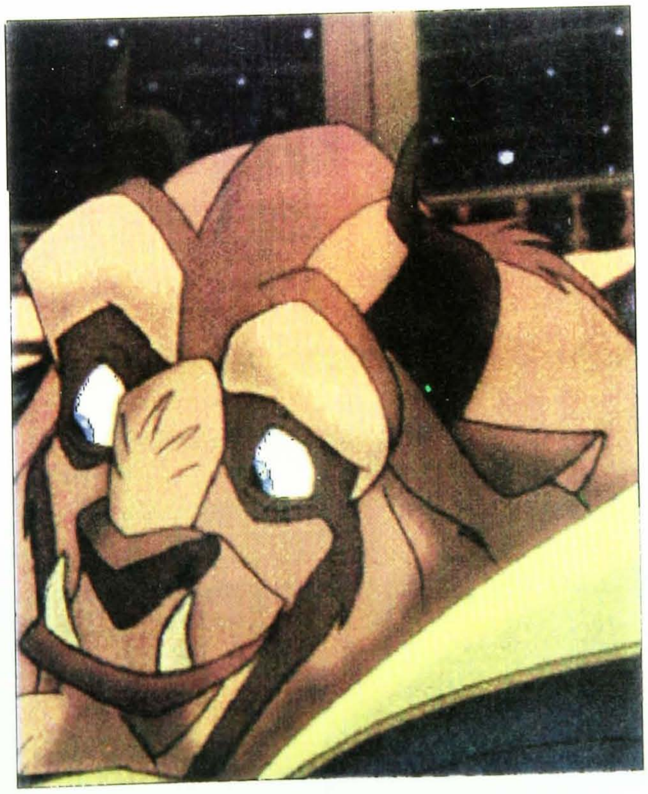


Halas points out how the introduction of synchronised sound benefited animators by helping them to create memorable characters — the most obvious example being Disney's Donald Duck. We know Donald as much for his impatient quacking voice as for his visual antics (ibid:25).

Snow White is recognised as a film classic, not just because it was the first full length feature animation film, but because it had strengths in many filmic elements: artistic use of colour (at a time when most films were black and white), sophisticated sound treatment with excellent music, voices and drawings full of character, in addition to a highly professional skill in storytelling — i.e. a well constructed narrative. The characterisation of the Queen's transformation into the Witch/Pedlar Woman was so convincing and scared its young audience so much that after the film was first shown at the Radio City Music Hall, it was reported that many of the velvet seats had to be replaced (Halas, 1987: 33). Current Disney animation features are winning acclaim for particular characterisation, namely the Beast in Beauty and the Beast, and the Genie in Aladdin.

Above: two studies from Snow White, Pedlar Woman/wicked Queen (Finch, 1975:67-75).

Below: the Beast in Beauty and the Beast and the Genie in Aladdin..



Until recently, traditional (hand-drawn/painted) animation and computer animation were totally separate techniques, rarely used together in a production, and even then for differing purposes. Most of Disney's characters for feature films are still, of necessity, drawn by hand. Bill Kroyer contends that trying to advance the computer into the area of character acting remains a controversial issue, especially for feature films: "In hand animation, when you've got just yourself, the pencil and the paper, it becomes so free -- you discover things. There's an unbelievable delicacy and subtlety to it. The difference between the right expression and meaningless expression is literally the width of the pencil line," (Pfitzer,1992:58).

Most animators would agree and this then begs the question: why use a computer when trying to give 'character' to an inanimate object like a teapot? The reasons lie in the computer's unique ability to give a photo-realistic quality to an object, an important requirement for The Creator, a video production which was concerned with successful image integration. It is possible to integrate hand-drawn animation with live action people, a recent example being the film Who Framed Roger Rabbit? One of the earliest examples was Invitation to the Dance, where animated figures dance in synchronisation with human dancers. Such films display remarkable technical achievement, but as Halas and Manvell say, also have a 'peculiar ugliness' which comes when wholly disparate art-forms are forced together, (1976:25). This peculiar feeling of discomfort or 'ugliness' stems from the essential differences between the two types of imagery, one being a mirror of the world around us -- people, objects and scenery depicted with full tonal ranges (photo-realism) and the other -- hand created, artificial images which are obviously painted, generally with flat tonal areas and hard edged shadows applied to the characters. The viewer is also asked to reconcile two opposing styles of movement within the same frame: the understatement of film acting and the deliberately exaggerated overstatement of animation.

With the computer's undoubted ability to create photo-realistic objects, many computer animators are accepting the challenge of creating synthetic 3D human characters and we have only to review some recent Hollywood films to gauge their success: the face of the villainous cyborg in RoboCop 2, animated skeletons in Total Recall, the watery pseudopod mimicking the expressions on a human face in The Abyss, Terminator 2. These are undoubted achievements but it is still too difficult to create an animated character so realistic that it can pass for an actual person. Stephen Porter states that the best of today's computer generated characters cannot fool a viewer into thinking they are real humans for more than the very briefest of moments, and in fact, the closer an animated character gets to simulating reality, the more unrealistic it looks (1990:62). This is probably because we have all learned to recognise and understand subtle nuances in facial expression from our earliest years and can easily detect the slightest variation from what we perceive as normal human behaviour.

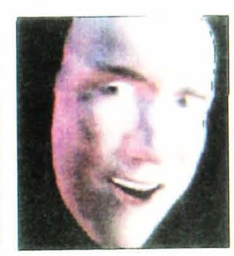
'TRACKING THE EVOLUTION OF SYNTHETIC ACTORS' in Computer Graphics World, August, 1990

1971

1974

1985

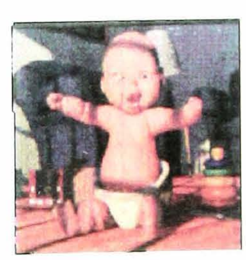
1985



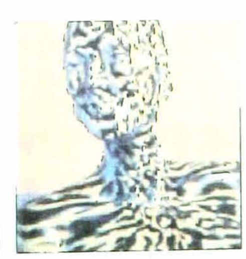
1988

1988

1988



1988



1989

Many computer animators and others in the computer graphics world disagree with the principle of attempting to emulate humans, a feat which may well prove possible, protesting that animation is intended to exaggerate reality, not imitate it. Matt Elson, an animator with Symbolics (Los Angeles), sums up this attitude when he says: "If you want photo-realistic actors, go get Jack Nicholson" (1990:65). This view is echoed by Carl Rosendahl, president of Pacific Data Images (PDI, Sunnyvale, CA) who says "... You have a medium here that is so varied and allows you to do so many unique, wonderful things, that to focus on this little point called 'reality' when there is already a great way to do reality is a waste of a medium" (1990:65).

Emulating humans via the computer may remain a controversial issue; emulating inanimate objects is not. Bringing such computer generated objects to life and injecting them with human personality still remains an interesting challenge for most animators. In the case of The Creator, once the hardware and software problems had been solved, the most difficult challenge was the characterisation of the teapot, a job which went far beyond mere model making, scene lighting and movement. In retrospect, as much thought should have been given to the teapot's character as was given to the two live actors. This would, undoubtedly have improved the teapot's 'performance'.

SECTION FOUR
CONCLUSION

This investigation has shown how computer graphics has been technology led and has progressed independently of conventional animation and live action film and video production, thus not benefiting from the body of knowledge built up by these traditional media. As all these technologies are drawn closer together through the process of digitilisation, there are no longer clear boundaries between them in the production of integrated imagery. This opens up exciting, creative opportunities for all artists.

The independent video artist working in this field cannot be compared to artists such as painters or graphic designers, in that the level of technology required will almost certainly be beyond the individual's means. Necessary resources include software, fast computers for rendering, adequate disk storage for large numbers of rendered images (e.g. magneto-optical cartridges), production and post-production facilities which allow for broadcast quality, and facilities for sound creation and dubbing. This is not to say that state-of-the-art equipment is necessary at every stage — the animation processes of model making and previewing were largely carried out on a '386 20Mz PC at home — but rendering could have taken days rather than weeks had faster '486 machines been available at the time.

The benefit of being an independent computer/video artist rather lies in the fact that one can originate and carry out one's own ideas without the constraints of commercialism: working to others' briefs, budgets and deadlines. This is an exciting and explorative process which can benefit both artist and collaborating establishment in finding new techniques to achieve creative results. Phoenix Video certainly extended their usual range of DVE effects, some of which may prove useful for other clients.

The use of the technology described does not ensure successful results.

Equally important is the understanding and application of aspects of perception, narrative and characterisation. A great deal of research has already been undertaken in these three areas with reference to fiction, photography, stage and film, but relatively little has been done with regard to 3D computer animation and its integration with live action video. This project has attempted to address this lack of research.

Some of the practical work was undertaken concurrently with the background research. The larger part of the preproduction and production was done prior to the final dissertation which was intended to be a reflection on the creative and practical issues thrown up by the production itself.

This reflective process has been both creatively stimulating and extremely useful, so much so that it caused revision of the video to be undertaken at a late stage. For example, after writing section three, the video was reviewed at a stage when it was thought to be complete, edited and dubbed. In the light of research and reflection, however, flaws in the narrative and characterisation became obvious: both teapot and Steve lacked sufficient motivation for their actions, and the drama lacked both pace and climax.

An additional day was arranged to shoot a single chroma-key shot of Steve disappearing into the monitor from a frontal viewpoint, which could then show the colourbars slamming shut, trapping him inside. This increased the dramatic impact of the narrative. Two additional shots of Steve were also used from previously discarded footage -- one showing him lying on the floor of the monitor, trying to get out, and the other, a big close-up of his face over which was dubbed additional dialogue ". . . and I'd like to smash up every one of them!" -- referring to his boss's sarcastic comment that there were "a thousand pots like this already on the shelves." This provided the necessary provocation to the teapot to confront its designer by popping out of the screen, thus providing a better basis for the narrative as a whole. The opening office scene of the interview between Steve and his boss was cut, and incorporated in flashback in a new opening. These changes necessitated considerable extra work and expense, requiring a new on-line edit, new music and effects creation, and a new dub.

One of the earliest rough cuts of the video included a battle scene between Steve and the teapot *inside* the monitor -- shot against blue for chroma-keying. The running time of this version was eleven minutes. The first edited and dubbed version lasted six minutes. The final version was cut to four and a half minutes.

The lessons learned through this reflective process, particularly with regard to narrative and characterisation, undoubtedly improved the final version and will, hopefully, bear still greater fruit in any future productions which incorporate various forms of image integration in narrative format.

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APPENDICES

PRODUCTION STILLS FROM THE CREATOR

1. Steve, the 'Creator', grabs the teapot which peeps out between the monitors.

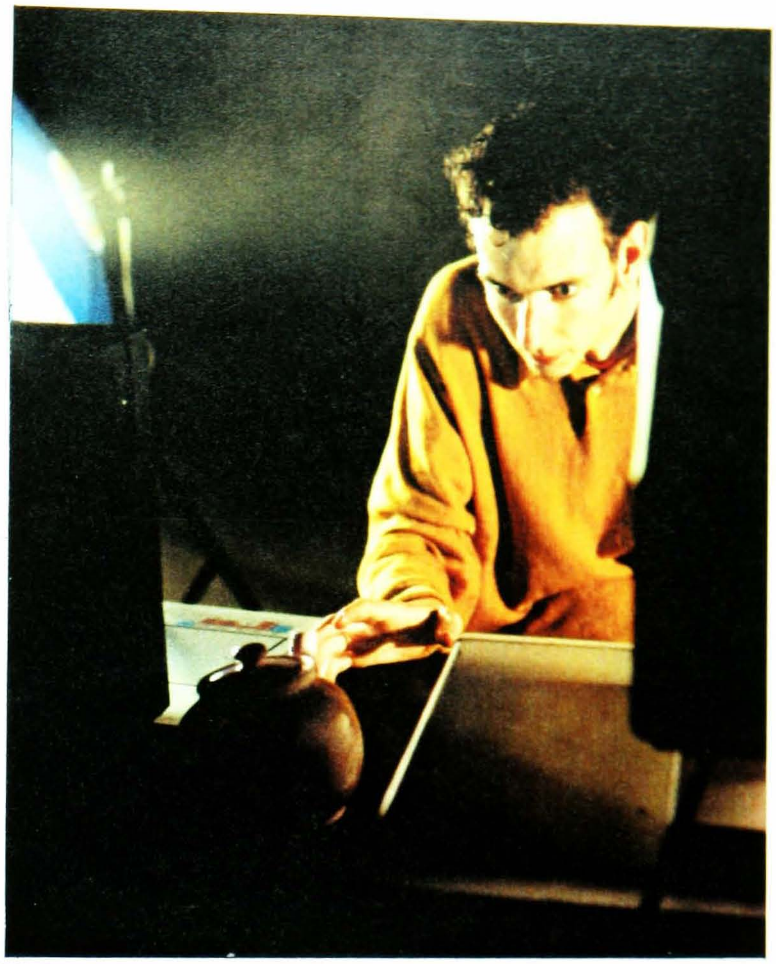
2. Crew members from Middlesex University's MA Video course adjust camera and lighting on the set.

3. The squeaks from Steve's swivel chair are recorded.

FOLLOWING PAGE_

4. The set of Steve's computer office. Shadows from the venetian blind (see top of pic. below) add interesting texture to the background 'wall' and give the impression of a window nearby.

5. The teapot is reflected onto Steve's face. Its shape follows the lines of his profile.



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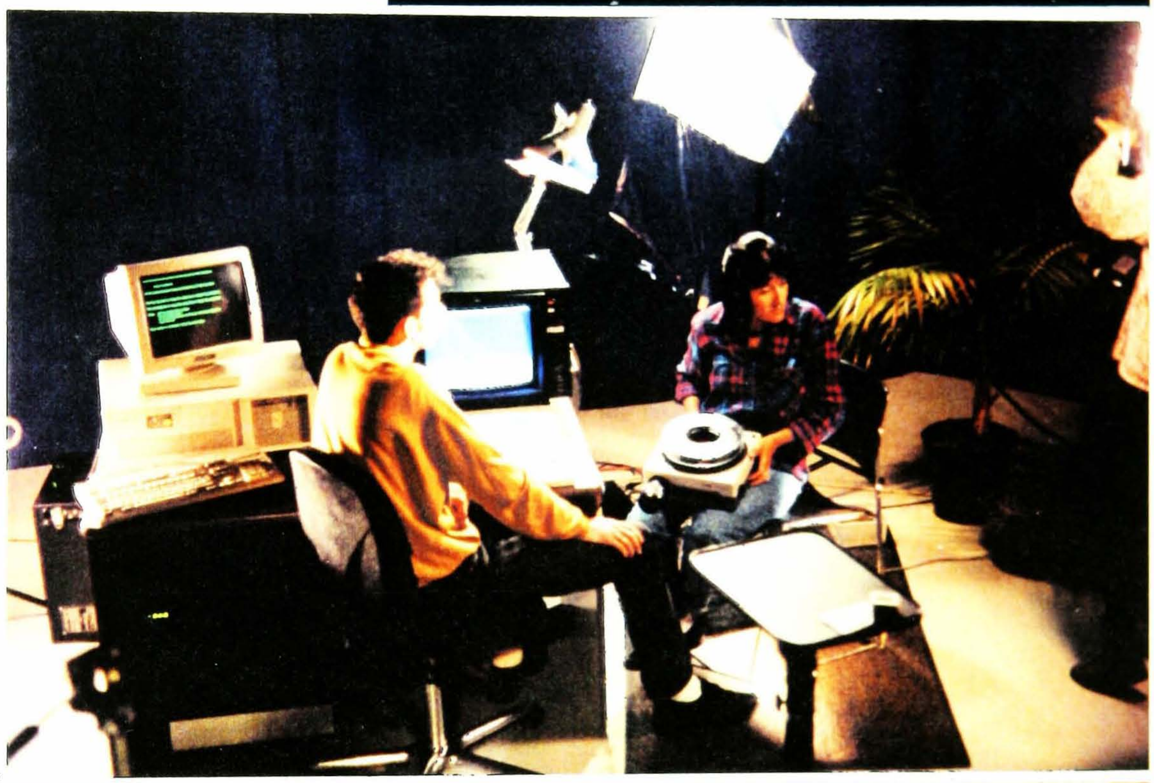

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3

6. Crew members adjust the lights on set. The picture in the background is a picture hung on the 'wall' of Steve's office. The monitor in the foreground monitors the scene as viewed by the camera.

FOLLOWING PAGE:

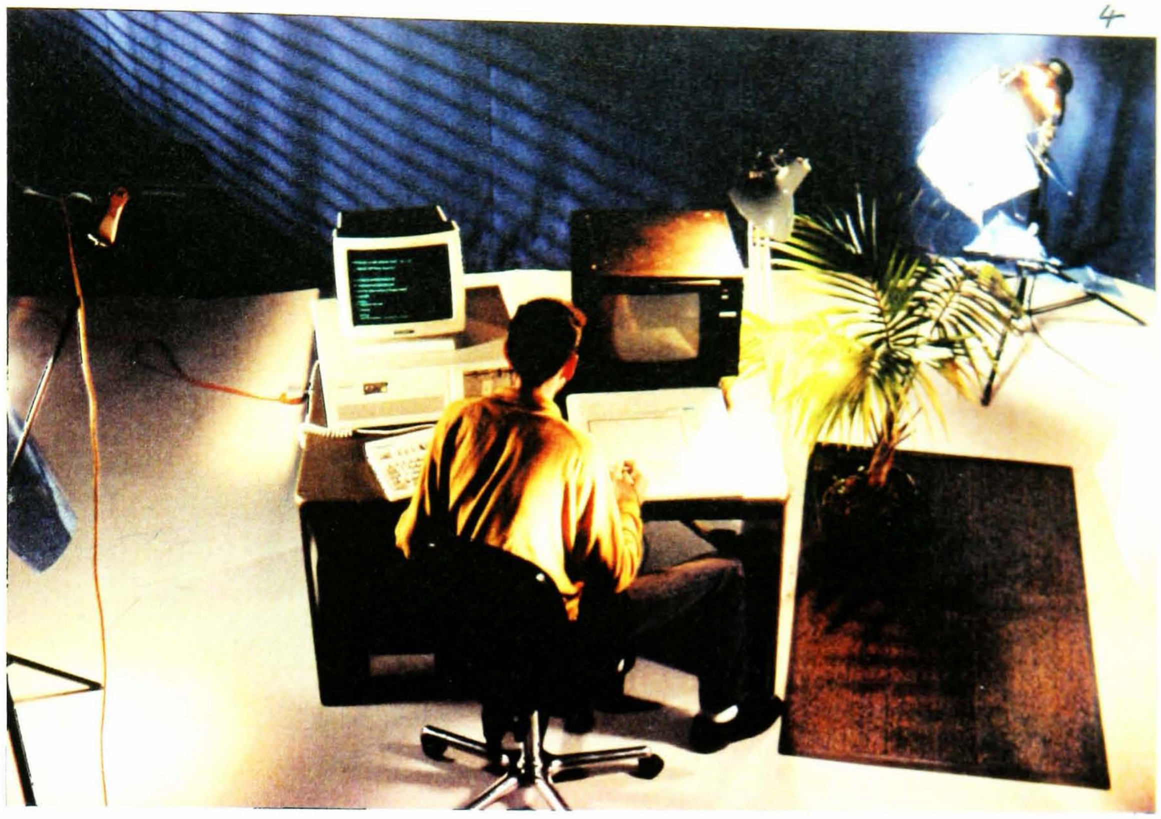
7. The Director, storyboard in hand, checks through the slides to be projected.

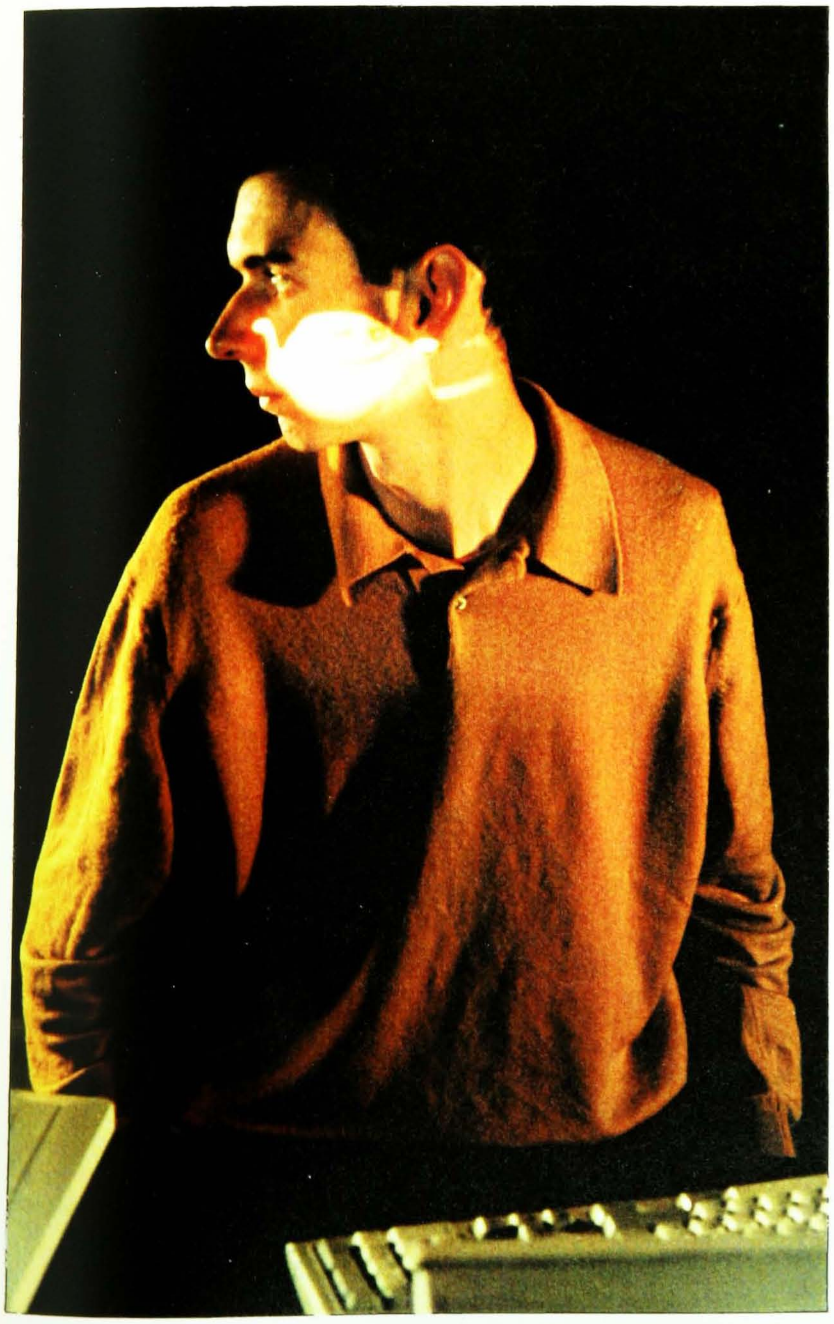
8. Close-up of Steve peering into the monitor.

9. Testing the effect of projecting colourbars onto Steve's face.

10. Aligning the slide projector to project a slide of the teapot onto Steve's profile

4





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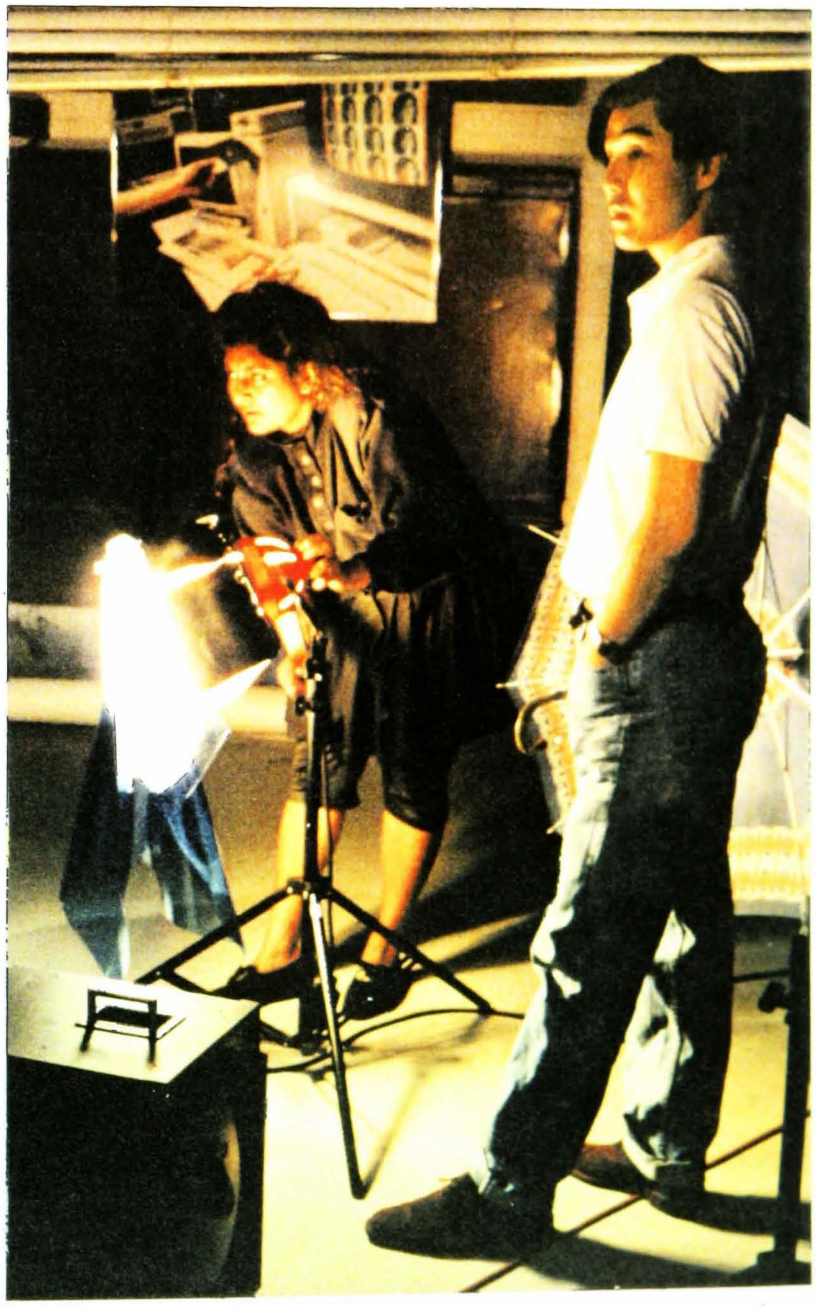

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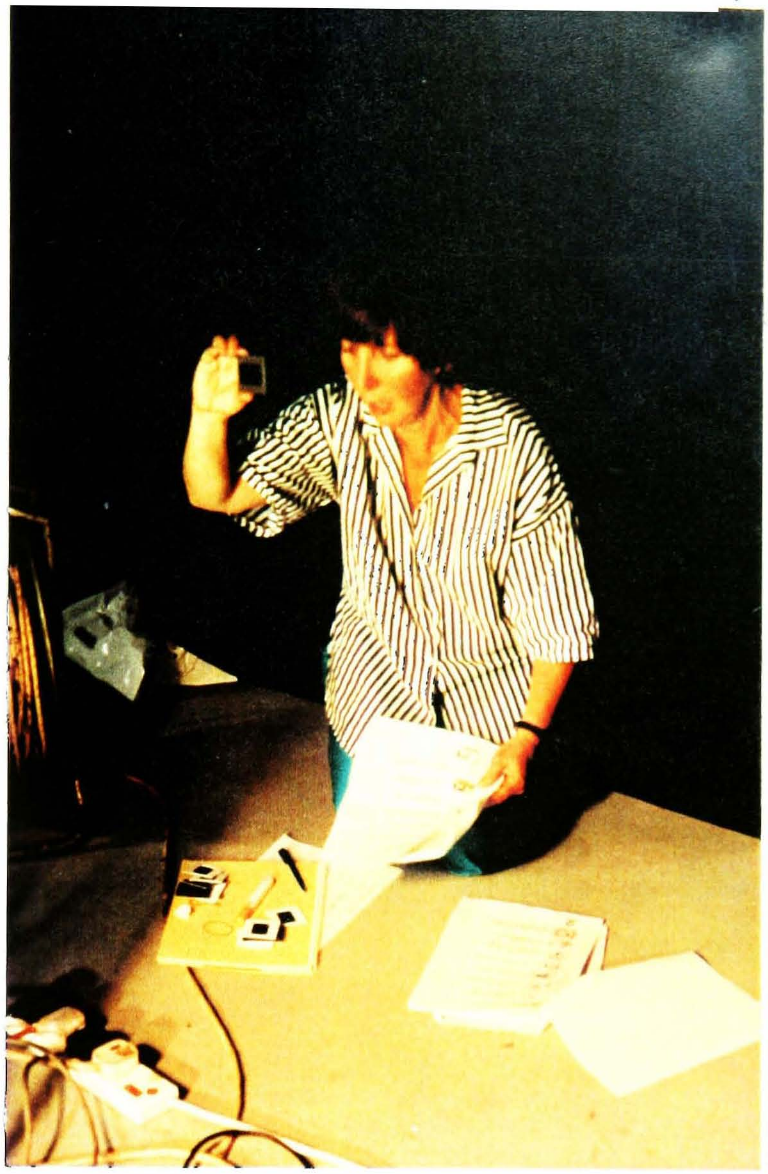

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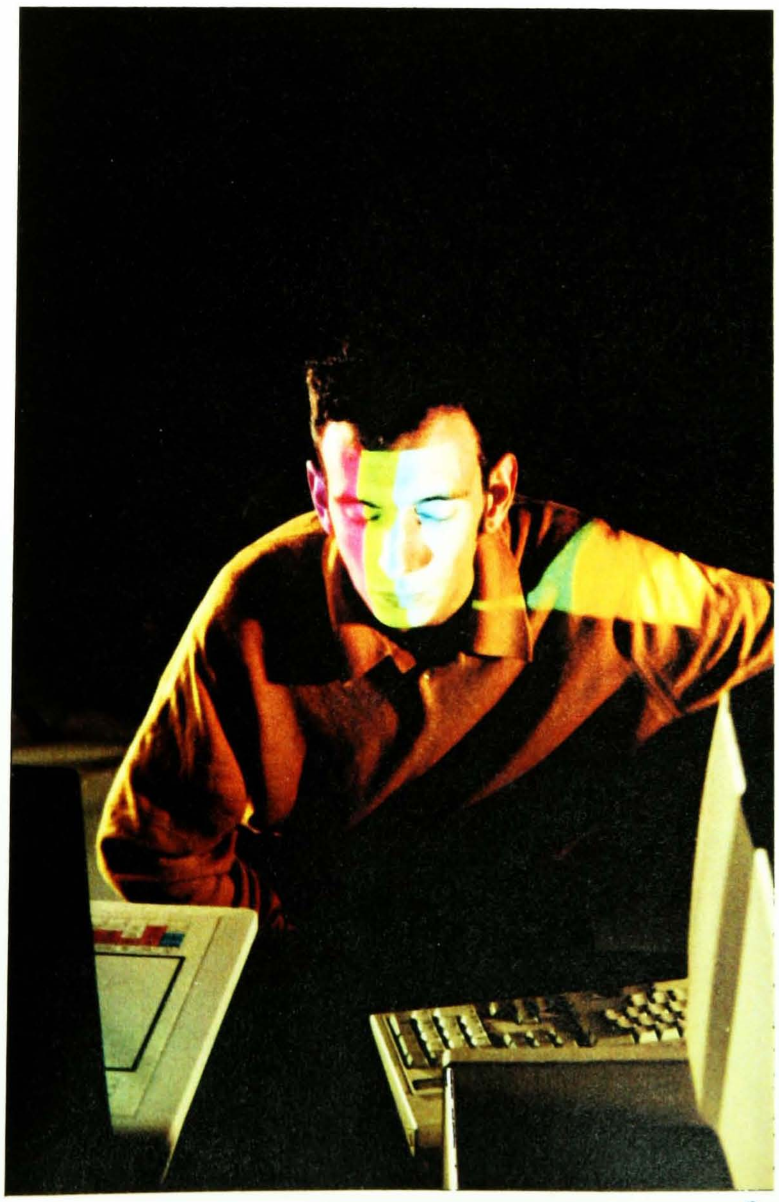

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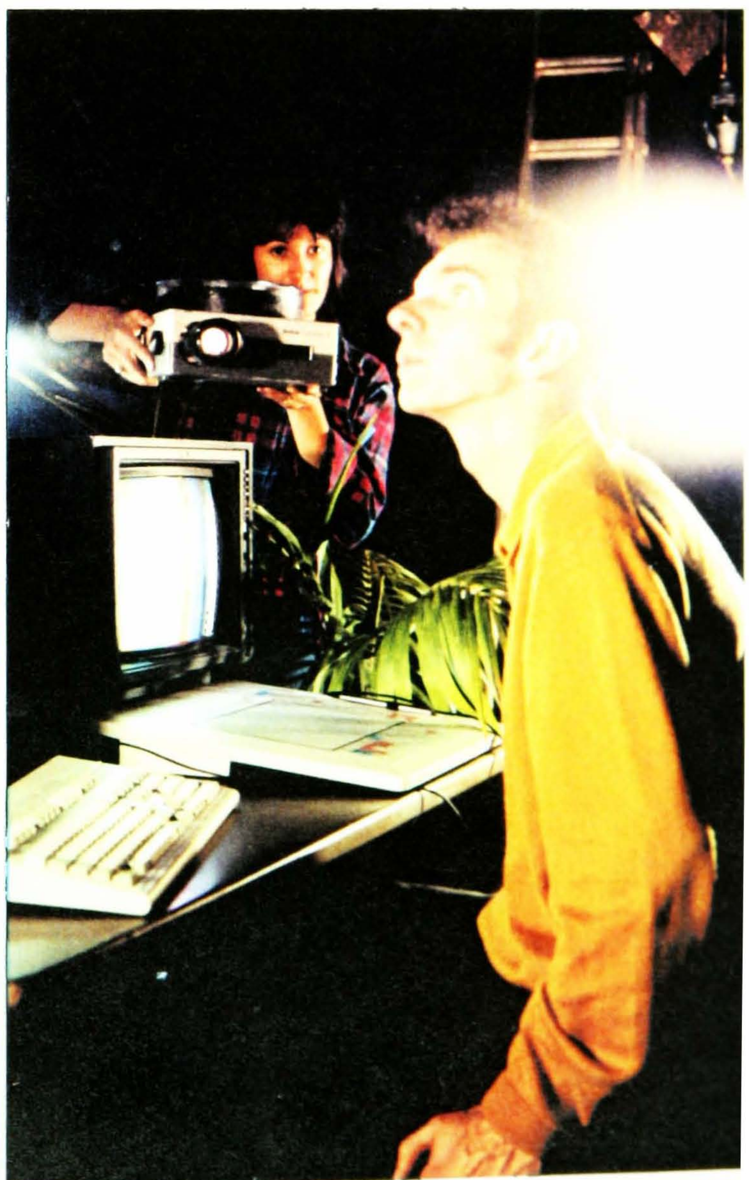

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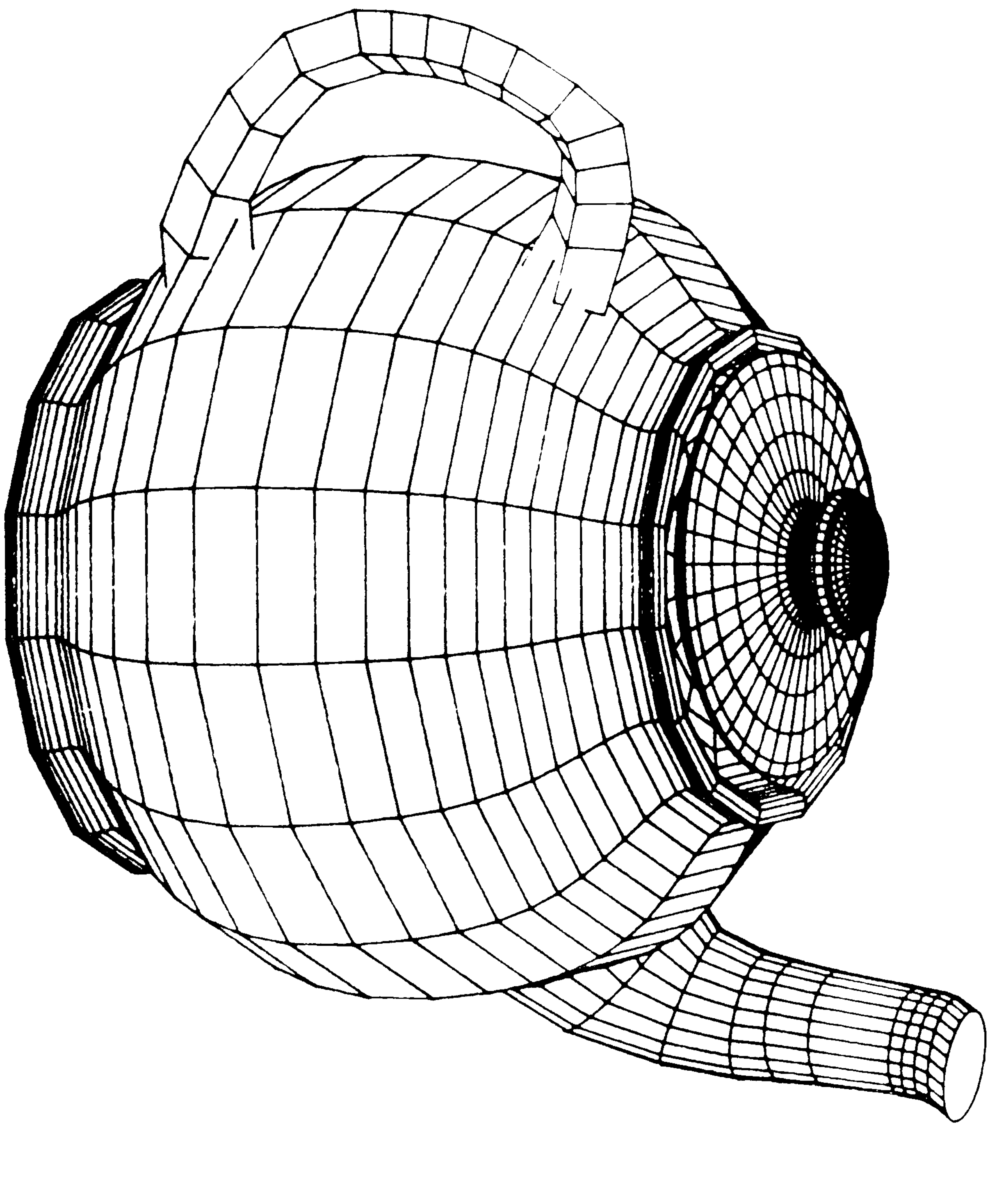

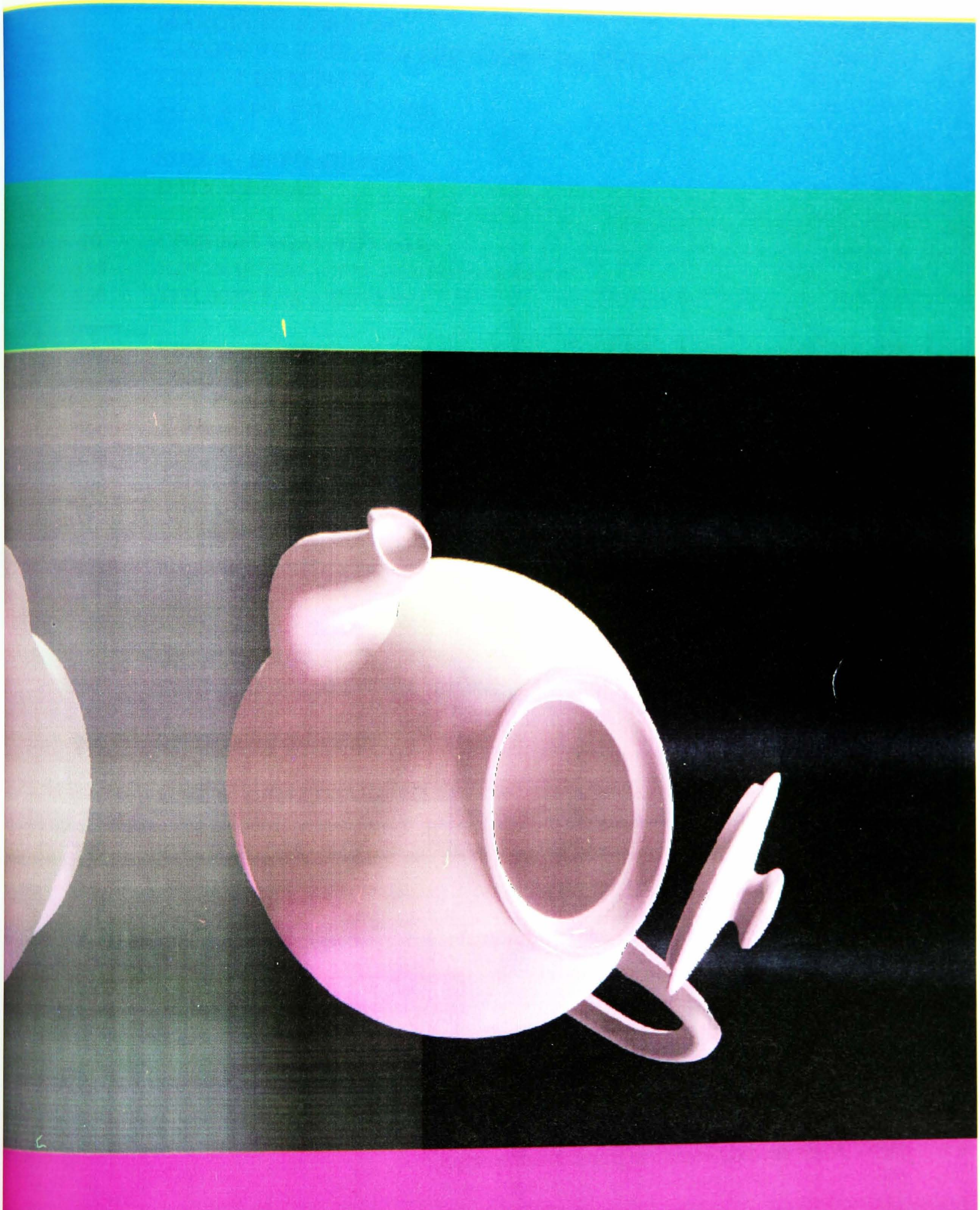

DATE: 12-1-93
MARCIA KUPERBERG
LAYOFF TO BETACAM FROM OPTICAL DISK SUPPLIED.
FIELD 2 DOMINATE
512 bytes per sector. 3DS files.

SIDE A D:\FILELIST.IFL
D:\TYMK\FILES

10 CPOT0065.TGA - 0075.TGA
155 HIPC0419.TGA - 0574.TGA (see note below)
300 TITL0000.TGA - 0299.TGA

---

465 **SIDE B D:\FILELIST:IFL**
D:\MK_B\FILES

500 A_CO0000.TGA - 0499.TGA
500 COLB0000.TGA - 0499.TGA
106 CPCU0345.TGA - 0451.TGA
179 HIPB0120.TGA - 0299.TGA

1285 Please supply BITC copy on VHS and low band

OPTICAL DISK 2
SIDE A D:\FILELIST.IFL D:\MKIMAGEA\FILES

206 BPOT0000.TGA - 0205

SIDE B D:\MKIMAGE\FILES

149 HIPC0000.TGA - 418 (this is followed by HIPC0149 - 0574.TGA on side A disk 1)

Total frames for layoff over the 2 disks, both sides: 2105.

DATE: 8-10-92
MARCIA KUPERBERG
LAYOFF TO BETACAM FROM OPTICAL DISK SUPPLIED.
FIELD 2 DOMINATE
512 bytes per sector. 3DS files.

SIDE A D:\MARK01.IFL

151+5 A_WT0000.TGA - A_WT0150.TGA
151+5 QQQQ0000.TGA - 0150.TGA
151+5 A_QQ0000.TGA - 0150.TGA
69+5 PPPP0000.TGA - 0068.TGA
69+5 A_PP0000.TGA - 0069.TGA

---

616 This sequence starts at 23:03:00:00

Total frames, side A: 616

SIDE B MARK02:IFL
D:\MK_B\FILES

186+5 BECK0000.TGA - 0185.TGA
206+5 BPOT0000.TGA - 0205.TGA
116+5 WATB0000.TGA - 0115.TGA
116+5 A_WA0000.TGA - 01115.TGA

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644 Please supply BITC copy on VHS and low band

Total frames, side B: 644

DATE: 08-9-92
MARCIA KUPERBERG
LAYOFF TO BETACAM FROM OPTICAL DISK SUPPLIED.
FIELD 2 DOMINATE
512 bytes per sector. 3DS files.

SIDE A D:\MARCAA01.IFL

126+5	WTTT0000.TGA - 0125.TGA
476+5	CPOT0000.TGA - 0475.TGA (see note below)
161+5	PWAL0000.TGA - 0160.TGA
151+5	WTEB0000.TGA - 0150.TGA
151+5	A_WT0000.TGA - 0150.TGA
151+5	QQQQ0000.TGA - 0150.TGA
151+5	A_QQ0000.TGA - 0150.TGA
68+5	PPPP0000.TGA - 0068.TGA
68+5	A_PP0000.TGA - 0068.TGA
1503	**Total frames side A: 1503**

Please supply BITC copy on VHS and low band

DATE: 20-8-92
MARCIA KUPERBERG
LAYOFF TO BETACAM FROM OPTICAL DISK SUPPLIED.
512 bytes per sector. 3DS files.
FIELD 2 DOMINATE

SIDE A D:\FILELIST.IFL

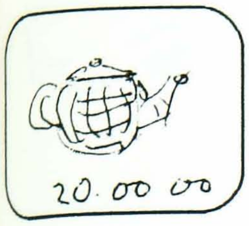
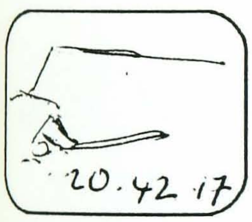
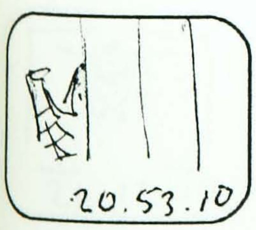
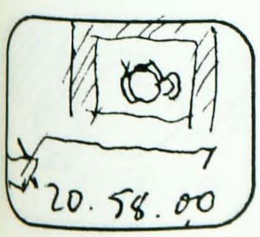
141+5	HIPS0000.TGA - 0140.TGA
121+5	POTH0000.TGA - 0120.TGA (see note below)
136+5	WSPO0000.TGA - 0135.TGA
413	**Total frames side A: 413**

Please supply BITC copy on VHS and low band

SOUND DUB GUIDE

Director: Marcia Kuperberg

PROGRAMME TITLE: THE CREATOR

	Action	Voice	Spot FX: pot	Spot FX: steve	Music
	F/In opening title. Mix to				sync on falling letters as before
	M/S Steve at desk in front of computers. Mix through of office scene.	There're a thousand pots like this already on the shelves. You've got to come up with something different - something - F/O			— GENERAL
	Office scene	I'm sorry, Steve, its back to the drawing board, I'm afraid, or should I say back to the computer. Everythings done on computer these days, isn't it? (add pause at dub)			
	M/LS Back view of Steve at his desk (computer studio) chin in hand - pensive. 20.41.08 He suddenly thumps knee with fist (reaction to last v/o dialogue)	**Boss:** (slight echo) -- but you know, Steve, its still possible to be *creative* on a computer! (just before 20.41.08)		26.27 thump	B'GROUND —
	Mix to C/U hand moves on pad, picks up pen. Mix to C/U keyboard, fingers tapping.	sync live sound			
	M/S Back view of Steve tapping keyboard. Bars wipe onto monitor at right & Steve picks up pen.	~~You've got to come up~~ with something different Something - oh, how shall I say - something with a bit more life in it			
	C/U colour bars. They wipe off to show pink wireframe pot. 20.56.00				
	M/S Steve's hand on pad. Pink pot is static on screen.	There're a thousand pots like this already on the shelves sync on 20.59.00			

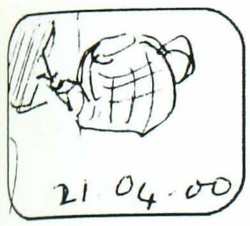
Director: **Marcia Kuperberg**

PROGRAMME TITLE: THE CREATOR

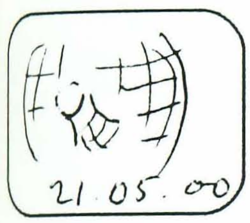
Action | **Voice** | **Spot FX** | **Music**

BC/U Steve's face, bitter and sneering

Voice: And I'd like to smash up every one of them...yeah!
sync on final sneer expression

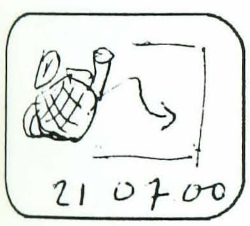


Steve's head leans into shot & wire pot moves toward him, sticking out its spout.

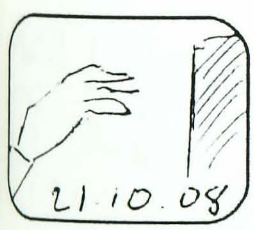


C/U pot (Steve's POV) moving forward, its spout moving outwards.

C/U Steve's face - amazed.



C/U monitor. Pot disappears back inside blackness of screen.

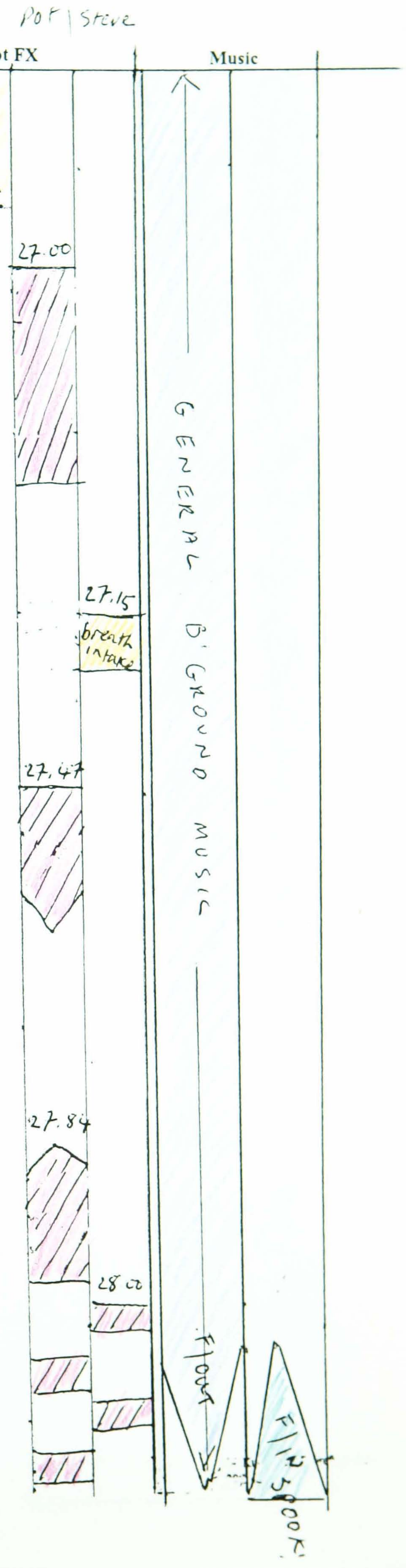


C/U Steve's hand as it moves tentatively toward side view of monitor. It begins to withdraw.

C/U pink pot (no longer wireframe) zooms out of blackness of monitor to fill screen.

Series of quick C/Us (jump cuts) of Steve's face moving in panic as teapot's reflection passes on & off.

mix final shot to



Director: **Marcia Kuperberg**

PROGRAMME TITLE: THE CREATOR

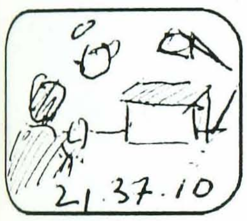
	Action	Voice	Spot FX	Music

BC/U Steve's face in profile as it slowly moves to other side of profile with pot reflection resting on nose & cheek. Eyes look down at reflection.

C/U face, bemused

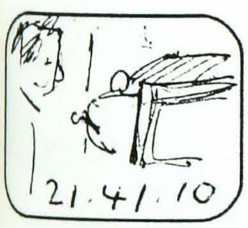
C/U F

ML/S Steve's face looks up as pot flies in from screen right & beckons. He gulps.



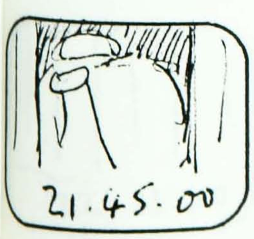
ML/S Back of Steve at desk. Pot flies in & darts down between monitors. He lifts hand toward it.

BC/U Steve's face looking down toward where pot disappeared.



M/S pot peeps out between monitors. Steve makes grab but misses. Colour bars wipe onto monitor screen.

BC/U Steve's face trying to spy pot between monitors.



C/U pot moves backwards into col. bars, beckoning.

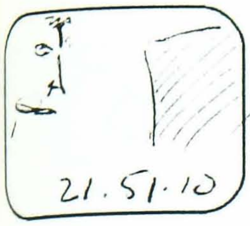
Spot FX: previous; 29.01; 27.35 Steve

Music: SPOOKY BACKGROUND MUSIC

Director: **Marcia Kuperberg**

PROGRAMME TITLE: THE CREATOR

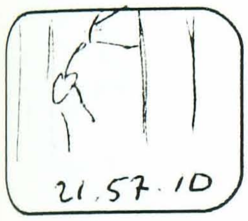
	Action	Voice	Spot FX	Music



C/U Steve's profile leaning toward monitor (bars reflecing on hand). His head begins to move forward.

B/CU Steve's face (bars reflecting on it) as he moves toward (offscreen) monitor.

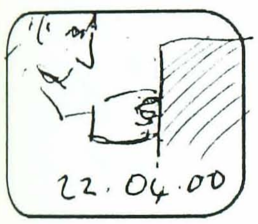
28.49 bars click



C/U Bars open. Pot, moving from behind, beckons - then turns just as bars close. Handle protudes for a split second.

music builds

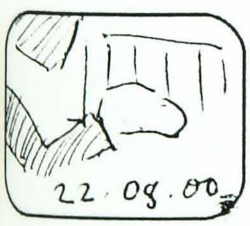
29.22 squeals



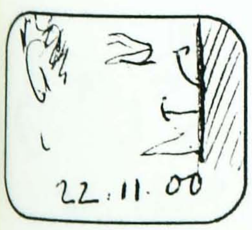
M/S Steve grabs the pot's handle as it retreats into monitor. He tugs it back & forth.

music climax

B/CU Face looking down as he tugs (face moves with tugs).



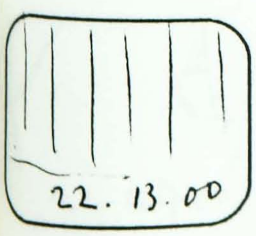
M/S Steve leaning toward monitor trying to scrape away bars with hand.



B/CU Steve's face squinting at monitor (pink bars reflecting onto face).

music clicks

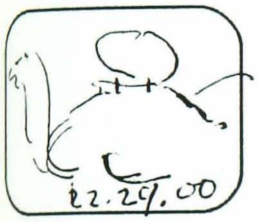
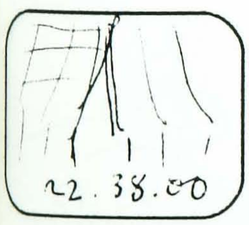
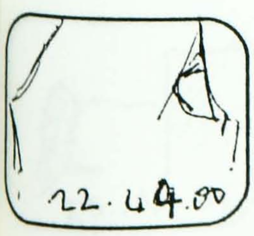
STRIPPER MUSIC



C/U bars on monitor - lit by spot light. Bars crunch into curtains & rise to reveal pot as it

Director: **Marcia Kuperberg**

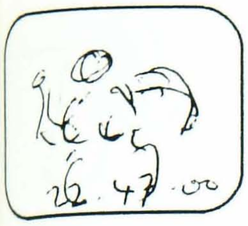
PROGRAMME TITLE: THE CREATOR

	Action	Voice	Spot FX	Music
	leaps forward into light at centre front of 'stage' & morphs to shape of woman.			STRIPPER MUSIC
	B/CU Steve's face.			
	B/CU female pot. It bows.			
	L/S female pot centre stage. Curtain lowers. Mix to			
	C/U real colour bars on monitor. B/CU of hand entering & scraping at bars.			
	L/S Curtain bars part to reveal pot in shaft of light. It begins to swagger forward.			
	C/U Steve - eyes wide			
	L/S pot walks to centre front of stage in shaft of light. C/U female pot in light shaft - right hand on hips --swagger with flourish, ends both arms outstretched.			

Director: **Marcia Kuperberg**

PROGRAMME TITLE: THE CREATOR

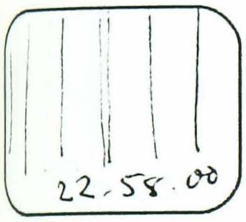
Action | Voice | Spot FX | Music



L/S female pot in light shaft between curtains. Curtains swing to close as pot morphs back to teapot shape. Shot ends with curtains closed.

Mix to

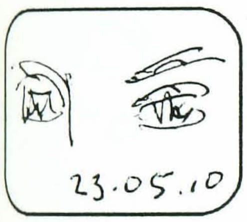
C/U Steve's hand reaching toward monitor with pink reflecting onto palm.



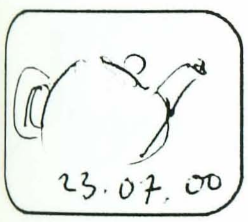
C/U bars, hands of Steve move them apart until face is visible.

click on 23.02.06

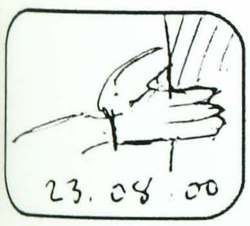
Zoom to



B/CU eyes which look from side to side & finally downwards to see

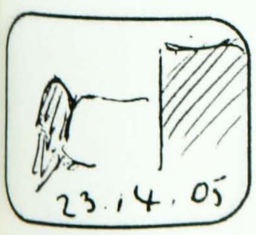


M/S pot walking away inside monitor.

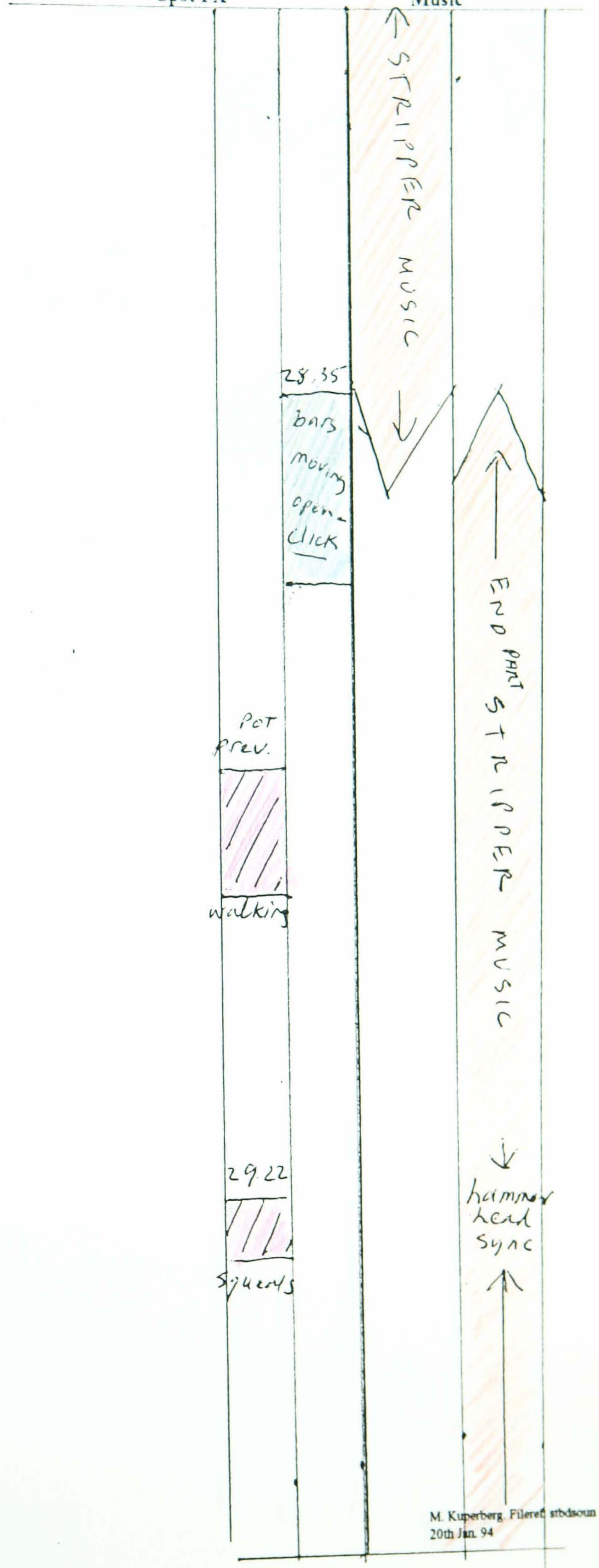


M/S Steve hangs onto monitor sides & sticks his head inside.

M/S female pot rocks back on heels & throws up arms in fright - does double take & morphs back into pot shape - before hurrying away.



M/S Steve's legs disappearing into monitor (side view).

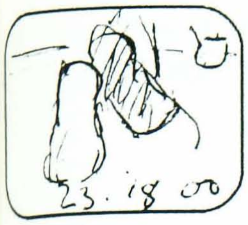


M. Kuperberg. Fileref: stbdsoun
20th Jan. 94

Director: **Marcia Kuperberg**

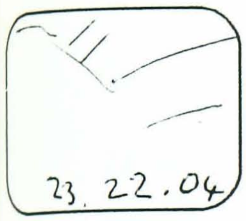
PROGRAMME TITLE: THE CREATOR

Action



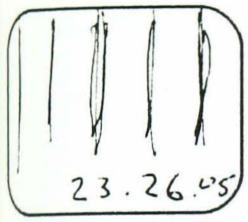
C/U front view (supposedly of monitor) as Steve's shoes move into monitor. Colour bars slam shut.

23 20 22



M/S silhouette of Steve inside monitor, kneeling. He flips round on sound of bars closing, and

lying on monitor floor, begins bashing at colour bar wall just out of shot on screen right.

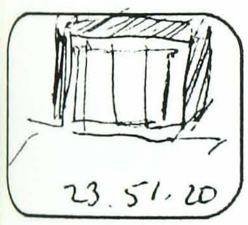


M/S monitor with moving bars & face showing behind.

Mix to

M/S Boss in office. She punches numbers on phone & speaks into it.

Mix to

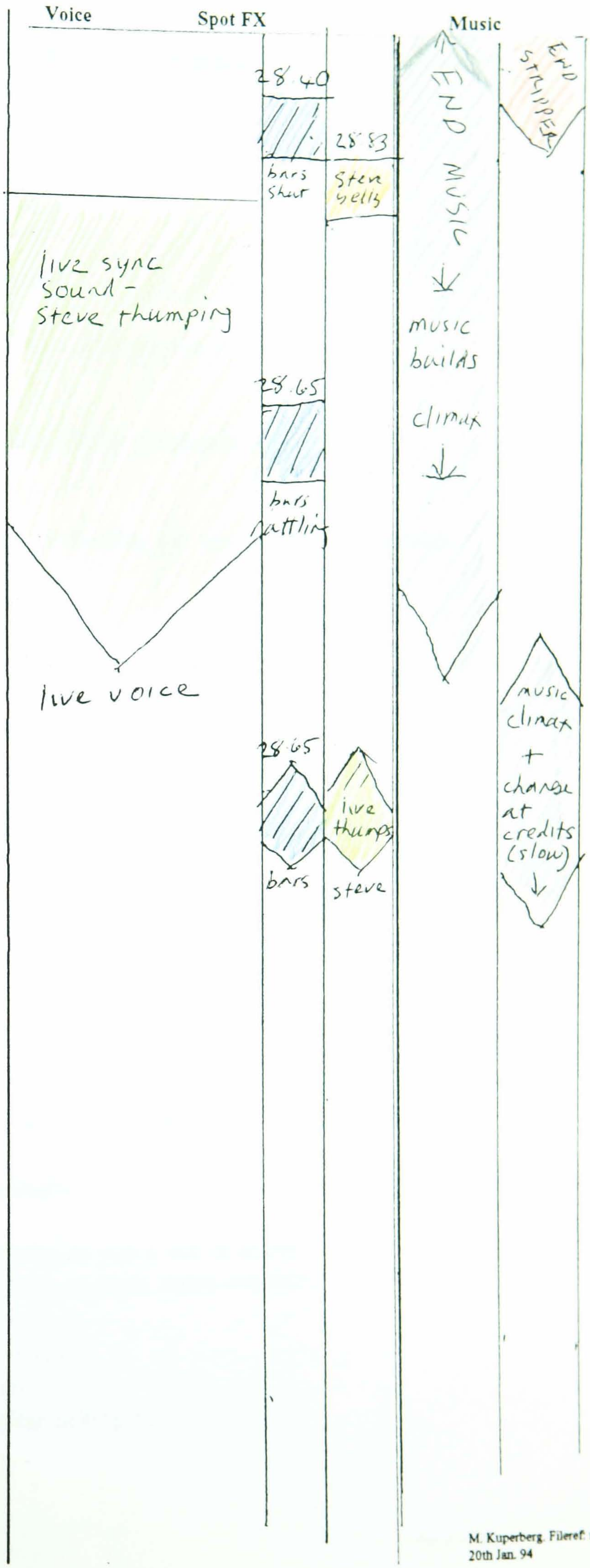


M/S monitor on desk with Steve trying to get out. F/O pic.

F/In end credits over monitor.

Fade out. (24.05.00

24.22.06-(end)



'THE CREATOR' SPOT FX LIST

Director Marcia Kuperberg. Composer Danny Kuperberg.
MIDDLESEX UNIVERSITY

DAT TIME

26.27	Thump on knee. **Choose best take.**
26.50	"--and I'd like to smash up every one of them -- yeah!"
26.70	**Last take best.**
27.00	Wire-pot pops out of monitor plus C/U of spout moving out (2 linked movements). **First take.**
27.15	Intake of breath (closeup of Steve's face after pot comes out). **First take.**
27.30	Angry sigh, as Steve misses grab at pot.
27.47	Pot turns, and zooms back into monitor (match movement with pitch bend).
27.75	Coloured pink pot zooms out of monitor filling screen.
27.84	**Last take.**
28.00	Light flashes across face. Three different takes of varied length. **Use all as appropriate.**
28.35	Bars being pushed back.
28.40	Bars slamming shut. **First take.**
28.65	Bars being rattled.
28.83	"Whoa!" Steve cries out when bars slam, trapping him inside monitor.
29.01	Teapot peeps out between monitors.
29.22	Teapot squeals in pain as Steve tries to pull it out of screen. Use also for pot's surprise, after Steve peers inside monitor.

Plus two effects used at last dubbing session:

i) pot dropping down between monitors, and
ii) pot walking away as Steve peers inside after pulling back colourbars.

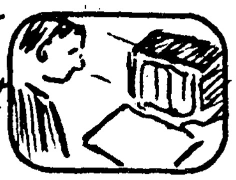
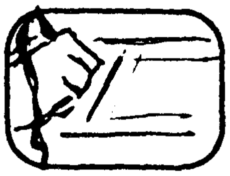
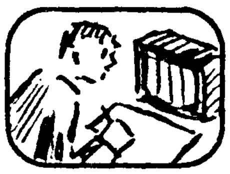
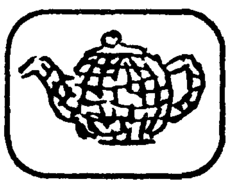
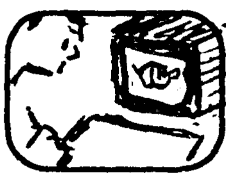
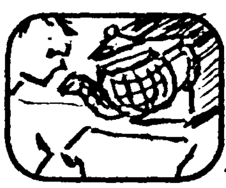
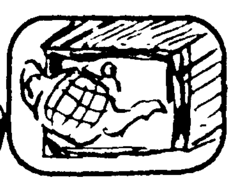
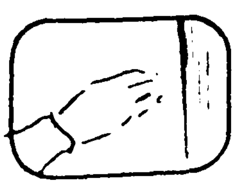
Fileref: dublst

Director: Marcia Kuperberg

Sheet No 1

WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

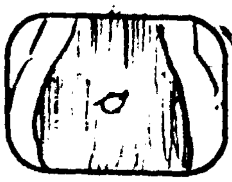
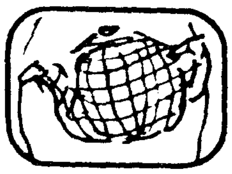
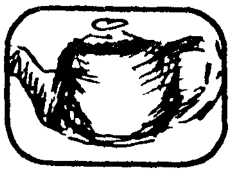
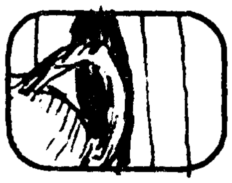
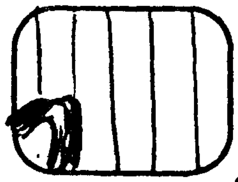
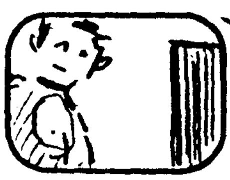
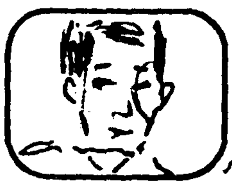
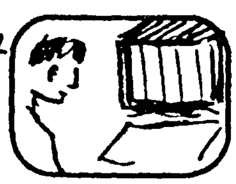
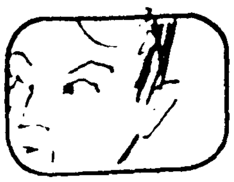
Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
1.13.13.15 13.22.25		1	9½	bc/u hand tapping keys		
12.47.15 12.49.24		2	2⅓	m/s col bars wipe onto monitor. Artist looks at monitor.		
19.21.17 19.31.14		3	10	c/u hand drawing on tablet.		
13.51.09 13.53.23		4	2½	m/s Artist - leans forward (live action bars on monitor)		
PUTER M ERT		5	4	Solely computer animation.Teapot renders itself in wireframe on screen.	1) BARS ARE ON SCREEN 2) BARS WIPE OFF 3) STOP FRAME(?) WIRE POT DRAWS ON. (?)	
4.07.24 4.14.23		6	7	Hand on tablet; monitor has wireframe pot DVE'd from prev shot. As face leans in, wireframe pot suddenly	1) STATIC POT DVE'd ONTO ANGLED SCREEN. AS POT STARTS TO MOVE, DVE ANGLE BECOMES FRONT-ON. 2) MATCH TO KEYED OVERLAY OF ANIMATED POT	
				swings its spout toward Artist & emerges from the screen, its lid lifting and tilting.		
1.31.23		7	1½	B/cu head, eyebrows raised in amazement.		
3.22.14 [illegible] TO [illegible]		8		Wireframe pot turns and zips back into monitor, getting rapidly smaller as it disappears into the black of the screen. Colour bars from either side slide shut at centre.	KEY ANIM. OVER LIVE ACT. STILL OF MONITOR WHEN POT HAS DISAPPEARED, DVE'd BARS CLOSE.	
1.43.05 1.51.04		9	8	Hand moves tentatively toward monitor. (NO SCREEN [illegible])		

Director: Marcia Kuperberg

Sheet No 2

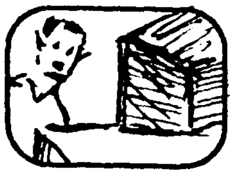
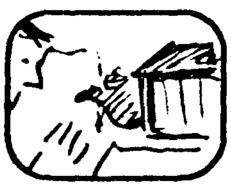
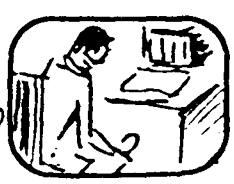
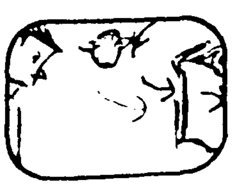
WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
		10		Solely computer animation. Col bar gates slide back to reveal wireframe pot in distance. Pot moves forward		
				into big closeup		
				and renders itself in full colour - pink and shiny.		
				It moves forward and down		
				and out of screen left, as colour bars click shut behind.		
00.50.13		11	33½	m/s shot of Artist. Camera moves to show side of monitor - reflection of pot passes onto Artist's chest. Camera moves in to show		
1.24.02				reflection on face, before passing off face.		
1.42.07 1.43.17		12	1½	ml/s Artist looks around.		
4.23.03 4.27.10		13	3¼	c/u face. Reflection passes off face. He gulps.		
32.24 2		14	¾	c/u face. Reflection goes up and off forehead.		

WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
17.42.23 17.44.05		15	1 1/4	m/s head down and bobbing about as reflection darts around.		
20.03.05 20.12.14		16	9 1/3	b/cu profile - pot reflection on face, eyes look down.		
01.13.10 01.14.12		17	1	c/u face - eyes blink		
15.27.03 15.27.21		18	3/4	m/s front view. Artist lifts hand toward pot as it flies in from screen right.	KEYED STOP FRAME ANIM.	
09.17.20 09.20.12		19	2 3/4	m/s back view. Artist's hand is lifted towards flying pot, which hovers just beyond hand. Pot suddenly darts down into dark shadow between monitors.		
13.24.10 13.25.02		20	2/3	c/u face - looking down slyly.		
.19.03 .20.12		21	1 1/3	m/s back & side view. Artist grabs for pot between the monitors (pot is real one, not computer animated one).	real pot	
.45.12 .47.22		22	2 1/2	c/u face, frustrated after futile grab.		
.17.00 .18.00		23	1	l/s Artist (back view) thumps knee in frustration.		
10.07.16 .11.15		24	4	^ l/s Artist staring at monitor - gulping. Pot zips around monitor.	Keyed S FR anim.	

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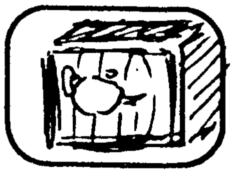
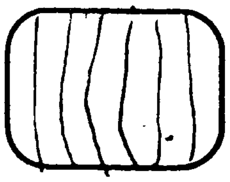
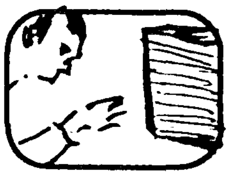
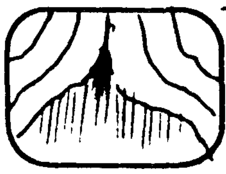
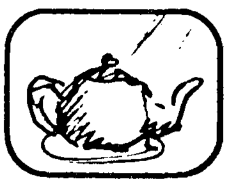
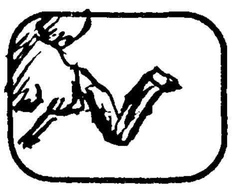
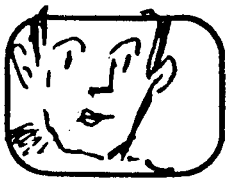
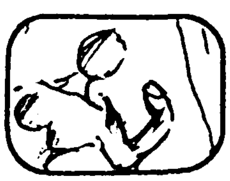
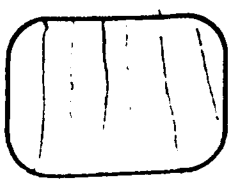
WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
this section .23.01 5.28.00		25	2	c/u monitor. Pot slips into colour bars, which click shut.	DVE ANIM. BARS KEYED POT	
		26		Solely computer animation. Colour bars bulge in & out slightly.	STOP FRAME ANIM.	
.2 .28.16		27	3 3/4	m/s Artist's head (& hands) move toward monitor.		
		28		c/u Solely computer animation. Bars swing back like curtains, revealing black beyond & faintly lit "stage".	STOP FRAME ANIM.	
				Spotlight grows to reveal pot, which remains still for a few seconds, and then suddenly transforms itself into a female form. Its lid becomes the head; spout and handle turn into arms.		
reaction this section 5.45.09 5.51.13		29	6	c/u Artist's face - reaction shot.		
		30		m/s Solely computer animation. Female shaped pot moves sensuously & beckons with its spout-arm.		
this section 4.49.00 5.13.21		31	2	B c/u Artist's face - reaction shot. - affronted/startled/enticed		
		32		c/u Solely computer animation. Colour bar curtain, half open, while female pot leans out, arm outstretched. Hand beckons and	STOP FRAME ANIM.	
				curtain swishes shut.		

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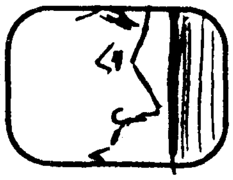
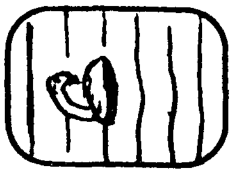
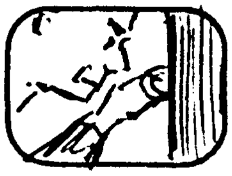
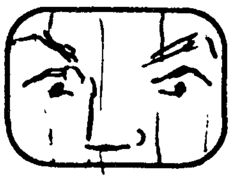
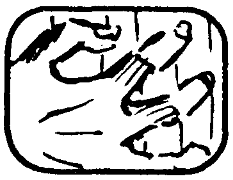
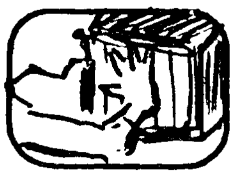
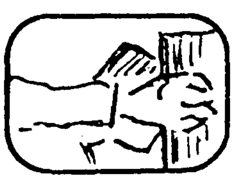
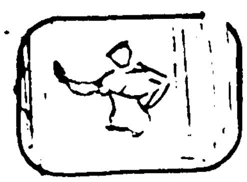
Sheet No 5

WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
19.42.03 19.49.09		33	7	bc/u face with reflection on it, very close to screen, peering in. (SCREEN NOT VISIBLE)		
		34		c/u Solely computer animation. Bars open and handle sticks out.	STOP FRAME ANIM.	
08.15 H. out 21.12 head looks 36.02 grab 52.12 (wire)		35	44	c/u Handle comes out Head looking down- hand makes sudden grab at handle. Tug of war; cut when no handle is visible.	end tug war with no live-action handle visible	
4 40.12 4.48.02		36	7 1/2	bc/u face with reflection of colour bars.		
4.23.22 4.25.00		37	1	bc/u col. bars (real live action). Hand comes in and tries to pull apart.		
4.13.24 4 22.23		38	9	m/s Artist trying to scrape/pull at colour bars on the screen.		
31.40.11 31.51.05	 	39	10 3/4	m/s view from inside monitor: hands push colour bars apart* (overlaid computer animation) and camera then zooms in to (* notes opp. (reversed) view of bars) b/cu of eyes which look first one way, and then the other.	START OF SHOT STATIC CAMERA TO ALLOW FOR C. ANIMATED COL. BARS TO BE PARTED AS KEYED ANIM. THEN (with no more bars) camera zooms in.	
5.25.05 5 26.01		40	3/4	m/s Artist, with hands clutched around monitor, begins to push his head inside it.		
		41		Solely computer animation. Black interior with dimly lit female teapot swaying to music.	STOP FRAME ANIM.	

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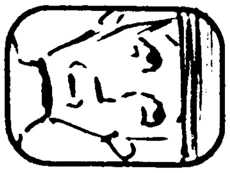
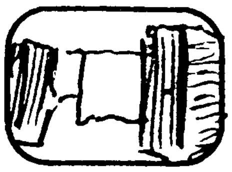
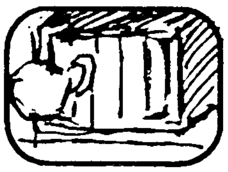
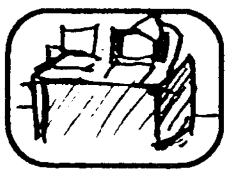
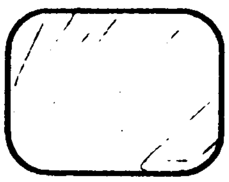
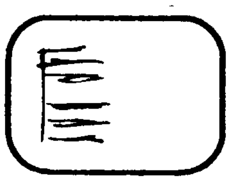
Sheet No 6

WORKING TITLE: THE CREATOR.

Live action video with integrated computer graphics. MPhil project 1989-92

Live action timecode		Shot	Secs	Action	Anim & DVE Notes	Sound
19 03 12 19.13.00		42	9½	bc/u Artist forces head into monitor.		
17.50.23 18.00.22		43	10	m/s legs disappearing into monitor.		
3.22.14 .28.00		44	3½	c/u monitor with bars. Bars are computer animated and DVEd into position on live action monitor. Computer pot (separately composited) slips out , & bars quickly click shut - leaving Artist trapped inside.	DVE BARS. STOP FRAME ANIM. KEYED OVER LIVE ACT. MONITOR	
2.10.12 2.31.00		45	24	l/s live action (real pot) sitting on the tablet in front of the monitor. The bars on the monitor are bulging in & out as the artist struggles inside.	COMPUTER ANIMATED BARS DVE'd ONTO MONITOR	
				Very slow fade out.		
		46		End credits.		