

In: Rick Altman, ed. (1992): *Sound Theory, Sound Practice*. New York & London: Routledge. S. 154-170.

8

1950s Magnetic Sound: The Frozen Revolution

John Belton

In the mid-1950s, the wide-screen revolution transformed the nature of the traditional motion picture experience. Screens became larger and wider and curved across the front of the theater, obliterating the old-fashioned proscenium and engulfing audiences within a semicircular ring of images. Sound spread from one central speaker behind the screen to additional behind-the-screen speakers on the left and the right, issuing forth from as many as five behind-the-screen speakers and from dozens of "surround" speakers mounted on the side and rear walls of the theater auditorium. The clearly delineated segregation of spaces which had characterized previous conditions of motion picture spectatorship gave way to an illusory integration of spaces in which images and sounds from the "fictional" space of the motion picture appeared to enter the "actual" space of the audience; the audience, thus surrounded by images and sounds, felt itself to be a part of the space depicted on the screen. Distraction, which (for Siegfried Kracauer) epitomized the motion picture experience of the movie palaces of the 1920s, in which the architecture of the theater encouraged the spectator's eyes to wander from the screen to the surrounding decor, gave way to "participation," the new entertainment catchword of the 1950s, which was used to describe the audience's absorption into the spectacular display of sound and images arrayed before (and around) them (Kracauer 1987).¹

But the revolution was not entirely successful. Though old narrow-screen aspect ratios were overthrown forever, stereo sound failed to unseat mono (except in a few large, first-run theaters which were equipped to run both). The magnetic movement began in the post-war era (*circa* 1946) when several studio sound departments, drawing upon confiscated German technology, began to convert their production and postproduction facil-

John Belton / 155

ities from optical to magnetic sound (Mullin; Ryder; Lafferty, 170-219). Magnetic sound provided an unprecedented fidelity, a dramatically expanded frequency range, a significantly improved signal-to-noise ratio, and a larger dynamic volume range. However, the magnetic revolution proved to be more of an in-house shake-up than an industry-wide transformation. Though it briefly disrupted established sound recording, editing, and mixing practice, it had little impact on what spectators saw and heard in movie theaters.² This was due, in part, to the fact that films continued to be released with optical rather than magnetic tracks in order to conform with existing theatrical practice where optical playback was the standard. As a result, whatever improvements in sound quality that magnetic recording and re-recording introduced were lost when the magnetic track was finally converted to optical sound for release prints, though magnetic recording and mixing did cut production costs considerably.³ In the related field of radio, a similar course of development took place. The broadcast industry had converted to magnetic sound several years before the film industry, but this new, improved sound was received and played over low-fidelity AM equipment in the home (though a small percentage of audiophiles with FM sets experienced considerably superior sound reception in the late 1940s and early 1950s) (Fortanale and Mills, 121-123).

In 1952-54, however, an assault on the twenty-five-year-old exhibition standard of optical sound took place in the form of stereo magnetic sound, which was a prominent feature of Cinerama, CinemaScope, and certain other wide-screen processes such as Todd-AO, as well as an element of several 3-D systems. The opening of *This Is Cinerama* in 7-track stereo magnetic sound in the fall of 1952, of *House of Wax* in 3-D and 4-track stereo in the spring of 1953, and of *The Robe* in CinemaScope and 4-track stereo in the fall of 1953 (as well as 32 other stereo releases in 1953) heralded a new, albeit short-lived, era in sound motion pictures. But this attempt to establish a standard, 35mm, magnetic stereo format did not succeed, and it was not until 1975 that a 35mm stereo sound system began to gain wide acceptance through the efforts of Dolby Labs to market a 4-track *optical* stereo sound system (Hodges; Larry Blake).

This essay explores the apparent failure of the stereo magnetic sound revolution of the 1950s. It looks at the demise of 35mm stereo systems from the perspective of the conflicting demands of a diverse motion picture marketplace in which the differing needs of producers, exhibitors, and spectators came into conflict over the issue of stereo magnetic sound. It will demonstrate how the compromises which resulted from this conflict led to the institutionalization of a two-tiered exhibition system in which the (theoretically) radical realism of large-screen (and large format) motion pictures with stereo sound was rendered "elitist" and "unrealistic," while

the old-fashioned format of monaural, optical sound became the bearer of a redefined realism, anchoring the spectacular, new wide-screen image in the familiar conventions of a pre-wide-screen sound, which had achieved a certain identification with realistic representation over the past twenty-five years. In the process of sketching out this argument, this essay will consider the advent of magnetic sound from the perspective of theories of technological change and the demand for greater realism implicit in those theories. It will also examine the interdependence of realistic representation and the conventionalization of aesthetic devices introduced by new technologies.

Did 1950s Stereo Sound Really Fail?

The "failure" of 35mm magnetic sound to become an industry standard has been regarded, by myself and others, as one of the great setbacks of the wide-screen revolution, unnecessarily depriving motion picture spectators of high quality, state-of-the-art sound in the theater, and delaying "the process of motion-picture engineering" (Belton 1988, Handozo). Not only is the appeal here to "progress" suspect, but so also is the notion of "failure." It is not entirely clear that magnetic stereo "failed," or, if it did, how extensive or complete that failure was. Several recent histories of Twentieth Century-Fox's innovation of CinemaScope (again, including my own) have termed Fox's experiments with stereo sound a failure and have attributed this failure largely to economic factors (Belton 1985, Hinch). The story of stereo's demise generally follows a predictable course. Small exhibitors reluctantly agreed to install CinemaScope projection lenses and wide screens but balked at the "extra" cost of converting their theatres to stereo sound (Hinch, 48–50). Fox insisted on a stereo-only policy and rented CinemaScope films only to those theaters equipped to show them in stereo. But when other studios using the CinemaScope process began to make prints available in an ersatz optical stereo format known as Perspecta Sound and in monaural optical versions, Fox relented and released films with dual, magnetic and optical soundtracks (Hinch, 50; Belton 1988, 719). As a result of this concession to exhibitor complaints about cost, only one-quarter of all movie theaters around the world ever installed stereo magnetic equipment (Belton 1988, 719).

The majority of theaters chose mono over stereo. But this apparent defeat of stereo was not without qualification. One-quarter of all movie theaters did convert to stereo; by the late 1950s, that amounted to over 10,000 theaters! And most of these were large, first-run houses. These theaters not only conferred prestige on the films (and special film processes) presented in them, but they also generated the bulk of the profits for Hollywood releases. As Spyros Skouras, president of Twentieth Centu-

ry-Fox wrote to producer David O. Selznick when the latter questioned the necessity of stereo sound, "the relatively small number of magnetic-equipped theatres contribute 75% to 80% of our income from a picture."⁴

Box office statistics on the performance of the first CinemaScope film, *The Robe*, give some indication of how problematic a simple economic determination for the failure of stereo can be. By the end of March 1954, roughly a month before Fox abandoned its stereo-only policy, *The Robe*, playing in 1370 stereo-only sites, had grossed over \$24.6 million and had returned over \$13 million in rentals to Fox (*Daily Variety*, March 30, 1954: 3). The economic status of the small exhibitor may have determined the failure of stereo, but the economic clout of the large exhibitor accorded it considerable success. As a result, stereo, which emerged as a crucial form of product differentiation, separating the first-class, showcase theaters from the rest, became a fixture of first-run, CinemaScope exhibition until the end of the decade.

When Fox abandoned its stereo-only policy, 35mm magnetic stereo did not so much disappear as begin a slow decline, the victim of apathy on the part of production personnel at Fox and elsewhere and of competition with other magnetic systems developed for wide film formats such as Todd-AO. In response to complaints from exhibitors who had converted to stereo, Fox production chief, Darryl Zanuck, sent a memo to studio personnel encouraging producers, directors, writers, and editors to make full use of stereo sound, noting that it had been used "conservatively rather than in its full potential" and he cited, in particular, the failure to use the fourth, surround track.⁵ The problem with stereo's "invisibility," however, was not entirely due to neglect.

After Fox relented on its stereo-only policy, filmmakers at Fox were forced to design films so that they could be played back in either stereo or mono. As a result, sound information that was crucial to the narrative or to the audience's understanding of the film could not be put on the fourth track because not all theaters could play it back; and even if that information were to be mixed down into a monaural track, it would lack the special spatial properties it originally possessed on the fourth track. It would no longer serve the purpose for which it was initially designed and thus, it would have little or no value for either the exhibitor or the audience of non-stereo films.⁶ Shortly after Fox agreed to mono releases of their stereo films, the fourth track fell into disuse, neglected for all but one or two minutes of service in a two-hour feature.⁷

By 1958, Fox had even ceased recording dialogue and sound effects in stereo and began to record them in mono, "panning" the sound in the mix to follow onscreen movement (Blake).⁸ At around the same time, the expensive practice of producing mag-optical prints for every release began to give way to more and more optical-only releases.⁹ One North Dakota

theater owner, who felt betrayed by Fox's policy reversal, wrote a letter to the president of Twentieth Century-Fox to voice his anger at the decline of stereo sound:

Dear Mr. Skouras,

In my projection booth I have a piece of equipment between the upper magazine and the projector head that my operator has forgotten how to use. Please advise if I will ever have any use for this equipment or should I throw it all away and just mark it up to experience?—and loss of faith in a man's word.¹⁰

Skouras had promised that CinemaScope and stereophonic sound would save the film industry and, to some extent, it did. But the original advantage which many exhibitors who had converted to stereo enjoyed quickly disappeared as Fox and other studios cut back on the number of stereo prints struck for circulation.

Meanwhile, CinemaScope's 4-track 35mm stereo magnetic sound was gradually being eclipsed by a variety of 70mm widescreen systems (such as Todd-AO, M-G-M Camera 65, and Super Panavision) which featured six-track stereo sound. Stereo thus continued to be connected not with the average movie-going experience of the 1950s audience but rather with special presentation large-screen processes and with blockbuster spectacles. Stereo films ranged across a variety of genres, from musicals (*Oklahoma!*, *Carousel*, *South Pacific*, *West Side Story*) to historical spectacles (*Around the World in 80 Days*, *Spartacus*, *The Alamo*, *Mutiny on the Bounty*, *Lawrence of Arabia*, *Cleopatra*) and biblical epics (*Ben Hur*, *The Big Fisherman*). Through its usage as an element of spectacle and through its identification with the genres of spectacle, stereo sound became associated for audiences not so much with greater realism as with greater artifice. The next section of this essay examines the relationship of stereo, as a technical innovation, to the traditional attribution of greater realism to new technologies.

Stereo and Greater Realism

Theorizations of technological change in the cinema have tended to posit models of development ranging from simple, sequential, linear accounts of autonomous evolution to complex, quasi-dialectical, non-linear notions of highly mediated process. At one end of the spectrum, André Bazin declared the cinema to be "an idealistic phenomenon" whose development unfolded along a teleological trajectory towards the realization of the myth which had guided its initial invention and subsequent development (Bazin 1967a, 17). Like Icarus who dreamed of human

flight, Bazin's cinema was obsessed with the fulfillment of primal dreams which "dwelt in the soul of everyman" (Bazin 1967a, 22). One of these dreams was "the myth of total cinema," which endowed the cinema with the (potential) power to reproduce reality—to reconstruct "a perfect illusion of the outside world in sound, color, and relief" (Bazin 1967a, 20). The course of the cinema's evolution, which passed through successive stages of development from black and white, silent motion pictures to a cinema of sound, color, relief (3-D), and wide-screen, "little by little made a reality out of the original 'myth'" (Bazin 1967a, 21).

At the other end of the spectrum, Jean-Louis Comolli challenged the linearity of earlier historiography (including Bazin's) and called for a "materialist theory of the cinema" (Comolli 1985, 47). Following Julia Kristeva, Comolli argued for "a *stratified history*; that is, a history characterized by discontinuous temporality, which is recursive, dialectical, and not reducible to a single meaning. . . ." (Comolli 1986). Thus, for Comolli, technique and technology did not evolve in a straightforward fashion but moved first forwards then backwards, then forwards again through a series of dead ends and detours.¹¹ Yet Comolli's uneven or "stratified" history proved ultimately to be driven by the same "myth" or (to use Comolli's terminology) "ideological demand" as was Bazin's (Belton 1987). The cinema's invention satisfied an ideological need "to see life as it is," that is, for a certain realism in representation (Comolli 1985, 55). Its advances in both technique and technology responded to a desire "to make things more real" (Comolli 1986, 437). In other words, for both Bazin and Comolli, technological development resulted in the production of "greater realism."

Technological innovation in the cinema has traditionally been associated with the production of "greater realism." The invention of the motion picture camera enabled filmmakers to create images which they described as "life-size" and/or "life-like;"¹² the Lumières presented their Cinématographe shows as "la vie sur le vif" or "life on the run."¹³ With the advent of sound, film could "provide the most marvellous reproduction of life as it unfolds before our eyes."¹⁴ Vitaphone insisted that "The Characters [in its pictures] act and *Talk like living people*" (Kreuger, 17). Movietone boasted that it was "More than Sound—Life Itself!" (Kreuger, 10). Launching the wide-screen era, Cinerama declared that it was a medium "that creates all the illusion of reality . . . [that] you see things the way you do in real life—not only in front of you as in conventional motion pictures, but also out of the corners of your eyes . . . [and that] you hear with the same startling realism."¹⁵ Charles Barr insisted that wide-screen processes such as Cinemascope enabled "complex scenes to be covered even more naturally: detail can be integrated, and therefore perceived, in a still more realistic way" (Barr, 157). Stereophonic sound was praised

for its realistic sense of directionality; "sound seem[ed] to come from the exact point of origin—made it appear as if the words spoken by each actress came from her lips, giving the whole scene a life-like quality."¹⁶

In the case of the evolution of sound technology, technical developments in sound recording could be seen as inspired, as Mary Ann Doane has suggested, by a quest for more realistic sound reproduction, that is, by attempts to improve the overall system's signal-to-noise ratio, to make the signal more intelligible and, at the same time, to reduce noise (Doane 1980a, 61). Thus, the introduction of magnetic recording in the late 1940s, of stereo magnetic playback in the theater in the 1950s, of Dolby sound in the 1970s, of digital recordings in the 1980s, and of digital playback in the 1990s mark the progress (to date) of this evolutionary progression toward an ideal, absolute sound lacking any attendant noise.

But "greater realism" was not always the product nor the goal of technological development. As Ed Buscombe has pointed out, early color films were associated not with realism but with its opposite—with "unrealistic" genres—with animated Disney cartoons, fashion shows and/or musical sequences inserted in black-and-white films, with fantasy films, and with musicals (Buscombe, 90). Indeed, realism continued to be signified in the cinema not by color but by black and white, which remained the dominant mode of realistic motion picture representation until the widespread diffusion of color television in the late 1960s. For Buscombe, the demand for greater realism which informed the models for technological development set forth by Bazin and Comolli may have been a dominant determinant of technical change but it was not necessarily the *only* demand satisfied by innovation (Buscombe, 87, 91). Color, for example, provided spectators with "luxury or spectacle;" and, in certain cases, it simply celebrated technology (Buscombe, 90–91).

Significantly, all of the technological developments discussed above were identified not only with realism but with spectacle as well. The attention of the audience was drawn to the novelty of the apparatus itself. The "greater realism" produced by the new technology was understood, it would seem, as a kind of excess, which was in turn packaged as spectacle. Nonetheless, the artifice which underlay the heightened illusion of reality was celebrated, if not always displayed. Thus ads for *Broadway Melody* declared it, as an "all talking, all singing, all dancing dramatic sensation," to be "the New Wonder of the Screen!" (Kreuger, 23). Fox Movietone "dubbed" itself "The Sound and Sight Sensation" (Kreuger, 10). Cinerama, CinemaScope, Todd-AO and other wide-screen processes regularly identified themselves with epic proportions and/or spectacular effects.

In a similar way, stereo magnetic sound was praised both for its realism and its artifice. Scientists celebrated its "greater realism" in relation to

monaural optical sound. Thus Fox engineers proudly noted that stereo magnetic sound provided "direction, presence, proper phase relationships of the sound waves, and all the other aspects of the actual sound from the original source."¹⁷ Showmen boasted of its greater artifice. Skouras informed reporters that "in *The Robe* you'll hear angels' voices. And they'll come from the only place where you'd expect to see angels—right above you. And when you see the film and hear the voices, you'll look up for the angels" (Prall, 21).¹⁸

In spite of the gradual decline of the use of the fourth track during the mid-1950s, Hollywood continued to use surround sound on occasion for special sonic effects. Concerned about his own studio's failure to fully utilize the fourth track, Darryl Zanuck sent a memo to Fox staff praising the work of a rival studio. "In some of the battle sequences [of Warner's *Battle Cry*] it is a tremendous and realistic thrill when you hear the roar of the cannon coming from behind you and then it seems to pass over your head and land on the screen in the distance. They use this about six or seven times . . . and each time . . . it gave a terrific impact."¹⁹ Though Zanuck refers to the realism of these effects, their "realism" is clearly bound up with spectacular display, as Zanuck himself seemed to realize when he mentioned that his wife, who is "usually never conscious of anything of a technical nature and concentrates only on the story or the actors" noted these effects and "discussed [them] after she had seen the picture. . . . I know we have used things similar to this, but this is the first time she has ever noticed them and it came without any coaching from me."²⁰

Cinerama pioneered the practice of "travelling" sound which so impressed Zanuck and his wife, and exploited it as a form of audience participation. In an attempt to heighten the participation effect, Cinerama sound recordists regularly mounted five microphones in fixed positions on a support that was itself attached to the Cinerama camera, effectively binding visual and auditory perspective together and putting the spectator in the very midst of the onscreen action.²¹ Thus, in the Cypress Gardens sequence of *This Is Cinerama*, the sound of a motorboat can first be heard dimly from the rear of the auditorium, then somewhat louder from the right surround speakers, then, as the image of the boat appears on the screen, the sound follows its movement from right to left across the fifty-one-foot-wide screen. During the Long Island Choral Society's rendition of Handel's *Messiah*, "as you sit in the theater, the music of the thrilling 'Hallelujah' chorus comes to you from every direction . . . first, behind you . . . then, on both sides of you, as the singers approach the stage pictured on screen . . . and finally, from the great stage itself."²² Though travelling sound contributed an apparent realism to the scenes, providing exact correspondence between sound and image, it also functioned as

a display of what multi-track stereo magnetic sound could do. While undeniably realistic, the practice nonetheless drew attention to itself, violating the timeworn conventions of stylistic invisibility which governed Hollywood filmmaking practice and which insured that the audience's access to the events which unfolded before them would be unmediated (that is, realistic). This self-consciousness remained consistent with Cinerama's overall marketing campaign, which foregrounded the experience of the process and, as the word "Cinerama" in the titles of the first two features (*This Is Cinerama* and *Cinerama Holiday*) suggests, the spectacular effects of the process itself.

Fox and other producers of narrative features in stereo relied upon a somewhat more sophisticated system of microphone placement, which did not establish the exact identity between visual and auditory perspective employed by Cinerama and which, therefore, drew attention to the camera itself. Rather, they adapted standard Hollywood sound recording practice to the new medium of stereo and placed microphones in positions that matched "visible or desired implied [onscreen] action" instead of the position of the camera itself (Grignon, 376). In this way the microphones, like the camera itself, occupied quasi-objective, unmarked positions and functioned as omniscient onlookers rather than as a subjective presence identified with the position of the camera.

Sound recordists set up microphones in an attempt to capture the original "directionality" of the sound information. Sound effects, such as the footsteps of a character walking across the screen, would "travel" from speaker to speaker with the onscreen action. In *The Robe*, when Demetrius scours Jerusalem in search of Christ in an attempt to warn Him that He is about to be arrested, Demetrius hides behind a range of pillars from troops of Roman legions whose marching footsteps move with them (from speaker to speaker) from screen right to screen left. During the crucifixion scene, first thunder signalling an impending storm, and then sound of wind and rain, engulfed the theater, moving from one speaker to another. On occasion, even music would have a directional quality. At the end of *Demetrius and the Gladiators*, the romantic sacrifice of Messalina (Susan Hayward), who has repressed her desire for Demetrius (Victor Mature) in order to assume her place as the wife of Caesar, is underlined with a melodramatic violin solo which emanates from a single speaker located at the same position in the frame that she occupies, underscoring her individual emotion within a larger context of an impersonal public ceremony.

For a time, stereo recording actually dictated onscreen composition; actors would be positioned across the frame so that their voices would be picked up by different microphones, ensuring their separation upon playback in the theater. Zanuck insisted that "stereophonic sound is not

effective when two people are face to face, unless of course they are in big closeups or a big 2-shot. The full value of stereophonic sound comes from the *distance* between the two people who are talking. If one person is planted at one end of the set and the other person is on the other side of the set then the sound has an opportunity to add to the illusion of depth."²³ As a result, even stationary performers spoke from screen right, left, or center, and the sound shifted from one theater speaker to another during conversations.

For the first time in film history, offscreen dialogue was literally offscreen, emanating from surround speakers on either side of the auditorium. In *The Robe*, when Marcellus bids farewell to Diana before his departure to Judea, fog-enshrouded shots of the couple are accompanied by offscreen calls warning him of his ship's immanent departure. From *Battle Cry* to *Spartacus*, stereo sound extended offscreen space further to the right and to the left than it had ever gone before, and provided a specificity of location which monaural films could only vaguely suggest. The effect was decidedly theatrical, duplicating the offstage voice which the theater had exploited for centuries, but which monaural cinema could only loosely approximate. Offscreen voices literally drew the audience's attention to offscreen space, spectacularizing the concept of voice off.²⁴

Although a number of studios eventually adopted CinemaScope's 4-track stereo magnetic sound process, only Fox (and Todd-AO, which employed a somewhat different, 6-track stereo system) persisted in maintaining both "directional" and "traveling" dialogue. By the mid-1950s, M-G-M, Warners, Columbia, and Universal, for example, recorded and played back music in stereo but recorded original dialogue and sound effects in mono; they played dialogue back in mono through all the behind-the-screen speakers and played sound effects back in stereo.²⁵

At Paramount, sound engineer Loren Ryder complained that "the movement of dialogue to follow picture action can be very annoying," though stereo playback could be quite effective for sound effects and music.²⁶ New York *Times* critic Bosley Crowther found travelling dialogue to be distracting and complained that "the business of switching from one to another outlet . . . as the character moves becomes an obvious mechanical contrivance that confuses the image on the screen" (Crowther). Though Crowther concurred with Ryder and others that stereo was ideal for "background music and disassociated sound effects," he concluded that voices and onscreen sound effects were "more uniform and plausible" when played back through a single, behind-the-screen horn (Crowther).

Crowther's reaction and that of the major studios, who refused to adopt completely both Fox's directionality of dialogue and sound effects and its practice of "travelling" dialogue, would seem to have been prompted in part by a sense that certain practices identified with stereo violated the

accepted conventions of monaural sound playback. In other words, Crowther, Ryder, and others perceived stereo sound not as realistic but as artificial. This perception can be attributed, I think, to essential differences between stereo sound, with which audiences had little familiarity, and mono sound, which audiences had already experienced for a number of years. Stereo records and tapes were not mass marketed until 1957 and FM broadcasts in stereo were not licensed by the FCC until 1961; thus audiences could not draw upon these other media for an understanding of stereo's codes and conventions (Fornatale and Mills, 124). Mono, on the other hand, was a familiar fixture in mass entertainment, made accessible to audiences through both radio broadcasts and the "talkies." As a commonplace in these media, mono had come to be associated by audiences with realistic representation.

In the first days of the transition to sound period—in 1926 and early 1927—theater loudspeakers were placed to the side or below the screen. Early Vitaphone films even drew upon silent film conventions, playing back orchestral scores through speakers placed in the area of the former orchestra pit.²⁷ The development, in 1927, by Earl Sponable of a porous screen material facilitated the placing of loudspeakers behind the screen. This encouraged the illusion of the homogeneity of sound and image, which was achieved quite literally through their physical superimposition. Over the years, this location became a rigid convention—sound came from the center of the image. For over twenty-five years, dialogue had been played back to audiences from central speakers located behind the screen.

CinemaScope changed that, shifting actors' voices from speaker to speaker. Though the directionality of stereo sound does have a source in the world of theatrical performance, upon which CinemaScope, Todd-AO, and several other wide-screen formats consciously drew, theatrical codes did not translate smoothly into the cinema, particularly when those codes violated pre-existent cinematic codes. On the other hand, the playback of film music in stereo succeeded for somewhat similar reasons, relying upon codes established earlier to insure its reception as verisimilitudinous. The live orchestra which accompanied the first-run exhibition of silent films had established a precedent for the "stereo playback" of music; it is this tradition to which *Fantasia* appealed in 1940 with its depiction of Leopold Stokowski conducting the Philadelphia Orchestra and which *How to Marry a Millionaire* revived in 1953 with its filmed overture, "Street Scene," featuring Alfred Newman and the Twentieth Century-Fox Orchestra. Cognizant of this tradition, critics, industry personnel and audiences accepted stereo musical scoring, while rejecting directionality for dialogue.²⁸

Stereo's perception as artifice can be attributed to technological factors

as well. All multi-track stereo systems *channelled* the original sound into a finite number of theater speakers. Ideally, as stereo expert Harvey Fletcher pointed out, every square inch of the screen should have a separate speaker and track to reflect the nearly limitless number of potential sources for sound, while an infinite number of speakers and tracks would be needed to duplicate sounds emanating from offscreen space (Fletcher, 356). Stereo systems that established three, four, five, six, or even seven sound sources, rather than creating a more perfect illusion of depth on the screen, necessarily called attention to the arbitrariness of their choice of sources. The number of sound channels, however, did play a major role in the reception of stereo sound. While CinemaScope was critiqued for its noticeable channelling of sound, other multi-track systems with more channels fared better in their overall reception. For example, Todd-AO's 6-track sound enabled it to use five, rather than three, speakers behind the screen; this lessened somewhat the abruptness of shifts in travelling dialogue as it moved from speaker to speaker and proved less objectionable to critics.²⁹ Contemporary 70mm stereo magnetic formats similarly avoid the excessive channelling of CinemaScope by relying upon six tracks instead of four.

The identification of stereo magnetic sound with spectacle was the product not only of diachronic but of synchronic differentiation as well. As I have suggested, stereo marked a dramatic departure from earlier, mono sound styles. Audiences, at least in certain CinemaScope and Todd-AO films, were repeatedly "distracted" by the dialogue, which travelled from one position to another behind the screen, and were overwhelmed by sound effects on the fourth track (when it was used).³⁰ But stereo also attempted to define itself against the background of monaural film sound, with which it competed. Stereo entered an industry dominated by monaural sound and sought to distinguish itself as a marketable commodity from its predecessor. The myth inspiring its evolution may have been the quest for "greater realism," but that demand was already being satisfied, it would seem, by existing sound technologies—in particular, by monaural optical sound. Instead, it satisfied other demands—the need for spectacle and the desire for/fascination with technological display.

The film industry satisfied these differing needs in different ways. Inexpensive neighborhood theaters offered general audiences the traditional "realism" of monaural sound on a regular, day-to-day basis, while the more expensive, first-run theaters provided them with the occasional opportunity to experience the spectacle of stereo sound as a special entertainment event.

Stereo's association with genres of spectacle and with special presentation in first-run theaters confirmed its status in relation to mono: it was not only different but deviant. Mono remained the dominant form of sound

reproduction in theaters around the country, functioning as a norm or “background set” against which stereo emerged as a violation of that norm. The conventions associated with mono had not only established its dominance but also its identification with realism as a representational form. For over twenty-five years, mono had served as the realistic form of sound reproduction par excellence. By contrast, stereo sound emerged in the early 1950s as “unrealistic.” This distinction was only confirmed by the widespread perception of certain non-stereo (black-and-white) 1950s films, such as *On the Waterfront*, *High Noon*, and *Marty*, as more realistic than their wide-screen, stereo, and color counterparts, such as *The Robe*, *Brigadoon*, and *A Star is Born*. Unable to displace mono as the dominant, stereo could only retain its status as a variant. And, as a variant, it could only continue to attempt to exploit its spectacular characteristics.

If this study of the wide-screen revolution teaches us anything about the nature of technological change and its relation to realism, it demonstrates that, as Buscombe observed years ago, greater realism is not the only determinant governing the development of new technologies. But realism nonetheless does play a crucial role in the ultimate form those new technologies take. Though it was introduced as a single technological phenomenon, wide-screen cinema subsequently evolved in two radically different directions—towards greater realism and towards greater artifice. These different forms of wide-screen cinema satisfied the demands of a new motion picture marketplace, which served different groups of spectators, ranging from the mass audiences serviced by CinemaScope and other 35mm wide-screen systems to the “class” audiences courted by Todd-AO and other wide film formats.

Ironically, the “greater realism” which inspired the evolution of wide-screen led to a dismantling of the original technology (wide-screen and stereo sound) and the substitution of a supposedly “less realistic” form—monaural sound—for a supposedly “more realistic” form—stereo sound. The first stage of the wide-screen cinema’s evolution towards “greater realism” lay in its adoption of monaural sound. The “failure” of stereo suggests that the combination of wide-screen images and multi-track stereo sound proved to be too much of a revolution in the mid-1950s. Wide-screen cinema and stereophonic sound, as idealistic phenomena, conceived by the film industry to provide a perfect illusion of reality, proved to offer an excess of spectacle that could survive only in the most artificially theatrical of venues—in high-priced, reserved-seat, first-run theaters which, like the legitimate theater they sought to emulate, adopted theatrical schedules, featuring matinees in the afternoon, one show in the evening, and three shows on weekends and holidays.

During the tumultuous transition period from narrow-screen to wide-screen cinema, monaural sound provided audiences with a stabilizing

convention to help them navigate the bewildering spectacle of the wide-screen revolution. The spectacle of widescreen was grounded in the everyday “reality” of monaural sound reproduction. In other words, the wide-screen revolution needed to anchor itself in the conventions of the past in order for it to break with that past. It was not a complete overthrow of traditional cinema; it only went so far and then stopped. It was a frozen revolution.

(3) actors who identify with their character but nonetheless manage to impress it partially with their own persona. The silent stars vanishing with the onset of sound would here belong to the second group, "their mannered acting excluding in effect communication for the benefit of a sort of sovereignty that refers to itself and gratifies itself in a kind of narcissistic fascination" (Gourdon, 26–27). What emerges from both discussions is that the quality embodied in a new star is something like "an epitome of expressive neutrality"; and that the paradoxical nature of such a figure is exactly what makes it both multipliable and reproducible. If we ask, finally, what makes the same figure/star equidistant to both its "domestic" (American) and "foreign" spectator, the question should bring us back to the issue of emergent "nationalization" of the USA touched upon at the beginning of this paper.

8. 1950s Magnetic Sound: The Frozen Revolution

1. For a discussion of the concept of participation, see Belton 1990.
2. Sound editors, accustomed to editing by reading the modulation on optical tracks, initially resisted magnetic tracks because it was impossible to "see" sound on them. See Stewart, 58; also Elisabeth Weis's interviews with Rudi Fehr and Ed Scheid, 1975. Loren Ryder soon developed a "modulation scribe," which traced a varying amplitude line onto the magnetic film, enabling editors to read its modulation visually (Ryder, 529).
Scheid reports to Weis that magnetic tape facilitated the recording of sound effects to match action on screen; previously, library sound effects footage had to be cut to match the action; with magnetic film, the effects could be recorded, after filming, to the image as it was screened in a re-recording studio.
3. William Lafferty reports that "full-coated 35-mm magnetic film cost \$20 to \$30 per thousand feet less than the cost of a thousand feet of processed sound negative and accompanying print, the savings compounded by the magnetic medium's reusability" and that "a study by Loren Ryder indicated . . . that for every half-hour of sound recording for 35-mm film, magnetic recording saved over 82% of the cost of the optical negative-positive process with no loss in sound quality" (Lafferty, 184).
4. Letter, dated January 7, 1958, Selznick folder, Box 111, Sponable Collection, Columbia University Libraries.
5. Memo from Zanuck to All Producers, Directors, Writers, Editors, dated December 24, 1954, Box 10, Philip Dunne Collection, USC Archives of Performing Arts.
6. In a memo to Skouras, Herbert Bragg of the research and development unit wrote that "it is clearly a difficult problem to make good use of the fourth track in such a way as to enhance the picture and, at the same time, produce a picture which will be compelling in those theatres having only three tracks, and still again, in those theatres using only optical sound. The very fact that we release pictures in several types of sound versions seems to me to preclude the possibility of putting anything on the fourth track which is absolutely essential to an understanding of the picture." Memo, dated April 6, 1955, "Skouras" or "Sound" file, Box 112, Sponable Collection.
7. A 12kc signal controlled the fourth track, turning it on only when needed in order to reduce system noise. Activation of the fourth track introduced an audible new sound "presence" in the theater, thus signalling attentive spectators to the track's impending operation. This tended to draw unwanted attention to the technology, making it "visible."
8. This practice actually dates back to 1953, when Fox began to pan and travel mono tracks in order to dub foreign language releases of magnetic stereo films; it was also used in several instances on dialogue in the original, English-language versions. See letter, dated June 10, 1953, from Earl Sponable to Carl Faulkner and letter, dated July 21, 1953, from N. Katkoff to Spyros Skouras, "Dubbing" file, Box 94, Sponable Collection, Columbia University Libraries.
9. The SMPTE's "Progress Committee Report for 1956" noted that the number of 4-track stereo release prints declined in 1956 in comparison to the number available in 1955 *JSMPTTE* 66.5 (May 1957), 246. The 35mm stereo output of studios other than Fox dropped markedly in 1957 to a total of seven—five at M-G-M and two at Warner Bros. See "Progress Committee Report for 1957," *JSMPTTE* 67.5 (May 1958), 295.
10. Letter from Theo Hoffman to Spyros Skouras, dated April 6, 1957, Box 114, Sponable Collection, Columbia University Libraries.
11. For Comolli, for example, primitive depth of field did not evolve directly into the deep focus of William Wyler in the late 1930s and of Orsen Welles in the early 1940s but took a detour through the shift from orthochromatic to panchromatic film stock, which sacrificed the depth of images available on the former for the more realistic range of tones and "colors" on the latter (Comolli 1986, 437).
12. See "Edison's Vitascope," *The New York Dramatic Mirror* 35, No. 904 (April 25, 1896): 20; and "The Cinématographe at Keith's," *The New York Dramatic Mirror* 36, No. 914 (July 4, 1896): 17. Cited in Pratt, 13–14.
13. The familiar phrase is actually a condensation of a description of the Cinématographe which appeared in *La Poste* on December 30, 1895: "C'est la vie même, c'est le mouvement pris sur le vif." See Sadoul, 119.
14. *Filma*, No. 260 (9/11/29), cited in Neale, 96.
15. Program booklet for *This Is Cinerama*, circa 1952.
16. "The CinemaScope Demonstration," *Harrison's Reports* 35, No. 12 (March 21, 1953).
17. Herbert Bragg, Speech on Stereophonic Sound, Twentieth Century-Fox Press Conference, Hotel Plaza (New York City), March 30, 1954. Publicity file, Box 106, Sponable Collection.
18. Approximately 30 surround speakers were installed in the Roxy for the premiere of *The Robe* (though no mention is made of ceiling speakers). See letter from Earl Sponable to Harry Enquist, dated November 20, 1953, "AGA" file, Box 86, Sponable Collection.
19. Memo from Zanuck to Sid Rogell, Carl Faulkner, Sol Halprin, Alfred Newman, All Producers, All Producers-Directors, dated January 8, 1955, Box 10, Philip Dunne Collection, USC Archives of Performing Arts.
20. *Ibid.*
21. Willem Bouwmeester and John Harvey of the International Cinerama Society, in conversation with the author, May 12, 1991.
22. Cinerama Program Booklet.
23. Zanuck memo on *How to Marry a Millionaire* sent to Nunnally Johnson, Jean Negulesco, Sid Rogell, Sol Halprin, Earl Sponable, dated March 25, 1953, Zanuck file, Box 116, Sponable Collection.

24. Zanuck reported that in *Battle Cry* "a character on the screen would be talking to someone off the screen and the off-stage reply would *definitely* be off stage. This gave a real sense of audience participation and . . . the effect is excellent." See Zanuck memo to Sid Rogell et. al., dated January 8, 1955, Philip Dunne Collection, USC.
25. "Progress Committee Report," *JSMPTTE* 64.5 (May 1955), 233.
26. Memo from Ryder to Earl Sponable, dated June 16, 1953, Box 119, Paramount folder, Sponable Collection, Columbia University Libraries.
27. Bob Gitt, UCLA film archivist, in conversation, January 8, 1989.
28. Limited experiments with FM/AM radio broadcasts of music in stereo, as well as high-end home stereo tape players, also tended to identify the stereo format with music for pre-1953 audiences.
29. Al Lewis, interview with the author, October 20, 1990.
30. Certain studios, such as Columbia, never even used the fourth track, according to the SMPTE Progress Report Committee, *JSMPTTE* 64.5 (May 1955), 233.

9. Women's Voices in Third World Cinema

1. In an article in *The New York Times*, Flora Lewis writes that "the idea of a 'third world' . . . was generated at the 1955 Bandung conference" and "reinforced at the 1961 non-aligned summit conference in Belgrade." The term's original "purpose was to reject the polarization of the world into blocs led by the U.S. and the Soviet Union, to map a third way, and to spur decolonization" ("Words and Work," *The New York Times*, January 18, 1985, p. 27).
2. Adding "within which as a woman . . . I am created and trying to create" (Rich, 1986, 212).
3. Martin and Mohanty note that the "claim to a lack of identity or positionality" is a colonialist gesture of the West's, "based on privilege, on a refusal to accept responsibility for one's implication in actual historical or social relations, on a denial that positionalities exist or that they matter, the denial of one's own personal history and the claim to a total separation from it" (208). The result of this gesture, according to Martin, Mohanty and Minnie Pratt, is "cultural impersonation," taking on "the identity of the Other in order to avoid not only guilt but pain and self-hatred" (Pratt, 207).
4. If "a place on the map is a locatable place in history," Trinh is all over the map, moving from Vietnam to Paris, Berkeley to Dakar, Senegal, framed as her current project "India/China" suggests by the unique colonial conjunction of the place known as French Indo-China, otherwise known as Vietnam. Her refusal to be restricted to an "insider" position as the West's authority on Asia by making films originally about Africa is something she discusses in her 1988 article.
5. While it is important to remember that this is a fictionalized recreation of reality (an enactment of a documentary), the accents are not "acted." They attest to the *speaker's* "otherness" or distance from the language she speaks, and by one remove, to the *character's* distance/absence from the world of the speaker (the U.S.) and the world of the film. This accent is one that links Trinh herself, through her voice-over narration, to the actresses/characters in the film.
6. In Peckham, 35. For Peckham, "translation is a truer image of the interpenetration of textualities that occur in an individual" (35).

7. It has also been pointed out that the film does not directly address contemporary *Vietnamese* political issues either, including the invasion of Cambodia, the boat people, and their exploitation by pirates. The latter may indeed be alluded to by the slow motion, grainy black-and-white footage of people in boats that recurs throughout the film and is especially privileged by being placed near the beginning and the end. The ambiguous beauty of these images situates them in the realm of poetry (where they are undeniably powerful) but at the same time limits their ability to serve as references to specific political events.
8. This argument takes Rick Altman's concept of "ventriloquism" (synchronization's illusion that the image produces the sound) a step further (1980c). To quote Edward Branigan, in this film synchronization itself forms the foundation for "a staging of a documentary about *voices and bodies which are absent*" (my emphasis). At once we move into the realm of Metz's "imaginary signifier" where the essential cinematic illusion of presence signifies a profound absence. I would argue that Trinh rewrites this absence as a *political* absence—of the exile, of those left behind, and of the exclusion from historical consciousness of women's experience of both exile and abandonment. I am also indebted to Kaja Silverman for her provocative reading of the film's presentation of the body, raised in discussion at the Sound Symposium, Iowa City, April 1990.

10. The Sound of the Early Warner Brothers Cartoon

1. I would like to thank Rick Altman, Jennifer Barker, and Steve Wurtzler for their valuable comments on an earlier draft of this essay, and I would also like to extend my appreciation to Leith Adams of the Warner Bros. Archive at USC.
2. Warner Bros. Music Legal Files, Box No. 1110, Warner Bros. Archives, USC School of Cinema-Television, Los Angeles, CA.
3. This refers to the process of acquiring permission to use copyrighted material.
4. Memo from the Warner Bros. Music Legal Files, Box No. 1109.
5. This method is certainly not limited to animation. Ernst Lubitsch did the same thing for the wedding march at the beginning of *The Love Parade* (1929).
6. Charles Wolfe discusses the issue of vocal performance in the Vitaphone shorts at length in "On the Track of the Vitaphone Short."
7. Thanks to Bob Gitt of the UCLA Archives for this information.

11. Imaging the Sound(s) of Shakespeare

1. Techniques not discussed here, but which could preserve the sense of "centripetal" space, might include limiting sound-off during a shot but allowing sound bridges between shots, de-emphasizing non-diegetic and subjective sound, and using only sync sound.
2. Even though Henry is turned from us in this scene, the sound of his voice does not of necessity have to be any less direct than were he facing the camera. A different mike placement could lead to an entirely different effect. Also, recall that reverb and other sound qualities can be simulated, altered, or removed in postproduction. In this scene and others like it, Oliver, by design, matches a spatial proportion on the sound track to a visual space.
3. It should be noted that in writing this essay I listened to an unrestored version of *Macbeth*. UCLA Film Archives and The Folger Shakespeare Library, Washington, D.C., have recently released a restored version of the film. This "restoration"