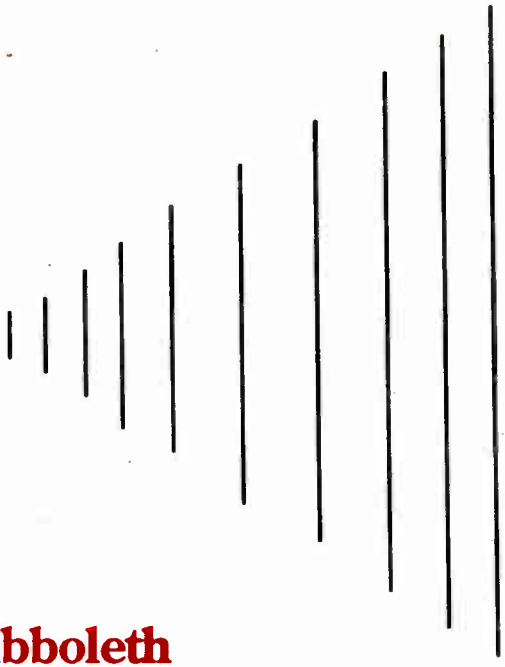
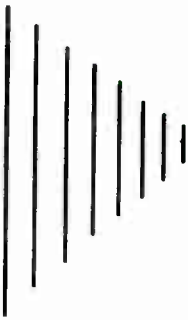
AM STEREO AND THE FCC

Case Study of a Marketplace Shibboleth





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AM STEREO AND THE FCC:

Case Study of a Marketplace Shibboleth

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Preface

The subject under investigation in this book is the Federal Communications Commission's decision making on technical standards for AM stereo. The AM stereo inquiry, which lasted from 1977 to 1982, should be at least generally familiar to anyone who has studied modern U.S. broadcast regulation. Various scholars have criticized the FCC's final 1982 decision on AM stereo as "a watershed in FCC technical thinking"; "a collective throwing up of hands"; "a textbook case in regulation impeding the development of technology"; "an FCC deregulatory breach of duty"; "a remarkably dubious way of making decisions" and a "bizarre species of technological Darwinism." Even some of the FCC Commissioners responsible for the decision have had serious doubts about the AM stereo inquiry. Consider these statements: Former Commissioner Joseph Fogarty admitted shortly after the 1982 final decision that "We botched up AM stereo." Recently, former Commissioner Abbott Washburn told me, "I think our Commission, today, if you go around and talk to them, they'd say, 'We made a mistake . . . that's one we muffed.'"

Of course, the AM stereo marketplace decision has its defenders also, most notably those who, like former Chairman Mark Fowler, see it as a "benchmark of the Commission's commitment to deregulation and its faith in the marketplace." In the end, regardless of the reader's predisposition about broadcast deregulation, this book on the AM stereo case offers readers an opportunity to judge for themselves the adequacy of this precedent-setting FCC inquiry and decision-making process. In addition, because the case investigates the sources of influence on regulation and

deregulation during both the Carter and the Reagan years, it provides a fascinating peek behind the scenes into a most remarkable period in U.S. regulatory history.

On a more personal level, I first became involved with AM stereo in 1984, while employed in commercial broadcasting for an AM/FM combo. As a radio station promotion director, I was given the daunting task of selling the AM stereo innovation to our listeners. Such promotional efforts were doomed to be conducted in a marketplace for which the adjective *confusing* would be an understatement. Our station happened to have adopted the Harris technology of AM stereo; later, it was forced by circumstances in Washington to switch to Motorola's C-Quam AM stereo system. Competing AM radio stations in our market area used other incompatible methods of broadcasting in stereo—or none at all. While I'm certain today that our station's AM stereo marketing spadework made not one iota of sense to the general public (in fact, in some ways we probably contributed to the public's confusion over AM stereo), my efforts were at least recognized by an award for AM stereo promotion from the National Association of Broadcasters in 1986. And yet this personal gratification in no way made up for the bitter taste of frustration felt by me and scores of others in the broadcast industry who were self-appointed "saviors" of AM radio. I must admit that my work on this book was driven by a desire to understand what had transpired to create what was, by then, commonly referred to in the industry simply as "the AM stereo mess." Several readers have commented that this research asks the right questions. For this, I take little credit; but I am in debt to the contributions of the following people who assisted in making this book what it is.

Thanks to editors Brenda Dervin, Lee B. Becker, the anonymous reviewers, and Joanne Palmer at Ablex Publishing. Special thanks to Donald R. Browne, David Rarick, Marshall Scott Poole, Daniel Wackman, Theodore Glasser, and Albert Tims. Thanks also to the present and former FCC Commissioners and FCC staff members, and sources in the industry who agreed to be interviewed. I wish to make special note of former FCC Commissioners Abbott Washburn and Anne Jones, who were both not only gracious but exceedingly forthright in their responses. Kudos to the employees at the FCC Dockets Reference Room; the FCC Library; the National Archives Repository in Suitland, Maryland; and the National Association of Broadcasters in Washington, D.C. Thanks to the Broadcast Education Association, especially to Kenneth Harwood, Douglas Boyd, and James Webster, and members of the Publications Committee; and to Christopher Sterling, whose work 20 years ago on the FCC and FM radio paved the way for books such as this. Thanks to the Telecommunications Policy Research Conference for recognizing my work on the AM stereo inquiry.

I appreciate the support of my colleagues and students at both Gustavus Adolphus College and the University of Minnesota, with special thanks to Gustavus Adolphus College for the faculty development grant that enabled me to devote an entire summer to revising this book. Sincere thanks also to Dr. Gwendoline Reid, for sponsoring the George Montgomery & Anna Florence Frizelle Reid Memorial Award fund that provided travel funding, and to the Department of Speech Communication, University of Minnesota, for providing additional underwriting in the form of a fellowship. I wish to acknowledge the contributions of George Shapiro, J. Vernon Jensen, Dean E. Hewes, Karlyn Kohrs Campbell, Richard Sykes, Robert L. Scott, and Patricia Palm-McGillen, all of whom know how they contributed to this research in special ways.

There are many friends, both in industry and academia, who labored through this with me, and whose expertise or encouragement were helpful. Special thanks to Todd Maass, Jan Loft, Robbin Crabtree, Judy Sims, Rebecca Lind, Christee Lucas, Dale Shannon, Jane Loeb, Bill Robertz, Sandy Frederick, Phil Voight, Eric Carlson, Florence Amamoto, Dick and Betty Painter, George Genz, Pete Steiner, and Doug Faust (and others whom I am surely overlooking, for which I am sorry).

I thank my parents, Jerry and Joanne Braun, and the rest of my family for their encouragement. I especially want to express my gratitude to my father-in-law, John Just, Sr., for providing both friendship and office space, and to "great grandma" Bunny Just, for sharing with us her extraordinary temperament.

This book is dedicated to my wife, Kristin, whose love and support has made a dream possible; and to Andrea, Elizabeth, Kimberly, and Michelle . . . "I'm a man who's rich in daughters."

CHAPTER 1

Technical Standards for Broadcasting in an Age of Deregulation

Introduction—"A Bold New Step"

In April 1980, the United States Federal Communications Commission (FCC) attempted to wrap up a three-year inquiry into the feasibility of authorizing stereophonic broadcasting for AM radio stations. Voting 4 to 2, the FCC designated as the national standard an AM stereo system developed by the Magnavox Corporation. This decision meant that all AM stereo radio receivers sold to consumers in the United States and all AM stereo broadcast transmitters sold to domestic radio stations, would operate on the technology developed by Magnavox. This action by the FCC should have simply closed the inquiry into AM stereophonic broadcasting. Since the beginnings of broadcast regulation in the 1920s, the federal government has consistently selected universal standards for broadcast electronics, although historically, FCC authorizations of new communications technologies have been accompanied by lengthy contests over which electronic system should be adopted. Some of these battles have been cutthroat—perhaps the most vicious took place in the late 1940s and early 1950s, as CBS and RCA fought for the color television standardization rights. Much more benign was the decision to adopt a combination of the G.E. and Zenith technologies as the *FM* stereo standard in the early 1960s. By the late 1970s and early 1980s, however, the winds of political change were already stirring up decades of regulatory tradition, creating uncertainty over the proper role of government in the establishment of technical standards.

Immediately after the FCC selection of the Magnavox AM stereo system was announced, broadcast industry opposition to the proposed standard

surfaced, forcing the Commission to reconsider its decision. A few months later, during the summer of 1980, the FCC mysteriously admitted that it was unable to defend the Magnavox selection and voted to reopen the decision-making process.

During the five year AM stereo inquiry, which spanned the years 1977 to 1982, the Commission was presented with a mass of testimony that eventually filled a 22-volume docket file. After first selecting the Magnavox system in 1980, and then reopening the inquiry under industry pressure, the FCC finally decided to simply *not* decide. On March 4, 1982, the FCC once again voted on AM stereophonic broadcasting. This time, rather than designate a single system, the FCC decided to grant *type-acceptance* to any system that met only minimal technical standards established to prevent interference. In other words, this decision purposely created a "marketplace" battle in which five different systems would fight to become the *de facto standard.* A new precedent had been set. No longer would the FCC promulgate technical standards. In what the Commission called a "bold new step" in the deregulated marketplace, consumers would decide which system or systems best fit their needs.

Many observers have been critical of the FCC action on AM stereo; and while it is estimated that there are now about 20 million AM stereo receivers in automobiles, the process to bring the technology to consumers has been largely unsuccessful. Although the Motorola C-QUAM system appears to have won the marketplace battle, numerous critics charge that AM stereo was irremediably slowed by the lack of a declared industry standard. Only about 16% of U.S. AM radio stations had adopted the innovation after nearly a decade in the nonstandardized marketplace (National Association of Broadcasters, 1990, p. 5). This slow diffusion pattern correlates with market research polls that indicate that consumer awareness of AM stereo is still extremely low. In February 1990, *Broadcasting* magazine stated:

> The continuing saga of AM stereo also will be a decision for some broadcasters to make [in the coming year]. . . . Implementation of the C-QUAM system developed by Motorola continues, but at an extremely slow pace, leaving Motorola now wishing that the FCC would set a standard. Leonard Kahn, Kahn Communications Inc., continues to lead the fight against C-QUAM with his rival single sideband system, even though no consumer radios are made to receive it. Slow sales prove that C-QUAM is a marketplace failure and that after current antitrust suits are settled, receivers for both systems will be available. ("On the Road," 1990, p. 65)

Of course, it is quite possible that AM stereo would not have made a major impact on listening patterns or consumer purchases even if the FCC had provided the surety afforded by the selection of a single national

standard. While neither the AM stereo technology nor the FCC decision in this case was crucial by itself, this new "marketplace" approach was subsequently applied to the authorization of other new technologies such as low-power television (LPTV), direct broadcast satellites (DBS), teletext, and—in a fashion—to television stereo. Consequently, the AM stereo decision is considered a "watershed in FCC technical thinking" (Sterling & Kittross, 1990, p. 527). The "marketplace" approach is now widely criticized as being deficient for the successful introduction of new broadcast technology, and it is feared that the FCC might follow this hands-off approach in authorizing new and advanced broadcast delivery systems. Throughout the 1980s many wondered if the FCC would utilize this unpopular and still unproven method in the development of U.S. standards for advanced or *high-definition television* (HDTV) and *digital audio broadcasting* (DAB). Until the 1988 FCC ruling that an HDTV terrestrial broadcast standard *would* be set, industry observers were anxious that a marketplace battle would doom this important new technology. The economic consequences of such an outcome would have been staggering. HDTV is predicted to be "one of the most important inventions of the 20th century," with far reaching implications in such areas as medical diagnosis and national defense ("How Fast," 1988, p. 77). According to testimony before the House Telecommunications Subcommittee, "HDTV has the potential of adding $150 billion to the U.S. gross national product over the next 20 years" ("America-firsters," 1988, p. 77). There was concern that if the United States did not proceed expeditiously with the adoption of standards, other countries—most notably Japan—would reap the profits of HDTV, leaving the United States at the starting gate. Initially, however, former FCC Chair Richard Wiley, head of the FCC Advisory Committee on Advanced Television Service, said that the question of standards for HDTV "must be determined by the marketplace," causing members of Congress to "express horror that so important a question could be approached so casually." Representative John Dingell, Chair of the parent House Energy and Commerce committee, replied that HDTV must be considered "of the utmost national importance in terms of our broad national technologies" ("John Dingell to," 1988, p. 77).

Regardless of the outcome of the HDTV standardization process, or the debates that will surely accompany the introduction of other new communications technologies such as digital audio broadcasting, there are still a variety of concerns about the appropriate province of government in setting standards for electronic technology. For this reason, prior to using the same procedure to facilitate the introduction of future technologies, a fuller understanding of the FCC decision-making process in choosing the "marketplace" method of AM stereo authorization is prudent. There are many unanswered questions about just how the Reagan FCC came to discard 50

years of standard setting precedent, embarking instead on the risky "marketplace" experiments that are said to have contributed to the sluggish diffusion of so many new broadcast technologies in the 1980s.

In addition to the applied interest in such a monograph, further study of these decisions is worthwhile because it can help to address significant issues concerning decision-making processes in administrative agencies in general. As Gandy (1982, p. 37) recognized in discussing administrative agencies and the policy process: "Policy making at the bureaucratic level is not as well studied as that at the legislative level, but it is no less important in terms of the allocation of resources." Because this book will address policy making processes at the bureaucratic level, it is hoped that it will contribute to the literature in this area.

From an organizational perspective, it has been noted that quasiexperimental "laboratory" research on group decision making necessarily leads to the exclusion of several important considerations in order to simplify the experimental process. Consequently, important intervening variables such as organizational power relationships, formal structure, personalities, goals of group members, the distortion of information, and, most importantly, the "many and varied pressures that exist within organizational systems" are all largely unstudied in the organizational literature (Conrad, 1990, p. 259; Rogers & Argawala-Rogers, 1976, pp. 122–123). Because this book will attempt to reconstruct aspects of organizational decision making as they occurred "in the field" as opposed to the laboratory, it is intended to convey some of the intricacies of these factors as they related to the FCC inquiry on AM stereo broadcasting.

For FCC-watchers, the fascinating AM stereo case has intrinsic historical interest. While most FCC rulemaking is notably tentative, and the agency's preference for incremental change is well documented, the five year AM stereo inquiry stands out as particularly tortuous. The serpentine route taken by the FCC in making the AM stereo decision is graphically outlined in this book. It is not commonly known, for instance, that the FCC had previously inquired into both AM stereo and TV stereo—and ruled against both innovations—when FM stereo was approved in 1961. The FCC could easily have introduced AM stereo technology much faster if it had simply proceeded with all-service stereo rulemaking in the early 1960s when it first inquired into AM, FM, and TV stereo (Rau, 1984, p. 18). And yet it seems unfair to condemn the FCC because its efforts to assist the struggling FM band by authorizing FM stereo in 1961 worked too well, resulting in FM becoming the dominant band by the mid-1970s. In fact, one could argue that the FCC is partially vindicated in that the AM stereo "marketplace" selection process *has* worked; a standard was produced in a relatively short period of time, despite what some describe as a retardation of the diffusion

process because of ongoing litigation between system proponents and radio manufacturers.

In the end, the central question prompted by the AM stereo case study is not "Did the FCC bungle AM stereo?" or "Will AM stereo eventually succeed or fail among consumers?" Rather, a more interesting and profitable question is "How can the decision-making process in the AM stereo case be better understood?" This is not another diffusion study about how the technology for AM stereo floundered in the marketplace because the FCC failed to establish technical standards. Instead, this is a book about the FCC and its internal workings. It is fitting, then, that the overall purpose of this book is to examine how and why the FCC reversed its 1980 Magnavox ruling and decided in 1982 not to designate a single technical standard for AM stereo. It is hoped that this book will provide answers to some of the questions still surrounding the controversy by probing into the FCC AM stereo decision-making process.

The Rationale for Standardization

The most basic issues that must be addressed before proceeding with the AM stereo case study revolve around questions concerning technical *standards,* more accurately called *standardized technical specifications.* Such questions shed light on the rationale for setting a standard, the potential benefits of clear technological standards—and, conversely, the risks involved in declaring such standards. Additionally, one must consider the relative roles of government and industry in the setting of standards, and the function of the marketplace in the absence of clear standards.

Actually, we are surrounded by "standards" in our everyday lives, and have become conditioned to the conveniences afforded by technological standardization. Economist David Hemenway (1975), in his book *Industry-wide Voluntary Product Standards,* pointed out the pervasiveness of standards in our society and outlined several different types of standards. One reason for standardization is *uniformity.* Hemenway asks the reader to imagine if railroad cars wouldn't fit on tracks from coast to coast because some tracks were constructed two feet wider than others. Railway cars from one company or region would need to be placed atop flatbed cars designed to the local standard—a costly and wasteful exercise. For this and similar reasons, we have established uniformity standards not only for railroad tracks, but for an endless list of products, including screw threads, record players, beds, electric light sockets and light bulbs, traffic lights, and even aluminum beverage cans.

A second type of standard is the *quality* standard, for which some governing body usually a sets minimum level of quality, accompanied by

the division of products into grades. Common examples of this second type of standard include United States Department of Agriculture (USDA) grading and Food and Drug Administration (FDA) standards (Hemenway, 1975, pp. 8–9). Other "quality" standards are set by nongovernmental bodies such as Underwriters Laboratory (UL) and the Consumers Union of the United States, publisher of *Consumer Reports* magazine (pp. 53, 87).

A third reason for standardization is *interchangeability*. When you buy a role of 35mm camera film, you know that it will work in your camera, regardless of what company manufactured either the film or the camera, because photography equipment and photographic film sizes are standardized. Likewise, when purchasing a compact digital disc or audio cassette tape, you expect that it will work in any equipped stereo system, because a standard evolved for those innovations. These standards serve the function of interchangeability (Hemenway, 1975, pp. 8, 34).

Yet most of us have also experienced situations in which consumer products did not fit together because of a lack of standardization. In nonregulated industries, such as the personal computer industry or the nonbroadcast consumer electronics industry, there is no centralized body that prescribes a single standard to be used by all manufacturers. This is why two different brands of computers might run on noninterchangeable disk operating systems, and why both Beta and VHS videotape recording were introduced for consumer use.

In the business of broadcasting, however, things tend to become more complex because of the addition of federal regulation, regulators, and national telecommunication policy goals. Some argue that it is the federal government's responsibility to see that broadcast equipment is interchangeable in order to promote the efficient use of the publicly owned airwaves. This argument carried the day for the first 50 years of broadcast regulation in the United States. More recently, some free-market economists have held that when government governs least, it governs best. This canon would tend to preclude government "interference" in matters that proponents argue are best decided by private industry and the free hand of the capitalist economic system. The problem lies largely in the public's expectation of radio and television receiver interchangeability.

There are several compelling reasons for standardizing electronic communication systems and, more specifically, the technology of electronic mass media. A vivid illustration of the need for international standardization was outlined in the 1960s by supporters of a single worldwide standard for aiport control communications. Proponents of the standard constructed a worst-case scenario in which an airplane equipped with state-of-the-art microwave landing gear is faced with making an emergency landing at a foreign airport. In this hypothetical illustration, the airport is equipped with a microwave communication system for the landing gear control, and the

pilot cannot talk to the control tower. Imagine the risk involved if the microwave communication system of the airport did not match that of the airplane involved ("Air Traffic," 1965).

Admittedly, telecommunications standardization is not a life-or-death situation for most of us, but consider the inconvenience of turning on your car radio while driving cross-country and finding that many of the radio stations could not be tuned in because they operated on a different transmission system than your car stereo was designed to receive. Envision moving from one city to another and discovering that your television set no longer received a picture, because the TV stations in your new city broadcast with several different transmission modes, none of which your brand of TV could pick up. Picture your frustration with buying a new telephone and then discovering that it couldn't work with the phone lines leading into your house, or with the computer system used by the local telephone company. Because federal communications policy has precluded such chaotic circumstances, the examples perhaps seem farfetched. Nonetheless, they illustrate the basic reason for technical standardization in telecommunications. Put in the most simple terms, standards "make the pieces of the puzzle fit together." FCC Commissioner Abbott Washburn, in dissenting from the 1982 AM stereo "marketplace" decision, presented the following illustration:

> I dissent to the majority's decision which denies the request of the AM broadcasting and manufacturing industry for authorization of a single AM stereo system. My fellow Commissioners have, instead, stepped aside and turned the destiny of this service over to the marketplace.
>
> I differ with them in assessing the consequences of multiple systems being offered to the public versus a single, nationwide system. The competing systems are technically incompatible. This means that in a given geographical area you might have two or three different stations broadcasting in AM stereo but using different systems, so the listener would have to have multiple radio sets in order to receive them.
>
> . . . Will the public accept these inconveniences and added costs, when they can already receive a universal FM stereo signal that is at least as good as AM stereo would be?
>
> . . . I submit that this type of marketplace referendum is not the way to make an informed choice. . . . It is a proper function of government to lay down the guidelines for a single system that will result in AM Stereo in every home at the lowest cost consistent with technical excellence and quality reception. (Washburn, 1982, p. 1)

Lacking uniform standards, an attempt to make the electronic "connection" between a station's transmitter and the radio or television receivers in a telecommunication system would be like trying to fit a Beta videotape into

a VHS player, or trying to make your computer run the "wrong" program language. Both would be impossible—or at least difficult without a relatively complex conversion process.

Potential Benefits and Risks of Technical Standards. Product standardization affords a measure of "insurance" to both manufacturers and buyers, in that the users of the technology receive a kind of guarantee that the product will fit into the marketplace, thereby increasing the chance of successful diffusion. In fact, the acceleration of the adoption process is a primary advantage of setting a technological standard. Other advantages include reducing the risk that the consumers will be left with obsolete products, lessening the hazards for companies wishing to enter a market by lowering R&D or production costs, decreasing the likelihood of product obsolescence, and increasing international market competitiveness (Rosen, Schnaars, & Shani, 1988). Such factors provided the rationale for the establishment of voluntary standard-setting industry organizations such as the SAE (Society of Automobile Engineers), the ASTM (American Society for Testing and Materials), and the IEEE (Institute of Electrical Electronics Engineers). Of course, the ramifications of standard setting do not stop at national borders. Crane (1979), using the French SECAM color TV system as a case study, demonstrated how an entire industry can be created by the establishment of a standard (see also Sterling & Kittross, 1990, p. 526). Crane's book suggests not only that technical standards can be used as a tool for economic development, but that at the international level, both cultural and nationalistic factors serve as sources of influence on the standard-setting process.

One peril associated with technical standards is that a "wrong" decision might be made (Barrow, et al., 1957; Laurence, 1968; Sterling & Kittross, 1990). A notorious example in U.S. broadcast history is the 1945 FM frequency shift. Perhaps even more infamous is the 1950 FCC adoption of the CBS "mechanical color wheel" television standard, which was later reversed in favor of the superior RCA electronic color system. And yet, despite the fear that a "bad" decision necessarily results in an inferior standard, Sterling (1982) asserted that there have been few broadcast or related industry cases where the risks of making a poor choice are dramatic in either direction.

Another potential risk of designating a standard is the eventual obsolescence of the ordained system as new technologies are developed (Hemenway, 1975; Brenton, 1987). Countless hard shellac 78 rpm records are stored away in basements and attics, and in recent years audiophiles have been heard to lament over the eventual obsolescence of vast LP record collections in this age of DAT and compact disc technologies. Perhaps we are on the verge of witnessing yet another outdated technology slide into obsolescence

as advanced television delivery systems wait in the wings, ready to brush aside the 50-year-old NTSC television standard, despite FCC plans for compatible standards and—at least temporarily—simulcast signals.

Government and Industry Roles. As mentioned earlier, opinons differ regarding the proper roles of government and industry in setting technical standards for broadcast apparatus. How was the Federal Radio Commission (FRC), and later the FCC, given the authority to mandate technical standards for broadcast equipment? The answer to this question lies in the historical development of manufacturing industry standards during World War I, and in the broadcaster's use of electronic spectrum space, which in the United States is considered public property. Of course the federal government did not always concern itself with technical standard setting in broadcasting. Prior to the first world war, the central issue in radio was one of patent control, and the U.S. government was more concerned with whether a proposed development was unique than whether it represented a potential standard for the emerging broadcast industry (Klopfenstein & Sedman, 1990). Thus the government was not in the business of saying that one invention was better than another and should therefore be used by everyone. However, during the war there was a general change in the country's industrial environment, prompted in part by the emergence of government-mandated standards for American manufacturing industries. During World War I, the U.S. War Industries Board sought the standardization of many consumer products. The government hoped to reduce wasteful excesses in the variety of goods produced in order to conserve materials and industrial output for the war effort. It is reported that conservation orders issued by the Board managed to cut the number of washing machine models produced in the U.S. from 445 to just 18, and reduced by 5,500 the number of styles of rubber footwear. Herbert Hoover, who served as president of the Federated American Engineering Societies in 1921, was impressed by the efforts of the War Board and subsequently promoted studies of waste in private industry. The result of such studies was a report that stimulated industry groups to voluntarily organize and create standards. Upon his appointment as Commerce Secretary, Hoover established a "Division of Simplified Practice" (Hemenway, 1975, pp. 22–23).

Of course, students of broadcast regulatory history are well acquainted with Hoover's efforts in the 1920s to bring some semblance of order to the chaotic state of broadcasting through voluntary industrywide "Radio Conferences" and later through federal government regulation of the airwaves. One of the duties assigned to the new Federal Radio Commission was to insure compatibility of both transmission and reception technologies in broadcasting. These duties were later awarded to the FCC as part of the Communications Act of 1934. It can be argued that the growing sentiment

favoring industrial standardization during the 1920s, coupled with Hoover's enthusiasm for the trend, at least indirectly contributed to the Federal Radio Commission being assigned the task of setting standards for the telecommunications industries. Under the trusteeship model, because the public owns the airwaves and since broadcasters hold a license to use the public's airwaves, broadcast technology is subject to the rules of the Federal Communications Commission. According to the authority vested in the FRC and transferred to the FCC in the Communications Act of 1934, when a new communication service requires the use of a portion of the electromagnetic spectrum the FCC is charged with assigning what band of frequencies the service will occupy. So, for instance, by FCC decree, AM radio stations are assigned spectrum space within a band of medium-range frequencies. Similarly, FM and television channels were placed in the very high frequency (VHF) or ultra high frequency (UHF) range of the spectrum by the FCC. Within these ranges, specific stations are licensed to use specific carrier frequencies.

Beyond this well-known assignment and allocation function of the FCC, a role of the Commission that is not as widely known is its mandate to decide on technical standards for each broadcast service in order to minimize interference. In order to prevent the chaos prevalent prior to radio regulation in the 1920s, the FCC has devised a set of technical standards for all broadcast transmission and reception equipment in each service; AM, FM, monochrome and color TV, telephone, and so on. Sterling (1982, p. 138) suggested that until the deregulatory 1980s, there was little reason to question the status quo:

> For decades, the Commission's role was clear-cut; industry developed potentially competitive standards for a given spectrum-using service and then, under FCC guidance, comparatively tested them. Based upon the results of that testing, the FCC would then decide which transmission standard best served the public interest by providing a new or modified service of the greatest quality to the most people at the least cost.

One might well ask why broadcasting is different from other consumer electronics industries, in that new broadcast technologies have traditionally benefitted from government-mandated standards while countless other electronic innovations are allowed to flounder in a confusing standardless marketplace. One important difference is that nonregulated technologies, such as personal computers or video equipment, are marketed directly to the consumer market by the manufacturer. In the case of regulated technologies, however, the FCC acts as a trustee on behalf of the public, and therefore manufacturers don't present their technology to the consumers, but rather to the Commission (Klopfenstein & Sedman, 1990, pp.

174–175). In the AM stereo marketplace ruling, it was the intention of the FCC to allow the consumers (in this case, probably not the general public, but rather the radio stations that would transmit in stereo, thus "consuming" the technology) to make the selection from among the competing systems. In any event, this case represents a dramatic break from the past, because consumers have been conditioned to expect that all U.S. broadcast stations will use standardized transmission technologies.

Marketplace Standardization. Of course setting a standard by government proclamation is not the only way to achieve the desired end result. Not only can standards be decreed by a government agency or industry body, they can also be "selected" by the marketplace. This is especially true in markets for electronic services that do not require the use of electromagnetic spectrum space—and thus are exempt from FCC regulation. In these cases, standards still somehow manage to emerge. A classic example of product standards that were winnowed from the ranks of competing technologies is the development of early sound recording devices. Recall how, around the turn of the century, Edison's cylinder-based phonograph and the disc-based technologies of the Gramophone and Victrola competed for consumer acceptance. Eventually the superior disc format emerged as the de facto standard. This standardization process has been accomplished in nonbroadcast markets time and time again without government oversight or interference. Even today, the consumer is asked to make choices between competing electronics technologies. A recent example is the public's ultimate acceptance of the VHS videotape format. While not ruled out by the FCC or any other standard-setting body, the competing Sony Beta format became less popular with video consumers for a variety of reasons, and was gradually phased out of consumer markets. Although Beta is still widely used in professional applications such as electronic news gathering, the VHS format emerged as the consumer's preferred standard via the marketplace standardization process. Nonetheless, this is an extremely time-consuming and imperfect methodology for selecting a standard. As Hemenway stressed:

> The fact that standardization generally requires conscious collective action may mean that there is no automatic *market* mechanism to insure the creation of beneficial standards. . . . The point to be made is that the difficulties of many independent, autonomous decision makers in agreeing on a course of action—even one beneficial to all—is an order above, say, those internal problems a firm has in trying to make rational choices. (1975, p. 16)

Thus, for 50 years, it has been commonly accepted that the unregulated marketplace could not efficiently select standards for apparatus to be used

on the publicly owned airwaves. Further, because industry self-regulation could not achieve the same ends due to antitrust laws and the competitive nature of the capitalist economic system, the United States has depended on federal regulation of the technical aspects of the telecommunication system since the 1920s.

Before leaving this general discussion of standards, it might be helpful to view the theoretical conception of standardization put forth by M.E. Brenton (1987) of British Telecom, who observed that standards can be regarded in two different ways. On one hand, standards can be legislated to "codify established practice" and "assure reasonable quality." The alternative view holds that "standards should define the direction of future development." The first view requires that a standard be issued only after the technology has been tried and tested in the field, and the innovation has been proven to be practical. Brenton admits that while this approach is more stabile because it ensures the wide acceptability of the standard, it is a slow process and can be expensive in terms of wasted investment in prestandard equipment. In addition, Brenton warns that this approach may not work in a field of rapidly changing technology because the standard can quickly become obsolete. In addition, there is the risk that during the evolutionary period a system may gain such dominance in the marketplace that it becomes a de facto standard, which, according to Brenton, may result in long-run disadvantages to both consumers and industry. These risks notwithstanding, under the first conception of standard setting the objective of the standard should be to protect the interests of both suppliers and users.

The other side of Brenton's conceptualization holds that "standards should define the direction of future development." This model would demand that only limited constraints be applied early enough to allow technical compatibility, without stifling product improvement. Thus, consumers would make a choice based only upon factors such as cost, quality, and specific product features, without having to judge competing systems based upon their technical design. A variation of this approach was seen in the early 1940s, when the FCC was considering television standards. It was decided to allow RCA to market its television system with the proviso that consumers must be made aware that the final standard had not yet been set, and that the technology employed was approved only on a temporary basis. The danger of this approach is that without full-scale testing procedures, unsound technologies may be introduced to the marketplace. Further, the shakedown period in the marketplace may result in even longer time delays before an "ultimate" standard emerges. Conversely, the early "limited constraints" intended to ensure compatibility might actually serve to discourage further innovation.

It can be readily seen from this discussion that the setting of technical

standards is, and always has been, a rather tenuous endeavor, in which the only certainty is—uncertainty.

LITERATURE REVIEW

Commentary on AM Stereo

There is only a small body of research that deals specifically with AM stereophonic broadcasting and the corollaries of FCC marketplace decision. Most of the commentary on this particular decision and the decision-making process has been critical. For instance, even before the final 1982 FCC decision in favor of the marketplace approach, Jeffrey S. Close of the National Telecommunication and Information Administration (NTIA) remarked that "the Commission has done a very poor job on AM stereo. . . . By not specifying exactly what tests the Commission wanted, the [industry submitted] data was not useful" (1981, p. 106). Shortly after the final marketplace decision, Christopher Sterling addressed the FCC's declining role in setting technical standards:

> On the surface, the decision appeared to be a collective throwing up of hands, as the Commission staff admitted its inability to make a clear-cut choice among the systems, all of which were compatible with existing AM technology. In fact, however, the AM stereo decision was a benchmark in the Commission's approach to regulation of changing technology. Throughout the four-and-a-half-years of the complex AM stereo proceeding, a constantly recurring issue has been the proper role of the FCC in a time of dramatic technical, economic, and political change. (1982, p. 137)

Sterling's insight is especially valuable because he served as a special assistant to FCC Commissioner Anne P. Jones from 1980 to 1982, the period in which both the Magnavox and the marketplace AM stereo votes were taken. In addition to Sterling's criticism of the AM stereo decision, Diamond, Sandler, and Mueller (1983) wrote:

> the Commission's efforts to bring AM stereo into the marketplace have been a textbook case in regulation impeding the development of technology, and in the disharmony/harmony that often develops between the regulator and the regulated. . . . The blame lies not only with the Commission, whose track record is marked with indecision and reversals, but also with the industry, which hoped to avoid risky decisions in the marketplace by having the FCC set its technical standard. . . . [Reagan FCC chief Mark] Fowler has pointed to the AM stereo decision as a benchmark of the Commission's commitment to deregulation and its faith in the marketplace. However . . . the lesson may

> have been summed up best by one broadcasting executive who said, The FCC has never been adept in dealing with new technologies. I'm not sure it ever will be either . . . that is rather troubling when you consider what is yet to come with the more complex new media technologies. (pp. 25–26)

Tunstall's study of communications deregulation, which focused primarily on the decade from 1975 to 1985 and particularly on the first term of Ronald Reagan, noted that the FCC had refrained from standard setting in dealing with AM stereo, DBS, and teletext. Tunstall remarked that "this is a remarkably dubious way of making decisions, and the effect may be yet to leave the United States entirely out of some new technologies. No decision at all is the ultimate in perverse regulatory behavior; in some cases almost any decision would be more welcome than none." Likening the marketplace route toward standardization to a contest that called for the survival of the fittest, Tunstall termed the FCC actions a "bizarre species of technological Darwinism" (1986, pp. 6, 255).

Beyond this criticism of the AM stereo decision-making process, it has been charged that the final result was flawed. Meyer (1984) argued in a law review article for clear technical standards as a requisite to the successful diffusion of broadcast innovations, and concluded that the AM stereo ruling was an "FCC deregulatory breach of duty." Citing case law (*FCC v. RCA Communications, Inc.,* 1953; *RCA v. United States,* 1951), Meyer charged that the FCC decision to permit incompatible AM stereo systems to compete in the market violated its mandate to consider the economic impact of its decisions in order to better regulate in the public interest. Another law review article criticized the FCC action on AM stereo and pointed out several anticipated failings of the marketplace approach, including the negative effect of antitrust laws, time lags in the diffusion process, increased costs to consumers, and the irreconcilability of the competing needs of manufacturers, broadcasters, and radio station listeners (Schreiber, 1983).

In addition to legal inquiry, the AM stereo standardization process has been the subject of diffusion theory research. Klopfenstein and Sedman (1990) criticized the marketplace approach to setting technical standards for AM stereo, concluding that "the failure of AM stereo technology to diffuse in the absence of a clear technical standard is evidence that a laissez faire approach to setting technical standards does not produce the marketplace efficiencies its proponents claim" (p. 190). Huff (1987, 1989) detailed the marketplace battle that started in 1982 and is still, technically, continuing today, concluding that, while the marketplace battle succeeded in eliminating three of the five proposed systems, generally "the marketplace proved to be inefficient in achieving the primary goal of the Commission—filtering out an AM stereo standard" (1987, p. 161). Huff argued that in the

first seven years of the marketplace contest, AM stereo "appeared at times to be losing its luster and appeal to many in the broadcast industry" (1989, p. 28).

Finally, Brotman (1987, pp. 329–331) suggested the importance of Commissioner Abbott Washburn's dissenting statement to the AM stereo *Report and Order*. Brotman contended that "the complexity of communications policy issues, particularly those dealing with deregulation, frequently generates forceful dissenting statements that can lend insight into the reasoning behind a particular decision." Brotman offered Washburn's AM stereo dissent as one of two such examples, and both the dissent and the former Commissioner's personal reflections will be discussed as part of this FCC case study.

Broadcast Deregulation. At the dawn of the deregulatory era in broadcasting, Emery discussed conflicting viewpoints on the extent of FCC powers and traced the history of administrative and legislative actions which have contributed to its organizational structure. He commented that "these vast [communications] industries are so vital to the security and well-being of our people, it is unthinkable that they could be carried on effectively without some governmental regulation" (1971, p. 6). Of course, communications regulation has undergone vast change since the early 1970s. Much of the more recent commentary on the Federal Communications Commission has centered on how well or how poorly the streamlined FCC has performed its duties. Several texts deal specifically with telecommunications deregulation and the hands-off approach to broadcast regulation taken by FCC Chair Mark Fowler during the Reagan administration. The literature on deregulation is briefly reviewed here, because the AM stereo controversy must be understood in the context of the general movement toward deregulation common to many industries and administrative agencies in the 1970s and 1980s. The trend toward reduced government intervention in private sectors was evident in banking and securities, transportation—including airline and trucking—and the deregulation of several other previously heavily regulated industries. Along with this general trend toward deregulation was a parallel movement in telecommunications. This tendency was most clearly evident in FCC matters relating to the break-up of AT&T and the deregulation of broadcasting. There can be no doubt that, with the Reagan mandate, during the early 1980s the ideological bent of the FCC changed dramatically, an issue which, because it corresponded with the FCC's reversed stance on AM stereo, will be dealt with in greater detail in later chapters.

Of course, in all of the discussion of deregulation that will follow, it is important to separate the conservative deregulatory agenda of the Reagan administration from that of the previous, more liberal Carter administra-

tion. While it is true that deregulation started in the Nixon administration under FCC Chairman Richard Wiley, it picked up steam under Charles Ferris during the Carter years. Certainly Ferris supervised far-reaching changes in the regulatory pattern of U.S. communications: the break-up of AT&T and its entrance into the computer and information service arenas; the deregulation of cable television and satellite earth stations; advances or proposals in direct broadcast satellite, subscription television, and multipoint distribution services; movement toward low-power television and the expansion of the VHS television market; the addition of more AM radio stations through the breakdown of clear channels, and finally the proposed reduction in channel spacing from 10 khz to 9 khz ("The Laissez Faire," 1981). Yet it must be remembered that Ferris fostered these changes as part of the liberal agenda. He advocated a less tightly regulated telecommunications marketplace on behalf of American consumers. His motivation was to create more diversity in the marketplace by increasing the number of voices in the TV, radio, cable, telephone, and satellite markets. Contrast the liberal-consumerist agenda with that of the conservative Reaganites, whose interest in communications deregulation during the 1980s was grounded in reducing regulation for the benefit of industry.

At the beginning of his first term, Ronald Reagan appointed three new members to the then seven-member Commission, all of whom were philosophically compatible with his administration's conservative-deregulatory policies. Foremost among the Reagan appointees in broadcast matters was the new FCC Chairman Mark Fowler, who called the FCC "the last of the New Deal dinosaurs" and promised that the agency would be transformed into a model of "speed and efficiency." An important law journal treatise by Fowler and his legal assistant Daniel Brenner (1982), "A Marketplace Approach to Broadcast Regulation," provides insight into Fowler's assessment of regulation and deregulation and the ideology of the Reagan era. A speech given by Fowler (1981) shortly after his appointment and confirmation sheds further light on Fowler's goal of reducing the "intrusive" nature of broadcast regulation without betraying the public interest touchstone. Yet another Fowler address (1986) argued for his view of "unregulation," and stated that "the key to this change is a commitment and belief in competition. This type of deregulation is not abdication. . . . More is at stake in this debate than merely satisfying the aspirations of the local Adam Smith Society." A version of this speech was later expanded upon by Fowler and two FCC staffers for publication in the *Federal Communications Law Journal* (Fowler, Halprin, & Schlichting, 1986). This series of articles and speeches spanning several years demonstrates that Fowler's views on deregulation were certainly not confined to the AM stereo issue, but were both general and enduring.

Also related to the FCC's handling of the AM stereo docket are political,

legal, and critical economic analyses, especially as they relate to the role of broadcast deregulation in the introduction of new technologies. Historically, new broadcast technologies are viewed as a threat by existing services, and the FCC often seems to favor the status quo (Mosco, 1979). At least one scholar concluded that the broadcast deregulation movement has reached an impasse, with the legislative branch refusing to "release the Commission from its obligation to regulate American broadcast services, while the agency refused to discharge this obligation with any more diligence or dedication than that absolutely required by law" (Le Duc, 1987, pp. 29–30). Much of the interaction in the AM stereo case appears to have some link to political motivation. Horwitz (1983, p. 275) argued that because deregulation was not a bureaucratic response to economic changes, it represented "a *political* change" (emphasis in original). Havick (1983) offered a model for government intervention in market imperfections. He reported on the part played by politics in the formation of communications policy, and addressed the role of elections and special interest groups, along with those of the legislative, judicial, and executive branches. An entire chapter (Starling, 1983) is devoted to technological innovation. Also from a political perspective, Krasnow, Longley, and Terry constructed a systems approach to broadcast regulation analysis, and identified six "recurring participants" in the broadcast regulatory process—the FCC, the White House, the courts, citizens' groups, regulated industries, and Congress; and argued that "the key to understanding the politics of broadcast regulation lies in simultaneously analyzing the individual participants and their interactions" (1982, p. 134). Krasnow et al. concluded that participants seek conflicting goals from the process; that they have limited resources, insufficient to continually dominate the policy-making process; that they have unequal strengths in the struggle for control or influence; that the component subgroups of participant groups do not automatically agree on policy options; that the process tends toward policy progression by small or incremental steps rather than massive change; that legal and ideological symbols play a significant role in the process; and, finally, that the process is usually characterized by mutual accommodation among the participants. Carmode (1986) discussed the limitations of the Krasnow et al. model as it applied to the FCC inquiry into low-power, class D, student-run FM radio stations, while Haeryon (1990) addressed the model's limitations as seen in relation to broadcast deregulation and the domestic direct broadcast satellite (DBS) inquiry of 1979–1982. Haeryon concluded that while the Krasnow, Longley, and Terry model allowed for the description of policy making by the FCC, it could not sufficiently explain these processes. Haeryon further suggested that studying broadcast deregulation necessitates reclaiming the FCC as the analytical focal point.

Of course the FCC is faced with many different types of choice

situations. Sometimes the job of the FCC is to make policy or create "law" in a sort of legislative role. At other times, the Commission is faced with simply carrying out previously set policy in its business as an administrative agency. In this role, the FCC still acts as the "traffic cop of the airwaves" envisioned by some framers of the 1927 Radio Act. Often the FCC is faced with making decisions that involve passing judgment on a licensee or a specific proposal. In this function, the FCC is more like a court of law than a legislative body or a police force. Naturally, this mix of judicial, legislative, and executive roles is not peculiar to the FCC. It has been said that combining "executive, quasi-judicial, and judicial functions in a single agency is, in fact, a common characteristic of, and difficulty for, all regulatory commissions" (Krasnow et al., 1982, p. 33). Still, as Gandy perceived:

> the regulatory commissions engage in a curious brand of policy making, in that most combine administrative, legislative, and judicial functions within a single bureaucratic agency. The Federal Communications Commission (FCC) engages in rule making that results in a series of regulations with the rule of law. Entitites whose activities fall under the jurisdiction of the Commission may be fined for activities in conflict with those regulations. Questions of fact and interpretation are decided by administrative law judges within the context of hearings, not unlike those before state and federal courts. (1982, p. 37)

Early in the FCC's history, the courts spelled out the difference between the Commission's legislative and judicial functions. When an action is legislative, "it is making a new rule to be applied in the future, not applying an already existing rule to past facts" (*American Tel. & Tel. Co. v. United States,* 1936). Conversely, even before the FCC was created, the United States Supreme Court had held that a regulatory commission's action is considered *judicial* in nature if the inquiry "investigates, declares and enforces liabilities as they stand on present or past facts and under laws supposed already to exist. That is its purpose and end" (*Prentice v. Atlantic Coast Line,* 1908; see also *Keller v. Potomac Electric Co.,* 1922). From this distinction it can be clearly seen that the role of the FCC in technical standard setting falls chiefly under the legislative function of a regulatory agency, in that it changes existing conditions by making a new rule or policy.

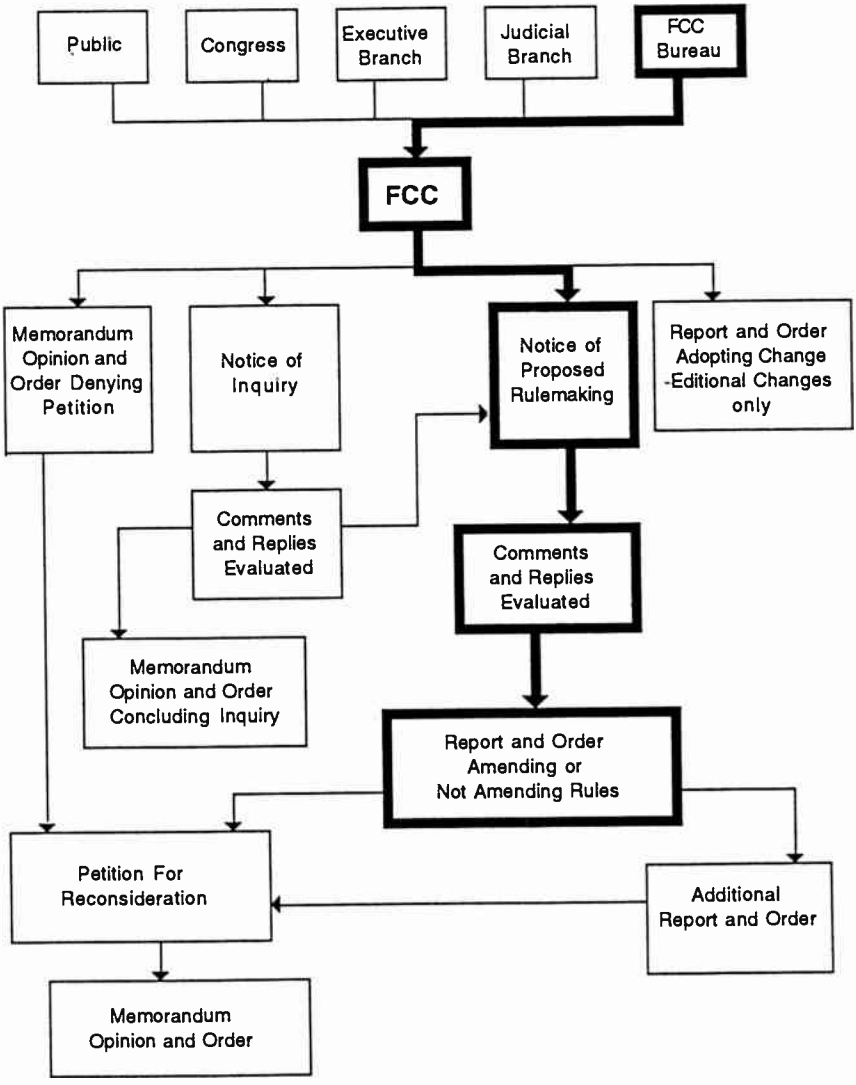
Ellmore described four stages normally followed in U.S. administrative agencies' procedures for this legislative "rulemaking" function: (a) investigating, (b) making tentative rules, (c) testing these rules, and (d) the final rulemaking (1982, p. 9). The first stage, to investigate or study the problem that has come to the agency's attention, is initiated with the understanding

that the issue may or may not require rulemaking. This stage can include hearings, consultations, or conferences. If this stage includes hearings, they are usually either investigatory or designed to permit persons who may not normally have access to the later stages to come forward with evidence or testimony. The reason for such early hearings is not to conduct a trial, but rather simply to inform the administrative agency, and to protect the public against uninformed or rash action. Ellmore notes that such hearings may contain an adversarial element, and that "hearings of this type may be held by administrative choice, as in the case of some proceedings of the Federal Communications Commission, or because of statutory requirements, as in the case of the Food and Drug Administration" (p. 10).

In any case, whatever method is used to conduct this initial inquiry, whether by eliciting written statements, by hearings, conferences, or investigation, all administrative agencies in the U.S. federal system engage in complex and extended studies of various problems, and both the proposed rules and adopted (substantive) rules must be published in the *Federal Register.* The rules of practice and procedure followed by the FCC are found in Part 1 of the FCC Rules and Regulations. Subpart C details rulemaking proceedings (Ellmore, 1982, p. 10, 52). All four of these stages are evidenced in Figure 1-1, which depicts the FCC's own flowchart of how FCC rules are made.

In Figure 1-1, the bold lines show what the FCC calls the "most common procedure," while the thin lines indicate "optional procedures." As this figure illustrates, the most common procedure is for an FCC Bureau Office to initiate the rulemaking proceedings. As an optional procedure, a *Notice of Inquiry* by which an investigation is initiated is sometimes adopted first. This optional pattern is analogous to the first stage described by Ellmore, investigation. As the flowchart indicates, however, normally the FCC goes straight to the adoption of a *Notice of Proposed Rulemaking,* which is followed by a comment and reply period. This Notice would be analogous to the second stage described by Ellmore, tentative rules. The period for comments and replies to be evaluated would be similar to the third stage described by Ellmore, testing of these rules, while the FCC *"Report and Order amending or not amending rules"* is described as the fourth stage, final rulemaking.

The FCC flowchart indicates that the "most common procedure" followed by the Commission deviates from the general pattern followed by U.S. administrative agencies in at least one important way: it would appear that the FCC commonly passes over the first two steps—the *Notice of Inquiry* and the first period for comment and reply evaluation—and instead moves directly to the third stage, that of proposed rulemaking. As later chapters will indicate, this was not the case with the AM stereo docket, in



Source: FCC Communicator (September, 1975).

Figure 1-1. Flowchart of FCC Rulemaking

which a *Note of Inquiry* was issued nearly three years before the Commission voted in favor of Magnavox, and ordered the staff to prepare a *Report and Order.*

Rulemaking as an "Adjudicatory" Function. Thus far, we have mainly addressed FCC technical standard rulemaking as legislative in nature. Typically, FCC analyses differentiate between the Commission's rulemaking and adjudication processes. For instance, Head and Sterling state that rulemaking functions are said to generate "the large body of administrative law called FCC *rules and regulations,*" while adjudicatory procedures "settle specific disputes" (1990, pp. 423–425). However, the distinction between these adjudicatory and legislative functions is not clear-cut, and what Krasnow, Longley, and Terry have called the quasi judicial role of the FCC can be seen in its rulemaking activities.

An interesting argument for a less than clear-cut distinction between these two FCC functions is offered by Kurt Borchardt (1970, p. 117, footnote), who discerned that "in the broader sense, rule-making proceedings designed to distribute tasks and opportunities are adjudicatory proceedings." In such proceedings, the contending parties are usually given opportunities to present arguments and evidence in support of their positions, and the government organizations are expected to decide the outcome "in accordance with some general rules or principles, even though these may be exceedingly indefinite." Borchardt says that while the degree of formality is usually greatest in court proceedings, independent regulatory commissions are less formal when they make rules applicable to tasks or opportunities among several groups whose membership changes, and they are more formal when the rulemaking involves two specific contending parties. In less formal procedures, while there may be a formal written record, experts are usually not cross-examined and "supplemental information secured informally from representatives of the contending groups" can be considered. However, in those situations (such as the AM stereo case to be presented in the following chapters) that require more formal types of adjudicatory proceedings because they involve "a few specifically identified companies that advance mutually exclusive schemes . . . relevant technical information must be presented for a formal record by experts . . . and the regulatory commissions are limited to considering the formal record" (Borchardt, 1970, p. 122).

Another consideration for the regulating agency is to decide what priority should be given to a particular proceeding in relation to others, and in light of this priority, what financial and personnel resources must be made available. Borchardt asserts that in the case of proceedings concerned with highly technical problems, organizations such as the FCC may seek assistance from external sources because of the scarcity of in-house

technical experts. Krasnow, Longley, and Terry agree, stating that throughout the FCC's history, it has been forced to rely on outside advice and technical opinion because it has lacked sufficient funds and skilled internal personnel to weigh the merits of new technology (1982, p. 24). Quite often organizations outside the FCC, such as the National Television System Committee (NTSC), the Radio Manufacturers Association (RMA), the Joint Television Advisory Committee (JTAC), and the Electronic Industries Association (EIA), volunteer, or in some cases committees are formed specifically to conduct tests for the FCC. In the AM stereo case, many of these same groups provided such help. In fact, two years before the FCC adopted the AM stereo Notice of Inquiry, on September 24, 1975, the EIA, the National Association of Broadcasters (NAB), the National Radio Broadcasters Association (NRBA), and the Broadcasting Cable and Consumer Electronics Society of the Institute of Electrical and Electronics Engineers (BCCE) all united to sponsor the "National AM Stereophonic Radio Committee," to be known as the NAMSRC. The goal of this committee was to evaluate and test various AM stereo systems, and eventually to report results of its findings to the FCC for possible rulemaking. The role of the NAMSRC will be explored more fully in the next two chapters.

Finally, Borchardt says that the distribution of opportunities deals with the question "who gets what and how," which is an eminently political question. While it is commonly accepted that "elected political bodies and elected political officials in deciding political questions rely extensively on negotiating and bargaining procedures," it is not equally accepted that such decisions remain essentially political conflicts when they are:

> delegated to executive departments or independent regulatory commissions to be decided in accordance with such general standards as "the public interest." In other words, the political nature of these conflicts remains, in spite of frequent expectations that such conflicts "should" be decided "objectively" by neutral experts or technicians in accordance with principles of law and economics. (Borchardt, 1970, pp. 125–126)

Borchardt is correct in asserting that it is only realistic to expect independent regulatory agencies to resort to bargaining procedures and informal negotiating. This is consistent with Krasnow et al.'s assertion (1982, pp. 19–21) that "the regulation of American broadcasting is no less controversial today than it was during the unsettled 1920s and 1930s. . . . Seldom can the FCC attempt to frame regulations without becoming entangled in this political thicket." They also maintain that the making of public policy in the area of technological innovation goes far beyond simply resolving technical questions; that technical issues frequently disguise what

are really economic interests vying to take over some market in broadcasting, and that for this reason the politics of broadcasting is present in both social and technical controversies (p. 24). Krasnow et al. provide examples of this, pointing to FM broadcasting, VHF and UHF television, color TV, cable, direct broadcast satellite, multipoint distribution services (MDS and MMDS), and "other new or modified services." This point is further illustrated on an international scale by Crane's (1979) examination of France's attempts to create an industry in the case of color TV standards.

This literature overview has so far addressed works specific to the study of AM stereo, deregulation in broadcasting, and the FCC from historical, legal, political, and economic perspectives. Let us now briefly turn to literature on organization and decision-making theory that informed this research.

Organizational and Group Decision-Making Literature

One piece that seems to bridge the gap between the topic of broadcast regulation and the more general fields of group process and decision theory and policy analysis is Park's (1973) "multiviewpoint" case study of the role of analysis in cable television regulatory policy formation. Park asserts that the Commissioners did not have "the time, the inclination, or the training" to actually read the dockets before them. In addition, although it was presumed that the Commissioners at least read the report summaries and conclusions, Park argued that their main impressions of the analyses were picked up from trade magazines (especially *Broadcasting* and *Television Digest*) and from internal staff summaries and briefings. It was said that:

> staff members, like the Commissioners, have too many other concerns and too little time to do detailed evaluations. Thus the FCC Commissioners are left with a good picture of *who* did the major studies and *what* their most important conclusions were, but with little understanding of *how* (or how well) the studies were done. (Park, 1973, pp. 75–76; emphasis in original)

Park's conclusion should come as no surprise because, of course, much of the analysis of the issues facing the FCC or any regulatory body has to be done at the staff level. From an organizational perspective, one of the functions of personnel who are in direct contact with information from the external environment is to absorb uncertainty (March & Simon, 1958, p. 165). This uncertainty absorption is seen as a byproduct of the process of summarizing and editing large amounts of information (such as, in this case, the FCC staff summaries of the voluminous AM stereo docket). Beyond just analyzing the data, however, certain staff members have an even greater role; Krasnow et al. observed that "since hundreds of decisions

must be made daily by the FCC, the formulation as well as the implementation of policy is frequently delegated to the Commission's middle-level staff" (1982, p. 37).

Central to this book are questions concerning the adequacy of the decision-making process that the FCC used to evaluate the AM stereo proposals. Decision makers tend to *satisfice;* that is, to select a least disruptive alternative (Simon, 1957; see also Perrow, 1986, p. 122). The principle of satisficing seems to apply in most administrative decision making because of limitations both on the amount of information available to the participants in the decision-making process, and on their interests (Moren, 1968). The more complex the decision, and the larger its scope, the tougher it is to try to set up a strategy that will optimize (Gouran, 1982), although extremely rational models and similar approaches often are based on unrealistic assumptions that cannot realistically be satisfied anyway (Braybrooke & Lindblom, 1963). Thus, optimizing strategies may simply be an idealization of the decision-making process. In acknowledging that most decisions are the product of suboptimizing strategies, one should not condone carelessness or superficiality, nor does this imply that such decisions are necessarily of poor quality. Rather, one should recognize that groups will approach the ideal in some situations, while in other contexts a group may reach the "best decision possible under the circumstances" (Gouran, 1982, p. 7). The AM stereo *Report and Order* in 1982 has strong overtones indicating such a resignation to outside influences.

Related to this concept of satisficing, Janis and Mann coined the phrases *optimizing* and *suboptimizing* to classify two strategies by which people or groups arrive at decisions (1977, pp. 21–24). According to this typology, an optimizing decision strategy is based on an overriding concern with making the best possible decision, while a process based on a suboptimizing strategy is more likely to settle on decisions that will work reasonably well or seem justified.

Leadership, Conflict, and Ideology. The role of the FCC Chairman seemed to be a key influence in both the 1980 and the 1982 AM stereo decisions. Specifically, this book will comment upon the role of leadership on the AM stereo decisions, especially the parts played by Charles Ferris in the reversal of the 1980 decision, and by his successor Mark Fowler in the 1982 marketplace decision. Krasnow et al. stated that, "unlike the heads of most regulatory commissions, the Chairman of the FCC has little formal 'extra' power. . . . The Chairman is more than first among equals" (1982, pp. 43–44). However, it is widely accepted that a leader or senior executive can adroitly manage an agenda "to nudge the day-to-day decision-making system, thus simultaneously imparting new preferences and testing new

initiatives" (Peters, 1978, p. 22). Accordingly, even if there is not additional formal power, the FCC chair can exercise informal power in several ways.

If an organizational chair wields extra formal or informal power, how is this clout communicated to others in the organization? Several organizational theorists have addressed how powerful figures get their ideas implemented; how they get the assumptions underlying those solutions embedded in the "thinking, feeling, and behavior of the group" (Schein, 1985, p. 223). One important communicative function of leadership has been termed the ability to *articulate a vision* (Bennis, 1983). The leader is partly an actor, who manipulates symbols in order to be associated with successes and to remain distant from failures (Pfeffer, 1978, p. 30). True leaders manage the evolution of the organizational mission by listening to and guiding others. They watch for opportunities to make key interventions, and to summon ideas, values, and images into meaning (Morgan, 1986, p. 176). This *symbolic power* allows leaders to shape their surroundings. Morgan concentrated on three aspects of symbolic leadership: the use of imagery, theater, and gamesmanship. Peters called this *tool* the use of "the dominating value" and said that if it is effectively handled, it can generate substantial, sustained energy even in institutions that are quite large. Peters also noted that Andrew Pettigrew spoke of the leader as a "symbol creator, an ideologue, a formulator of organizational vocabularies, and a maker of ritual and myth," while Louis Pondy equated leadership effectiveness with the achievement of "language renewal" (Peters, 1978, p. 18).

Strong ideology has two effects on the power distribution in organizations. First of all, when the "system of ideology" is strong, the systems of expertise, authority, and politics are usually weak. Secondly, strong ideology has a leveling effect on power. In other words, differences between the status of members are diminished—there are only those who accept the ideology, versus those who do not accept it (Mintzberg, 1983, pp. 161–162). Additionally, Morgan argued that the issue of ideology is not given the attention that it deserves, and that in using metaphor to understand organizations:

> a strong case can be made for the idea that the metaphor of "organization as ideology" should be developed in its own right. This would require that we attempt to understand how organizational life reflects a process of *power-based reality construction,* and to trace how people become trapped by ideas that serve specific sets of interests (1986, p. 366) (emphasis in original).

The concept of ideology will surface later in this book, when we examine the sources of political influence on the FCC decision-making process.

In many ways, the AM stereo story is also one of intra-organizational

conflict. At the time of the tentative 1980 decision to go with the Magnavox system as the single national standard there were intense disagreements between various FCC staff offices. In 1980, the FCC Office of Science and Technology (OST) was pushing for a single AM stereo standard, while both the Broadcast Bureau (BCB) and the Office of Plans and Policy (OPP) favored the new, untested marketplace approach. This case study will outline how, just days before the Commission's April 1980 decision date, an ad hoc committee headed by Larry Middlekamp, chief of the research division of the OST's research and analysis branch, negotiated the Magnavox recommendation, which prevailed in a 4 to 2 vote. When the selection of the Magnavox system as the technical standard came under attack, and the OST was unable to justify the recommendation, each group returned to its original position. This book will unveil the fascinating manner in which the various factions jockeyed for position in the AM stereo contest. In terms of the organizational literature, it is known that the bargaining arena can act as a model for exploring influence strategies, arguments, and persuasive messages in conflict situation (Putnam & Poole, 1987, p. 587). Additionally, the concepts of coalition formation, deviance and conformity, and interpersonal power (Crosbie, 1975) can inform an analysis of the ad hoc FCC committee, and other less than formal alliances.

In sum, a complex skein of factors influence policy makers in general, and those who set federal communications policy are certainly not exempt from such influences. The FCC inquiry into AM stereo, which was undertaken between 1977 and 1982, coincided with a period of remarkable change in broadcast regulatory policy. Because of this, the "normal" and expected web of political, legal, and economic factors that has typically influenced the standard-setting process became further enmeshed in the powerful rhetorics of shifting ideology. Perhaps above all, the fascinating case of the AM stereo inquiry illustrates the profound difficulties faced by federal regulators when ideology and the public interest collide.

Preview of Chapters

Chapter 2 will establish the historical context for the case study, first touching briefly upon the formation of standard setting as an engineering function of the FRC and FCC. We can then turn our attention to the history of AM stereo as a technology, focusing on the early development of AM stereo and the FCC consideration of all-service (AM, FM, and TV) stereo around 1960, the AM broadcast industry's renewed interest in AM stereo in the mid-1970s, and the events that led up to the FCC adopting a *Notice of Inquiry* that opened the AM stereo investigation in 1977.

Chapter 3 will spotlight the FCC AM stereo authorization decision-making process, moving chronologically from 1976 through 1990. The bulk of this chapter centers on the period from 1977 to 1982, during which time

the FCC AM stereo docket was open. This chapter will present primary evidence from the docket, and portions of transcripts from participant interviews that will be used to examine the FCC AM stereo authorization process. Specifically, the period from 1975 to 1979 saw renewed interest in AM stereo, petitions for FCC rulemaking, the issuance of the *Notice of Inquiry* in 1977, and the collection of formal comments from system proponents and other interested parties. The year 1980 was marked by the tentative Magnavox selection, the strong negative reaction by the broadcast industry, and the adoption of a *Further Notice of Proposed Rulemaking,* which in effect overturned the earlier Magnavox vote and reopened the docket for comments. The year 1981 saw the nomination of four FCC Commissioners by newly inaugurated President Ronald Reagan, including Chairman Mark Fowler. In 1982, the FCC decided not to set a single AM stereo standard but to leave the determination to the marketplace. From 1982 to 1992, the marketplace struggled to produce a de facto standard, apparently settling on the Motorola C-QUAM system. In late 1993, the FCC responded to a Congressional mandate and officially designated C-QUAM as the U.S. AM stereo standard (FCC says, 1993).

Finally, Chapter 4 will offer an analysis of the case, and Chapter 5 will provide a discussion of conclusions that can be drawn from the AM stereo case study, including a proposal for revisions in the existing structure of FCC technological policy making.

CHAPTER 2

Historical Context

> Technology does not spring forth in full regalia, like Minerva from the head of Zeus, armed to do battle for good or evil. Rather, technology is called into existence by a particular set of historical circumstances that shape and define the technology.
>
> Jennifer Daryl Slack (1984, p. 1).

Regulatory Foundation for Standard Setting

The history of telegraphy is marked by both international and national regulation, based on the belief that government supervision—or some other collective form of direction—is necessary to maintain the integrity and efficiency of the communication systems. Because the general history of broadcast regulation has been thoroughly discussed in several books, the events that led to the regulation of broadcasting in the United States will not be repeated in detail here (see Schmeckebier, 1932; White, 1947; Lichty, 1975; McMahon, 1979; Krasnow et al., 1982; Sterling & Kittross, 1990). It must be remembered, however, that like broadcasting, broadcast policy making is a relatively recent phenomena. Prior to 1927 there was almost no government control of broadcasting in the United States. The Radio Acts of 1910 and 1912 gave some control to the Commerce Department, but in 1926 a federal district court ruling in the *United States v. Zenith* case stripped the Commerce Secretary of the power to impose penalties in order to regulate broadcasting. This resulted in a continued state of chaos that was not corrected until the following year, when the 1927 Radio Act was passed, creating the Federal Radio Commission.

Although the House and Senate differed sharply as to the proper scope of authority for the Federal Radio Commission, and members were said to be confused by radio terms and technical matters, the problem was surmounted by turning over the entire mess to the new agency it was creating. An important part of the 1927 Radio Act required that the FRC:

> from time to time, as public convenience, or necessity requires, shall . . . regulate the kind of apparatus to be used with respect to its external effects and the purity and sharpness of the emissions from each station and from the apparatus therein. (44 Stat. 1162, 1927, Section 4 [e]).

Accordingly, except for an early geographic-balance provision, and the prohibition of FRC censorship, "the Commission was given 'carte blanche' to do whatever it felt the 'public interest' required relative to the licensing and regulation of broadcasting" (McMahon, 1979, p. 38), including the power to establish technical standards for broadcast apparatus. The original makeup of the Commission befit these technical duties, as six of the seven members of the Commission during its formative years had experience in "some phases of broadcasting, engineering, programming, or equipment manufacture" (Lichty, 1975, p. 623). Unlike later FCC appointments, which have largely been awarded to men and women with legal backgrounds and/or government or political service, most of the original FRC members were broadcast "experts" appointed for the task of establishing technical standards and controls for broadcasting.

The first priority of the Commission "was devoted almost exclusively to cleaning up the broadcast situation" (FRC, 1927, p. 1). From 1928 to 1934, the major efforts of the FRC were toward this end. As McMahon noted:

> The Commission was required to form a smooth and integrated national engineering picture out of the jig-saw pieces that already happened to exist, and that had come into being as the result of economic rather than engineering factors. Whatever its other failings may have been, the newly formed and precariously maintained Commission did not lack courage or energy. It immediately began to follow up the "broad powers" concept of its enabling legislation by beginning to establish standards in specific cases . . . indeed, in establishing certain of these standards, the Commission may have gone somewhat beyond the powers with which it had been provided. (1979, pp. 42–43)

Llewellyn White (1947, pp. 126–127) called the period from 1927 to 1932 the "cleanup period," and while about 10 percent of the Commission's decisions were appealed to the courts, clearly the FRC made a diligent attempt to work out the "detailed standards" that were called for in the 1927 Radio Act. An Institute for Government Research service monongraph

prepared by the Brookings Institution in 1932 estimated that "while the frequencies used in broadcasting represent little more than four per cent of all usable frequencies, the control of broadcasting requires probably 50 per cent of the time of the Commission" (Schmeckebier, 1932, p. 42).

While the 1927 Act had authorized the employment of necessary technical experts, a formal engineering division was not part of the organizational structure of the FRC until August 1928. Prior to that time, the FRC had borrowed the services of radio engineers from other departments within the federal government. Even with this engineering division, there was a need to provide leadership and coordination in the engineering efforts at the FRC. While the March 4, 1929 FRC Extension Act (45 Stat. L., 1559) recognized the legal needs of the Commission, and provided for the appointment of a General Counsel at $10,000 per year, and up to three assistants at $7,500 per year there was still no position of Chief Engineer. By July 1, 1929, the FRC staff had reached 80 persons—not counting the Commissioners and their secretaries—an increase of 59 people over the year before (Schmeckebier, 1932, p. 33).

The Congressional Act that permanently vested licensing power in the Commission instead of in the Commerce Department was finally passed on December 18, 1929. This important legislation also provided for a better organization of the FRC engineering tasks by authorizing the position of a Chief Engineer at an annual salary of $10,000, and two assistants to the Chief Engineer at $7,500 each. The reason for this increased emphasis was summed up in the 1932 service monograph, which pointed out that:

> as many of the problems growing out of the control of radio communication involve technical and scientific questions it is necessary for the Commission to have an engineering staff to analyze and study the conditions, and to present the facts to the Commission as a basis for formal action. (Schmeckebier, 1932, p. 66)

The relative value of expert engineering to the FRC is evident in the September 12, 1931, Federal Radio Commission budget, which provided for only the five Commissioners, the Legal Division's General Counsel, and the Engineering Division's Chief Engineer to be paid at the Commission's highest salary level of $10,000. The growing emphasis on engineering matters is also reflected in the total *salary* budget of $84,040 for the Engineering Division, which by 1931 employed 26 persons. This figure amounted to about 22.3 percent of the total FRC salary schedule of $376,960, and 19.5 percent of the total expenditures of just over $431,000 for the FRC in 1931. (These calculations are extrapolated from tables in Schmeckebier, 1932, pp. 69–73, 108.)

A glimpse into the kinds of engineering tasks performed in the FRC is

found in several sections of the 1932 Institute for Government Research service monograph. The chapter on activities of the Commission stated that "the activities of the Federal Radio Commission fall into two fields, (1) the licensing and regulation of domestic radio transmission, and (2) the protection of interests of the United States in the international field." The description of the Engineering Division declared that it:

> consists of the Office of Chief Engineer, who supervises the work of the three sections which handle the details, namely, the Broadcasting Section, the Commercial Communications Section, and the International and Interdepartmental Relations Section. . . . Within its field of operations each of these sections is responsible for the technical examination of all applications to insure that the frequencies, power, and time conform to the regulations and policy of the Commission. Each section presents expert testimony before the Commission when needed, prepares drafts of technical regulations, and makes studies looking for the better use of the facilities available. . . . The personnel of the Engineering Division consists of a Chief Engineer, two assistant chief engineers, and 23 other employees. (Schmeckebier, 1932, pp. 66–67)

Another example of the work of early FRC engineers can be found in the Government service monograph's Appendix 6, titled "Information to be Submitted by Applicants For Licenses." This section states that:

> In order to pass judgment on the applications for licenses the Commission must have before it a considerable amount of detailed information. Some of the information which must be submitted is specifically required by statute, and some is necessary in order to determine whether the proposed station meets the statutory requirement of "public interest, convenience, or necessity." . . . Some of the technical details which must be submitted are specified in the law, but some are required under the broad general powers conferred on the Commission. The technological details will necessarily vary from time to time as new devices are used, and new problems must be solved. (Schmeckebier, 1932, p. 109)

In 1933, newly elected President Franklin Roosevelt asked Commerce Secretary Daniel C. Roper to conduct an inquiry into the organization of broadcast regulation. The Roper Committee report was issued in January 1934 and recommended that the communication regulatory functions of the Federal Radio Commission, the Interstate Commerce Commission, the Postmaster General, and the President be consolidated into a centralized regulatory body. Propelled by this report, and by a nagging dissatisfaction with the existing structure of communications regulation, in 1934 Congress

passed the Communications Act, which established a new seven-member Federal Communications Commission.

While there were several changes in the structure of communications regulation resulting from the Act of 1934, much of the wording in the new law that related specifically to broadcasting was taken directly from the 1927 Radio Act. The most notable new provision of the Communications Act of 1934 was that the Federal Communications Commission was vested with many of the powers formerly held by the Commerce Secretary. Under the "Provisions Relating to Radio" in Title III of the 1934 Act, the FCC was again expressly directed by Congress to regulate such technical matters as transmitting apparatus (48 Stat. 1082, 1934, at 303 [g]). In fact, the phrases used in Section 303 of the 1934 Communications Act were borrowed almost word for word from Section 4 of the 1927 Radio Act. The FCC was thus allowed to "regulate the kind of apparatus to be used with respect to its external effects and the purity and sharpness of the emissions from each station and from the apparatus therein" (303 [e]). Consequently, the day-to-day engineering supervision functions of the FRC were carried over into the activities of the new FCC created by the Communications Act of 1934.

This brief history of the origins of the technical regulation of U.S. broadcasting leads to two conclusions: that Congress invested in the FRC—and later in the FCC—broad authority to shape broadcasting while upholding the "public interest, convenience, and necessity"; and that even from its earliest days, the FRC and the subsequent FCC recognized the need to establish and regulate technical standards for the broadcast industry. To accomplish these ends, the U.S. government considered it a proper and necessary function of the FRC to operate an Engineering Division and to standardize and regulate virtually all aspects of radio engineering in order to maintain order in the technical aspects of the nation's system of broadcast transmitting apparatus. However, in more recent years, the FCC has failed to maintain its engineering capacity, as will be seen in the next chapter.

Additionally, it must be understood that the selection of a single standard for new broadcast technology was consistent with FCC practice since the early days of broadcast regulation in the United States. Sterling and Kittross (1990, p. 526) called the role of the FCC in testing, enforcing, and determining standards for broadcast technologies "consistent and essential," noting that this role, which was at times reluctantly carried out by the FCC, grew out of the limited technological knowledge about radio transmission when the Radio Act of 1927 and the Communications Act of 1934 were drawn up. They observe that in the 1980s, however, under Chairman Mark Fowler, "this role of the Commission as a national technical overseer was strongly questioned for the first time," first with the elimination of radiotelephone operator's licenses, and next with the AM stereo decision

and a wave of similar decisions which followed (pp. 536–527). But what are the "rules" if any, that the FCC has established either explicitly or implicitly through tradition and past practice? We will turn now to an examination of the decision-making technology of the FCC, especially as it relates to the role of the Commission in the introduction of new technologies or product improvements.

Organization and Decision-Making Structure of the FCC. The original structural organization of the FCC was patterned after that of the Interstate Commerce Commission (41 Stat. 492, 493; 1887). Following the broad directions of Congress, the newly established FCC established three divisions; broadcast, telegraph, and telephone. Each division consisted of two Commissioners, with the Chairman of the FCC being an ex officio third member of each division (1 FCC Report, 1934, p. 3). By 1937, however, the FCC grew displeased with this compartmentalized structure, and since the 1934 Act allowed the FCC to set its own organizational configuration, the Commission unanimously voted to abolish these three divisions, and "assumed full responsibility for all their functions" (4 FCC Report, 1937, p. 41). After this, the Commission acted as a unit in regulatory matters relating to the three industries, with each Commissioner having an equal voice. Despite this large-scale organizational shift at the top, the staff level organization set up in 1934 was not changed in 1937, but continued in a departmentalized fashion. The Secretary's office was responsible for record keeping; the General Counsel's office handled legal matters, investigations, complaints and applications; while the Accounting, Statistical, and Tariff Department was under the supervision of the Chief Accountant. The Engineering Department, under the charge of the Chief Engineer, did the FCC technical work, which included "research on radio propagation, the installation, operation, and maintenance of radio equipment, and such matters as the preparation and presentation of expert testimony at hearings conducted by the Commission" (Emery, 1971, pp. 57–58).

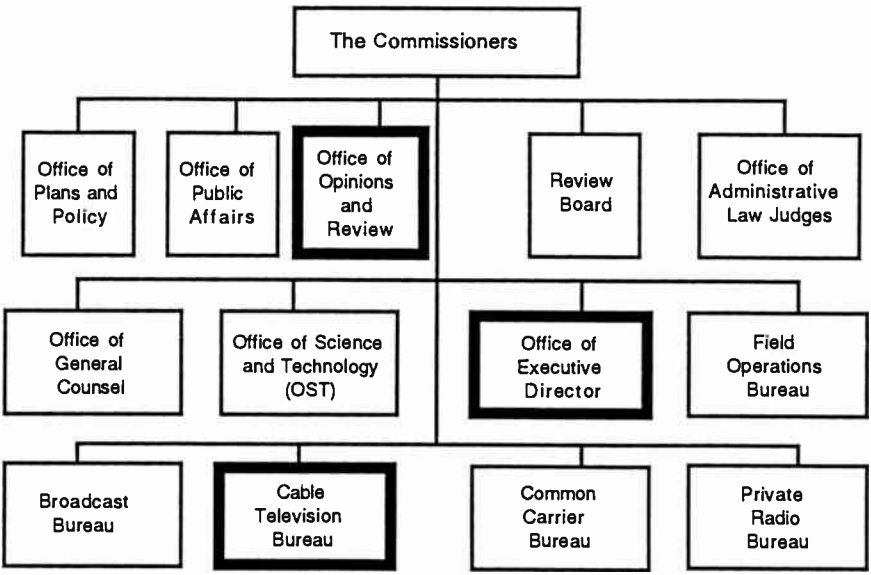
This departmentalized framework was used by the FCC from 1934 until the mid-1940s, when the postwar work load increase forced a reexamination of the Commission's structure. In August 1945, the wartime director of the Foreign Broadcast Intelligence Service, Charles S. Hyneman, was reassigned to study the organizational options of the FCC. Hyneman recommended that one of two options be taken: firstly, the FCC staff could be organized according to specialized knowledge or skill, a tactic that would ensure full disclosure and investigation but that might prove inefficient; or, secondly, the FCC staff could be organized according to the industry to be regulated, a more efficient plan, but one that might encourage conscious or unconscious intimate relationships between the regulated and the regulators, which might prejudice FCC decisions. In 1949, the Hoover Commis-

sion on Independent Regulatory Commissions recommended that agencies such as the FCC, whose staffs were structured around professional duties (legal, engineering, accounting, and so on) be reorganized on a functional basis (similar to Hyneman's second option). In 1951, Congress became involved directly, when the Senate Committee on Interstate and Foreign Commerce recommended that the 1934 Act be amended to provide for, among other things, a functional organizational blueprint with the Chairman taking administrative responsibility (Emery, 1971, pp. 58–59). The Committee report to Congree said in part:

> in the committee's opinion one of the most important [portions] of the entire bill here recommended, is subsection (b) which would reorganize the Commission into a functional organization . . . the Commission has been organized into three principal bureaus—Engineering, Accounting, and Legal . . . Whether or not this system is responsible, the fact remains that the Commission's backlog of cases has continued to mount. . . . Hearings rarely get out in less than two years . . . the three bureaus have become self-contained and independent little kingdoms, each jealously guarding its own field of operations and able to exercise almost dictatorial control (97 Congressional Record 658; Sen. Rep. No. 44, 82nd Congress, 1st Session, 25 January, 1951)

Subsequent to this investigation, Congress amended Section 5 of the Communications Act, requiring the FCC to organize into "integrated bureaus, to function on the basis of the Commission's principal work load" with each bureau including personnel from the various professional divisions (Emery, 1971, pp. 60–61). In 1961, President Kennedy syggested a second plan for reorganization, which would have given the FCC Chairman greater power to delegate responsibility to individual Commissioners, FCC panels, and staff members. The House defeated the plan 323 to 77, perhaps reflecting the unpopularity of Chairman Newton Minow's "Vast Wasteland" speech delivered five weeks earlier ("Did Minow Scuttle," 1961). Today the functional arrangement established in the early 1950s is still in place, although in the period between the 1980 AM stereo Magnavox decision and the 1982 "marketplace" *Report and Order,* the organization of the FCC underwent an important change. In 1980, at the time of the Magnavox decision, the Commission was organized as reflected in Figure 2-1, which shows the now outdated FCC organizational chart.

Reagan-era Reorganization of the FCC. On September 17, 1981, shortly after Mark Fowler came on board as FCC Chair, the FCC asked Congress to amend the Communications Act allowing the ad hoc creation of "integrated bureaus . . . as the Commission may determine to be necessary to perform its functions." The FCC argued that the reason for the



Note: the three darkened boxes indicate offices which were eliminated or dramatically changed in the FCC reorganization.

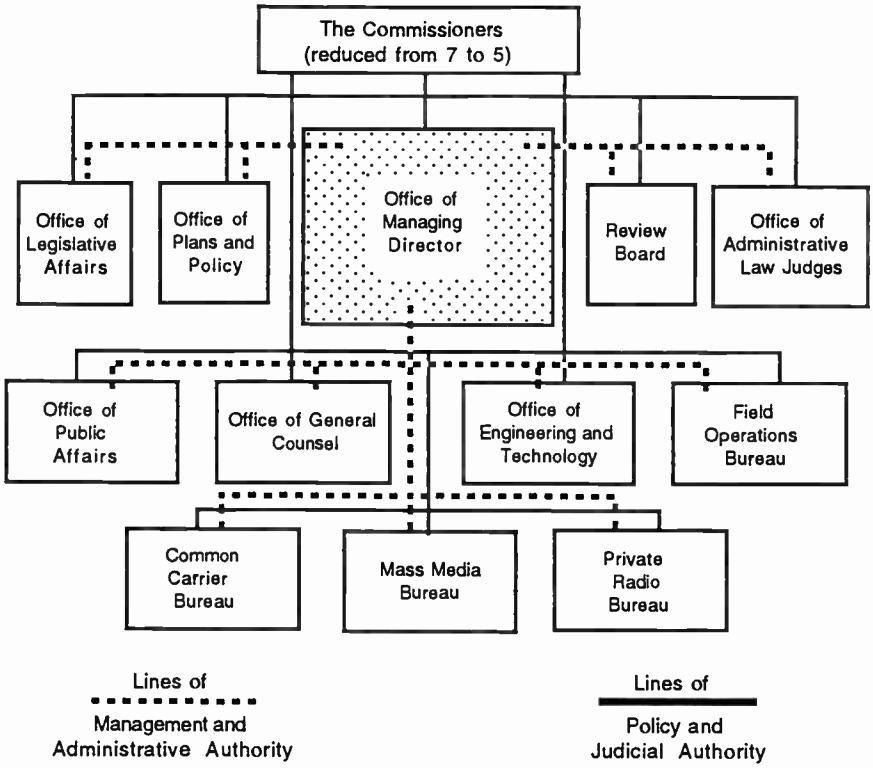
Source: The Politics of Broadcast Regulation (3rd. ed.), by Krasnow, E.G., Longley, L.D. & Terry, H.A. (1982). Copyright © 1982. Reprinted with permission of St. Martin's Press, Inc.

Figure 2-1 Organization of the FCC in 1980

amendment was to "permit reorganization of the Commission staff to account for alterations in the nature and distribution of the agency's regulatory responsibilities (*FCC Legislative,* 1981, pp. 15-16). Krasnow et al. stated that,

> by fiscal year 1982, the Commission, like other federal agencies, was reacting to the impact of Reagan administration budget cuts. The Office of Opinions and Review was abolished, and the number of positions in other bureaus and offices slightly reduced. At the direction of Congress, the FCC eliminated the Office of Executive Director and created a more powerful Office of Managing Director through which the offices and bureaus reported to the Commissioners. Additional changes to streamline the Commission, including elimination or consolidation of bureaus, were under consideration (1982, p. 36)

The results of these structural changes can be seen in Figure 2-2, which illustrates the current FCC organizational chart. The reorganization differentiated between "lines of policy and judicial authority" and "lines of



Source: FCC, *Information Seeker's Guide,* 1989, p. 4.

Figure 2-2 Reorganized FCC

management and administrative authority," another change necessitated by the inclusion of the powerful Office of Managing Director.

A History of the AM Stereo Technology

This second part of the chapter laying the historical groundwork for the case study will chronicle a history of AM stereo, focusing on the development of the technology. It will be seen that while AM stereo and FM stereo evolved contemporaneously, for a variety of reasons the FCC authorized only FM stereo in 1961, rejecting stereophonic broadcasting for both AM radio and television. With the rising popularity of FM radio in the 1970s, the AM broadcast industry expressed renewed interest in AM stereo. This chapter ends with an account of events leading up to the FCC adoption of a *Notice of Inquiry* into AM stereo in 1977.

Like nearly all technological inventions, stereophonic sound and stereo broadcasting were developed over a number of years by a number of researchers. It must be understood from the outset that the technology for AM stereo is considered "more difficult" than that of FM stereo—because of the relatively narrow spectrum occupied by AM stations compared to FM's generous 200 kHz channel (Head & Sterling, 1990, p. 136). Additionally, the ability to broadcast AM radio signals in stereo was not, as might be supposed, developed in the 1970s. In a speech at the National Association of Broadcasters' convention in 1975, Emil Torick of CBS Laboratories described how AM stereo was actually "invented" as far back as 1925. In that year WPAY radio in New Haven, Connecticut, broadcast one channel of sound on one AM frequency while a second AM frequency carried the other channel ("Developments in AM," 1975). There were several additional attempts at stereophonic broadcasting over the next three decades, but as with the New Haven experiment, all of these methods of broadcasting required two transmitters and could be thus described not as true "stereo," but more accurately as various AM-AM, AM-FM, FM-FM, or TV-FM combinations (Sunier, 1960; FCC 77-445, 1977; Graham, 1979). Still, the problem with such arrangements included wasted spectrum space, and the fact that listeners to just one of the radio station "channels" only got half of the sound (Sterling & Kittross, 1990).

In spite of this early technological capability and some developmental testing for crude systems of AM stereo, the real story of the AM stereo broadcast *authorization* process began in the 1950s. In that decade, both the broadcast and the recording industries worked to develop standards for true "stereophonic" technologies. Throughout the decade, several record companies experimented with various forms of stereo recording, and by January 1959 the Record Industry Association of American (RIAA) had adopted recording industry standards for stereo ("Stereo Record Standards," 1959). Experiments in two-station stereo broadcasting were also revived in the 1950s. These broadcasts usually consisted of live music, since few stereo recordings—even on tape—were made until the end of the decade, when the RIAA standards were set. In 1952, WQXR, the *New York Times*-owned station, tried two-station stereo broadcasting, this time with AM for the right channel and FM for the left. In 1954, Boston's WCRB began this type of stereo broadcasting for four hours per week, and by 1959, the station was AM-FM stereocasting for 40 hours per week. NBC's *Bell Telephone Hour* was broadcast in stereo in 1958 on the four network-owned AM/FM combinations, with CBS soon joining in to the stereo radio competition. ABC brought television into the stereo picture with TV-AM stereo broadcasts of the Lawrence Welk program (Sterling & Kittross, 1990, p. 320). It was soon realized that the technical limitations of wasted spectrum space and "half" broadcasts for listeners with access to only one radio were not the only problems with such arrangements. Simulcast

AM–FM stereo broadcasts made the inherent differences between AM and FM readily apparent. The FM "side" of the stereo broadcast sounded better, due to FM's higher fidelity, while the AM side of the signal reached out farther geographically, due to differences in the wave propagation laws of the two technologies. It was clear that putting half of the signal on AM and half on FM was an unsatisfactory solution, because the two types of radio were so different. Since few people owned two FM radios in the 1950s, the idea of two-station FM–FM stereo broadcasts wasn't practical.

These problems with the crude two-station stereo experiments prompted broadcasters, especially FM broadcasters who were trying to attract an audience, to petition the FCC for single-station stereo broadcasting (Sterling & Kittross, 1990; Feldman, 1984; Montgomery, 1986; "Stereo Specs," 1959). Yet there was a technical conflict that prevented the immediate authorization of FM stereo. Before the FCC could authorize the use of spectrum space for stereophonic broadcasting, the questions of *storecasting* and *multiplexing* had to be worked through.

Storecasting and Multiplexing. In the late 1940s, cash-starved FM stations had discovered *store*casting—not to be confused with *stereo*casting—as a way to build revenue. This system of broadcasting, a rather technologically primitive forerunner of today's background music services often now referred to as "elevator music," allowed stores and offices to tune in to a regular FM signal over special receivers rented from the station. When the song ended and the station announcer spoke, a special tone would cut out the talk on these particular "storecasting" receivers, leaving the business listeners with background music only. The process by which this cut-out tone was broadcast was called simplexing, and the FCC ruled against this practice in the early 1950s, claiming that, contrary to the provisions of the 1934 Communications Act, the businesses had more influence with the station than the ordinary listeners when it came to music choices. Under continued pressure to allow storecasting as a way to stem the tide of red ink facing FM broadcasters, the FCC later ruled that stations could storecast only by multiplexing, a more complex and expensive process by which the radio station utilized its radio frequency sidebands to transmit two different signals simultaneously. This meant that the businesses would not receive the same broadcast music as the general public, but could instead receive a separate broadcast through the technology of multiplexing under a station's "subsidiary communication authorization" ("What's All This About Multiplex?," 1961; Eisenberg, 1958; Sterling & Kittross, 1990). In 1955 the FCC authorized FM multiplexing, which opened the door to several SCA services, including data transmission and storecasting (FCC 55-340, 1955).

A few years later multiplexed storecasting proved to be a barrier to stereo broadcast authorization because broadcast engineers did not yet know how

to transmit more than one FM subcarrier channel at a time. This meant that FM stations, already strapped for cash and closing down in record numbers, would have had to choose between storecasting and stereocasting. Choosing just one SCA service was not acceptable to the broadcast industry, however; because storecasting was a proven money-maker for struggling FM stations, and because stereo broadcasting offered FM a way to build a larger listening audience, broadcasters wanted to be able to provide *both* services (Sterling & Kittross, 1990, p. 321). By 1958, the FCC issued a *Notice of Inquiry* to investigate whether additional uses were feasible or appropriate for the FM band. The Commission's Notice listed stereo broadcasting as a possible FM service, along with many other SCA services, from paging and data transmission to traffic-light control (FCC 58-636, 1958). The FCC recognized that the technical details of multiplexing and SCA would have to be ironed out before stereo could be authorized. Nonetheless, overcrowding on the AM band, along with the promise of the FM band as an FCC "preferred service," caused the number of FM stations to actually increase to 548 in 1958—the first increase in 10 years (Sterling & Kittross, 1990, p. 323).

As the FM stereo movement gained momentum and the FCC received petitions from several FM stereo system proponents, developments continued on the AM side of the band also. RCA, in conjunction with Belar Electronics Laboratory, Inc., first successfully tested true "AM stereo" in 1959 (Prentiss, 1985). On December 4, 1958, the Philco Corporation filed a *Petition For Rulemaking* in regard to AM stereo. Subsequently, on November 13, 1959, RCA filed a similar petition. Philco filed a supplement to its first petition on December 1, 1959. Kahn Research Laboratories filed two petitions with the FCC around this time: the first on January 26, 1960, and a second on September 25, 1961. Leonard Kahn, the maverick president of Kahn Research Labs, filed a "petition for lift of stay" in regard to his first petition on March 4, 1960 (Rau, 1984; Yarrow, 1982). About the same time, the Philco company developed an experimental "quadrature modulation" AM stereo system, which was tested on station WABC in New York (Motorola, 1985).

Formation of the NSRC. On March 11, 1959, the FCC separated the question of stereo broadcasting from the SCA inquiry by adopting a *Further Notice of Inquiry* (FCC 59-211, 1959). Initially there were 17 FM stereo systems proposed, and in order to sort out the many different systems, the industry resorted to an approach that had been used 20 years earlier for television allocations and standards: It established a committee of engineers from the industry to test the various proposals in order to eliminate inferior systems. This new industry group was called the National Stereophonic Radio Committee (NSRC).

Unfortunately, RCA and CBS, two industry heavyweights, did not join the ad hoc NSRC group, because of concerns that a joint move to help establish standards would have possible antitrust implications. David R. Hull, president of the Electronic Industries Association (EIA), went so far as to assert that without these two companies' cooperation, the industry could not be sure of arriving at the proper standards ("Closed Circuit," 1960). To allay the fears of CBS and RCA, William Reynolds Jr., the EIA general counsel, wrote to the FCC and explained that the NSRC was set up by the electronics industry not to recommend specific standards, but simply to gather technical information. FCC Chairman John C. Doerfer replied to the EIA, stating that the FCC would be "pleased to receive such information," and he offered to supply FCC observers for NSRC meetings. In April 1959 the *Electronic News* wrote that:

> Although this does not guarantee anyone exemption from the antitrust laws, it comes about as close as anything can to doing so. It is the Justice Department policy to give its blessing informally to such advisory committee arrangements provided a Government Agency states it needs the help; if the agendas are prepared by Government personnel; if a Government official served as chairman, and if complete minutes are kept. The group must also act in a strictly advisory capacity. ("Stereo Unit," 1959, copy of article submitted as addendum to Kahn, 1976b)

CBS and RCA, still expressing fears that they did not have adequate antitrust assurances from the FCC, did not join the group; so in October, 1959, the work of the NSRC was officially begun without the assistance of these two industry giants. The NSRC sent a proposal to the FCC offering to "field test various systems," and asking the FCC to move rapidly "through a TASO-like,[1] government sponsored ad hoc group, to establish standards for stereo for all services"—meaning both AM and FM radio, and television. In January of 1960, the EIA began an internal campaign to raise an initial fund of $300,000 to be spent for print ads in the *Saturday Evening Post* and *Life* magazines to "indoctrinate the public on the virtues of stereophonic reproduction" ("Closed Circuit," 1960).

Also in January 1960, Leonard Kahn asked the FCC to permit AM stations to operate with compatible-single sideband (CSSB) systems, which, unlike standard AM, concentrated the spectrum energy on only one side. Kahn said that the public interest would be served, citing several technological advantages. Conversion of standard AM stations to the single sideband system could be accomplished by "an adapter that can be installed

[1] *TASO* stood for the Television Allocations Study Organization. The EIA asked that the stereo committee be patterned after the 1940s TV channel allocation committee.

without any modifications of the transmitter" ("Rule Change Sought," 1960, p. 83).

The very next week the real reason behind Kahn's interest in single-sideband broadcasting became apparent, when he petitioned the FCC to approve standards and rules for his new "adapter system" of AM stereo broadcasting. Kahn revealed that his method of AM stereo reception required that listeners use "two conventional AM receivers, one tuned just above, the other just below, the main carrier" [frequency]. Kahn assured the Commission that his system was compatible with existing AM mono receivers, would be simple and cheap, and would not necessitate an increase in designated AM spectrum space ("All-AM Stereo Rules," 1960).

As the all-service stereo committee continued its work, interest in FM stereo continued to grow both at the FCC and among FM broadcasters. Boosters called stereo "the one big thing" needed to ensure the struggling FM band's acceptance by advertisers and ad agencies, claiming that stereo was "a startling feature that will set *fm* apart from *am* radio" ("Opinions Differ on Value," 1960). In an interesting maneuver, the FCC said that it could not become involved in the actual *testing* because of an existing backlog of other business. Because the FCC refused to sponsor the tests, RCA and CBS did not submit their systems to the NSRC committee ("Stereocasting at Crossroads," 1960). So while initially 17 systems had been entered in the FM stereo competition, by January 1, 1960, the NSRC, working with FCC engineers, cut the number of systems under consideration to 7 systems (presented by six firms). In the end the NSRC studied FM stereo systems by Crosby-Teletronics Corp., Calbest Electronics Corp., Multiplex Development Corp., Zenith, EMI-Cossor, and two designs submitted by General Electric. In typical "protective" fashion, the FCC eliminated from consideration those systems that would not permit simultaneous storecasting and stereocasting, since about 250 stations were now making money with storecasting.

"FM Stereo First"—NSRC Disbands. The FCC, however, chose not to authorize stereo for all three services. In late January 1960, the Commission had "made known its preference that stereo FM broadcasting be adopted prior to stereo considerations in either AM or television broadcast services." In a letter to David Hull, head of the EIA, the FCC said it would attempt to announce its position on FM stereo "shortly after March 15." The Commission said it would defer Hull's request for a *government* sponsored "National Stereophonic Radio Committee" until it announced its position on the FM stereo matter, and assured Hull that "the Commission is desirous of proceeding expeditiously . . . with its consideration of FM stereo in light of the interest which has developed in it and its relatively long pendency before the Commission" ("Position on FM Stereo," 1960). Reacting to this

word from the FCC, the EIA "regretfully" concluded the work of its National Stereophonic Radio Committee on Friday, February 12, 1960, but said that the committee would continue on a "standby basis" ("At Deadline: Stereo Group Quits," 1960). Hull confirmed that the decision to suspend the activity of the committee was due to the FCC's failure to sponsor a TASO-like organization to study and test stereo broadcasting. Hull also said that the committee would turn over to the FCC its completed test data on FM stereo.

By the middle of March, the deadline for public comment in the two-year FCC stereo inquiry period passed. As the Commission's technical staff "buckled down to evaluate a flood of comments," the FCC publicly announced its target deadline of authorizing FM stereo by the fall of 1960. An FCC source said that proposed rulemaking "may come in 30 days," and that *after* FM stereo standards were established, the FCC would consider standards for AM stereo and television stereo ("FM Stereo Standards," 1960). The general tone of the industry in commenting to the FCC was that more testing was necessary before the final standards could be established. RCA stated that it was not possible to determine "the optimum" system from "purely theoretical considerations," and that actual field testing was needed. Likewise, the EIA's ad hoc National Stereophonic Radio Committee, which had put together the test data on FM stereo broadcasting, told the FCC that it was not yet prepared to "offer any recommendations," saying that its study thus far represented "nothing more than a firm foundation" for the FM stereo choice. While the Committee informed the FCC that several proposed FM multiplex stereo systems had been studied, it said that "until questions are answered . . . and until the proposed systems are field tested . . . there is not sufficient technical information available for the choice of a system ("FM Stereo Comments," 1960). The FCC asked the NSRC for a final report no later than July 29, 1960.

On May 4, 1960, the FCC finally completed the nonbroadcast rulemaking for the multiplex inquiry it had initiated five years before, and adopted two documents that prepared the way for FM stereo authorization: one allowing for certain "specified" multiplex activities, and the second calling for technical comments on the seven FM stereo systems which were still under NSRC consideration at the time of the committee's dissolution (FCC 60-498, 1960). To meet these FCC requests, panel #5 of the disbanded NSRC was reactivated to administer the field tests during the summer of 1960 ("Stereo Tests on the Way," 1960).

While the FCC had requested the committee report by July 29 so that the Commission could rule on FM stereo by the fall, the paperwork for the tests was not completed and submitted to the FCC until October 1960, which put the Commission several months behind its schedule ("The Question Now," 1960). Observers now speculated that the decision might come in early 1961,

and that the FCC might create a "hybrid" of two or more FM stereo systems.

Finally, in April 1961, six months past its target date, the FCC issued a *Report and Order* authorizing stereo broadcasting for FM radio only, and adopting as the national FM stereo standard a composite of the Zenith and GE multiplex systems. In its *Report and Order*, the FCC noted that it was impressed with the new FM stereo standard's "apparent lower cost" to install, while observing that it also met the criteria established by the NSRC (FCC 61-524, 1961). Following the precedence set in previous decisions, such as those establishing technical standards for both monochrome and color television, the Commission followed the advice of an industry-wide expert engineering and testing committee, which recommended a specific standard. This approach would "allow stereo broadcasting without harming SCA income" (Head & Sterling, 1987). The selection of a single national standard is also important, as the FCC opted not to select a standard in authorizing stereo for AM radio in 1982.

There are four overlapping reasons for the FCC's decision to authorize FM stereo before offering the same chance for stereo television or AM, and there is significant doubt as to whether the leading argument was technical or economic. First of all, there were technological considerations. At the time of the FM stereo authorization, AM was viewed as too inferior technologically to FM to take full advantage of stereo broadcasting (Sterling, 1970). The FCC argued that AM produced poor frequency response and fidelity, and tended to suffer from fading and static. In addition, the narrow AM channel spacing and bandwidth made stereo broadcasting more likely to cause co-channel interference. A second reason, dealing more directly with television, is that FCC engineers felt that "stereo sound mated with the small-screen pictures of a typical television set would be distracting and unsatisfying" (Feldman, 1984, p. 37). A third reason, cited at the time by the FCC Broadcast Bureau's assistant chief, was that the FCC simply did not have adequate resources to introduce AM stereo, television stereo, *and* FM stereo simultaneously—that it was too big a job for the FCC to undertake all at once, and that indefinite postponement of AM and television stereo was a consequence of the Commission being forced to prioritize ("Stereo Stimulates F-M Broadcasters," 1960). A fourth reason, perhaps most often recounted today, is that FM needed a boost to compete economically with AM. In other words, the FCC rejected the notion of AM stereo out of greater concern for FM survival (Sterling, 1982; Tlasma, 1978). Most likely, it was a combination of these factors that caused the FCC to favor FM stereo over AM stereo authorization.

AM Stereo Benefits Ruled "De Minimis." In a decision released in October 1961, the FCC ruled on the petitions from AM stereo proponents,

denying rulemaking in the manner of AM stereo. In rejecting proposals filed by RCA, Philco Corporation, and Kahn Laboratories, the FCC offered the following observations:

> The reasons for rejecting the proposals were lack of evidence of public need or industry desire for rule changes with respect to stereophonic transmissions by standard broadcast [AM] stations; the prospect of only minimal benefits from innovations of this nature; the problem of providing a dual channel transmission system with the requisite separation and without deleterious side effects in an AM system; and the current problems facing the Commission which require more immediate consideration. . . . [The FM band is] the ideal medium for the full and orderly development of high quality stereophonic broadcasting. (FCC 61-1154, 1961)

The FCC held that the pleadings contained no persuasive reasons for initiating rulemaking on the AM stereo proposals at that time, stating that "the pattern of operation of the nearly 4,000 stations now licensed, the needs and the purposes served, and the very nature of the service itself are such that the beneficial effects of innovations of this nature are clearly de minimis." While the FCC purposely left open the possibility of future rulemaking, it said that it was simply too busy to spend its resources on an AM stereo inquiry. In fact, the AM stereo proponents received something of a "brush-off." The Commission suggested that with all of the other problems facing the new Kennedy administration/Newton Minow FCC, "we cannot find that the diversion of effort . . . is in the public interest."

On January 12, 1962, almost one year after the FCC FM stereo *Report and Order*, the Commission—in a split decision—denied two petitions for reconsideration on AM stereo proceedings. The first petition was filed by radio station KVOO in Tulsa, Oklahoma, and the second was from Kahn Research Laboratories. The FCC said in part:

> The Commission is watching closely the development of stereophonic broadcasting in the FM band and the refusal to institute rulemaking proceedings at the present time on the proposals here submitted does not preclude rulemaking at some future date if the Commission is convinced a need exists for stereophonic broadcasting in the AM band. (FCC 62-68, 1962)

AM Stereo Reborn With Prosperity of FM

During the next decade and into the 1970s, the FCC and the U.S. broadcast industry seemed to consider AM stereo an unnecessary frill. AM radio was preeminent, and except for an intensely loyal FM classical music audience in the major markets, for the majority of radio listeners FM was seen as an incidental service. As with most other telecommunication innovations, the

diffusion period for FM stereo was relatively protracted. Because the cost of the FM stereo transmitter adaptation equipment was quite high for the generally unprofitable FM broadcast industry—estimated at between $2,000 and $4,000 per station—and because there were "too few stereo equipped receivers to make the decision pay off" ("Stereo Decision Creates," 1961), FM sales were initially sluggish and remained so for the rest of the 1960s. In fact, only 25 percent of the U.S. FM stations were using stereo by 1965, and less than half by 1971. However with the economic growth of FM broadcasting in the early 1970s, and with the increased availability of stereo receivers, a large majority of FM outlets were broadcasting in stereo by the mid-1970s (Sterling & Kittross, 1990).

It is worthwhile to elaborate further on the rise of FM radio, because the changing trend in listenership was perhaps the single most important factor in the FCC decision to finally reconsider the authorization of AM stereo. Perhaps the FCC did not realize that the young upstart service would eventually threaten the survival of many AM stations, but a David and Goliath situation was created by at least three FCC decisions in the early 1960s that were intended to give FM stations a fighting chance against the AM giant. The first of these, as noted earlier, was the authorization of FM stereo. While AM radio technology had certain built-in physical advantages over FM, such as the ability of an AM signal to travel over vast distances and over mountainous terrain, FM's wide bandwidth afforded greatly superior sound. This inherent superiority, coupled with the boost provided by the FCC's stereo authorization, contributed to FM's rise and eventual dominance.

A second FCC ruling contributing to the eventual success of FM was the July 1962 decision that created three classes of FM stations and an orderly scheme for license assignment. According the Sterling and Kittross (1990, p. 380), "to avoid the first-come first-served shoehorning typical of AM since broadcasting's start, both FM and television channels eventually were assigned to specific communities to permit orderly and efficient growth and to avoid concentration of facilities in the largest cities." In addition, the three classes of FM stations carried different power and antenna height limitations, so that stations on the wide-open plains could use higher power and taller towers than stations in the more densely populated Northeast United States and Southern California areas.

In addition to stereo authorization, and an orderly license assignment scheme, a third, equally important factor contributed to the rise in FM: the nonduplication rule. In 1944 and 1945, shortly after FM was first introduced, AM broadcasters convinced the FCC that FM would grow more quickly if it could "simulcast" or duplicate AM programs. Since 80 percent of all FM licenses were owned by established AM broadcasters, this arrangement of simultaneously carrying the same program on a station's FM as on its AM

was both simple and economical. Unfortunately, the result was that FM did not offer much programming that was different than AM, giving the public little incentive to buy the more expensive FM receivers. Consequently:

> FM was temporarily out of the running. Whether or not it was a "conspiracy," the AM radio broadcasting industry effectively throttled FM development by making the new medium sound just like existing radio but without static and costing more for a receiver. Lacking sufficient unique appeal, FM—not surprisingly—did not attract audiences and stations began to leave the air. (Sterling & Kittross, 1990, p. 277–278)

In May 1963 it was proposed that AM–FM "combos" be required to provide separate programming at least some of the time. This proposal was aimed at reducing the amount of replication of AM programming carried on FM stations. Against protests from some broadcasters that such a move would actually hurt FM by taking away popular programs from FM listeners, the FCC ruled in July 1964 that in markets of over 100,000 population, FM stations had to offer separate programming at least 50 percent of the time. This rule was expanded in the 1970s to include smaller markets, resulting in a new era of creative programming on FM. Instead of simply duplicating stale AM fare and a few classical and beautiful music programs, FM was now the home of more popular music formats, including rock, "progressive jazz," and country music (Sterling & Kittross, 1990, p. 397). These three FCC decisions, stereo, channel allotment, and nonduplication, helped to pave the way for the growth of FM in the 1970s. Finally, in the late 1970s, FM surpassed AM in the United States in terms of total listening audience (see Pember, 1992, p. 215; Huff, 1987, p. 30; Rau, 1985, p. 80), as shown in Figure 2-3.

Despite the early setbacks for AM stereo and television stereo, and the favoritism shown by the FCC to the FM band, hopes for "all-service" stereo

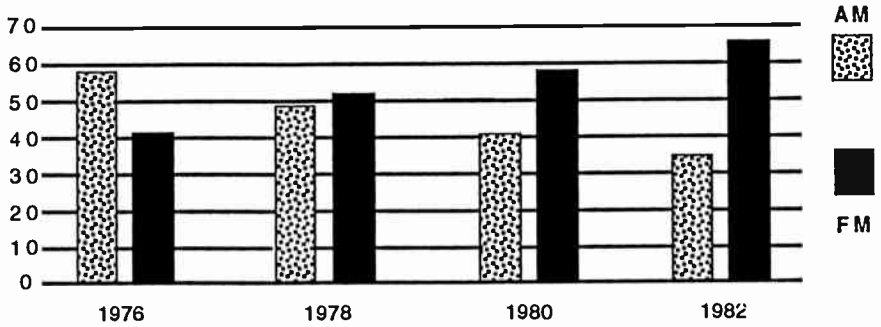


Figure 2-3 AM vs. FM Radio Listenership, 1976–1982

broadcasting did not die. In the early 1960s, CBS experimented with an AM stereo system that was very similar to the Philco quadrature modulation system of the late fifties. CBS auditioned this system by conducting experimental transmissions on its New York station, WCBS (Motorola, 1985). Leonard Kahn of Kahn Communications persisted in refining, and later, beginning in 1970, testing his independent sideband system by broadcasting in AM stereo for several years on the 50,000 watt Mexican station XETRA-AM in Tijuana ("Leonard Kahn: Sporting," 1982). This station operated on 690 kHz, from facilities just south of San Diego, California, and transmitted English-language programming with a highly directional antenna pointed to Los Angeles. Because station KMPC in Los Angeles operated at an adjacent frequency of 710 kHz, Kahn Communications claimed that this experiment successfully provided "a most severe test of the spectral cleanliness of the AM stereo system" (Kahn Communications, 1976a). In other words, the Kahn system was shown to operate successfully without causing interference to stations adjacent on the radio dial.

By the early 1970s, as FM stereo had begun to capture an increasing share of the total listening audience, AM broadcasters became worried (Sklar, 1988). Seeing their audiences begin to slip away, such AM giants as WNBC in New York City, KHJ in Los Angeles, WLS in Chicago, and WMAL of Washington, D.C., recognized the need for some way to combat the shrinkage of AM's audience, and began to "take a second look at stereo" (Yarrow, 1982).

In May 1973, station WFBR in Baltimore, Maryland petitioned the FCC to "engage in experimental on-the-air operation" of the Kahn single-sideband AM stereo system, which was already being broadcast into Los Angeles from Mexico. On April 19, 1974, in a victory for Leonard Kahn, the FCC granted a six-month test on WFBR ("Future Seen for AM Stereo," 1975). However, since the station decided that it was inadvisable to attempt a "shakedown" of a new transmitting facility while conducting the experiments, the FCC granted a delay until after the stability of the new WFBR facility was well established. In April 1975 WFBR again requested permission, and on-air tests of the Kahn AM stereo system began in Baltimore on April 27, 1975 (Association for AM Stereo, 1976). Although Leonard Kahn had never given up the dream for AM stereo, by now other electronics firms realized that AM broadcasters would demand AM stereo authorization, and several major companies, including RCA, Magnavox, and Motorola, renewed work on AM stereo during this time.

The NAMSRC is Formed. In the spring of 1975, RCA demonstrated an AM stereo broadcast system at the National Association of Broadcasters' convention. The demonstration, which was called RCA's "big draw" for the

exposition, was geared to the nation's 4,500 AM broadcasters and emphasized the compatiblity of existing monophonic systems with the new RCA AM stereo system. A CBS Laboratories representative at the 1975 NAB convention stated that "With the current success of FM two-channel broadcasting and the potential of extending the service to three- and four-channel transmission, the AM broadcasting community has begun to show concern about the possibilities of expanding the scope of its own service" ("Developments in AM," 1975).

Another important development occurred in 1975, when Motorola's corporate research and development staff conceived, as mathematical models, several improvements in the quadrature system that had been unsuccessfully developed by Philco and CBS in the late fifties and early sixties. While earlier efforts at quadrature had proven incompatible with existing monaural receivers, the new Motorola "compatible quadrature" system seemed feasible, at least according to computer analysis. Staff scientists began work on the technology in 1975, and it eventually developed into the "C-QUAM" system, which indeed proved to be compatible with mono receivers (Motorola, 1985).

Perhaps the greatest development in the resurrection of AM stereo occurred on September 24, 1975, when the Electronic Industries Association (EIA), the National Association of Broadcasters (NAB), the National Radio Broadcasters Association (NRBA), and the Broadcasting Cable and Consumer Electronics Society of the Institute of Electrical and Electronics Engineers (BCCE) all united to sponsor the "National AM Stereophonic Radio Committee," to be known as the NAMSRC (Prentiss, 1985). The goal of this committee was to evaluate and test various systems, and to eventually report results of its findings to the FCC for possible rulemaking. This new committee was strictly interested in *AM* stereo, as opposed to the late 1950s ad hoc group called the National Stereophonic Radio Committee (NSRC), which promoted all-service stereo for AM, FM, and television ("Technical Briefs," 1975). Of utmost importance was the wide range of industry support, indicated by the participation of several major manufacturers and broadcasters. The roster of those heading up various work groups included representatives from A.D. Ring (a well-known broadcast engineering consulting firm), the Electronic Industries Association, Zenith, Motorola, radio station WTOP AM-Washington, CBS Technology Center, Delco Electronics division of General Motors, Magnavox, the National Association of Broadcasters, and station WMAL AM-Washington.

The NAMSRC was supported financially by the four sponsoring organizations, and stipulated that AM stereo system proponents deliver and adjust their own equipment. This equipment was to include an AM stereo exciter unit, a wideband demodulator (in most cases the transmitter monitoring equipment), and a stereo receiver for the laboratory tests. For the on-air

tests, the exciter was to be used at the transmitter site of the participating test stations, and the receiver would be set up at the laboratory site. Stations WGMS and WTOP in Washington, D.C., supplied their facilities for the on-air tests, and WBT in Charlotte, North Carolina, was the site of the sky wave tests. The NAMSRC field test site and receiving location was to be in Bethesda, Maryland, a Washington suburb (Kassens, 1977). The Committee submitted a "call for proponents" on October 3, 1975, and the head of the National AM Stereophonic Radio Committee stated that a report to the FCC would be submitted in "a year or so" ("Future Seen," 1975). Field testing was to be conducted under the direction of Chris Payne of the NAB, who served as the NAMSRC field test Project Manager. In order to conduct the studies and tests, the NAMSRC was divided into four areas of special interest: Panel I: System Specifications; Panel II: Transmission Systems; Panel III: Receiving Systems; and Panel IV: Field Tests.

Kahn Refuses to Participate. Despite the NAMSRC call for system proponents, Leonard Kahn did not submit his proposal to the committee because he was already conducting tests that had been approved by the FCC, and because he felt that "individual action would get things moving faster." As an explanation for not going through the committee (and as an indication that the tide for AM radio had indeed turned since the first FCC inquiry in 1960), Kahn claimed that broadcasters had urged him to go "directly to the FCC, as AM operators are anxious for the 'shot in the arm' that stereo capability would give them in competing against stereo FM" ("Go-ahead Sought," 1976). Kahn would later claim that his nonparticipation was due to simple economics, stating that a company as small as his could not afford to get involved in the NAMSRC and still "protect its interests." Kahn explained that he "sure didn't want to cooperate with a group whose purpose was to head us off." Kahn claimed that the NAMSRC was formed as a "defensive move" against his firm, as the front-runner in the race for AM stereo authorization ("Leonard Kahn: Sporting," 1982).

By the fall of 1975, Kahn Research Laboratories announced that its system had completed the six-month test authorized by the FCC on WFBR-AM in Baltimore. On October 31, WFBR had demonstrated the Kahn system for a dozen engineers and station managers. Throughout the six-month test, WFBR had received no complaints of audio distortion from users of existing monaural radios, a prime purpose of the FCC authorized experiment. In submitting its test data, Kahn intended to ask the Commission to permit AM stations to broadcast in stereo.

NAMSRC Tests Only Three Systems. By early 1976, four companies—RCA, Motorola, Sansui, and Communication Associates—submitted their

proposals on paper to the NAMSRC. The committee developed a series of field tests, designed to test the performance of each monitor and receiver system (Prentiss, 1985). Eventually, only three "finished" systems were actually tested by the NAMSRC: the first from Magnavox, which manufactured home electronics equipment for consumer use; a second system from Motorola, a large manufacturer of electronics components and automobile receivers; and a third system, which was based on the RCA technology and which was proposed by Belar, a manufacturer of broadcast station monitoring equipment. As noted earlier, Kahn Laboratories declined to participate in the NAMSRC testing. The Harris Corporation, another broadcast equipment manufacturer, developed a fifth system that was later considered by the FCC but was not tested by the NAMSRC because the Harris prototype was not sufficiently developed in time for testing by the industry committee (FCC 82-111, 1982).

Two Petitions for Rulemaking. Late in 1975, a group of seven AM station licensees formed the "Association for AM Stereo, Incorporated" with its "sole purpose [to] encourage the adoption of standards" to permit AM stereo broadcasting. On January 9, 1976, the group petitioned the FCC (FCC Petition RM 2646) "to issue a *Notice of Rulemaking* and/or a *Notice of Inquiry,* looking towards the adoption of standards for stereophonic broadcasting in the standard broadcast band." The petition stated that the group had "no quarrel" with the recent audience growth for FM broadcasting, but protested that FM's stereo authorization "has led to many situations in which AM stations find themselves at a marked competitive disadvantage." The association argued that AM broadcasting often provided better automobile reception than FM, and that many Americans did not yet own FM radios, especially in their cars. Finally, the group stated that while it did not intend to endorse any specific stereo system initially, it took "cognizance of the fact that two systems have currently been demonstrated," citing the Kahn tests at XETRA, Tijuana, and WFBR, Baltimore; and RCA's NAB convention demonstration in April, 1975 (Association for AM Stereo, 1976).

In June 1976, Kahn again petitioned the FCC (Petition RM-2717) to institute a rulemaking proceeding that would permit AM stereo broadcasting. Kahn said that his company was ready with transmitter equipment, and stated that his AM stereo system had been "developed over a sixteen (16) year period, (a) Is completely compatible with standard AM broadcasting and will in no way degrade present broadcast service, and (b) Will allow radio listeners to enjoy stereophonic reception with little or no additional investment in receiving equipment." Kahn also contended that his equipment had been extensively tested, was production engineered, and could be

installed in conventional transmitters in a few hours, and that he could tool up for production within 60 days of the Commission's approval (Kahn Communications, 1976a).

Perhaps the most interesting aspect of Kahn's petition was the potentially controversial list of "six basic requirements" that Kahn felt must be met by the chosen system. Kahn noted that "it is the Petitioner's contention that only one type of modulated wave can, even in theory, essentially meet all six requirements." Certainly this was the case for the sixth of Kahn's suggested requirements, which stated that the chosen system should allow stereo reception "without the purchase of special receivers." Kahn argued that this sixth requirement was essential "if even the lowest income families are to participate in a new form of entertainment." He backed this assertion by noting that:

> Those people who cannot afford the purchase of special equipment will not be deprived. . . . Fortunately, most of our citizens are able to afford the purchase of special stereo equipment but those who cannot will especially appreciate such a free new service. The huge number of inexpensive transistor sets in the hands of the public almost insures the availability of two radios even in the lowest income homes. . . . If technology can provide our lowest income citizens with cost-free entertainment, there is no reason why it should not be made available. . . . By adopting a system which is affordable by the least affluent nations . . . the Commission can minimize the probabilty that more than one AM Stereo system will be selected by the various countries. Again there is a lesson to learn from the history of color television where the U.S. failed to provide technical leadership and a number of countries adopted competitive systems placing U.S. broadcast equipment and receiver manufacturers at a serious disadvantage (Kahn Communications, 1976a; Appendix III).

Kahn Spars with the NAMSRC. Kahn's petition to the FCC was seen by many as an attempt to "jump the gun" on the industry committee ("Go-ahead Sought," 1976). In fact, the NAMSRC group filed comments with the Commission on July 29, 1976, stating that its steering committee was in opposition to the Kahn petition for rulemaking (Petition RM-2717) "on the basis that the committee had begun a comprehensive series of tests on several possible AM stereo systems, other than Kahn's, and that to begin rulemaking on Kahn's system before the committee completes its tests would be premature" (Rau, 1984).

On August 17, Kahn offered a rebuttal to the NAMSRC, stating five reasons why the FCC should proceed with rulemaking. First of all, Kahn argued that the WFBR Baltimore tests of his system had been approved back in 1974, almost 17 months before "the September 8, 1975 date when, as stated in the NAMSRC submission, 'the Commission encouraged' its [the committee's] formation." Secondly, Kahn argued that the FCC had stated

in the authorization of the WFBR test that upon successful completion of the tests, "a petition may be filed for amendment of the rules to provide for AM Stereo transmission on a regular basis." Kahn recalled, however, that he was cautioned by the FCC that "the successful completion of the test program, standing alone, would not guarantee favorable Commission action." The third argument presented by Kahn was that the FCC's later " 'encouragement' to NAMSRC certainly should not negate the conditions established in the earlier authorization." Kahn noted that his small firm had spent a relatively large amount of money to perform the WFBR tests. The fourth of Kahn's arguments raised a constitutional question. Kahn said that he questioned whether Congress authorized the FCC to delegate authority to nongovernmental groups "to stand between individuals or firms, and their Government, and to empower such groups with the responsibility of studying in detail various systems, establishing test procedures, running experiments, performing analysis, issuing reports, etc." Kahn also questioned the make-up of the NAMSRC, asking whether such committees should be "composed of cooperating, putative commercial competitors who neither represent the public nor the broadcasters." Kahn asserted that the high cost of such committee participation might prevent a small company from both petitioning the FCC on its own behalf, or from serving on such a committee. He stated that such a double financial burden would "eliminate the right of petition for small organizations and most individuals." Kahn cited similar committees formed in the past, and said that "small organizations have not been well represented on such committees because of the high cost of participation and their lack of bargaining muscle." Kahn reminded the Commission that "RCA withdrew, and CBS failed to participate in the original Stereo committee (the undersigned was active on that committee at appreciable expense) reportedly because of concern over the question of anti-trust." Finally, Kahn suggested that a committee such as the NAMSRC would cause still further delay, and that Kahn had been waiting 15 years since his first petition to the FCC in the late 1950s. He asserted that the committee would "repeat expensive and time consuming tests," which would further delay authorization. Kahn closed by noting that "NAMSRC has already established at least five sub-committees which would require Petitioner's representation and thus the cost required to redo tests is beyond Petitioner's means"—citing GE's estimate of a $300,000 price tag for participating in the similar National Quadraphonic Radio Committee (Kahn Communications, 1976b).

FCC Notice of Inquiry Adopted. In early December 1976, the Magnavox Company established a program to develop an amplitude-modulated/phase-modulated (AM/PM) system for AM stereo. The development plan called for both transmitter adapters and stereo receivers to be

field tested by the NAMSRC. In addition, station WFWR in Fort Wayne, Indiana, agreed to make its facility available for nighttime tests. The system was proposed to the NAMSRC on December 14, 1976, and the preliminary tests were run with FCC approval from 2 A.M. to 5 A.M. on January 3, 1977. These tests "gave encouraging results," and a preliminary report was filed by Magnavox with the FCC on February 23 (Streeter, 1977a). Additional on-the-air tests were performed on WFWR on March 16, and May 17 and 18, and Magnavox filed its second test report with the FCC on May 23 (Streeter, 1977b).

Throughout 1976 and 1977, the various committees of the NAMSRC conducted tests on both transmitting and receiving systems. The Receiver Panel tried five different kinds of monaural receivers, ranging from auto radios and inexpensive pocket portable models to hi-fi component tuners, in order to test the AM stereo systems for mono compatibility. The Transmission Systems Panel field tested the Magnavox, Motorola, and Belar systems over stations WGMS and WTOP in Washington, D.C., and WBT in Charlotte, North Carolina. Each of these stations had a different model transmitter, and with only very minor adjustments, each of the stereo systems performed well. Manufacturers of other transmitters sent data to the Panel. The NAMSRC concluded that there was an "excellent chance of successful stereo operation of these transmitters" with any of the three AM stereo systems which were tested (Prentiss, 1985, pp. 14–15).

The FCC had before it two Petitions for Rulemaking—the Association for AM Stereo petition (RM-2646), which did not specify a proposed system; and Kahn Communications' petition (RM-2717), which requested authorization for the Kahn "single sideband" system. Finally, the FCC *formally* reopened the question of authorizing AM stereo by adopting a *Notice of Inquiry* on June 22, 1977 (FCC 77-445, 1977). The stated purpose of this inquiry was for the Commission to investigate the level of interest in AM stereo by broadcasters, consumer electronics manufacturers, and the general public. It is clear that at this time, the FCC fully intended to select a standard for AM stereo. As the FCC would later admit, another purpose of this inquiry was to seek "information on what *technical performance standards* were desirable or necessary to provide a viable stereo service by AM stations, and to *establish criteria for system standards*" (FCC 82-111, 1982; emphasis added).

Before the conclusion of the inquiry, six companies petitioned the FCC to formally consider their systems. These firms were Kahn, Motorola, Magnavox, Belar, Harris, and Hazeltine.[2] According to the Commission, each

[2]Kahn and Hazeltine subsequently joined their AM stereo petitions, leaving five system proposals before the FCC. Hazeltine Research became a manufacturing licensee of the Kahn technology.

of the systems submitted for consideration contained "sufficiently different characteristics of the transmitted signal that each required a different receiver circuit for satisfactory reception." However, the systems were all "designed to be adaptable to existing broadcast transmitters" (FCC 82-111, 1982). It will become clear in the next chapter that the differences between the five systems were so slight that they presented the FCC and the Commission's engineering staff with an exceedingly difficult problem.

Chapter Summary

The preceding chapter has outlined the history of the technical regulation and standard setting functions of the FRC and FCC. Government regulation of electronic communication was justified by a commonly recognized need to maintain the integrity and efficiency of the communication system. With the inability of the 1912 Radio Act to accommodate the sudden growth of radio in the 1920s, the combined pressure from the Courts, from the Executive Branch through the Commerce Department and the Attorney General's office, from the radio set manufacturing and broadcast industries, and from the general public, forced Congress to enact a new law to regulate radio. The resulting 1927 Radio Act created the Federal Radio Commission (FRC), which was given wide latitude to regulate in the "public interest." The FRC interpreted this delegation of powers to include the authority to establish technical standards for broadcast equipment. The years 1927 to 1932 were seen as the FRC "cleanup period," during which the FRC engineering division grew dramatically. In 1934, the passage of the Communications Act created a permanent Federal Communications Commission (FCC), charged with the regulation of telephone, telegraph, and radio. Much of the new law that related to radio broadcasting was simply carried over from the 1927 Act, and both the 1927 and 1934 Acts empowered the Commissions to regulate broadcast transmitting equipment relative to both "external effects" and "purity and sharpness of the emissions." These justifications for technical standardization guided the FCC through 1982, when, with the AM stereo decision: "for the first time in its history, the FCC refused to select a specific technical standard, a decision that became a precedent for future refusals to impose standards" (Head & Sterling, 1990, pp. 460–461).

Next, the organizational structure and rulemaking functions of the Commission were explored. It was seen that the FCC was organized by "professional" departments until the early 1950s, when it was "functionally" organized in order to improve efficiency. In the early 1980s, about the time of the AM stereo decision, the structure of the FCC was modified again, with the creation of the powerful Office of Managing Director.

Finally, the preceding chapter outlined the history of AM stereo from the 1950s to the present, and it was seen that AM stereo technology was devel-

oped in the 1950s concurrent with FM stereo technology. Of special importance to the analysis of the AM stereo case was the EIA sponsorship of a group called the National Stereophonic Radio Committee (NSRC), which was set up to "assist" the FCC in its stereo decision-making process, much as the electronics industry had formed the NTSC to assist with the standardization of television in the 1940s. The NSRC was seen to have favored "all-service," or AM-FM and TV stereo, but in April 1961, the FCC authorized only FM stereo, combining the Zenith and General Electric multiplex technologies into a single FM stereo standard. While the FCC offered four reasons for giving FM stereo preference over AM or TV stereo, the FCC's stated goal of wanting to give the struggling FM band a competitive, and therefore economic, "boost" is typically cited as the primary reason for this decision. Despite this setback for AM stereo, proponents of the technology continued to press the FCC for favorable rulemaking; however, in 1961 and 1962 the FCC again denied AM stereo authorization, citing a lack of "public interest" benefits and other demands on the Commission's resources. Throughout the 1960s, AM continued to dominate FM in terms of radio listenership, but by the 1970s, this trend was reversed as FM stereo broadcasting gained in popularity with both stations and listeners.

In the mid-1970s, efforts in AM stereo research and development were rekindled, and the FCC was petitioned for rulemaking by two parties; an "impartial" industry association, and by 1950s AM stereo proponent Leonard Kahn. In 1975, the National AM Stereophonic Radio Committee (NAMSRC) was set up with the encouragement of the Commission. This committee was formed only to conduct tests, and not to recommend any particular system. The NAMSRC operated under the sponsorship of four large industry trade associations, and eventually tested three AM stereo systems—proposed by Motorola, Belar, and Magnavox. The older Kahn system was not tested because its inventor refused to participate in the NAMSRC testing. A fifth system proposed by the Harris Company was not fully developed in time for NAMSRC testing, although it was later considered by the FCC. By 1977, calls for AM parity in the stereo market increased in volume, and in June of that year, the FCC officially adopted an AM stereo *Notice of Inquiry*.

These events leading up to the formal consideration of AM stereo by the FCC are especially important background considerations in this case study because they reveal the embryonic development of two patterns typical of FCC decision making in the standardization process; the emergence of industry "assistance" in the form of the NAMSRC, and the roots of intense competition between proponents, as evidenced by the inability of the industry committee to gain universal cooperation. In the coming chapter, it will be seen that these two characteristics will be joined by two other complicating factors; external political forces impacting the FCC, and unclear decision-making procedures within the Commission.

CHAPTER 3

Case Study of the FCC AM Stereo Inquiry

> As the births of living creatures at first are ill-shapen, so are innovations, which are births of time.
>
> Francis Bacon

This chapter will chronologically detail the events in the AM stereo inquiry from 1977 to 1982, and then briefly describe the workings of the AM stereo "marketplace" after the 1982 authorization. Two features of FCC decision making in the standardization process are seen to emerge; the ambiguity of the decision-making "technology," and the changing political climate in Washington. These factors are the key characteristics that mark the FCC AM stereo inquiry.

Recall from the FCC rulemaking flowchart in the first chapter that after a *Notice of Inquiry* there is normally a period for comments and replies to be evaluated. This next section will explore several of the comments filed with the FCC, in order to provide the reader with a sense of the complexity of the various arguments that are intended to influence the Commission in its attempt to select the standard for a new technology.

The Inquiry

The FCC *Notice of Inquiry* attracted many comments, mostly from interested manufacturers, station licensees, or individuals. Typical of the comments from station personnel were those filed on behalf of Progressive Broadcasting Corporation, licensee of WINU of Highland, Illinois. WINU's president described the 1,000-watt daytimer as "a typical small

market AM station," and his comments suggested the frustration of AM broadcasters:

> persons should not be denied the benefits of stereophonic broadcasting just because they prefer an AM station over an FM station. . . . Since the manufacturers of radio receiving equipment do not have a conscience, some legislation should be passed to require them to provide equally good engineering standards to the AM portion as well as the FM section of AM/FM sets. . . . The tests underway at the present time conducted by NAMSRC have proven the fact that AM can sound as good as FM. . . . The writer is of the opinion that AM stereo will be a great success and will be a shot in the arm to the radio industry as a whole, provided that AM receiver manufacturers will market a better product. (Bircher, 1977, pp. 1–5)

Consumer electronics manufacturers also indicated early interest in the technology. Comments from Shunkichi Kisaka, Managing Director of Matsushita Electrical Industrial Co., Ltd., the manufacturer of Panasonic brand electronics products, stated that both the public and the AM licensees were sufficiently interested in AM stereo to make it a success. He predicted that AM stereo would not adversely affect the development of FM—an area of concern to the FCC as reflected in its general list of questions directed at parties filing comments in the *Notice of Inquiry*—since "listeners wishing for a high-fidelity signal reception would be likely to tune in FM stations." The comment for Matsushita also argued against the proposal to use two conventional mono AM radios to pick up AM stereo signals (as in the Kahn system) stating that precise tuning would be difficult, and that "theoretically such a system would have substantial distortion." Finally, Matsushita estimated the price to the public for AM stereo would be "$10 to $20 up," with the price for a combined AM stereo/one channel mono receiver being "$20 to $40 up" (Kisaka, 1977).

Other consumer electronics manufacturers expressed concerns that AM stereo be easy for consumers to use. Both Ford and GM/Delco insisted that the AM stereo system must have a stereo indicator signal, since consumers were already used to such a light coming on for FM stereo reception. In addition, Ford stated that if full bandwidth reception was a goal, a potentially costly dual-bandwidth receiver would be necessary. Ford suggested that it just be accepted that while FM offered full bandwidth reception, this was an impractical expectation for AM automobile radios. Lastly, Ford commented that there was a definite growth pattern in the public demand for automobile radios that had stereo capability (Ford, 1977; Carpenter, 1978).

The Association for AM Stereo, the group that had filed the first petition for the FCC to adopt rulemaking proceedings, naturally supported the

adoption of standards for AM stereo, but reiterated that the group had not, and would not, take a stand for or against any particular system. The comments of the group centered around FCC concerns for the impact of AM stereo on the development of the FM band:

> FM broadcasters, like AM broadcasters, have no right to expect the government to protect them from economic competition. *Sanders Brothers Radio,* 309 U.S. 470 (1940). Rather the criterion to be followed in evaluating any new service is whether the service will benefit the *public.* AM stereo will cost the public absolutely nothing, but will enable the public to receive a superior aural reception service, in the present AM band. (Association for AM Stereo, 1977)

It is interesting to note the contrast in communication styles in letters addressed to the FCC. While most of the comments are written in formal, quasijudicial prose, at least a few of those commenting chose more informal rhetorical strategies. A one-line, handwritten comment is indicative of the frustration felt by many:

> Dear FCC. I'm *For* Docket #21,313 and #21,310. So Lets get the *ball* rolling before I'm dead. (Mueller, 1977; punctuated as in the original)

The NAMSRC Report. In December of 1977, Harold L. Kassens, Chair of the National AM Stereo Radio Committee (NAMSRC) submitted the group's technical report to the FCC. The committee submitted copies of its test results on the Belar, Magnavox and Motorola systems, and said that:

> All three systems are capable of transmitting and receiving stereophonic sound with fidelity nearly comparable to FM stereo, are basically compatible with existing radio receivers and radio stations, are generally practical and economically feasible to implement for both transmitting and receiving, and do not occupy substantially more spectrum space than standard AM. The principle differences in observed tests results are a consequence of the proponent's system design philosophy. (Kassens, 1977)

Ford Motor Company again filed comments after the NAMSRC test results were in. A table in this letter showed that in 1973, Ford provided monaural-only radios in 69.6 percent of the vehicles Ford sold in the United States, compared to 30.4 percent that were equipped with stereo radios. By 1977, the mono figure had dwindled to 40.7 percent, while the stereo percentage had grown to 59.3 percent. Ford said that this trend meant that:

> If the FCC approves any of the three systems recently tested by the National AM Stereophonic Radio Committee (NAMSRC); Ford Motor Company would give serious consideration to offering the AM stereo feature on its

> radios. However, Ford does not favor the two-radio concept proposed by Kahn Communications because of the system's complexity and the additional cost of adding a secondary receiver to radios of the type currently installed in automobiles. (Page, 1977)

Ford closed by noting that because the company produced 3 million new radios per year, adequate lead-time was an important factor. Yet even with the need to retool facilities, Ford estimated that if the FCC approved one of the NAMSRC systems in early 1978, AM stereo products could be "in high-volume production starting in the mid-1979 calendar year and available for installation on U.S. passenger cars in the 1980 model year." As 1977 came to a close, little did Ford or the other interested parties realize that it would take the FCC more than four years to decide *not* to set AM stereo standards, or that 15 years later the matter would still not be completely settled.

Comments Continue in 1978. So far we have examined comments from the NAMSRC and members of both the broadcast and the consumer electronics industries. Early in 1978 the FCC heard from two noteworthy groups, the National Association of Broadcasters (NAB) and the Association for Broadcast Engineering Standards (ABES), a nonprofit corporation founded in 1963 with the principle purpose "to assist the Congress and the Commission in developing and maintaining sound technical standards." The ABES ventured that while there was no guarantee of a commercial market for AM stereo receivers, "given the experience of the past as a guide, ABES has no doubt that the adoption of a practical and cost efficient set of AM stereo standards will lead to a successful commercial development of this new service." ABES noted that it intended to closely study the comments and supporting data submitted to the FCC, and that in its opinion, the principle issue was "the technical quality of AM stereo and the compatibility of the AM stereo parameters to emerge from this proceeding" (Association for Broadcast, 1978).

The National Association of Broadcasters (NAB), which was one of the sponsors of NAMSRC and the nation's largest broadcast lobbying group, stated that:

> The Association *at this time* does not endorse a specific AM stereo system. Tests of the NAMSRC indicate that at least three of the five systems are shown to be capable of . . . fidelity comparable to FM stereo, are basically compatible with existing radio receivers and radio stations, and do not occupy substantially more spectrum space than with standard AM. Two other systems are being separately tested and the data is expected to be included in the AM stereo proceeding. . . . Early authorization of AM stereo by the FCC is

> mandated, in NAB's view, by Section 303(g) of the Communications Act which directs the Commission to "study new uses for radio" and "generally encourage the larger and more effective use of radio in the public interest." . . . AM stereo should be a top priority item on the Commission's agenda. (Krasnow, 1978a; emphasis in original)

There were also records of ex parte communications included in the archives by individual Commissioners. The dictionary defines *ex parte* communication as communication "from a one-sided point of view," while the FCC defines an ex parte contact as a written or spoken message "concerning the merits of a pending rulemaking other than comments officially filed at the Commission or oral presentations requested by the Commission" (FCC 78-638, 1978, ¶ 32). Evidence of a series of ex parte contacts made in the AM stereo inquiry *before* such contacts were restricted is found in an internal FCC memo addressed to Commissioner Abbott Washburn, which states that Dan Domingo of National Semiconductor called for an appointment on Friday, May 12, to discuss the "upcoming decision" on the AM stereo case. The memo noted that the FCC General Counsel had indicated that there was a "Notice of Inquiry but no ex parte [restriction]." The note also indicated that Domingo was "bringing two people with him from National Semiconductor," and that there would "also be two people from Magnavox—names unknown." The memo said that the group also had appointments "so far" with Commissioners Lee, Brown, and White; and that a subsequent meeting between the National Semiconductor group and Commissioner Washburn was arranged for the following Monday ("Cathy," 1978). This memo, by no means atypical, illustrates how interested parties are able to "lobby" FCC Commissioners when ex parte meetings are not restricted. This open policy on such contacts regarding the AM stereo proceeding was changed shortly after the above meetings, and the question of ex parte contacts would prove to be a source of controversy over the next three years as the proceedings on AM stereo continued.

Summary. The preceding section shows that during the period for comment in the AM stereo inquiry—from the issuance of the *Notice of Inquiry* in June 1977 through the January 1978 deadline—both letters of comment and ex parte communications had been received from system proponents, several leading manufacturers of receiving equipment, and radio station owners. In addition, the NAMSRC test results were delivered to the Commission. In all, the FCC had received comments on the *Notice of Inquiry* from more than 90 sources, and summarized the comments as follows:

> Responses to the *Notice of Inquiry* express the view that FM stereophonic radio service is inadequate in automobiles and at fairly long distances from

> broadcasting stations. It is further noted that many small communities have only AM stations and thus are lacking stereophonic radio service. Regarding the possible impact of AM stereo on the continuing development of FM broadcasting, it is reported that in many markets FM stations have already surpassed AM stations in audience and revenue. Many AM licensees claim that AM stereo is needed to keep their stations competitive. Additionally it is claimed that the stereo performance of FM broadcasts in automobiles is poor due primarily to fading and multipath which should not be a problem with AM stereo. (FCC 78-638, 1978, p. 2)

After the window for comment had closed, the inquiry entered a second phase in which interested parties could file "reply comments" in response to the comments of others. In March 1978 the National Association of Broadcasters filed reply comments urging the FCC to take action on AM stereo. The NAB reply comments are included here because they also serve as a good "independent" summary of the comments received by the Commission:

> Approximately three volumes of comments have been filed in this proceeding to date. The overwhelming majority of . . . interested parties favor the adoption of AM stereo transmission standards by the Commission. The comments contain a wealth of technical supporting data, especially those filed by the individual AM stereo system proponents and the National AM Stereo Radio Committee (NAMSRC). . . . We believe that the record thus far complied [sic] in this docket is more than ample to assist the Commission in resolving most, if not all, pending technical issues. . . . There are no significant technical impediments to the early authorization of AM stereo . . . [it] does not require additional spectrum space . . . it makes more efficient use of the present allocations as did color television and FM stereo. (Krasnow, 1978b)

With these comments and technical data on file, the stage was set for FCC action. Recall that in "normal" FCC rulemaking, after the initial period for comments and replies, the Commission has a number of options. It can decide that the issue does not merit action; in that case, it writes a *Memorandum Opinion and Order Concluding Inquiry.* If the Commission decides to continue the proceedings, it adopts a *Notice of Proposed Rulemaking.* If this second route is taken, the FCC enters into a second period for comments and replies, prior to adopting a *Report and Order* amending or not amending the rules. This second path is the one taken by the FCC in the autumn of 1978.

Notice of Proposed Rulemaking

Based on the favorable response to its initial inquiry, the FCC issued a *Notice of Proposed Rulemaking* on September 14, 1978, with the objective

of determining which AM stereo system would best serve the general radio audience. An interesting development at this stage in the inquiry was the prohibition of ex parte contacts or presentations (FCC 78-638, 1978, ¶ 32). Although the FCC claimed that it was not compelled by law to restrict the proceedings as prescribed under the *Sangamon Valley Television* (1959) case, it did so nonetheless, in order to avoid any appearance of improper influence. Later in the inquiry, it would be charged that this restriction on ex parte contacts actually served to isolate the FCC from those conducting tests, causing a breakdown in the flow of necessary information to the Commission staff. With restrictions on ex parte contacts in force, the FCC staff could not speak directly with engineers from the firms proposing AM stereo systems unless the engineers were formally called before the Commission. Critics later charged that this caused much confusion on how tests were conducted and how best to evaluate measurements. In addition to the problems caused by this "early" enforcement of ex parte restrictions, the measure really did not completely stop the flow of ex parte contacts. As the inquiry proceeded, several parties observed the restriction less scrupulously than others, and the question of ex parte contacts became a source of acrimony between system proponents. Two years later, the FCC declined to relax the "restricted" status of these proceedings, even when petitioned to do so (FCC 80-477, 1980, ¶ 40).

FCC Sets Criteria. More important than the closure of the proceedings to ex parte meetings was the Commission's discussion of the procedural technology by which it would decide on AM stereo standards. Of special note was the establishment of criteria for AM stereo standards. Several goals were set by the FCC:

1. compatibility with existing AM broadcast receivers,
2. compliance with the existing AM bandwidth limitations,
3. compatibility with existing AM transmitters and antennas,
4. no loss in service area or loudness for either mono or stereo,
5. simple design and reasonable receiver cost,
6. satisfactory stereo service for nighttime skywave reception,
7. simple administrative procedures for implementing AM stereo upon Commission approval. (FCC 78-638, 1978)

Despite the appearance of organization at the Commission, the FCC later admitted that in September of 1978, when the *Notice of Proposed Rulemaking* was adopted, the Commission did not have "firm guidelines or a consensus on the essential performance standards" against which each of the five proposed systems could be judged. The FCC also stated that by this time in the inquiry "none of the systems had been shown to be significantly

superior to the others" (FCC 82-111, 1982). Consequently, in order to pick the "best" system from five systems that actually appeared to be about equal, the *Notice of Proposed Rulemaking* asked for additional information on each system, promising a "full and systematic comparative evaluation" of the five systems. It also encouraged on-air testing by AM stations, as an evaluation aid.

Request For FCC Oversight Denied. What a federal regulatory agency says it will do and what the agency actually does are sometimes two very different things. In the case of the AM stereo inquiry, while the FCC promised a "full and systematic comparative evaluation" of the five systems vying for selection as the U.S. standard, what actually occurred was a rather hodgepodge procedure by which competing AM stereo systems were tested by the independent NAMSRC only if the system proponent submitted to the tests voluntarily. If not, the company proposing the system would conduct its own testing and submit the results to the FCC. Assuming that the tests were conducted honestly, there was still the problem of trying to compare apples and oranges after the results were submitted. No one could be sure what types of data would be turned in to the FCC, since even the Commission could not come up with a firm set of testing guidelines and procedures. Consequently, each group might submit those technical measurements that it deemed most crucial—or most favorable. Needless to say, as 1978 came to close, not everyone was pleased with the FCC's hands-off supervision of the testing procedures.

On November 24, 1978, Belar Electronics Laboratory, Inc., one of the five system proponents, filed a motion with the FCC asking that the *Notice of Proposed Rulemaking* be amended "to provide that the further studies and tests called for in the *Notice* be conducted by the Laboratory Division of the Commission's Office of Chief Engineer." Further, Belar Electronics called for "the Commission's participation in all over-the-air testing of the proposed systems" (FCC, Memorandum Opinion, 1979). In other words, Belar wanted the FCC to do the testing, instead of the NAMSRC or individual stations or proponents. Opposition to the Belar petition was submitted by Motorola and the NAB, stating that an extensive technical record had already been established, and that individual proponents could most effectively provide any additional information to the FCC. However, a second of the five system proponents, Magnavox, submitted comments agreeing "in principle" with Belar. Magnavox requested that the FCC:

> prescribe particular tests; require the proponents to supply the Commission with an AM stereo receiver; require the proponents to advise the Commission of over-the-air tests; and to designate a FCC staff department (*e.g.* the Field

> Operations Bureau) to be responsible for inspecting, measuring, and monitoring the over-the-air tests. (FCC, Memorandum Opinion, 1979, p. 1)

These requests would seem to make sense, were the FCC interested in a "full and systematic comparative evaluation" as was stated. However, on April 12, 1979, Wallace E. Johnson, chief of the FCC Broadcast Bureau, issued an internal FCC memo outlining an "Agenda Item" recommending a *Memorandum Opinion and Order* be adopted that would deny the Belar request. The four-part memo—from which part three was deleted before it was photocopied for inclusion in the docket files—was signed as "noted" by Nina W. Cornell, head of the FCC Office of Plans and Policy, and by Will A. McGibbon "for" Raymond E. Spence, FCC Chief Scientist. On June 7, 1979, the Commission adopted the proposed *Memorandum* denying the requests of Belar and Magnavox. The FCC stated in the Order that it wanted to conclude the AM stereo proceeding "as expeditiously as is practical and reasonable," and that in its view this could be best accomplished:

> if the proponents conduct the various tests and furnish the requested information rather than encumbering the FCC's Laboratory with this additional workload. The history of this proceeding up to the present has shown that data submitted individually by different proponents can be readily analyzed and compared. Parties should recognize, however, that analysis of a record developed pursuant to this procedure will be greatly facilitated if detailed information on the manner in which tests were conducted is furnished the Commission [sic]. Analysis will be additionally facilitated by submission of comments which critique the test methods employed and the data reported. . . . We will, however, observe the over-the-air testing as time and personnel permits. (FCC, *Memorandum Opinion,* 1979, p. 2)

In other words, the FCC judged that the tests were fair and comparable, yet hoped that proponents would tell the FCC just how these tests were conducted. Further, hopeful proponents were even instructed to critique their own tests. The Commission brashly ruled that it simply couldn't add to its workload, and only vaguely promised to make an attempt to send staff to observe the testing.

Response to the NOPR. As is the case with a *Notice of Inquiry,* a period for comments also follows a *Notice of Proposed Rulemaking;* in this case, comments were submitted to the FCC throughout the remainder of 1978 and the first half of 1979. Most of these comments indicated confidence in AM stereo, while some expressed a sense of hesitation concerning the

technological aspects of the standardization process or the future of AM in general.

ABC stated that "the real issue" was the determination of what standards would assure the best service. General Electric recommended an interim transmission standard for further testing and review. The Consumer Electronics Group of the EIA argued that AM stereo was a sound concept, but suggested a nine-month delay for initiation of authorized broadcasts after the Commission's rule, stating that it was "of crucial importance to avoid the type of inventory disposal problems that arose when the number of channels available for CB radio was increased" ("Not Whether," 1979).

There were other technical concerns. For instance, because the FCC was considering a reduction in the AM bandwidth allocation from 10 kHz to 9 kHz, National Public Radio urged the FCC to "defer its choice of an AM stereo system *until it is certain* that that system will operate with full capabilities in 9 kHz channel spacing" (NPR, 1979). The BBC noted the "growing interest on this side of the Atlantic in the possibility of 'Signalling in Radio'," and, wondering if there was a similar interest in the United States, asked the FCC to take this into account in order to avoid compatibility problems (Jones, 1979). Sansui Electronics took advantage of the opportunity to make comments on the *Notice of Proposed Rule-making* by speculating on the future of AM broadcasting. Noting that AM operated on a 70-year-old technology, and that "major advances in communication theory have virtually eliminated amplitude modulation as the method for point to point communications," Sansui predicted that the future of AM would lie in the incorporation of single sideband and double sideband technologies, and for this reason recommended adoption of either the Harris or Kahn/Hazeltine systems, which Sansui felt to be more adaptable to future technological advances. Finally, Sansui recommended that AM stereo be phased in, with "significant future improvements" being mandated "5 or even 15 years in the future" (Sansui, 1979). This interesting proposal addressed one of the most common criticisms of mandated technical standards—that they effectively "freeze" the technology in time, without regard for breakthroughs that might come in the future.

A Question of Ethics. On April 27, 1979, Eric Norberg of station KEX in Portland, Oregon wrote a "P.D. Notebook" column in the national radio programming magazine *The Gavin Report* in which he questioned the ethics of tactics used by Kahn Laboratories to convince stations to lobby for the Kahn AM stereo system. A copy of the column was submitted to the FCC attached to a letter of comment from Norberg that cautioned the FCC to fully understand the reasons for petitions by ABC, RKO, and others favoring the Kahn/Hazeltine system. The column charged that:

> Now, in an effort to improve their position before the FCC, Kahn Laboratories have mounted an intensive effort to sell stations the $12,000 worth of equipment necessary to transmit their kind of stereo signal—which stations can apply to the FCC to "test" for a 90 day period. . . . Test data is then filed with the FCC, and with $12,000 worth of *nonreturnable* Kahn/Hazeltine stereo transmitting gear in their possession, participating stations naturally are urging the FCC to adopt the system which they not only have invested in, but with which they are prepared to be first in transmitting when the final approval is given.
>
> The ethics of this ingenious stratagem are questionable, but it is entirely legal. . . . I personally, am deeply concerned not only by the tactics being used by the Kahn Laboratories . . . but also with two severe shortcomings I see in their system . . . the AM band with stereo will be badly blunted . . . if the system selected is one which can be demonstrated with inferior radios. AM stereo receivers will yield spectacular performance. This is the only way stereo can be heard on four of the systems; but though this will showcase the Kahn/Hazeltine System too, it still can be heard (poorly) using the two-radios trick. And secondly, the lack of stereo beacon-light capability in the Kahn/Hazeltine System will prevent AM stations from dramatizing stereo capability as FM stations do. (Norberg, 1979)

The charge that some stations and networks were pushing for the Kahn AM stereo system because they were economically tied in to it would continue to be heard the following year, when "Kahn" stations helped to rally the broadcast industry against the FCC's choice of Magnavox for the AM stereo standard.

Not all of the comments submitted to the FCC were favorable toward AM stereo. A typical example of the few negative letters is found in the following comment from Richard Terry of Canoga Park, California: "we sure don't need AM stereo. It makes no sense at all. The quality of AM sound is too limited and why do we need to hear static and news in stereo? Why don't you apply the time and money to an improvement in the sound on television?" (Terry, 1979).

On May 15, 1979, the Harris Company proposed a modification to its system, now called Variable-Compatible Phase Multiplex (V-CPM), that was said to overcome a main drawback of the Harris system: the reduced stereo coverage relative to the larger monophonic coverage area. The new system was said to be a compromise between the earlier Harris system and the Motorola C-Quam system. After this change, Henry Geller, the Assistant Secretary of Communications and Information, and Gregg Skall, Chief Counsel of the National Telecommunications and Information Administration of the U.S. Department of Commerce (NTIA), filed comments with the FCC stating that the modified Harris proposal "deserves equal consideration and that the Commission should proceed to a decision

on AM stereo." The NTIA added that "the possibility of 9 kHz channel spacing does not warrant a delay in the resolution of this proceeding" (Geller & Skall, 1979, p. 3).

On June 15, 1979, Ford Motor Company declared its endorsement of the Magnavox system. Ford said that it had tested the five proposed systems and concluded, "our evaluation of the circuit complexity, economic factors, and applicability to the automotive entertainment environment indicates that the Magnavox or Belar systems present the most desirable alternative. The Magnavox system is more attractive because it has provision for a stereo pilot tone" (Ford Motor, 1979, pp. 1-3). The endorsement of Ford Motor Company, a major player in the U.S. automobile radio market, probably did as much as anything to begin to turn the tide of sentiment at the FCC toward selecting the Magnavox system as the U.S. AM stereo standard.

Frustration Grows. It was now late in the summer of 1979, and the FCC was to "close up shop" for its annual August hiatus. A year had passed since the FCC had adopted the *Notice of Proposed Rulemaking,* and the AM stereo docket files continued to grow. Most of the comments during the period from September 1978 to August 1979 were highly technical in nature. Yet intermixed with the technical comments were letters showing increasing impatience for FCC action on AM stereo. By now nearly four years had passed since the initial AM stereo petitions and the formation of the NAMSRC. AM broadcasters were continuing to lose audience shares to FM competitors. In the period since 1975, when the NAMSRC was formed, the AM band's share of the total radio audience had fallen from about 80 percent to only about 50 percent. Not only had FM radio gained parity with AM, it had the momentum to make further inroads—indeed, by 1984, FM captured 70 percent of the listeners, while AM commanded only 30 percent of the total radio audience, a drop from 80 percent to 30 percent in just 10 years (Rau, 1985, p. 80).

Also by this time, the patience of proponent Leonard Kahn was beginning to wear thin. Kahn, who had been battling to have his AM stereo system authorized by the FCC since the late 1950s, filed a scathing comment in which he listed the "serious flaws in the competitive systems" and said "as harsh as this may sound, the Kahn/Hazeltine system is the only system before the Commission in these proceedings which can truly satisfy the AM stereo requirements of the majority of broadcasters and the public they serve." Kahn provided a table showing 10 stations that had tested his system, and two Canadian stations that had tests scheduled; and said that "the Kahn/Hazeltine system has been, by far, the most thoroughly tested system" and that "none of the other proponents allowed broadcasters to fully test their systems without exercising tight control over the test conditions" (Kahn, 1979, Section 11, and Appendix B-7).

Two years had passed since the FCC issued the *Notice of Inquiry*. Still there was no decision. In October 1979 William LaFollette, an FCC spokesperson, explained that the FCC was not yet taking action on AM stereo because it was "swamped" with "other business," including hearings on the deregulation of radio ("No Go," 1979).

One tongue-in-cheek letter written in December 1979 to Commissioner Joseph Fogarty indicates the heightened frustration many broadcasters were feeling as the AM stereo inquiry dragged on. This letter was written on the letterhead of KIML radio in Gillette, Wyoming:

> Dear Commissioner Fogarty:
>
> My name is Roy Mapel. I drive a four wheel drive truck with a snow plow. I am writing to you concerning my favorite radio station, KIML, in Gillette, Wyoming. It's winter out here, so I am spending quite a bit of time plowing snow, getting the hands back and forth to work, and listening to the radio. That's where I think you may be able to help.
>
> I, like you I am sure, enjoy listening to my favorite station in stereo. The problem is, my favorite station is an A.M. station and can't program in stereo. Therein lies the reason for this letter.
>
> Besides driving a snow plow I am also the Manager of KIML radio. Our station has over sixty thousand stockholders who joined together to "get Gillette a radio station" in 1957, when it was very speculative to say the least. Since that time we have built new studios and installed the latest equipment. All equipment is stereo, or compatible to conversion to stereo.
>
> Now, there are other people out there who also would like to hear their favorite station, KIML, in stereo. They sometimes talk to us, when they are not plowing snow too. It seems that they have heard talk about A.M. stereo. I guess I'm the guilty party. I told them a year or so ago about the possibility. They are getting a little restless about when it's going to happen.
>
> I thought it would help to tell them that our new studios and equipment are all stereo. It didn't! It just created another problem. I don't mind all these folks in the county sitting around our studios listening to the music in stereo, but it's starting to get a little crowded with all these snow plows in the waiting room so they can listen in their trucks.
>
> We sure would appreciate your letting A.M. stereo out of the corral so that the general public could get some good out of it. (Mapel, 1979)

As the new decade began, AM broadcasters were increasingly vocal about the lack of FCC action. On January 16, 1980, the Missouri Broadcasters Association adopted a resolution strongly urging the Commission to expedite a decision on AM stereo (Griffin, 1980). A typical explanation of the FCC AM stereo timetable on AM stereo is found in a letter from FCC Chairman Charles Ferris to the president of an El Paso, Texas radio station, which said, in part: "The staff is now in the process of reviewing the filings made as a result of the *Notice*. It is my anticipation that a staff recommen-

dation will be made to the Commission in the early spring of 1980" (Ferris, 1980a).

1980—Emergence of the "Marketplace" Option

After spending the autumn of 1979 reviewing the responses to the *Notice of Proposed Rulemaking,* the FCC seemed ready to tackle the AM stereo question. However, the winds of change had begun to sweep through the FCC. While the FCC was still behind the pace of other federal agencies that were more actively pursuing deregulatory goals, the changes had not gone unnoticed on M Street. Already in 1978 and 1979, the idea of "deregulation" began to move through the federal communications policy-making structure, promising to sweep away decades of regulatory undergirding.

The first signs of the trend toward deregulation as it affected the AM stereo inquiry appeared not with the Commissioners themselves, but at the staff level. In early 1980, Nina Cornell, the chief of the FCC Office of Plans and Policy (OPP), began to openly question the goal of selecting a particular AM stereo system. She was joined by the Commission's Broadcast Bureau (BCB) under its new manager Richard J. Shiben (who had recently replaced former BCB chief Wally Johnson). There was growing support in these quarters for the idea that the FCC could better encourage the development of new technologies by enforcing only minimal technical parameters of acceptable performance. While radio deregulation was only meant to be applied to nontechnical areas (FCC, 79-518, 1979), the Office of Plans and Policy envisioned a broader application of deregulatory measures, spreading even into technical matters. Evidence for the fact that the deregulatory philosophy was seen as applicable to technical innovations is found in the OPP's 1980 staff report on direct broadcast satellite, which contained the following statement:

> Any decision concerning the regulation of a new service should accord with the deregulatory trend in the Commission's decisions and the Commission's recognition of the inappropriateness of detailed regulation in the presence of competition. To impose conventional broadcast or common carrier regulation on a service in a competitive market, while the Commission is deregulating other services, would be to ignore the lessons of recent years and create yet another service in need of deregulation at some later date. (FCC, Office of Plans and Policy, 1980, pp. 93–94).

This statement indicates that the new interest in pursuing a "deregulatory" route was not isolated to the AM stereo introduction, but reflected a more general inclination to allow free markets to arrive at standards without direct regulatory intervention. In the case of technical standard

setting and the introduction of new technologies, the newer league of FCC economists who had been brought on board by Chairman Charles Ferris during the Carter Administration were vying with the "old school" engineers to gain the ear of the Commissioners.

Following this general deregulatory theme, Richard Shiben's Broadcast Bureau (BCB) proposed what came to be called the AM stereo "marketplace" option under which "the market" could, without Commission intervention, selected its own AM stereo standards. The advantage of this approach, according to the BCB, was that it left the door open for the future development and prompt introduction of greatly improved stereo systems. The drawback was that radio stations would be allowed to use any AM stereo technology that met the FCC minimal standards for type acceptance, even though the system used by any given station might be incompatible with AM stereo transmission by other radio stations in the market or with individual consumers' receivers.

This marketplace notion was by no means unanimously supported by the FCC staff. Contrary to the recommendation of the Broadcast Bureau, the FCC's Chief Scientist, Steven J. Lukasik, head of the Office of Science and Technology (OST), felt that the Commission should choose a single system, expressing a preference for the Magnavox system because it used relatively simple technology, featuring a pilot tone that could be used for data or control transmissions. Lukasik and staffers in the OST felt that even though the technical data available was not as complete as they desired, the FCC should proceed to select a single standard. Proponents of this "single standard" point of view held that a marketplace approach might slow down the implementation of AM stereo "because broadcasters and receiver manufacturers would be reluctant to make a substantial investment in a technology that might not ultimately be successful" (FCC 82-111, 1982, p. 4, ¶ 12). This "single standard" faction within the FCC further argued that the general consuming public would be left out of the selection process because of undue influence on the part of the first receiver manufacturer to introduce product, or the first broadcasters to select a particular system.

By early 1980, the industry trade press was reporting rumors that the FCC staff would recommend approval of as many as three systems rather than one ("Where Things," 1980). However, Chief Scientist Lukasik advised that such rumors be ignored. In response to these rumors, four of the five manufacturers under consideration (all but Kahn) indicated that they opposed the marketplace approach ("Three's a Crowd," 1980). Magnavox, Motorola, Harris, and Belar officials were quoted in the industry trade press as saying that the FCC should pick one system, and that they would be willing to go along with whatever system was selected ("There's Only One," 1980). During what turned out to be the final weeks before the FCC decided the issue, there was a flurry of industry lobbying, in the form of

both letters to the Commission and ex parte meetings with individual Commissioners.

J. Edward Day, Special Council to the Consumer Electronic Group of the Electronic Industries Association (EIA/CEG), offered a written "summary of comments in opposition to [the] three system approach," arguing that the FCC should select only one system. The summary, which is quoted here at some length because of the clarity with which it explains the opposition to the marketplace option, stated that:

> CEG has consistently supported the implementation of AM stereo. We have not advocated any one particular system, but have said that the FCC should select one of the five systems which have been proposed and that this should be the only system. All past FCC decisions on new broadcast technology have produced a single technical standard. This has been true with FM stereo, black and white television and color television.
>
> Information has come to us that the FCC staff has recommended three different incompatible systems be approved and that it be left to the marketplace to find out over the years which system consumers prefer. The receiver manufacturers consider this result, if followed by the Commission, to be disastrous for the following reasons:
>
> 1. The design of radio receivers to receive three different incompatible systems would greatly increase the cost. . . . National Semiconductor . . . has estimated that providing the circuitry to make it possible to utilize three different systems in one receiver would increase the cost at the manufacturers' level. . . . 10 times over the cost of providing circuitry to accommodate one uniform system. . . .
> 2. The technology of automatic switching of a receiver from one system to another has not been developed, and it would be necessary to use manual switching. . . .
> 3. CEG is advised that some leading manufacturers of radio have stated that they would not manufacture receivers equipped with switching capability. . . .
> 4. If an appreciable number of receiver manufacturers decline . . . it would greatly handicap AM Stereo. . . .
> 5. It is likely that receiver manufacturers and broadcasters alike would be motivated to wait until one system was settled on before they invested . . . listeners and consumers cannot be expected to make a marketplace decision as to which of the three systems is preferable.
> 6. No home radios are made in the United States. . . . If no single U.S. standard is decided on, it is possible that Japan will adopt its own standard, that that will become the American standard, and that the decision as to which system is preferable will have been left to others without FCC input.
>
> Having three systems is almost comparable in the chaos that can be expected to what would have happened if the FCC had decided that each television receiver be designed with the ability to receive any of the three basic

> systems of television [proposed]. . . . Fortunately, this expensive and impracticable result was avoided long ago. The same theoretical argument could have been made that if all three systems could be received on a television receiver, and some broadcasters were using different systems, the public could have made a choice as to which system they preferred. This is an unrealistic argument now just as it would have been then, and the same economic waste would have occurred as will occur if three AM Stereo systems are approved. (Day, 1980, pp. 1-3)

This comment is especially noteworthy because it contains a forewarning of a scenario almost identical to that which eventually came to pass after the 1982 marketplace decision.

The Proceedings Sour. Near the end of February 1980, accusations erupted that some of the test materials presented to the FCC by Motorola and others might be tainted. The Magnavox company submitted a reply comment to tape-recorded material submitted by "several proponents and interested parties," warning that "the Commission should be cautious in extracting scientific data from the audio tapes submitted in this docket" due to differences in program content, types of recording machinery, and the potential effects of storage and aging on the tapes (Magnavox, 1980a). Motorola's Vice-President and Director of Government Relations, C. Travis Marshall, responded to the Magnavox allegation of chicanery in the submission of audio tapes, charging that "Magnavox has chosen to misrepresent Motorola's position . . . [and] evidence on the significance of any potential interference." Marshall stated that "Motorola finds it incredible that Magnavox chose to ignore all of the carefully gathered objective and scientific evidence to concentrate on the vagaries and measurement variations of tape recordings in an attempt to discredit Motorola." Marshall thanked Magnavox for "pointing out that one of the 11 tapes on file was wrongly recorded in monaural rather than stereo." He said that "Motorola shares with Magnavox 'concern for the accuracy of *scientific* inquiry that may be obtained from the submitted tapes' " but that "Motorola cannot stand by and allow such an incredulous accusation to stand unchallenged" (Marshall, 1980a).

Two weeks later, in a letter that demonstrates the acrimonious atmosphere now pervading the AM stereo inquiry, Kahn Communications filed a response to the Magnavox "late reply comments":

> we believe that for Magnavox to have delayed their initial comments on these tapes until the last day of February, 1980, clearly makes a mockery of their statement that "Magnavox has consistently opposed a waiver of the Rules and has urged an early decision by the Commission."
>
> In actuality, the new Magnavox procedure (a form of noice blanker) could have been suggested as a fix to Magnavox by most junior engineers with

> amateur radio experience. . . . What disturbs us now is that at this last minute in these proceedings, six months after [the] close of the final reply comment acceptance period, Magnavox introduced a brand new technical issue. Indeed, what puzzles us is that Magnavox, part of the 15 billion dollar per year Philips organization, and with an excellent engineering group specifically assigned to the AM stereo program, did not earlier consider a fix that most engineers would have recognized (and discarded) as a possibility almost as soon as the problem surfaced. (Kahn Communications, 1980a)

One gets the feeling, when reading the comments submitted to the FCC in the spring of 1980, that had representatives of the five AM stereo system proponents met face to face, some of them might have come to blows; such was the level of animosity demonstrated in their letters to the Commission.

The Ad Hoc Joint Committee. The FCC was now in its fourth year of the AM stereo inquiry, and as proceedings continued to heat up, the Commissioners issued a "directive" to the FCC staff saying that the time had come for the staff to finish deliberations and to make its recommendation by preparing an agenda item on which the Commissioners could rule. While the OST still preferred that a single standard be set, the BCB wanted to try the newly proposed "marketplace" route.

Finally, a joint conference committee was established on a relatively informal basis, to try to come to some compromise on the single-standard/marketplace dilemma. This ad hoc staff committee was formed under the direction of Larry Middlekamp of the OST. On February 26, 1980, Frank L. Rose, chief of the FCC Technical Standards Branch, wrote an internal memo that was copied to several middle and senior level FCC staffers, outlining a "meeting to discuss course of action in AM stereo proceeding, Docket 21313." Rose noted that "there was considerable discussion on the pros and cons of selecting a single stereo system vs. specifying general operational parameters within which any system would be permitted to operate" (Rose, 1980). On March 3, Larry Middlekamp, head of the research division of the OST's Research and Analysis branch, sent a memo to Chief Scientist Steven Lukasik stating that:

> In response to a directive from the Commissioners, the staff is preparing an Agenda Item recommending action on the existing *Notice of Proposed Rulemaking in the Matter of AM Stereophonic Broadcasting, Docket No. 21313.* Two courses of action are being considered: (1) Proposals of broad standards . . . that would encompass the five systems discussed in the Notice. (2) Adoption of specific standards . . . for a single AM stereophonic broadcasting system chosen from the five presented.
>
> A third course of action, not being considered, is possible: no AM stereo. However, petitions and comments have convinced us that there is sufficient

demand for the service and that it is compatible with existing services. (Middlekamp, 1980a)

On March 10, 1980, Frank Rose received a memo from committee member John Reed noting that the first meeting of the ad hoc committee had been held, and that "the sole purpose of this meeting was to discuss the formulation of a weighting system under which the various AM stereo systems could be evaluated" (Reed, 1980a).

A second memo from Reed to Rose on March 12 stated, "Larry Middlekamp is now considering all five proposed systems rather than only three as was mentioned yesterday," (Reed, 1980b). As this memo indicates, the OST was initially planning to drop two of the five systems from consideration, but retracted itself from this course.

On March 17, 1980—a full week after the joint committee's first meeting—Middlekamp sent a memo to Chief Scientist Lukasik, which said in part, "In response to your directive, I formed a staff committee to select one of the five AM stereophonic systems" (Middlekamp, 1980b). One might conclude that Middlekamp intended to have the committee pick a *single* standard rather than allow the marketplace option to be selected, which would contradict the March 3 memo to Lukasik, in which Middlekamp included the selection of "broad standards" as an alternative to the selection of a single standard.

The Secret Matrix

Late in March 1980, the engineers in the Office of Science and Technology constructed an "AM Stereo System Evaluation Table," which came to be known simply as "the matrix." Based upon this matrix, the OST "numerically evaluated and compared" the five AM stereo systems in 11 categories, and intended to have the ad hoc joint committee recommend to the Commission that a single system be chosen. Further, it was the conclusion from the OST technical evaluation that the system proposed by Magnavox was the best choice (FCC 82-111, 1982, p. 5). The FCC's table, presented here in Figure 3-1, was at the time considered "secret" by the FCC, and, in fact, a Freedom of Information Act request for its release was initially denied by the Commission.

The entire process of constructing the matrix appeared to be accomplished with remarkable and uncharacteristic speed. Consider that the Broadcast Bureau and the Office of Science and Technology assembled a joint committee, and then in meetings held over just a couple of weeks studied and deliberated over the immense AM stereo docket, constructed the matrix, and, a very short time later, recommended the Magnavox technology to the Commissioners.

EVALUATION CATEGORY: Numbers in parenthesis ( ) indicate the maximum possible scores in the various categories or sub-categories.	MAGNAVOX	MOTOROLA	HARRIS	BELAR	KAHN
I. MONOPHONIC COMPATIBILITY (15):	12	11	7	12	11
II. INTERFERENCE CHARACTERISTICS:					
(1) Occupied bandwidth (10)	7	5	9	5	8
(2) Protection Ratios (10)	5	3	8	5	7
III. COVERAGE (10):	7	6	6	5	5
IV. TRANSMITTER STEREO PERFORMANCE:					
(1) Distortion (10)	8	7	3	9	2
(2) Frequency Response (10)	9	4	5	10	7
(3) Separation (10)	9	9	6	10	2
(4) Noise (10)	7	8	7	6	6
V. RECEIVER STEREO PERFORMANCE:					
(1) Propagation degradation (5)	3	5	4	3	5
(2) Directional Antenna Effects (5)	3	3	4	3	3
VI. MISTUNING EFFECTS (5):	3	3	4	3	3
TENTATIVE TOTAL SCORE (100):	73	64	63	71	59

Source: FCC 80-477, 27920. *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking: In the Matter of AM Stereophonic B/casting,* FCC docket file 21313 document, adopted 31 July, 1980; released 11 September, 1980: 4.

Figure 3-1 *AM Stereo Evaluation Table* (March, 1980)

Committee Breakdown. Despite the OST faction's preference for the selection of the Magnavox system as the AM stereo standard, the Broadcast Bureau/Office of Plans and Policy marketplace faction led by Shiben and Cornell would not give up without a fight, and intended to argue its case for the "minimal standards" solution before the Commissioners. Although the FCC staff had been instructed to work on an agenda item in the form of a proposed *Report and Order* for the Commission's consideration, actually the OST and the Broadcast Bureau began to draft *separate* versions of the final ruling document. Consequently, while the OST side had "won" in the joint committee, and the single-system solution, which favored the Magnavox system, was to be presented as an outcome of the joint OST/BCB committee (with the "matrix analysis" table included as an "associate

item,"), there can be no doubt that the decision was not a consensus among senior staffers. Instead, the Magnavox preference reflected the position of a few mid-level staffers serving on a joint committee that actually operated under the direction of the OST research chief with a 4 to 3 OST membership advantage. But because those who favored the marketplace option were committed to fighting on in the name of deregulation, a storm was brewing and threatened to erupt in front of the seven FCC Commissioners.

Eleventh Hour Efforts. As the FCC AM stereo decision appeared imminent, two of the five system proponents sent out mass mailings to radio station managers urging them to contact the FCC. Some broadcasters responded as requested, while a few took the opportunity to inform the FCC of the pressure that was being brought to bear on the licensees by the proponents. One letter, addressed to Chairman Charles Ferris, stated that:

> during a very short period of time this station has received 11 of the enclosed letters from the Harris Company . . . the Kahn Company followed up with a mailing to stations telling why their system was superior to all others and urged that stations write the Commission and tell them so.
>
> It is my hope that these less than ethical procedures will not be an influence on the determination that the Commission will make in the decision on AM-Stereo. (Blotter, 1980)

Another letter said in part:

> I am writing at the behest of Harris Corporation who are not surprisingly pressing their system. The Kahn system developers have also urged me to put in a word for their system. I find it strange that I have not heard a word from the other AM Stereo system developers. I generally get the impression from these others that their total thrust is toward the receiver market with a simplistic view to cost only. (Lewis, 1980)

In this last-minute rush to lobby the Commission, there was also a whirlwind of ex parte contacts—even though the proceedings had been restricted. Richard Wyckoff, George J. Gray, and David Markey of the NAB made ex parte presentations to several Commissioners. Records kept by the offices of Commissioners Robert E. Lee and Anne P. Jones show that the NAB urged the adoption of a single system for AM stereo for reasons of economy, to encourage the confidence of broadcasters and the public, and to provide for quick, efficient, and effective implementation (Jones, 1980; Lee, 1980). Although ex parte restrictions were in place at this time, such presentations were not only being allowed, but in some cases were checked off on the oral presentation summary cover sheet as having been "considered by this office." Taking such ex parte contacts into

consideration in a restricted case was clearly a breach of the Commission's own rules.

Motorola sent last-minute letters to members of the Commission stating that "multiple systems will result in chaotic conditions for broadcasters, broadcast equipment and receiver manufacturers . . . will have an adverse impact on the consumer" and that "selection of a single system does not create a windfall condition" (Marshall, 1980b).

Marshall M. Brown, Technical Director of Craig Corporation, a large electronics manufacturer, wrote the FCC about the rumored plan to approve three different systems, stating that he was:

> seriously concerned about the implications of this action. It would seem to involve: (1) additional research and development time and expense on the part of each manufacturer to bring product to market, (2) added cost of manufacture, (3) added cost to the consumer, (4) payment of three royalties instead of one, and (5) greater likelihood of receiver malfunction as a result of the added complexity.

The letter concluded by threatening that "although Craig Corporation has been looking forward to this new service, the above factors would require us to reconsider our entry into this market. We find it difficult to believe that there are three identically superior systems, and urge that only one system be selected for approval" (Brown, 1980).

Kenneth C. Meinken, Jr., the President of Magnavox, sent a two-page mailgram to each Commissioner, which stressed that:

> It will be contrary to the public good for the Commission to authorize more than a single stereophonic broadcast system. . . . The American consumer will gain nothing by have more than one AM stereo system adopted. . . . The public would wisely refuse to purchase an economic [sic] "single system" receiver because it would be incapable of receiving all the different stereophonic broadcast signals. . . . If more than one system is adopted for AM stereo, the receivers must be capable of automatically identifying the particular AM stereo signal present. This represents an extremely expensive concept . . . such an inflationary situation can only be detrimental to AM broadcasting. (Meinken, 1980)

Similar telegrams urging the Commission to select a single standard were sent by the vice-presidents of Radio Shack/Tandy and Sony Corporation of America within 24 hours of the FCC meeting at which AM stereo was decided (Roach, 1980; Oniki, 1980). In addition, a powerful member of Congress, James T. Broyhill of North Carolina, sent a letter to FCC Chairman Ferris and the other Commissioners which stated in part:

> My concern is that these systems are not compatible and that each system would require a separate receiver. I simply don't see how this would benefit the listening public. Why not work out a plan to permit one system that all concerned can easily and economically implement? Then competition can occur within the industry as this technique is shared by all. (Broyhill, 1980)

It is not stated in Broyhill's letter what or who prompted his concern, but at the time Broyhill served on both the Budget Committee and the Interstate and Foreign Commerce Committee, which had direct oversight of the FCC, so it is possible that Broyhill was acting either on his own initiative or in reaction to a complaint from an interested party.

When word leaked out that the Magnavox system would be selected, system proponents questioned the FCC selection process. Just two days before the scheduled Commission meeting, William Borman of Motorola contacted members of the Commission. The records of Commissioner Abbott M. Washburn indicate that Borman was concerned about trade press reports that the OST would recommend the Magnavox system: "Mr. Borman raised questions as to the procedures used in arriving upon such recommendation and questioned the availability to the Commission of all relevant data. He stated that he believed the Magnavox system was not desirable" (Washburn, 1980).

Summary. The events that transpired between the end of the comment period in August 1979 and the end of the staff evaluation of the comments in April 1980 show three major developments in the AM stereo inquiry: (a) The emergence of the marketplace solution, which conflicted with traditional FCC "single standard" approaches to new technologies; (b) questions over appropriate decision-making procedures, which led to a joint ad hoc committee, and eventually the justification of a preferred outcome through the construction of a "matrix analysis" evaluation table; and finally, (c) political influence in the form of a last minute rush of ex parte contacts. These contacts were flagrant violations of the FCC's ex parte restrictions, took place long after the period for comments had closed the previous August, and contributed to the rancorous atmosphere that enveloped the proceedings.

The presence of unclear decision making procedures within the Commission and external political pressure on the FCC will become even more clear in the following section, in which the Commission's decision erupts into a storm of controversy.

The Magnavox Decision

Finally, after nearly three years of formal inquiry, AM stereo docket 21313 was placed on the FCC agenda for Wednesday April 9, 1980. At that open

"sunshine" meeting, the Broadcast Bureau (BCB), feeling that any selection by the Commission would be arbitrary, recommended the adoption of the "marketplace" solution—that is, rules that would have provided only minimum technical standards without selecting a particular AM stereophonic system (FCC 80-477, 1980). The chief of the BCB's policy analysis branch, Jim Green—backed by the Office of Plans and Policy's Nina Cornell—argued that "although the information is not all we prefer, we think all the systems have acceptable quality. Every one is superior or tied for superiority with another system in one respect or another, and there would be costs in choosing a single system." Green said that the greatest cost would be the penalty of a single technical mandate putting a halt to further competition, and noted that he would prefer that broadcasters do their own weighing of criteria and make their own AM stereo decisions based on attempts to maximize their audiences" ("FCC Makes," 1980).

Representatives from the Office of Science and Technology (OST), on the other hand, made a presentation in which it was argued that a single system be designated the national standard, noting that the "OST has worked closely with BCB on this item and we support much of their analysis. However, we disagree with their recommendation to authorized five incompatible systems." In his presentation, OST Research and Analysis Division deputy chief Robert Powers stated that the single-system approach was the better choice for two reasons: First, that "multiple, incompatible systems do pose uncertainties and costs on the broadcaster and the consumer." The second reason was that the five systems posed the problem of important quality differences, which are difficult for ordinary consumers to perceive, including technical variations such as "received signal quality, protection against degradation of monophonic compatibility and spectrum efficiency." Powers added that AM would be at a disadvantage to FM, which has only one stereo system. The OST provided the Commission with a confidential "associate item," which contained the newly constructed matrix analysis. The OST was recommending that the Magnavox system be adopted, based on the table of numerical scores said to represent a consensus of the OST engineers for each matrix category. Powers stated that "the quality of AM sound is 'fundamentally and physically' limited by the bandwidth available, amplitude modulation and its broadcast frequencies, which have certain propagation qualities. We are arguing hardware on one hand . . . and the format of the broadcast wavewidth on the other. The system proposed by Magnavox is reasonably close to those theoretical limits."

Speaking against the joint OST/BCB matrix, Daniel L. Brenner of the Office of Plans and Policy (who would later become Chairman Mark Fowler's legal assistant) pointed out that:

> A matrix of numbers such as has been presented looks impressively concrete. I think, however, that looking at it more closely, it is in fact less concrete and more arbitrary than it would appear. . . . One can, in fact, take Magnavox and turn it from the first system into the third system and take the fourth system and turn it into the best. (Hazeltine, 1980a, p. 3)

At the meeting, FCC Chairman Charles D. Ferris asked if the proposed five-system marketplace would be a "likely environment for AM stereo to get off the ground." The BCB's Green answered that "to assume [that it wouldn't] would be pushing it to the worst case in the short run. [We feel] the marketplace would winnow it down to one system." To this, Ferris responded that "If all five systems are eligible, why not try a lottery? . . . At least some decision would be made so service would be made available in the shortest period of time rather than go with a further gestation period." Commissioner James H. Quello asked: "Hasn't Magnavox been found to be superior, or is that a supposition? . . . Consumers aren't going to challenge our decision; it's highly technical. Let's bite the bullet and choose. We would not help the consumers—just confuse them, causing unnecessary delay and a waste of resources." When the deputy chief of the BCB, Frank Washington, responded that such a choice would be "arbitrary," Quello suggested, "If they're all equal, then use a lottery."

Despite Quello's comment about consumer confusion, it seems clear that the Commissioners were under no delusion that the consumers who would do the choosing in the marketplace were individual Americans. Rather, the real marketplace was made up of the corporations that would consume the standard. For instance, Commissioner Tyrone Brown questioned Nina Cornell, chief of the OPP, about how the marketplace might function, and she painted three scenarios: "Well, General Motors could decide to put just one system in their cars, or broadcasters could decide they were going to use one system, or the EIA could choose one." Larry Middlekamp, head of the OST's research division, countered that "We are in a very good position to make an engineering judgment that others doubt we have the ability to do," and explained that the Magnavox and Belar systems had the most points on the evaluation table, with the Magnavox system coming out on top in the over-all rating (as indicated on Figure 3-1, Magnavox had 73 points, Belar 71, Motorola 64, Harris 63, and Kahn 59).

Commissioner Anne Jones was not comfortable with the OST recommendation saying "the social costs of not picking one system disturb me—but maybe I'm more concerned with picking just one." Commissioner Tyrone Brown also said that he was disturbed that the Commission was not making a technical choice, but rather an economic one.

After a lengthy en banc discussion, the ballot was cast. (Commissioner

Robert E. Lee was absent, so only six FCC Commissioners participated.) Voting in favor of the single system—which, based on OST staff recommendations, would be the Magnavox system—were Commissioners Ferris, Fogarty, Quello, and Washburn. Voting against were Jones and Brown. Chairman Ferris said that "the urgency to develop the market is the reason for this decision," and the Commission made it known that while it would endorse the marketplace theory when appropriate, it felt that AM stereo should not be delayed further. Thus, on a four-to-two vote, the Commission tentatively approved the Magnavox system as the official U.S. standard for AM stereo, and at the conclusion of the meeting, the staff was "directed to prepare a *Report and Order* to implement rules for a single national AM stereophonic broadcast system" (FCC 82-111, 1982, p. 5). Commissioner Joseph Fogarty, who voted in favor of the standard, quoted Justice Oliver Wendell Holmes: "Every year, if not every day, we have to wager our salvation upon some prophecy based upon imperfect knowledge" ("FCC Makes," 1980, p. 27).

Reflections on the Decisions. Years later, when the 1980 decision was discussed with former FCC Commissioners and other participants, striking differences were noted in how the decision and how the FCC engineering staff were regarded. For instance, in trying to clarify whether her vote was influenced more heavily by the lack of confidence in the engineers or by a preference for free-market forces, Commissioner Jones stated, "It's a hard balancing act. I guess maybe if I had had total confidence in the staff's recommendation, I probably would have gone with it." But, she explained, in this case:

> the [Broadcast] Bureau wanted to go "marketplace," and the OST wanted to go "standard." That makes it more difficult. Generally a recommendation comes over from the staff which is one way, and it's very hard to disagree with them. You do, often—but you don't do it easily, you don't do it lightly. So that was part of the initial unease; that the [Broadcast] Bureau and the Engineers were split. But then when they changed their minds about which one was the best system, and I remembered all the discussion about the fact that the Commission had really blown it when they picked the [NTSC] standard for television—that we would have been much better off going with the European system—then I thought "We're not experts. We are not technical experts in any area. And why should we attempt to pick one?" I think we would have picked the wrong one. And I felt that if you left it to people who are in the business, who are the real experts about what will work and what won't, that everyone would gravitate toward whatever was perceived to be the best system by the majority of the people. (A.P. Jones, personal interview, March 7, 1990)

Commissioner Anne Jones further explained that her 1980 dissent to the single standard/Magnavox decision was grounded not only upon the larger question about the historical role of the FCC in the area of technical standard setting, but also in a lack of confidence in the recommendation of the engineers in the Office of Science and Technology:

> We didn't know what we were doing. The staff had no idea what it was doing. . . . There was a matrix, and it was very convoluted . . . it was just a total lack of confidence. . . . I mean what do we know about standards? Truly, we have some very fine engineers and what have you at the FCC, and we still do. But the chances are that the really great engineers are someplace else, just because the Commission doesn't pay. And when you have them waffling . . . changing their mind mid-stream, I just think it would do a whole lot better to have the marketplace make the decision.

Losing system proponent Leonard Kahn of Kahn Communications, however, presented a different view of engineering at the FCC:

> I have great respect for a number of engineers at the FCC. I've been dealing with the FCC for a long time, and they have had some great engineers. . . . They know their theory, and they relied on the laboratories to prove it. Now indeed, the FCC was set up in what I find a solid engineering base; they will listen to your arguments concerning technology, but they will never make a decision—I'm saying what used to be—would never make a decision without laboratory confirmation, which is the ultimate in science. . . . There has to be a proof in science and engineering, and that proof is the laboratory—the final judge. So while they did do things like that years ago, I'm afraid the laboratory end of it has been significantly down-played in recent years. And I was always fearful that even in the early eighties and seventies when the laboratories were in control of such tests, that there was too much pressure from upstairs. There was too much political pressure. . . .
>
> One of the problems is the attitude of the Commissioners, and how they listen to them [the engineering staff]. If you treat them with disrespect, then you'll find that the good ones will leave fairly quickly. (L. R. Kahn, personal interview, April 2, 1990)

It is important to note that Kahn is himself an engineer of some distinction. He was awarded the 1980 Institute of Electrical Electronics Engineers (IEEE) Armstrong Medal in recognition of his work in AM stereo, independent sideband, time diversity, voice processing, and other advanced electronic techniques. Nonetheless, the statements of Jones and Kahn illustrate opposing opinions about the role of electronic engineering in technical standard setting.

Controversy in Las Vegas. After the FCC Magnavox decision was announced, three of the losing system proponents, Belar, Motorola, and Harris, began to back off initial pledges to support whichever system was selected. Although none threatened immediate litigation, their reactions left open the possibility of future legal action. Leonard Kahn, on the other hand, who favored the marketplace approach from the beginning, predicted that lawsuits *would* be filed and that AM stereo would be held up in the courts for years, causing an intolerable delay to broadcasters. He said that he was going to try to get the Commission to reconsider, and would file a request that oral hearings be held, which he said "would be good for the Commissioners." Kahn felt that his system had the broadest support among broadcasters. Indeed R. L. Pointer, vice president of broadcast engineering at ABC; John Bailie, director of the NBC radio engineering division; and George Capalbo, vice president of engineering for RKO, all expressed disappointment in the Magnavox decision, and stated their preferences for the Kahn system ("There's Only One," 1980). Despite Kahn's request, the FCC did not schedule an oral hearing on the matter.

By no coincidence, the FCC timed the AM stereo decision so that it immediately preceded the huge convention of the National Association of Broadcasters (NAB), which was to be held the following week in Las Vegas, Nevada. This convention annually attracts thousands of radio and television station owners and personnel for the most extensive broadcast technology shopping venue in the world, and consequently is a natural spot for seeing and learning about state-of-the-art broadcast innovations. The FCC has historically timed the announcement of favorable rulemaking to coincide with the NAB convention; as Commissioner Quello's assistant, William Harris, observed, "historically Commissions have tried to deal with any broadcast regulation or deregulation as kind of a nice thing to announce at the NAB convention" (W. Harris, personal interview, December 19, 1989). In 1980, the authorization of AM stereo represented the Commission's "gift" to broadcasters. That is, after years in limbo, the FCC's decision to authorize the use of AM stereo technology and to select a single standard was to represent a benevolence on the part of the Commission for the struggling AM broadcast industry. The FCC Commissioners and staffers present probably expected a warm reception in Las Vegas. Instead, the broadcasters' response made it clear to the FCC that many in the industry vehemently opposed the Magnavox decision, and felt that the Magnavox system was technically deficient.

Speaking at the NAB engineering luncheon, Commissioner Robert E. Lee, who was absent for the original vote, confirmed that the FCC had gotten "a lot of flak" about the decision. Lee perhaps opened a floodgate when he told the engineers "we may have made a mistake, but I don't think we did" ("Bad Vibes," 1980).

Broadcasting magazine, in an article titled "The FCC on the Firing Line in Las Vegas" (1980), offered this contemporaneous account of the AM stereo controversy as it unfolded during the FCC session at the NAB convention:

> [NAB President Vincent] Wasilewski then threw out the subject of AM stereo for discussion. . . . A TV engineer asked why the Commissioners approved the Magnavox system without reading all the technical information submitted. Lee said the purely technical decision was made on the basis of recommendations from the FCC's engineers. The questioner then asked, "Why did the FCC approve a system that every AM broadcaster in the country disapproves of?" Lee replied that if every AM engineer makes a filing saying the FCC made the wrong choice, "I would change my mind." This remark brought loud applause from the audience. Leonard Kahn, whose Kahn/Hazeltine stereo system seems to have a great deal of support from broadcasters, then stepped forward and asked the Commissioners if they would consider holding oral arguments to reconsider their decision.
>
> Brown answered that if an oral argument proved to be a help in aiding the decision-making process, he would go along with it. Fogarty and Quello also said they would favor an oral argument on the subject.

Commissioner James Quello gave this account of what happened at this FCC forum in Las Vegas:

> At the NAB convention they had—like they usually do—a Commissioners' day. They got all the Commissioners up on the stand and you have a thousand people out in the audience—going to try to ask you all questions [about issues on which] they disagreed with the Commission. They zeroed in on me, a former broadcaster running a 50,000 watt clear channel station—all that stuff—supposed to know something about engineering. They said "why did you pick a standard which so many of the AM chief engineers disagree with?"
>
> I didn't know this. We picked a standard. We agreed that there were four or five different systems that would have been adequate. Our man in technology at the time said that he thought Magnavox would make 'em as good as any—probably better.
>
> Well, they kind of had me. . . . So instead of going to the NAB regular lunch that day, I went to the engineering lunch, and I sought out my engineer at WJR—I made him director of engineering for the station—and I said "Here's what they said. Truth? or B.S.?"—B.S.—I used the full word. And he said "It's B.S." And I said "Well what happened?" He said "Well you know a few engineers had already adopted a competing system, and when you came out with Magnavox, they had their stations in there for thousands of dollars on another system. They had to say they disagree with you—put them in one hell of a spot.
>
> Then I went to Wally Johnson. Wally Johnson used to be head of our Broadcast Bureau. He's an engineer—he's a consulting engineer. Very honest,

> earnest guy. I have the greatest respect for Wally Johnson. I thought "When you talk to Wally Johnson, it's like talking to Abe Lincoln." In communications—you're going to get it straight. He said "Ah, it's [the Magnavox system] as good as any." He said "These people had other interests, certainly." I came back and I said "Well, I think we have to stay with the standard." (J. H. Quello, personal interview, December 19, 1989)

The "Wally Johnson" to whom Quello referred is Wallace E. Johnson, who was replaced as head of the FCC Broadcast Bureau by Richard J. Shiben shortly before the Magnavox decision. Certainly these comments show that Commissioner Quello relied heavily on the judgment of the professional engineers at the FCC and in the broadcast industry.

The pressure to which the Commissioners present at the NAB convention were subjected can be detected in the following internal FCC memo, which was dictated to staff in Washington directly from Las Vegas on the afternoon of April 15, 1980:

> To:Frank Lloyd
> From: Ed Dooley (dictated by phone 2:00 p.m.)
> Subject: AM STEREO
>
> Commissioners Quello, Fogarty, and Brown encountered significant protests today regarding AM Stereo action by which Magnavox was chosen as the main supplier system. The protests surfaced at a panel at which the three appeared to discuss various Commission actions.
>
> The crux of the opposition was that the Commission relied on faulty data from the engineers in OST.
>
> Quello appeared genuinely surprised when told that many AM engineers opposed Magnavox systems. He said that if a sizable or overwhelming number of engineers expressed a similar view that he would give careful consideration to reconsideration of the AM Stereo action by the Commission.
>
> Fogarty said that in view of the opposition he would favor oral arguments but emphasized that a petition for reconsideration could well delay final implementation of AM Stereo. The remainder of the meeting dealt with some emotions of EEO standards to which Fogarty and Brown responded with stalwart defense of Commission actions.
>
> The bottom line is that it [sic] seems to be some considerable opposition to the Magnavox decision and word should be relayed to Chairman Ferris and [OST Chief] Steve Lukasik. (Dooley, 1980)

After the convention closed, *Broadcasting* magazine offered this summary of the turn of events concerning AM stereo at the Las Vegas convention:

> it became increasingly clear . . . that the FCC's decision of April 9, selecting the Magnavox stereo system from a field of five, would not go without serious

challenge that could hold up the implementation of AM stereo for years. Surprisingly, the challenge may come not only from the losing system proponents but also from many broadcasters and broadcast engineers who feel the Magnavox system is so technically flawed it may jeopardize the entire AM stereo concept. . . . During the convention, it also became apparent that there was broad support among broadcasters for the Kahn/Hazeltine system. . . . Even Bob Streeter, one of the developers of the Magnavox system, had to admit that Kahn has "marvelous support" among the broadcasters. "It's something about the way he explains his system that attracts their interest."

The objections to the Magnavox system are technical and the most serious one is a "popping" that is said to be heard on receivers when the negative modulation peaks are allowed to surpass 95 percent. According to Robert Reymont, chief engineer at WGAR (AM) Cleveland and a panelist at the engineering session on AM stereo, restricting peaks is not as simple as Magnavox contends. . . .

Magnavox's Streeter, who was on the panel with Reymont, admitted that the negative peaks had to be restrained, but did not see it as a problem . . . it's a matter of finding the proper technology to make the technique workable." . . . Streeter feels that the technical problems are false issues and that the real reason the Magnavox system is the target is because Magnavox is the winner. Streeter said "it's only natural" that the losing proponents would react the way they have. "I would be surprised if that didn't happen," he said, especially in light of the way system proponents were always "throwing bricks at each other" in the docket proceedings. . . . Although Kahn's system seemed to be the popular favorite, he may have been simply the most convenient rallying point for the anti-Magnavox sentiment. ("Bad Vibes," 1980, p. 80)

Criticism of the Secret Matrix. At the center of the controversy was the FCC's secret evaluation table or "analysis matrix," which the Office of Science and Technology had used to rate the five systems, and through which it eventually recommended the Magnavox proposal. The fact that the FCC staffers attempted to keep the matrix a secret would soon come back to haunt them. Losing proponents felt that they had been robbed of a fair hearing in the evaluation process. On April 11, just two days after the Magnavox decision, the Hazeltine Corporation, co-proponent with Kahn Communications, had filed a motion requesting that the FCC "permit public inspection of and comment on an Office of Science and Technology (OST)/Broadcast Bureau so called 'matrix analysis.'" Hazeltine argued that:

No public notice of the decisionally significant matrix analysis study was ever given. No public notice of the factors to be evaluated as a part of that study or of the methodology to be employed in it was given. Indeed, the only information presently available with respect to the matrix analysis study is the public discussion at the Commission's April 9, 1980 Sunshine Meeting of the

> confidential "associate item" containing it. No interested party, therefore, had an opportunity to comment on the appropriateness or reliability of the study or to provide data appropriate for such an analysis. Indeed, it appears that the matrix analysis methodology may, in fact, have been created only a short time before April 9.
>
> . . . If all but one AM stereo system designer is to be forever precluded by the Commission from the AM stereo transmitter and receiver markets on the basis of a mathematical scheme, basic rationality and fairness require that competing system designers have an opportunity to know what that scheme is before, rather than after, the decision based on it is finally reached. If the analysis reflected by the matrix is wrong, then the Commission reached the wrong decision. If the analysis is correct, it will withstand scrutiny by informed parties. The Commission should assure itself that it was sound analysis, not arbitrary methodology, which determined the outcome of the decision. (Hazeltine, 1980a)

Also on April 11, the Harris Corporation went one step further. Harris filed a "Freedom of Information Act" (FIA) request, asking for disclosure of "all documents, reports, memoranda, evaluations, comparisons, and additional information . . . which the Federal Communications Commission's Broadcast Bureau and the Office of Science and Technology (OST) used, prepared, reviewed or relied upon . . . [and] . . . a copy of a document prepared by a joint Broadcast Bureau/OST Committee referred to in the April 9 Commission meeting as a "matrix" (Harris, 1980a).

Shortly after the debacle in Las Vegas, on April 21, 1980, Motorola filed comments supporting the Hazeltine request that the matrix be made public. Motorola cited two court cases that it said "make clear that, in order to give interested parties notice of and an opportunity to comment on a proposed rulemaking, the agency must release, to permit public comment on, studies and other documents embodying the crucial factual basis for the agency's decisions." The first citation, from the 1974 Portland Cement case, said:

> It is not consonant with the purpose of a rulemaking proceeding to promulgate rules on the basis of inadequate data, or on data that, [to a] critical degree, is known only to the agency. The Court noted that the agency's failure to disclose and receive comment on this information was not merely an error in judgment but a "critical defect in the decision-making process." (*Portland Cement Association v. Ruckelshaus,* 1974; cited by Motorola, 1980a, pp. 1-4)

The second citation, from the FCC's recent WNCN "format doctrine" case, stated:

> In view of the study's importance, we might have expected that, before reaching a decision, the Commission would release it for adversarial testing of

> its data base, methodology, and conclusions. . . . Yet it appears that, prior to the issuance of the Policy Statement, only the Commission itself knew of the study's existence. . . . The Commission's use of the staff study was infected with the serious flaw that it never even divulged the existence of the study; much less gave the participants the opportunity to comment thereon, before issuing its Policy Statement. This procedural unfairness, coupled with the substantive uncertainty flowing from the lack of adequate adversarial testing during the comment period, is enough to make us view skeptically the Commission's use of the study. (*WNCN Listener's Guild v. FCC,* 1979, at 846 and 856; cited by Motorola, 1980a, pp. 1-4)[1]

On April 21, 1980, Kahn Communications filed a motion for oral hearings before the FCC, charging that:

> A number of important points were not brought to the attention of the Commissioners concerning the AM stereo matter. For example, it was apparent that there was little or no discussion concerning the wishes of the broadcasting industry . . . nor was there any serious consideration given of the opportunity of providing stereo service to those members of the American public who cannot afford special stereo receiving equipment. Instead, a rather unusual approach was followed in attempting to make a decision on a scientific or engineering problem, apparently with little or no regard for the detailed and extensive testing performed by major broadcasters throughout the country who cooperated with the Commission in performing on-the-air testing. (Kahn, 1980b)

This series of petitions reveals that the FCC was coming under attack not from just a single proponent, but from several fronts. On April 28, 1980, Richard Shiben, chief of the FCC Broadcast Bureau, responded to the Freedom of Information Act request filed by the Harris Corporation. Shiben said that internal documents would not be released until the FCC issued its final ruling in the case:

> It is our view that the "matrix" is at this time but one inextricably interwoven element of a predecisional intra-agency memorandum. . . . We note that upon release of the Commission's *Report and Order* in this matter, a petition for reconsideration of the Commission's action would be proper under both the Communications Act and Section 1.429 of the Commission's Rules. Matters of decisional significance will of course be included in the *Report and Order*. . . . Therefore, we find no compelling public interest basis to grant a

[1]In all fairness it should also be noted that the following year the U.S. Supreme Court overturned this decision, although not on the grounds of the FCC's decision-making procedure. Of course when Motorola cited this decision by the D.C. Court of Appeals in 1980, it could not have known that it would be overturned by the Supreme Court the following year. See *FCC v. WNCN Listeners Guild,* (1981).

> waiver. . . . Accordingly, your request for release of the "matrix" is DENIED. (Shiben, 1980)

The next day, Hazeltine filed with the Commission Secretary a packet of "extracts" from the AM stereo docket file that "reflect the views of a cross-section of the chief engineers of AM station licensees. . . . They also reflect tens of thousands of hours of on-air testing of the Kahn/Hazeltine AM stereo system." The attached letter said that the statements of several Commissioners at the NAB convention, and elsewhere, that they would be influenced by the views of broadcast chief engineers about AM stereo, were "perplexing in view of the substantial amount of station-provided data in the record in Docket 21313, which does not appear to be reflected in any way in the so-called 'matrix analysis' made by OST engineers." Noting that "the record is adverse to the Magnavox (and the technically similar Belar) system," Hazeltine continued:

> In fact, it appears that the OST "matrix analysis," decisively relied on by the Commission is in substantial part a rehash of laboratory tests of *only* three of the five systems (Belar, Magnavox and Motorola) done by the National AM Stereo Radio Committee (NAMSRC). It further appears that the OST "matrix analysis" was the product of a one-week crash program to "pick one system," rather than a "very careful study . . . made by people who have been studying it for months," as suggested by Commissioner Quello at the April 9 Sunshine Meeting. At least, it is clear that OST based its recommendations on something other than the record of actual on-air testing contained in Docket 21313. (Ferrall, 1980)

Hazeltine went on to request that the Commission reconsider its decision before the *Report and Order* was prepared and released:

> Hazeltine believes that such pre-Order reconsideration will be facilitated and enhanced by (1) prior release of the still undisclosed contents of the OST "matrix analysis," (2) expedited comments on that as yet confidential study, and, if necessary (3) oral presentations by knowledgeable persons (particularly broadcasters who have tested AM stereo systems) to the Commission *en banc*. (Ferrall, 1980)

Broadcasters soon joined in the fray, and before long the FCC received about 60 comments from broadcast licensees objecting to the selection of the Magnavox system. At least some of these were stimulated by Magnavox's competitors. An article in the *Wall Street Journal* reported that "much of the broadcasters protest has been encouraged by some of the losers in the FCC competition. . . . Motorola and Harris each sent letters to more than

4,000 radio stations urging them to ask the FCC to reconsider the decision." ("Broadcasters Protest," 1980)

Most of the letters urged reconsideration of the Magnavox decision in favor of the broadcasters' preferred system. However, some were supportive of the FCC and critical of what seemed to be an orchestrated campaign against the Magnavox selection. One letter, from Chris Cain, the Engineering Director of WISM in Madison, Wisconsin, said in part:

> We fully support the FCC in its decision for the Magnavox system! We will not be swayed by what could be termed "sour grapes." . . . I would like to point out that many stations have invested thousands of dollars in one particular system (one that lost out). Many of them were sitting in front of me at the recent Engineering session in Las Vegas & were openly "cheering" on their man & his system. Could the possibility of losing thousands of dollars have anything to do with this reaction? We think so! I am composing this letter to you in response to a letter received on behalf of the Motorola people who point out the "dangers" of the Magnavox system & urge us broadcasters to sway your decision. I expect a similar letter any day from Mr. Kahn & Harris Broadcast. (Cain, 1980)

During May 1980, Senator Daniel Moynihan of New York, Senator John Culver of Iowa, Congressman Norman Lent of New York, and Congressman Thomas Kindness of Ohio each asked for an explanation of the Magnavox decision. Richard Shiben of the Broadcast Bureau replied to these members of Congress with a personally addressed form letter stating that the FCC staff was preparing a *Report and Order* on the matter that would "detail the rationale used in the selection of the Magnavox system," noting that further comment was inappropriate because the proceeding "is subject to the Commission's ex parte rules and limitations."

During the first week of May, Motorola, like Kahn, petitioned the FCC for oral presentations (Motorola, 1980b), while ABC petitioned for the matrix to be made public (American Broadcasting, 1980). As would be expected, the "winner" in the proceedings, Magnavox, opposed oral hearings or reconsideration of the rulemaking (Magnavox, 1980b) and instead went "on the offensive" for its system. Magnavox staunchly defended its technology and announced plans to begin licensing the stereo equipment patents to manufacturers "as if the decision was final." Magnavox President Kenneth Meinken stated that critics "are unaware and uninformed of facts connected with the Magnavox decision," and, in an apparent effort to placate the broadcast industry, vowed not to assert its stereo patents against broadcasters or broadcast equipment manufacturers. This promise created what amounted to a "free license" in the transmitter market. However, Magnavox Senior Vice President Kenneth Ingram estimated that *receiver*

manufacturers would generate as much as "$4 million per year" for the company. Magnavox, in a press release, said that its system was strongly supported by receiver manufacturers Pioneer, General Electric, and Ford, because it was the least expensive to make ("Magnavox Goes," 1980).

On May 13, the FCC partially relented to public pressure, and released a Freedom of Information document describing, in only general terms, 23 items that contained "pre-decisional deliberative evaluations, analyses, opinions or recommendations." The FCC granted the Harris Corp. the release of 12 partial "section" or "part of paragraph" documents.

Kahn Communications, on May 21, petitioned the FCC for "emergency relief," asking the FCC to "terminate all activities" of the staff toward the requested *Report and Order*—the final ruling that would standardize the Magnavox system. In addition, Leonard Kahn claimed that he had not been served with copies of summaries of nine ex parte contacts that took place between March 9 and April 9. He asked for "true copies" of records for all such contacts, and for the Commission to "set dates for allowing parties to answer last minute ex parte documents and oral contacts." In addition, he again requested that the Commission "set a time for an Oral Hearing" (Kahn, 1980c).

During June 1980, the five system proponents continued to file motion after motion, and submitted comments to each other's reply comments. Eventually other members of Congress would become cognizant of the storm brewing at the FCC. The docket file contains letters from Henry S. Mitchell, the northwest representative for Kahn Communications. Mitchell contacted Senators Henry Jackson, Harley Staggers, Warren Magnuson, and Barry Goldwater, and Representative Joel Pritchard. After contacting the FCC, these members of Congress received standard ex parte replies from Richard Shiben of the Broadcast Bureau and Henry L. Baumann, chief of the BCB's Policy and Rules Division.

Summary. During the second quarter of 1980, the AM stereo case reached new lows. In early April the FCC decided, over the objections of its Broadcast Bureau and Office of Plans and Policy, to select a single AM stereo standard. Based on engineering staff recommendations, the Commission picked the system proposed by the Magnavox Company. Whether prompted by losing proponents or by their own analyses, many station engineers objected to the selection of Magnavox because of alleged technical deficiencies, most notably an audible popping noise. The week after the decision, several FCC Commissioners came under attack at the National Association of Broadcasters' convention in Las Vegas, in what proved to be only the first volley in a clash that continued for several weeks. The losing system proponents hinted at litigation, filed petitions for oral arguments,

and filed for the release of documents under the Freedom of Information Act.

In the normal course of FCC rulemaking, after a *Notice of Proposed Rulemaking* is issued and the comments and reply comments evaluated, the next step is the issuance of a *Report and Order* either amending or not amending the rules. As was expected, in the AM stereo case we saw the Commissioners order the FCC staff to prepare a *Report and Order* amending the rules. But due to the legal challenges certain to follow any such rulemaking, the Commission was placed on the defensive. With the Commission under attack from all quarters, a carefully considered response was imperative.

"A Sudden Twist"

By this time, the efforts of the four unsuccessful system proponents to overturn the decision were apparently having an effect on the FCC. Word that the Commission would back down came in the last paragraph of an FCC press release announcing the denial of Harris Corporation's Freedom of Information request for disclosure of the matrix. In this rather circumvent fashion, it was revealed that the Commission had decided to issue a *Further Notice of Proposed Rulemaking* instead of a *Report and Order.* In what one trade magazine called a "sudden twist," the FCC made this concession because it had concluded that the original decision in favor of Magnavox had been made too hastily. The FCC staff was preparing the *Further Notice of Proposed Rulemaking* in order to seek more information and technical data in the AM stereo docket. The trade press offered a new reason for the last-minute haste in the decision making process and the creation of the ad hoc joint committee, which, "in less than two weeks, reviewed the massive AM stereo docket, prepared the matrix and recommended the Magnavox system" ("FCC Brings," 1980). One reason given in the trade press for the rushed decision was a promise made to Capitol Hill by the FCC Chair:

> it has also been suggested that in the final few months before the April 9 meeting, the entire proceeding was pushed too hard and too fast so that [FCC Chairman Charles] Ferris could honor an oversight hearing pledge to Lionel Van Deerlin (D-Calif.) Chairman of the House Communications Subcommittee, to have the AM stereo matter out in the first quarter of 1980 and because the FCC wanted to make AM stereo its traditional "gift" to the annual convention of the National Association of Broadcasters which started on April 13. ("FCC Brings," 1980)

Commissioner Jones commented that the scenario of Ferris promising a first quarter decision to Congressman Van Deerlin would not have been out

of character considering Ferris's manner of dealing with Capital Hill. She said of the alleged Ferris AM stereo pledge to Van Deerlin:

> That wouldn't surprise me. . . . Charlie [Charles Ferris], to the best of my knowledge, dealt with the Hill extremely well. Charlie had been on the Hill for 20 years, and for him to say to a Van Deerlin: "Yes, we will get to it by the first quarter," sounds to me consistent with Charlie. Not that he would say: "And we will vote this way," or "We're not going to do what you want," but he would simply say: "Yeah, we'll deal with it." (A. P. Jones, personal interview, March 7, 1990)

Magnavox Goes Down Fighting. As the FCC AM stereo decision continued to unravel, attorneys for Magnavox made one last push in what they now must have known was a futile effort. In a letter urging the Commission to "promptly adopt and issue an opinion and order in the AM stereo Rulemaking," Magnavox's lawyers chastised the FCC for having "lost control of the proceeding":

> we believe that any further delay will serve only to compound the already unseemly posture in which the Commission has been placed by the rather extraordinary efforts of those dissatisfied with the April 9th decision to obtain a reversal. . . . This effort to influence the Commission by ex parte communications induced by parties to this proceeding long after the cutoff date is totally inconsistent with the Commission's policies and regulations. Unfortunately, it appears now that this lobbying activity may have had an impact on the Commission, or at least on its staff. For example, a by-lined AP wire story on June 26th quotes a "top Commission official who requested anonymity" as saying that the staff was reviewing the matter and that "Magnavox is definitely put on hold with this." Nor is this the first instance of such commentary. Mr. Middlekamp was quoted in *Broadcasting* on April 21st as saying that the technical judgments behind the decision were being reevaluated based on information received from unnamed sources. This type of news leak debases the administrative process and makes a mockery of the Sunshine Act procedures. The Commission should instruct its staff to avoid comment on pending decisions. (Verrill, 1980)

Magnavox also noted that *Broadcasting* magazine was implying that the FCC staff, and not the full Commission, had decided to go back to the drawing board on AM stereo. The Magnavox attorney wrote:

> We are also concerned that the news release announcing the denial of the Freedom of Information Act request for the matrix . . . indicated that the staff is considering submitting a proposal for further rulemaking to the Commission. The comment can only serve to fuel the speculation about the Commission's decision-making process. . . . According to the article, the staff—and

> not the Commission—has "decided to go with the notice [*Further Notice of Proposed Rulemaking*] instead of issuing a report and order. . . ." While *Broadcasting* is to be commended for reportorial diligence, the content of the article leads to the uncomfortable conclusion that the Commissioners have lost control of the proceeding. (Verrill, 1980)

The plan to issue a *Further Notice* caused some to speculate that the marketplace concept might reenter the picture, but the trade press noted that:

> despite Kahn's advocacy and some sympathy for the marketplace concept still lingering the halls of the FCC, it appears that the concept is dead. Dick Shiben, chief of the Broadcast Bureau, said the Bureau and the OST have no intention to recommend the marketplace scheme. He said they were instructed by the Commission to pick a "system that will probably be Magnavox" and that is what the notice is aimed at doing. FCC Chief Scientist Stephen Lukasik put it more bluntly: "There is no doubt that the Commission . . . wants one system. . . . What the notice will explore is the best way to choose that one system." ("FCC Brings," 1980)

Commissioner Quello said that it was probable that the marketplace option would be brought up at the August 1 meeting, when the Notice was expected to be brought before the Commission, but said that it was questionable whether it would be adopted.

On July 14, 1980, the Commission was notified that yet another industry committee had been formed; this one called the "Stations' Committee for AM Stereo" (Stations' Committee). This group of unnamed licensees stated its support for "one key policy option—the marketplace concept . . . as the only practical, workable, and politically acceptable policy option available" (The Stations' Committee, 1980).

In the next section, we will see that although the Commission did indeed go "back to the barn" on AM stereo, the decision was not a fait accompli when the matter came before the seven Commissioners. There was still considerable discussion, with some Commissioners preferring to continue on a steady course. Clearly, too, the staff, and not the Commissioners, had made the decision to reopen the proceeding.

The FCC Reversal

The Commission traditionally holds a "summer housecleaning"—a few days of hectic meetings on a range of issues--before adjourning for the August hiatus. During this two day period, as expected, the Commission adopted a *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking* on the AM stereo controversy (FCC 80-477, 1980). Fearing that a final decision based on the existing docket would not survive legal chal-

lenges, the FCC intended to strengthen the record by reopening the proceedings. Jim McNally, the FCC staffer who wrote the Notice and presented it to the Commission (and one of the members of the joint OST/BCB committee), said that in the course of preparing the final *Report and Order* requested by the Commissioners in April, the staff quickly recognized "ambiguities and omissions" in the docket record, which made the selection of Magnavox not wholly defensible ("The Final," 1980).

Referring to the matrix fiasco, Chief Scientist Steven Lukasik apologized to the Commissioners for the "ambiguities, discrepancies and inconsistencies" in the record, and said that the *Further Notice* was necessary to reinforce the record and "replace arbitrary decisions with 'hard data.' " In other words, the *Further Notice* was being proposed to "clear up those ambiguities and fill the holes." At the meeting however, Commissioner Robert E. Lee said the *Further Notice* "makes us look vacillating [sic]. I don't know why we can't stick to our guns." Commissioner James Quello asked why, if all the systems were "minimally acceptable," the FCC wouldn't just stay the course, saying "Let's pick one and take the heat." Commissioner Abbott Washburn said that the *Further Notice* would cause the Commission "more legal problems" instead of fewer ones, and called the notice a "step backwards." Chairman Charles Ferris worked to persuade the Commission that the notice was needed to create a record that was legally defensible ("The Final," 1980).

An interesting twist developed when the *Further Notice* reopening the AM stereo proceedings first came to a vote. Although word on the street had been that the marketplace option was dead, Commissioners Anne Jones and Tyrone Brown voted against adoption of the *Further Notice* specifically because the marketplace solution was not included as an alternative. Suddenly, like Lazarus, the marketplace solution, which everyone thought was dead, was brought back to life. Both Richard Shiben, chief of the Broadcast Bureau, and Nina Cornell, chief of the Office of Plans and Policy, spoke up and indicated their continued support of the marketplace approach. A compromise was reached with the inclusion of a paragraph that asked for public comment on the desirability of leaving the selection up to the marketplace. Additional language was also added inviting comments on the possibility of manufacturers developing a "universal decoder" that could allow a receiver to decode more than one system's signal. After these additions, the vote adopting the *Further Notice* was unanimous.

A "Revised Matrix." When the *Further Notice* was released, it included a copy of the secret analysis matrix. The notice explained that the scores on the evaluation table "resulted from the consensus opinion of Commission engineers," and with uncharacteristic candidness said that in a number of cases, "desired information was not submitted by a system proponent and

it was necessary to make engineering estimates of the anticipated system performance. All in all, the system ratings indicated in the initial table should be regarded as based upon engineering judgments of the different systems' operations" (FCC 80-477, 1980, p. 7, ¶ 7).

The *Further Notice* went on to justify the staff's actions, and included a rather bizarre account of what had transpired from the viewpoint of the FCC:

> After the April 9 meeting the Commission engineering staff began a second phase of its review of the technical data . . . in order to validate the initial work that had been done and . . . to allow for the preparation of a more complete *Report and Order*. It was not anticipated that the outcome of the review would indicate a system other than Magnavox would be superior in its performance characteristics. Rather, it was felt that a second review would furnish additional justification for the initial selection of the Magnavox system. It was also felt that the *Report and Order* resulting from such an analysis could not only document the rationale and methodology leading to the particular system selection but should also, through a thorough and complete discussion, anticipate most, if not all, of the concerns and objections which could be raised by losing system proponents. . . . Such an approach was felt desirable to permit the rapid introduction of AM stereo service. This could only occur, we reasoned, if our initial selection was bolstered with a methodical step-by-step evaluation of each of the proposed systems. (FCC 80-477, 1980, p. 7, ¶ 8)

This "second review" was to be a revised quantitative treatment of the data furnished by the proponents and by others. The Commission stated that it felt that further "quantification of the data would minimize the need for engineering judgments once criteria, weights, maximum and minimum system performance limits (where possible) and scoring procedures were determined." In the end, the FCC hoped that "depending on the reliability and accuracy of the submitted data, the system evaluation process would be as objective and as accurate as possible" (¶ 9).

This second review yielded a revised evaluation table. There were still 11 test categories on the table, but now, instead of there being 55 numerical scores—scores for five systems in 11 categories yields 55 scores—there were only 36. In 19 of the system categories, an asterisk indicated areas in which the FCC staff no longer felt that it had sufficient data to make a rating. This revised table showed that, based on the categories for which the FCC felt it had gathered sufficient data, Motorola's C-Quam system—and not the system proposed by Magnavox—had the most points.

The revised table, although incomplete, showed Motorola with 67 points, Kahn and Magnavox with 51 points each, Harris with 50, and Belar with 41. A leaked copy of the revised matrix published in the August 4 issue of

Broadcasting—two months before the release of the *Further Notice*—incorrectly gave Belar 12 points instead of an asterisk for one of the categories. At the time the magazine knew that there was one error on its table, but could not identify which number was "slightly different." The second matrix is reproduced in Figure 3-2 as it correctly appeared in the *Further Notice.*

In its *Further Notice* the FCC requested additional data from the five

EVALUATION CATEGORY:	MAGNAVOX	MOTOROLA	HARRIS	BELAR	KAHN
Numbers in parenthesis ( ) indicate the maximum possible scores in the various categories or sub-categories.					
I. MONOPHONIC COMPATIBILITY:					
(1) Average Harmonic Distortion (15)	*	9	6	*	12
(2) Mistuning Effects (5)	5	5	5	5	5
II. INTERFERENCE CHARACTERISTICS:					
(1) Occupied bandwidth (10)	10	10	10	10	10
(2) Protection Ratios (10)	7	10	8	*	9
III. COVERAGE (Relative to Mono):					
(1) Stereo to mono receiver (5)	*	*	*	*	*
(2) Stereo to stereo receiver (5)	*	*	*	*	*
IV. TRANSMITTER STEREO PERFORMANCE:					
(1) Distortion (10)	8	8	6	8	4
(2) Frequency Response (10)	8	5	5	6	8
(3) Separation (10)	7	10	2	6	3
(4) Noise (10)	6	10	8	6	*
V. RECEIVER STEREO PERFORMANCE: Degradation in stereo performance over that measured at the transmitter, including consideration of directional antenna and propagation degradation (10)	*	*	*	*	*

Note: In 19 of the system-categories, an asterisk (*) indicated areas in which the FCC staff no longer felt that it had sufficient data to make a rating. The *Further Notice* asked for additional data in order to complete the matrix, in addition to asking for general comments on the use of such a matrix.

Source: FCC 80-477, 27920. *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking: In the Matter of AM Stereophonic B/casting,* FCC docket file 21313 document, adopted 31 July, 1980; released 11 September, 1980: 9.

Figure 3-2 *Revised AM Stereo Evaluation Table* (July, 1980)

system propnents, comments on the "matrix" scoring table (including the basic question of its appropriateness), and comments on the possible use of a lottery in the case of a tie on the revised table. In addition, the *Further Notice* invited comments on the necessity of a single national standard, as opposed to the marketplace option, and on the feasibility of a multisystem receiver that could receive signals in stereo from each of the competing systems—at a reasonable cost and preferably with an automatic decoder that would sense which system was being received and automatically switch to that mode of reception. Specific technical questions were asked of each system proponent about its respective system. Because the Commission wished to proceed expeditiously, the deadline for filing data and comments was set for December 9, 1980.

A Brief Congressional Inquiry. On November 7, 1980, Congressman Bob Eckhardt, Chairman of the House Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, sent a letter to FCC Chairman Ferris requesting that the FCC make available to the Subcommittee staff "all public and non-public documents, materials, and memoranda relating to Docket No. 21313, *In the Matter of AM stereophonic Broadcasting.*" Congressman Eckhardt further requested that the Commission give the Subcommittee staff copies of any documents which it designated (Eckhardt, 1980).

Nearly two weeks later, Ferris sent a response to Eckhardt, which stated in part that "The Commission is prepared to promptly comply with this request on the basis that non-public documents will be treated as confidential by the Subcommittee unless prior agreement between the Commission and the Subcommittee is reached as to disclosure." Ferris went on to note that the nonpublic materials were "generally internal pre-decisional staff memoranda exempt from public disclosure under . . . the 'deliberative process' privilege the Freedom of Information Act," and stated that:

> Additionally, because this ongoing proceeding involves "conflicting claims to a valuable privilege" as between the various parties proposing different systems of transmission and is thus quasi-adjudicatory in nature, discussion with Commission decision-making personnel regarding any substantive matter related to the proceeding is prohibited by Commission rules. (Ferris, 1980b)

Although the House Subcommittee was granted access to the docket files, there is no indication that the Subcommittee found any basis on which to continue the investigation. Nonetheless, Ferris's assertion that the proceeding involved "conflicting claims to a valuable privilege" and was "thus quasi-adjudicatory in nature," proved to be a gaffe that later had to be

retracted. In a letter dated December 19, 1980, the FCC's Associate General Counsel, Randolph J. May, pointed out that the Commission took the position in both the FM quadraphonic and AM stereo opinion and orders that the proceedings did *not* necessarily involve "conflicting claims to a valuable privilege" (May, 1980). Had the earlier contention been allowed to stand, the Commission would have been bound to scrupulously uphold the ex parte prohibitions under the legal precedent set in the *Sangamon Valley Television* case.

Comments on the "Marketplace" Option. The most interesting aspect of the comments filed during the fall of 1980 was the emergence of voluminous testimony on the "marketplace" option. Kahn and Hazeltine, the only system proponents favoring this solution, argued strenuously for this outcome and found plenty of support for their arguments in recent FCC decisions. Hazeltine commented that "the free market mechanism will produce the best equilibrium among competing systems, and should not be supplanted absent special circumstances necessitating regulation." Hazeltine cited Chairman Ferris's "separate statement" in the Commission's 1979 decision concerning TVRO or backyard satellite dishes (FCC 79-710, 1979) and requested that the marketplace issue be decided first before turning to the matrix analysis process of single system selection:

> The Commissioin has recognized in other proceedings (1) that free market competition is the most efficient allocator of scarce resources and the most effective means for satisfying consumer needs and wants, and (2) that regulation which preempts the marketplace, in the absence of compelling evidence that the marketplace cannot be trusted, is inconsistent with the public interest. The Commission has deregulated many areas of the communication field, to "encourage rapid and wide dissemination of technological innovation, and do away with redundant government regulation where the marketplace itself operates in the public interest." (Hazeltine, 1980b, p. 7)

The Hazeltine/Kahn pro-marketplace argument was also strengthened by citing the recent FCC Office of Plans and Policy staff report on direct broadcast satellite (DBS) technology:

> Any decision concerning the regulation of a new service should accord with the deregulatory trend in the Commission's decisions and the Commission's recognition of the inappropriateness of detailed regulation in the presence of competition. To impose conventional broadcast or common carrier regulation on a service in a competitive market, while the Commission is deregulating other services, would be to ignore the lessons of recent years and create yet another service in need of deregulation at some later date. (FCC, Office of Plans, 1980: pp. 93-94; cited in Hazeltine, 1980b, p. 8)

Based on this recent report, Hazeltine argued that "in considering the imposition of regulatory limits on an embryonic technology, the Commission should first consider the 'marketplace solution.' Marketplace competition should be foreclosed by regulatory fiat only if unique economic or other characteristics of the technology compel such foreclosure." Hazeltine also charged that in the AM stereo case, the FCC "has felt impelled to resort to competition-foreclosing regulation because of its 'concern that incompatibilities among systems may have an adverse effect on public reception of AM stereo' " (Hazeltine, 1980b, p. 9; citing *Further Notice,* ¶ 35). Hazeltine retorted that the Commission's concern about incompatibility was "unwarranted," and that:

> To support the conclusion that the AM stereo market requires governmentally dictated technology to avoid consumer misinvestment, three assumptions are necessary: (1) that the Commission is in fact able to identify the "best" (*i.e.,* most listener and broadcaster satisfying) AM stereo technology with reasonable certainty not only now but for the future period during which the regulation will be in effect; (2) that the market's operation, absent Commission intervention, would be disjointed, costly or malfunctioning; and (3) that the interests of all broadcasters and listeners would necessarily best be served by the universal imposition of a single system. These assumptions are not met. (Hazeltine, 1980b, p. 10)

Hazeltine said that the use of the matrix attempted to objectify what is really a subjective consumer decision, and that the matrix was flawed because it ignored price variables. Hazeltine even went so far as to liken the FCC action to economic actions in the USSR. This argument against the matrix stated that:

> in communist Russia, one of the basic economic planning tools used is Wasily Leontief's elaborate matrix model of a free competitive market. That is, the Russians seek to approximate, through state control, the functioning of the free marketplace. That is what the Commission, were it to pursue its matrix model attempt to choose the "best" AM stereo system, would be doing. Hazeltine urges that the Commission stand aside and let the marketplace itself do the job. (p. 19, footnote 15)

Hazeltine charged that the FCC incorrectly assumed that "all broadcasters and all listeners will necessarily prefer one AM stereo system" and cited the consumer videocassette recorder market introduction as evidence that "experience with innovation technologies shows that the market adjusts to eliminate less desirable technologies before excessive consumer resources are invested," noting that in the VCR case, "a number of 'incompatible' technical formats were initially introduced. The marketplace quickly win-

nowed them down to the Betamax and VHS formats." The company argued that large-scale consumer purchases of AM stereo receivers would not occur immediately upon their introduction; rather, there would first be a proliferation of comparative consumer information upon which early adopters would heavily rely. Later purchasers would benefit from this marketplace experience, according to Hazeltine's scenario, avoiding the costs of a "changeover" between competing technologies. Finally, Hazeltine concluded that the worst side effect of a single AM stereo standard mandate would be the "detrimental effect on advances in the state of the art." It again cited the new FCC staff report on DBS, which stated that:

> The selection of a single system prevents important information from being collected about alternative systems. Moreover, selecting and mandating a single system may severely hinder technological change, since technical improvements will not be possible without Commission approval. The administrative process required to obtain approval will certainly delay changes, in part because of a reluctance to make rapid changes that make equipment in the hands of large numbers of consumers obsolete. (Hazeltine, 1980b, p. 16; citing FCC, Office of Plans, 1980, p. 66)

Hazeltine's comments are reported here at length because this series of arguments clearly articulated the pro-marketplace point of view. Yet Hazeltine cautioned that it did not intend to suggest that free competition was "a perfect method of economic decision-making, totally efficient and free from transition and transaction costs." Nonetheless, the company "vigorously" urged that it was the best method available for the introduction of AM stereo because it would "radically accelerate" the technology's introduction and diffusion (Hazeltine, 1980b, pp. 18–19).

The Hazeltine motion was buttressed by the inclusion of a report authored by Robert W. Crandall, Senior Fellow at the Brookings Institution, called *Government Standards Versus Market Selection: The Case of AM Stereo Broadcasting*. Dr. Crandall had impressive credentials in both government service and academia, and in his report warned that "the Commission should be wary of choosing a single AM stereo technology." The report invoked many of the same arguments cited by the Hazeltine report, concluding that:

> from the point of view of (1) insuring that the best AM stereo technology is introduced (2) as promptly as possible and (3) in such a manner as to insure that future technological innovation is not impaired, the wisest course for the Commission is to leave the choice of the "best" AM stereo technology to the market. This is, after all, an important function of the market and one which it typically performs very well. (Crandall, 1980)

About the same time, Kahn filed an "alternative proposal," which also favored the marketplace option and also criticized the FCC's matrices:

> As harsh as it may sound it is our belief that the present staff procedure in using a matrix to forecast "marketplace" acceptance of an AM stereo system is doomed to failure. We want, at the outset, to state that we believe that if the Commission staff carefully studies the record it will find the Kahn/Hazeltine system competes very favorably in such a matrix comparison. Thus this is not a statement from a hopeless proponent.
>
> Nevertheless, no matter which system wins the matrix comparison, the matrix procedure is subject to severe challenge and in all probability such a challenge will be made to an Appeal Court by one or more of the unsuccessful proponents.
>
> We believe that the reason why the Commission's staff is finding it most difficult to select the AM stereo system that would have the best chance of succeeding in the "marketplace" is that such an analysis is most difficult even when performed by people who are marketing research experts. (Kahn, 1980d, p. 3)

Kahn listed a seven step scenario for marketplace diffusion of AM stereo, and concluded:

> there is little or no chance that the public will suffer from a "Marketplace" decision because AM stereo receivers will not be made available until the broadcasters have selected a system that they, based on a great deal of experience and knowledge in radio marketing, have determined will be accepted by their listeners. (Kahn, 1980d, p. 11)

In spite of these arguments, as 1980 came to a close the FCC responded by denying the marketplace motions. In a ruling by Henry L. Baumann, chief of the Broadcast Bureau's Policy and Rules Division, the FCC's latest AM stereo marketplace stand was articulated: "Our review of this filing does not convince us that we should alter our view of the role of the marketplace decision alternative at this time; but this filing will be restudied during our general review of additional comments and reply comments generated by the *Further Notice*" (Baumann, 1980, p. 3).

Still, the Commission did not completely close the door on future consideration of this course of action. Ronald Reagan had just been elected President, and the FCC was preparing to further embark down the deregulatory path. The future was indeed uncertain.

NAB Invites Industry Assistance. During the last few months of 1980, there were motions for time extensions from three of the system proponents. The National Association of Broadcasters sent a letter to the system

proponents offering its assistance. Lew Wetzel, NAB Senior Vice President for Engineering, wrote in part:

> NAB has been an avid supporter on AM stereo, having been a major sponsor of the National AM Stereophonic Radio Committee (NAMSRC) as well as supporting the adoption of AM stereo at every opportunity with the FCC. NAB has not supported any one particular system. . . . We have however, strongly supported the choice of a single system. . . .
>
> With the release of the *Further NPR* [*Further Notice of Proposed Rulemaking*] on AM Stereo, we are asking what role NAB can play to assist in the successful completion of the docket. In reading the *NPR*, it becomes quite clear that the Commission staff relied quite heavily upon the NAMSRC and other non-proponent data. It therefore appears that for the next round of comments, the Commission would prefer data . . . either produced by a cooperative industry committee or under the supervision or observation of a neutral industry representative.
>
> . . . In summary, we would like to know if you are interested in a meeting for all proponents with the FCC staff to clarify the means for obtaining the data requested in the *NPR*, and whether you would be interested in some form of industry coordinated testing. (Wetzel, 1980)

Not surprisingly, this proposal received an unfavorable response from some of the proponents. Magnavox responded "While we agree that the NPRM [*Notice of Proposed Rulemaking*] could lead to ambiguous results, we are nevertheless very concerned that the procedures you propose would not be consistent with the restricted ex parte status" (McCarthy, 1980). Kahn did not respond, but furnished co-proponent Hazeltine with the NAB letter, to which Hazeltine's General Patent Counsel responded "Hazeltine supports the idea of a meeting between AM stereo proponents and the FCC staff . . . however, Hazeltine has serious reservations about other aspects of your proposal." Hazeltine objected to the idea that only *proponents* would participate, and felt that the NAB's preference for a single-system choice biased the testing sponsor (Onders, 1980). Motorola wrote that it "would be pleased to participate in any objective realistic effort to complete the AM stereo record" (Parker, 1980); while Harris promised "our willingness to assist in this matter and to help with a timely resolution" (Whicker, 1980). Lastly, the president of Belar Electronics expressed interest in participating, but said "we would want assurances that such a meeting would be within *ex parte* guidelines and would not result in one or more of the proponents making advocacy statements or influencing the Commission's thought or process" (Meyer, 1980).

Because the NAB's cooperative testing could not be worked out, Motorola arranged to test its system independently for about two weeks at WTAQ in LaGrange, Illinois, beginning November 17, 1980. This late start

would have given Motorola only about one week to analyze and file its data with the FCC, so Motorola submitted a request that the date for filing comments be extended by 30 days, until January 9, 1981, and that the subsequent reply comments period also be extended by 30 days. Motorola justified this request by arguing that additional testing of its AM stereo system had been delayed pending a proposal by the NAB for all system proponents to participate in a joint AM stereo testing program (Motorola, 1980c).

Late in November 1980 a similar request was filed by Magnavox, which claimed that it had "diligently attempted to devise appropriate test procedures and complete the additional testing required to provide the Commission with objective data" (Magnavox, 1980c). Both of these time extension requests were granted, moving the deadline for comments to January 9, 1981, and the deadline for reply comments to February 13, 1981 (Baumann, 1980).

On December 19, 1980, the Harris Corporation filed for yet another time extension, testifying that it had not become clear until early that month that no NAB-sponsored joint testing would occur. Shortly after December 1, Harris then arranged with WGEM, Quincy, Illinois, to conduct the tests of its system requested by the Commission. Harris claimed that it would have preferred the joint testing concept proposed by the NAB, on the grounds that it would have provided more comparable and useful data. Harris told the FCC that the tests at WGEM would commence on or about December 30, 1980, the earliest date that could be scheduled (Harris, 1980b). Responding to the Harris request, the FCC granted yet another time delay, providing for the filing of comments by February 9, 1981, and the delay of the deadline for reply comments until March 9, 1981 (Baumann, 1981a).

Summary. Just before its summer recess, the FCC adopted a *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking.* The stated reasons for this unusual action, which was clearly a major deviation from the normal course of events, were fears that a final decision based on the existing docket would not survive legal challenges, and the need for the FCC to strengthen the record because of the failure of the "revised" matrix. This second matrix, although incomplete, showed that the Commission should have selected the Motorola C-Quam system instead of the Magnavox system. In order to make a better evaluation, the Commission requested additional data from the five system proponents. In addition, the FCC asked for comments on the appropriateness of the matrix, on the use of a lottery in case of a tie, on the necessity of a single national standard, and on the feasibility of a multisystem AM stereo receiver.

Most of the comments centered around the marketplace option, with only Kahn and its co-proponent Hazeltine favoring this approach. Although the

deadline for this third round of comments was originally set for early December, it was eventually extended twice. These extensions were granted because several proponents had anticipated that the NAB would conduct a joint test of all five systems. When this cooperative effort did not develop, other testing plans were made, and the FCC had to further delay any action on AM stereo.

The last half of 1980 might best be described as a giant step backward in the AM stereo decision-making proceedings. The FCC reopened the inquiry, the NAB was unable to organize cooperative testing, and now not only were the system proponents throwing rocks at each others' electronic technology, they were questioning the Commission's decision-making technology as well. It was now over five years since the establishment of the NAMSRC and the first petitions for AM stereo rulemaking, but as 1980 came to a close there was no light at the end of the tunnel. What happened next was not so much that the Commission changed its mind, but that the Commission simply changed.

The AM Stereo Inquiry During 1981

A New Administration. Radio began to be more generally deregulated by January 1981, just as the Carter Administration/Charles Ferris FCC was winding down; the *Deregulation of Radio* decision was released in late February 1981. The deregulation measures, which had been under formal consideration at the FCC since 1979, called for a reduction in content regulations and a reduction of paperwork. The FCC eliminated its guidelines on the amounts of news and public affairs programs that stations were required to carry, along with the suggested time limits on the amount of commercials per hour. Additionally, the FCC eliminated its community ascertainment mandate and its program log-keeping rules in order to "reduce the paperwork and other burdens on commercial radio stations without having a substantial adverse impact upon the public interest" (FCC 81-17, 1981, p. 13888).

In addition, the new Reagan administration changed the personnel of the Commission immensely in the first half of 1981. The incoming President nominated four Commissioners to the FCC—creating a Republican majority with even greater deregulatory ambitions than those of the Carter FCC ("Within," 1982). Reagan nominated a conservative Republican broadcast lawyer named Mark Fowler as FCC Chairman to fill the remaining five years of Tyrone Brown's term. Henry Rivera, an Hispanic lawyer and conservative Democrat, was selected to fill the three remaining years in outgoing Chairman Charles Ferris's term. Reagan also nominated Republican Mimi Weyforth Dawson, who had been chief aide to Oregon's Republican Senator Bob Packwood, and nominated for reappointment

Commissioner James Quello, a marginal Democrat, to a second term ("Out Of," 1981). With remaining Republicans Anne Jones and Abbott Washburn, the Fowler FCC had a 4 to 3 Republican majority, with two sympathetic, conservative Democrats. Joseph Fogarty was thus the last "liberal" Democrat left on the Commission. While this breakdown of political party affiliation may be useful, it is not meant to imply that FCC votes necessarily follow party lines. As Commissioner James Quello has said, "Every Chairman finds out, regarding the members; everyone has his own background, and forms his own conclusions" ("Dilemma For," 1982).

Much of what occurred in the AM stereo case in 1981 and 1982 can best be understood within the larger context of Mark Fowler's *unregulation,* which will be described in detail in the following chapter. For now, let it suffice to say that the Fowler years at the FCC were a time of massive change. When Fowler's confirmation hearings began in the Senate in the spring of 1981, Senator Barry Goldwater observed, "Today, we begin a new era at the Commission." Goldwater spoke of the development of new technologies, which he said would make "much of what the Commission has done in the past irrelevant to the future." Further, Goldwater said that the Congress, "not the Commission or the courts," would set future telecommunications policy, and told Fowler, "The bottom line . . . is that you are going to be seeing and hearing from us much more than the FCC has in the past." Fowler responded that he welcomed congressional oversight, remarking "I am attuned to this philosophy [which] emphasizes consumer choice and entrepreneurial initiative over pervasive government control and direction." Fowler would have to contend with deep budget cuts imposed by Congress and the Office of Management and Budget, which cut $634,000 and 106 positions from the FCC budget in 1981, and $4,816,000 and 103 positions in 1982. Fowler seemed comfortable with the cuts, and said that reductions would be made by "increasing the efficiency of Commission operations and by 'unregulating' [Fowler's word for eliminating unnecessary work]" ("Fowler Hearings," 1981).

Fowler's move to put his own stamp on the FCC was swift and decisive. After only three days in office, he won approval of a "management by objectives" plan that outlined five principal goals, including the creation of an unregulated marketplace for the development of telecommunications to the maximum extent possible, and the elimination of unnecessary regulations and policies. Fowler said, "I approach my task as a regulator with a presumption against intervention," and noted that regarding new technologies, his policy was one of "neutrality" ("Dilemma For," 1982).

Belar Drops Out. As the deadline for comments on the *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking* approached, one system proponent dropped out of the AM stereo contest,

while another new player tried to join the game. By the end of 1980, officials at Belar Electronics, which was promoting the RCA system of AM stereo, decided to call it quits in the AM stereo contest. Rather than continuing to file extensive comments and reply comments with the FCC in hopes of gaining approval for its system, Belar quietly withdrew from the race. Belar's President, Arno Meyer, simply said, "We didn't want to keep pouring money down a bottomless pit" ("AM Stereo Gets," 1981, p. 84). The FCC had before it AM stereo system proposals submitted by five different firms: Belar, Magnavox, Motorola, Kahn, and Hazeltine. While the withdrawal of Belar removed the RCA system from the marketplace, the Belar proposal was still officially under FCC consideration.

A Sixth System. On January 9, 1981, F.T. Fisher's Sons, a Canadian firm of consulting engineers, filed a 100-page proposal for FCC consideration of a sixth AM stereo system. Fisher called its engineering method the DPC (Dual-Program Capability) System of AM stereo. However, this sixth firm lacked the organization and credibility of the original five system proponents. The Fisher proposal noted that the company had submitted "hastily assembled" comments in response to the October 1978 *Notice of Proposed Rulemaking.* The Fisher proposal now said that a U.S. stereo patent had been granted it in January 1980. Remarkably, Fisher claimed that while it had been concerned with telephone multiplex problems for many years, knowledge of the AM stereo proceedings came only from a June 1978 article in the IEEE *Spectrum* magazine on the response to the *Notice of Inquiry.* Thus the Fisher proposal "lacked laboratory and field trial tests" and could not be given further consideration. Still, there was some promise to what Fisher had on paper, so the FCC asked Harris and Fisher to "comment individually or jointly on the feasibility of combining the Fisher technology with the Harris V-CPM system" (F.T. Fisher's Sons, 1981; citing FCC 80-477, 1980, p. 17). This attempt at cooperation yielded one of the most incredible tales from this already unusual FCC docket. Fisher included in their proposal the following rather bizarre account of an aborted attempt to join proposals with the Harris Corporation:

> As Fisher was and is convinced of the potential of this system . . . it initiated a meeting with the Broadcast Division of Harris Corp. on July 20, 1980. The meeting included the Harris divisional General Manager, the divisional Assistant General Manager (who was the Chairman of the meeting), the Washington Counsel and the divisional Director of Engineering. After some five hours of discussion, in response to Fisher's direct question the Chairman, after a brief private discussion, stated a Harris decision to make a joint proposal with Fisher and to hold a meeting with Fisher to plan such a proposal after the *Further Notice* had been received and studied. This date was estimated to be in August but became late September. Fisher was unable to

> arrange such a meeting with Harris and by early November it was evident but not stated that Harris would not make the joint proposal verbally agreed to by the divisional Counsel. This change of arrangements was deeply regretted by Fisher although the Harris proposal had been rated at the bottom by the *Further Notice,* as Fisher had found excellent means of melding the two technologies. (F. T. Fisher's, 1981, p. 4)

The Fisher company of Canada was alleging that the Harris company officials had agreed verbally to join forces with Fisher as a joint-proponent, but then, later, silently reneged from the promise. The Fisher letter went on to ask the FCC to consider its proposal *on paper only* because the company did not have the means to run the required testing or the time to hire out the task. Further, Fisher claimed that the FCC could use the data submitted by the Harris company, since the two systems had technological similarities:

> Fisher lacks Harris' extensive AM transmitter experience and does not have an adequate AM receiver laboratory. By November it was too late for Fisher to secure an alternate joint proponent with the necessary background and facilities.
>
> We therefore again make a proposal to the Commission, which we submit has merit beyond the competing proposals, which at this time lacks the "real world" testing desired by the Commission only in the sense that we have not generated such data ourselves. . . . We respectfully submit that the present proposal, which uses substantially the same transmitted wave as the Harris CPM System, and the Harris V-CPM System under poor modulation conditions, legitimately draws on extensive Harris field results furnished to the Commission and is thereby nearly fully documented. (F. T. Fisher's, 1981, pp. 4–5)

Needless to say, the FCC was interested in the sixth proposal, but it did not adopt the system, stating that "the Fisher system depends upon an improved equipment technology which has not been tested in operation." The Commission also noted that the proposed Fisher system was not compatible with the millions of existing monophonic radios, prompting Fisher to propose "a required phasing in of the conversion of all stations to dual program capability over a ten year period" (FCC, 82-111, 1982, p. C2). Clearly this was an impractical request in light of the FCC's statement that any acceptable system had to be compatible with existing mono receivers.

"Entangled in a Matrix Jungle." The FCC was figuratively buried in paper in early February 1981: the deadline for comments on the AM stereo *Memorandum Opinion and Order and Further Notice of Proposed Rule-making*. Thousands upon thousands of pages of both technical and

ideological rhetoric rained upon the Commission. What follows on the next few pages is a brief glimpse into the nuts and bolts of broadcast regulation in the United States. Summarized here are the AM stereo comments of the leading players in both the consumer electronics and the broadcast industries.

Kahn Communications opted to push the FCC for a marketplace resolution. Apparently, with his well-established industry ties, Leonard Kahn was willing to gamble that his single-sideband system would have a leg up on the competition in a marketplace battle. Motorola expressed confidence that their system would be chosen by the FCC, and went so far as to suggest ways in which the FCC could improve the inquiry. Harris criticized the FCC matrix evaluation table, stating that "The matrix will not only fail to assist the FCC in picking the best system, but will also mislead the FCC." Harris cited several flaws in the matrix, including "improper data selection, invalid and unfair comparisons, computational errors, evaluation scales unrelated to real-world broadcasting conditions and blatant omissions of categories vital to a proper decision" ("AM Stereo Gets," 1981, p. 84). Finally, proponents of the initial FCC choice, Magnavox, blithely suggested that its system was so superior to the others that in-house Magnavox engineers had awarded it a perfect score of 100 on the FCC matrix.

Perhaps the most notable outcome of the FCC reopening the inquiry was that the Commission found itself increasingly swamped in the AM stereo quagmire. There were so many points of view that it became difficult to sort out the conflicting arguments, much less to arrive at a decision that would be accepted by the industries and the public. Some of the comments were primarily economic in nature, and while it may be tempting to abstract the arguments into strictly "ideological" ones, one must remember that there were real dollars (and yen) at stake. In this vein, Matsushita reminded the FCC that the AM stereo decision would have immense economic consequences. Matsushita Managing Director Shunkichi Kisaka suggested that in comparatively evaluating the five proposed systems, the social costs should be given greater weight. The social costs as estimated by Matsushita were $40 million for 4,000 station transmitter-processors at $10,000 each; plus $100 million to $200 million *per year* in annual unit sales of "no less than 10 million," including car radios, AM receivers, tuners, and radio cassette recorders (Kisaka, 1980, p. 4). In the end, Matsushita commented (pp. 9–10) that judging from the receiver manufacturer's point of view, Magnavox or Belar were the best alternatives, based on simplicity of design and low manufacturing cost. As the maker of Panasonic brand consumer electronics and thus the largest radio manufacturer in the world, surely the input of Matsushita would rank high with the FCC, so the endorsement of these two systems could not be taken lightly.

One of the major problems with the marketplace proposal was the fear

that in any given city, different radio stations might transmit incompatible AM stereo signals. For instance, station "K" might use Motorola C-Quam AM stereo, while station "W" utilized the Kahn single-sideband method. Already there were five systems of AM stereo—a sixth was on paper—and the marketplace supporters underscored the advantages of leaving the door open for the introduction of more advanced systems in the future. Sensing the chaos that might result with so many kinds of AM stereo on the airwaves, some advocates of the marketplace option had pressed for an automatic circuit in the AM stereo receiver that would detect which type of AM stereo signal was being transmitted by a particular station, and then automatically switch over to properly receive that signal. The FCC had specifically invited comments on a multisystem receiver in the *Further Notice*. National Semiconductor addressed this idea, arguing that a five-system universal decoder with automatic switching was technically and economically untenable. Further, in comments filed by Tim Isbell, Engineering Manager for Consumer Linear Development, National Semiconductor professed that while the Magnavox, Belar, and Motorola systems were similar enough in the signal path that a single integrated circuit could be "switched" to decode any one of them, manual switching among systems was "commercially unacceptable" (Isbell, 1981).

One company used the AM stereo inquiry as an opportunity to sound off to the FCC about the general economic effects of Japanese influence in U.S. broadcast policy making. Al Kelsch, Radio/Audio Manager of National Semiconductor, complained that the proposal to reduce the AM bandwidth channel spacing from 10 kHz to 9 kHz—the Japanese standard—would eliminate the use of 2 million units per year of a product made by companies such as National Semiconductor to tune digital radios. Kelsch further expressed concern that the FCC was "working to the benefit of our chief competitor: Japan, Inc.," and that:

> The delay in the AM stereo proceeding . . . has cost National important business *this* year in AM stereo decoder chips. National has built an important lead in development of this product (vs. Japanese manufacturers) and was in a position to do perhaps $3 million first year business . . . after the preliminary decision of April, 1980. This lead is rapidly dissipating as Japanese integrated circuit manufacturers catch up. This is a U.S. development, for U.S. markets, with U.S. money and expertise which is slipping away at the decoder end, because the U.S. FCC has extended the proceeding. (Kelsch, 1980)

Members of Congress again contacted the FCC in January 1981, in regard to letters from Kelsch to Steven Sharp of the Reagan transition team. Copies were also sent to several members of Congress, including Senators

Orrin Hatch and Barry Goldwater, and Congressman Don Edwards, Norm Mineta, Paul McCloskey, Toby Moffet, Barry Goldwater, Jr., and William R. Ratchford. In response to letters from members of Congress, Richard Shiben of the FCC Broadcast Bureau sent out a two-page letter explaining the status of the AM stereo proceeding and the reasons for the unrelated 9 kHz channel spacing proposal.

The National Broadcasting Company (NBC), as licensee of several major market AM stations, expressed support for Hazeltine's request that the marketplace issue be decided first before turning to the matrix analysis process of single system selection. In a letter from Howard Monderer, Vice President in NBC's Washington legal office, the network argued that the Commission should review and reverse the staff order issued in December by Henry L. Baumann, chief of the Broadcast Bureau's Policy and Rules Division, which rejected the "marketplace decision first" appeals (Monderer, 1981). At the end of January 1981 (with outgoing Chairman Ferris and outgoing Commissioner Brown not participating), the FCC ruled on Baumann's rejection of the Kahn and Hazeltine motions. The Commission found "no error in the determination made on delegated authority to deny that the 'marketplace issue' be decided first and separately from any consideration of technical data" (FCC 81-44, 1981, p. 6, ¶ 18).

The week after the latest marketplace ruling was released, NBC filed its comments with the Commission, saying:

> In many instances, NBC believes that selection of specific standards may impel the forward movement of technical innocation [sic]. In the case of AM Stereophonic Broadcasting, however, the search for a single acceptable system has had just the opposite effect. The advent of AM stereo has now been delayed for years, and further impediment to the institution of this needed, desirable and feasible service is undesirable.
>
> Accordingly, NBC believes that the only reasonable approach to follow at this point is to let the marketplace decide. . . . The alternative approach would be to select a single system, based on some matrix evaluated by the Commission Staff. There is no question that one or more of the losers in that case would seek legal redress, thereby delaying AM stereophonic broadcasting . . . possibly for years. . . .
>
> Therefore, NBC urges the Commission to abandon its search for a single "best" AM Stereophonic system. Instead, any system meeting minimum requirements with regard to compatibility with existing monaural service and protection of that service from new interference should be authorized for use. (Monderer, 1981)

The American Broadcasting Company's (ABC) response generally criticized the FCC matrix analysis. ABC stated that, based on the network's tests at station WABC, the Kahn/Hazeltine system was a "reasonably sound

basis for ISB standards"; and, citing the 1979 WABC report, said that the independent sideband system "is one which, if adopted, could provide the basis for a satisfactory AM stereo system now and likewise permit the improvements that may result from utilization of present and future technology" (American Broadcasting Company, 1981).

System Proponent Comments. In response to the *Further Notice,* Kahn and Hazeltine filed separate but similar responses in favor of the marketplace option. Neither of these responses differed remarkably from those petitions filed the previous autumn asking for a marketplace hearing. Hazeltine relied heavily on the Crandall/Brookings Institution report, which it filed for a second time, and on Harris's surveys of broadcast industry executives, which Hazeltine claimed showed the beginnings of a swell of support for the marketplace option (Hazeltine, 1981).

Again, Kahn Communications requested the bifurcation of the proceedings—to consider the marketplace question first, and advance to the single-standard option only upon a negative determination in the marketplace inquiry. Kahn claimed that "it is a complete waste of time, money, and the Commission's own engineering staff's valuable services to continue on the present lengthy path" (Kahn, 1981a, pp. 1–2). Kahn also cited an October 1980 Harris Corporation poll that had indicated that 33 percent of the "leading stations" favored the marketplace approach. Kahn wrote, "We believe that, in view of recent statements by highly respected broadcasters, the number of AM stations favoring the free enterprise solution will swell and shortly achieve a substantial majority (p. 2, Note 1).

The Motorola response offered some technical refinements to the matrix and concluded that the Commission's general matrix categories and weighting criteria were reasonable. Motorola claimed that the matrix, when coupled with Motorola's refinement of the evaluation process and factors, confirmed the clear superiority of the Motorola system, making the consideration of marketplace or lottery approaches unnecessary. In addition, Motorola retained the economic consulting firm Robert R. Nathan Associates, Inc., to prepare a report on the marketplace approach. This report, called "The Economic Effects of Alternative FCC Decisions Concerning AM Stereo," said that the marketplace option would not produce a decision that was in the public interest. The Nathan Report concluded that the marketplace would be an inappropriate mechanism for selecting the AM stereo standard, and it went to great lengths to criticize the examples provided in Dr. Robert Crandall's Brookings Institution Report (Motorola, 1981, pp. 19–20). The Nathan report specifically was critical of Crandall's use of the following innovations as parallels to the AM stereo case: (a) Beta vs. VHS video cassettes, (b) unleaded and diesel automobile fuels, (c) photographic film, (d) 220 volt appliances, (e) audio recording (for

example, 33 1/3 rpm disc, 45 rpm disc, cassette, eight track cartridge, reel-to-reel), (f) different socket sizes for light bulbs, (g) lens mounting for 35 mm cameras, (h) different computer languages and protocols, (i) telephone terminal equipment, (j) MDS—multipoint distribution service, (k) DBS—direct broadcast satellite, and (l) STV—subscription television—decoder. In each of these examples, the Nathan report submitted by Motorola attempted to rebut the Crandall Report offered by Kahn/Hazeltine.

The Magnavox comment was several hundred pages long. In fact, it filled all of Volume 19 in the FCC docket file. Magnavox argued that the "marketplace" was a misnomer, because "it is not the American public, or any consumer segment, but rather the receiver manufacturers, or more likely yet, the broadcasters who will decide which system or systems will prevail." Citing Matsushita's claim that "the total economic impact of small differences in receiver cost far outweighs that of broadcast equipment cost," Magnavox charged that the marketplace would be comprised of "some receiver manufacturers, or more likely some broadcasters, each acting in his own self interest to force a selection without regard for the public interest," and said that for the FCC to follow this course "under the guise of deregulation or free-market determination or any other popular cause would be to abdicate the exercise of the responsibility and authority for which it was created" (Magnavox, 1981, Section VI, pp. 7–8). In arguing that the "Commission authority to regulate transmissions is well established," the Magnavox comments took exception to the Crandall/Brookings report filed by Kahn/Hazeltine, which implied that "the Commission made a mistake in choosing a single color television system, a mistake they contend could be repeated in AM stereo." Magnavox argued that Kahn/Hazeltine "neglect to state the real reason why the initially selected CBS color television system failed in the marketplace—because that reason does not apply to AM-stereo. In adopting color television standards, the Commission underestimated the effect of incompatibilities with *existing receivers;* it did not err in choosing one among several mutually incompatible systems" (pp. 8–9; emphasis in original).

Finally, the Harris Company urged the Commission staff to "divorce itself from its flawed proposed matrix analysis" (Harris, 1981, p. 10). Harris wrote that it had:

> carefully analyzed the proposed matrix and believes that it is so severely flawed in its present form as to be a meaningless evaluation tool. . . . The present evaluation table will in fact badly mislead the Commission if it is used. . . . These deficiencies include improper data selection, invalid and unfair comparisons, computational errors, evaluation scales unrelated to real world broadcasting conditions and blatant omission of categories vital to a proper decision.

> While many of these flaws can be cured, the fact that the Commission staff would then be in a better position to structure a proper matrix analysis, however, does not bring the staff significantly closer to satisfying the underlying objective of this proceeding—to select an AM stereo system of superior quality which would permit AM broadcasters to compete effectively with FM broadcasters.
>
> It would appear that the staff has lost sight of the underlying objective of this proceeding and has instead become entangled in a matrix jungle. . . .
>
> By rejecting the ill-conceived proposed matrix analysis and by evaluating the systems on the basis of the Commission's underlying objective, the staff will be able to select a superior AM stereo system. In this regard, the Commission must select the system that most effectively fulfills the Commission's larger objectives of technical improvement of AM to permit more effective competition with FM, compatibility with present and future technical advances, and cost efficiency. (Harris, 1981, pp. 9–12)

In addition to these comments, Harris filed as appendices "confidential" copies of two surveys of leading AM broadcasters. The surveys were conducted by a company called Weeks Research Associates. The first sampling, "Weeks I," was conducted in May (Weeks, 1980a). The second, "Weeks II," was done in November (Weeks, 1980b). It should be noted that the two surveys did *not* use random sampling, but rather used a "selected sample weighted toward the larger stations" in which "a substantial number of respondents" were included because "they had seemed particularly aware of the technological problems involved" (Weeks, 1980b, p. 14).

Portions of the first survey had been reported in the trade press, so there was already a general awareness that Harris had commissioned an opinion poll on the AM stereo issue, but a report of the results of the first survey was not filed with the Commission until February 1981, when it was included by Harris as an appendix. Hazeltine Corp. also attached a copy of "Weeks I" with its comments. "Weeks II" had been filed by Harris with its pleading on December 19, 1980, and was also filed again with the February 1981 Harris comment. Harris used the survey report documents to support its conclusion that "broadcasters strongly oppose multiple systems and will only convert their equipment to stereo after a single system is selected" (1981, p. 181). The second Weeks survey had indicated that 67 percent of the AM broadcasters who responded to the survey favored FCC selection of a single standard. Of the 33 percent who preferred the marketplace option, Weeks Associates offered this conclusion:

> It is our opinion that most did not realize what chaos could develop. Many did not realize that an all-system receiver would be both difficult to develop and relatively high in cost. It also seemed to escape them that few, if any, receiver manufacturers would set up a mass production line on such a gamble (Weeks, 1980b, p. 17).

Perhaps most interesting, the Weeks II survey indicated that more than 40 percent of the broadcast engineers interviewed favored neither an FCC-selected single standard or the marketplace option. This group of engineers supported a third option, that of establishing a "standards committee with representatives from the FCC, from the broadcast community and from the manufacturers to develop a system with the best features" as had been done in the SMPTE mediation of standards for one-inch videotape (Weeks, 1980b, p. 17).

In addition, Harris argued that "a marketplace solution will unreasonably delay the adoption of AM stereo," that "radio receiver manufacturers are unable to produce a cost-efficient receiver capable of receiving multiple systems," that "in the absence of a cost-efficient multi-decoder semiconductor chip, adoption of multiple AM stereophonic broadcasting systems would be contrary to the public interest," and finally, that "a lottery for the selection of an AM stereophonic broadcasting system is unacceptable, arbitrary and without a rational basis (1981, pp. 184–190).

In commenting on the role of the FCC in technical standard setting, Harris argued that:

> Paragraphs 34 and 35 of the *Further Notice* suggesting the alternative of a marketplace solution indicate a minority sentiment in the broadcasting industry concerning "certain imperfections" in the Commission's decision to choose a single nationwide standard. The "imperfections" referred to are generally the difficulties facing the Commission in designing completely objective selection criteria. These difficulties, which are inherent in any agency decision, should not be used by the Commission to shirk its administrative responsibilities. The Commission, as in the case of other government regulatory agencies, is frequently called upon to choose among competing applicants, to allocate scare resources and to select technical standards from inconsistent proposals.
>
> Such agency involvement is the proper role of government in situations where the marketplace lacks the necessary expertise to make a determination or where uniformity and standardization is beneficial. Regulatory agencies are uniquely equipped in terms of personnel, information and objectivity to make these choices. Although such decisions are rarely made in situations of perfect information, the Congressional delegation of powers to federal agencies does not require that decisions be made in a laboratory environment. Rather, such delegation rests on the premise that agencies will assemble a complete record, weigh the pertinent criteria and use their technical, economic, and legal expertise to formulate rational decisions in regard to the public interest.
>
> In the instant proceeding, the Commission has assembled sufficient evidence to permit it to select a single nationwide standard for AM stereophonic broadcasting. The Commission has provided parties to this proceeding with at least five separate opportunities in which to present evidence and comparative technical data. . . . The record, compiled over a four year period, comprises over seventeen volumes and represents the opinions of numerous broadcast-

ers, equipment manufacturers, and other interested parties. On the basis of this evidence, Harris believes that the Commission can competently choose the best AM stereo system among the five systems under consideration. (Harris, 1981, pp. 181–182)

Trade Group Comments. In addition to the comments received from members of the broadcast and consumer electronics industries, many affiliated trade organizations chose to make comments to the FCC regarding the AM stereo inquiry. The Consumer Electronics Group of the Electronic Industries Association (EIA/CEG) stuck by its assertion that the FCC should choose a single system, saying, "Although it does not endorse any one of the five proposed systems, the EIA/CEG is committed to the belief that only by Commission selection of a single system will the public benefits of this service be realized in a rapid and low-cost manner." The EIA/CEG went on to say that multisystem decoders would be cost prohibitive; that manual switching systems would be unacceptable to consumers and would not be marketed by many manufacturers; and that automatic switching technology was not available now, nor was it likely to be in the foreseeable future. The EIA/CEG also cautioned the FCC to allow adequate lead-time, so that all affected parties could make necessary preparation for the onset of AM stereo (Consumer Electronics, 1981). Finally, the group also addressed the role of the FCC in technical standard setting:

> The public responsibility borne by the Commission in selecting one system to the exclusion of others is the same one that it (and other federal agencies such as the ICC and the CAB) bears in all licensing or privilege-granting cases: adherence to procedural fairness [citing 1 Davis, *Administrative Law Treatise,* Section 7.20 at 506 (1958)]. Undoubtedly, the presence of numerous technical factors has made selection of the "best" system more difficult and was instrumental in the Commission's decision to expand the procedural safeguards available to affected parties.
>
> Nevertheless, the fact that a "completely objective selection method" is unattainable, and that no matter what selection method is used there will be "imperfections" [citing FCC *Further Notice of Proposed Rulemaking,* 19 ¶ 34] cannot become an excuse for delay, inaction, or abandonment of the single system approach. The Commission has the statutory discretion and the practical expertise to make a rational selection among the competing systems; the decision-making procedures adopted by the Commission ensure a fair result; and the public benefits of the single system approach are clear and compelling. In these circumstances, the Commission need not be concerned that it will be "second-guessed" by a reviewing court. (Consumer Electronics, 1981)

The comments of the National Association of Broadcasters attempted to summarize industry efforts to assist the Commission in the AM stereo

inquiry. NAB noted that its participation as sponsor of the NAMSRC predated even the Commission's own initiation of proceedings. The NAB pointed out that the NAMSRC committee sponsors paid the costs of office and laboratory space, test equipment, personnel, and administrative work; and said that the only costs paid by the system proponents were for travel to the test sites. The NAB stated that the NAMSRC sought to provide the FCC with "comparable test data," and then "rather than recommending a system, looked to the FCC to adopt technical standards . . . consistent with the Commission's statutory mandate to determine the frequency, power, hours of operation and emission of broadcasting stations" (Wetzel & Payne, 1981, p. 3 [Citing Section 307(b) of the Communications Act of 1934]). NAB reminded the Commission that in the fall of 1980, the NAB had offered to sponsor testing under "identical conditions" so that the FCC could work with uniform data and information, but, partly because of "ex parte rules, anti-competitive possibilities, FTC regulations on product standards and the expression of advocacy statements to the Commission staff," such joint testing did not develop. The NAB attached copies of the five proponent's responses to the invitation for joint testing in Appendix B and, while urging the Commission to bring the parties together for joint testing, stated that "although some proponents expressed a willingness to cooperate, it is evident that the results of the proposed tests would be of greatest value to the Commission if all five AM stereo proponents were to participate (Wetzel & Payne, 1981, p. 5).

The NAB also offered an extended comment on the marketplace and said that in "the long chain of events between the development of an invention, such as AM stereo," and the decision of the consumer to "select a specified brand or model of receiving equipment," there are a number of marketplace components involved. The NAB felt that there were "four distinct marketplace components all affected by an FCC decision or non-decision on a broadcasting technical standard" (pp. 9–11). The Association saw these as (a) the marketing of the invention, or the patent market; (b) the marketing of transmitting equipment, typically in small quantities with small or nonexistent patent licensing fees; (c) the marketing of radio programming, in which—if there was no clear standard—the public would be "confused and would be deterred from attempting to enjoy the broadcasters' transmissions"; and (d) the marketing of radio receiving equipment, in which the general public would participate in economic decisions. The NAB argued that the general public has little direct or even indirect influence over broadcasting technology choices, and that "this decision making responsibility typically has been borne by the FCC, representing the public interest." As further evidence that "the traditional selection method is best," the NAB noted that "there are many countries which wait for the U.S. to decide on broadcast technical standards . . . in the case of AM stereo, Canada, Mexico, Japan, Australia and several South American countries are

awaiting a U.S. decision which will be incorporated directly in their respective broadcasting systems" (pp. 12–13). The NAB argued that "a technical standard does not inhibit competitive advances in equipment," citing product improvements and quality advances in both color television and FM stereo as examples of equipment moving "closer and closer to the ideal form envisioned by the standard's drafters" without a change in the standard itself. The NAB said that prior to its Executive Committee adopting the "single-standard" preference stance, an informal poll was conducted. Results of this poll are displayed in Table 3-1.

Finally, of special interest in the NAB comment is the protracted discussion of "information flow in technical rulemaking proceedings." The association said that while it was imperative that the Commission be given the tools for an informed decision, under present application of the ex parte rules, the rules may act "as a deterrent to the FCC staff's understanding of the implications of new technology." The NAB said that the introduction of AM stereo was slowed by the FCC's standardization process, in which an imcomplete record forced the Commission to ask for additional data. The NAB noted that the FCC asked 35 questions about AM stereo in the original 1977 *Notice of Inquiry*, and requested even more information in the *Notice of Proposed Rulemaking* of October 1978. Based on these questions, the NAB concluded that:

> The Commission's staff initially did not have a sufficient grasp of the technology to specify the information desired, how tests were to be performed, what data should be obtained, and how it should be presented. Some of the same questions have been asked three times. In each case the system proponents have had to guess at what the Commission wants. Because of the

TABLE 3-1
"Informal" NAB Industry Poll:

ORGANIZATION	*ONE SYSTEM*	*MARKETPLACE*
Kahn/Hazeltine		X
NAB Engineering Advisory Committee	X	
Delco (General Motors)	X	
Electronics Industries Association	X	
Harris Broadcast Products	X	
Panasonic	X	
Pioneer	X	
Magnovox	X	
Motorola	X	
Belar	X	
Ford Motor Company	X	
RCA	X	
Sprague Electric (Integrated Circuits)	X	
National Semiconductor	X	

> Commission's failure to specify its information needs with precision, the rulemaking process has been confused and inordinately time consuming.
>
> The NAMSRC attempted to assemble the proponents, design and carry out tests and present the information to the Commission. Commission personnel were invited to participate in the committee work and to give suggestions for the tests. The tests were conducted in Washington to enable FCC personnel to participate. Unfortunately, Commission involvement was negligible at the inquiry stage. At two later phases of this proceeding there has been even less communication between the Commission's staff and the industry. The anxiety over the application of the ex parte rules has limited severely communication between government and industry, and has lengthened the period of time in which the Commission might authorize AM stereo.
>
> Consequently, and in view of the experiences in this proceeding, where complicated technical matters are involved, NAB believes the proceeding should be kept in inquiry status until the Commission's staff has gathered enough information to make specific proposals. The proceeding could then advance to the proposed rulemaking stage where the ex parte restrictions might apply. (Wetzel, 1981, pp. 6–7)

Analyzing the "Latest Jumbo Submissions." With the addition of the comments to the *Further Notice,* the already bulky docket file had now grown to 19 volumes. The deadline for reply comments had been set for March 9, 1981; however, the sheer bulk of the filings prompted Motorola to make yet another motion for an extension of time (Motorola, 1981). In response to this motion, the FCC chief of the Broadcast Bureau's Policy and Rules Division ordered the time for filing reply comments extended to March 23, 1981 (Baumann, 1981b).

Perhaps the only truly remarkable thing about this round of reply comments was that Motorola somehow managed to submit yet another document the size of a large telephone book. Leonard Kahn was moved to ridicule the size of the document, filing "Brief Comments on Motorola's Latest Jumbo Submission," and noting that the Kahn submissions were:

> much smaller in size than the submissions of its billion dollar competitors. For example, compare our last 49 page submission with the 500 page (or more) submissions of Motorola, Magnavox, and Harris. We urge the Commission not to be fooled by the size of the documents. . . . We know . . . that the Commission's engineers were under severe pressure to complete their studies of these documents in a short period of time . . . it is important that the coincidence—whether purposeful or not—of massive documents and brief time not be permitted to blind the staff to the actual substance of the comments. (Kahn, 1981b, pp. 8–10)

Kahn's comments were even more on target when the reply comments managed to fill three more volumes, bringing the size of the massive

documentation to 22 large volumes. It was the job of FCC staff to sort through the leviathan mass.

The FCC summarized the filings by noting that in response to the *Further Notice,* 23 formal comments were filed (along with 17 reply comments) by a total of 33 parties. The FCC later reported that "no new matters or issues of significance were raised," although there was criticism of the methods by which measurements were made. It was typically argued that a universal multisystem decoder, while technically possible, would be cost prohibitive and difficult if not impossible to develop. Some parties favored a tie-breaking lottery, but most respondents were against this proposal, stating that there was sufficient data available on which to base a decision.

Regarding the FCC's evaluation matrix, much of the information missing in the earlier decision-making process was provided by the manufacturers (along with data for the theoretical sixth system proposed by F.T. Fisher's Sons). The information that was not or could not be ascertained was replaced with previously compiled data, or with the FCC's estimates of performance. However, few changes were made in the basic construction of the matrix because the FCC came to realize that—as NBC maintained—there can be "no assurance that *any* table will be sufficiently comprehensive or so weighted as to be acceptable to all interested parties" (FCC 82-111, 1982).

When the FCC came back from its summer hiatus in September 1981, Broadcast Bureau chief Richard Shiben said that final rulings for AM stereo, low-power television, and probably FM quadraphonic would all be issued in the first part of 1982 ("FCC Readies," 1981). Speaking at the National Radio Broadcasters Association (NRBA) convention in Florida on September 15, 1981, the new FCC Chairman, Mark Fowler, said that the Commission would redirect its engineering resources toward completing the AM stereo docket. He aimed at "the first quarter of next year" as a target date for action, and said that he was "shocked" that the AM stereo proceeding had been dragged out so long ("Fowler On," 1981).

As 1982 began, *Broadcasting* magazine summed up the task facing the Fowler Commission as follows:

> The FCC as it looks ahead to the issues of 1982 resembles nothing so much as Janus, the Roman god of doorways with one head and two faces, each looking in an opposite direction. One one hand, Chairman Mark Fowler . . . is making it clear that he, like the President who appointed him, thinks it good public policy to peel off the layers of regulations imposed over the past 50 years—in effect, to retreat to square one. On the other hand, the technological revolution in telecommunications continues with increasing fury, imposing on the Commission the responsibility for determining how the new services being made available are to be incorporated into the country's telecommunications scheme. All this during a time of sharp budget cuts.

> How to proceed? Fowler, at least, has a polestar to follow: the marketplace. He believes the marketplace provides for more efficient regulation than any rules government is wise enough to devise. And as he charts the Commission's course toward the condition of marketplace regulation, he quotes with approval the command of Murray Weidenbaum, Chairman of the President's Council of Economic Advisors: "Don't just stand there! Undo Something." ("Dilemma For," 1982, p. 36)

Hints of a Marketplace Decision. In early 1982, the Harris company released the results of a third survey, which indicated that top managers at 75 percent of the nation's AM stations disagreed with the marketplace approach for AM stereo, and preferred a single standard. The survey, conducted by telephone between January 25 and February 1, 1982, involved general managers and chief engineers at 83 AM stations. Harris said that of the 71 stations that stated a preference on the question, 53—almost 75 percent—preferred that a single system be chosen ("Broadcasters Favor," 1982). Support for a single AM stereo system also came from unexpected quarters: in response to an FCC invitation for comments on AM SCA proposals (subsidiary communications authorization would allow AM stations to carry signals such as financial or utility load management data on a closed circuit sideband—as does FM). Many of those commenting to the FCC felt that a marketplace approach for AM stereo would frustrate AM SCA by causing compatibility problems ("SCA Comments," 1982).

Yet regardless of what proponents of a single standard argued, the stage was set for a marketplace ruling in February 1982, in remarks by Commissioner Anne Jones to the Electronics Industries Association in Washington, D.C. Citing budget cuts at the FCC, along with the predilection for broadcast deregulation, especially with the addition of the three new Reagan appointees to the Commission, Jones, who with Tyrone Brown was one of two dissenting Commissioners in the 1980 single-system Magnavox vote, said that in the future, the FCC would be reluctant to set standards for services such as AM stereo, FM quadraphonic, and teletext. Remarking that "arguments for a so-called marketplace decision have increased in volume," and that attitudes were "rapidly changing," Jones hinted in a not-so-subtle fashion that the FCC would begin to depart from its traditional role of approving and certifying new electronic equipment. Concerning AM stereo, Jones said:

> I claim no special foresight in that vote, but would suggest to you . . . that the two years of work and delay since [the Magnavox decision] demonstrate the problems of rulemaking and government procedures which result when the FCC is asked to select a specific system and thus provide a measure of certainty to broadcasters and manufacturers alike. . . . I feel as I have said before, only now it appears that I am no longer in the minority, that the

Commission—in the absence of compelling reasons to do otherwise—should require only the minimal standards necessary to protect existing services from interference. ("Future Will," 1982)

Yet Another Last Minute Push. Just as the AM stereo decision appeared imminent, Dr. Joseph A. Boyd, Chairman and chief executive of the Harris Corporation, sent out last-minute pleas in the form of mailgrams to members of the U.S. House and Senate. The dispatches read:

As the country's largest manufacturer of transmitters for commercial radio stations, Harris Corporation is in favor of prompt selection by the FCC of a single technical standard for AM stereo broadcasting, regardless of the system selected.

We believe it would not be in the public interest to allow the five proposed AM stereo standards to engage in an on the air survival contest, as some have proposed. This would drastically increase the cost to consumers of receiving sets, would force AM stations to gamble on which of the transmission systems to invest in, and would further delay or even kill the advent of AM stereo in the United States.

We are not alone in this belief. According to our industry surveys and daily contacts, a 3 to 1 majority of AM stations also favor selection of a single stereo standard by the FCC.

This is not a question of "deregulation," a principle of which we approve, but a matter of the nation's designated authority on broadcast technical standards assuming its responsibility. I am communicating with you simply to make our corporate position clear, not to request your assistance. (Boyd, 1982)

In response to this late effort, attorneys for the Hazeltine Corporation filed a complaint with Edward J. Minkel, Managing Director of the FCC. The Hazeltine complaint said in part:

Dr. Boyd's concluding statement notwithstanding, the mailgram is on its face a solicitation of Congressional assistance *at the FCC.* The mailgram requests no action by Congress and addresses no issue before the Congress. Rather it deals solely with the FCC proceeding, specifically FCC adoption of the marketplace approach. There can be no explanation for this mailgram other than soliciting Representatives and Senators to communicate the Harris position to the FCC.

The AM stereo proceeding has suffered from an extraordinary deluge of last minute ex parte communications each time, in its lengthening history, it has appeared that the Commission was about to act. For example, the Commission was bombarded with ex parte communications from system proponents and equipment manufacturers during the week before its April 9, 1980 Sunshine Meeting. . . . Those communications, like the instant mailgram, contained misleading claims which interested parties had no opportu-

> nity to correct. Indeed, in the *Notice* the Commission felt constrained to remind parties that the AM stereo proceeding is restricted and all ex parte contacts prohibited . . . it is requested that all Commission decision making personnel refrain from accepting any ex parte presentations from members of the House or Senate. . . . Finally, it is respectfully suggested that the Commission can stem a recurrence of past ex parte floods in this proceeding by promptly reaching a decision. (Ferrall, 1982)

Staff Recommendation. In addition to personnel changes among the FCC Commissioners in the two years since the "Magnavox" decision, there were many new employees in staff-level positions. This new cast of characters acted in a far more unified fashion than the FCC bureau chiefs who had been so deeply split on the single standard versus marketplace question two years before. On February 11, 1982, the FCC's new Broadcast Bureau chief, Lawrence E. Harris, presented and recommended adoption of a proposed *Report and Order* under which the FCC would rule in favor of the "marketplace" option. The second section of the "factual summary" for the agenda item admitted that:

> The data submitted to the Commission were of varying degrees of quality and were not gathered under methods of uniform testing. On occasion, even questionable techniques were employed. Furthermore, the Commission staff has encountered great difficulties in deciding how the attributes of the various AM stereo systems should be weighted and has come to the conclusion that there is no one "best" way of going about the selection. Indeed, any decision reached would contain elements of arbitrariness and could be challenged by other reasonable researchers. Finally, even assuming that the data and methodology employed were flawless, the deliberations of the Commission staff found the systems extremely close in their performance characteristics.

The second, third, and fourth sections of the document went on to outline the following issues and options:

II. *Issues*

1. Should the Commission continue its efforts to select a single AM stereo system?
2. Should the Commission authorize AM stereo without mandating the use of a single system?

III. *Options*

1. Allow market determination of an AM stereo system.
2. Continue seeking information and attempt selection of a single system.

IV. *Recommendation*

1. The attached item would terminate the AM stereo proceeding by adopting rules setting up minimum standards for an AM stereo service but basically leaving the way clear for any non-interfering stereo system to be used. . .
2. The [Broadcast] Bureau firmly believes that the most prudent course to follow is to cease our attempts to find the "best" system and allow those parties in the private sector to exercise their own best judgment in choosing the system or systems. . . . We, therefore, urge the Commission to adopt the attached *Report and Order* (L. E. Harris, 1982)

The Agenda Item was signed as "noted" by the new FCC Managing Director, Edward J. Minkel, and the new chief of the Office of Plans and Policy, Peter K. Pitsch. In addition, the item was also signed by Chief Scientist Steven J. Lukasik, a holdover from the group that had created the matrix strategy and had pushed for the Magnavox single standard in 1980. Unlike the 1980 FCC staff split, the divisions now presented a united front, recommending a decision that would allow broadcasters to use any system they wished as long as the system provided acceptable stereo service and would not cause interference with other stations. Commissioner Quello offered this account of the OST and the Chief Scientist's new-found agreement with the "marketplace" option:

> A funny thing happened here. All of a sudden the Office of Engineering and Technology went marketplace on us. Well, the reason you go marketplace when you're a bureau chief is when the Chairman of the FCC—who appoints you—goes marketplace, it's not a bad idea to go marketplace, even though you have one Commissioner who wonders what happened to you. So as a result, we had threatened litigation, we had a choice of saying "let the marketplace decide" or selecting another standard and facing three years of litigation which would have had the same effect of holding up the development of AM stereo. (J. H. Quello, personal interview, December 19, 1989)

Summary. The year 1981 produced major changes at the FCC. Radio was deregulated in January 1981, just as FCC Chairman Charles Ferris left to make way for the incoming Reagan administration. The new president changed the character of the Commission greatly, creating a Republican majority with clear deregulatory policy goals. Reagan nominated a conservative Republican broadcast lawyer named Mark Fowler as FCC Chairman, and built a free-market Commission around his "new conservative" philosophy.

Kahn and Hazeltine continued their push for the marketplace question to be settled prior to picking any "best" system. They were clearly in the minority among system proponents, but did pick up the support of NBC.

On the technical side, National Semiconductor claimed that a multisystem receiver chip was impractical, and tried to whip up Congressional pressure to force the FCC to act quickly. There were conflicting economic reports filed by Hazeltine and Motorola; Robert Crandall's research showed support for the marketplace option, while Robert Nathan's report claimed that the marketplace would be an "inappropriate mechanism" for selecting an AM stereo standard.

The Harris Company supported its comments with surveys purporting to show that broadcasters strongly favored a single standard, and both the NAB and the EIA/CEG stuck by their assertions that the FCC should pick one system. Overall, the comments indicated that the FCC's credibility had been eroded considerably by the AM stereo debacle. By the beginning of 1982 the Commission began to send signals that a decision was forthcoming, and that with the new Reagan FCC members on board, the marketplace option was now favored by a majority of the Commissioners.

Finally! – A Final Decision

On March 4, 1982, the FCC on a 6 to 1 vote adopted its permanent position on AM stereo: the AM stereo standardization decision would be left up to the marketplace. The marketplace option was favored by Chairman Mark Fowler, and by Commissioners Henry Rivera and Mimi Weyforth Dawson, all Reagan appointees, along with Commissioner Anne Jones. Also concurring with the majority, although not favoring the marketplace solution, were Commissioners James Quello and Joseph Fogarty. The lone dissenting vote was cast by Abbott M. Washburn. The marketplace *Report and Order* stated that:

> The Commission's decision to leave it up to private decision makers to choose an AM stereo system is both driven by a desire not to make tenuous choices and encouraged by the fact that allowing a marketplace determination offers many advantages. Three fundamental reasons underlie this conclusion. First, the data processed by the Commission are incompatible in some instances since no uniform test procedures were employed. Second, the weights assigned to the various factors and the engineering judgments employed are subject to variance depending on the analyst. Finally, the results obtained are close even if the data and methodological difficulties were absent. Thus, from the results in the evaluation table, no clear choice is apparent in any case.
>
> Private markets do not always function perfectly and with instantaneous speed; however, neither do government decision makers. In the case of AM stereo, the Commission had decided not to intervene in ordinary market processes and thus will permit broadcasters to choose whichever AM stereo system will best serve their interests and will allow them to alter their decisions

> as they see fit. The only concern that the Commission retains is that any AM stereo system employed must not interfere with the services of other users of the electromagnetic spectrum, it must comply with all international agreements and must furnish a stereo service that conforms to our basic technical requirements for stereo. (FCC 82-111, p. 14, ¶ 45 and 46)

The majority also commented on the fact that the FCC was deviating from its norm of nearly 50 years:

> It is recognized that allowing the market to determine the selection of an AM stereo system or systems is a bold, new step for the Commisison to take. It clearly represents a change from tradition. . . . Although some costs may be incurred . . . the potential benefits are substantial and should not be ignored. Therefore, we believe that pursuing the course of action set forth herein best serves consumer well-being and furthers the Commission's mandate to regulate to the public interest. (p. 17, ¶ 59)

The one dissenting Commissioner, Abbott Washburn, wrote:

> I dissent to the majority's decision which denies the request of the AM broadcasting and manufacturing industry for authorization of a single AM stereo system . . . I differ with them in assessing the consequences of multiple systems. . . . in a given geographic area you might have two or three different stations broadcasting in AM stereo but using different systems, so the listener would have to have multiple radio sets in order to receive them. . . . Will the public accept these inconveniences and added costs, when they can already receive a universal FM stereo signal that is at least as good as AM stereo would be? . . . I continue to believe that it is in the public interest for the Commission to choose a single system . . . [as] has been our practice for over 50 years. For example: monochrome and color TV, FM stereo, telephone and other communications systems were all designed to a standard selected by the FCC. The data and analysis we need to set a standard in AM stereo are before us. I dissent to the majority's unwillingness to make the choice which would have assured a national standard. (Washburn, 1982)

Although the vote was 6 to 1, two Commissioners, James Quello and Joseph Fogarty, agreed in spirit with Washburn's dissent, but were resigned to side with the majority and be done with the controversy. Both of these Commissioners had served in 1980 and both had supported the single (Magnavox) standard. Recognizing that the three new Reagan appointees, along with early marketplace supporter Anne Jones, gave the marketplace a four-vote majority, these two went along with the changing tide. Nonetheless, their unhappiness with the outcome is evident in the statement that Quello wrote, and with which Fogarty concurred—part of which said:

> One thing that the marketplace doesn't do very well and something government should be prepared to do, it seems to me, is to establish technical standards in the interest of nationwide compatibility. . . . To expect the American public to select a nationally compatible AM stereo system in a reasonable period of time . . . is sheer folly. . . . I am appalled that it has taken this Commission five years to decide that it cannot decide this issue. We have vacillated, temporized and rationalized this matter until I believe the *Report and Order* is correctly stating that a viable standard can no longer be set. . . . While this state of affairs is not my preferred outcome, the *Report and Order* appears to be merely a concession to the practical realities in this unfortunate situation. (Quello, 1982)

Indicating his rationale for concurring with a majority with which he disagreed, Commissioner Fogarty said after the decision that he remembered his embarrassment at the National Association of Broadcasters' convention immediately following the 1980 Magnavox decision, when "the engineers took us apart" ("FCC Gives Up," 1982). Fogarty readily conceded that the FCC had made a tough decision, saying:

> We botched up AM stereo. On the advice of the experts we had here at the Commission, we selected Magnavox a couple of years ago. At the time, I was convinced it was correct . . . [but] we really weren't sure, so we delayed the delivery of AM stereo; and now we've left it up to the marketplace. Well this one was too close to call. ("Fogarty: Favors," 1982, p. 69)

While Fogarty indicated that he voted for the marketplace because the five systems were so similar, he stated that in such standards decisions, he would support picking one system if it was clearly superior to the others. Commissioner Henry Rivera agreed that he would vote for the marketplace if he wasn't certain that the FCC could make a better selection. He admitted that in the AM stereo case, the Commission had used a "flawed" selection methodology, but noted that:

> unless it can be demonstrated to me that the FCC can make a better decision than the marketplace, I will go with the marketplace because I think it works. I don't buy the argument that unless we set a standard, it won't get done. If there's enough of a demand for the service—such as AM stereo—the people who want to sell it and want to buy it will get together and decide what they want to buy and what they want to sell; and the American people will have these services without the federal government intruding and saying "You will utilize this standard." ("Rivera: Pessimistic," 1982, p. 75)

Despite the authorization of all five systems—and an open door for any future systems that met minimal technical requirements—the Commission could not resist justifying its earlier use of the quantitative analysis by

introducing a third version of the controversial matrix. When unveiling this third matrix, the FCC stated:

> we carefully considered all of the comments that we received and took them into account when completing the Table. However, we made few changes in the structure of the Table and in our methods. . . . The completed AM stereo system evaluation table which follows represents our analysis of the stereophonic performance of the five proposed systems based upon the data which were presented to us or our own estimates where the data was not available. In the scoring of each category the Commission's staff used its best engineering judgment based upon the information and data which were available. However, no claim is made to any special uniqueness for any of the chosen methods of evaluation. In many of the categories, several other scoring methods and evaluation scales could perhaps have been devised that would have yielded an equally acceptable measure of a system's performance in that category. (FCC 82-111, 1982, pp. 10–12, ¶ 35, 43)

The final evaluation table, as displayed in Figure 3-3, showed Magnavox still in the lead with 76 points, Harris with 72, Motorola with 71, Kahn with 65, and Belar with 58 points.

Commissioner Abbott Washburn reflected on the 1982 marketplace decision, contending that the consensus today among those who had served on the Commission in 1982 would be that the decision was a mistake:

> The economics of the whole thing rests on what would be competition between FM and AM stereo, and I don't think the economics were particularly strong. Which was one of the reasons I thought we should have set a standard, because [AM stereo had] a weak base to begin with.
>
> When you read Quello's concurring statement, it's about as strong as my dissent. . . . They were not seizing the nettle. I think our Commission, today, if you go around and talk to them, they'd say "We made a mistake." I think Jim Quello would say "Well I guess that's one we muffed." (A. M. Washburn, personal interview, December 19, 1989)

Commissioner Quello reflected on the marketplace decision, placing the blame not on the FCC, but with the vocal opposition within the broadcast community to the Magnavox decision:

> If we would have selected a standard, I'm sure that Mr. Kahn would have enjoyed a nice three year litigation out of it. We didn't do it. We should have stayed with the original Magnavox. When broadcasters come after me I say, "You guys are to blame." They said, "Hey, why did you do it when you had an inferior system?" It wasn't [an] inferior system. There was a system [Magnavox] that a few engineers hadn't adopted. They were embarrassed because they had their company out on a line, but [that was] a few thousand dollars that shouldn't have been there. (J. H. Quello, personal interview, December 19, 1989)

EVALUATION CATEGORY:	MAGNAVOX	MOTOROLA	HARRIS	BELAR	KAHN
Numbers in parenthesis ( ) indicate the maximum possible scores in the various categories or sub-categories.					
I. MONOPHONIC COMPATIBILITY:					
(1) Average Harmonic Distortion (15)	15	9	6	9	12
(2) Mistuning Effects (5)	5	5	5	5	5
II. INTERFERENCE CHARACTERISTICS:					
(1) Occupied bandwidth (10)	3	4	10	5	6
(2) Protection Ratios (10)	7	7	8	1	9
III. COVERAGE (Relative to Mono):					
(1) Stereo to mono receiver (5)	5	5	5	5	5
(2) Stereo to stereo receiver (5)	*	*	*	*	*
IV. TRANSMITTER STEREO PERFORMANCE:					
(1) Distortion (10)	8	8	6	8	4
(2) Frequency Response (10)	8	5	5	6	8
(3) Separation (10)	10	10	10	8	3
(4) Noise (10)	6	10	8	6	8
V. RECEIVER STEREO PERFORMANCE: Degradation in stereo performance over that measured at the transmitter, including consideration of directional antenna and propagation degradation (10)	9	8	9	5	5
TOTAL SCORES:	76	71	72	58	65

Note: The entries in the table which are underscored are the ones which we have either completed or modified based upon data submitted in response to the *Further Notice* of September 11, 1980.

Source: FCC 82-111 *Report and Order (Proceeding Terminated): In the Matter of AM Stereophonic B/casting,* FCC docket file 21313 document, adopted 4 March, 1982, released 18 March, 1982: 13.

Figure 3-3 *AM Stereo Evaluation Table* (March 1982)

Commissioner Jones admitted to confusion on the question of how history would view the AM stereo marketplace decision, but also did not completely concede that it was an error:

> . . . only because I've heard now enough times, and it's a long enough passage of time; people say "That was a big mistake, Jones, that was a big mistake."

> And maybe it was. No one has proven it to me, but maybe it was. I don't know. If people say it enough then I'll be willing to listen. (A. P. Jones, personal interview, March 7, 1990)

The Marketplace Battle. While the focus of this chapter is on the events leading up to the 1982 decision, included here is a brief summary of events in the years that followed the marketplace decision, in order to bring a sense of closure to the case study. The 1982 FCC marketplace decision cleared the way, after years of delay, for AM broadcasters to transmit in stereo. However, the initial introduction of the stereo innovation in this new, experimental marketplace was slow and awkward. Even when turning to their own trade associations, broadcasters and electronics manufacturers found little guidance or direction in choosing an AM stereo system. Because of antitrust laws, the National Association of Broadcasters and the Electronics Industries Association had to shy away from influencing the adoption decisions of broadcasters and manufacturers. Additionally, the same antitrust laws prohibited groups of receiver manufacturers or groups of stations in a particular market from jointly picking an AM stereo system ("Jockeying For," 1982). Still, the year after the FCC announced its decision, NAB President Vincent Wasilewski promised that the NAB would "concentrate every effort to equip broadcasters with the technical and marketing information necessary to aid them in converting to stereo transmission," adding that consumer demand was "predicated on availability" (NAB, 1984, p. 154).

Although Belar Electronics, citing a lack of financial resources to wage such a fight, had withdrawn its RCA system from the AM stereo transmission market in 1981, the remaining system proponents—Kahn, Magnavox, Harris, and Motorola—indicated that they would "slug it out" in the marketplace battle. Belar's President, Arno Meyer, predicted that the Magnavox system would emerge as the standard, and signed on as a licensed manufacturer of the Magnavox monitors. Naturally, each of the four remaining firms predicted that its system would emerge victorious in the marketplace battle. *Broadcasting* magazine editorialized that while it was too early to predict a trend in the marketplace, Kahn and Magnavox had the best chances of winning the battle. Magnavox, since it was named as the tentative standard in April 1980, was given a good chance for victory because many manufacturers, such as Matsushita's Panasonic subsidiary and National Semiconductor, had geared up for the Magnavox decoder chip and receiver design. Additionally, Magnavox is a subsidiary of North American Philips, which was "second only to Matsushita as a worldwide maker of radio sets." Some felt that the Kahn system had the inside track on winning the race for marketplace acceptance, because Kahn had been working on AM stereo authorization for two decades and "was ready with a list of nearly four dozen stations in the U.S., Canada, and Mexico" with

contingent orders for the Kahn system ("Jockeying For," 1982). The *New York Times* wrote that Kahn and Harris were the initial front-runners because of their aggressive marketing tactics and their early FCC approval (Yarrow, 1982). Harris's Washington attorney, Andrew Lipman, said that Harris had the best chance, because its internal polls showed that broadcasters preferred the Harris system. Additionally, Harris would prevail, he predicted, because it was the only transmitter manufacturer among the proponents, and therefore had more contact with broadcasters ("FCC Gives Up," 1982). Thus, there were as many predictions as predictors, and it was anybody's guess which AM stereo system would win the battle in the marketplace.

There were also many differing opinions about how the marketplace would function. Kahn said that he believed that the broadcasters would make the decisions. Some optimists even went so far as to hope that a standard would emerge at the NAB convention in Dallas, which was only a few weeks away. Needless to say, this did not happen, although a *Radio and Records* survey a few months later indicated that 61 percent of the broadcasters in the nation's top 30 markets supported the Kahn system. Others felt that receiver manufacturers would play the pivotal role; that the Japanese manufacturers, unencumbered by antitrust legislation, would simply begin flooding the market with a specific set, which would then be accepted as the industry standard worldwide. And yet the receiver manufacturers were at a much greater financial risk than the broadcasters. It was estimated that while the cost to individual radio stations for AM stereo was only 10 to 20 thousand dollars, the cost to the receiver industry was "in the tens of millions of dollars," causing manufacturers to move cautiously (Yarrow, 1982).

Motorola Becomes "De Facto" Standard. Kahn was the first proponent to gain FCC "type acceptance," meaning that on July 23, 1982, the Kahn system was approved by the Commission as meeting the minimum criteria required for station transmission ("AM Stereo Goes," 1982). That very day, KTSA AM of San Antonio, Texas, became the first full-time commercial AM stereo broadcaster. Although KDKA in Pittsburgh had switched on AM stereo about 11 minutes before KTSA, the pioneering Pittsburgh station broadcast in AM stereo for only about 10 minutes, and after that used it only on certain occasions (Huff, 1987). Type acceptance proceedings continued during the summer and fall of 1982, and by November, the Motorola, Harris, and Magnavox systems were each granted type acceptance.

Recall that opponents of the marketplace solution had predicted that the true marketplace would be decided not by demands of the individual consumer, but by choices made by big business prior to the innovation's

introduction in consumer markets. Now these predictions were coming true. Much of the attention during this period was focused on the testing of the various systems by car stereo manufacturers, especially GM/Delco, which made radios for factory installation in approximately 90 percent of GM's cars and trucks. What proved to be a major catalyst in determining the U.S. *de facto standard,* as it now came to be called, occurred in early December 1982, when General Motors's Delco Electronics Division completed its in-house testing of the various AM stereo systems and announced that GM/Delco would manufacture automobile radios using the Motorola C-Quam system. Although both Harris and Magnavox accused GM of unobjective testing procedures, nearly 40 receiver manufacturers followed the lead of GM and adopted Motorola C-Quam (Huff, 1989, pp. 8, 24).

The only other remarkable development during this period occurred on August 17, 1983, when the FCC ordered the Harris Corporation to withdraw from the AM stereo market because the Commission found that the Harris STX-1 stereo exciter being sold was different from that which had been given type acceptance. In addition, Harris was ordered to notify the 71 stations using its system to revert back to monaural transmission ("FCC Pulls Plug," 1983). This delay and embarrassment placed Harris at a formidable competitive disadvantage until the following month, when the FCC again authorized Harris equipment for AM stereo broadcasting ("Harris Corp. Stereo," 1983). But it was not until January 1984 that Harris was granted a waiver of FCC rules (which required that harmonic distortion not exceed 5 percent), once again permitting type acceptance of the Harris exciter (NAB, 1984, p. 154).

A Lottery For AM Stereo? On June 8, 1983, the National Black Media Coalition (NBMC) filed a Petition for Rulemaking asking the FCC to use a lottery to select a technical standard for AM stereo. Pluria Marshall, Chairman and CEO of the National Black Media Coalition, explained the reason for the petition—that many minority-owned radio stations also happen to be AM stations, not necessarily because of FCC minority preference tax certificate or distress sale policies, but simply because the AM stations on the market commanded a lower price. Marshall said "FM was the new glamour boy, while AM was the dog. If we [are] going to own the dogs, we might as well enhance the dogs." Thus the NBMC was interested in AM stereo as a way to improve the popularity and value of the AM stations, which were more frequently becoming minority-held properties.

The NBMC petition was "dismissed by the Commission staff under delegated authority on the grounds that it was repetitive of the Commission's action in the AM stereo *Report and Order.*" On March 12, 1984, the NBMC filed an Application for Review requesting that the Commission

review the staff action that dismissed its petition. The FCC Commissioners ruled on July 26, 1984, that it found "no reason to revise its AM stereo policy and therefore affirms the staff decision" (FCC 84-357, 1984). Commenting on the FCC denial of the NBMC's petitions, Marshall said "The FCC wimped out on us" (P. W. Marshall, Sr., telephone interview, May 2, 1990).

1984—Magnavox and Harris Drop Out. In early 1984, two system proponents withdrew from the race. After two years in the marketplace battle, Magnavox has only six stations on the air, and "with little fanfare and no public announcement," Magnavox, the original choice of the FCC in 1980, stopped promoting its AM stereo system (Huff, 1989, p. 9).

By September 1984, automobile makers were warming up to AM stereo. GM, Chrysler, and Ford were ready to install Motorola C-Quam receivers. At this point, the marketplace battle was being fought with no clear winner, although Motorola had a strong lead in both the number of receivers on the market and the number of broadcasters transmitting with C-Quam.

It is reasonable to conclude that Harris's temporary, yet serious, setback the year before, when its system was pulled from the market by the FCC, contributed to Harris's decision to drop out of the AM stereo contest and instead to adopt the Motorola C-Quam system for its transmitters. On December 17, 1984, the Harris Broadcast Group announced that it had entered into a licensing agreement with Motorola, Inc., to market and manufacture both AM stereo exciters and monitors using the C-Quam design. Current Harris users—there were about 200 of them by that time—were offered a C-Quam exciter modification kit and a modification program for the AM stereo modulation monitor. This made the total number of C-Quam/Harris AM stereo stations on the air in the U.S. almost 400 (NAB, 1984, p. 154), allowing Motorola C-Quam to emerge as the clear market leader, both in the United States and worldwide. By the late 1980s only two systems remained in the AM stereo battle—Kahn and Motorola.

Legal Battles Cloud the Marketplace. In September 1986, Texar, Inc., a Pennsylvania receiver manufacturer, attempted to "save AM stereo" by petitioning the FCC to reconsider the marketplace stance and to instead select a single standard. The petition was put on hold for over a year by the FCC, which was awaiting an NTIA study on multisystem receivers and the functioning of the AM stereo marketplace (Huff, 1987, p. 123). In August 1987, the NTIA finally reported that while there is no inherent degradation of sound quality in multisystem receivers, implementation of this technology was not feasible because of a lack of support among radio manufacturers and the dominance of the Motorola C-Quam system internationally ("Where Things Stand," 1988a). The NTIA also recommended to

the FCC that the Motorola C-Quam pilot tone be protected from possible intereference, an issue that was to have been discussed by the FCC the following November, but was taken off of the agenda at the last minute. Protecting its pilot tone would have been tantamount to the FCC declaring Motorola the winner in the AM stereo battle, and this type of marketplace interference was not in the Commission's plan. On January 14, 1988, the FCC turned down the NTIA's recommendation that the C-Quam pilot tone be protected. Petitions to adopt a single AM stereo system—to declare Motorola's C-Quam the national standard—and to make multisystem radios mandatory were also rejected by the Commission. FCC Chairman Dennis Patrick and Commissioner James Quello said that since the majority of AM stereo stations transmit C-Quam, and since 100 percent of the receivers on the market can receive it, C-Quam was already close to being the de facto standard ("Where Things Stand," 1988b). Nonetheless, the C-Quam system had been declared the officially mandated standard in Australia, Canada, and Brazil, and it was under consideration in Japan (Motorola, 1988b).

In addition to wrangling within the FCC, the AM stereo battle was fought in the patent office and in the federal courts. For a time, Sony produced multisystem radios—both AM Stereo "Walkman" and tabletop models—that were manually switched by the listener, but these receivers eventually were discontinued. In December 1987, Kahn had filed a complaint with the FCC stating that in 1985 Motorola had improperly blocked Sony Corp. from selling its multisystem receivers by asserting two AM stereo patents. Additionally, Kahn alleged that the patents had not been properly obtained by Motorola in the first place. Motorola responded by simply dismissing Kahn's charges, stating the standards battle was essentially over, and that C-Quam's position would be solidified by the introduction of new integrated circuits in "soon to be released" AM stereo radios ("Where Things Stand," 1988a). In 1988, the U.S. Patent office held that Motorola's patent claim (#4184046) was allowable and did not require any changes in wording or specifications (Motorola, 1988a).

On April 29, 1988, Kahn filed suit in a federal court in New York against General Motors (*Kahn v. General Motors,* 1989a), claiming infringement of claims 53 and 54 of Kahn's '994 patent (United States Patent Number 4,018,994). Leonard Kahn claimed that he was not only "entitled to substantial damages, but also to have GM enjoined from manufacturing and selling the type of AM stereo radios that have so interfered with the AM stereo marketplace." One month later, on May 27, 1988, the Motorola Corporation, GM's indemnifier and licensor of the C-Quam AM stereo technology adopted by GM/Delco, filed a declaratory judgment action in Chicago, against both Kahn and his licensee, Hazeltine Research. Motorola sought "judgment that the '994 patent is invalid, unenforceable, and not

infringed by Motorola or by AM stereo receiver manufacturers, such as General Motors, that incorporate certain integrated circuits into their AM stereo receivers" (*Motorola v. Hazeltine,* 1989).

General Motors then requested that the U.S. District Court for the Southern District of New York temporarily stay the New York suit while Motorola attempted to invalidate Kahn's patent in Chicago. This motion, which was granted on June 10, 1988, held that the New York suit was "merely a 'customer suit' against General Motors" and that "all issues would be settled in the litigation with Motorola in Illinois." Kahn responded that the suit against GM could not be settled in Chicago, because GM was not a party to the suit in Illinois, and because the damage amounts involved were not equivalent.

Hazeltine and Kahn won the lawsuit filed by Motorola in Illinois. On October 23, 1989, a federal judge in Chicago dismissed the Motorola suit, stating, "the court is of the opinion that this suit does not serve a useful purpose and may serve to harass an individual [Kahn]." Kahn scored another legal victory when, on November 17, 1989, a three-judge panel of the Court of Appeals for the Federal Circuit in Washington unanimously reversed the June 1988 New York Federal Court decision that had granted a stay in the *Kahn v. General Motors* suit, concluding that "the district court exceeded its discretionary authority in creating the stay. The stay is vacated, and the case is remanded to the District Court for proceedings on the merits" (*Kahn v. General Motors,* 1989b).

As this book was being written, the matter of the AM stereo patents was still in the courts. In the latest development, Kahn claimed that GM was obstructing the discovery process and thus frustrating the progress of the legal action, and asked a district judge in New York for "the ultimate sanction" against General Motors. However, on November 12, 1991, the judge denied Kahn's motion (*Kahn v. General Motors,* 1991) because Kahn had "failed to show misconduct or obstruction by the defendant of a sort that could justify the extreme sanctions plaintiff seeks." Thus, in 1992, 12 years after the Magnavox decision caused Kahn to threaten legal action in the AM stereo standardization proceedings, and 10 years after the "marketplace" battle began, the AM stereo patent battle was still in litigation, winding sluggishly through the Federal Court system.

Commissioner Washburn expressed the opinion that the litigation would have been settled more rapidly had the functioning of the marketplace not protracted the selection process:

> If we had set a standard, the legal mess that's in there in the situation now would probably not have developed. Or if it had developed, if the Kahn thing had gone to court it would have been settled. . . . If you look at the history of FM and TV color and all those things, the government, the FCC, did set a

> standard, and then you had legal cases, and they were resolved, and the public got served. I think that this thing [AM stereo] was left in such a maze of five or six different competing systems that you're still involved seven years later in the legal mess. (A. M. Washburn, personal interview, December 19, 1989).

By October 1988, *Broadcasting* magazine reported that C-Quam was the "virtual de facto standard, with adoption by 657 stations worldwide." Kahn's system was used by about 100 stations ("Where Things Stand," 1988c, p. 10). In 1988, 28 percent of all foreign and domestic cars were sold with C-Quam AM stereo. There were a total of 16 million receivers in the marketplace (Motorola, 1988b).

In the 1989 automobile model year, which began in September 1988, Chrysler Motor Company discontinued monophonic radios, offering only AM stereo/FM stereo models. Ford Motor Company made C-Quam AM stereo standard equipment on the Lincoln Continental, Mark VII, and Town Car models, and offered it as optional equipment on seven other models. GM/Delco offered C-Quam as an option in nearly all of its cars and trucks. Additionally, by 1988 there were nearly 30 manufacturers offering approximately 50 models of C-Quam AM stereo.

At the 1989 NAB convention in Las Vegas, Commission James Quello spoke at the Annual FCC/Congressional staff breakfast and said, "As far as having a standard, I've always believed in it. I was on a panel here two or three years ago . . . and I said 'if I were a practical broadcaster, I would probably wait and see what standard of stereo General Motors accepts and puts in its cars.' It (GM) took Motorola. That is pretty much the standard. . . . I would vote for it and codify immediately. I assure you that you wouldn't have too much trouble getting that through the Commission" (Motorola, 1989, p. 2, citing *Radio World,* June 14, 1989).

Assessing the growth of AM stereo in the 1980s, Marcia L. DeSonne, the NAB Director of Technology Assessment, wrote "There has been a slow but steady rise in the number of stations broadcasting in AM stereo. In 1989, about 9 percent of AM stations were broadcasting in stereo." DeSonne noted that in the same year, a slightly larger percentage of AM stations in AM/FM stereo combination ownership, about 10 percent were AM stereo; 7 percent of the "stand-alones" were broadcasting in stereo. In addition, stations in larger markets were more likely to use AM stereo technology. In 1989, only about 5 percent of small-market AM stations were broadcasting in stereo, just 3 percent of medium-market AM stations, while fully 28 percent of U.S. large-market AM stations were broadcasting in AM stereo (DeSonne, 1990, p. 36).

By spring 1990, the NAB reported that 16 percent of U.S. AM radio stations were "AM stereo equipped" (National Assoc. of Broadcasters, 1990, p. 5). In addition, the 1990 NAB *Broadcast Technology Report* revealed

that a much higher percentage of stations expressed an intention to begin stereo broadcasts in the future, as Figure 3-4 indicates.

As this research was being conducted, the C-Quam/Harris total represented about 90 percent of all *AM stereo stations* in the U.S. In addition, AM stereo was being introduced in other markets worldwide. Motorola's C-Quam was being broadcast not only on 580 stations in the United States, but also 80 in Canada, 75 in Australia, and 40 in other countries. The international adoption of C-Quam included 16 stations in Brazil, seven in Venezuela, four each in Taiwan and South Africa, two each in Puerto Rico and Thailand, and one each in China, Spain, Chile, Ecuador, and Mexico. In addition, there were 40 stations that broadcast AM stereo with the Harris C-Quam-compatible pilot tone, giving C-Quam a world-wide total of 815 stations (Motorola, 1990a). It was projected that with the invention of new low- and medium-current semiconductors, home or portable AM stereo receivers would soon "catch up" to the number of car and truck AM stereo radios (S. N. Kravitz, personal interview, April 12, 1989). This has not yet occurred, however.

In related developments, the FCC is working to improve the overall quality of the 70-year-old AM transmission technology. In order to combat the continued general downward spiral of AM listenership, the FCC acted in the late 1980s to mandate higher fidelity standards for AM stations. In 1985 the EIA and the NAB reformed the National Radio Systems Com-

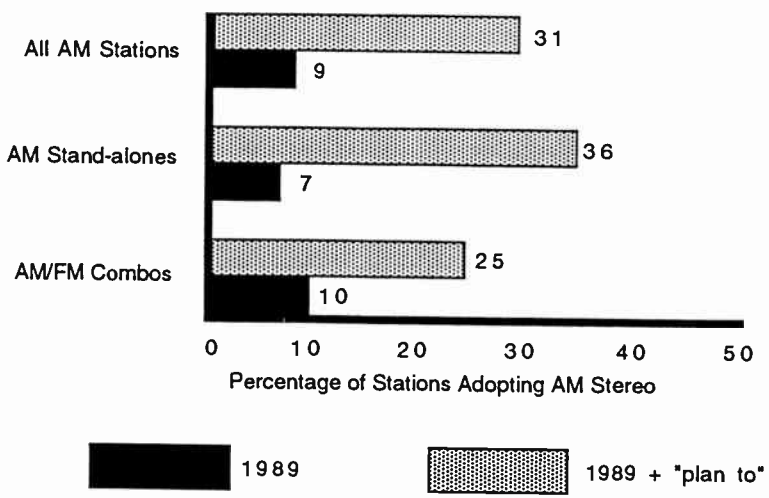


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Figure 3-4 AM Stereo Adoption by U.S. Radio Stations

mittee (NRSC) to provide an "open forum" for the improvement of AM radio. "NRSC-1" was a measure to reduce interference on the AM band. As of April 1989, more than 1,000 stations adopted the standard voluntarily. "NRSC-2" expanded on the first standard, and while first presented as voluntary, was later made mandatory by the FCC. In April 1989, the FCC adopted NRSC-2 as the new AM broadcast standard, effective June 30, 1990. Stations that had already adopted NRSC-1 would "be presumed to be in compliance with NRSC-2 until June 20, 1994" (NAB, 1989, p. 4). In addition, in 1990 the FCC announced a package of five rule changes to "rejuvenate the flagging AM service," which included a proposal to mandate AM stereo broadcasting, "or in alternative, awarding preferences or conditioning grant applications on agreement to go stereo" ("FCC Issues," 1990, pp. 35–36). In late 1991 the Commission took another step toward AM improvement by approving a plan to reduce interference by offering existing AM stations first option to move to an expanded portion of the AM band (1605–1705 kHz). The FCC expects to insure that the stations broadcasting on the expanded band are competitive with FM by giving preference "to those pledging to broadcast in stereo" ("FCC Moves," 1991, p. 30).

Summary. In March 1982, the much-changed FCC reversed the "single standard" 1980 decision and voted in favor of allowing the "marketplace" to select the U.S. AM stereo standard. The Commission majority called the decision "a bold, new step for the Commission to take," and said that the choice was "both driven by a desire not to make tenuous choices and encouraged by the fact that allowing a marketplace determination offers many advantages." Dissenting Commissioner Abbott Washburn questioned whether the public would accept the inconveniences and added costs of multiple-AM stereo systems, when a universal FM system was readily available, and said "The data and analysis we need to set a standard are before us." Concurring Commissioners Quello and Fogarty noted that the FCC had "vacillated, temporized and rationalized this matter," and that "the *Report and Order* appears to be merely a concession to the practical realities in this unfortunate situation."

As the marketplace battle began, the leading industry groups had to stay neutral because of antitrust laws. While four of the five system proponents indicated that they would slug it out in the marketplace battle, Belar Electronics, citing a lack of financial resources to fight on, withdrew from the race and signed on as a licensed manufacturer of a competing system. Initially, each remaining system proponent predicted victory.

Kahn's system was the first to be approved as meeting the FCC's minimum standards, and so, in the summer of 1982, a station using that

system was the first full-time AM stereo broadcaster in the United States. However, when General Motors' Delco Electronics Division selected the Motorola C-Quam system as its choice for GM cars and trucks, Motorola was boosted to the position of market leader. When the Harris system was temporarily pulled from the market by the FCC, Harris lost momentum, and was subsequently forced to join forces with Motorola, giving C-Quam an even larger market share. Despite petitions to declare a single standard, the FCC held steadfast, claiming that the marketplace selection process had worked, and that because Motorola emerged as the de facto standard, no further action was necessary. Nonetheless, in 1992 Congress ordered the FCC to set a national AM stereo standard, and the Motorola C-Quam technology was selected by the Commission in late October 1993. Rival Leonard Kahn vowed to continue his pending antitrust suit against Motorola in federal court (FCC says, 1993).

As of late 1993, the AM stereo innovation had been adopted by only about 13 percent of the nation's AM radio stations, and although there are now roughly 20 million AM stereo-equipped automobile radios in use, legal battles and consumer confusion are said to be the greatest impediments to more universal acceptance. In addition, preference for FM stereo may now be so strongly established among the largest users of radio—the youth market—that the survival of the AM band as a traditional radio medium has been questioned. In response to the continuing supremacy of the FM band, the FCC has begun a program to improve sound fidelity by updating the technical standards for AM broadcasting and expanding the AM spectrum allocation.

It is the thought of waiting yet another decade for AM parity that troubles critics of the FCC AM stereo decision-making process. As Michael Rau noted, "It is difficult not to believe that certain alternative Commission decisions could not have introduced AM stereo technology much faster. The Commission could have began rulemaking in the early sixties . . . that rulemaking would have been unlikely to take twenty years" (Rau, 1984, p. 18). And yet it seems unfair to condemn the FCC because of its successful efforts to assist the struggling FM band. As noted earlier, the FCC is partially vindicated in that the marketplace selection process *has* worked; a de facto standard was produced in a relatively short period of time, despite later retardation of the enthusiasm in the manufacturing marketplace because of litigious system proponents. As noted in the introduction, in the end, the central questions prompted by the AM stereo case study are not "Will AM stereo succeed or fail?" or "Did the FCC succeed or fail?" but rather "How can the FCC decision-making process in the AM stereo case be better understood?" and "Can the FCC decision-making process be improved in future cases which offer similar challenges?"

The final two chapters will attempt to answer these questions.

CHAPTER 4

Analysis of the AM Stereo Case

> Every year, if not every day, we have to wager our salvation upon some prophecy based upon imperfect knowledge.
>
> Oliver Wendell Holmes

Perhaps the most striking feature about the AM stereo case is the continued inability of the FCC to arrive at a more standardized methodology by which to standardize communications electronics. The FCC is, even today, repeatedly reinventing the wheel by conducting its business in an ad hoc fashion. It is evident that in the AM stereo case, the Commission was faced with as much conflicting testimony on *how* to conduct its inquiry as on *what* to decide. The FCC was constantly asked to reexamine and justify the very process by which the inquiry was conducted, rather than simply to decide which system to adopt based on the technical and economic data. This lack of established methodology in setting standards for new technologies, which has plagued the FCC in the past, points to a major source of influence on broadcast regulation in the United States, which is less comprehensively researched and discussed than is the political side. This second layer of influence concerns procedural aspects of how a decision is made. This might be called the *procedural* or *decisional* technology. In other words, under this rubric we can examine sources of influence on *how* the Commission reaches a decision. This procedural aspect is certainly interwoven with questions concerning sources of influence on *what* the FCC decides. Both issues, the procedural and the political, will be explored in this analysis. Finally, both types of influence must exist in a distinct social and interpersonal context. It is by purposely including participant data on

values, roles, power, conflict, personality clashes, and formal and informal subgroups—much of it interpretive in nature—that the larger picture comes to life. All three of these sources of influence upon the FCC, political, procedural, and social/environmental, will be explored in analyzing the facts of the AM stereo case.

Political Factors

The evidence in the case study leads to the conclusion that three key political factors most directly produced the 1982 marketplace decision. These three elements were (a) the movement toward broadcast deregulation, (b) the role played by the FCC chairmen during the period from 1977 to 1982, and (c) the Executive Branch's power of appointment. Each of these three political factors will be discussed here, before turning to an examination of the procedural and interpersonal factors that may have had an impact on the inquiry.

Deregulation. Any inquiry concerning the political influences of FCC decision making during the period under investigation, not just on the topic of AM stereo but on almost any issue facing the FCC at the time, must consider the role of communications deregulation, and the emergence of the marketplace as a preferred means of regulation. Haeryon (1990) astutely suggested that the deregulation of broadcasting was a response by the Commission to "environmental complexity," while Head and Sterling (1990, p. 455) wrote that there was more than one motive for the "impulse" to deregulate. On the least controversial level:

> deregulation simply wanted to discard outdated rules . . . and to lighten the FCC's administrative load. Deregulation based on these motives began in the 1970s, supported by both Democratic and Republican administrations. On a more controversial level, the impulse to deregulate also stems from ideological motives, arising from a specific vision of the government's role in national life. This vision minimizes the need for government intervention, advocating instead reliance on the economic marketplace as a nongovernmental source of control over private economic behavior. Deregulation of this type emerged as a major item on the national agenda when the Republican administration came to power with President Ronald Reagan in 1980.

Head and Sterling are correct in asserting that broadcast deregulation was not a phenomenon strictly associated with Ronald Reagan or the Republican party. The "deregulatory" period for broadcasting actually began during the Nixon Administration under Chairman Richard Wiley in about 1972, and continued through the 1980s. The political perception, and

therefore to some extent the political influence of broadcast deregulation under each of the FCC Chairs during this time, can be interpreted by reflecting upon the labels attached to the various phases of the deregulatory movement. The three chairmen of the FCC during the period between 1972 and 1982 each adopted a catchy, yet somewhat enigmatic, phrase for his own "brand" of deregulation. Richard Wiley, who was chairman under Presidents Nixon and Ford, called for *reregulation* of the industry. Charles Ferris, FCC chair under the Carter administration, proposed *deregulation,* and Reagan's FCC chief, Mark Fowler, pushed for *unregulation.* Each of these three phrases carried with it specific connotations. Moreover, the label each chairman attached to his deregulatory stance was based on what he felt were the expectations of his audience, and thus were reflections not only on the direction of the FCC, but also on its sense of the mood of the parties that influence broadcast regulation, most notably Congress, the White House, and to a lesser extent, the broadcast industry, the courts, and the general public. The language surrounding these regulatory "actions" can aid us in understanding the overall pattern of intent of the regulators.

The FCC, and the FRC before it, had a vague mandate written into its charter: to uphold the "public interest, convenience, and/or necessity." Over the years the FCC used this obligation, referred to as the *trusteeship model,* as justification to regulate virtually every aspect of communications, stopping—usually—just short of censorship. The fact that Congress purposely gave the Commission such wide discretion to act in the public interest contributed to the rapid growth of the bureaucratic processes. In fact, by the mid-1970s the FCC was cited by the Small Business Administration as being the federal agency with the largest number of application forms—a dubious distinction indeed. Also, in the mid-1970s the General Accounting Office pointed to the FCC as generating the most time-consuming paperwork (Krasnow, 1986). Clearly the rapid growth of the federal regulatory measures and the promethean bulk of the government's regulatory mechanism spurred the movement toward deregulation, not only in the broadcast industry but also in other industries, such as the trucking, airline, investment, and thrift industries.

Richard E. Wiley, FCC Chairman under the Nixon and Ford administrations, was the first Commission head to actively chart a course toward deregulation. Wiley pioneered the beginning of less paper shuffling and reduced government interference in broadcasting matters, and called his campaign *reregulation* ("Making Life," 1972). The period of reregulation has been called "among the most productive in the agency's history for the handling and disposition of cases and the bureaucratic flow of paper" (Brown, 1976), and Wiley has been widely regarded as one of the most powerful FCC Chairmen in recent history, having also served as a Commission member and as General Counsel to the FCC (Robb, 1977).

However, Wiley had to placate a Congress that was not enthusiastic about the prospect of deregulating the broadcast industry. While Congress was receptive to the idea of less regulation in some industries, broadcast deregulation was slowed, in part, because "its consequences were recognized to be potentially extreme in significance" as compared, for instance with airline deregulation. Communications deregulation was perceived as "something much bigger—a leap into the dark" (Tunstall, 1986, pp. 30–31). During Wiley's tenure, "even the word 'deregulation' waved a red flag in the direction of Capital Hill" (Krasnow, 1986, p. B-212). Thus, rhetorically, Wiley had to construct for his audience an image that was the opposite of deregulation. Wiley found the answer in the word *re*regulation.

The term reregulation created the image of an industry that did not ask for the apron strings to be cut, but merely wished to reexamine some of the existing regulations. The result was what Jeremy Tunstall called "a phase of regulatory turbulence, with moves toward both more and less regulations." Of course, some of the difficulties of this period can be traced to the Watergate crisis, which distracted both Congress and the public, not to mention the Executive Branch. By 1976, some progress was made toward the deregulation of cable and telecommunications, but the FCC was also attempting to create new regulations in response to "a flood tide of consumer demands for access, equal opportunity and fairness in broadcasting" (Tunstall, 1986, p. 29).

In 1977, with the inauguration of President Jimmy Carter, the FCC gained a new Chairman, Charles Ferris. Perhaps even more important than this change of leaders at the FCC was the more general change in the mood on Capital Hill. Lionel Van Deerlin, a California Democrat, headed the newly beefed-up House Communications Subcommittee, which hastened the move toward deregulation by holding hearings on telecommunications competition, which helped to reshape the image of AT&T from what Tunstall called "that of a benign and competent Ma Bell to a backward-looking, vindictive monopoly, out of kilter with the onrush of new technology." The actions that had the greatest impact on the broadcast industry were attempts led by Van Deerlin and his sympathizers to almost completely rewrite the Communications Act of 1934, which had set up the FCC under the trusteeship model. While House rewrite bills failed in 1978, 1979, and 1980, the long hearings changed how many in Washington viewed broadcast regulation. The Senate during this time also pursued rewrites, although less comprehensive than those in the House. In any event, the stage was set for more decisive FCC action.

It was against this backdrop that Charles Ferris dared to use the word deregulation. While the Carter administration had at first resisted deregulation, it later embraced the concept, and the Ferris FCC gained more confidence in moving toward deregulation in radio, television, and cable.

The gradual reduction of paperwork under Wiley's reregulation gave way to a more intrepid stance during the Carter term, resulting in Ferris's deregulation of radio and the beginning of proceedings to deregulate television (Le Duc, 1987). Yet, according to Krasnow (1986, p. B-212), Ferris's *de*regulation was actually "deregulation with strings attached," namely, "fewer regulations as the *quid pro quo* for restructuring the broadcasting industry by means of stricter multiple ownership restrictions and the encouragement of new services without proper concern for their interference potential." Sterling and Kittross (1990) offered the following paragraph as a synthesis of the period from 1977 to the mid-1980s:

> The policy debate after 1977 was chiefly defined by two schools of thought in continuous collision. On one hand, "traditional liberals" argued that the "public interest, convenience, and/or necessity" wording of the 1934 act meant that government had to continue playing an important central role in charting the direction and operations of electronic media to make sure the industry served the public, and that the success of the current system in serving the public showed the wisdom of that course. On the other side, "marketplace conservatives" claimed that government regulation cost far more than the limited value derived from it (for either the industry or consumers) and thus that the years of past regulatory precedents were now merely baggage to be discarded so that the public could benefit from the effects of highly motivated competition. Both sides relied on ideological argument more than on reliable data, and neither side was willing to carry its argument to the extreme. Sometimes—as with the conservatives' dismissal of the "spectrum scarcity" argument—any attempt to analyze the matter objectively would run afoul of very slippery definitions of such basic terms as "market" and "competition." (p. 517)

On April 13, 1981, Ferris left office, "trailed by criticisms of inefficiency and of having contributed to low staff morale" (Krasnow et al., 1982, p. 45). However, the Ferris term was not without major accomplishments, including, in the final days of Ferris's tenure, the passage of the FCC rule changes that amounted to the "deregulation" of certain aspects of radio broadcasting by the Commission (FCC 81-17, 1981). The FCC had initially planned to limit radio deregulation just to major markets, but eventually "the plan had been expanded to cover all commercial radio stations and had become highly controversial (Sterling and Kittross, 1990, p. 523). The radio deregulation measures adopted by the FCC in January 1981 struck down limits on commercial matter, removed guidelines on the amount of nonentertainment programming, and did away with formalized procedures for the ascertainment of community needs and interests (FCC 79-518, 1979). In addition to these three areas, a fourth long-standing rule that was eliminated had required the maintenance of detailed station program logs.

It should also be noted that under Charles Ferris, an economist himself, the FCC hired a large number of economists at the top levels of the agency, which Krasnow et al. said "created an atmosphere in which past legal structures for broadcasting regulation were challenged by economic models" (1982, p. 46). This team of economists helped to create a pro-marketplace atmosphere that certainly carried over into the next administration.

Interestingly, Larry Darby (personal interview, December 19, 1989), a former chief of Charles Ferris's Common Carrier Bureau, noted that Ferris did not have the freedom to apply his deregulatory philosophies as broadly as did his successor, Mark Fowler. Commenting on the difference between the liberal's proconsumer brand of deregulation versus the conservative's proindustry version, Darby said that:

> Mark just hit it [at the right time]. Mark was an articulate guy, and he just got a lot of his agenda through there. It was easier. For example, Charlie Ferris had a Democratic majority on the Commission, but one of those [Democrats] was a guy named Ty Brown, who was a leading Black liberal. . . . You know, Ty was a liberal Democrat. So you can talk free market rhetoric, but at the end of the day that's not the liberal point of view. And even Charlie [Ferris] came from the Hill staff, off the Speaker of the House's staff, so he could *talk* the rhetoric, but he had to *apply* it selectively because a lot of his constituents and a lot of his supporters were people in the Democratic party, and were moderate, more to the left of center. But not Fowler. Fowler campaigned for Reagan. That's how he came to power.

When Mark Fowler was sworn in as Reagan's new FCC Chairman in May 1981, he sensed that his audience was ready to move toward massive deregulatory measures in broadcasting. Fowler created the label *unregulation,* a term that he used "to suggest something beyond 'deregulation' " ("Out of Neutral," 1981). He called the FCC "the last of the New Deal dinosaurs" and promised that the agency would be transformed into a model of speed and efficiency. One month after taking over as FCC Chairman, he told *Broadcasting* magazine: "As you look across the landscape in Washington, you see all the agencies moving in a marked deregulatory mode—with the exception of the FCC. . . . It has not been deregulatory in broadcasting." When reminded of the recent radio deregulation actions only a few months before, he replied, smiling, "That's an appetizer. It's an hors d'oeuvre" ("What Makes," 1981).

Perhaps Fowler's zeal was most evident in a landmark speech before the International Radio and Television Society in September 1981. Fowler said, "I believe that we are at the end of regulating broadcasting under the trusteeship model. Whether you call it 'paternalism' or 'nannyism,' it is 'Big

Brother,' and it must cease. I believe in a marketplace approach." In the same speech, Fowler declared: "the FCC has no business trying to influence by raised eyebrow or by raised voice for that matter. I confess that there was a romance bordering on chivalry when a Chairman might declare television to be a wasteland. Those kinds of pronouncements, as I see my job, are not mine to make. You are not my flock, and I am not your shepherd" (Fowler, 1981). Of course, the characterization of television as a wasteland is a reference to FCC Chair Newton N. Minow's famous "Vast Wasteland" speech, which was highly unpopular with Kennedy-era broadcasters when delivered at the NAB convention in 1961. That an FCC Chairman would be an active critic of the broadcast media was viewed by many in Fowler's audience as a "meddling" role. Thus Fowler used this reference to distance himself from a "failed" mode of regulation. Pfeffer (1978, p. 30) referred to effective leaders as "actors," who manipulate symbols in order to be associated with successes and to remain distant from failures. Certainly, the "Vast Wasteland" speech was a symbol that Fowler could evoke in order to distance himself from past regulators, and to show the broadcasters that he was "one of them." By employing this icon, Fowler was giving many in the industry what they wanted to hear. What Congress wanted was less clearly understood.

By November 1981, the House Republican Research Committee criticized the FCC for both the pace and the direction of its deregulatory efforts. The report said that "The performance of the new Commissioners at the . . . FCC have [sic] been out of step with the strong deregulatory activities of the rest of the administration" and that the FCC under Fowler had "decelerated action on . . . deregulatory initiatives it inherited from previous administrations" ("House Report," 1981). But while the Republicans obviously wanted more—and faster—deregulation, Representative John Dingell, a Michigan Democrat who was Chairman of the House Committee on Energy and Commerce, announced that the movement had gone too far, stating that "the airwaves belong to the public" and lamenting that deregulatory fever had reached "epidemic proportions" ("Dingell Puts," 1981). Against this somewhat contradictory backdrop, Chairman Mark Fowler's position was clear. He declared that "the Commission's fiduciary approach to broadcast regulation may be ending at last. . . . The perception of broadcasters as community trustees should be replaced by a view of broadcasters as marketplace participants" (Fowler & Brenner, 1982, p. 209).

Not everyone in Washington, or at the FCC for that matter, was in favor of communications deregulation and all that it entailed. William Harris, an aide to Commissioner James Quello since Quello first began at the FCC in 1974—and even prior to that as Quello's program manager at station WJR in Detroit—remarked that:

> No former Chairman has approached the deregulation process with the wild abandon of a Mark Fowler or a Dennis Patrick [Reagan's appointee to succeed Fowler in 1987]. They were very much ideology driven. "If it's regulated, deregulate it" was kind of their attitude. They could see very little reason to continue to regulate anything. Now the other Commissioners were a little more careful in their approach to deregulation. Commissioner Quello has always approved of deregulation where there were no strong reasons to continue regulating. But he's often said that "he does deregulation but he doesn't do anarchy." (W. Harris, personal interview, December 19, 1989)

Commissioner Abbott Washburn, a Republican, also expressed reservations about Fowler's deregulatory fervor:

> I think the Fowler Commission . . . swung the pendulum way over to the right. You know, it almost got to the point where if he had his way you'd get rid of stop and go lights. But there's a place for stop and go lights . . . there is a place for discrete, useful rules. That's what the Commission is for. Of course it shouldn't have been defined by ideology, but it was. He had an administration, a whole atmosphere, which was to get rid of regulations. You had a President who came in with a big mandate to do that. You had Fowler, who was a broadcast lawyer and had been sweating against the FCC all his life and career and the tendency was to move in and get rid of everything in sight that might be any kind of a hamper to broadcasters, which is not exactly what the Commission was formed to do. (A. M. Washburn, personal interview, December 19, 1989).

Clearly, one of the key political factors which influenced the FCC action on AM stereo—especially the 1982 marketplace decision—was the impulse to deregulate broadcasting.

Role of the FCC Chair. The second major source of political influence in the FCC AM stereo case seems to have come from the office of the head of the agency. As the case evidence indicated, and as the following additional quotations will show, beyond the general trend toward deregulation, specific actions of Charles Ferris and Mark Fowler contributed to the "politics" of the AM stereo decision.

While Krasnow et al. (1982, pp. 43–44) concluded that, "unlike the heads of most regulatory commissions, the Chairman of the FCC has little formal "extra" power, they allowed that "still, the Chairman is more than first among equals." As Commissioner Abbott Washburn observed, "there are all kinds of ways in which the head of the agency—the head of the Commission—can apply pressure." Washburn said:

> It's a collegial body, and you get things done by racking up enough votes, and at that time there were seven Commissioners so you had to get four votes; and

> one Commissioner would want something, another Commissioner would want something else on a particular case or on a group of cases, and there was always this business of "how is it going to turn out," "where are the votes going to be." You find people marching around from office to office lobbying each other. And that is the way a collegial body works. . . . You know what's important to the other Commissioners.
>
> And the Chairman has the most power of all. Particularly, because the press was in there. He gets more power in the media. Statements come from the Chairman, and he gets more speech opportunities, and it gets his position forward. (A. M. Washburn, personal interview, December 19, 1989)

Commissioner Anne Jones concurred (personal interview, March 7, 1990), saying "Remember, the office of the Chairman of the FCC is a very strong, very powerful office in the sense that they can set what comes up for voting. They can't make you decide how you are going to vote, but they can decide what gets voted on. And so they really do have a great deal of power."

Fowler clearly used his access to both oral and written channels as a means by which to communicate his overall philosophy of government regulation and his views on specific issues. Such a use of these "extra" communicative opportunities is consistent with the literature of Schein, Bennis, and Morgan in the field of leadership communication. Schein (1985, p. 223) wrote that powerful figures in a group are able to get their assumptions underlying preferred solutions "communicated and embedded in the thinking, feeling, and behavior of the group." Bennis (1983) said that the ability to "articulate a vision" is an important communicative function of leadership. Morgan (1986, p. 176) held that that true leaders manage how the organizational mission evolves using "symbolic power," which allows the leader to shape the organization's surroundings. All of these functions are seen in the leadership of Mark Fowler at the FCC.

Another potent example of the perceived if not the actual power of the chair is seen in the comments of Quello staffer William Harris, who said that the 1980 staff retreat from the Magnavox decision was really a "political decision" on the Chairman's part:

> Charlie Ferris changed his mind for whatever reason. Because we had a strong recommendation from, I can't remember what it was called at that time—I think it was the Office of Chief Scientist—and the record was fairly complete. We had tested systems, we had observed systems being tested in various markets, and I think most of us concluded that none of the systems was perfect, most of them were adequate, and that choosing between one of four or five systems really wasn't that critical. That certain ones were stronger in certain areas than others, but there were compensations among four or five systems.

> The about-face on the part of the recommendation from the Chief Scientist, I think, was a political decision, because it didn't make any sense from a technical point of view. (W. Harris, personal interview, December 19, 1989)

Harris claimed not to know the basis of such a "political decision," but he said "I am fairly confident in my own mind that it *was* a political decision." While the veracity of his charge is a matter of speculation, it points to the presence of a perception within the FCC that the Chair holds the power to dictate the direction of staff recommendations based on political factors.

The case history reported that *Broadcasting* magazine had charged that Ferris pushed the 1980 "Magnavox" decision along too quickly; in order to honor a pledge to Capital Hill, and also in order to give the broadcast industry a "gift" at the NAB's spring convention. Anne Jones and William Harris both confirmed that this was a possible scenario. Jones also said that overall, the FCC policy initiatives came from the office of the Chair, and that the other Commissioners did not have the political clout to influence policy:

> I think policy was formulated in the Chairman's office. And maybe that's right, and maybe that's wrong. Let me tell you the worst job in the world. To be one of seven Commissioners, and not the Chairman . . . if you don't agree, you can dissent, and you really can't influence anything. That's a very frustrating kind of job. (A. P. Jones, personal interview, March 7, 1990)

Commissioner Washburn, who played the role of lone dissenter in the AM stereo case, commented on Chairman Mark Fowler's persuasive strategies, and on Fowler's relationship with the White House:

> He was so totally deregulatory. He was more purple that the Pope on that. And the President had to pull him back on the whole stuff about CBS and the other networks and the financial ownership of programs. [Reagan] called him over. . . . Of course Mark Fowler never admitted that he was slapped on the wrist, but the Commission shortly thereafter pulled its horns in on this one.
>
> He wanted to get rid of all regulations . . . there were those of us [on the Commission] who felt there was a place for regulating, but as far as broadcasting went, he just felt that the broadcasters could do it all themselves, they *would* do it all themselves, they didn't need . . . to be constrained. (A. M. Washburn, personal interview, December 19, 1989)

Speaking specifically about the power of the Chair, and also on the pressures facing younger Commissioners, Washburn said:

> Fowler was quite blatant in the way he would wield that power. "I'll do this for you," "You should do this, you're a Republican," "I have access to the

> President." You know. . . . It didn't work on me, because I didn't want reappointment [in 1982]. But maybe somebody else wanted reappointment. I felt that you're there to try to live up to that "convenience and necessity" standard. You're there to try to do what's in the "public interest," and should not be controlled by Republican or Democrat ideology of the moment. Now, if I had been up for reappointment, I don't think it would have affected me a heck of a lot . . . I would have done whatever I wanted to do. But not everybody is such an unreconstructed rebel, you know. And then I was older, too, than most of them. [Commissioner Robert E.] Lee and I were the old . . . curmudgeons of the Commission. . . . You go through your career, and you're not as competitive. You're not looking to something greater. That some decision you take is going to influence where you're going to be. That's one of the nice things about getting older. You say 'To hell with people."

Fowler's "use" of ideology is consistent with the literature developed by Peters, Morgan, Pettigrew, and Pondy, explored in the first chapter of this book. Recall that Peters described the use of the dominating value as a tool, and said that if effectively handled, it can generate substantial, sustained energy even in institutions that are quite large. Peters noted that Louis Pondy equated effective leadership with "language renewal," while Andrew Pettigrew examined the "symbol creator, an ideologue, a formulator of organizational vocabularies, and a maker of ritual and myth" (Peters, 1978, p. 18). Finally, Morgan (1986, p. 366) argued that research on the "organization as ideology" requires that we understand how organizational life reflects a process of *power-based reality* construction, and to trace how people become trapped by ideas that serve specific sets of interests. Clearly, Fowler's tenure at the FCC was ideology driven, and the comments of those who worked with him, as well as his own public statements and writings, reflect the ways in which he used this political philosophy as a management tool to construct a deregulatory agency according to his vision.

William Harris, describing Fowler's persuasive style, said that:

> Various Chairmen had different approaches to the job, but Fowler's was more of a log-rolling or a horse trading approach, and he would try to get another Commissioner to feel committed to his position before that other Commissioner may realize that he was being committed. And so, he was a very persuasive guy . . . it was just his style of persuasion, that he would get you to commit to a piece of what he wanted, and then translate that into a commitment in everything he wanted. He did that on a number of occasions. (W. Harris, personal interview, December 19, 1989)

It is safe to say that Fowler used his influence on the subject of marketplace regulation as it applied to AM stereo and other technological innovations before the Commission at the time. Fowler's position was

clearly outlined in his speech before the International Radio and Television Society in September 1981:

> Lacking current information on the people's needs, wants, and choices, and free from the risks and rewards of the market, I approach my task as a regulator with a presumption against intervention. My presumption is ever more intense in light of the way the Commission got into regulating under the trusteeship model. Broadcast regulation under this approach is shrouded in myths: myths about service to the community, myths that have little to do with broadcasting day to day in America. The FCC must deal with the reality of broadcasting, a reality that begins with the fact that broadcasting is a business.
>
> . . . Today we must recognize the many competitors in radio and television. We need a regulatory philosophy that acknowledges their presence and their expertise. A reliance on market forces, not on dubious value judgments by insulated regulators, is the next right step.
>
> . . . No longer should the drawbridge be raised and lowered as in the past. We must allow market forces to respond to consumer demand, not attempt to pick the winners for the eyes and ears of the people. (Fowler, 1981)

If there is any doubt as to the power of the FCC Chair, remember that the AM stereo matter could probably never have come to a final vote in March 1982, unless Chairman Fowler was confident of the outcome and approved of it. As one trade press account suggested a few weeks before the final AM stereo vote: "As Chairman, Fowler . . . is demonstrating a quiet but effective leadership. Some of his colleagues describe him as a persuasive lobbyist. And since he controls the agenda, he can usually be certain that items do not surface until he is confident the results will be satisfactory to him" ("Dilemma For," 1982, p. 36). This "controlling" function is certainly consistent with the organizational communication literature discussed in the first chapter, and is best described by Peters's observation that the senior executive can adroitly manage an agenda "to nudge the day-to-day decision-making system, thus simultaneously imparting new preferences and testing new initiatives" (1978, p. 22).

It is clear from press accounts, participant interviews, and his own speeches that Fowler made his views on marketplace regulation known to the rest of the Commissioners in no uncertain terms, as indicated in the conclusion to his speech before the International Radio and Television Society, in which he said "What will the marketplace approach mean for the FCC? As regulators we must be willing to self-destruct to the extent necessary to move from a trustee to market model. I know our staff is ready to meet this challenge; and we at the top must be ready, too" (Fowler, 1981). It is plain that Fowler expected not only the FCC staff, but the Commissioners as well, to lead the way down the path of "unregulation."

Power of Appointment. The third main political influence on the AM stereo case, which is interwoven with both the first and the second factors, was the appointment of three new FCC Commissioners by the Reagan administration in 1981. The three Reagan appointees, all of them conservative, tipped the scale in favor of experimenting with the so-called marketplace approach.

Traditionally, an incoming administration has the power to reshape the make-up of the Commission, and in the process to influence communications policy making. Krasnow et al. commented that:

> The White House influences communications regulation in many ways. One of its most important formal controls is the power of the president to choose administrative agency commissioners as resignations occur or terms expire and, in most instances, to appoint a chairman. . . . The appointment power enables the president to set the tone for administrative agencies. Although the Communications Act specifies that only four [of the then seven] Commissioners of the FCC may have the same party affiliation, the president has wide latitude in appointing those who he thinks will reflect his own political and administrative ideas. . . . Virtually every president has tried to select persons as Commissioners who agree with the administration's philosophy and policy objectives, regardless of party identification. Because few Commissioners serve out their full terms, even a new president may quickly gain control of the FCC. (1982, pp. 67–68)

The organizational literature also supports the notion that individuals recruited for service in an organization are sometimes selected, at least in part, for their agreement with the dominant ideology of the organization or its leaders. Mintzberg (1983, p. 156) held that:

> Many organizations cannot rely solely on identification that develops naturally. Their needs for loyalty are too great. And so they take steps to influence the process of identification. This is most obviously done in the selection process: The organization chooses job candidates not only for their ability to do the work, but also for the match of their values with its ideology. . . . Recruiting becomes a device to reinforce identification with the organization's ideology.

As was noted in the case history, within six months of taking office President Ronald Reagan was able to make four FCC appointments. In addition to nominating Mark Fowler and renominating "friendly" Democrat James Quello, who had earned a reputation as being pro industry in his views on regulation, Reagan tapped Henry Rivera and Mimi Weyforth Dawson to serve on the FCC. William Harris (personal interview, December 19, 1989), observed that while deregulation was "not a Reagan

phenomenon," after the Reagan appointments of 1981 the ideology espoused by Fowler "was a consistent vision among most of the Commissioners." Indeed, Commissioner Anne Jones said that "there was no question" that the three new Reagan appointees in 1981 came into the FCC with a predisposition to favor deregulatory measures such as the marketplace option. Jones said that she generally agreed with the deregulatory momentum in Fowler's FCC, and often voted with Fowler on important issues. However, she stressed that her 1982 AM stereo marketplace vote was "absolutely" an extension of her earlier stance in 1980 against a single standard, and had nothing to do with Fowler or Reagan ideology (personal interview, March 7, 1990). Remarkably, Jones was quoted just a few weeks before the final AM stereo vote in 1982 as remarking, "I hope the Commission will be sensible about deregulation. . . . I'm a little concerned that there may be a headlong rush" ("Dilemma For," 1982, p. 36).

But while the views of Jones and Fowler on marketplace regulation and the deregulatory process are clear, less has been said and written about the other two Reagan appointees. As noted in the previous chapter, Henry Rivera was an attorney from Albuquerque, New Mexico. He was regarded by the administration as "able," and although he was a Democrat, he was considered "conservative, and likely to support Fowler." This prediction proved to be true in the AM stereo case. The other newcomer, Mimi Weyforth Dawson, a Republican appointee who had worked as chief aid to Senator Bob Packwood, professed to be "as pro-competition as any member of the FCC," and it was said that "staffers proposing regulatory solutions know she must be reckoned with" ("Dilemma For," 1982, p. 42). Thus it is not at all surprising that these two new Commissioners joined with Chairman Fowler and Commissioner Jones to produce a 'four-vote majority in the AM stereo case. This four-vote majority prompted Commissioners Quello and Fogarty reluctantly to "concur" with the foregone conclusion that the new appointees had changed the direction of the Commission. Quello and Fogarty's concurrence made the vote 6 to 1 in favor of the marketplace option. The fact that Quello and Fogarty would have preferred a different outcome is clear from their separate statement quoted in the case, in which Quello wrote: "While this state of affairs is not my preferred outcome, the Report and Order appears to be merely a concession to the practical realities of this unfortunate situation. Therefore, I concur in the result" (Quello, 1982). Commissioner James Fogarty, who was called "the last liberal Democrat serving on the Commission," joined with Quello in the separate statement. There is also no doubt where Fogarty stood on the marketplace approach to broadcast regulation. Shortly before the AM stereo vote in 1982 Fogarty was quoted as saying, "We still license the spectrum. If we want to follow Fowler's views, let's call in the 9,000

licenses and raffle them off, and let the marketplace—which I've never been able to find—control the destiny of America, so far as broadcasting is concerned" ("Dilemma For," 1982, p. 36).

Based on the fact that the three new Reagan appointees, Fowler, Rivera, and Weyforth Dawson, joined Commissioner Jones in voting for the marketplace option, it can be concluded that political appointments served as a source of influence on the AM stereo decision making, because these three appointments turned the final decision in the marketplace direction.

Finally, before leaving the discussion of political sources of influence, it should be noted that the facts of the case do *not* offer evidence leading to the conclusion that there was any consequential groundswell of influence from the general public. Likewise, perhaps surprisingly, Congress is not on the list of political influences on the AM stereo debate. Larry F. Darby, who worked on Capital Hill and was with the FCC from 1976 to 1979 as an economist and eventually as chief of the Common Carrier Bureau, admitted that:

> if you really want to get something done at the Commission, you go over and get Congress lathered up, because Congress controls their budget and Congress controls a lot of their press; because a member of a subcommittee, a fairly junior member, if he's got stroke with the chairman of the subcommittee or the chairman of the full committee, he can get a hearing, and call those people over there and lash them. (L. F. Darby, personal interview, December 19, 1989)

Indeed, former FCC Commission Glen Robinson said, "The chief purpose for lobbying Congress today is not so much to obtain legislation but rather to gain Congressional leverage to pressure the agency to take some particular action" (Robinson, 1978, pp. 169, 175). This was the route taken in the AM stereo case by such interested parties as Kahn Laboratories, National Semiconductor, and the Harris Corporation, all of whom directly petitioned members of Congress on the AM stereo issue. However, while not for lack of trying, none of the interested parties was able to whip up much of a fuss on Capital Hill over the proceedings. While there were a few letters in the docket files from members of the House or Senate, these were merely in response to the questions or concerns of consultants who were as often as not stakeholders in the AM stereo proceedings. In addition, the brief Congressional inquiry in late 1980 never amounted to significant influence. Consequently, while the threat of a *legal* challenge was a frequent topic of concern, there was no serious fear of Congressional investigation clouding the inquiry. It seems safe to say that the real thrust of Congressional pressure during the period from 1977 to 1982 was concerned with the larger policy questions of broadcast deregulation.

Procedural Factors

Under the rubric of sources of influence on the FCC decision-making methodology or "procedural technology," many factors that might influence the decision-making process could be considered. Typical issues in a technical standardization inquiry might include formal and informal rules, administrative efficiency, budget and staffing concerns, electronic criteria, economic impact considerations, and legal implications. From the preceding AM stereo case history, the following six "procedural technology" issues have emerged as most central: (a) the matrix analyses, (b) ex parte contacts, (c) fears of judicial review, (d) budget cuts, (e) rules of evidence, and (f) the role of industry assistance. Each of these six procedural topics will be explored in the following section, prior to addressing the social/environmental influences.

Matrix Issues. Certainly the most controversial although probably not the most important source of influence on the AM stereo decision-making process was the use of the evaluation table, or matrix analysis, constructed by the joint Broadcast Bureau/Office of Science and Technology committee under the supervision of Larry Middlekamp of the OST. Any importance attached to the matrices is more directly linked to their rhetorical value, their use as tools in argumentation, than to the rather pedestrian concept of quantifying variables and then attempting to clarify a complex data set via a comprehensible table. The literature recognizes this organizational behavior; March and Simon (1958) predicted that the political disruptions within organizations cause them to approach all decisions as if they were analytical puzzles. In other words, although decisions are reached via a bargaining process, organizations attempt "to conceal it in an analytical framework" (March & Olsen, 1976, pp. 88–89). In the end, the controversy really stemmed not from the use of a matrix, but from the criteria and weights by which the competing systems were evaluated prior to being placed on the evaluation table.

There were three different matrices devised by the FCC staff in the AM stereo inquiry. The first was a rather hastily constructed table created by Middlekamp's joint committee, apparently in the last couple of weeks before the April 1980 Magnavox decision. The main objection to the use of this table was that no prior public notice was given. In addition, the FCC did not even disclose to the system proponents the technical factors to be evaluated, or the methodology to be employed in scoring the table.

The second matrix was constructed during the summer of 1980 in an attempt to "give a more rigorous and analytical basis" to the work done by the OST. This second attempt yielded a revised but largely incomplete matrix. This table omitted many scores—fully 35 percent (19 of the table's

55 scores were left blank—because the FCC found that it did not have sufficient data with which to complete the matrix. Additionally, many scores that had been assigned just a few months before were mysteriously changed in the second matrix. Most importantly, this second table demonstrated just how futile the FCC's post hoc attempt to quantify the decision had become. Because there was so little control over the gathering of data on the competing systems, the data submitted to the FCC could not be summarized on a single table in a meaningful fashion.

The third table, presented in the 1982 *Report and Order,* was a revision based on the additional information gathered during 1980 and 1981, the period for comments on the *Further Notice.* This third matrix proved as difficult to defend as the first two, and the FCC concluded that "in many of the categories, several other scoring methods and evaluation scales could perhaps have been devised that would have yielded an equally acceptable measure of a system's performance in that category" (FCC 82-111, 1982, p. 12, ¶ 43).

In retrospect it is clear that the matrix strategy was depicted in two very different lights. On the one hand, the matrix was originally presented by the FCC staff as an attempt to improve the decision-making process through the objectification of a largely subjective process. On the other hand, application of the matrix criteria was considered by critics to be a post hoc attempt on the part of FCC engineers to justify a preferred outcome—the Magnavox system. Whichever way one interprets the use of such an evaluation procedure, there is no doubt that the three matrices and the controversy surrounding them were sources of influence on the final FCC decision-making in AM stereo. The Commission's procedural technology was criticized as flawed; the FCC staff eventually admitted such flaws by saying that the first matrix was in error and the second matrix could not be completed because more information was needed. In the end, the FCC set itself up for legal challenges to any system that might have been selected via the matrix scheme. The Commission admitted "our previous efforts to select a single system failed to meet our own internal standards of confidence" (FCC 82-111, 1982, p. 9 at ¶ 30). Ultimately, the marketplace option allowed the FCC to escape this predicament, and rendered moot any criticism or legal challenge over the use of the matrix.

Ex Parte Contacts. Another controversial, although certainly less important, source of influence on the FCC procedural technology in the AM stereo case was the question over ex parte contacts. The FCC justified placing such restrictions on the proceedings at a relatively early stage in order to protect the integrity of the decision-making process. The Commission had hoped that it could be isolated from external presentations that might bias the proceeding. However, critics charged that the FCC decision

to enforce ex parte rules actually restricted the ability of system proponents and other interested parties to effectively communicate with the Commission, even when such contact was necessary or desirable. Such an early cut-off made it difficult, according to critics, for the FCC staff to ask questions of the proponents in order to acquire the additional information needed to effectively compare the proposed systems.

A related area of controversy was the question of whether the AM stereo proceeding involved "conflicting claims to a valuable privilege" and was "thus quasi-adjudicatory in nature." While this was the position originally taken by Chairman Ferris, the Commission later retracted this tenuous stance on the advice of counsel. The reason for this change was clear. Although the FCC voluntarily closed itself off from ex parte contacts, it also claimed that this stand was not required by law under the *Sangamon Valley* ruling, because the proceeding was not adjudicatory in nature. Had the Chairman's statement that the AM stereo inquiry process would award a "valuable privilege" to one of the proponents been allowed to stand, the AM stereo inquiry would have to have been restricted under more stringent and legally binding ex parte rules. Such a change would have opened yet another door for judicial challenge by losing system proponents.

Judicial Trepidation. The question of the ability of the FCC to defend legal challenges regarding ex parte presentations and the use of the matrices leads to the third major source of influence on the FCC's AM stereo decision-making technology: the fear of judicial review. Krasnow et al. wrote:

> Even though only a very small proportion of the FCC's actions are reviewed by the courts, the significance of judicial review in the Commission's policy-making and adjudicatory processes cannot be measured by statistical analysis alone. Judicial review, no matter how seldom invoked, hangs as a threatening possibility over each administrative or legislative decision. . . . Consequently, the FCC must always keep one eye on the courts to make sure that the policies it adopts can successfully run the judicial gauntlet. The continual threat of judicial review thus tends to have an impact on the policies of the FCC even when these policies are not formally adjudicated. (1982, p. 62)

These legal concerns were a source of influence on the AM stereo decision-making process, even though the FCC enjoyed a fairly successful track record versus the District of Columbia Court of Appeals during the 1980s. While relations between the FCC and the DC Court were difficult in the 1970s, two studies conducted in the following decade—the Preskill Study and the Markey Report—showed that the FCC won between 72 and

75 percent of the cases reviewed by the DC Circuit Court of Appeals (Trauth & Huffman, 1989).

An example of the threat of judicial review looming over the AM stereo inquiry can be seen in the events of the spring of 1980. After the FCC Magnavox decision was announced, three of the losing manufacturers backed off from their earlier pledges to support whichever system was selected. As noted in the case, although neither Belar, Motorola, nor Harris threatened immediate litigation, all three left open the possibility of future legal action. On the other hand, Leonard Kahn, who favored the marketplace approach from the beginning, predicted that lawsuits *would* be filed and that AM stereo would be held up in the courts for years, resulting in an intolerable delay to broadcasters. In the end, this was indeed partially true. Although Kahn did not sue the FCC per se, the ongoing litigation throughout the 1980s between Kahn and the other system proponents did little to encourage broadcasters and manufacturers to enter the AM stereo marketplace.

Another example of the threat of litigation that clouded the entire AM stereo inquiry surfaced a few months after the Magnavox decision, during the FCC meeting in the summer of 1980 at which the *Further Notice* was adopted. As cited in the case, Commissioner Abbott Washburn said at this meeting that the *Further Notice* would cause the Commission "more legal problems" instead of fewer ones, while Chairman Charles Ferris worked to persuade the Commission that the *Notice* was needed to create a record that was "legally defensible." Through similar such statements contained in the *Further Notice,* it became clear that the FCC fretted over its inability to create a decision-making process that would appear thorough and impartial enough to stand up to legal challenges. It was stated when the Commission adopted the *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking* that:

> fearing that a final decision based on the existing docket would not survive legal challenges, the FCC intended to strengthen the record by reopening the proceedings. Jim McNally, the FCC staffer who wrote the Notice and presented it to the Commission, said that in the course of preparing the final *Report and Order* requested by the Commissioners in April, the staff quickly recognized "ambiguities and omissions" in the docket record, which made the selection of Magnavox not wholly defensible. ("The Final," 1980)

Later, some proponents, and eventually the Commission, saw the marketplace option as a way to avoid litigation. This argument was articulated in comments filed by NBC:

> NBC believes that the only reasonable approach to follow at this point is to let the marketplace decide. . . . The alternative approach would be to select a

> single system, based on some matrix evaluated by the Commission Staff. There is no question that one or more of the losers in that case would seek legal redress, thereby delaying AM stereophonic broadcasting . . . possibly for years. (Monderer, 1981)

Certainly then, FCC actions such as the construction and subsequent modification of the matrices, the limitations on ex parte restrictions, and eventually the selection of the marketplace solution, were influenced by this desire to avoid expensive and time consuming lawsuits over AM stereo.

Budget Cuts. There was also evidence in the case history that FCC budget cuts under both the Carter and Reagan administrations impacted the Commission's decision making on AM stereo. For instance, Belar filed a motion on November 24, 1978, asking that the *Notice of Proposed Rulemaking* be amended "to provide that the further studies and tests called for in the *Notice* be conducted by the Laboratory Division of the Commission's Office of Chief Engineer." Further, the Belar petition called for "the Commission's participation in all over-the-air testing of the proposed systems." The FCC declined, with BCB chief Wally Johnson ruling that the proponents should furnish the requested information rather than "encumbering the FCC's Laboratory with this additional workload" (Johnson, 1979). The FCC said, however, that it would "observe the over-the-air testing as time and personnel permits" (FCC, *Memorandum Opinion and Order,* 1979, pp. 1–2). Despite these good intentions, FCC participation in the testing process simply did not develop.

As the Reagan administration took charge, the Office of Management and Budget cut the proposed FCC budget by $634,000 and 106 FCC positions in 1981, and $4,816,000 and 103 positions in 1982 ("Fowler Hearings," 1981). In February 1982, just weeks before the final ruling on AM stereo, Commissioner Anne Jones cited budget cuts at the FCC as part of the justification for less technical regulation. In a speech given to the Electronics Industry Association in Washington, D.C., Jones said that the FCC would begin to depart from its traditional role of approving and certifying new electronic equipment, and concerning AM stereo, remarked that the FCC "in the absence of compelling reasons to do otherwise—should require only the minimal standards necessary to protect existing services from interference." Jones stated that the FCC engineering staff at the lab at Laurel, Maryland, faced a cut from 25 persons to "no more than five" persons, and said "clearly, these few people, no matter how dedicated, cannot continue the equipment authorization or standard-setting tasks done in the past." Instead, Jones said that the FCC lab would become "more of a repository of manufacturer filings . . . than an active participant to verify" such industry submissions ("Future Will," 1982).

System proponent Leonard Kahn also reflected on the budget cuts at the Commission lab, saying that it was "one of the best, until recent times when they've had their neck cut" (L. R. Kahn, personal interview, April 2, 1990). Such comments demonstrate that the budget cuts were more than a remote influence on the proceeding. The Commission was faced with a number of technical tasks, and with its resources dwindling, it seems that it simply could not accomplish all of the laboratory work necessary. The evidence points to an already overworked FCC engineering staff that simply was not given the time or money to adequately test the proposed systems. Because the FCC lab was unable to run the necessary system tests, the work was left to others outside the Commission. The conflict faced by the FCC is consistent with the organizational literature presented in Chapter 1, especially Perrow's (1986, p. 133) assertion that organizational goals are multiple, and generally in conflict. Perrow suggests that conflicting goals cannot be met—at least not simultaneously—in malevolent environments or when resources are scarce.

Rules of Evidence. The fifth major area of influence upon the Commission's AM stereo procedural technology deals with the Commission's lack of clear methodology for outside testing of the proposed AM stereo systems. As was noted above, the FCC was unable to conduct its own tests, but in delegating to the private sector, and by allowing both individual proponents and the NAMSRC committee to assume the responsibility for submitting data, the FCC failed to provide adequate guidance. As a result, the FCC was given a largely useless mass of incomparable data. Recall the NAB comment from February 1981:

> The Commission's staff initially did not have a sufficient grasp of the technology to specify the information desired, how tests were to be performed, what data should be obtained, and how it should be presented. Some of the same questions have been asked three times. In each case the system proponents have had to guess at what the Commission wants. Because of the Commission's failure to specify its information needs with precision, the rulemaking process has been confused and inordinately time consuming. (Wetzel & Payne, 1981, pp. 6-7)

Ultimately, the NAB offered to sponsor testing under "identical conditions" so that the FCC could work with "uniform" data and information. However, partly because of "ex parte rules, anti-competitive possibilities, FTC regulations on product standards and the expression of advocacy statements to the Commission staff" (Wetzel & Payne, 1981, p. 5), such joint testing did not develop. From the case history, it became apparent that a major source of influence on the FCC decision-making technology was

the lack of comparable data for the various systems. This inconsistency in the data resulted from the FCC decision to allow proponents to submit technical information based upon their own tests. In addition, Leonard Kahn pointed to yet another rationale against allowing proponents to do their own testing; the temptation to falsify or distort test findings:

> For example, in the AM stereo [case], they knew that the Motorola system didn't meet the FCC specs. . . . There was a consultant who did type approval tests for a firm, and he fudged the data. How do I know he fudged the data? Because the measurements weren't mathematically [balanced]. . . . The Commission laboratory guy said you haven't given me a measurement with high modulation . . . and it was a very rough letter written by the good engineers at the laboratory. "You want type acceptance? You give it to us." And it came back, this response, "How dare you question me on this." Which puts up a warning signal, "How dare you." Of course, the Commission will dare all they damn please, and nobody should be offended. They want a measurement. So then came back this measurement which was absolutely phony. The Commission knew it was phony, and what did they do? Nothing. (L. R. Kahn, personal interview, April 2, 1990)

Whether or not Kahn's account is factual, it is certainly plausible, and it brings up the possibility that when proponents are simply asked to provide test data on their own systems, there is greater room for fudging than when the testing is done by the FCC or another independent body. Had the FCC played a more active role in the testing of the systems, it is certain that the evidence would have been gathered in a uniform manner under more clearly defined rules. As it turned out, the FCC was unable to make a decision partly because of the unclear testing procedures, despite its claim that "a great deal of staff time and technical resources were devoted to analyzing the large amount of technical information, some of which were [sic] confusing and conflicting" (FCC 82-111, 1982, p. 14, ¶ 44).

Industry Participation. The NAB's 1980 offer to conduct independent testing leads to what I interpret as yet another procedural technology issue facing the FCC in the AM stereo case: the question of the proper role of industry in the proceedings. Throughout the AM stereo deliberations from 1977 to 1982, there were dozens of industry members—both broadcasters and manufacturers—attempting to either assist or influence the Commission. These ranged from state broadcast associations to the National Association of Broadcasters; from major U.S. radio and television networks and billion-dollar multinational firms including Sony, Mitsubishi, G.E., and Philips (Magnavox), to such small companies as Belar Electronics, F. T. Fisher's Sons of Canada, and Kahn Laboratories.

Even back in the 1930s, '40s, and '50s, the industry formed cooperative

committees to assist the FCC. During the television standardization process in the early 1940s, the industry was responsible for the formation of the RMA-sponsored National Television System Committee (NTSC). Later on, when color TV and the question of allocations were issues in the late 1940s, the Joint Television Advisory Committee (JTAC) was formed by the RMA and the Institute of Radio Engineers. During the 1950s, the EIA sponsored the Television Allocations Study Organization (TASO). In the more specific concern of *stereo* authorization, the EIA sponsored a group called the National Stereophonic Radio Committee (NSRC) in the late 1950s to promote "all service stereo." This EIA/CEG sponsored group was paralleled by the National AM Stereophonic Radio Committee (NAMSRC) of the 1970s and 80s. All of these groups operated with the encouragement of the FCC. Other industry groups formed to lobby or influence the FCC on the AM stereo question included the "Association for AM Stereo," which first filed a petition for AM stereo rulemaking in the 1970s, and the "Stations' Committee for AM Stereo," which was formed in 1980 to promote the marketplace option.

Of course, the most important of these groups in terms of potential impact on the AM stereo decision-making process was the NAMSRC. This committee, however, was passed over by Leonard Kahn, who refused to participate or cooperate with the group. Kahn explained that his nonparticipation was based on economics, that a company as small as his could not afford to get involved in the NAMSRC and still "protect its interests." Kahn also explained that "I sure didn't want to cooperate with a group whose purpose was to head us off." Kahn claimed that the NAMSRC was formed as a "defensive move" against his firm, as the front-runner in the race for AM stereo authorization ("Leonard Kahn: Sporting," 1982). Kahn later said:

> The loners—I'm a loner, there are a lot of loners—never work well in committees. And big government, big industry are committees. General Motors is run by committees. That's their problem. . . . Play it safe is the bottom line, because you don't get rewarded proportionally for some great step you've taken. But you make a mistake, and you're out. And you know who would get into those committees? Those industry boards? Senior marketing guys who know how to handle themselves in committees. It's an art form. A committee—an industry advisory—has never done anything right. Now there are people who'll say I'm absolutely wrong, and maybe I am. I haven't done studies of every damn committee around (L. R. Kahn, personal interview, April 2, 1990).

This mistrust of industry committees carried over into Kahn's attempts to influence the FCC decision-making technology. In August 1976, Kahn

offered a rebuttal to the NAMSCR proposal to test various stereo systems. Kahn's comments centered around the following argument:

> Petitioner questions whether Congress authorized the Commission to delegate, in turn, authority to non-Governmental groups to stand between individuals or firms, and their Government, and to empower such groups with the responsibility of studying in detail various systems, establishing test procedures, running experiments, performing analysis, issuing reports, etc. (Kahn Communications, 1976b)

Kahn questioned whether such committees should be "composed of cooperating, putative commercial competitors who neither represent the public nor the broadcasters." Kahn asserted that the high cost of such committee participation might prevent a small company both from petitioning the FCC on its own behalf, and from serving on such a committee. Such a double financial burden would "eliminate the right of petition for small organizations and most individuals." This contention is supported in the literature by the economist who noted that "as in the case of trade associations, it appears that corporations (generally major corporations) dominate the standards-writing process within engineering societies. . . . It is clear that, compared to the large-scale enterprise, a single small firm finds it relatively more costly to pay the expenses of employees engaged in standards activities" (Hemenway, 1975, p. 85).

Because of Kahn's refusal to cooperate in the testing, and because the Harris prototype was not sufficiently developed when the testing took place, only three of the five major systems were tested by the NAMSRC. This, along with the lack of clear testing instructions from the FCC, led to inconsistent data measurement and test procedures. This flawed data gathering program was one of the reasons for the FCC matrix analysis: to attempt to construct a methodology by which to fairly compare the five systems using test data not readily comparable in the first place.

In summary, the six greatest sources of influence on the FCC procedural technology in the AM stereo case were industry participation, rules of evidence, budget cuts, legal trepidation, the question of ex parte contacts, and the matrix analysis issue. Of these six, it would seem that the sources of influence that weighed most heavily upon this case were the lack of clear rules of evidence and the FCC budget cuts. The other four variables—the fear of judicial review, the use of the questionable matrix as a means to justify the desired standard, the question of ex parte contacts, and the FCC's inability to effectively utilize the services provided by private industry—appear to have been tangential to the two more central problems with the inquiry. While the other four sources of influence were serious factors and worthy of consideration, the *ability* of the FCC to set an AM

stereo standard that was acceptable to the industry and legally defensible was most clearly hampered by the FCC's unfortunate lack of clear direction for outside testing, confounded by the Commission's inability to conduct its own testing at the FCC lab in Laurel, Maryland. Lacking a technically sound basis for selecting a standard, the FCC eventually had no choice but to turn to the untested marketplace experiment—a final outcome that was attractive to some, and repugnant to others.

Social/Environmental Factors

Finally, both the procedural technology and political areas of influence must exist in a social or interpersonal context. The two main social/environmental issues that appear to have impacted the AM stereo case were, in fact, internal to the FCC. Naturally there are other cases that would call for a greater concentration on the matters *external* to the FCC, or that would require an examination of forces both inside and outside the organization. However, in the present case, there surfaced two environmental or social circumstances *within* the FCC that influenced the atmosphere at the Commission in the period from 1977 to 1982, and therefore, most likely impacted the AM stereo inquiry. These two issues are (a) the heavy workload faced by the Commission and by system proponents during that period, and (b) the way in which interpersonal relationships colored interactions between individual Commissioners.

Workload Factors. It is not surprising that the FCC, with its small technical support staff, was swamped in the late 1970s and early 1980s. The fact that even the employees of the five system proponents were not able to keep up with the massive docket submissions is evidenced by the numerous requests for time extensions. For instance, during the last few weeks of 1980, there were motions for time extensions from three of the five system proponents. Motorola submitted a request that the date for filing comments to the *Further Notice* be extended by 30 days, until January 9, 1981, and that the subsequent reply comments period also be extended by 30 days. On November 24, 1980, a similar request was filed by Magnavox. The company claimed that it had "diligently attempted to devise appropriate test procedures and complete the additional testing required to provide the Commission with objective data," but that it could not compete the task before the Commission's deadline of December 9, 1980. Both of those time extension requests were granted, moving the deadline for comments to January 1981, and the deadline for reply comments to February 1981. Then on December 19, 1980, the Harris Corp. filed for yet another time extension. Those petitions for more time continued into the spring of 1981, as the AM stereo docket files grew in length to 22 volumes. Because each of the proponents

needed to analyze the comments and the reply comments on all of the other parties in order to file their own reply comments—which in some instances ran several hundred pages in length—the inquiry comment system fed on its own rapid growth, creating yet more paperwork.

In addition to the workload faced by the proponents, the Commission itself faced a full plate of concerns. Naturally, there are always a multitude of issues before the FCC, as with any federal regulatory agency. So while it is difficult to quantify the workload of the Commissioners and staff, and to say that one period is "busier" than another, a number of participants in the AM stereo inquiry commented on the enormous array of tasks facing the FCC during the period from 1977 to 1982. In the nontechnological arena, the FCC was faced with a host of problems, including—to name just a few—continuing questions over minority interests and affirmative action, indecency, the fairness doctrine, television violence, children's programming and advertising, the third broadcast network inquiry of 1980, the AT&T divestiture, network takeovers and buy-outs, the 12–12–12 rule, fin/syn rules, and finally the court battle over must-carry rules for cable. In addition, the FCC was, at the time considering what role, if any, it should play in cable television and several new technologies, including "wireless cable" (MMDS), pay-per-view (PPV), direct broadcast satellite (DBS), low-power television (LPTV), over-the-air pay broadcasting (called subscription television, or STV), AM stereo, TV stereo, FM quad, interactive cable (such as QUBE), and teletext. Commissioner Abbott Washburn, no stranger to "new" technologies as head of Intelsat in the 1970s and deputy director of the United States Information Agency (USIA) in the 1950s, commented on what he termed the *exploding period* at the FCC:

> You've got to remember that this was one of so many, many decisions we had. And I frankly, today, don't understand how the Commission with its limited number of Commissioners covers things. There's a lot of work that's involved. Because we had seven [Commissioners, as opposed to the present number of five], and we were really working our heads off. And you'd have agendas that were 40 items on a weekly agenda. Sometimes 10 or 12 of those 40 would be big, serious, difficult items. . . . The answer is that you can't comprehend all of it. The staffs are small. I had only one legal assistant, who was a brilliant woman, and one engineering assistant, and some clerks, and some interns who were very good. (A. M. Washburn, personal interview, December 19, 1989)

Washburn went on to explain how each Commissioner develops an expertise in certain areas, and how the other Commissioners then depend on this expert opinion when related matters come before the FCC. He said that "while you wouldn't just take what they said in that area when a case would come along, you recognized that they had a good deal of expertise and you listened to them," so that:

> between seven of us we were able to handle this immense amount of stuff, and of course that period was an exploding period in the field of telecommunications, as all these new things were coming along all of the time. It was a wonderful time to be on the Commission.

Washburn named as the experts on the "whole economic side and on the market side" Commissioners Wiley, Brown, and Jones, but, surprisingly, said that Mark Fowler's expertise in this area was more limited. He said that because of Fowler's background in the field of communications law, his main area of expertise was broadcast-related issues, not economics.

Commissioner Jones agreed with Washburn's assessment that at the time of the AM stereo decisions the FCC workload was heavy, and said:

> Each Commissioner at that time had two, and then sometimes three assistants. . . . Now some people had a staff person who worked on common carrier issues, and a separate person who worked on broadcast. I never did that. Anyone who was interested in being involved in anything could be involved. I had people who were primarily responsible for broadcast, or primarily responsible for common carrier, but I'd take "divies" . . . we were all amateurs as I say, but we would get through most of the comments and summarize them for each other. . . . We all had strong views and I encouraged people to express their views. (A. P. Jones, personal interview, March 7, 1990)

Again, all of this is not to say that the FCC workload in the period from 1977 to 1982 was any heavier than that faced by prior Commissions. Indeed, the FCC's 1945 Hyneman Report addressed this very issue, as did the more general 1949 Hoover Commission. The point is that the problem of immense workloads and small staffs contribute to a hectic FCC decision-making environment. History will doubtlessly conclude that during the 1980s, the FCC found that the best way to deal with technological issues was to simply not to deal with them. Head and Sterling note that the Commission eventually threw up its hands and gave up trying to regulate new technologies, saying "The FCC, beginning with its AM stereo 'nondecision' abandoned its traditional role of helping to shape electronic media by controlling application of technology through mandated standards" (1987, p. 124).

Interpersonal Relationships. Finally, the interpersonal and intraorganizational relationships both among the proponents and within the FCC contributed to the social environment in which the decision making on AM stereo took place. It is clear in the comments and reply comments submitted to the FCC that some system proponents, most notably Leonard Kahn, developed ill-concealed animosity toward other proponents. In fact, there

were even third-party references to the squabbling among the system proponents. Yet beyond this, among the Commissioners themselves, the interpersonal dimension certainly contributed to the social environment surrounding the decision makers. While FCC insiders are often guarded in what they say in an interview about other Commissioners or staffers, the remarks presented in this and the previous chapter certainly give brief glimpses into the interpersonal difficulties at the FCC. The most candid interview source on this count was former Commissioner Anne Jones, who recalled how Chairman Ferris would sometimes carve other Commissioners out of key deliberations:

> When I went to the Commission . . . and I never understood the politics- . . . Charlie [Ferris] apparently did not like, whatever that means . . . Abbot [Washburn], or didn't like Jim Quello, or didn't like Joe [Fogarty]. And those people were carved out of most of the communications. What's that mean? It just wasn't as easy for them to have access to information. It wasn't that they didn't have it, but it wasn't as freely shared with them. And that makes your job ten times harder. In any week, we used to meet on a weekly basis at least, you'd get a stack of items to be voted on. And you'd get them at *maximum*—the big fight was always how much ahead of time did you get them, the rules said like a week—well, you didn't get them a week ahead. At the last minute you'd get four. And, funny, it was always the really important ones that you got just the day before. And if you had not been tuned-in to the process beforehand, how could you make that "breeze in" decision? It was very, very difficult. And *that's* the power of the Chairman's office. Load them up! . . . Take a terribly important item and bury it with 450—I'm exaggerating—but bury it with 32 other items. Maybe put a couple of complicated ones in there. But load them up with readings so they can't possibly have time to sit and analyze them. Those are the games that are played. (A. P. Jones, personal interview, March 7, 1990)

As noted in the first chapter, Morgan (1986, p. 176) concentrated on three aspects of symbolic leadership; use of imagery, theater, and gamesmanship. We have already seen former Chairman Mark Fowler's use of imagery in excerpts from his speeches and writings. Commissioner Jones said that Fowler was "too obvious" to be much of a game player, referring to Fowler simply as "very difficult." Jones admitted that she did not care for Fowler personally, which caused a rift between them:

> We really didn't talk very much, because I think he knew how I felt about him. And I think he felt the same way about me. . . . I voted with him a fair amount. But Mark could not brook what I would consider to be honest intellectual inquiry. I did not have an instinctive Republican reaction to decisions. I'd try to figure out what's right, yet I'm not sophisticated enough to also figure out what's politically right. So I did what I thought was right,

> and I think he did not appreciate the fact that sometimes I'd be with him, and sometimes I'd be against him.

Jones's observations are especially interesting because she is no stranger to working with top-level decision-making groups. She was on the staff of the Securities and Exchange Commission from 1968 to 1977, later serving as the General Counsel of the Federal Home Loan Bank Board. When she left the Federal Communications Commission for private law practice, Jones joined the boards of directors for the IDS Mutual Fund Group, C-COR Electronics, and the Motorola Corporation.[1]

Such a difference in the underlying philosophy of individual Commissioners is consistent with the characterization of an ideologically driven organization, as typified by Mintzberg's (1983, p. 162) assessment that strong ideology has a leveling effect on power; in other words, there are only those who accept the ideology, versus those who do not accept it. There is support for the rationale behind Fowler's appointment as Chair of the Reagan FCC in Mintzberg's statement that organizations with strong ideology:

> can afford to have only the most ideologically committed in positions of formal power. This applies increasingly as one climbs the hierarchy, so that at the top, the chief executive tends to exhibit the strongest identification with the organization's ideology. The CEO is the person . . . who "embodies" the ideology. (p. 157)

Certainly, then, the Chairman of the FCC has the potential to influence the interpersonal relationships within the Commission by implicitly or explicitly setting the tone for interaction and by promoting and reinforcing an ideology.

Finally, Commissioner Jones spoke of how, under Chairman Fowler, she didn't feel that the staff recommendations had been tested in the crucible of free discussion. She said that with Fowler's entrance at the FCC:

> The staff opinion was valued as highly, but . . . I think only a limited group of people participated in the formulation of the staff recommendation. And they were people who had been brought in and appointed by the Chairman. And people who were long-time career people, if they disagreed, were not

[1]Regarding Jones's position on the board of Motorola, one of the AM stereo system proponents, William Fox of the Motorola Legal Division stated that Jones's election to the board was not connected with any particular FCC vote, or her stand on any particular issue affecting Motorola. Jones left the FCC in May 1983, became a partner in a Washington law firm in September 1983, and joined the Motorola board in 1984. Jones served on Motorola's Audit and Legal Committees (W. Fox, telephone interview, May 24, 1990; Motorola Incorporated, 1990b, pp. 8. 15).

> allowed to come to the meeting, and you certainly never heard about it. No, usually, when you would call staff up to your office, you would find that there was a great deal of disagreement. But you would never know that by reading the item that was delivered to the Commissioners to vote on. . . . They [dissenting viewpoints] were suppressed. I mean, you would get a memo from the Common Carrier Bureau, or the Broadcast Bureau . . . you would get a recommendation which would say "and staff recommends X." And you'd say "God, there must be some other alternative." I used to say "give me some other alternatives," and they'd say "Oh, either X or not X, but X is the answer." I mean you never got alternatives—every question had a very clear-cut answer. No it didn't. It didn't. But that's the way it was presented. And they wouldn't say "Now the downside is if you deal this way, you may have to worry about . . . whatever." And I think that the part that bothered me the most was that I used to say to them "Ok, this is one decision in a range of decisions we have to make—what are we locking ourselves into? Show me the road map." [The staff would respond] "There is no road map." I still don't believe there wasn't a road map. I believe there *was* a road map, and if there wasn't, there should have been. (A. P. Jones, personal interview, March 7, 1990)

These comments demonstrate how the interpersonal relationships within the Commission had the potential to impact decision making, although this discussion is kept at the contextual level because there is no indication that such factors were sources of direct influence on the AM stereo case, either in the decision-making technology area or as a source of political influence. Of course, this discussion is not intended to represent a report of research on deep levels of social system structure within the FCC. Such a tract could only emerge from a study which utilized very different methodology than was employed in this case study. Consequently, while this is not intended to be interpreted as a social network analysis, these fragments of discourse are included merely as pieces of evidence that came to light during interviews and help to illuminate the general social nature of everyday work-life in a federal bureaucracy.

The preceding chapter was an analysis and summary of the major sources of influence upon the FCC AM Stereo inquiry. However, it is neither sufficient, nor responsible, simply to point out flaws without extending the analysis in order to make suggestions to correct a faulty situation. As the conclusion to this book, the final chapter will offer a proposal for modification of the FCC technological policy-making process.

CHAPTER 5

Conclusions

> Deregulation does not take communications out of politics. . . . Communications in many respects has become politics, and politics has become communications. Therefore communications policy is every bit as contentious, all-encompassing, obscure and fast-changing as U.S. federal politics itself. Communications deregulation has no neat beginning, and is unlikely to have a neat end.
>
> Jeremy Tunstall (1986)

The analysis of this case clearly showed that the FCC did *not* have adequate resources in place to effectively select a standard for AM stereophone broadcasting. The main reason for this conclusion is indicated in the discussion of the six sources of influence on the FCC decision-making technology, especially the capricious nature of the Commission's rules for gathering evidence, and the noted lack of participation by the FCC engineering staff in the testing of the various systems. To its credit, the Commission had "devoted two senior technical personnel full-time" for a period of over five months to the review of the available material, with "additional engineering personnel" contributing as needed. The FCC claimed that even this somewhat meager level of involvement "represents a substantial investment of the Commission's scarce technical resources in view of our other responsibilities" (FCC 82-111, 1982, p. 9 at ¶ 30). Nonetheless, FCC participation was not only limited, but it came after the fact. The test measurements had already been made by others and were simply submitted to the FCC for review. By then it was too late to conduct the tests under fair and impartial conditions, using identical means of measurement. As the FCC observed, "a great deal of staff time and

technical resources were devoted to analyzing the large amount of technical information, some of which were [sic] confusing and conflicting" (FCC 82-111, 1982, p. 14 at ¶ 44). The implications of this conclusion will be discussed more fully in the final section of this chapter, in which a remedy to the problem is offered.

Additionally, the evidence in the case leads to the conclusion that the Commission selected the marketplace option because of the 1982 majority's commitment to a political philosophy based on reduced government regulation of communications. The marketplace became a rallying point for those who favored less government interference in industry concerns. In the preceding analysis, the predilections of Chairman Mark Fowler and the Reagan appointees to the FCC were seen as leading reasons for the marketplace shift at the FCC. However, this shift was also the result of a long-range trend toward deregulation in telecommunications. Whether or not the marketplace would eventually have been the direction chosen by the Commission in 1982 had the 1980 Commission remained intact, with Commissioners Lee, Brown, and Ferris staying on, is open to speculation. Even to Commissioners Quello and Fogarty, who voted in favor of the single standard in 1980, the marketplace option provided a convenient escape from the industry uproar that followed the Magnavox decision. It is difficult to say whether or not the same outcome would have developed had a new cast of players not come on the scene. Nonetheless, it is clear that the new Commission of 1981 was predisposed to rule in favor of the marketplace, and that such a ruling sent a desirable message to both the White House and at least the Republicans on Capitol Hill.

Finally, recall Simon's theory on the tendency of decision makers to *satisfice,* that is, to select a least disruptive alternative. Along parallel lines, Janis and Mann coined the phrases *optimizing* and *suboptimizing* to classify two strategies by which people or groups arrive at decisions. According to Janis and Mann, an optimizing decision strategy is based on an overriding concern with making the best possible decision, while a process based on a suboptimizing strategy is more likely to settle on decisions that will work reasonably well or seem justified (1977, pp. 21–24). The evidence in the AM stereo case ultimately leads to the conclusion that the FCC *did* operate under a suboptimizing decision strategy in the matter of AM stereophonic broadcasting. Especially telling was the 1982 "concurring statement" of Quello and Fogarty in which the Commissioners allowed that the FCC had "vacillated, temporized and rationalized this matter," saying that "the *Report and Order* appeared to be merely a concession to the practical realities in this unfortunate situation." Certainly this depicts a decision that was merely "justified" because it would work reasonably well, but did not reflect the optimum choice.

The FCC was dealing with a massive and complex docket in the AM stereo case, in which literally thousands of pages of technical data had been submitted. Braybrooke and Lindblom (1963) had argued that extremely rational models are based on unrealistic assumptions, and that optimizing strategies may simply be an "idealization" of the decision-making process. Later, Gouran (1982, pp. 6–7) noted that the more complex the decision, and the larger its scope, the tougher it is to try to set up a strategy that will optimize. In the AM stereo case, such an "idealization" can be seen in the construction of the matrix evaluation table, by which the FCC staff made it appear that it had followed an optimizing strategy. In fact, the FCC had simply tried to gloss over the shortcomings of a faulty decision-making technology that yielded a decision based on the comparison of data that could not be scientifically or rationally compared because it was not collected under comparable conditions. Indeed, the matrix was a rhetorical tool that created the illusion of a carefully developed decision-making strategy. Such an impression was useful in order to convince the seven Commissioners, the five system proponents, perhaps even the ad hoc committee participants themselves, that an optimal strategy was being followed. In fact, the matrix was largely a facade. It was intended to coverup the procedural shortcomings of the FCC testing process. The FCC was not optimizing, but merely satisficing. Gouran (p. 7) cautioned that simply because most decisions are the product of suboptimizing strategies, one should not condone carelessness or superficiality. Gouran also noted that this does not imply that such decisions are necessarily of poor quality. Nonetheless, in the AM stereo case, the FCC's failure to clearly outline the tests to be performed, even if it was not able to directly supervise the testing of the various systems, would seem to be an exoneration of careless and superficial procedural technology, and typifies the suboptimizing strategy followed by the Commission.

Moren's research showed that the principle of "satisficing" aptly applied to most administrative decision making, because of limitations on the amount of information available to, and the interests of, the participants in the decision-making process (1968, p. 80). While the FCC was not lacking in the sheer volume of available information, it has been demonstrated that due to the incomparable conditions under which much of the data was collected that the amount of *usable* data was actually insufficient. In the revised matrix of 1980 (Figure 3-2), fully 35 percent of the scores had to be left blank due to insufficient data. This was the reason that the FCC could not defend its Magnavox decision, and instead had to reopen the proceedings by issuing a *Further Notice* in order to collect more—and better—data. Similarly, recollect how Commissioner Jones rationalized her 1980 dissent to the single standard/Magnavox decision:

> Because we didn't know what we were doing. I mean, the staff had no idea what it was doing. The staff came up with one recommendation and [then] said "Oop, no no we made a mistake, it should have been. . . ." There was a matrix, and it was very convoluted . . . it was just a total lack of confidence. (A. P. Jones, personal interview, March 7, 1990)

Jones's remark is reminiscent of Park's assertion the Commissioners did not have "the time, the inclination, or the training" to actually read the dockets before them, that their main impressions of the analyses were picked up from trade magazines, internal staff summaries and briefings, and that "staff members, like the Commissioners, have too many other concerns and too little time to do detailed evaluations" (Park, 1973, pp. 75–76).

The conclusion that the decision strategy used by the FCC in the AM stereo inquiry was suboptimal is further reinforced by comparing the flowchart for AM stereo rulemaking with the procedure commonly used for FCC rulemaking, as was illustrated previously in Figure 1-1. Of special note is the deviance in the AM stereo inquiry from the "most common" decisional route. As illustrated in Figure 5-1, the petitions for rulemaking that prompted the inquiry came not from one of the five usual sources, but rather from sources within the broadcast and manufacturing industries: Kahn Laboratories and the Association for AM Stereo, Incorporated. The figure shows that in June 1977, the FCC adopted a *Notice of Inquiry* rather than progressing directly to the rulemaking stage. After a period for comments and replies, a *Notice of Proposed Rulemaking* was issued in 1978, and a second period for comments and replies followed. In the spring of 1980, the FCC decided in favor of the single system approach, and selected the Magnavox system as the industry standard. The staff was ordered to prepare a *Report and Order,* which should have closed the matter in 1980. However, in August 1980 the FCC reversed the Magnavox decision and reopened the proceedings. After nearly two more years of delay, the Commission finally ended the inquiry in March 1982. The circularity of the route taken by the FCC is clearly seen in Figure 5-1.

One can only conclude that the FCC botched the AM stereo inquiry at every turn and finally decided not to decide—a decision that was in agreement with the dominant political philosophy at the time.

AM Stereo and the Garbage Can Model

Certainly the FCC Office of Science and Technology (OST) was able to draw upon a variety of persuasive arguments in its push for a single standard. The OST's preferred outcome was backed by 50 years of precedent in FCC technical standard setting. Further, the OST was backed by the lobbying of the National Association of Broadcasters (NAB), the

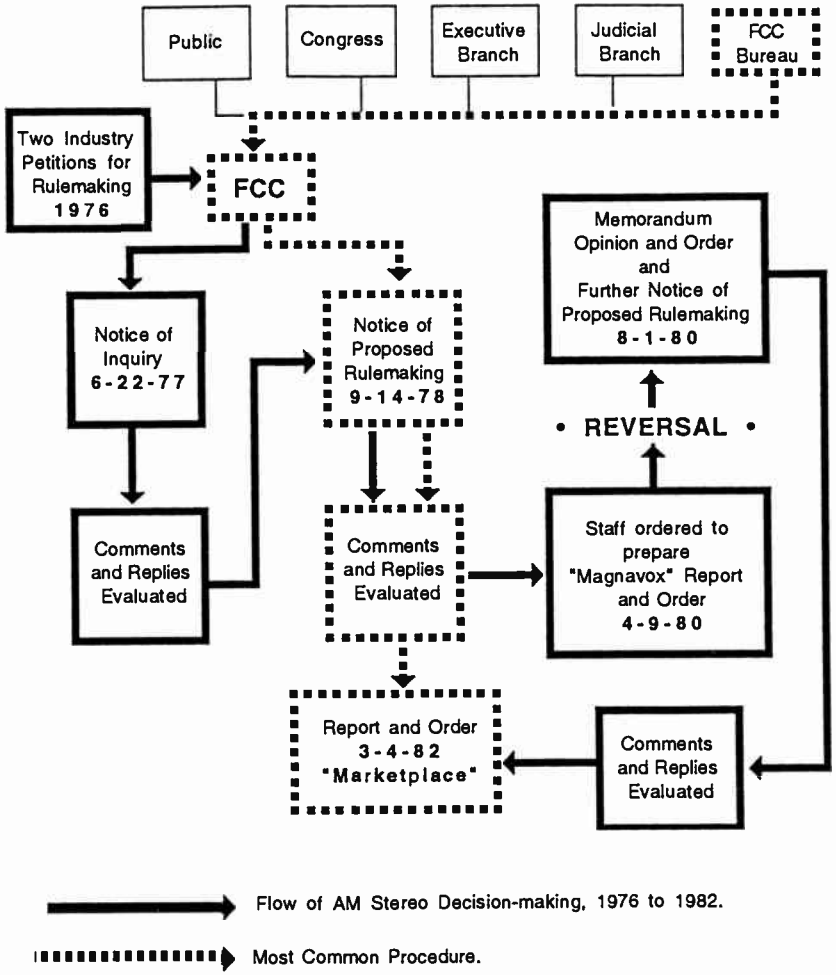

Figure 5-1 Flowchart of AM Stereo Rulemaking, 1976–1982

Electronic Industries Association (EIA), and various other industry groups. In addition, there was strong partisan lobbying by all five AM stereo proponents favoring protection of their system as a single standard. For these reasons, it is not surprising that the "single standard" was the route first taken in the 1980 Magnavox decision. As a firmly entrenched method with a 50-year track record, and with the firm support of several FCC constituencies, the standardization of technical standards can be seen to have represented a "most frequent response." As such, a decision following this pattern would be predicted by the literature. Zaleska (1978) wrote that proponents of most frequent responses are:

> more confident in their position and in the arguments supporting it; they would defend it more vigorously and manifest more resistance to persuasion than other group members, [and that] . . . this type of group process occurs in various situations when groups . . . are confronted with choices among a limited number of untestable responses or propositions. (p. 74)

Perrow (1986, p. 133) challenged the idea that organizations are oriented toward the achievement of a specific goal, arguing that organizational goals are multiple and generally in conflict. This assumption would, according to Perrow, force the abandonment of viewing the leader as establishing an order of preference among goals, and implies that conflicting goals cannot be met—at least not simultaneously—in malevolent environments or when resources are scarce. According to Cyert and March (1963, p. 35), such conflicting goals actually become an important resource for the organization to draw upon. These goals become manifested in determinate choices that can be pulled out of storage when warranted by a specific situation. The conflicting goals expressed in arguments presented to the FCC from external sources, and similar conflicts from groups and factions within the Commission, can be seen as having the potential to foment yet another decision-making pattern found in the literature: the phenomenon of "garbage can" decision-making proposed by Cohen, March, and Olsen (1972).[1] In this model, problems are depicted by the authors as *choice opportunities.* The metaphor used to describe these opportunities is a garbage can, into which participants can toss solutions that appeal to them. These bins full of solutions and problems are considered a resource for the decision makers. Thus, according to the garbage can concept, "an organization is a collection of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they might be the answer" (Cohen et al., p. 4). In addition to the "goal/solution as resource" proposition, another set of resources are the various problems facing the organization.

Of special interest in terms of FCC analysis is the assertion that this garbage can model is most likely to fit *organized anarchies,* defined as organizations that face "problematic preferences," "fluid participation," and have "unclear technology"—that is, procedures for operating that are often unclear even to members, characterized by "simple trial and error procedures, the residue of learning from accidents of past experience, and pragmatic inventions of necessity" (p. 1). A major feature of the garbage can model is the separation of choices from problems, and the subsequent linkage of problems and solutions. In this way, while decision-making

[1]My thanks to M. Scott Poole for suggesting the garbage can theory as an avenue for consideration in analyzing the data in AM stereo case.

processes are still seen by participants as a means of solving problems, what actually happens is that "choices are made only when the shifting combinations of problems, solutions and decision-makers happen to make action possible. Quite often this is after problems have left a given choice arena or before they have discovered" decisions by flight or oversight (Cohen et al., p. 16).

Certainly the linking of AM stereo—and subsequent technological standardization problems—to the marketplace solution seems intuitively to fit the model described here, especially when one thinks of how the structure of the FCC fits the description of organized anarchy with the Commission's rapid turnover in personnel (fluid participation), unclear procedures, and problematic preferences. A growing body of literature has offered some mixed, though mostly positive, conclusions concerning the garbage can model, and several modifications have been proposed (see Levitt, 1989; Magjuka, 1988; Mandell, 1988; Sajo & Csillag, 1987; Masuch, LaPotin, & Verhorst, 1987; Hickson, 1987; Padgett, 1980; Hofstede, 1980; Bartunek & Keys, 1979; Powell, 1978; Mohr, 1976; Rommetveit, 1974). Nonetheless, this theory seems to have explanatory potential for the eventual route taken in the 1982 AM stereo marketplace decision. Clearly the FCC faced problematic preference decisions in the adoption of standards for new broadcast technologies. As history has repeatedly demonstrated, the FCC often faces difficult choices selecting technical standards. Such was the case with AM stereo; even the Commission's *Report and Order* stated that the Commission faced three "fundamental" problems, blocking the selection of a single system:

> First, the data possessed by the Commission are incompatible in some instances since no uniform test procedures were employed. Second, the weights assigned to the various factors and the engineering judgments employed are subject to variance depending on the analyst. Finally, the results obtained are close even if the data and methodological difficulties were absent. Thus from the results in the evaluation table, no clear choice is apparent in any case. (FCC 82-111, 1982, p. 14, ¶ 45)

In addition to the fact that the Commission faced tough choices in such situations—or in the words of Cohen et al. (1972), "problematic preferences"—the FCC did not have clear decisional processes by which to determine technical standards. This problem of "unclear technology" was readily seen in the last chapter.

Lastly, the concept of *fluid participation* seems to accurately describe the FCC, especially at the top of the agency. Many FCC Commissioners do not even serve out their terms. They are lured away for a variety of reasons, often taking jobs in the industry they once regulated, or in private law

practice. In the present case, the change of participants was not only an unsettling factor in the decision-making process, but is seen to have contributed to a radically changed final outcome. By its ability to renominate "friendly" Commissioner James Quello, and to select and nominate three new Commissioners (including the new Chairman), the Reagan administration was able to hasten the adoption of free market policies at the FCC.

Now that the FCC is understood to contain the three elements of an *organized anarchy,* let us examine the other key components of the garbage can model. Surely the marketplace solution was an option for the Commission prior to the Reagan Revolution and the Fowler FCC. The AM stereo docket files clearly indicate that such an outcome was seriously considered by the Ferris Commission in 1980 and strongly supported by the Broadcast Bureau and the Office of Plans and Policy. Certainly the marketplace solution was in the bin for a long time, waiting for the right combination of forces to come along to make it possible to match appropriate problems with this solution. Thus the marketplace solution came to be not just another philosophical or economic brainchild, but in fact a valuable resource for the FCC. The value of this solution, which was not to be fully realized until the Reagan administration took office, was primarily its appeal to those who favored a reduction in the level of government intervention in private commerce.

The change at the Commission in 1981, and the resulting series of marketplace decisions, fit the description provided by Cohen et al., who observed that the solution-problem combinations will be pulled out of the garbage can "only when the shifting combinations of problems, solutions, and decision-makers happen to make action possible." That the AM stereo decision making fits the pattern drawn in the garbage can model is unmistakable. The fact that the AM stereo decision was merely the first in a string of similar marketplace decisions at the FCC between 1982 and 1984 reinforces the conclusion, and indicates that the marketplace option was viewed as a solution-resource just waiting for problems to which it could be attached.

The Marketplace Shibboleth

> He captured the fords of the Jordan behind the army of Ephraim, and whenever a fugitive from Ephraim tried to cross the river, the Gilead guards challenged him. "Are you a member of the tribe of Ephraim?" they asked. If the man replied that he was not, then they demanded, "Say 'Shibboleth'." But if he couldn't pronounce the H and said "Sibboleth" instead of "Shibboleth," he was dragged away and killed. So forty-two thousand people of Ephraim died there at that time.
>
> Judges 12: 5–6.

In the end, the marketplace solution took on a variety of meanings. It became to some an ideological symbol, to others a battle cry, a kneejerk reaction, almost a rubber stamp. But in all of these meanings, support for the marketplace model of broadcast regulation became a *shibboleth*—that is, a means to express membership in the in-group of fervent deregulators. As it did for the guards of Gilead, this marketplace shibboleth evolved into a means to distinguish friend from foe—if you were with the Reaganites, you would invoke the marketplace shibboleth.

Commissioner Jones gave credence to the theory that there was a marketplace shibboleth when she said that, during the Fowler days at the FCC:

> the marketplace notion . . . was in fact attached to a lot of problems. The marketplace was the answer for every question to some people. *Every* question. Now whether everyone believed that or not, those were the recommendations which came up because senior staff make the recommendations for most of the choices. . . . Any choice that they thought was worth answering, they would probably answer by way of the marketplace . . . I think it was more automatic—the marketplace reaction (A. P. Jones, personal interview, March 7, 1990)

Krasnow et al. (1982) discussed how the power of symbolism can contribute to reflex reactions in FCC policy making:

> Throughout the evolution of policy a recurring theme of participants is the legal and ideological symbolism they may attach to a discussion of alternatives . . . without refined and, most importantly, commonly agreed upon specification of the meaning of those concepts. Broadcast policy-making can also become embroiled in arguments over stock, symbolic rhetoric such as "localism," the "public interest," "access to broadcasting," or "free broadcasting." The terms become symbols cherished by participants in and of themselves without careful thought, or they are not commonly understood, so that ideological rhetoric sometimes supersedes real issues and actions in importance. (p. 141)

Certainly during the headlong rush toward telecommunications deregulation in the early 1980s, the concept of the marketplace served as an ideological symbol within the corridors of the FCC headquarters. Sterling and Kittross (1990) composed a provocative essay that sums up the use and abuse of ideology in communications policy-making in the 1970s and 1980s:

> The pressures of budget and day-to-day duties have restricted the FCC's long-range vision. . . . It is this lack of long-range, policy oriented thinking that has led to government *reaction* to recurring problems rather than

> *anticipation* of their recurrence, even with an increase in telecommunications policy research in the 1970s. In the 1980s, doctrinaire conservative economists dominated policy that previously had taken account of technical constraints and broad political economy theory. Much of the agenda of the Reagan administration was determined by ideological economic principles, and the administration preferred to develop new policies within conservative think tanks rather than in the give-and-take of traditional policy-making procedures.
>
> . . . The swings from regulation to reregulation to deregulation and back again ensure that the current situation will not remain stagnant. It might be said that the debate is between those who believe "that government is best which governs least" and those who believe "that government is best which governs best." At one time, both sides cited the public interest standard as backing their positions. Today with this standard in eclipse, there appears to be little appeal to the idea that broadcasting is unique and important in our society and that it should be carefully nurtured—or restrained, if necessary.
>
> The time is past for continual application of ad hoc solutions to seemingly permanent problems. As both the industry and government are understandably looking out for themselves, the public interest suffers as a result. (pp. 579–580, emphasis in original)

Although Sterling and Kittross did not provide their interpretation of the "public interest" standard, they did observe that "past experience suggests that it would be desirable to have solid, impartial research and policy initiatives supported by funds generated outside of either bureaucratic or industry control. The potential for such a 'third force' in the electronic media is great." The last section of this book will outline a proposal for an independent body to assist both the FCC and the broadcast and electronics industries in setting technical standards in order to more efficiently introduce new communications innovations. Such an independent body can be interpreted as a part of the "third force" to which Sterling and Kittross alluded.

A Proposal for the Future

In the final analysis, the AM stereo case points to serious flaws in the FCC procedural technology relative to the introduction of new communications technologies. As the concluding note to this book, let us consider what has been learned in the AM stereo case study as a springboard for a proposal to modify the existing technology for decision making at the FCC in the area of technological standards. In drawing deductions from this research, the evidence leads inevitably to the conclusion that the means by which new innovations are considered by postderegulation era Commissioners must be improved upon. While there might be several possible alternatives for

modification of the present system, the change that holds the most potential concerns the relationship between the broadcast and electronics industries and the FCC. Generally, in the past the various industry groups seemed not only willing but anxious to assist the FCC in the tasks associated with the technology standardization process. This willingness, of course, is only fair and equitable, because both the broadcast and consumer electronics manufacturing industries have much to gain from the security afforded by concrete standards, and therefore should help bear the costs.

In the AM stereo case, the most notable potential source of assistance by the industry to the Commission was the formation in September 1975 of the National AM Stereophonic Radio Committee (NAMSRC). This group enjoyed wide support; as the case study indicated, it was sponsored by four large industry groups, the Electronic Industries Association (EIA), the National Association of Broadcasters (NAB), the National Radio Broadcasters Association (NRBA), and the Broadcasting Cable and Consumer Electronics Society of the Institute of Electrical and Electronics Engineers (BCCE). The stated goal of this committee was to evaluate and test the various AM stereo systems, and to eventually report the results of its findings to the FCC for possible rulemaking. In order to conduct the studies and the electronic tests, the NAMSRC was divided into specialized panels that carried out the following four areas of testing: system specifications, transmission systems, receiving systems, and field tests.

While the NAMSRC was well organized and well funded through private sectors, it was doomed from the beginning for two reasons. First, the FCC did not provide proper guidance or engineering involvement in order to ensure the success of the committee's efforts. The FCC never clearly articulated what tests should be run, nor exactly how the measurements should be made. Secondly, lacking official government sponsorship and a sense of true independence, the NAMSRC could neither mandate participation by rebel firms such as Kahn Laboratories, nor could it recommend a specific system or technology to the FCC for Commission rulemaking. As a committee representing many interests, it was formed with the stipulation that it remain officially neutral in so far as advocating any specific system. Instead, the industry committee was set up simply to turn its findings over to the FCC, where, it was hoped, the findings would be thoroughly and impartially analyzed.

These shortcomings of the NAMSRC—like the NSRC in the late 1950s and early 1960s—bring us back to the calls for a government sponsored standards board, similar to the TASO group that worked on television spectrum allocation. One of the reasons that industry committees have failed in the past has been the fear of violating current U.S. antitrust laws. Naturally, modern corporations are skeptical about simply sitting down and hammering out standards, although perhaps the manner in which the

television industries agreed upon a TV stereo standard flirted at the edges of antitrust violation. Yet such an industry-wide agreement can be in the best interest of both the public and the industry. In the TV stereo case—put in the most simple terms—the key players arrived at a standard, and then simply asked the FCC to protect the desired technology (while not ruling out other marketplace participants). Klopfenstein and Sedman (1990) realized the depth of the antitrust problem. In outlining implications of their research on the AM stereo case they concluded that:

> The FCC must decide whether it should hold future technological developments hostage to the impasses which can be expected in lieu of the rapid emergence of a technical standard. The other solution is the relaxing of antitrust oversight to allow industry groups to work toward a consensus in setting voluntary standards for new media technologies. (p. 190)

Already, a positive first step toward overcoming antitrust concerns in the HDTV standard-setting process was undertaken with the establishment of the Advanced Television Test Center (ATTC) in Alexandria, Virginia. The ACCT was created as a joint venture of the major broadcast-related trade associations and the U.S. broadcast networks. The industries had pledged between $13 million and $15 million to construct an ACCT lab to test the proposed HDTV transmission systems, including those for terrestrial broadcast.[2] The first stage in the HDTV standardization plan was to conduct tests in the ACCT lab. After these tests, the best system(s) would be field tested. Finally, an advisory committee would recommend one of the systems, or a hybrid of several systems, to the FCC ("HDTV, Coming," 1990).

It would at first appear that the proposed HDTV testing procedure is disconcertingly similar to the NAMSRC/FCC arrangement in the AM stereo case. However, upon closer examination it appears that in the case of HDTV, two differences exist. First of all, unlike the NAMSRC, in the case of HDTV the industry will actually make a *recommendation* to the FCC. Secondly, with the huge medical and national defense potential for HDTV, the FCC has been forced to take its standard-setting responsibilities more seriously. Assisting in the success of HDTV has ramifications beyond those impacting the broadcast entertainment industries. To meet these responsibilities, the FCC requested $500,000 in its 1990 budget proposal for its HDTV standard-setting efforts. The FCC planned to allocate $300,000 for outside studies, and $50,000 for new lab equipment for the Office of

[2]Wired cable and VCR technologies are much less constrained by government regulation than is terrestrial or over-the-air broadcasting, and can therefore "reconfigure" their spectrum to adapt to HDTV more easily.

Engineering and Technology (OET, formerly the Office of Science and Technology, or OST) to conduct the HDTV tests. The rest of the monies were to go toward the hiring of six additional full-time employees: three OET engineers, two Mass Media Bureau engineers, and one attorney ("FCC Wants," 1990).

Despite these improvements in the standard-setting process for advanced television broadcasting, it is disappointing to see the setting of HDTV standards conducted once again on an ad hoc basis. The money and effort in the HDTV case consequently will be of only slight benefit for the introduction of other communications technologies, such as interactive broadcasting, as we enter the 21st century. In order to ensure the continued efficient cooperation of government and industry in technical standard setting, a *permanent* industry-financed–government-sponsored FCC lab should be established. This permanent lab could be staffed by engineers on loan from private industrial concerns, who would have the expertise to handle questions of communications technology standardization along with such other related duties as equipment type acceptance and compliance monitoring. This lab, which for all practical purposes would replace the FCC lab at Laurel, Maryland, whose effectiveness was seriously jeopardized by the budget cuts of the late 1970s and early 1980s, should be financed by a patent tax placed on the industry. Such a tax could be conceptualized as a user fee in the current vernacular. The fee would be a just tariff for the manufacturing industry to pay, because, in fact, the manufacturers of consumer electronics, as the users of the FCC standards, derive the largest economic benefit from the security afforded by technical standards. This patent fee or license tax, which would amount to a fraction of a percentage of the license fee already paid by users of a consumer electronics patent, would provide a fair and equitable way of independently financing the lab. Both large and small concerns would pay equitably out of today's patent returns to finance tomorrow's standardization research, according to their level of productivity (patent use).

In addition to benefitting the affected industries, the FCC would gain from the establishment of such a facility, and therefore related benefits would accrue to the general public. Further, all innovation proponents would be forced to participate in the process if they chose to have a chance at their technologies being sanctioned as a standard. This blanket participation would provide uniform test data, which could then be applied to carefully defined decisional criteria set by the Commission.

In the end, it appears that such a joint industry/government lab, if properly financed and independently supervised by the FCC, would provide a win–win solution to the unclear technology of FCC standard setting. Capital would win because the broadcast and manufacturing industries are in a sense consumers who would benefit from the assurance that they could

invest in a selected standard with the knowledge that the standards would not change capriciously. Such assurance would protect equipment manufacturers and broadcast licensees from wasting resources on systems that might fail in a marketplace shakedown. The general public would win in a similar fashion, because of the certainty provided by government decreed standards. As was so often stated in anti-marketplace arguments in the AM stereo case, consumers benefit when standards serve to ensure that electronics equipment can be purchased with some measure of surety that it will not be rendered obsolete a short time later by changing marketplace standards.

The proposed permanent FCC/industry engineering board would allow for the removal of many of the stumbling blocks that plagued the FCC and prevented the Commission and the affected industries from effectively setting uniform standards in the AM stereo case. Such an improvement in the decision-making technology at the Commission would help insulate the decisional process from the pressures of political whim and competitive acrimony. The AM stereo case has clearly demonstrated that radical change is justified by the necessity of maintaining an orderly communications system in which all of the pieces fit together in an efficient and well-planned manner.

The AM stereo debacle is an embarrassment to the FCC. Because the Commission did not or could not control its own decision-making process, political posturing carried the day. Rarely has a federal regulatory agency made such a fool of itself. In addition to the problem of flawed decision making, the subsequent AM stereo marketplace experiment was largely a failure, as evidenced by the 1988 FCC decision to abandon the marketplace route and instead to declare a terrestrial broadcast transmission standard for HDTV. It is the task of the FCC and the regulated industries to learn from this series of mistakes and to profit from the AM stereo experience by constructively working toward creating a more orderly protocol by which to standardize telecommunication innovations in the future.

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FIELDS *and* WAVES *in*

MODERN RADIO

BY

SIMON RAMO

Electronics Laboratory of
General Electric Company
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Electronics Laboratory of
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