Gearing up for tomorrow
new technologies and film aesthetics

by Carol Rutter

It has been said that there is no such thing as a true invention. An invention is actually the result of combining two or more existing components, creating something that functions quite differently than either of the original components would ultimately suggest. An inventor, driven to satisfy his boundless curiosity, possesses the necessary vision and imagination to keep experimenting with existing materials in endless combinations.

When we examine technological innovations in film history, the term "research and development" refers to a two-part process. First the equipment is invented and developed for practical use. But it is not until some time later that the full aesthetic potential of the equipment is realized. For example, the moving picture camera was invented long before its users realized either camera movement or in-camera editing. It was later still before camera movements were refined enough to be aesthetically interesting and before post-shooting editing was realized.

Even today, when we look at many films that use new high technology, we find tremendous underuse of its potential. Few examples of high-tech experimentation and application seem motivated by a well-developed aesthetic sensibility.

Apocalyptic sound

Although dozens of films have recently been released with multi-channel sound, not even a handful stand out as aurally interesting. Of these few, Apocalypse Now possibly heads the list as the film with the most interesting creative development of multi-channel sound.

Just as the invention of the moving camera depended upon and borrowed from still photography equipment, multi-channel sound in film merely applied the audio technology already widely used in both the home stereo and recording studio industries. Although the application of this technology to film was a relatively small step, the aesthetic development by the moviemakers and technicians is evidently a lot more difficult.

Several kinds of prints of Apocalypse Now are available for public screening. Here, we focus only on the 70mm print with no on-screen credits and projected in a theatre with multi-channel sound facilities, like Montreal’s York Theatre or the Vancouver Center Cinema. Although the application of this technology to film was a relatively small step, the aesthetic development by the moviemakers and technicians is evidently a lot more difficult.

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Apocalypse Now is broken down into discrete components that variously remain either in a fixed position or move from one speaker to the next, depending on the intended effect, or on the sound’s source position to, or within the image. Each of the six channels can project mutually exclusive sounds at various points in the film. For example, when Captain Willard and the Chief are in the jungle, preceding the tiger attack, the sound is quite broken down: in one speaker we hear a hyena in a second we hear dialogue, in a third a bird’s call, and in a fourth wings flapping, etc. In this case there is little if any mobility of sounds or significant volume adjustment.

Because of soundtrack manipulation, the helicopters in Apocalypse Now are elevated far beyond the status of prop. Coppola’s attention to the helicopters’ sound mix best demonstrates the variables of discrete and mobile sound possible in multi-channel sound projection. Furthermore, he aurally suggests changes in frame position. The following example demonstrates this:

As the Playboy Bunny helicopter descends, the frame is flooded with the helicopter’s front light. As the angle of light to camera changes, we see that this is the central of three helicopters—the other two are escort helicopters. As the escorts fly forward to the foreground and move off-screen via the top of the frame, their sound continues, moving to the back of the theatre from one set of speakers to the next. It is as if the helicopters are in the theatre flying overhead, even though the screen shows only one stationary helicopter. When the sounds reach the last two speakers, the volume gradually diminishes to nothing.

The term “depth of field” usually refers to the illusion of a third dimension measured from the screen innsights conveyed by a subject’s placement in the frame. With multi-channel sound, depth of aural field can either be accomplished by adjusting the volume of the off-screen object’s sound relative to its changing position in the frame, or by suggesting its presence in the field from the screen onwards into the theatre.

Before the existence of multi-channel sound, off-screen phenomena were usually perceived from above below, left or right of the frame; they depended on off-screen glances, followed by an entrance or placed immediately after an exit. So, the perceived amount of off-screen space was wildly fluctuated within one film, as clearly demonstrated in many Renoir films. Theoretically, with multi-channel sound, a filmmaker can consistently stretch off-screen space through aural suggestion.

A subtle use of this technique is found in the first sequence of Apocalypse Now. While we see a medium shot of purple haze in the foreground and jungle in the background, we hear vague rumblings in the back of the theatre. Barely audible at first, these sounds are heard in the midst of much louder music and other sounds from the middle and front speakers. Gradually, the rumblings increase in volume and move forward on the left set of speakers. Before they actually reach the left front speaker, we are finally able to identify the sounds as helicopters. Then, a helicopter enters the frame’s left side, travels across the frame and exits on the right. While the helicopter is in sight, its sound is equal in volume to the other sounds. The process is then reversed as the unseen helicopter sounds travel down the right side of the theatre, gradually diminishing in volume and eventually disappearing from the soundtrack.

The rate of the sound’s movement is worth noting in this sequence. Before and after we see the on-screen helicopter, its sound travels the distance to and from the screen at what seems to be the exact rate of the on-screen helicopter’s movement across the frame. It is as if Coppola timed the helicopter’s rate of travel across the screen, figured out the average theatre size and speaker placement, and through some kind of mathematical wizardry was able to gauge how the implied helicopter should travel to and from the screen as if this calculation was motivated by awareness of the spectator experience.

There are too many examples of this kind of sound aesthetic in the film for it to have been just a happy accident.

According to John Sperdakos, Vice-President of the United Theatre exhibition chain, a Zoetrope representative arrived in Montreal with film tape weeks before Montreal’s opening of Apocalypse Now. He was to verify and approve the sound projection quality at the York, before Zoetrope okayed its release to United Theatres. The film was projected for the Zoetrope representative while he moved from one area of the theatre to another about every 15 minutes.

Mona Skagar, the film’s associate producer, said that if this test fell below Zoetrope standards the exhibitor would be deprived of the 70mm multi-channel print and be forced to accept another version with conventional sound only available some time after the other’s release.

Apocalypse Now demonstrates the obviously high correlation between the off-screen aesthetic and Coppola’s behind-the-scenes experimentation.

High-tech “cut and paste”

A film like One From the Heart had to be made to prepare technicians for the complexities of Electronic Cinema. No innovative production techniques were however, matched by an identifiable look—The uninformed viewer will notice little.

Coppola had vivid memories of his days as a scriptwriter and the pressure of writing nearly one script a week. This background, together with an established writer’s tools, the scissors and the stapler, Coppola reasoned that this “cut and paste” process could be applied to an entire motion picture.

Given the new technology, the pre-production, production and post-production steps, conventionally done sequentially, were now simultaneously possible, and could be accomplished in a different order.

Coppola was interested in linking each production department with the nine sound stages at Zoetrope, to have the ability “to pump images, sound and data around like hot and cold water.” In preparing for One From the Heart, some of the desired equipment was so new that only prototypes were available.

A word processor was used as the electronic version of the storyboard. The word processor was so flexible that it became like a drawing board for the film’s design adjustments. Virtually everyone from every department was a designer. This adjustment and growth process continued until the result was...
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The Japanese Broadcasting Corporation (NHK) is currently engaged in viewer response tests on various combinations of scan lines. Along with other independent indicators, this test has led to a nearly unanimous opinion that between 1500 and 1600 scan lines are the ultimate goal of High Definition Video research and development.

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The potential problems and complexities just detailed merely serve as a simplified introduction to those familiar with the imminent applications of Electronic Cinema.

But, let's step back from the future to the present limitations of video technology. Most aestheticians would agree that the film look is far superior to the electronic look. The difference is often misunderstood, the film look is far superior to the electronic look. The difference is often misunderstood, the film look is far superior to the electronic look.

Further pioneering efforts in creative Electronic Cinema will probably be dominated by Coppola's name for some time to come. For as Garrett Brown puts it, "Francis Coppola is an acknowledged master of the film medium as it is presently constituted. However, he is gifted or cursed with the ambition to innovate to advance the art and science of filmmaking and to drag the film industry into the 21st century. He looks ahead to an era when movies will be digitally recorded as high resolution video, edited strictly by a computer juggling trillions of binary numbers, and distributed by transmitting the ultimate numbers via satellite to exhibitors, or even straight to subscribers in the home. Francis will of course direct by satellite from Shangri-La or space shuttle with actors in San Francisco, New York and London. He believes, as do many, that he is a sensitive artistic human being, but he is clearly here on earth somewhat ahead of his reservation."