The Relationships Between Music and Sound Effects in Post 1960 Popular Hollywood Film

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Unless indicated in the text, this thesis is entirely my own work.

CONTENTS

1. **Introduction**

With the future of communications set to proclaim the world a "global village," and the advances made in the media industry summoning in the age of information, dissemination of creative ideas in the entertainment industry is relying more on collaborative efforts between the media arts. Technology is blazing the trail of advancement, but how do the aesthetic concerns of the media industry relate to the ever increasing possibilities available?

For the purposes of this dissertation, technology's role in forging new and exciting film sound practice will remain a matter of course. Of primary concern though is the creative consciousness of the film sound artists. Film sound by its very nature has always relied on technology, but it is ultimately the people involved that will determine how the technology will be utilized.

There is much written on sound effects and film music as individual entities, but very little has been published on the relationships between them. It is in this light that one might be tempted to question the relevance and importance of this subject. After all, relationships are hardly tangible. Why not just study the music or sound effects components whose presence and functions are palpable? Claudia Gorbman offers an answer:

> Music behaves synergically in films... studying the functions of music in narrative cinema necessarily entails studying, as a first step, its relations with other elements in the textural system.[1]

The viewing experience is a contemplation of all the elements of the film, and any component, be it audio or visual, should be analysed in the context of its subordinate service to the entire whole. Gorbman maintains that, "...ultimately it is the narrative context, the interrelations between music and the rest of the film's system, that determines the effectiveness of film music."[2] If the above two quotations are applied to all of the film's elements, it then becomes apparent that the effectiveness of the film as a whole is determined not by its components, but by the relationships between them.

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[1] Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington: Indiana University Press, 1987), p. 30.
[2] Ibid., p. 12.

While this dissertation will deal primarily with films of the post 1960 period, the foundations for the theories and techniques analysed and proposed here were laid by many extraordinary film makers, composers and theorists in the 1920's and beyond. Sergei Eisenstein, Alfred Hitchcock, René Clair, Jean Renoir, Jean-Luc Godard and Maurice Jaubert were all pioneers in the exploration of the newly developed sound film.

"Sound should be used selectively, not indiscriminately."[1] This pregnant statement acts as a point of departure for the respective film sound theories of the above-mentioned pioneers. That is to say that film sound practice should strive to "...eliminate sounds that fall outside understanding or significance; every sound must signify."[2]

These are the threads on which modern Hollywood film sound practice is being woven, with one noteworthy exception: many of the pioneers deliberately avoided tautology as much as possible in their films while Hollywood has always embraced the tautological use of sound. This is indicative of a fundamental ideological difference: Hollywood is essentially an entertainment industry and strives to provide escapism while early French and especially Russian Formalist cinema were anti-bourgeois and strove to provide art for art's sake.

While the scope of this dissertation does not encompass further study into the ideology behind film sound, Hollywood's status as an entertainment industry governs its artistic decisions and therefore has a direct effect on the very subject of this dissertation.

Post 1960 popular Hollywood film has seen a small but significant rise in the awareness among the film industry and audience alike of the possibilities that sound may offer a film. This is not to say that there were no Hollywood films before 1960 that achieved excellence in their usage of sound (Citizen Kane [1941] and Forbidden Planet [1956] are both fine examples), but the shower

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[1] Louis Giannetti, Understanding Movies, (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1966), p. 151.
[2] John Belton, "Technology and Aesthetics of Film Sound", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 66.

scene in Alfred Hitchcock's <u>Psycho</u> (1960) marked the beginning of a new era in film sound. Such visionary directors as Francis Ford Coppola, Stanley Kubrick and David Lynch soon were to violate the traditional Hollywood rule of film sound, "see a dog, hear a dog". They made films that used sound connotatively, as an equally important component of the story telling process that is able to relate to a subtext, to allude to a part of the diegesis[1] which the visuals cannot.

To be sure, an increasing amount of Hollywood's output displays creative and well orchestrated sound component relationships. The relatively new title of 'sound designer' has spawned a whole new generation of film sound artists who can conceptualize the finished product and work with the components to achieve an integrated soundtrack. Ben Burt and Walter Murch have this ability and have graced many films including <u>Apocalypse Now</u>, <u>Star Wars</u>, <u>The Godfather</u>, and <u>E.T.</u> with their sound design. Frank Serafine, a sound designer whose credits include <u>Tron</u>, <u>Star Trek</u>, and <u>Brainstorm</u>, offers the following prophesy:

> We're a new breed of sound artist; we combine music and effects. And someday, I don't think you'll be able to tell the difference between the two. It'll be such an abstract kind of art form that you'll wonder if it's music or sound.[2]

Throughout this dissertation I will attempt to discredit the notion that sound be subservient to the image:

> The belief that aural techniques are a means of expression inferior to visual ones is shared by most film scholars, and, indeed, by many filmmakers. Insofar as most directors do not realize the potential of the sound track, sound is indeed a secondary component. But there are enough glorious exceptions...to prove that sound can be an equal partner to the image.[3]

In agreement with Elizabeth Weiss's above statement, this dissertation will propose that to use sound as an equal (but different) partner to the visuals is to

[1]Diegesis-The world of the narrative film's story and everything that surrounds it or is inferred by the story.
[2]Greg Armbruster, "Frank Serafine: Designing harmonious, hallucinatory, & horrifying sounds for Hollywood hits", <u>Keyboard</u>, vol.10, no.9 (September 1984), p. 16.
[3]Elizabeth Weiss, "The Evolution of Hitchcock's Aural Style and Sound in *The Birds*", <u>Theory and Practice of Film Sound</u>, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 298.

maintain a balance between the elements of filmic discourse. Without some balance being achieved, film is denied the depth that the connotative abilities of audio can offer.

Hollywood film sound has so often been reduced to mere tautology, the epitome of which is the television soap opera. In the words of Alfred Hitchcock:

> In many of the films now being made, there is very little cinema: they are mostly what I call 'photographs of people talking'.[1]

This dissertation will begin by introducing the five audio components of a film, namely; music, sound effects, ambience, foley and dialogue. I will then analyse the dubbing session as this is where the five components are mixed together onto a few audio tracks and married to the picture. Analyses on ten films that exhibit different sets of relationships between the music and sound effects will then be conducted. Drawn from the findings in the analyses, six models of relationships between music and sound effects will be propounded which are intended to encompass all types of relationships likely to be found in popular Hollywood film.

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[1] Francois Truffaut, <u>Hitchcock</u>, (New York: Simon & Shuster, 1967; paperback updated ed., London: Paladin, 1984), p. 73.

2. <u>The Components of a Soundtrack</u>

This chapter will investigate the five components of a film soundtrack separately. As the trajectory of this dissertation makes its way toward an understanding of the relationships between the components, it is of prime importance to be aware of the common ground shared by all of the components. It is on this ground that the relationships are formed.

At the outset then, the shared attributes of these components must be mentioned:

-The components are all composed of the following information: duration, pitch, timbre and amplitude

-The components may all operate on denotative and/or connotative levels. That is, sound may merely confirm the visual content, and/or add to its meaning, thereby elucidating a subtext

-Sound may operate on conscious and sub-conscious levels of audience perception

-All of the sound components will ultimately emit from a determined number of speakers placed in certain patterns around a film theatre. The spatio-temporal functioning of the components is then by default, an audio illusion. The dialogue, for example, does not actually emit from the actor's mouth, but from a speaker

-The sound components may all be manipulated to define spatial and/or temporal specifics

2.1 <u>Music</u>

This is the only component of the soundtrack that is not necessarily an attribute of the image. Music can exist independently from all other audio components in any space or plane and can function on different levels of the story telling process. As Claudia Gorbman puts it, "...we forsake contemplating that abstract arrangement and rearrangement of sound which is music, because it is non-representational and nonnarrative and does not inhabit the perceptual

foreground of the narrative film."[1] Gorbman continues that "...music in film *mediates*. Its nonverbal and nondenotative status allows it to cross all varieties of 'borders': between levels of narration (diegetic/nondiegetic), between narrating agencies (objective/subjective narrators), between viewing time and psychological time, between points in diegetic space and time (as narrative transition)."[2]

2.1.1 Diegetic Music

Narrative diegesis is "...all that belongs, by inference, to the narrated story, to the world supposed or proposed by the film's fiction."[3] Diegetic music is then "...music that (apparently) issues from a source within the narrative."[4] A car radio, a band in a night club and a busking guitarist on the sidewalk are examples of diegetic music which is known in the industry as source music as it has a visible source in the filmic space.

Diegetic music can be further sub-divided:

External- Music that all the characters in the diegetic space would be aware of. External diegetic music can be onscreen or offscreen:

Onscreen- music emanates from a visual source within the image

Offscreen- the source is outside of the image, but not outside of the diegetic space. For example, the camera closes in on a character's face in a restaurant but the cocktail pianist's music continues to be heard

Internal- subjective music that has its only existence in the dreams, imaginations or hallucinations of the characters (Gorbman calls this 'metadiegetic')

Diegetic music is bound by association to function on a denotative level because it remains subordinate to the diegesis. However, this does not prohibit

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[1]Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington: Indiana University Press, 1987), p. 12.
[2]Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington: Indiana University Press, 1987), p. 30.
[3]Ibid., p. 21.
[4]Ibid., p. 22.

it from being expressive. On the contrary, diegetic music will create a mood in association with the diegesis, and is thus capable of connoting visually that which the diegesis may not.

In Ridley Scott's futuristic <u>Blade Runner</u>, the Taffy Lewis bar scene relies on the bar's 'canned' music to express a futuristic mood as the mise-en-scène is fairly ordinary by present day standards. Later on in the film, after Deckard has killed one of the androids, a 1930's song, 'One more kiss dear' is played over a take-out bar's speakers. In the context of the futuristic street scene, this temporally displaced song communicates a strong sense of nostalgia for a time when all people were human and capable of feeling. The music alone expresses the feelings Deckard has begun to develop for the androids.

In both these examples, diegetic music provides a connotative counterpoint to the mise-en-scène and simultaneously acts as a bearer of similitude for the images.

2.1.2 <u>Nondiegetic Music</u>

Also known as underscoring or background music, nondiegetic music has no explained source within the narrative diegesis and can therefore not be heard by any of the characters. When a couple in love is walking on the beach, the accompanying orchestral music is not part of the narrative space as there is no orchestra on the beach to explain the music's existence. Why then does it exist? Gorbman offers this suggestion:

> The bath of affect in which music immerses the spectator is like easy-listening, or the hypnotist's voice, in that it rounds off the sharp edges, masks contradictions, and lessens spatial and temporal discontinuities with its own melodic and harmonic continuity. It lessens awareness of the frame; it relaxes the censor, drawing the spectator further into the fantasy-illusion suggested by filmic narration.[1]

The purpose of nondiegetic music then, is one of affect: it creates and manipulates mood and emotion in keeping with the narrative content and can mask the filmic apparatus. In Oliver Stone's <u>JFK</u> and Steven Spielberg's <u>Schindler's List</u>, documentary style photography and fast cutting editing

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[1]Gorbman, ibid., p. 6.

techniques are masked and welded together by the music. The underscoring maintains its own musical continuity and is determined by the presiding emotional subtext and not the editing.

The function of nondiegetic music is exclusively connotative in relation to the narrative (with the exception of 'mickeymousing'[1]). Tony Zaza contends that "...music enforces an interpretation of picture by acting like a poetic insert, an aural montage... of significance in relation to the story, but not categorically denoting narrative specifics."[2] Obviously Zaza is referring only to nondiegetic music because diegetic music, being a part of the narrative, has no option but to denote narrative specifics.

It is the non-denotative status of nondiegetic music which sets it apart from the other components of the soundtrack as it can be used to "...underline or create psychological refinements- the unspoken thoughts of a character or the unseen implications of a situation."[3] As these implications are often in counterpoint to the immediate narrative, only that which functions exclusively outside of the diegesis is effective in communicating these implications to the spectators.

Nondiegetic music is extremely effective in attaching certain properties or expectations to a familiar scene or character. In John Carpenter's Halloween, the main theme is used throughout the film to alert the viewer to the possible presence of the killer. What makes this so effective in Halloween, is that the appearance of the theme is often a false alarm which heightens the level of tension of the scene. This approach is very common in the horror film genre and has its roots in the Wagnerian idea of the leitmotif where different but related musical fragments or themes might be assigned to characters, situations, or places.

An often used device is the introduction of visually confirmed diegetic music which at some point becomes nondiegetic. This bridge between diegetic and nondiegetic is effective in joining different or even unrelated scenes or cuts

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[1]See chapter 5.2.5.
[2]Tony Zaza, Audio Design: Sound Recording Techniques for Film and Video, (Englewood Cliffs, NJ: Prentice-Hall, inc., 1991), p. 21.
[3]Roy Prendergast, Film Music: A Neglected Art: A Critical Study of Music in Films, (New York: W.W. Norton & Co., 1977), p. 216.

together. Robert Altman's <u>Short Cuts</u> makes liberal use of this device: Jazz singer Annie Ross, whose life and activities are explored as one of the many unrelated stories in the film, is often seen singing in a bar. When the scene changes to the unrelated activities of one of the other characters whose lives are not related to the jazz singer's, the diegetic music that she was singing in the bar continues uninterrupted and unaltered across the scene change. It is now nondiegetic and is perceived as underscoring to accompany the new scene. We soon forget that this was source music and surrender to the connotative function that the music has now assumed. It is through music that the many unrelated stories and characters in the film are joined together as the audience contemplates the diegesis.

The climactic scene in <u>The Godfather Part 3</u> is another example of the manipulation of the relationship between diegetic and nondiegetic music. The central scene takes place in an opera house where Mascagni's opera 'Cavalleria Rusticana' is being performed. The plot (and its related events) unfolds inside and outside the opera house. Meanwhile the opera continues and the visual editing is carried out in accordance with the dramatic pitch of the unfolding opera. Thus the same music operates on three levels of the diegesis: When the opera is in view, the music is external onscreen diegetic; when events take place in the gallery or in the passages outside, the continuation of the opera on the soundtrack acts as external offscreen diegetic; and when events take place on the train to Rome or in the Vatican or elsewhere, the opera functions as nondiegetic. The music does not announce its trilateral position and therefore seamlessly blends the events together in an operatic disguise.

2.2 **Sound Effects**

As a direct component of the diegesis, sound effects are "...attributes of the world and the objects within it".[1] They award the image a degree of verisimilitude, but unlike Foley which is concerned with basic movement sounds, "...sounds that articulate space may express emotional, symbolic, or intellectual connotations, whether because of their inherent character, their

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[1] John Belton, "Technology and Aesthetics of Film Sound", <u>Theory and Practice of Film Sound</u>, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 64.

association with familiar experience, or the content of the visual images."[1] It follows that sound effects are able to fulfil a highly manipulative function in film and therefore, the creation of sound effects relies heavily on the manipulation of audio material.

In Hollywood film, the most required of all sound effects seems to be the gunshot. Why does a real pistol or rifle sound so timid compared to their Hollywood counterparts? Why does Rambo's gun sound so different to James Bond's gun? In an attempt to answer these questions, which will in turn engender other questions, we need briefly to look at the birth of film sound.

The most obvious use of the newly developed film sound systems in the 1920's like the Vitaphone and Movietone systems, was to be able to hear the characters as they spoke on screen. This entailed having a few well placed microphones on the set and the sound was recorded directly as the film was shot. However, film sound practice was to change forever when, in 1929, King Vidor rented the Movietone system to make his film, Hallelujah. The equipment never arrived on time and King Vidor decided to commence shooting the film without any sound, and consequently, had to do much of the film's sound in post production. However, it is the way he used the sound effects that is of particular importance here:

> It is probably the first example of SFX [sound effects] being used in place of music to arouse emotions. In a scene where the hero is being chased through a swamp, all the sounds are exaggerated to emphasize the nightmarish horror being experienced by the hunted man. Branches tear loudly and cruelly at his clothes; the thick mud sucks at his feet, making it difficult to run; birds shriek, and the hounds bark and howl viciously.[2]

It was not the authenticity of the sound effects that made them so effective in this account, but quite the opposite. Returning to the use of gun shot sound effects in Hollywood should clarify this statement.

An excerpt from a review of a film called On Trial might prove illuminating; "...that instead of adding to the suspense of the scene, the sound of the gunshot actually broke the mood by sounding about as loud and threatening as a

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[1]Lincoln Johnson, Film: Space, Time, Light and Sound, (New York: Holt, Reinhart and Winston, Inc., 1974), p. 169.
[2]Robert Mott, Sound Effects: Radio, TV and Film, (London: Focal Press, 1990), p. 37.

peanut being snapped".[1]   In real life, the sound of a particular weapon being fired remains constant, irrespective of who is firing it.   In Hollywood, though, the sound of the hero's gun must act as an extension of the character and situation of the scene.   Rambo's gun sound is untamed and uncompromising in empathy with his character, while James Bond's gun sound is smoother and more sophisticated.   In getting the right gun sound for Arnold Schwarzenegger in Terminator 2, "it was recorded at less than top speed, then speeded up in the mix, with a touch of EQ added and a thunderclap from the house library to sweeten the initial burst of sound."[2]   The sound of the starfighters in Star Wars (1977) was an elephant bellow, slowed down and electronically treated, while the lazer gun fire was really a radio tower's support wire being tapped with a metal rod.[3]

The 1989 film, Glory won an oscar for best sound.   Lou Bender explains how they recorded the bullet and cannon sounds:

> For the bullet whizzes, we had about 30 Civil War re-enactors come up to my ranch...We actually wanted to get the sound of real Civil War bullets being shot through the air, because we knew the velocity would not be the same as an M-16 or an AK-47; it would be slow enough to actually make an air whiz-by (sic)...When the bullet whiz-bys were manipulated-played in reverse on the Synclavier and slowed down-they sounded like the cannon ball whiz-bys[4]

To elucidate the latter concepts in broader terms, an understanding of sound effects that have no reference points is desired.   In science fiction films the veil of authenticity is lifted as most of the mise-en-scène belongs to the film's futuristic fantasy and not to present day reality.   Therefore, one might think, the sound effects creator is free to create any effect he or she might deem suitable.   However, the film viewing public has expectations governed not by authentic reference, but by Hollywood convention itself.   When a spaceship roars across the screen, the viewer forgets that in reality, sound cannot travel in space.   But if

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[1]Ibid., p. 36.
[2]Tom Kenny, "Terminator 2: Judgement Day", Sound for Picture: An Inside Look at Audio Production for Film and Television, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 32.
[3]Marc Mancini, "The Sound Designer", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 367.
[4]Blair Jackson, "What's That Sound?", Sound for Picture: An Inside Look at Audio Production for Film and Television, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 21.

the spaceship crossed the screen without an accompanying roar, the verisimilitude of the image may be contested in the viewer's mind.

In the same way as the hero's character is emphasized by the gun sound, so the nature of the spaceship's sound is important in defining the characters on board the spaceship. Sound designer Gary Rydstrom explains:

> In Cocoon, the aliens bodies glow with a fire effect. You might automatically go for a low, crackling fire sound. But these aliens are friendly, so we chose a source sound- a flute- that had a friendly quality.[1]

It becomes apparent that the source of the sound effect has little bearing on its effectiveness; it is the nature and quality of the sound, and more importantly, its relationship to the visual action to which it is assigned, that determines a sound effect's functional efficiency. "Synthetic sound may thus isolate a quality for emphasis and therefore be more effective in a particular context than natural sound."[2] Theoretically, almost any sound (synthetic or otherwise) can be used to create a particular sound effect, if that sound is manipulated in such a manner as to become inextricably linked to its visual source in the viewer's mind. We intend to demonstrate that music is thus able to function as a sound effect. It is also this nonspecific quality of sound effects that enable them to function as music.

But sound effects are not music and what sets them apart is sound effect's inability to exist as nondiegetic. If a sound effect is used nondiegetically in a musical context, it ceases to function as a sound effect.[3]

Sound effects can be placed in every diegetic category to which music may belong. The distinction between on and off-screen sounds is perhaps the most manipulated property of sound effects: "Off-screen sounds bring off-screen

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[1]Michael Marans, "Sound FX: From Footsteps to Space Ships", Keyboard, vol.16, no.3 (March 1990), p. 41.

[2]Lincoln Johnson, Film: Space, Time, Light and Sound, (New York: Holt, Reinhart and Winston, Inc., 1974), p. 170.

[3]In my composition portfolio Ninja Version 5, the sound of the attacker's flick knives first appears as a sound effect; an audio confirmation of the visual image. Later, however, the same sound is woven into the musical component and has no visual representation, no reason to exist other then its belonging to the nondiegetic music. Whether or not a viewer recognizes the sound, he or she has no reference to perceive it as a sound effect.

space into play: The sound expands the image beyond the confines of the frame."[1] Examples of this can be seen in many horror films where the sounds of the monster/psychopath/killer are heard without a visual confirmation of their presence. Thus, the viewer is aware of the impending danger, but is not able to award it a precise physical space which dramatically heightens the tension of the scene.

Sound effects can be synchronous; that is they sound simultaneously with their visual source; or asynchronous, where the sound effect and its source appear at different times or places within the film. In the <u>Nightmare On Elm Street</u> series, the sound of Freddie's claws scraping along various objects is not a manifestation of his physical presence as he exists only in the world of children's nightmares. However, when the scraping sound appears outside of a child's dream, it is an asynchronous sound effect and is extremely effective in manipulating the viewer's perception of the spatio-temporal content of the diegesis.

2.3 <u>Ambience (Room Tone)</u>

Often referred to as ambient silence, this component is inherently a paradox in film. Our auditory systems have learned to perceive room tone as silence; we are generally not conscious of the presence of ambience. The ambience of a factory may seem obtrusive at first, but in time as our auditory system strives to adapt to a new environment, the ambience will cease to be perceived on a conscious level and will inhabit only the sub-conscious levels of our perceptive systems. In the film world, this phenomenon has to be paralleled so that the ambient track is not a conscious autonomous entity, but rather a foundation on which the other components may be perceived as natural sounds in a natural environment.

Ambience tracks are thus by default denotative; they provide aural confirmation of a visual environment and provide the mise-en-scène with a semblance of actuality. The veridicality of a city street scene will be uncontested by our perceptive systems if it is accompanied by traffic hum, hooters, and tyre

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[1]Louis Giannetti, <u>Understanding Movies</u>, (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1966), p. 155.

screeches, for example. While this kind of tautology is the most basic function of an ambience track, the above example poses many possibilities:

-Does the traffic hum sound sinister or is this a friendly city?

-Are the hooters fairly low pitched and soothing, or are they shrill and uncomforting?

-Do the tyre screeches seem far off and part of the general traffic mass, or are they close up and part of an unfolding drama of which we are visually unaware?

The connotative ability of an ambience track as a sub-conscious element is what makes the ambience track arguably the most effective way to convey an emotional subtext. Alfred Hitchcock used an ambient drone to great effect in The Birds:

> For the final scene, in which Rod Taylor opens the door of the house for the first time and finds the birds assembled there, as far as the eye can see, I asked for a silence, but not just any kind of silence. I wanted an electronic silence, a sort of monotonous low hum that might suggest the sound of the sea in the distance. It was a strange, artificial sound, which in the language of the birds might be saying, "We're not ready to attack you yet, but we're getting ready. We're like an engine that's purring and we may start off at any moment." All of this was suggested by a sound that's so low that you can't be sure whether you're actually hearing it or only imagining it.[1]

Slight processing of an ambience track may change its character completely while remaining unnoticed by the conscious. A soft room tone may be lowered an octave or modulated to sound ominous. This change may not be perceived by the conscious mind, but the sub-conscious will prompt us to be aware of an impending danger thereby inducing a sense of unease.

In George Lucas' Star Wars, ambiences are an integral part of the soundtrack. In the beginning of the film when Darth Vader boards the consular ship after attacking it, he is accompanied by an ominous sounding low ambience drone which is the same ambience sound used for the death star throughout the film. When the camera moves to others aboard the same space ship, the ominous ambience is absent. Later, when Darth Vader uses the 'force' to strangle one of his military advisers, the low drone ambience of the death star gets

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[1] Francois Truffaut, Hitchcock, (New York: Simon & Shuster, 1967; paperback updated ed., London: Paladin, 1984), p. 459.

progressively louder until Vader releases his grip. In this case, a particular ambience is selected to act as a 'signature sound' which is attached to any manifestation of Darth Vader or his evil empire.

In contrast to the above example, an ambience track might disappear seconds before an important event is due to take place. In using this 'silence before the storm' concept, sound designers can use ambience tracks very effectively to engage or disengage the audience's concentration on certain aspects of the drama. Frank Warner, who was the sound effects editor on Steven Spielberg's Close Encounters Of The Third Kind, explains:

> One thing that came up was the idea that whenever a happening was going to occur, all ambient sounds, all real nature sounds would stop. Then after the encounter was over, the natural sounds would start up again.[1]

In The Lawnmower Man, the ambience tracks for the laboratory and boardroom scenes were created by the music composers Dan Wyman and Jürgen Bräuninger from sampled low piano strings and synthesized pink noise[2]. Here the ambience tracks are operating on a connotative level where in reality, one would not expect low piano string sounds to emit from a laboratory. However, because this ambience evades the conscious level of perception, we are only sub-consciously alerted to the sinister nature of the ambience and not the fact that we are actually hearing a piano.

2.4 Foley

Foley describes any realistic non-manipulative 'movement sound' and the term is derived from the innovative work of Jack Foley, a sound effects editor at Universal Studios around 1950. In the larger proportion of contemporary Hollywood films, the production sound recorded on site is not acceptable for use in the final product because of the presence of unwanted sounds. Instead, the Foley artist must "...coax the desired sounds from inanimate objects"[3]. This

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[1]Thomas Durwood, ed., Close Encounters of the Third Kind: A Document of the Film, (New York: Ballantine Books, 1978), p. 36.
[2]White noise is an electronically produced sound which theoretically contains all the possible frequencies. Pink noise is a softer form of white noise where certain frequencies have been filtered. Pink noise sounds much like the sea while white noise sounds like a gas leak.
[3]Mott, ibid., p. 192.

is accomplished in a Foley studio which contains many different walking surfaces and shoes, and typical Foley props which may include metal trays, hubcaps, staple guns and bathtubs to name a few.

While watching the film on a projection screen, the Foley artist will 'perform' some of the character's actions like walking or unzipping a jacket or a host of different actions which fall under Foley. These actions and movements are recorded and will be married or 'cut in' to the visuals during post-production.

While one would generally not be conscious of Foley, an exaggeration of the Foley track can help to pinpoint the intimacy of a scene. In Terminator 2, when Sarah escapes from the hospital, the sounds of her picking the lock and moving the straps are exaggerated above the music and are the most predominant sound components at that instant. Similarly in Born on the Fourth of July, when Ron Kovic gets shot for the second time, all the other sounds stop. The rustling of his clothes as he tries to move and the sound of him grabbing the gravel in pain is all that occupies the soundtrack for a few seconds.[1] Thus, Foley in its denonative capacity forces the viewer to pinpoint and contemplate an action subjectively. We are briefly relieved from a contemplative position and drawn into the action of the moment.

Foley is tautology; it is inextricably linked to the image and cannot appear asynchronously and therefore does not constitute a creative link in the formation of relationships between sound effects and music. It is only the spatial positioning and relative volume functions of the sound mixing process which may assist in the development of relationships.

2.5 Dialogue

Of the five disparate components of a soundtrack, dialogue exhibits the highest degree of autonomy and "...has the effect of taking us out of space and placing us in the realm of ideas"[2]. The purpose of dialogue per se in Hollywood film is to communicate the narrative to the viewers and not to define diegetic or

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[1]See chapter 4.4
[2]Penny Mintz, "Orson Welles's Use of Sound", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 292.

temporal space. However the viewer's perception of the dialogue can be manipulated to create suspense. John Belton offers this example:

> In...Psycho (1960), in which off screen sound is employed to create a nonexistent character (Mrs. Bates), the particular revelation of the sound's source carefully avoids synchronism: we never see Bates speak in his mother's voice; even at the end, his/her request for a blanket comes from off-screen and his/her final monologue is interiorized. Image and sound here produce a tenuous, almost schizophrenic 'synchronization' of character and voice, which precisely articulates the fragmented nature of the enigma's 'resolution' and completes a "incompletable" narrative.[1]

It is Hollywood convention that the dialogue be the most important component of the soundtrack:

> What caused Eisenstein's gloom when he anticipated that the arrival of sound would generate a flood of 'highly cultured dramas'? No doubt he feared lest the spoken word might be used as the carrier of all significant statements and thus become the major means of propelling the action.[2]

These all too prophetic words have always been relevant in Hollywood. The dialogue track usually enjoys priority in its placement and relative volume. It is seldom obscured by the music or sound effects while the opposite almost always occurs. Thus the contributions of dialogue to the relationships between sound effects and music are not usually complementary.

Dialogue is always recorded during the shoot, but it is more often than not replaced later using a technique called automated dialogue replacement (ADR). In ADR (also known as 'looping') the scene or lines earmarked for replacement are looped and the actor can practice repeating each line separately until the results are as convincing as the original. The dubbed dialogue will now be recorded over the original dialogue. This technique is used when the production dialogue is cluttered with unwanted sounds from the film set and a clean dialogue track is desired. ADR is also used for dubbing films into other languages or replacing an actor's dialogue altogether.

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[1]John Belton, "Technology and Aesthetics of Film Sound", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 65.
[2]Siegfried Kracauer, "Dialogue and Sound", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 128.

3. <u>The Dubbing Session</u>

The five audio components may collectively be contained on hundreds of tracks on various formats (1/4 inch stereo analog, multitrack analog or digital, DAT, mag, etc). In the post-production phase, these audio tracks are mixed down to the few composite tracks that will ultimately be heard in the cinema theatre.

This process is called the final dubbing or mixing session and may take from a few days to several months to complete, depending on budget and time limitations. Ideally (but not usually) the dubbing sessions are attended by the director, producer, film editor, sound effects, music, and dialogue editors, composer, sound designer, and the dubbing engineers. This is the first time that the creators of the film are able to hear all of the audio tracks simultaneously with the picture.

Many important aesthetic and technical decisions have to be taken at the dubbing sessions and the intricate balancing and spatial placement of the music, ambience tracks, dialogue, sound effects and Foley are of primary importance. Relationships between music and sound effects may be created or destroyed by people who were not necessarily initially responsible for creating or conceptualizing these relationships. We will now discuss the principles which guide the decision making processes at a dubbing session.

3.1 <u>Aesthetic Considerations</u>

The component audio elements (units) along with the image are virtually inseparable during the viewing experience. The audio content is heard from the same set of speakers in the cinema theatre, although the components are at various times perceived as coming from different spatio-temporal diegetic and non-diegetic space.

> Why do voices in a movie seem to come directly out of the mouths of the characters, when we know they really come from metal speakers scattered around the theatre? Why do contrived sound effects often seem more plausible than the actual effects originally recorded on the production track?"[1]

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[1] Joseph Anderson, "Sound and Image Together: Cross-Modal Confirmation", <u>Wide Angle</u>, Vol.15, No. 1 (January 1993), p. 33.

These questions posed by Joseph D. Anderson are explored in his paper on cross-modal confirmation.

3.1.1 Cross-Modal Confirmation

A summary of this concept (which has its roots in the cognitive sciences) is significant to this chapter as answers to the above questions are essential in understanding the aesthetic fundamentals of the sound mixing process:

> We are biological creatures-mammals with well developed sensoria, sensoria that came into being through the processes of evolution in response to the contingencies of survival. In retrospect, it is clear that what survival demanded of perception was veridicality-the truth of the situation from an ecological perspective. We could not afford to be wrong about what was going on around us. We developed discreet senses that carried information along separate pathways. We gained the capacity to check the information being processed by one sensory mode against the information being processed by the other modes.[1]

Thus, as Anderson claims, an event in the 'real world' is not only detected by some or all of our senses, but we seek to construct a perception of veridicality by cross-checking these senses. If we are seeing, hearing, smelling, and feeling information from the same event, than it must exist in our perceptual reality.

Viewing films is a bi-modal experience; sight and sound are the only two senses involved. ('Showscan' cinema, a fairly new technological development based on flight simulators where the theatre seats move and vibrate, is a tri-modal experience). Even though we sub-consciously seek the same cross-modal confirmation while viewing a film, the linking process is relatively simple compared to the 'real world.'

Anderson states that "...synchrony alone is sufficient for the human processing system to link the auditory and visual elements as one event."[2] This concept governs the process of how our senses confirm filmic reality. However this process functions at a subliminal level and therefore we need to elucidate this

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[1] Anderson, Ibid., p. 39.
[2] Ibid., p. 36.

concept in order to award it significance as a basis of conscious human perception in film.

3.1.2 Idealized Reality

Reality is a subjective concept and whether or not it is ever absolute would make for interesting study beyond the scope of this thesis. Filmic reality is never absolute: "What one means by realistic at any time is determined by a complex historical confluence of convention, technology, and larger social and representational contexts."[1] Every sound in Hollywood film must be significant and comprehensible; it must have a specific function in the service of creating an illusion of reality. But what or whose reality is being examined here?

As an example to illustrate this point, a hypothetical film scene may be contemplated wherein a 'normal' looking character is walking down a passage. If the footsteps are soft and unobtrusive, the character seems introspective and possibly in danger; if the footsteps are loud and resounding, the character seems to pose a danger, and if the footsteps are synchronously replaced by a soft bell-like sound [2], the character seems to be in a dream world.

The presence of any synchronous sound confirms the character's filmic reality, but the director necessarily wants the viewers to perceive a certain specific reality, the reality of the diegesis. Therefore the sound of the footsteps will be chosen to place the character in a specific reality. This is an idealized reality. It is constructed according to specific recipes to present the diegetic narrative as intended by the creators of the film.

Referring back to the previous chapter, creating the right gun shot sound or space ship drone is in the service of creating an idealized reality. Each component of the soundtrack must relate to and propagate the idealized reality of the film.

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[1] Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington: Indiana University Press, 1987), p. 48.
[2] See portfolio Ninja Version 6

In <u>The Wonder Years</u> television series, sound designer Bruce Nachbar prostituted reality in the service of an idealized reality:

> Kevin's bicycle is a three-speed, but it makes the sound of a ten-speed, because a three-speed doesn't make any sound. But who cares? You expect to hear the sound of a bicycle![1]

3.1.3 <u>Selectivity</u>

As a spectator in a crowded bar where many conversations are being conducted amidst the constant din of a band and noisy drinkers, our human systems of perception enable us to focus in on any of the audible sounds, and select to comprehend a specific conversation to the exclusion of all others. A microphone recording the same scene would be unable to distinguish between any of the received sound. On playback of the above-mentioned recording, it is very unlikely that any of the conversations would be comprehensible unless the microphone was placed close enough as to distinguish one specific conversation.

> Because of the 'equal presence' of all the sound components of a film as they are channelled through the 'funnel' of the loudspeaker in the theatre , an overall 'musical' orchestration of all the distinct elements of the sound track seems to be imperative[2]

In film practice the selection process is consciously performed at the dubbing session by the manipulation of relative volume and placement of the audio components. Our human auditory and visual selection processes are interdependent and are thus both guided by manipulation of the sound elements at the dubbing session. If a loud and obviously intentional sound effect is heard to the right of the stereo field in the theatre, our eyes would scan the right part of the screen in search of visual confirmation of that which emitted the sound in question.

An audience may be alerted to any actions or spatio-temporal planes within the narrative by the selection process of sound components during the final mix.

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[1] Amy Ziffer, "Audio for The Wonder Years", <u>Sound for Picture: An Inside Look at Audio Production for Film and Television</u>, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 106.

[2] Noël Burch, "On the Structural Use of Sound", <u>Theory and Practice of Film Sound</u>, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 201.

Sound close-ups (where a certain sound or group of sounds is closer than the rest of the sound track by having a higher relative volume and a more upfront spatial placement) can focus an audience's concentration on a particular event, even in absence of a visual close-up.

3.1.4 Tautology

Joseph and Harry Feldman, in their rather didactic chapter on film sound, maintain that "...sounds may not be used indiscriminately in the film. They must, on the contrary, be used *plastically* : that is, they must be moulded or shaped or selected for the purpose of conveying meaning to the spectator."[1] They go on to illustrate how often Hollywood is 'guilty' of tautology: "To accompany a shot of a group of horsemen riding furiously with the sound of horses' hooves adds nothing to its meaning."[2]

If sound acted autonomously only as a conveyor of meaning then there would be no reason to put the Feldman's tautology theory to the test. Sound however, by its very nature acts subserviently to a visual image; sound can only be produced by a visible source. Sound and image are inextricably linked in the 'real' world and consequently our perception apparatus automatically seeks to link sound to a tangible image. Thunder comes from lightning, music from instruments, howling wind from a physical object in the wind's path, and so on.[3]

We can therefore deduce from this phenomenon that sound is not an autonomous medium. It is often desirable to use sound 'plastically' to convey meaning, and this thesis is based on this connotative ability of sound but the denotative function of sound is inherent in a sound/image relationship and cannot be denied.

The Feldmans' theory denies the fact that sound may operate on many different levels of the diegesis; denotative, connotative, internal, external, diegetic, and nondiegetic. The example of the galloping horses is not irrelevant, however.

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[1] Joseph and Harry Feldman, Dynamics of the Film, (New York: Arno Press Inc., 1972), p. 216.
[2] Ibid., p. 218.
[3] In Scientific terms, some sounds are produced by rather complex physical phenomena; suffice to say for the purposes of this dissertation that sound always requires a visible apparatus.

While the sound of horses' hooves may not infer meaning, it will add a semblance of reality to the mise-en-scène, which is the most basic function of sound in film.

In David Lynch's <u>The Grandmother</u>, the soundtrack is completely devoid of spoken dialogue and Foley. What might be considered the obvious and expected tautological sounds for certain actions are either missing or have been synchronously replaced by sounds that relate abstractly to the source. While these sound effects do not try to hide the fact that they belong to a very specific idealized reality, they function simultaneously as bearers of similitude and as abstract manifestations of the subtext.

In the beginning of the film when the parents first see their son, their mouths are open but their anticipated grunting has synchronously been replaced by the sound of barking dogs. When the boy wets his bed, Lynch has dubbed the sound of a large stream or river. Later when the boy waters his plant, we hear a recording of rain and thunder. As the boy jumps into a hole at the end of the film he opens his mouth to scream, but Lynch has instead used a single note high pitched electronic drone which pitch bends downwards as he falls into the hole.

<u>The Grandmother</u> is a fine example of tautology being deliberately and completely avoided in favour of sounds that relate to the subtext of the film and not to the actions. Thus while an audience would not believe that the boy's parents were actually dogs, the barking tells us about their nature in the context of the drama. Similarly, the sound of the river when the boy wets his bed alludes to the severity of his bed wetting problem. <u>The Grandmother</u> is strengthened by the avoidance of tautology, while in contrast, many outstanding Hollywood films work precisely because of their undeniable embrace of the tautological use of sound.

3.2 <u>Technical Considerations</u>

The post-production phase is where all the visual and audio elements are united and satisfactorily mixed and placed to achieve the desired aesthetic results. There are three chief concerns at the dubbing session, as follows.

3.2.1 Relative Volume

Each sound is carefully awarded a position of importance by being either softer or louder in relation to the other components. Thus in relation to the diegesis, the relative volume of sound guides the viewer's perception of narrative significance. The selectivity of sound is primarily performed by manipulation of the relative volumes of the different components.

The total output volume of a film at any given moment has a limit. It is therefore imperative that the understanding of relative volume is seen as a relationship. A balance must at all times be maintained to ensure that the maximum overall volume limit is never exeeded. The manipulation of a certain sound's volume will affect the relative volumes of all the other components at that point.

The volume relationships between all of the components are ultimately determined at the dubbing session. While individual composers and sound effects editors will specify and record dynamics into their work, the mixing process has the ability to nullify those aspects. All too often composers complain that their big cadential climax was compressed to favour a sound effect or section of dialogue.

In the 1994 remake of The Getaway, composer Mark Isham paid attention to the dynamics of the car chase so that his music moves in support of the visual action. However, the sound effects all but drown out the music and the scene is robbed of the continuity which the music might have awarded it. This is a result of the manipulation of relative volume where one particular component is favoured to the extent that other components are rendered almost inaudible.

3.2.2 Sound Processing

Most importantly, the mix has to be transparent; each sound unit should be clearly audible without masking other units. This is achieved by equalizing the frequency contents of all the sound units so that no sounds compete for dominance in similar frequency ranges. Care has to be taken to ensure that dialogue will not be 'muddy' because of music or sound effects that exist in the same frequency ranges. Ideally, the entire possible frequency range should be

used and each sound component should occupy a different range. If the music is bass heavy and a low frequency sound effect is placed on top of the music, they will mask each other making clarity unlikely. Conversely, the blurring of music and sound effects can often be achieved on a sonic level by the manipulation of their frequency contents.

Artificial reverberation, echo, and delay are of paramount importance in defining the timbral quality of a sound element and defining spatial specifics. Adding reverb to a sound element will place it in a large space, possibly a cave or large hall. This might be of literal consequence where the visual source of the sound confirms that the sound was produced in a cave. Reverb may also be used non-literally to accentuate an element of the story. For example, in Citizen Kane, the last words that Kane speaks as he dies are flooded with reverb for no literal reason as Kane is in his bedroom. The reverb however, helps to accentuate the significance of Kane's final word, "Rosebud," as the rest of the film's story is concerned with finding out what this word meant to Kane.

3.2.3 Spatial Placement

Aside from various three dimensional (3-D) picture releases, the visual component of a film remains a two dimensional experience. Sound however, is able to project spatial placement within a three dimensional field. In most modern movie theatres, sound may emit from anywhere on the screen and from the sides of the theatre walls. Individual sounds may be placed anywhere within these fields to define spatial specifics. The last few decades have seen the rise to prominence of many film sound systems that are designed to aid in spatial placement.

The majority of Hollywood films are released in Dolby Stereo which requires a four track mix which is encoded down to two tracks and optically recorded onto the celluloid. The film theatre equipment will decode the two optical tracks back to four tracks which address left screen, centre screen, right screen and surrounds. For some films like Apocalypse Now and Indiana Jones and the Last Crusade, the 70mm release prints contain more than four tracks in order to yield stereo surrounds and sub-woofer information. Dolby SR (Spectral Recording) is an improvement on the Dolby Stereo system which boasts better

sound quality and increased bass frequency response. This is presently the most frequently used system.

Developed in 1974, Sensurround is no longer in widespread use because it has been surpassed by Dolby SR and Digital Stereo. The Sensurround system uses a high-powered sub-sonic bass amplification system which surrounds the audience in the theatre. The low frequency sub-woofers are felt rather than heard which could be seen as a tri-modal experience.

The sound quality and signal to noise ratio of Digital Stereo (DTS) is comparable to compact disk. The audio information is recorded digitally onto the release prints and is reproduced digitally by the theatre sound systems. Digital Stereo is mixed down to six tracks: left screen, centre screen, right screen, left surround, right surround, and sub-woofer. The sub-woofer emits only frequencies lower than 100hz which (as with Sensurround) is not quite audible, but aims to physically vibrate the theatre and audience.

The effect of the sub-woofer is clearly felt in Disney's DTS release of Aladdin when the mountain is caving in and one can feel the vibrations. The elephant steps in The Lion King also get the air moving inside a digitally equipped theatre.

In all of the above formats, the screen left, centre, and right speakers are used to carry the bulk of the sound track. By panning sounds between these three channels, the entire screen can be covered on a horizontal plane. While these systems are not able to accommodate sound on a vertical plane, nor put sounds behind the theatre audience, the surround and sub-woofer speakers work together to create a sufficient aural illusion so as to convey the experience of sound on other spatial planes.

The surround speakers are mostly used for the reverb and delay information in order to spread the sound emitting from the front. In Disney's Beauty And The Beast, when Gaston arrives at the castle and calls to the Beast, his voice seems to be omnipresent.

Terry Porter reveals how he achieved this effect:

> That's a combination...the main component is the delay, but with each delay there are secondary delays with reverb on them...sent out left-center-right-surround, with a very large delay reverb in the surrounds so that it trails out behind you with each delivery of the line.[1]

Apart from using stereo reverb and delay to create spatially wide ambiences, stereo panning can enable the audience to aurally pinpoint an event or character's position. A gunshot may sound from the extreme left of the screen where a cowboy is visibly seen to be shooting at something on the extreme right of the screen. If the ricochet sound effect is placed at the extreme right of the screen, the sound and visuals are working in tandem to delineate spatial information.

In Steven Spielberg's Schindler's List, when the Jews are being herded into a train, the station announcer's voice travels left to right across the stereo field as the camera pans right to left. This allows us to pinpoint the announcement as coming from one static source, namely a visible station announcement speaker.

Spatial placement of audio information helps the audience to overlook the filmic apparatus and to be drawn into experiencing the drama itself and not just the celluloid images of it. As more theatres are digitally equipped and DTS becomes the industry standard, spatial definition will likely become a most important creative concern during the mixing process.

3.3 **Post Production**

The physical process of combining all the sound components onto a composite master is undergoing a metamorphosis as the new digital technology is changing the way sound is recorded, manipulated, mixed, and stored. Although analog systems are still in widespread use today, the industry trend is to invest in digital equipment as soon as the budget allows.

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[1]Tom Kenny, "Beauty and the Beast", Sound for Picture: An Inside Look at Audio Production for Film and Television, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 45.

3.3.1 **Analog Post-Production**

Once all the dialogue, music, Foley, ambience and sound effects have been completed, they are re-recorded or 'cut' onto mag (magnetically coated 35mm film stock onto which only audio information can be recorded). Typically, there may be around two to six mag tracks per component. Once all the desired audio is on mag, the dubbing sessions may commence:

> The dubbing stage is a projection room adjoined by a machine room with film recorders and dummies (the machines that play back the dialogue, sound effects, and music sound-track 'units' so the dubbing mixers can mix them into the final composite audio track). The mixing itself takes place at a long mixing console at the rear of the room, where the music mixer, the effects mixer, and the dialogue mixer are each sitting before their respective sections of the board. Each has charts, often called **dubbing logs,** giving the film footages of the entrances and exits of all the sounds on their units. On these logs, they make additional notes about fader levels, equalization settings, special signal processing effects, and any other audio elements with which they should interact. At the front of this small theatre, a prominent footage counter is displayed beneath the large movie screen so that each mixer can add the sounds he is responsible for at exact footages while watching the screen.[1]

The dummies are controlled by a mechanical synchronizer which ensures that the film and mag tracks remain in synchronization at all times. The reel to be dubbed is now rehearsed and when a satisfactory mix is achieved, it will finally be recorded along with the visuals onto the answer print.

3.3.2 **Digital Post-Production**

Instead of the individual component tracks being cut onto mag, they are assembled onto a digital workstation, computer, or sampler and stored digitally on digital multitrack tape, hard disk drives, or optical disks. There are many advantages over analog mag systems:

-Once the sounds are in the digital domain they can be re-edited or re-positioned at any stage with ease
-The signal to noise ratio is negligible
-The mixing session may be entirely digitally automated as the need for mag tapes and dummy machines is eliminated

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[1] Fred Karlin and Rayburn Wright, On The Track: A Guide to Contemporary Film Scoring, (New York: Schirmer Books, 1990), p. 363.

-If editing changes are made to the film at any stage of the post-production, the digital system allows for compensation without the need to re-record anything

-Mag tape is extremely expensive and the dummies require operators to change and set up each individual reel

As with analog systems, the reel or scene may be rehearsed (although this process may now be digitally automated) until the desired results are achieved. The final mix may now be committed to the answer print, which may remain in the digital domain or be transferred to analog, depending on the screening format.

As technology becomes more accessible, it is becoming common for film soundtracks to spend their entire existence in the digital domain. From the digital recording of an ensemble or digital synthesizers, the sound may remain digitally recorded throughout the entire post production phase. Thus the sound in the DTS theatre is first generation; it has retained 100% of the clarity of the source.

The dubbing sessions will produce the answer print which is the first composite print of the film. This is previewed by the creators of the film and selected members of the public for final approval. Once any necessary changes have been made, the final version will be printed onto release prints and distributed to the theatres.

4. <u>Analysis</u>

Ten films have been chosen for analysis which in the author's opinion best illustrate the diverse sets of relationships as studied in this dissertation. There is no template for the analyses; the structure of each analysis is determined by the specifics of how the music and sound effects relate in each film. The timings are indicated as real time in six digits; namely, hour: minute: second (00:00:00")

4.1 <u>2001: A Space Odyssey</u>

Composer Alex North was commissioned by director Stanley Kubrick to compose an original score for <u>2001,</u> which was eventually discarded in favour of Kubrick's temporary[1] tracks which contained the music of Richard Strauss, Johann Strauss, Ligeti and Khatchaturian. <u>2001</u> presented some interesting possibilities to North: "It was the greatest opportunity to write a score for a film...where there are...hardly any sound effects."[2]

Kubrick attempted in every way possible to preserve scientific realism. Sound effects are only present where the camera's point of view suggests a position where such sounds may exist in reality. The sounds of a space ship flying past the camera and the dying screams of an astronaut in space are not heard in this film as the vacuum that is space is not able to relay sound waves.

As Dr. Floyd journeys from earth to Clavius, the soundtrack is filled with 'The Blue Danube' and is devoid of sound effects, foley, ambience and dialogue. <u>2001</u> is one of the few examples in popular Hollywood film where the visuals were edited to the music. Certain events coincide with cadential points in the music like the landing of the space ship on Clavius and the docking of Dr. Floyd's ship at the space terminal. In Kubrick's own words: "In trying to find a

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[1]Temporary tracks or temp tracks - musical examples or role models which are actually cut and dubbed into the film prior to scoring. Directors do this to be able to edit and view the film with a concept of what the final score should do for the film.

[2]Irwin Bazelon, <u>Knowing the Score: Notes on Film Music,</u> (New York: Van Nostrand Reinhold Co., 1975), p. 219.

frame of reference to cut them [the visuals] to, I thought of it as a musical sequence- a kind of machine ballet."[1]

2001 does not present an example of music functioning as sound effects or visa versa. It is rather representative of a non-traditional way of using music and sound effects in film. The murder of Dr. Poole and the four hibernating astronauts by the HAL 9000 computer is carried out in almost complete silence. The only sounds present are those which might be audible to the point of view subjects. In the Dr. Poole murder scene, it is from his audio point of view that we experience the action. We hear the sound of compressed air flowing into Dr. Poole's space suit and the sound of his breathing. When the visuals switch to Dr. Bowman's point of view inside the mother ship, room tone or in-ship ambience is added as we are now experiencing the scene from an audio point of view which (in reality) would contain ambience.

The murder of the four hibernating astronauts is chillingly executed with only in-ship ambience and computer malfunction beepers on the sound track. By avoiding the use of music here, and in many other scenes where the drama warrants it, Kubrick dehumanizes the drama and induces in the audience a deep feeling of helplessness which man may experience when pitted against machine.

The contemplation of the motionless monolith ushers in Ligeti's microtonal 'Requiem for Soprano, Mezzo Soprano, Two Mixed Choirs and Orchestra.' This 'unearthly music' is not diegetic: if it were emitting from the monolith then there would have been diegetic confirmation of its existence. It is unashamedly nondiegetic and along with all of the nondiegetic music in this film, it operates only on a connotative level. The music is not denoting narrative specifics; it is merely a 'mat' on which the all important visual aspects of the film are based allowing the film to be experienced rather than perceived. However, when the team of scientists examine the monolith on Clavius, a loud single pitch electronic tone is heard to the exclusion of all other audio material. This diegetic sound effect is representative of a strong radio transmission and it is obvious that the team is acutely aware of this sound.

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[1] Alexander Walker, Stanley Kubrick Directs, (London: Davis-Poynter, 1972), p. 248.

Kubrick had this to say about the sound/visual relationship:

> There is a basic problem with people who are not paying attention with their eyes. They're listening. And they don't get much from listening to this film. Those who don't believe their eyes won't be able to appreciate this film.[1]

2001 is essentially a nonverbal visual experience and contains just forty minutes of dialogue in a film lasting 139 minutes. Kubrick went to great lengths to scientifically justify every visual element in the film. Constructing the audio elements of the film was seemingly not nearly as painstaking a process as assembling the visuals. The sound track was designed to be completely subordinate to the visuals in that the sound effects are merely providers of verisimilitude and therefore completely denotative while the music functions exclusively on a connotative platform.

As an example to clarify Kubrick's statement, if one were to listen to the soundtrack for any number of popular Hollywood space epics without watching the film, not all would be lost in the contemplation of the drama. The intensity and nature of the music would at least guide the audience a portion of the way in identifying with the visual drama. With 2001 however, the classical repertoire has no inherent association with the film or the subject matter of the film. Listening to well known music such as 'The Blue Danube' and 'Thus Spake Zarathustra' would no doubt prompt individual associations within each member of the audience. This frees the music completely from a denotative function and allows it to act symbolically rather than functionally. It is noteworthy that two and a half decades later, many people consider 'Thus Spake Zarathustra' to be the 'theme' from 2001.

4.2 **Altered States**

Director Ken Russell commissioned concert hall composer John Corigliano to write the music for his Altered States in 1980. This was Corigliano's first film score and was nominated for an Academy Award. Listening to the soundtrack on CD (on which the sound effects components are absent) reveals a highly acclaimed avant-garde score for full orchestra reminiscent of Varèse's Arcana

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[1]Stanley Kubrick, notes in the CD booklet 2001: A Space Odyssey, p. 4. EMI LC 0542

(1927) and the orchestral sections of his Deserts (1954). Portions of the music for Altered States are also reminiscent of Ligeti's 'Atmospheres' which was used by Kubrick for the hallucinatory sections of 2001.

Corigliano had to use special notational tools to ensure that the aleatoric orchestral sections could easily be aligned to the visuals. Instead of the music being conducted according to beats, it was notated so as to allow the conductor to work according to cues. The music could then easily be synched to the picture in much the same way that sound effects and Foley would be performed or 'cut in' according to visual cues.

The avant-garde nature of the prevailing musical textures during the hallucinogenic scenes (coupled with the "...aleatoric procedures and nonmetric notation"[1] employed by the composer) gives the score a close kinship with the sound effects. Portions of Musique Concrète composer Pierre Henry's work was used as sound effects in the final score. While it is true that Corigliano composed the score with no awareness of what the sound effect component was to be, the shared nature of the music and sound effects allowed integrated relationships to form between the two at the dubbing session . However, the composer felt that the dubbing session ruined the possible impact of his score:

> But I left the dubbing stage when I entered to hear my stark solo oboes for the first hallucination being overdubbed with gongs right and left and seagull sounds...The people on the dubbing stages can't understand the possibilities that the composer can envision. We could be of real help to them if they'd let us.[2]

Much of the action in Altered States takes place in the internal diegetic (metagetic) realm as Dr. Jessup's hallucinations are visually enacted in the third person. Towards the end of the film the hallucinations and transformations become externalized and the distinction between internal and external diegetic becomes unclear and therefore manipulable. In a metagetic scene there will be at least two parallel filmic realities: the idealized reality of the diegesis where time and space remain subordinate to the diegetic narrative, and the subjective reality of the metadiegesis where diegetic time and space are transcended.

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[1]Fred Karlin and Rayburn Wright, On The Track: A guide to contemporary film scoring, (New York: Shirmer Books, 1990), p. 300.
[2]Ibid., p. 369.

What makes <u>Altered States</u> an interesting candidate for analysis is that there are many transformations of function that occur between the music and sound effects, internal and external diegetic filmic space, and between nondiegetic and external diegetic sound.

Appendix A is a graphic representation of the laboratory experiment scene (01:19:45" into the film) on a time versus placement grid where all the music and sound effects are plotted. Foley and unaltered dialogue have not been transcribed.

This scene is broken down into five sections:

-Section 1 begins as Emily says "I want this thing stopped" and ends as the upward pitchbend drones stop abruptly

-Section 2 begins about five seconds after section 1 ends with Emily sighing and looking toward the door. Section 2 ends with the explosion of the tank

-Section 3 begins with the introduction of the string drones just after the explosion and ends with Emily's last call for Eddie

-Section 4 begins with the scream which is an altered extension of Emily's screaming for Eddie. Section 4 ends with Eddie regenerating his human form in Emily's arms

-Section 5 begins with the high tonal choir and ends at the scene change

In analysing the diagrams, the following questions may be posed:

-What is the function of the sound effects? Do they form part of the music or do they act as autonomous bearers of verisimilitude?

-Which reality does the music patronize, and which do the sound effects patronize?

-If the music is nondiegetic, how does it differ from nondiegetic music in external diegetic scenes, and why?

The diagrams reveal that the sound units, be they tyre screeches, orchestral percussion, or altered screaming voices, are all orchestrated on the same

plane. That is to say that no sound unit enjoys a linear existence throughout the scene. Each sound is used in the dubbing process as a single sound element to provide a particular effect. There is no hierarchy in terms of the placement of individual sounds.

It is clear that some of the sound effects relate directly to a visual occurrence like the explosion of the tank and the crushing metal pipes. Other sound effects like the screeching tyres, heart beat drone, and high bird-like sounds are abstractly linked to the visual content where they are highly stylized and are part of a very specific idealized reality. There is not much room to contend the sound of a tank exploding or metal pipes warping, but how does a large beating heart inside of a metal tank sound, or how do exploding cells sound?

These actions are ambiguously positioned between the internal and external diegetic realms and the sounds that manifest the internal diegetic world will be inherently ambiguous. Corigliano had this to say about the avant-garde nature of his score for Altered States:

> What I wanted to get was a feeling of tension and disorientation and hallucinatory wildness. Hallucinations are not tonal! They're not logical! The music had to have that quality of constantly becoming something it wasn't--taking you and turning your head from side to side.[1]

The music in external diegetic scenes in Altered States is of a completely different nature to the hallucinogenic scenes. It is tonal and neo-romantic and helps to provide a much needed contrast between the internal and external diegetic scenes. The use of sound effects in the external diegetic scenes is limited to tautology, providing yet another contrast between internal and external diegetic filmic space.

In the hallucinatory scenes the distinction between music and sound effects is often unclear, both functioning on the same connotative level. Listening to the soundtrack CD may clarify the ambiguity of origin as the sound effects are not included. However, there are many instances in the film where the music is obscured by the relative volume of the sound effects. In terms of functionality,

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[1] Randall Larson, Musique Fantastique: A survey of film music in the Fantastic Cinema, (London: The Scarecrow Press Inc., 1985), p. 340.

both components operate on the same level with the same purpose during the hallucinatory scenes. There are only a few instances where the sound effects function as sound effects: the sound of the knife slashing the goat's neck in the first hallucination and the sound of the lizard's tongue in the Hinchi mushroom rite scene are both synchronous and stylized. Generally though, metagetic scenes are played without sound effects per se and Foley in order to preserve the subjective reality of an hallucination.

> It wasn't unintentional on my part, because a lot of the music is very abstract music. It comes out of sonority rather than melody of chords, so it was integrated a good deal with the sound effects.[1]

4.3 Apocalypse Now

Francis Coppola's epic film on the Vietnam war was released in 1979. Francis and his father Carmine are credited as co-composers while Walter Murch is credited as sound designer, a term which made its debut in this film. Murch has previously worked on other films with Coppola (The Godfather, The Conversation). Murch also doubles as film editor on some films (including Apocalypse Now) and has therefore developed a thorough understanding of editing and montage techniques which aids his ability to conceive his input as sound designer in broader terms.

There are many instances of interesting and creative sound manipulation in the first reel of Apocalypse Now:

> The first reel of Apocalypse Now was edited by Murch and directed by Coppola, using music, sound effects and visual images as equal components...Sometimes the music determined what shot would be chosen, sometimes the sound effects; sometimes the visuals led, sometimes dialogue. The elements were mutually dependent, and there was a willingness to experiment.[2]

At 00:01:40" into the film, after almost constant electronically produced helicopter sounds with visual confirmation since the beginning of the film, the visuals show a ceiling fan and start to offer a dual function for the supposed

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[1]Larson, ibid., p. 341.
[2]Randy Thom, "Sounding off in a visual medium", Sound for Picture: An Inside Look at Audio Production for Film and Television, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 11.

helicopter sound. At 00:03:30" the helicopter visuals cease and the camera focuses in on the ceiling fan certifying that this sound is in fact the sound of a ceiling fan.

At 00:03:50" however, a recorded helicopter sound fades in as the electronic one fades out and the camera pans down to the window, confirming reality and that the sound we are listening to is beyond any doubt a helicopter sound emitting from outside the window in the city of Saigon. There is no musical functioning of sound in this example, but the ambiguous nature of sound in relation to the visual context is the basis of cross modal confirmation and how we sub consciously seek to perceive modal stimulus in relation to other modal stimuli.

The following example follows the above one and is quoted in Walter Murch's own words:

> Captain Willard ... is in a hotel room in Saigon. He wakes up and looks out of the window, and what you hear are the off-screen policeman's traffic whistle, the car horns, motorbikes, the little fly buzzing in the windowpane, etc. Then he sits down on the bed and starts talking, in narration, about how his heart is really in the jungle and he can't stand being cooped up in this hotel room. Gradually, what happens is that all of those street sounds turn into jungle sounds: the whistle of the policeman turns into a cricket; the car horn turns into different kinds of birds; and the fly turns into a mosquito. You are watching Willard sitting in his hotel room, but what you are hearing is a very strong jungle background. One reality is exchanged for another. The thread that links them is the fact that although his body is in Saigon, his mind is in the jungle...By gradually making that shift you've presented the audience with a dual reality which-on the face of it is absurd, but one which nevertheless gets at the dilemma of this particular character.[1]

Dan Wyman, who worked on the film during the early stages of post production as composer and synthesist, offers the following insight:

> The sound production team designed a sound score for the entire film...because of the total organization of the audio material, they played with the sound in a musical fashion...we would use different types of musical elements which were indistinguishable from the sound effects.[2]

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[1]Frank Paine, "Sound mixing and Apocalypse Now: An interview with Walter Murch", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 356.
[2]Interview in August 1992 with Prof. Dan Wyman, composer of various soundtracks and teacher of composition at San Jose State University in California. He worked on Apocalypse Now during the early stages of post-production.

The nondiegetic music is mostly electronic and this allowed for an intermingling of music and sound effects, especially as helicopter and boat sounds constitute such an integral part of the audio material in this film. There are a number of examples in Apocalypse Now where a low synthesizer drone has been modulated and manipulated to sound like a river boat or helicopter. This musical element, while functioning as a sound effect, remains the bass drone on which the music is built.

To furnish an example of this, I have transcribed a transitional cue (Appendix B) eighteen minutes into the film where the dual functioning of a bass drone ushers in a new scene. Towards the end of their meeting, the intelligence officers inform Captain Willard of the nature of his mission: that he is to track down and assassinate a US officer. From the beginning of the example through the first six bars of music, Murch provides distant jet rumbling sounds with the sound of a helicopter starting up as a metaphor for the Captain's mission which is 'rumbling' and ready to be 'started up'. The diegetic existence of these effects is uncontested though, as it reasonable to assume that an army base would be home to such sounds.

The music begins at the end of the uniformed Colonel's last sentence twelve seconds into the cue: "You understand Captain that this mission does not exist, nor will it ever exist," and signals a period of contemplation as the camera closes in on Willard's face while the absurdity of his mission sinks in. The music amplifies this absurdity by utilizing sounds that are electronically produced and non imitative of acoustic instruments and by remaining homophonic and atonal. At this point the music occupies nondiegetic space exclusively while the sound effects (distant jet rumbling and helicopters) are assumed to be diegetic.

At 00:00:38" into the transcribed cue, the visuals cut to an extreme long shot of a helicopter flying over a mountainous landscape. This cut is effective in informing the viewer that the Captain's mission has 'taken off' and is under way. At the exact point where the visuals cut, the helicopter and jet sound effects cease. The previous melody note is resolved and augmented by strings. An ominously sounding synthesizer drone is introduced on a low A and glues the whole cue together for one bar before it is lowered by a semi- tone and modulated to sound like a helicopter.

As the viewer recognizes the helicopter sound, cross modal confirmation comes into play as we seek to confirm the existence of the visual representation of a helicopter. Therefore, the modulated helicopter drone sound will effortlessly be perceived as a diegetic sound effect while it is in reality part of the nondiegetic music. It is in this capacity though, that this sound changes in pitch from an Ab up to a C and then back down to an A and functions as the bass drone underpinning the harmonic movement of the music.

Close scrutiny of the transcription will confirm that the music follows its own musical progressions from bar to bar, and a viewing of the example will show the effect of the dual functioning bass drone. This example and many others like it, confirms the notion that music may perform a dual function as nondiegetic underscoring, which serves to identify and amplify emotional elements, and diegetic sound effects which are denotative providers of verisimilitude.

Immediately after the above transcribed example, the music continues with a dual functioning drone. The drone is modulated differently this time however as the Captain is now aboard a river boat and the musical drone is also perceived as the sound of the boat's engine. Thirty-six minutes into the film another example of the dual functioning bass and helicopter drone occurs where the air mobile division of helicopters take off against the sunrise. As in the transcription, a bass drone sound is modulated to sound like a helicopter.

4.4 **Born on the 4th of July**

This is Oliver Stone's second film in his Vietnam trilogy. It deals with an intensely patriotic boy, Ron Kovic, who was born on Independence Day. Ron is shot and paralysed in Vietnam and returns home to find that an even bigger war awaits him. Oliver Stone is a master at drawing emotion from his scenes and he is aware of the power of sound in communicating emotion.

The transcription of the scene where Ron gets shot thirty-six minutes into the film (Appendix C) graphically illustrates how the five sound components and visual elements are constantly working together to enhance the emotional content of the scene. It is through the fades, silences, and emphasis of the

various sound elements at specific times that the viewer is drawn into experiencing the action and emotions of the scene on a subjective level. In this scene it is through Ron's point of view that the viewer experiences the emotional content of the scene.

The scene opens from the enemy's point of view with the camera panning up from the village and focused on Ron's approaching platoon in the distance. The whispering and Foley sounds (shuffling and nervous movement) suggests that the enemy are preparing for battle. The high and low string drones underpin the suspense and provide a platform for theme A. The approaching helicopter drowns out all other sound components which return as the helicopter passes by. The sombre theme B in conjunction with close-up camera shots of Ron's face, suggests that a few years of war has made Ron a tougher and harder character. Contrasting this seriousness is the small talk between the soldiers which suggests a nervous feeling on their part.

As the visuals cut back to the village at 00:01:09" into the transcription, only the sounds of flies and a squeaking wagon are present. This period of 'silence' acts as the 'quiet before the storm' and alerts the viewer that something is about to happen. The absence of music and the utilization of realistic battle sounds keeps the viewer aware of the confusion and reality of the ensuing gun battle. It is only when Ron gets shot and a 'hyper-real' sound effect is used as a bullet plunges into his flesh that we are thrust into Ron's point of view. Suddenly, the surrounding battle sounds are subservient to Ron's speech and movement Foley and the viewer is hearing what Ron would supposedly be hearing.

At 00:02:14", theme B begins to flood the sound track and the reality of the previous few shots give way to emotion. The music together with the slow motion shots stagger the stark reality of the scene and invite the viewer to contemplate the situation on an emotional level.

At 00:02:53" the viewer is summoned back into the battle. The action moves quickly and the music continues to build in intensity, serving to hint at an approaching dramatic climax. At 00:03:24" the sound of Ron's gunfire and the helicopter sound are welded together and become one just before the helicopter explodes. After the helicopter explosion, the drama zooms in on Ron

as his Foley and gunshot sounds and dialogue are now predominant over the general battle sounds. At 00:03:37" an aerial shot zooming down on Ron whose gun is now non-operational alludes to the helplessness of Ron's situation and the introduction of the trumpets playing the theme suggests a dramatic climax.

At 00:03:46" Ron is shot and once again, the absence of any surrounding sound and music thrusts the viewer back into Ron's point of view. The only audio content at this point is Ron's Foley and moaning and gurgling. At 00:04:10" the visual shot from Ron's point of view goes slowly out of focus while new underscoring material fades in and suggests that Ron is losing his consciousness. The altered children's voices are possibly a reference to the beginning of the film where Ron as a young boy is playing war games with his friends.

The camera focuses in on the same scene but from a third person point of view and reveals a soldier running toward Ron to help him. The re-introduction of general battle sounds and Foley at this point confirms that this is not from Ron's point of view. We are soon drawn back into Ron's point of view, however, and new dissonant material fades in and dominates the soundtrack. At 00:04:46" it is the underscoring that provides a perception of continuation of the scene through the visual cuts to the heliport and to the hospital.

When Ron is lying in hospital, we hear the diegetic sound events around him subjectively as he might have heard them; dialogue is altered, reversed or processed; the hospital Foley sounds become distant as Ron's consciousness fades in and out, and the pastor's sermon fades and gives way to underscoring. All through this montage, the music is carefully mixed in and out so as to reinforce the pain and disorientation that Ron is experiencing. It does not compete with the other components or with the emotional content of the scene. It functions on a nondiegetic connotative level, relentlessly forcing the viewer to identify with Ron's emotional condition.

While the relationships between the sound elements in this example are interactive, the individual components remain autonomous. Neither the music nor the sound effects attempt to masquerade as one another and they operate

strictly within their perspective boundaries. These boundaries were never transgressed by the creators of the individual components. However it was at the dubbing session where the relationships between the components were initiated by careful mixing and placing of the individual sound elements.

4.5 **Eraserhead**

Eraserhead (1977) was one of director David Lynch's first films and was the first in which he and sound designer Alan Splet collaborated. There would be many more Splet/Lynch collaborations and the innovative sound design concepts in Eraserhead would be refined and implemented in Lynch's future work like Blue Velvet and Twin peaks.

Lynch and Splet created all of the sound material with the exception some of the diegetic music. What makes this film so interesting is that the distinction and relationships between diegetic sound and nondiegetic sound are difficult to define. Also, the distinction between sound effects and music are blurred in terms of their origin, but not in terms of their function.

Eraserhead is a rather sombre film shot in black and white which has as its central theme the alienation of people in an industrial society. From this theme is derived the strongest component of the soundtrack, namely the ever present sounds of the factories surrounding the mise-en-scène. The characters are prisoners in this industrial society and the soundtrack never lets the viewer forget that the factories are responsible for their imprisonment. Almost the entire film consists of factory and machine sounds and ambiences at relatively high volume levels; machine hums, metal hammering, gas or air hissing, train whistles, and general machinery sounds constitute the bulk of the soundtrack.

The use of industrial sounds as music has seen much development in contemporary music. Composer Luigi Russolo tried to compose a music that would "...relate to the sounds and rhythms of machines and of factories, an 'art of noises' which must be strident, dynamic and eagerly in tune with modern life."[1] Even as far back as 1917, Erik Satie's 'Parade' made use of hooters,

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[1] Paul Griffiths, Modern Music: A concise history from Debussy to Boulez, (London: Thames & Hudston, 1978), p. 105.

sirens, typewriters and general machine noises woven into the musical texture and used as instruments, rather than just sound effects.

The first appearance of music is well into the seventh minute of the film as Henry walks along the street and a 'Fats' Waller tune appears on the soundtrack at a relatively low volume. The existence of what seems to be a socially displaced music could be explained from two points of view. Either it is to be perceived as diegetic and therefore emitting from an apartment along the road on which Henry is walking, or its explanation may rest in the supposition that it is a non-diegetic anticipation of the coming scene in which Henry plays a 'Fats' Waller record in his apartment. The latter explanation seems least likely though as throughout the film, 'Fats' Waller music is used at low volume when the scene takes place close to or inside apartment buildings, suggesting that this music is a diegetic confirmation of the existence of human life in the industrial nightmare that is the mise-en-scène of this film.

This would appear to be the first 'humanizing' sound element up to now (aside from the sparse dialogue). However, the relentless persistence of the factory sounds have alienated the viewer enough at this point to render the diegetic music absurd and therefore even further alienating. Had the first seven minutes of the film been silent, the presence of the music would have seemed 'normal' as the character is walking past a row of apartments where one expects people to be playing records or listening to the radio or television.

Five minutes further into the film one sees the use of the same technique of alienation being used. Henry is inside his apartment and puts on a Waller record. Though the factory ambience is correspondingly lower in volume as the scene has moved indoors, it remains uninterrupted by the diegetic music. Gradually, a steam sound crescendos and eventually masks the music out altogether. The camera then cuts to the window which faces directly onto a brick wall. With the humanizing possibility of the music being suffocated by factory sounds and the view through the window being obscured by a brick wall, the viewer is thrust into Henry's lonely and hopeless world. As the steam sound subsides, a constant record click is heard suggesting that the record has come to an end. The music, which represented hope, is now reduced to nothing more than just another mechanical sound.

The nondiegetic musical element consists exclusively of drones which are created on synthesizers and function alongside the sound effects, acting as an extension of the ambient factory sound. There are two types of musical drones: a single note drone (usually low) which signals that a significant event is about to take place; and a cluster drone (usually high) which is used as a 'stinger' to accentuate certain events. For example, when Henry wakes up one night, a low single note drone suggests that something is wrong. Suddenly, a cluster drone draws the viewer's (and Henry's) attention to the baby which has suddenly and visibly become very ill.

The stage behind the radiator offers another example. The first time our attention is drawn to the radiator, it is because of the crescendo of the steam drone, which we assume to be coming from the radiator as the camera closes in on it. The next appearance of the radiator is awarded special significance as a musical drone accompanies the steam drone. The visuals eventually confirm this significance by showing the existence of a stage behind the radiator.

In many respects, the sound effects exhibit more musical characteristics than the musical drones; they change pitch and contain inherent rhythms, while the musical drones always remain on one pitch and are completely devoid of rhythm. The sound effects and music both function on connotative and denotative levels:

-the relentless steam and machinery sounds and ambiences not only give the mise-en-scène a semblance of actuality, they force upon the viewer the claustrophobia that Henry feels in his environment. The first time Henry enters his apartment building, the sound of the elevator is loud and upfront, suggesting Henry's subservience to the industrial world
-the cluster drones are denotative as they induce in the viewer a visceral shock when the visuals present a shocking event. The single note drones are connotative as they signify events or emotions

A similarity to <u>Forbidden Planet</u> may be drawn here: The sound effects and music components of both these films are created from just a few sources. In <u>Forbidden Planet</u>, the electronic circuits are the sole sound source apart from

the dialogue and Foley. In Eraserhead, electronic oscillators generating white noise, musical drones and tape recordings of industrial sounds treated as in the musique concrète genre, are the sole providers of the sound effects and music.

If Edgard Varèse and John Cage "...both wish to reappraise the raw material of sound and make it a primary factor in music"[1] as they have done in much of their music, then David Lynch has achieved the same objective by taking the raw material of sound and making it a primary factor in the realization of his film score.

4.6 **Forbidden Planet**

Forbidden Planet (1956) was the first commercial release to have a completely electronic score. It was scored by Bebe and Louis Barron and even by today's standards, remains a landmark of film sound by boasting complete and seamless integration of sound effects and music. The Barrons had previously worked under John Cage's direction in an investigation into the nature of sonic perception.

Cage had a grant for six months and employed the Barrons to assemble a library of recorded sounds:

> He had us make up sounds to fit into eight categories. We had little sounds, like striking a match-not necessarily sounds of low volume, but sounds you would associate with something small-and country sounds, city sounds, electronic sounds, and so on...You pick up a great deal of enthusiasm working with someone like John Cage. And you realize that you don't have to be restricted by the traditions, or the so-called laws of music. So we began exploring, and I began developing my circuits.[2]

All the sound effects and music heard in Forbidden Planet were created on electronic circuits designed and built by Louis Barron. Barron refers to his circuits as 'cybernetic' because he claims that they "...function electronically in a manner remarkably similar to the way that lower life forms function psychologically."[3] This may be an interesting and valid comparison, but an

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[1] André Hodeir, Since Debussy: A View of Contemporary Music, (New York: Grove Press Inc., 1961), p. 138.
[2] Ted Greenwald, "The self-destructing modules behind The revolutionary 1956 soundtrack of Forbidden Planet", Keyboard, vol.12, no.2 (February 1986), p. 57.
[3] Bill Malone, Forbidden Planet Record sleeve notes. Planet Records PR 001 A

inquiry into how these circuits function musically would be more akin to the subject of this dissertation.

The electronic circuitry generated sounds which contained timbral, pitch, and rhythmic information. The control possible over any of these properties was not predictable, reliable, or pre-planned. The method the Barrons used in coaxing sounds out of these circuits was to overdrive the circuits until one of the components overloaded and failed, and then to apply a 'stimulant'[1], which might be an external voltage or a change in current or resistance or the initiation of feedback to some part of the circuit. This would rejuvenate the circuit into producing some unpredictable sound and the selection process for deciding which sounds might be useful is described as follows: "If it sounded good to us, we'd try to capture it on tape."[2]

The music of <u>Forbidden Planet</u> is reminiscent of Karlheinz Stochhausen's 'Kontakte' (1960), and particularly the electronic textures employed in 'Gesang der Jünglinge' which was composed in 1955/6, around the same time as <u>Forbidden Planet</u>. The electronic music sections of Varèse's 'Déserts' (1954) also come to mind here. Early electronic music composed around this time exhibits a degree of textural similarity due to the technical infancy of electronic sound generators. However, music created on this primitive electronic circuitry is indeed capable of conveying emotional content and exhibiting individualism:

> Most remarkable is that the sounds which emanate from these electronic nervous systems seems to convey strong emotional meaning to listeners. We were delighted to hear people tell us that the tonalities in 'Forbidden Planet' remind them of what their dreams sound like.[3]

Each circuit generated its own characteristic sound and the Barrons developed themes and motifs for the various characters by using different circuits or sets of circuits for each motif or theme. All the potentially useful sounds were committed to tape after which they were manipulated by accelerating, slowing, or reversing the tape. Reverberation, delay, echo, and flanging effects could then be added to the sounds to define their spatial placement or to alter them even further.

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[1] Barron's term
[2] Greenwald, ibid., p. 58.
[3] Bill Malone, <u>Forbidden Planet</u> Record sleeve notes. Planet Records PR 001 A

> The Barron's score makes no distinction between the emotional underscoring of the love scene, the sounds of the United Planetary Cruiser C57D whizzing toward the planet Altair, and the otherwordly strains of music created by the long extinct Krell civilization. During a scene in which the audience is shown a vast extra-terrestrial power plant, it is impossible to know whether the soundtrack represents an ominous intent on the part of the film's director, or the sound of the alien machinery itself.[1]

There are two main reasons for the distinction between music and sound effects being so blurred in this film:

- The level of electronic technology in 1955 limited the variety of sonic capabilities available to the Barrons. Thus all the sound effects and music exhibit a great degree of coherence due to the relative textural sameness of the Barron's work
- The Barrons' aesthetic conception was very innovative compared to that of their Hollywood contemporaries. In an interview with Keyboard Magazine, Louis describes their artistic concerns in doing this project:

> We took upon ourselves the privilege of ignoring conventions. We did our own editing and recording, so we didn't feel that we had to limit ourselves to what the musical score had been doing. We felt that we could invade the domain of sounds, and in that way build bridges, from time to time, between what's happening on the screen and what you're hearing.[2]

The question "but is it music?" must inevitably be dealt with in an analysis of sound of this nature. Randall Larson claims that the electronic sounds of <u>Forbidden Planet</u> did not constitute an "actual score".[3] Composer Gil Mellé is quoted as saying: "The sounds were generated by ordinary test equipment which you would find in any television repair station. They were ordinary test sine-wave generators, which is <u>not</u> electronic music."[4]

These are remarkable statements in the light of Louis Barron's own comment on the circuits he developed for this project: "...each one possesses a distinct personality, which it expresses with its own unique sonic character."[5] Even

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[1]Greenwald, ibid., p. 57.
[2]Ibid.
[3]Randall Larson, <u>Musique Fantastique: A survey of film music in the Fantastic Cinema</u>, (London: The Scarecrow Press Inc., 1985), p. 270.
[4]Ibid.
[5]Greenwald, ibid., p. 58.

more remarkable is the reason for which Mellé discredits the <u>Forbidden Planet</u> score as not being music. If Mellé had presented some sort of tangible argument along the lines of the musicality of sound being dependent on the source of the sound, then his claim might have been worth some serious discussion. However, to claim that sound created by 'ordinary test sine-wave generators' is therefore not music is as incomprehensible as to claim that sound created with ordinary washboards as in Jamaican 'ska' music is not musically valid.

4.7 **Psycho**

Scored by Bernard Herrmann and directed by Alfred Hitchcock, <u>Psycho</u> was released in 1960. The shower scene in this film has been described as "...the most horrifying *coup de theatre* ever filmed"[1]. The entire film was shot in black and white and Herrmann decided to score only for strings: "I felt that I was able to complement the black and white photography of the film with a black and white sound."[2]

The success of the shower scene has often been attributed to the startling music, and it is interesting to note that Hitchcock's original intention was to avoid music during this scene. It must have soon become apparent to Hitchcock that "...even the sight of a knife repeatedly entering the body of a nude woman, and even the sounds of her screams and gasps, did not create sufficient visceral involvement"[3].

Herrmann's shower scene music has confused some critics/writers as to its origins: "During a brutal murder sequence, the soundtrack throbs with screeching bird music."[4] It is not unreasonable to hear shrieking birds in this cue, especially when bird symbolism is so important in <u>Psycho</u>. However, during the shower murder, only the music and the screams of the victim are present. It is also not unreasonable for this music to be perceived as sound

[1]James Naremore, <u>Filmguide to Psycho</u>, (Bloomington: Indiana University Press, 1973), p. ?
[2]Royal S. Brown, "Hermann, Hitchcock and the music of the irrational", <u>Film Theory and Criticism: Introductory readings</u>, ed. Gerald Mast and Marshall Cohen, (New York: Oxford University Press, 1985), p. 640.
[3]Brown, ibid., p. 620.
[4]Louis Giannetti, <u>Understanding Movies</u>, (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1966), p. 156.

effects: possibly the sound of the knife repeatedly plunging into flesh or echoes of the screaming victim. All of these possibilities originate from Herrmann's powerful manipulation of a string orchestra.

Herrmann's music throughout Psycho is more concerned with creating atmosphere than it is with developing melody and harmony. Most of the melodic material is based on Herrmann's omnipresent two note motif and is structured according to rhythmic cells rather than developmental sections. In this sense similarities may be drawn between Herrmann's music score for Psycho and Stravinsky's 'The Rite Of Spring' or Varèse's 'Arcana'. Where the latter two works use all the available instrumentation ('Arcana' calls for 120 musicians) and orchestration techniques to achieve atmospheric textures, Herrmann's work limits itself to one tone colour and thus achieves an omnipresent atmosphere that relates to the claustrophobic terror which the narrative induces.

The shower murder music is not just terrifying music to accompany a murder. It attempts to mimic not only the terror of the deed, but also sounds that might have a relationship to this scene: namely the screaming of the victim, the sound of a knife plunging into naked flesh, and possibly even the sounds of shrieking birds, which would be a subtext manifestation of Norman, the murderer who happens to be an avian taxidermist.

Whether or not Herrmann intended this mimicry or not is of no real significance to the film. The fact that through using only strings and employing various contemporary orchestration techniques, the music assumes a certain ambiguity which allows it to transcend its nondiegetic status.

> The shrieking effect is created by reiterated, dissonant, sharp downbow strokes and wild glissandos: the brutal harshness of the sound is heightened by the wide spacing of the constituent notes, the use of the extreme high register of each instrument, and the addition of reverberation.[1]

The shower scene music exhibits a dual function: It is nondiegetic as music (there is no diegetic music per se in the entire film) but diegetic as a sound effects imitator.

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[1]Christopher Palmer, Psycho CD booklet, p. 6. Unicorn Records UKCD 2021

A crucial aspect of the Psycho scoring is that the shrieking not only associates Norman with his stuffed birds of prey but also associates the viewers with the on-screen victims. That is to say, the cries of the victims, the screeches of the violins, and the screams of the audience merge indistinguishably during the violent sequences.[1]

4.8 Tap

A film about tap dancing will inevitably bear some characteristics of the great American musical and be either a musical or a narrative film containing elements of the musical tradition. Tap is the latter and the scene I have chosen to analyze is essentially a production number in disguise. Sound effects provide that disguise by ushering the whole sequence in and the characters keep the disguise in place by remaining oblivious to the camera's presence.

As Max Washington is standing on a New York street with a group of tap dancing students, he hears a rhythmical stomping sound coming from a nearby construction site at a tempo of 107 beats per minute. He takes the group over to where an earth compressor machine is operating and starts to vocalize and dance to the rhythm he is feeling. Shortly, a nearby busker starts to set up a rhythm with his congas in time to the compressor. While the viewer's attention is now diverted from the busker back to the group as Washington gets them dancing, an ostinato marimba line and a hi-hat cymbal pattern creep into in to the song unnoticed.

Washington now starts singing while the original machine press pattern, which is acting as the bass drum, changes from:

without any change in the sound, which signals that the machine press sound was coming from a drum machine or sampler all along. Any visuals of the earth

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[1]Elizabeth Weiss, "The evolution of Hitchcock's aural style and sound in The Birds", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 304.

compressor are avoided from this point on as it would be too obvious that the new pattern is not in synch with the machine.

The next three instrumental additions are visually accounted for: piano, bass guitar complete with amplifier, and finally, the horn section. The tap dancing and various other visually unaccounted for percussion instruments complete the song line up.

In summary then, a diegetic sound effect supposedly made by the compressor initiated the sequence and then assumed a dual function as sound effect and music (bass drum). It was then augmented by diegetic music (congas, piano, horns and bass guitar) as well as nondiegetic music (marimba ostinato, cymbals, bass drum and various percussion). In non-analytical terms however, the entire sequence is diegetic; few viewers will question or even notice that parts of the supposedly diegetic music are in fact not visually accounted for and therefore not 'real'.

4.9 **The Birds**

Hitchcock made this film in 1963, three years after Psycho. If the sound track in The Birds is as effective as the Psycho sound track, what is worthy of mention here is that they operate from opposite ends of the music/sound effect relationship. In the Psycho shower scene, the music assumes a dual function and simulates sound effects. In The Birds, Hitchcock employs sound to the same dramatic benefit, only "...instead of orchestrated instruments there are orchestrated sound effects".[1]

There are other examples of sound effects assuming the function of music, but what makes this film so remarkable is the complete absence of any music at all. The most interesting elements on the sound track are a combination of natural sounds and electronically generated avian sounds. The avian sounds were

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[1]Elizabeth Weiss, "The evolution of Hitchcock's aural style and sound in The Birds", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 305.

created and assembled by Bernard Herrmann, Oskar Sala, and Remi Gassman on a Studio Trautonium.[1]

Some of the bird sounds, especially the bird cries and flapping wings are relatively abstract and highly stylized: that is to say that they would not necessarily sound like birds if heard without a visual confirmation. Abstract sound effects are more easily able to transcend a purely denotative function than natural sound effects as they are not bound by convention to a natural source. A natural recording of a bird squawk could not easily be misinterpreted as coming from an unrelated sound source. However, an electronic rendition of a bird squawk (especially in 1963 when electronic music techniques were in their infancy) could easily pass as a baby screaming, or a wild animal's mating call for example. It is this ambiguity that allows the sound effects to be universalized in order to isolate human response patterns (fear in the case of The Birds) and address a subtext.

This elaborate stylization of the sound effects and their resultant ambiguity enable the soundtrack to exhibit a great deal of coherence. The sound effects are often found to be blending into one another:

> The birds sound like machines because of the electronic origins of their sounds; the human beings sound like birds (especially when the children shriek during attacks), and...the machines sound like birds and/or people.[2]

Like diegetic music which is able to provide connotative comment on the drama while remaining a part of the diegesis, the bird sounds in this film are orchestrated to achieve the same effect that music might have. However music would have to announce itself whereas the bird sounds are, in the context of the film, expected and completely natural.

Thus Hitchcock has a way of "...controlling tension that is effective and unobtrusive-even less noticeable than music would be".[3] With a visual shot of a bird, the accompanying bird sounds may go unnoticed by the conscious. These

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[1] An early electronic Keyboard instrument invented by DR. Frederick Trautwein. It was first used commercially by the New York City Ballet. Gassman and Sala modified it to produce atonal sounds.
[2] Weiss, ibid., p. 309.
[3] Weiss, ibid., p. 305.

sound effects can then be manipulated and used to evoke an emotional reaction in the same way that underscoring might have. As Hitchcock confesses, "We were really experimenting there by taking real sounds and then stylizing them so that we derived more drama from them than we normally would."[1]

In an interview with Ted Gilling in 1971, Herrmann suggested that there was no conscious attempt to make the avian sounds function in a musical way:

> Remi Gassman, a composer of electronic avant-garde music, devised a form of sound effects. I just worked with him simply on matching it with Hitchcock, but there was no attempt to create a score by electronic means. We developed the noise of birds electronically because it was not possible to get a thousand birds to make that sound.[2]

This statement might seem to contradict the theory that the sound effects function in a musical manner, but taking cognisance of Hitchcock's attitude to the function of music in film might alleviate the contradiction: ·

> Conventional music usually serves either as a counterpoint or a comment in whatever scene is being played. I decided to use a more abstract approach. After all, when you put music to film, it's really sound, it isn't music per se.[3]

So for Hitchcock, both music and sound effects constitute sound to be used in the service of the image, and nothing more.

4.10 Tron

Tron is a Disney production in which the computer generated graphics and sound design were on the cutting edge in 1982, the year of its release. Most of the film takes place inside a computer fantasy world where the software characters and hardware mise-en-scène is almost entirely computer generated. The actor's faces are just about the only elements of this world not artificially created.

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[1]Francois Truffaut, Hitchcock, (New York: Simon & Shuster, 1967; paperback updated ed., London: Paladin, 1984), p. 456.
[2]Roger Manvell and John Huntley, The Technique of Film Music, (London: Focal Press, 1975), p. 241.
[3]Alfred Hitchcock quoted by Kyle B. Counts, "The Making of THE BIRDS," Cinefantastique, Vol. 10, no. 2 (1980), p. 29. (M F 122)

This made for a challenging project for all on the sound team as the mise-en-scène provides very little reference for authenticity beyond the dialogue. In a situation where the choice and placement of sound material is not defined in the service of reality and convention, "...the question of what sounds authentic and realistic takes second place to the question of what is original and exciting, yet appropriate."[1] Appropriate is the key word here and any sound material, be it music, sound effects, or even Foley, must elicit appropriate patterns of response from an audience, and that response must ultimately be in the service of what the visuals are trying to accomplish, namely, an idealized reality.

One might be tempted to think that such a situation could easily lend itself to a total obliteration of any distinctions between music and sound effects as is the case in Forbidden Planet. This is not true for Tron. The reason for its inclusion in this analysis is that the soundtrack exhibits a creative awareness of the co-existence of the different sound components. This can be attributed to Michael Fremer, head of the sound production team, who "...saw the necessity of planning music and sound effects together, since they represent complementary aspects of the soundtrack's impact."[2]

Wendy Carlos composed the music for Tron and her approach was as follows:

> It became clear to me that the part of the score for the computer world should be as full of colour as possible. I wanted to use a combination of symphony orchestra and synthesizer for the computer world, and just a string orchestra for the real world.[3]

It is interesting but most unfortunate to note that during the final dubbing session, people who had very little to do with the conceptualization and creation of the soundtrack were in total control of the mix and consequently the functional capacity of the music was suppressed. Michael Fremer offers the following explanation:

> There was no strong musical spokesman on the dubbing stage. It was a blueprint for disaster. Instead of letting the music carry the emotions, they gave priority to the effects and mixed the music down or out.[4]

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[1]Robert Moog, "Wendy Carlos and Michael Fremer reveal the secrets behind the soundtrack of Tron", Keyboard, vol.8, no.11 (November 1982), p. 53.
[2]Ibid.
[3]Ibid., p. 54.
[4]Ibid., p. 57.

As has been said before, this is a very common occurrence in Hollywood films and it can reduce a film to two dimensions where the possibility of the subtext being emotionally and subtly played out by the music is reduced by over-emphasized sound effects. As Fremer points out, "...sound effects have an impact that is literal, whereas music carries the emotions on a higher plane."[1] More than most films, Tron needed to have a stronger emotional impact because of the unfamiliar mise-en-scène, and in such imaginary film worlds, "...the music has to guide the audience through emotionally alien territory, to cue the viewer to the desired response."[2]

Frank Serafine created the sound effects and Foley and this turned out to be a monumental task as every sound in the computer world had to be processed. Even the footsteps and dialogue were processed through reverb and delay units. When Flynn is placed on the circular game grid to play against an opponent, the sound of their footsteps is synthesized. Flynn's footsteps sound a G below middle C while his opponent's footsteps sound a B below the G. Thus Flynn's agility and speed are musically counterpointed against his opponent's more sluggish movements. Serafine had the following to say about working on Tron:

> One of the problems with synthesizers, is that they don't create ambience...so I usually combine a synthesized sound with an organic sound, which makes a full bodied sound effect. This technique was particularly important for Tron...The 'aircraft carrier' which cruised the landscape like big brother was a combination of low synthesized frequencies with the recorded sound of the Goodyear blimp. When the light cycles made sharp turns, the resulting scream came from a circular saw processed though a Fairlight[3].[4]

It is only some seven minutes after Flynn is thrust into the computer world that music appears in the new computer environment. Occupying those seven minutes are ambiences, Foley, dialogue, and sound effects. While the sound effects and Foley help to orientate the viewer to their new fantasy environment, the ambiences assume some of the functions that the music at this point might have. The ambiences are relatively high in volume and are of synthesizer-

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[1] Ibid., p. 53.
[2] Ibid.
[3] A Fairlight CMI is a Sample based computer music workstation.
[4] Greg Armbruster, "Frank Serafine: Designing harmonious, hallucinatory, & horrifying sounds for Hollywood hits", Keyboard, vol.10, no.9 (September 1984), p. 17.

generated low frequencies. These ambiences serve to enhance the emotional content of the scene by sounding purposefully ominous, thereby serving the visuals in the creation of an unfriendly and foreign environment. Music could easily have accomplished this, but its absence assisted the visuals in maintaining a period of disorientation as the mise-en-scène moves into a foreign environment.

From a technical standpoint, Tron saw the utilization of some state-of-the-art techniques and equipment. Due to budget restrictions, Fremer decided to employ a non-traditional method of recording all the sound material. Instead of having the music and sound effects recorded on expensive sprocketed mag tape, he had them committed to time-coded multi-track tape which could easily synchronize with the dialogue and picture using fairly new digital techniques. This is a trend that (especially in the digital multi-track tape format) is becoming more of an industry standard as technology improves.

5. The Relationships

5.1 Exposing Natural Sound.

It should prove illuminating at this point to enter into a caveat and briefly contemplate the music/sound effect relationship scenario outside of film. From around the beginning of the twentieth century, concert hall composers began experimenting with and using natural sounds[1] in their music.

In the music of the Futurists like Charles Ives, George Antheil, John Cage (his earlier period) and George Gershwin for example, one can often hear the musicalized sounds of everyday life: hooters, sirens, machines, street bands, and so on.

Claude Debussy suggested that: "The sound of the sea, the curve of a horizon, wind in leaves, the cry of a bird leave manifold impressions in us. And suddenly, without our wishing it at all, one of these memories spills from us and finds expression in musical language."[2]

The expression of natural sound in music can be as literal as in Satie's 'Parade' where actual machines are used as part of the score. Oliver Messiaen notated the melodies, rhythms, and timbres of birdsong and incorporated this material into his orchestral compositions as thematic material. In the music of Stravinsky and Debussy, natural sound does not find its expression in literal terms, but rather through musical and orchestration technique.

The arrival of the commercial tape recorder[3] in the early 1950's saw the development of a new kind of musical composition which was to develop hand in hand with film sound practice.

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[1]When dealing with sound effects outside of film, the favoured terminology is 'natural sound' or 'musique concrète'.

[2]Paul Griffiths, Modern Music: A concise history from Debussy to Boulez, (London: Thames & Hudston, 1978), p. 82

[3]Grammophone records had been used before to record and manipulate natural sound for compositional purposes, but the tape recorder allowed a far greater degree of manipulation.

Musique Concrète gave composers a way of taking natural sound out of a temporal framework:

> Concrete music is a 'montage' or assemblage of live sounds which are subjected to two main kinds of treatment: (1) tape manipulation and (2) electronic modification. Through those two means, relatively familiar sounds can be made unrecognizable and then reassembled to give the most unexpected results.[1]

Pierre Schaeffer and Pierre Henry, who were the leading composers in this field, "...had first looked upon sound-objects as the makings of strange, poetic sound-effects and nothing more."[2] Musique Concrète is a music of sound effects, of natural recorded sounds which are manipulated and orchestrated into some musical form or context. Edgard Varèse preferred the term 'organized sound' to music and was concerned with the "...emancipation of noise"[3]. It is no surprise that Varèse had an interest in film, for like so many modern composers, he saw the possibilities that film composition offered as a new musical language:

> The eye and the ear don't perceive in the same way, and synchronized music doesn't take this into account. They insist on recording music played by the usual orchestras, when in fact the instrumental values are completely distorted...It is the first modern, scientific means music has so far been given to escape from the tradition in which it is imprisoned. I myself am waiting for my first opportunity to have a try at it.[4]

It is most unfortunate that Varèse never did get to write music for film as his work, especially the audio-visual composition 'Poème èlectronique' (1957/8) suggests that he might have offered some very interesting music for film.

Film has **always** employed natural sound: almost all Foley and some sound effects and ambiences are unaltered recordings of natural sound. However, it is the musicalization of certain sound effects or the use of natural sound in a

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[1]Reginald Smith Brindle, The New Music: The Avant-garde since 1945, (Oxford: Oxford University Press, 1975), p. 100.

[2]André Hodeir, Since Debussy: A View of Contemporary Music, (New York: Grove Press Inc., 1961), p. 141.

[3]Griffiths, ibid., p. 116.

[4]Ferdinard Ouellette, Edgard Varèse, trans. Dereck Coltman (London: Calder & Boyars, 1966), p. 106.

musical fashion that bears relationships with other sound elements. While this cross-fertilization of audio material in film is only beginning to find precedence in Hollywood, it is by no means an innovative development. Maurice Jaubert, for example, "...had a pioneering concern with the porous nature of the wall separating music and natural sound, and with the unique possibilities that cinema offers for organizing sounds into music."[1]

The relationship between natural sound and music exhibits several points of convergence, both in and outside of the film world:

- -Duration: When working in the domain of natural sound, the chief structuring device in composition must surely be rhythm as "...duration is the most fundamental musical characteristic, shared by both sound and silence."[2] In the world of film, duration is the most vital element in structuring the audio content and is dictated to the composer by the film's requirements
- -Pitch: Every sound has pitch content. Absolute white noise theoretically contains all of the frequency spectrum, but in electronic synthesis, white noise can be filtered and tuned to a specific pitch. Any ambience, sound effect, dialogue, or foley has an inherent pitch which can be manipulated via physical and/or electronic means (tape manipulation, digital sampling or effects processors)
- -Timbre: Not all footsteps, bombs or violins sound the same. Again, what determines the texture of a specific sound can be manipulated via physical and/or electronic means
- -Amplitude: Any sound has an inherent volume level or amplitude which is measurable in decibels (dB). An orchestra may be able to cover a wide dynamic range, but the amplitude information transmitted over the speakers in the theatre remains a product of the reproduction apparatus. Thus (in film) a gentle flute passage may be relatively louder than an atomic bomb blast just as an actor's softest whisper may be louder than a tutti fortissimo orchestral section

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[1] Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington: Indiana University Press, 1987), p. 130.
[2] Griffiths, ibid., p. 127.

These shared attributes provide the basic means by which music and sound effects can be manipulated to form relationships in film. It is on this common ground that any sound may be able to relate to any other sound according to the nature and intensity of the applied electronic manipulation.

Technology plays an important role in facilitating the development of the relationships between music and sound effects. In film, the manipulation of all sound is ultimately reliant on technology. As the film sound components have to exist outside of their intrinsic temporal framework and be committed to a storage medium like tape, this material may be altered to whatever recipe the sound artist requires, within the limits of the available technology.

While modern digital technology allows one person to create the music and sound effects on a single workstation, the specialist orientation of the industry argues against such a trend. Moreover, collaboratory efforts between sound effects designers and composers are becoming easier as digital technology allows all the audio material to be stored on standardized formats, allowing easier access to one another's work.

From the body of analysis conducted for this dissertation, six model relationships between sound effects and music have been constructed. It must be noted that most films will provide examples that may be addressed by more than one of these models. These models are therefore not intended to provide a system of categorisation or codification of films, but rather to provide a template against which film sound may be read.

It is necessary to bear in mind that the relationships are only unveiled during the viewing experience when all the elements of filmic discourse are in motion. Very often the relationships are a by-product of the dubbing stage, with no conscious creation. Some of the model relationships set out below are inherently unconscious entities while others are products of conscious creative processes.

5.2 Six Models of Music/Sound Effects Relationships

5.2.1 Autonomous

Music and sound effects function on unrelated levels and can easily be differentiated by virtue of their timbral and rhythmical characteristics. Such examples are usually a result of non-collaborative efforts by different specialists. Representative of a typical classical Hollywood scenario, the composer, sound effects designer, and Foley artists do not communicate the aesthetics and techniques of their creative inputs. There is thus no awareness of what might govern each specialist's decision-making process.

In Born on the Fourth of July, the sound elements have been carefully mixed and placed during the dubbing session. It is clear, though, that the different sound components remain autonomous and unintegrated. It is only the final mix which brings the unrelated sound effects and music together. While the mix is expertly and effectively realized in this film, many other films which fit into this model suffer from a lack of sound score planning.

This type of relationship usually embraces tautology where the sound effects are relegated to the position of providing the image with verisimilitude and nothing more. Most low budget, B-grade, and television films use sound in this way. The Born on the Fourth of July example shows that this type of relationship between sound effects and music need not always harm the film. The danger is that it often leaves the building and conceptualizing of the sound score to people like the producer, director, and sound engineer (that is, people who did not actually create the audio components.) Even more common and harmful is the following scenario as illustrated by Dan Wyman:

> So they [the creators of the individual components] build everything up to the maximum and let the producer make the choice...At the dubbing stage the sound effects person, the dialogue mixer and the composer get together and they put on boxing gloves for the amusement of the producer, and one of them wins. Generally the dialogue has bigger gloves.[1]

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[1] Interview in August 1992 with Prof. Dan Wyman, composer of various soundtracks and teacher of composition at San Jose State University in California. He worked on Apocalypse Now during the early stages of post-production.

It stands to reason that so much potential is lost in situations like this where sound elements are pitted against one another instead of operating in relation to one another in the service of the film as a whole.

5.2.2 Similitude

There is no distinction between the music and sound effects; only through their perceived function are they able to be differentiated. This model engenders the dialectic of whether this sound material is to be considered as music or "organized sound." This argument, which has seen much exposure in academic musicology circles, has no place in the context of this dissertation as the audio material in a film has to be judged in the context of the film as a whole. Its intrinsic value as music or noise is of no consequence thereto.

In Forbidden Planet, the sound score fulfils both the functions of the sound effects and music while not alluding to the conventional use of music or sound effects. In The Birds, the avian and machine sounds are highly stylized, and especially in the absence of what one might call 'pure' music, they assume all the functions that music might have, without being literally musicalized.

Soundtracks addressed by this model are most often created by a single person or through an intensely collaborative effort.

5.2.3 Sound Effects as Music

The component sound has been carefully orchestrated to include the sound effects in a musical fashion. As more sound designers become aware of the relationships between the sound effects and music, more sound effects composers are musicalizing their sound effects. Frank Serafine:

> The people that hired me for sound effects knew that I was a musician. I collaborated with their composer, and I didn't over-score my sound effects. In fact, I always tried to blend the effects into the music by putting them in the same key if possible.[1]

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[1]Greg Armbruster, "Frank Serafine: Designing harmonious, hallucinatory, & horrifying sounds for Hollywood hits", Keyboard, vol.10, no.9 (September 1984), p. 17.

Ben Burtt is also representative of a new breed of sound effects artists, "...co-ordinat[ing] carefully with the film's composer, placing his sounds between notes and at contrasting pitches."[1] It is noteworthy that while Serafine prefers to match the pitches of his sound effects to the music, Burtt has a different approach and deliberately avoids matching the pitch content of his sound effects to the music.

In Tron the electronic footsteps on the game grid are musicalized as each character's footsteps are on related pitches. In Tap the sound effect of the earth compressor is musicalized to sound like a bass drum. In Disney's The Lion King, the sound of the elephants walking during a production song is in synch with the music and functions as the bass drum. David Lynch has often played with natural sound in a musical fashion as his sound designer for Twin Peaks, Doug Murray, illustrates:

> One of the things David likes is to take sound effects of machines and slow them way down to make almost musical textures out of them and mix them together in abstract ways to create backgrounds that have emotional impact the way music often does. I'd done a little of that sort of thing before, but most directors aren't interested in that direction.[2]

He goes on to give an example from a scene in Twin Peaks:

> In the boxcar scene, the sound effects were very textural and musical in a way that was evocative of a train graveyard. I used slowed-down train whistles and train tracks rat-a-tat-tatting, and dogs and drips and all kinds of other sounds mixed in there, and it got used without any music at all. They went into the scene with music, then favoured the effects, and then went out of it musically. It happened so seamlessly you did'nt realize it wasn't one continuous flow of sound. It was all part of the 'musical score,' and it took you down to this deep, dark place.[3]

Relationships belonging to this model are reliant on a certain amount of collaboration between the composer and sound effects editor.

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[1]Marc Mancini, "The Sound Designer", Theory and Practice of Film Sound, ed. Elizabeth Weiss and John Belton (New York: Columbia University Press, 1985), p. 367.
[2]Blair Jackson, "Twin Peaks", Sound for Picture: An Inside Look at Audio Production for Film and Television, ed. Jeff Forlenza and Terri Stone (Milwaukee: Hal Leonard Publishing Corporation, 1993), p. 108.
[3] Blair Jackson, ibid., p. 110.

5.2.4 **Music as Sound Effects**

This model presupposes that the distinction between music and sound effects exists in the form of timbre and structure. The component sound has been carefully orchestrated to include the music as sound effects.

The music co-exists with the other sound elements and while it functions as sound effects, is inherently ambiguous and does not mimic a specific sound effect as its aim is to produce visceral response, and not to attempt to match the specific missing sound effect as closely as possible.

A multitude of horror films use music as sound effects designed to provoke a visceral response. 'Stingers' are a part of the musical score and are usually a single tone or cluster of relatively high volume and brash timbre which accompany an unexpected event. In John Carpenter's The Fog, every time the fog creatures claim another victim, a loud musical 'burst' is heard, usually out of musical silence. Dan Wyman, who was responsible for the electronic realization of Carpenter's music for The Fog, explains:

> The weird shrieking sound at the end of the film with the radio announcer on top of the tower and the fog creatures are getting her and there is this weird Vertigo-like sound and I thought of it as score, as music, but most people think of it as sound texture or sound effect.[1]

In Eraserhead, simple musical drones and 'stingers' are used with great effect to induce visceral involvement and to sonically point to significant parts of the narrative. The drones and 'stingers' are harmonically and rhythmically very simple and perform exactly the same function as sound effects. They are, however, a part of the musical score as they contain harmonic, rhythmical, and textural characteristics which relate to the rest of the musical score.

In Psycho, the shrieking strings during the murder scenes are unquestionably a part of the musical score. However, the music mimics possible sound effects and provides the visceral involvement that the sound effects might have. The reason Psycho could be placed in this model is that the shrieking strings remain

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[1] Interview in August 1992 with Prof. Dan Wyman, composer of various soundtracks and teacher of composition at San Jose State University in California. He worked on Apocalypse Now during the early stages of post-production.

fairly ambiguous in their mimicry; they could be mimicking the screams of the victim or the sound of the knife or they could be relating to the bird imagery which permeates the film.

5.2.5 Music in Lieu of Sound Effects

Sound effects are not present and musical elements assume a dual function as sound effects while still functioning as part of the score. The difference between this model and the first model (Autonomous) is that the music retains its identity as music at all times. While it may function as sound effects by mimicking the real and expected sound, it is beyond any doubt still part of the musical score.

In Apocalypse Now, the dual bass drones which function simultaneously as helicopter sound effects were conceived of as part of the musical score prior to any sound components being recorded. The sound score was designed by the sound production team and "...it was talked about and it was a conscious element in their minds that the music would also have the same effect, that we would use drones, we would use different types of musical elements which were indistinguishable from sound effects."[1]

In The Omen, composer Jerry Goldsmith wrote an unaccompanied whispered choir chant for the scene where the possessed dog runs through the house seeking its victim. The chanting motif may sound like the dog's panting or footsteps or even the evil spirits spurring the dog on in its murderous endeavours. The ambiguity of the chant renders this scene one of the most chilling and frightening scenes in the horror film genre. When victims are murdered in Damien-Omen II, a crow appears as a physical manifestation of Satan. There are no natural crow sounds here and composer Jerry Goldsmith has the bass voices imitating the sound of a crow squawking together with col legno 'stabs' on the basses and celli.

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[1] Interview in August 1992 with Prof. Dan Wyman, composer of various soundtracks and teacher of composition at San Jose State University in California. He worked on Apocalypse Now during the early stages of post-production.

'Mickeymousing' refers to a style of music composition for film (specifically animated cartoons) where the music literally mimics the physical movements of the characters or objects. The score acts as a literal equivalent to the image. For example, if Donald Duck falls from a cliff, the music might follow his descent with a downward gliss or if Jerry cautiously tiptoes past Tom, each step may be accompanied by a musical note and not Foley footsteps. This style of film music composition is synonymous with Disney cartoons, hence the term 'mickeymousing.'

The most relevant aspect of the 'mickeymousing' technique is that the musical score is often responsible for many or most of the sound effects. The score must therefore provide the musical characterization, the emotional underscoring, as well as the synchronous sound effects. In doing so, scores for animated cartoons often make use of various slides, whistles, pop machines, and other unusual percussion instruments.

In the early days of cartoon music, the music was composed first, mainly in eight bar phrases and symmetrical forms. The animators would then do their work in relation to the timing of the music. In <u>Fantasia</u>, for example, the animators had to work to a selection of popular classical music and their storyboard and animation had to follow the dynamics and rhythms of the existing music.

As technology has improved, it has become more practical to score the music after the animation has been completed. This has been the trend over the last five decades and has produced some highly integrated cartoon scores. While Disney's cartoons represent the most consistent use of the 'mickeymousing' technique, there are examples to be found in almost every film genre.

In animal documentary films, television commercials, and especially comedy features, 'mickeymousing' is often used for humorous or dramatic purposes. In the 1962 James Bond adventure 'Dr. No,' the 'mickeymousing' technique is used to great humorous effect in the tarantula scene. As James Bond beats the tarantula to death with his shoe, the score mimics the action and we hear a synchronous orchestral stab for every stroke of Bond's arm.

In the more recent Disney features like <u>The Little Mermaid</u>, <u>Beauty and the Beast</u>, and <u>Aladdin</u>, the tendency in the underscoring has been more akin to dramatic scoring for narrative film than to their animated counterparts, the cartoons.

In this model, the relationship has to be conceived before any of the post-production sound begins. The composer is responsible for the sound effect in question and integrates it into the musical score. The sound effects editor also needs to be aware of the director's intention so as not to provide conflicting material for the scene in question.

5.2.6 <u>Music and Sound Effects Supplement One Another</u>

The music and sound effects function in tandem and are placed on an equal footing. The music might attempt to match to the sound effects or vice versa in terms of timbre, rhythm, and/or pitch and thus augment the intensity of the soundtrack. Similarly, a counterpoint may exist between the two components so as to achieve a specific goal, be it dramatic or musical.

One is able to tell the difference between the music and sound effects, but in terms of their functioning in service of the film, there is no difference between the two. This kind of relationship is usually formed at the dubbing session where the director sees the sound elements as a palette from which he or she may choose any colour or combination thereof.

In <u>Altered States</u>, music and sound effects elements are used as equal units or fragments and situated according to the prevailing overall sound texture. The orchestration of the sound elements is then horizontal or linear, rather than vertical or hierarchic.

<u>Wolfen</u> presents a good example of music and sound effects supplementing one another:

> One of the score's most striking effects came from the whip-like slashes used to introduce the unique wolfen-point-of-view sequences, which was accomplished electronically. "Half the sound was musical and half was a non-musical effect," [James] Horner [composer] said..."basically a processed gunshot which was enhanced electronically and added to

musically." Horner worked closely with sound effects technician Andrew London to achieve this startling, unearthy motif.[1]

For the first pilot episode of <u>Star Trek</u> it was suggested that:

> Some of the sounds to be heard on the mystery planet Talos IV- such as the elevator doors in the rocks, wind blowing over the tundra, and the imprisoned Captain Pike beating in the invisible force field imprisoning him- could be done with musical instruments...These were then altered and distorted electronically in many ways, just to produce new and different effects, as Roddenberry [the producer] explained, "that sounded interesting to us, and possibly useful".[2]

Though not always the case, situations where the composer and sound effects person work together are ideal as the above two examples illustrate. The dubbing session, however, remains the most crucial link in this model as the powers that be are in a position to use and manipulate the components at will. Throughout this dissertation we have seen many examples of films that have been harmed at the dubbing session.

[1]Randall Larson, <u>Musique Fantastique: A survey of film music in the Fantastic Cinema</u>, (London: The Scarecrow Press Inc., 1985), p. 325.
[2]Fred Steiner, "Music for Star Trek: Scoring a television show in the Sixties", <u>Wonderful Inventions</u>, (Library of Congress)

6. Conclusion

A film made fifty years ago sounds very different to a modern Hollywood film. Techniques, technology, convention, and the aesthetics of film sound practice are very different today, as they will be in fifty years time. While no one is able to predict how a film will sound in the future, we can be sure that it will not only be determined by technique, technology, convention, or film sound aesthetics, but above all by how the film sound artists adopt and employ them.

It has been noted in this dissertation that many directors, mainly through ignorance, have diluted the possibilities that sound (particularly music) may offer a film. However, it is noteworthy that the pioneers of modern film sound practice were mostly directors and not composers. Directors, after all, are prone to reducing music to a filmic element, while composers tend to remain partisan to their music as an art form.

According to Hitchcock, "...when you put music to film, it's really sound, it isn't music per se."[1] While the older school of traditional Hollywood film composers might have taken offence at this statement, music in Hollywood film is generally becoming more related to the other elements of the film and less so to its own musical systems.

Hugo Friedhofer feels that:

> The composer should regard the visual element as a cantus firmus accompanied by two counterpoints, i.e., dialogue and sound effects. It is his problem to invent a third counterpoint which will complement the texture already in existence.[2]

In many of the films studied in this dissertation, the composers were evidently striving not only to complement the existing texture, but to merge with it. Viewings of these films will attest to the author's claim that a more solid integration of sound components elevates the function of all sound in film to an art form, rather than just the music alone.

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[1] Alfred Hitchcock quoted by Kyle B. Counts, "The Making of THE BIRDS," Cinefantastique, Vol. 10, no. 2 (1980), p. 29. (M F 122)
[2] Roger Manvell and John Huntley, The Technique of Film Music, (New York: Focal Press, 1975), p. 229.

The old school of film composers saw themselves as an elite and highly trained group of people whose contributions to the film were somehow detached from the other sound artists. Danny Elfman, composer of the Batman scores, was publicly criticized about his lack of formal music education. In his response, Elfman made some relevant points about the function of film music which pits the old school of film composers against the younger school.

> Film music is written for no other reason than to accentuate the images on the screen, to underline the emotions of the characters, and...to help breathe life into a two-dimensional medium. A film score is not 'pure music,' and should be judged on its dramatic, emotional, and/or visually enhancing merits...Comparison of a film music composer to Mozart is...pointless[1]

Every film requires different sets of relationships between its elements. There are no absolutes when dealing with film sound. Film sound is essentially a malleable art form of which the purpose is to enhance the celluloid images as the director intends. Film composer Max Steiner contends that "...some pictures require a lot of music and some of them are so realistic that music would only hurt and interfere."[2] In working on Steven Spielberg's Close Encounters Of The Third Kind, composer John Williams acknowledged the director's intentions:

> The reason why there's less music in this picture than in a movie like **Star Wars**, for example, which is not realistic but fantastic, is because this feeling of realism occasionally had to be protected by having only natural sounds. It was necessary to respect Steven's atmosphere of realism.[3]

Maurice Jaubert has stated that "...it [music] has still to explore the whole territory which lies between its frontiers and those of natural sound."[4] More precisely, it is the film composers and sound designers who have to do more of this exploring in the future.

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[1]Robert Doerschuk, "Top Guns: Trends, frustrations, artistic skills and the impact of electronics", Keyboard, vol.16, no.3 (March 1990), p. 47 and 62.

[2]Max Steiner quoted in Roger Manvell and John Huntley, The Technique of Film Music, (New York: Focal Press, 1975), p. 255.

[3]Thomas Durwood, ed., Close Encounters of the Third Kind: A Document of the Film, (New York: Ballantine Books, 1978), p. 31.

[4]From Gorbman, Unheard Melodies: Narrative Film Music. p. 130. This is a translation of what was originally a lecture Jaubert gave in London on December 10, 1936, entitled 'La Musiqué dans le film,' and which was subsequently printed in Cinema (Cours et conférences de 1'IDHEC), 1, 1944. It was also reprinted in Ecran francais no. 522(June 26, 1946).

Time: 0:00" 0:10" 0:20" 0:30" 0:40" 0:50" 1:00" 1:10" 1:20" 1:30" 1:40"

SECTION 1

Tyres

Orchestra

Altered Voices

Drums

Slow Oscillating electronic sound

Explosion

Escaping Gas

High Cluster Drone

Upward Pitch Bend

Pulse Drone

Upward Pitch Bend

Low Rumbling

SECTION 2

Orchestra

Pitch Bend Downwards

Reverb Effects

Repetative Down Gliss Electronic Drone

Gliss Stops-Remains on single pitch

Heart Beat

Percussion

Water and Gas Sound Effects

Screaming

Tyres

Pipes Squeaking and Bending

Explosion and Breaking Glass

Section 3

High String Drone

Low Electronic Drone

Whirlpool Sound Effect

Orchestra

<u>Appendix A</u>. <u>Altered States</u> sound map. <u>Source</u>: author's transcription.

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Appendix A. _Altered States_ sound map. _Source_: author's transcription.

Time:	0:00"	0:05"	0:07"	0:08"	0:12"	0:16"	0:20"
Visuals:			MCU: Civilian inteligence officer offers capt. Willard a ciggarette.	CU: Capt. Willard.			
Dialogue:	"Terminate with extreme prejudice"		"You understand captain that this mission does not exist, nor will it ever exist"				
Sound Effects:	Helicopter startup with distant jet engine rumbling.						
Music:					*Freely*		

Time:	0:25"	0:28"	0:29"	0:34"	0:38"
Visuals:		MCU: General, panning left to curtained window.			CUT: ELS: Helicopter flying over mountainous landscape.
Dialogue:					
Sound Effects:		Helicopter sounds increasing in volume.			All sound effects stop.
Music:					

Appendix B. Apocalypse Now sound map. Source: author's transcription.

Appendix B. Apocalypse Now sound map. Source: author's transcription.

Apocalypse Now Sound Key

Sound Key: 1- Metal Pipe Guitar

2- Sonar Synthesizer

3- Warm Phase Drone

4- String Ensemble

5- Modulated Helicopter Drone (Sound 3 modulated)

6- Square Wave Electronic Flute

7- Distorted Electric Guitar

Time:	0:00"		0:06"	0:12"	0:21"	
Visuals:	LS from village	Pan up to soldiers in the distance			CU : soldiers walking	Pan L>R
Dialogue:		Unintelligible whispering from the enemy.				Unintelligible conversation between the soldiers
Sound Effects:			Distant helicopter rumbling / Insects	Rooster		
Foley:	Movement foley from unseen enemy in village preparing for battle				CU walking and movement foley of soldiers.	
Music:	High A drone			Theme A: / Low D drone		etc.

Time:	0:29"	0:33"	0:56"	1:09"
Visuals:	CUT: approaching helicopter	CU : Ron's face	CUT: another soldier	CUT: village
Dialogue:		Conversation now intelligible, but still inconsequntial small talk		
Sound Effects:	Helicopter	Insects	Distant helicopter	Flies
Foley:		CU walking and movement foley of soldiers.		Walking foley and wagon moving
Music:		High drone / Theme B:		

Appendix C. Born on the Fourth of July sound map. Source: author's transcription.

Time: 1:13" | 1:21" | 1:56" | 1:58" | 1:59"

	1:13"	1:21"		1:56"	1:58"	1:59"
Visuals:	CUT: back to soldiers	Soldier gets shot / Various battle shots	Helicopter	MCU: Ron firing his rifle	MCU: Enemy firing his rifle	Ron gets shot
Dialogue:		Shouting and 2-way radio dialogue ———————————				Ron's moans and grunts.
Sound Effects:	Helicopter ——→ / ←— Insects ——→	Gunfire and general battle sounds —————	⊢ Helicopter ⟶	Ron's rifle fire pinpointed	Enemy rifle fire pinpointed	Metal sheet sound as bullet hits flesh.
Foley:	Soldier's walking foley ←—	Battle movement foley ———————————————————————				
Music:						

Time: 2:00" | 2:04 | 2:06" | 2:14" | 2:34" | 2:43"

	2:00"	2:04	2:06"		2:14"	2:34"	2:43"
Visuals:	Ron falls face down		CU: Ron's injured foot.	Ron moves around trying to fire his rifle.	Unsteady camera movement.	Brief slow motion shot.	Ron fires rifle at enemy.
Dialogue:		"Son of a bitch"	Ron's grunts and moans ———————				
Sound Effects:		Gunfire and general battle sounds —————————			——————→		Ron's rifle fire pinpointed.
Foley:	Sound of Ron falling to the ground.	Movement foley ———————————————————					
Music:					←— Theme B: ——————— ←—		

Appendix C. Born on the Fourth of July sound map. Source: author's transcription.

Time:	2:53"			3:21"		3:24"
Visuals:	Action moves to others in battlefield	Fast cutting between the elements of the mise en scene	Ron fires his rifle.	Radio operator gets shot	Ron fires his rifle again.	CUT: helicopter in slow motion.
Dialogue:	Various shouting and 2-way radio communication					Frantic screaming of helicopter pilot on 2-way radio. ⟵——————⟸
Sound Effects:	Battle sounds resume an upfront position.	Helicopter⟶	Ron's gunfire pinpointed.	Battle sounds——————— Helicopter⟶	Ron's gunfire pinpointed.	Tempo of Ron's gunfire remains constant while the timbre changes and ⟶ becomes the sound of the helicopter.
Foley:	Genaral battle movement foley ————————————————					
Music:	Development of theme B and increasing intensity of orchestration density builds up the tension. ⟵——————————				⟵ Continues to build in intensity.	

Time:	3:33"		3:37"	3:45	3:46"		4:10"
Visuals:	Helicopter explodes.		MCU aerial shot of Ron trying to get his rifle to work.	Enemy firing at Ron	Ron gets shot and falls to the ground. CU shots of Ron	Grabs ground with his fist.	Long grass from Ron's p.o.v. slowly goes out of focus
Dialogue:		Ron's shouting and screaming —————————————			Ron moans Ron's breathing and gurgling sounds	Whispers his girlfriend's name	Sounds of children screaming which have been altered and reversed
Sound Effects:	Explosion.	Battle sounds——————————— Ron's gunfire————		Enemy gunfire pinpointed			Sound of dry grass moving in the wind
Foley:		Ron's battle foley————————————			General movement foley as Ron falls to the ground and remains there ————		
Music:	Theme B development: ———————————		Trumpet takes the melody at the climax.				⟵ Low piano notes with percussion at regular intervals.

Appendix C. Born on the Fourth of July sound map. Source: author's transcription.

Time:	4:13"		4:26"		4:46"	5:19"	
Visuals:	Focus in on grass, but not from Ron's p.o.v.	Soldier running toward Ron and picks him up and carries him to saftey.	Various upside down shots from Ron's p.o.v. as he is carried by the soldier. Unsteady camera movement		CUT to airport tarmack	CUT to hospital	
Dialogue:		Various swearing from the soldier carrying Ron.				Various frantic dialogue, screaming and moaning	Certain dialogue is now electronically processed
Sound Effects:	Battle sounds ⟶	⟵ Helicopter ⟶			Helicopter and jeep ⟶⊣ sounds		
Foley:		General movement foley ⟶				General movement foley	
Music:	Low piano and percussion ⟶		⟵ New dissonant material	⟵⟶			

Time:	6:03"	6:08"	6:23"	6:43"	6:46"	6:54"	7:08" 7:10"
Visuals:	Heart shock machine is used on a wounded marine	CU: Ron's face	Pastor speaks to Ron				CUT to darkness
Dialogue:	⟶	Some of the processed dialogue is unintelligible	The Pastor and Ron's conversation is unaltered and predominates	"I've come to give you your last rights"	"Are you ready?"	Pastor reads the ⟶ ⟶ last rights	"Blessed be the name of the Lord"
Sound Effects:	Sound of lights flickering on and off						"Whoosh" sound
Foley:	General movement sounds					⟶ ⟶	
Music:	⟶		⟵ ⟶		Theme B: ⟶ ⟵ ⟵		

Appendix C. Born on the Fourth of July sound map. Source: author's transcription.

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