THE DEVELOPMENT AND GROWTH OF FM STEREOPHONIC BROADCASTING: A HISTORY

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ABSTRACT

THE DEVELOPMENT AND GROWTH
OF FM STEREOPHONIC BROADCASTING:
A HISTORY

by Ronald K. Salak

This study provides the first detailed historical account of the development and growth of FM stereophonic broadcasting in the United States. Although the study describes the AM-FM stereophonic broadcasts and experimental FM stereo broadcasts of the 1950's, the majority of the thesis is concerned with events after the Federal Communications Commission approved the Zenith-General Electric system of FM stereophonic transmission on April 19, 1961. This is also a study of broadcasters, advertisers, receiver manufacturers, government officials, and listeners. It reports their expectations, opinions, and controversies that continually surround stereophonic broadcasting.

The thesis follows a basic chronological pattern in presenting the history of FM stereo. Material for this study has been obtained from a wide variety of sources including trade publications, private correspondence, government agencies, and trade associations. The study does not attempt to provide a detailed technical explanation of the Zenith-G.E.

FM stereophonic transmission and reception system. It is, instead, designed to acquaint the general student of broadcasting with the background of this newest technique of broadcasting to be used on a commercial basis.

FM has always been the 'poor sister' of the broadcasting industry. For a number of reasons, it has never obtained the financial success or listener acceptance achieved first by AM radio and later by television. To overcome these problems, FM broadcasters have attempted to capitalize on FM's main technical advantage; the ability to transmit high quality sound. In the late 1950's, many FM broadcasters and radio receiver manufacturers became interested in the possibility of broadcasting stereophonic sound via one FM frequency. The earlier method of AM-FM stereophonic broadcasting, while often capturing many listeners, was inefficient and expensive. Thus after extensive testing by the electronic industry's National Stereophonic Radio Committee and lengthy hearings by the F.C.C., the Zenith-G.E. system of FM stereophonic broadcasting was selected over a number of other proposed systems.

On June 1, 1961, FM stereophonic broadcasting became a reality with three stations initiating stereophonic broadcasts. Although many broadcasters and receiver manufacturers had predicted a rapid growth for FM stereo, the number of FM stations broadcasting in stereo increased rather slowly.

Receiver sales also lagged behind the rosy industry estimates made during the spring and summer of 1961. In many areas of the country, an unfortunate 'chicken and the egg' situation developed. FM broadcasters were reluctant to spend the money for stereo equipment and records when there were no sets available to receive the broadcasts. At the same time, listeners were reluctant to pay the comparatively higher prices for FM stereo receivers when there were no stations in the area broadcasting in stereo. Even after stereophonic broadcasting had become a commercial reality, some broadcasters and receiver manufacturers continued to believe that there was little advantage in stereophonic broadcasting. Thus a controversy over the merits of FM stereo that had begun in the late 1950's continued well after the Zenith-G.E. system had been approved by the FCC.

FM stereo, however, was slowly accepted by broadcasters, advertisers, and listeners. Many FM stations found stereo to be a success factor when used in combination with good programming, active promotion, and aggressive salesmanship. Some major national advertisers, including General Electric, Chevrolet, and R.C.A. Victor, also became interested in FM stereo; interested at least on a trial basis. Listeners too were interested in FM stereo. The excellent sound reproduction provided by FM stereo attracted hi-fi

enthusiasts and housewives alike. Stores with a limited number of stereo receivers in stock were often swamped by customers when the first FM station in the community began broadcasting in stereo.

By the fall of 1964, when the writing of this thesis began, FM stereo had grown to the point where nearly 1/4 of all FM stations were broadcasting at least part of their daily program schedules in stereo and radio manufacturers could count stereo receiver sales in the millions.

THE DEVELOPMENT AND GROWTH OF FM STEREOPHONIC BROADCASTING: A HISTORY

By

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RKS

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INTRODUCTION

The Problem

This is a study of the newest technique of broadcasting to be used by the electronic mass media on a commercial basis; FM stereophonic broadcasting. Stereo broadcasting has been a source of controversy since the first experimental broadcasts were conducted in the early 1950's. Broadcasters, engineers, electronics manufacturers, and advertising executives were discussing the merits of FM stereophonic broadcasting long before the Federal Communications Commission gave its final approval to the technique on April 19, 1961. Many people believed that stereo would save the faltering FM broadcast industry. Others saw it as a vast new area of consumer buying at a time when the consumption of television receivers was reaching the saturation point. But there were also people who believed FM stereo was little more than a 'gimmick.' They predicted that FM stereo would be an unnecessary expense for the broadcaster and an unwanted product by the consumer.

This study provides the detailed historical account of the development and growth of FM stereo. Although it reports the major events in the development of stereophonic

broadcasting previous to the FCC decision of April, 1961, this study focuses on the growth of FM stereo following the formal FCC approval. This is also a study of the expectations and opinions held by broadcasters, advertisers, receiver manufacturers, and listeners; a study of the controversy that has surrounded stereophonic broadcasting almost from its creation. It reports the opinions and arguments used by both sides and in the concluding chapter, weighs their validity.

Organization

This thesis follows a basic chronological pattern. Chapter I concentrates on the relevant events before the FCC Report and Order of April 19, 1961. Beginning with WQXR's experimental AM-FM stereo broadcasts in 1952, the main events included in this chapter are the initiation of FM multiplex services, the development of FM stereo systems, the controversy over the merits of the various systems, and the establishment of FM stereo standards by the FCC.

Chapter II is a study of the 1 1/2 month period between the FCC Report and Order and the initiation of FM stereophonic broadcasting on June 1, 1961. This chapter focuses on the predictions and preparations for FM stereo broadcasting by the FCC, the electronics industry, and the broadcasters. Although the time span covered in this chapter is relatively short, the activity surrounding FM stereo was especially intensive.

Chapter III continues the historical account of FM stereo broadcasting; concentrating on the period from June 1, 1961 through the Summer of 1964. The chapter describes the growth of FM stereo and reports the opinions formed about the value of FM stereo as a broadcast technique.

The final chapter draws together the material reported in this study and presents the conclusions reached by the author. It also suggests future areas of study for the student interested in the subject of FM stereophonic broadcasting.

Limitations

The key point in the development of stereophonic broadcasting was April 19, 1961, when the FCC released its Report and Order establishing the technical standards for the FM stereo system. The main period under consideration, then, begins on April 19, 1961, and closes during the summer of 1964, just prior to the writing of this thesis.

Examination of the opinions expressed about FM stereo has been limited to groups which have had a direct interest in the development of FM stereo, including the FCC, broadcasters, electrical equipment manufacturers, advertisers, and the listeners.

This study is also limited by the quantity and quality of source material available. Few reliable figures are available in such important areas as FM stereo set

production and the advertising revenue of FM stereo stations. In addition, little material has been published by those persons or organizations that have been directly concerned with the development of FM stereo.

Sources

Material used in this study has been obtained from a wide variety of sources. Descriptive material has been obtained from many trade publications including Broadcasting, Printers Ink, and Electrical Merchandising Week. Important facts and figures were furnished by such organizations as the National Association of Broadcasters, the National Association of FM Broadcasters, the Electronic Industries Association, the Federal Communications Commission, and the General Electric Company. A complete list of sources can be found in the bibliography that follows Chapter IV of this study.

Definitions and Abbreviations

This study is written with the assumption that the reader has at least a basic knowledge of the technical aspects of broadcasting. The technical terms in the following list are defined in relation to this study. Following this list of definitions is a key to the initials of trade groups and other organizations discussed in this study.

Definitions

AM (Amplitude Modulation)	-	A method of broadcasting in which the frequency of the carrier wave remains constant while the amplitude (power) varies. The electrical signal power of the sound to be transmitted varies the voltage strength or "amplitude" of the carrier wave. Static is an amplitude modulated wave that can be received by an AM radio.
FM (Frequency Modulation)	-	A method of broadcasting in which the amplitude of the carrier wave remains constant while its frequency (wave length) varies. The electrical signal power of the sound to be transmitted varies the frequency of the carrier wave. Because FM receivers cannot accept AM signals, they are rarely affected by static.
Multiplexing	-	The electronic technique that permits the simultaneous transmission of two or more signals within a single channel. Multiplex transmissions, when applied to FM stations, means the transmission of facsimile or other signals in addition to regular broadcast signals.[1]
Stereo	-	In the context of this study, "stereo" refers to the dual channel electronic reproduction of a sound in a manner that simulates a live presentation.

[1]Federal Communications Commission, Rules and Regulations, Vol. III (Washington: U.S. Government Printing Office, 1964), p. 157.

FM Stereo (or FM Multiplex Stereo)	- The electronic technique that permits the transmission of a stereophonic program by a single FM broadcast station utilizing its main channel and a stereophonic sub-channel.[1]
SCA (Subsidiary Communications Authorization)	- An FCC authorization that permits FM stations to transmit by the multiplex process specialized programs to a limited number of subscribers. These programs are in addition to the FM station's regular broadcast programs.

Abbreviations

E.I.A.	- Electronic Industries Association
F.C.C.	- Federal Communications Commission
N.A.B.	- National Association of Broadcasters
N.A.F.M.B.	- National Association of FM Broadcasters
N.S.R.C.	- National Stereophonic Radio Committee (Formed by E.I.A. to recommend FM stereo technical standards)

[1] Ibid., p. 157.

CHAPTER I

THE DEVELOPMENT

1952 - April 19, 1961

> It is not easy for me, on a Sunday morning, to turn myself into one corner of an equilateral triangle. I did so last Sunday, however, at the behest of the British Broadcasting Corporation--disposing myself, my tv set, and my radio set to test the new development known as stereophonic sound . . . The only way in which I could try to obey the imperative "the volume must be the same for each set" was to turn both on full. This must have been correct because, as we were told it should, the sound seemed to come from a point midway between the sets - from, in my case, an early drawing by Dali called Mire mangeant son fils. When, however, it was of its nature antiphonal (as in a table tennis match, in which the click of the balls alternated with cries and stiffled oaths from the players), it seemed to come, as it would in real life, from each side in turn. . . .
>
> I must say that the effect was startlingly realistic, and also, sometimes deafening. When an express train rushed through the room, the floor did--literally, I swear--tremble, and, since we are seven miles from a station, the cook nearly dropped the quiche Lorraine, she was making in the kitchen.[1]

This rather humorous description of an early British attempt to transmit a stereophonic program was in broadcast technique and listener reaction similar to many conducted in the United States during the 1950's. Throughout this period, American radio broadcasters were desperately trying to find

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[1]Thomas Driberg, "I Am a Stereophone," New Statesman, LV (May 17, 1958), p. 635.

a solution to the problem of fewer listeners and advertisers; a problem created by the advent of television. FM broadcasters in particular were trying to discover some program idea, some technical innovation, some 'gimmick', to get the people away from their television sets and back to radio.

Early FM Problems

FM, or frequency modulation, was a method of radio transmission perfected in 1933 by Professor Edwin H. Armstrong.[1] It was immediately recognized by most electrical engineers and broadcasters as being technically superior to AM as an aural medium. FM, with its wider range of frequency response and almost static free reception, appeared to be the logical replacement of AM as the dominant broadcast medium. But AM had powerful support. AM had been well established since the middle 1920's and broadcasters, who had purchased millions of dollars of AM equipment, had little desire to see their investment go down the drain. At the same time, few listeners could understand the need for buying a second completely different radio when they could already obtain all the programs they wanted on their AM receiver. Fewer yet understood the technical advantages of FM radio and of those who did, many believed that there was little need for a 'wider frequency response' on such programs

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[1]Lawrence Lessing, Man of High Fidelity: Edwin Howard Armstrong (Philadelphia: J. B. Lippincott Company, 1956), p. 206.

as "Kay Kyser's Kollege of Musical Knowledge." But FM managed to hang on. By the time that the Second World War had forced the suspension of all commercial radio development, nearly fifty FM stations were on the air and many others were in the developmental stage.[1]

After the war, FM continued to expand. A wartime decision by the FCC to shift the FM band, and thus render obsolete all existing FM receivers, did little to dampen the medium's growth.[2] By 1949, there were 737 FM stations and more than a million FM receivers being sold annually. But then came television; television, a medium that brought a picture as well as sound into the living room. As television sets became commonplace in the living room, the big console radio was moved to the basement; and the big advertisers moved to television. In this shuffle of people and money, both AM and FM broadcasters were hit hard. Most AM stations, however, managed to stay on the air, if not make a profit, by turning to local programming that consisted mainly of music and news. But FM was not so fortunate. Continual radio listening had become old fashioned. Radio was now being used to catch the morning headlines, keep mother company in the kitchen during the day, soothe father's nerves on the

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[1]Federal Communications Commission, F.C.C. Reports, Vol. IX (Washington: U.S. Government Printing Office, 1943), pp. 362-3.

[2]Federal Communications Commission, 11th Annual Report (Washington: U.S. Government Printing Office, 1946), pp. 20-21.

way home from work in the evening, and entertain the teenage set at night. And the family found that their AM radio could do that well enough. Few people saw the reason for spending a fairly large sum of money for a second radio, an FM radio, when continual radio listening was so rarely practiced. With few listeners, FM broadcasters found that they were selling fewer advertisers, and soon the result was fewer stations. By 1956, the number of FM stations had dropped to 530. Only 200,000 FM receivers were manufactured that year. To complete this bleak FM picture, most of the FM stations that went silent were owned by independent broadcasters. At the same time, most broadcasting companies that owned both AM and FM facilities began to economize by duplicating their AM programs on their FM outlet. This resulted in even less reason for the listener to spend money on an FM receiver.

AM-FM Stereo

Fortunately, there were some bright spots on the radio scene in the early 1950's. A few 'good music' stations were experimenting with a new broadcast technique, stereophonic sound. As early as 1952, WQXR, the New York Times Station in New York City, began broadcasting several of its live classical music programs in stereophonic sound.[1] To

[1]Nat Hentoff, "FM Boom: Radio for Grown-ups," Reporter, XVII (May 1, 1958), p. 33.

broadcast the stereo effect, WQXR's AM and FM stations combined forces. (See Figure 1.) The AM microphone was placed on one side of the musical group and the FM mike on the other side. The separate signals were then broadcast by each station to the home listener. The listener, in turn, placed the AM radio on one side of the room and the FM receiver on the other side. By tuning to both WQXR stations and sitting between the two speakers, a listener could hear the stereo effect.

This stereo effect was soon found to be a vast improvement over standard radio broadcasts, especially for musical presentations. In standard broadcasting, all the sounds of an orchestra reach the listener through one source, usually a small speaker. (See Figure 2.) This, however, results in a lack of realism since the effect is much different when a person attends a live concert. There the listener hears music in 'depth.' (See Figure 3.) The instruments on the left side of the listener are recognized by him as coming from the left, instruments to the right are heard as coming from the right, and instruments in front of the listener are recognized as such. In a live performance, the listener is also aware that the left side of the orchestra may be louder than the right side. All of these impulses, simultaneously received and noted by the brain, are combined into a 'real' performance for the listener.

FIGURE I

AM-FM STEREO BROADCAST

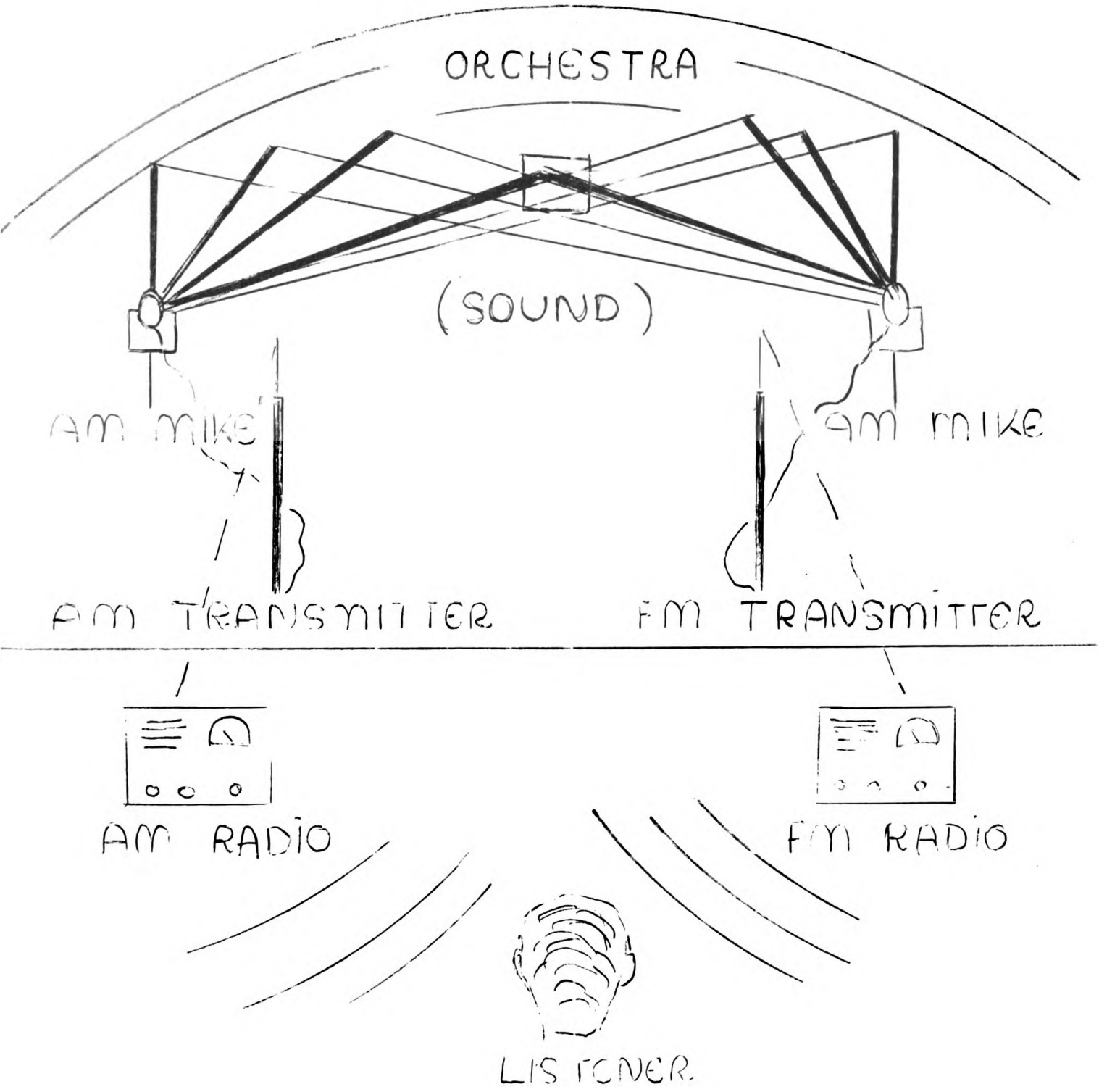


FIGURE II

MONAURAL BROADCAST

ORCHESTRA

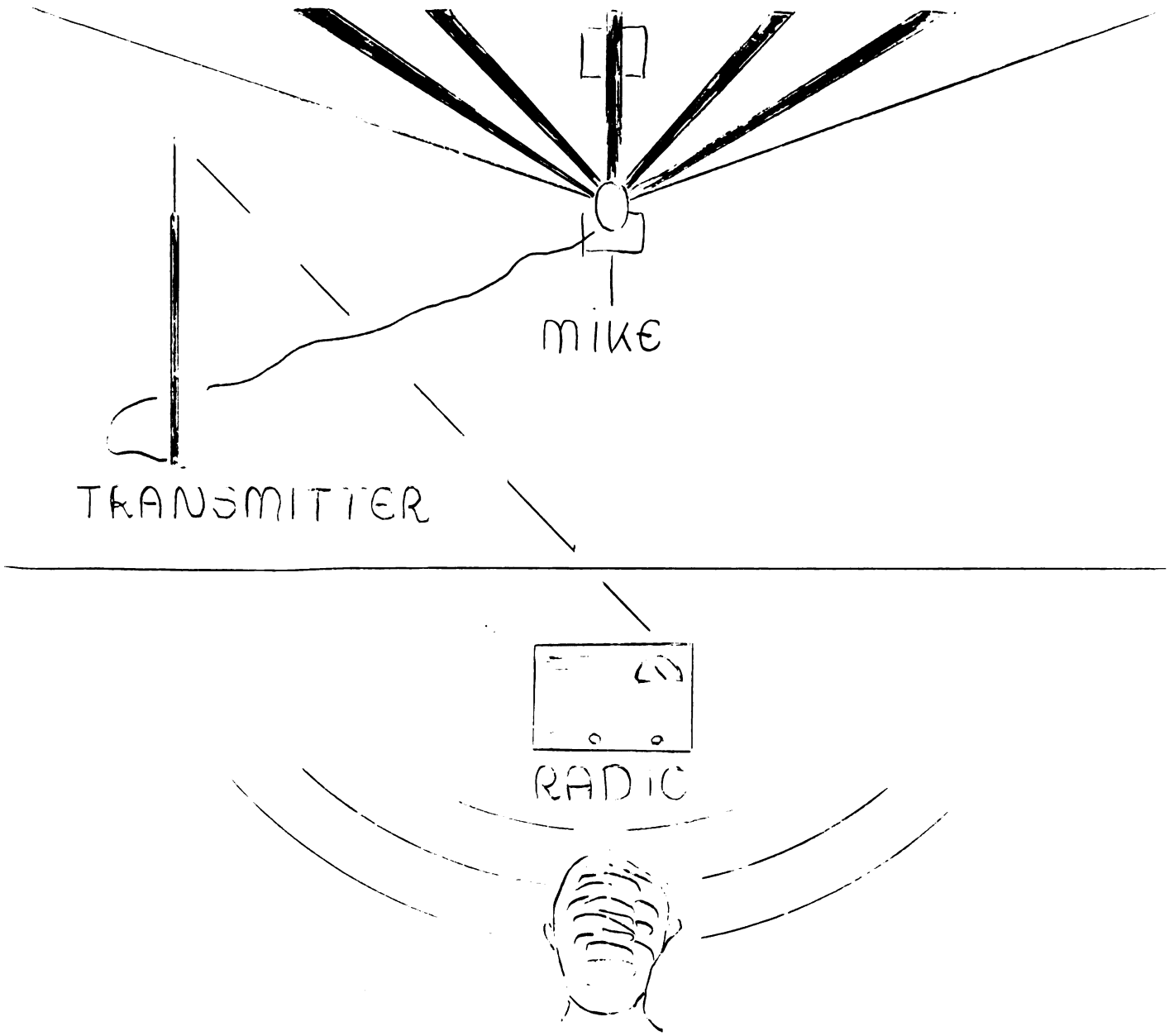
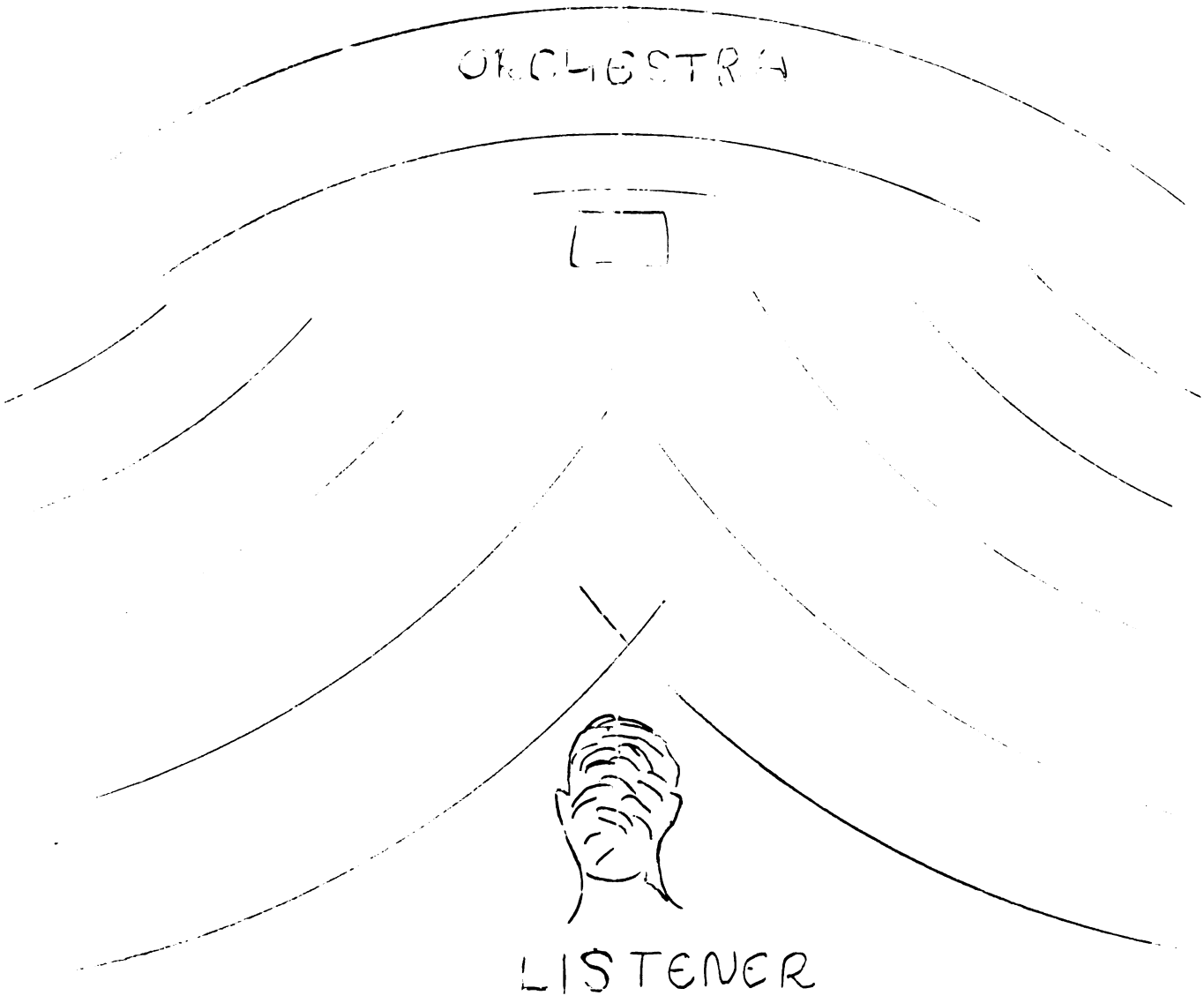


FIGURE III

LIVE CONCERT



Until the institution of stereophonic broadcasts, these impulses of orchestral placement and volume were lacking in broadcast performances. However, with the use of two microphones and two signals, stereo broadcasts could reproduce these impulses in the home. (Compare Figures 1 and 3.) If the center section of an orchestra was playing alone in a radio studio, both mikes in a stereo broadcast would pick up the sound in equal volume and both speakers in the home would reproduce the music equally. Since both ears would receive the same volume from the two speakers, the brain would be 'tricked' into believing the music was actually coming from in front of the listener. If only the right side of the orchestra was performing, the right microphone would pick up most of the volume and the listener would hear the music coming from the right side of the room. When a section more to the left began playing, the left mike would transmit more volume to the home listener and it would appear to him that the music was coming from the center right portion of the room. By this method, stereophonic broadcasting was able to reproduce the "live" dimensions of an actual concert.

Unfortunately, the AM-FM method of stereophonic broadcasting also had many faults. As was pointed out earlier, AM sound reproduction is inferior to FM transmissions. Thus the AM channel of a stereocast often suffered from interference and distortion. To make matters worse, the AM receiver was often of poorer quality than the FM

receiver. In many instances, the FM signal was weaker than the AM transmission in the outlying "fringe" areas, and again the stereo effect suffered. Because the AM-FM system required two separate receivers, the listener could not just flick a switch to obtain stereo. Instead, he had to make the determined effort of turning on both sets, tuning them to the proper stations, and adjusting the volume of both sets until the proper stereo balance was achieved. For many a casual radio listener, this procedure was too much of a bother. But perhaps the greatest drawback to AM-FM stereo system was that most homes did not have an FM receiver. As a result, the listener with only an AM receiver would, in theory at least, hear only one-half of a stereo performance. In reality, the AM mike would usually transmit the sound of the entire orchestra, but with the AM side sounding much louder than the FM side to the listener. Because of this imbalance, the presentation of an AM-FM stereo broadcast would usually alienate most of the AM station's audience. This few stations could afford to do. Another problem for stereo broadcasters was the lack of stereo program material. In the early 1950's, stereo tapes and records were still laboratory experiments.[1] Stations, then, were limited to stereo broadcasts of live concerts which were often few and far between. However, a few stations such as WQXR continued the broadcasts.

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[1]George A. W. Boehm, "Stereo Goes To Market," Fortune, LXIII (August, 1958), pp. 108-11.

FM Multiplex

In 1955, FM broadcasters received an important break. In an attempt to keep FM stations financially solvent, the FCC on October 12 permitted WPEN-FM, Philadelphia, and WWDC-FM, Washington, to initiate 'multiplex' programming.[1] Developed by Professor Armstrong almost immediately after his perfection of FM, the multiplex process allows a second program signal to be superimposed on the carrier of the standard FM broadcast signal. This multiplex or 'subcarrier' signal is broadcast on a frequency that the ordinary FM home set could not receive. By using the subcarrier to broadcast uninterrupted background music, weather, time, or news to special receivers in supermarkets, doctors' offices, or factories on a subscription basis, many FM stations were able to remain in business when the commercial revenue from their standard broadcasts was not enough to keep them going.

AM-FM Stereo Growth

During the mid-1950's, AM-FM stereo broadcasting started to become more commercial and less experimental. The magazine Printers Ink reported that in 1957, more than 40 AM-FM stations were conducting stereo radio broadcasts. In the Summer of 1958, the national radio networks also began conducting stereo broadcasts. The National Broadcasting

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[1]Federal Communications Commission, 21st Annual Report (Washington: U.S. Government Printing Office, 1956), p. 104.

Company managed to beat out its major rival, the Columbia Broadcasting System, by three days when it broadcast the "Telephone Hour" in stereo on June 30. From July 3 through 6, CBS carried an hour long evening broadcast of the Newport, Rhode Island Jazz Festival. In both cases, only a few AM-FM network stations transmitted the stereo version. Most of the affiliates broadcast the programs in the usual monaural method.[1]

FM Stereo Multiplex

The year 1958 was also the beginning of another type of stereo radio broadcasting. Two small electronics companies, Crosby Laboratories, Inc. and Multiplex Services Corp., had each developed a stereo broadcast system that utilized only one FM frequency. Although these experimental systems required special FM receivers to receive the stereo signal, multiplex stereo did have the advantage of doing away with the second AM frequency and all of its problems. In early 1958, the FCC authorized WASH-FM in Washington, D.C. to begin experimental stereo broadcasts with the Multiplex Service Corp. system.[2] Several other stations submitted similar applications almost immediately. On September 9, 1958, after several years of waiting, Murry Crosby, the president

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[1] "Stereo Broadcasting: A Potential New Ad Medium Looms on the Radio Dial," Printers Ink, CCLXIV (July 11, 1958), p. 31.

[2] Ibid., p. 34.

of Crosby Laboratories, was granted a patent for a transmission system that permitted compatible FM stereo broadcasts.[1] Although the system required a special FM radio to receive the stereo broadcasts, regular FM radios could also receive the stereo transmissions in monaural form. This was an important, and necessary, feature designed to save the several million FM receivers then in existence from obsolescence. By the end of October, WBAI and WFUV in New York were conducting experimental broadcasts with the Crosby system. These broadcasts, however, were limited to a few hours per week since the only receivers capable of receiving the broadcasts in stereo were experimental models being tested by Crosby Labs.

In the middle of 1958, the Federal Communications Commission also began to take a more official interest in the future of FM stereo broadcasting. As part of a rule-making proceeding initiated on July 8 to widen the scope of SCA (Subsidiary Communications Authorization) multiplex services, the FCC invited comments on the use of multiplex transmissions for stereophonic broadcasting. There was enough interest in such a stereo system for the FCC on March 12, 1959 to request comments from interested parties on the specific subject of "stereophonic broadcasting on a multiplex

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[1] U.S., Patent Office, File #44732, 1964, p. 285.

basis by FM broadcast stations."[1] By this time, however, interest in single frequency stereophonic broadcasting was not being limited to FM. Various electronic companies had also begun to experiment with stereophonic systems for AM and television.

AM Stereo

In October 1958, the Radio Corporation of America demonstrated its first compatible AM stereo system. Two months later, the Philco Corp. asked the FCC for permission to make field tests of an AM stereo system that it had developed. In promoting its AM stereo system, RCA used what might be called reverse psychology. An RCA vice-president, O. B. Hanson, stated quite forcefully that one advantage of his company's AM system was its lack of high fidelity. Hanson claimed that many people, particularly women, find it uncomfortable to attend live concerts because the extreme high notes are somewhat painful to their ears. FM radio, he said, had this same disadvantage because it could reproduce all musical sounds up to and beyond the range of human hearing. RCA's system, however, had a built-in advantage because AM radio "automatically screens out" the high notes that might be painful to some people.[2] The FCC, however,

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[1]Federal Communications Commission, 25th Annual Report (Washington: U.S. Government Printing Office, 1959), p. 48.

[2]"Stereo Broadcasting: What Does It Mean to Advertising?" Printers Ink, CCLXV (October 24, 1958), pp. 21-24.

decided to delay any field tests of an AM stereo system until a decision could be reached on an FM system.

Establishing FM Stereo Standards

With additional experimental stereophonic radio systems being developed by various companies in the United States and Great Britain, the Federal Communications Commission prepared to determine technical standards for the stereo system to be used commercially in the U.S. The electronics industry through its trade group, the Electronic Industries Association, was also becoming actively interested in the problem of establishing technical standards. In the spring of 1959, the E.I.A. formed the National Stereophonic Radio Committee to review the technical factors involved in stereo broadcasting, to test the various systems in existence, and to submit a final report to the FCC. The Committee was composed of six panels that studied these particular areas:

(1) system specifications
(2) interconnecting facilities
(3) broadcast transmitters
(4) broadcast receivers
(5) field testing
(6) subjective aspects.

The entire study was under the policy direction of an administrative committee headed by Dr. W. R. G. Baker, the

director of the EIA's engineering department, and David B. Smith, vice-chairman of the Philco Corporation.[1]

Both Types of Stereo Broadcasts Continued

As the NSRC began to consider more than a dozen FM stereo systems, broadcasters continued to use the two-station stereo system. In some instances, separate FM stations combined forces in an attempt to provide high fidelity on both channels of the stereophonic broadcast. For example, WNCN and WOR-FM, both of New York City, combined to broadcast the Philadelphia Orchestra concerts in stereo. WNCN transmitted the left channel and WOR the right. As a promotional gimmick, WNCN formed 'neighborhood pools' where one person would bring his FM receiver to a neighboring FM home so that both could listen to the concert in full stereo.[2]

From 1959 to 1961, many FM stations were also conducting experimental stereo multiplex broadcasts; often with unexpected results as one Washington, D.C. station discovered. Although the station was broadcasting some of its programs in stereo, they were designed for experimental purposes only. Since commercial stereo broadcasts had not been approved by the FCC, the public was to receive the

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[1]"Electronic Industries Association Committee to Set Stereophonic Standards," Broadcasting, LVI (February 2, 1959), p. 65.

[2]Julian Boone, "Sound of FM," Esquire, LV (April, 1961), pp. 62-4.

experimental stereocasts in the usual monaural form. However, Washington hi-fi enthusiasts became so frustrated at hearing a station announcer continually state that programs were being transmitted experimentally in stereo that they began to build their own stereo adapters. When the station heard about this growing do-it-yourself audience, it decided to discontinue the experiments because "we were getting too many listeners." The station feared that the broadcasts were taking on more of a commercial aspect than was considered advisable under the FCC's experimental license.[1]

N.S.R.C. Activity

With increasing interest on the part of both broadcasters and listeners, the FCC and the NSRC came under increasing pressure to get things moving. When the FCC deadline for comments on its original inquiry into multiplex stereo arrived in early March, 1960, Broadcasting magazine reported that the Commission had received a "flood of comments" ranging from "professional technical dissertations to pleas scribbled on postcards by hi-fi enthusiasts."[2] The NSRC, however, was not to be rushed. Although seven of the 14 systems originally submitted to the NSRC were eliminated " . . . either because they were withdrawn by the proponent

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[1]Allen Long, "Next: Stereo Sound in FM," Science Digest, XLVI (December, 1959), pp. 33-36.

[2]"FM Stereo Comments Filed," Broadcasting, LVIII (March 21, 1960), p. 66.

or rejected as impractical," the Committee reported to the FCC that it was not ready to offer any recommendations.[1] Its study of FM stereo up to that time represented "nothing more than a firm foundation."[2]

The problem faced by the NSRC was a difficult one. In its studies up to March 1960, the Committee could not find one FM stereo system that was clearly superior to the others. W. T. Wintringham, the Acting Chairman of the NSRC's Panel 1 (system specifications) discussed this major problem in a letter to the British radio manufacturer, R. M. Godfrey:

> No doubt you are aware that when the National Stereophonic Radio Committee was formed, it was hoped that a very few systems, possibly as few as one, would show definite advantages over the others which had been proposed. As time has passed, however, it has become evident that nearly every system has some benefit not possessed by the others. This may be such a factor as simplicity of the receiver, or it may be an advantage in received signal-to-noise ratio, or it may be in the quality of performance given to the monophonic listener. Consequently, the goal of the NSRC has shifted from trying to pick a best system, to trying to appraise the comparative merits of all the systems offered.[3]

By July, the NSRC and the FCC were ready to conduct field tests of the seven remaining FM stereo systems in the Pittsburgh area and around Uniontown, Pa., 50 miles away. Prior to the field tests, stereo systems from these

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[1]Federal Communications Commission, Notice of Proposed Rule Making - Docket #13506, May 9, 1960, p. 1.

[2]"FM Stereo Comments Filed," op. cit., p. 66.

[3]U.S., Patent Office, op. cit., p. 272.

manufacturers remained:

(1) Crosby-Teletronics (formerly Crosby Laboratories)
(2) Calbest Electronics
(3) Multiplex Development Corporation
(4) Electric and Musical Industries Ltd. (Great Britain)
(5) Zenith Radio Corporation
(6) General Electric Company (two systems submitted)
(7) Philco Corporation.

Philco later withdrew its only system. General Electric also withdrew one system and changed the specifications of the other so that for all practical purposes it was identical to the system proposed by Zenith. This resulted in the formation of the GE-Zenith composite system that was field tested by the NSRC. As the Committee's tests continued through the summer months, the GE-Zenith and Crosby-Teletronics systems gradually moved to the front of the competition. The Committee found, for example, that the EMI system did not produce "true stereo," but only an "illusion" of stereo which was not acceptable.[1] The Calbest Electronics and Multiplex Development Corp. systems were also found to be unacceptable because of the lack of frequency response and stereo separation above 8,000 cycles per second.

Principle of FM Stereo

How did the G.E.-Zenith and Crosby-Teletronics stereo systems operate? Although there were differences in construction and operation, both systems followed the same

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[1] "Radio Stereo Group Completes Its Study," Broadcasting, LIX (October 17, 1960), p. 90.

basic principle of transmission. In a multiplex stereo system, two electronic signals are obtained from the sound to be transmitted; usually microphone A is placed on the left side of the source and mike B on the right. (See Figure 4.) The electronic signals from these two microphones are then sent separately to an electronic device called a matrix. This matrix combines these two original signals in two different ways to produce two entirely new signals. The first new signal is the electrical equivalent of the left signal plus the right signal while the second is composed of the left signal minus the right. The L+R signal then goes directly from the matrix to the FM transmitter. This is the blended signal received by the monophonic FM receiver. Before the L-R signal is sent to the transmitter, however, it is first superimposed on a 38 kilocycle tone called a subcarrier. This keeps the L+R and L-R signals separate while being transmitted over the single FM frequency. The subcarrier with the L-R signal, which must be capable of carrying audio frequencies from 50 to 15,000 cycles per second, is then amplitude modulated. Both of the new signals are now ready to be transmitted.

When the transmissions arrive at the stereo receiver, the process is reversed. (See Figure 5.) In the receiver, the two signals are first separated by a series of electronic "gates" that are designed to permit only one signal frequency to pass through it. One of these gates sorts out

FIGURE IV

FM MULTIPLEX TRANSMITTER

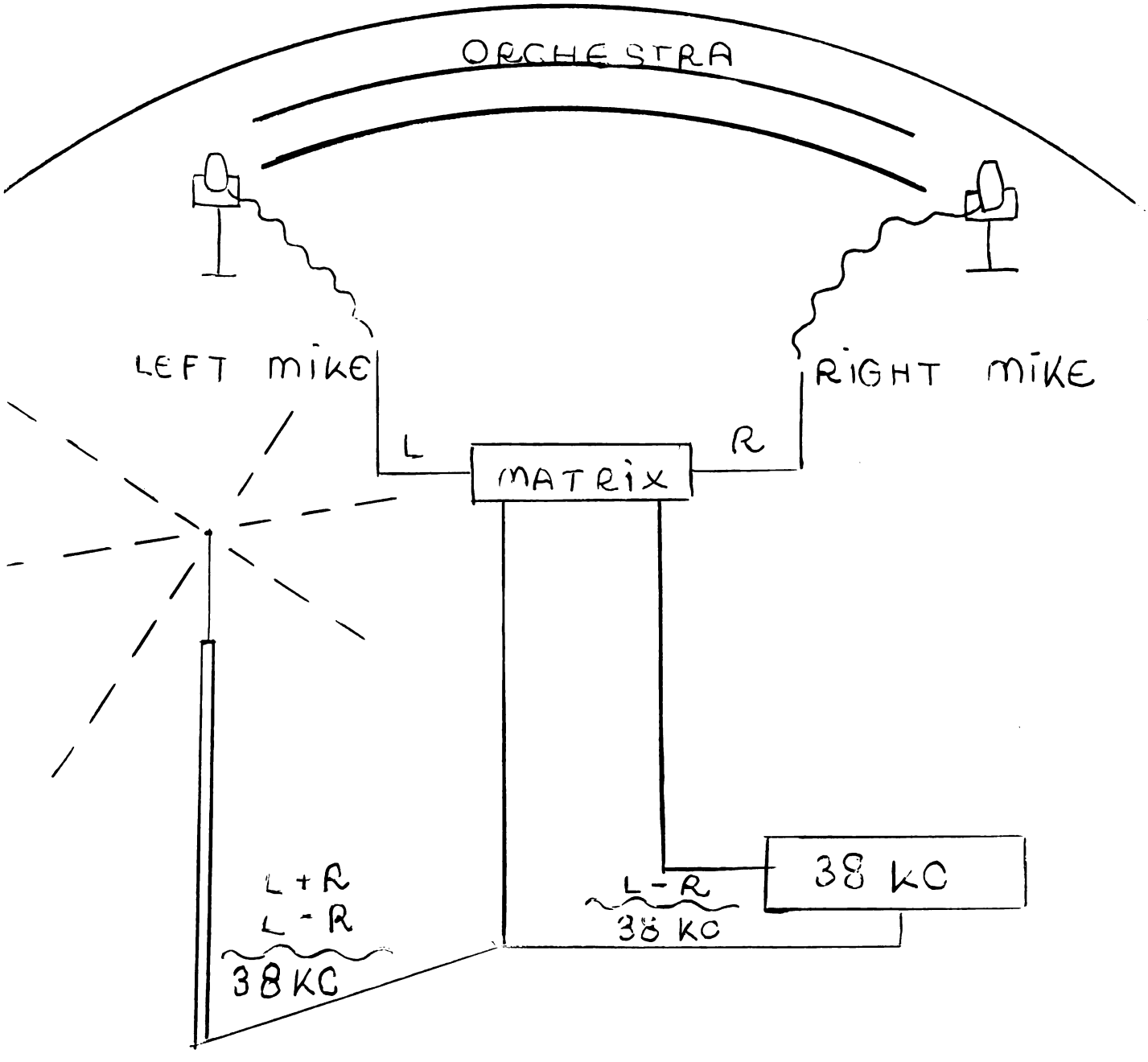
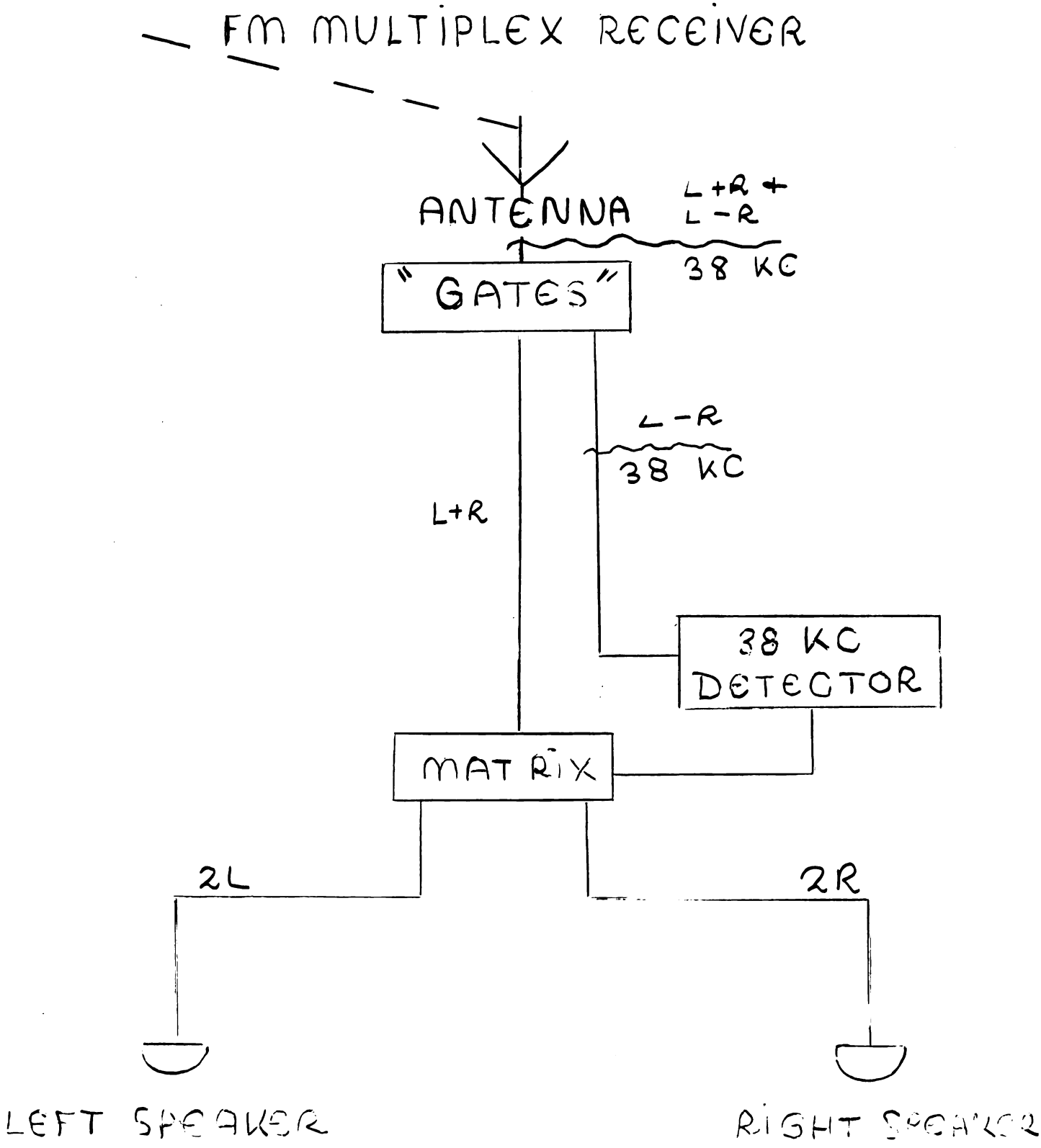


FIGURE V


FM MULTIPLEX RECEIVER
ANTENNA
L+R +
L-R
38 KC
"GATES"
L-R
38 KC
L+R
38 KC
DETECTOR
MATRIX
2L
2R
LEFT SPEAKER
RIGHT SPEAKER

the L+R signal and another the L-R signal. Once the L-R signal passes through the gate, a special circuit strips away the 38 kilocycle subcarrier leaving the original L-R signal. The L+R and L-R signals are then sent to a second matrix. In one section of the matrix, the L-R signal is electronically added to the L+R signal.[1] In another part, the L-R signal is subtracted from the L+R signal. This is the result: $\begin{array}{r} L+R \\ +L-R \\ \hline 2L \end{array}$ and $\begin{array}{r} L+R \\ -(L-R) \\ \hline 2R. \end{array}$ Although the two signals are electronically twice as large, they are still the same signals that were originally generated by the two microphones in the radio studio. These two signals are then sent to individual amplifiers and speakers where they become, once again, two separate audio channels.

NSRC Tests Completed

On October 11, 1960, the engineering manager for the National Association of broadcasters, A. Prose Walker, reported to the NAB's Fall Conference that the NSRC had completed its study and that a final report would be given to the FCC by the end of the week.[1] It is important to remember that the FCC had to make the final decision as to the technical specifications of the FM stereo system. The NSRC could only report the findings of its study and make recommendations.

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[1] "Radio Stereo Group Completes Its Study," op. cit., p. 90.

The FCC in making its final decision had to consider the NSRC report, over 2,500 comments submitted by interested parties, its own knowledge of the stereo systems, the state of the FM industry, and broadcasting in general. In its final decision, the FCC could completely adopt the specifications of one system or combine the specifications of two or more systems.

Controversy Begins

As the FCC began sifting through all of the information it had received, a controversy began raging within the broadcasting and electronics industries concerning the relative merits of the various stereo systems. Both groups had much at stake. For an electronics company, the adoption of its system would mean millions of dollars in sales and royalties. The winning company would receive royalties from stereo receiver manufacturers, producers of transmission equipment, and perhaps FM stations using the system. An FCC nod for the Crosby-Teletronics system would probably have more than doubled its 1960 sales of $1,600,000.[1] Broadcasters also had a great deal at stake. Many stations had already installed multiplex equipment from various manufacturers for experimental stereo broadcasts and SCA operations. If a company using different technical specifications won the FCC nod, many stations would have had to

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[1] *New York Times*, April 9, 1961, p. 1.

spend additional money to reconvert to the new stereo system. Some of the proposed stereo systems also did not permit SCA activities along with stereo broadcasts. Thus the broadcaster would have had to make a choice between the two activities; and often he could not afford to choose stereo.

Although hopes soon died for an FCC decision in 1960, the fighting among manufacturers did not. Broadcasting noted on February 20, 1961, that Crosby-Teletronics was actively promoting its stereo system at a mid-February Hi-Fi Show in Washington.[1] Crosby-Teletronics had also challenged the NSRC's findings on the signal-to-noise ratio of the various systems, claiming that "very poor control of measuring techniques" occurred during the field tests: they also charged that the conditions surrounding the field tests were poor, and complained that the NSRC used poorly adjusted receivers.[2] Finally, however, on April 19, 1961, the Federal Communications Commission published its decision; its choice was the composite system developed by the Zenith Radio Corporation of Chicago and the General Electric Company of Schenectady, New York.

The FCC Decision

In its report, the FCC noted that both the Crosby-Teletronics and Zenith-GE systems reproduced the full audio

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[1] "Opinions Differ on Value Stereo Will Have for FM," Broadcasting, LX (February 20, 1961), p. 96.

[2] Norman Eisenberg, "FM's Next Chapter-Stereo," High Fidelity, XI (April, 1961), pp. 48-51.

range of human hearing for both stereo and monophonic broadcasts. Both systems also had good stereo separation throughout the range. For the monophonic listener, the FCC found that the distortion in the two systems was about equal. But in stereo broadcasts, under some conditions, the Crosby-Teletronics system had a higher degree of distortion than the GE-Zenith system. The FCC concluded that the cost of overcoming these distortions would be less in the Zenith-GE system. In both systems, the FCC found the stereo signal to be weaker than the monophonic signal. With increasing distance, and under otherwise identical conditions, the Zenith-GE system had a greater stereo signal loss than Crosby-Teletronics. In monophonic broadcasts, however, the Crosby-Teletronics system had a greater signal loss as the distance increased. The FCC concluded that this was a strike against Crosby-Teletronics rather than G.E.-Zenith. In backing up its decision on this important point, the FCC cited its May 9, 1960 Notice of Proposed Rule Making:

> . . . any stereophonic system adopted should be based upon standards capable of rendering as high a quality of service as the art can provide, consistent with economic and other factors involved, and without significant degradation of the service now provided under existing FM rules.[1]

One of the most influential factors affecting the FCC decision, however, was the inability of the Crosby-Teletronics system to handle simultaneously the transmission of stereo

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[1]Federal Communications Commission, Report and Order-Docket #13506, April 19, 1961, p. 13.

and SCA broadcasts. A station using the Crosby-Teletronics system would have had to choose between stereo broadcasts to the home listener and the SCA broadcasts which often kept the FM station financially solvent. In its report, the FCC noted that a number of FM station operators had told it that they could not afford to make this choice. One such statement came from the then president of the National Association of FM Broadcasters and co-owner of KITT-FM in San Diego, C. Frederic Rabell:

> It would be a financial disaster for FM if only a single carrier system is adopted by the FCC. In my opinion, it's impossible for the FCC to pick one subcarrier. If they do, the stations with the single subcarrier now won't go to stereo because that background music operation has been supporting them all along.[1]

The FCC was also quick to point out that the Crosby-Teletronics system would probably have deprived the smaller cities of stereo service more than it would have the larger urban areas. It noted that in the larger cities, only a small proportion of the FM stations were involved in SCA activities. However, 81 of the 250 stations holding SCA permits were located in cities where they were the only FM station. In these on-station cities, the Commission noted that the inability of the Crosby-Teletronic system to provide both SCA and stereo transmissions:

> . . . assumes greater importance, for a decision by station management to continue with SCA operations

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[1] "What About Stereo FM Programs?" Electrical Merchandising Week, XCIII (September 12, 1960), p. 3.

> would deprive the community of local stereophonic broadcast service for an indeterminate period of time.[1]

The FCC found one further fault with the Crosby-Teletronics system. If it had been selected, home stereo receivers would have been able to receive illegally the SCA broadcasts from local FM stations that chose to "storecast' rather stereocast. While the Zenith-GE system also allowed the transmission of an SCA channel, the home stereo receiver would be unable to pick it up.

Shortly after making its decision, the FCC was to comment: "The attraction of the accepted FM (stereo) system for broadcasters is understandable;" but if the FCC believed that their decision would end the controversy surrounding FM stereo, they were soon proven wrong.[2]

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[1] Federal Communications Commission, op. cit., p. 9.

[2] "What's All This About Multiplex? Questions and Answers," Consumer Reports, XXVI (July 1, 1961), pp. 422-23.

CHAPTER II

THE PREPARATIONS

April 19, 1961 - June 1, 1961

"FM stereo is the new sound of broadcasting which has given FM something AM cannot provide."[1]

"We're banking on stereo FM being a step forward in quality and not a technological stunt."[2]

"It will be a gimmick, but we're being forced into it anyway."[3]

"In my opinion, this stereo stuff will never make a dent as a mass medium."[4]

And so the controversy continued . . . before, during, and after the Federal Communications Commission's decision. To better understand the controversy that surrounded the preparations for FM stereo, this chapter concentrates on three broad groups that were directly concerned with

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[1]"Stereo Gives FM Something Extra," Broadcasting, LXI (August 28, 1961), p. 81.

[2]Wall Street Journal, May 16, 1961, p. 1.

[3]Ibid., p. 1.

[4]"Stereo Broadcasting: A Potential New Ad Medium Looms on the Radio Dial," op. cit., p. 31.

FM stereo: the government, the electronics industry, and the broadcasters.

GOVERNMENT

> . . . the Commission from time to time, as public convenience, interest, or necessity requires shall . . . study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest.[1]

Confusion Among Manufacturers

When the FCC released its Report and Order on April 19, 1961, it established June 1 as the starting date for FM stereo broadcasting. In its original news release, the FCC stated that the approved system was the one submitted by Zenith-GE with certain modifications. This left a few manufacturers with the impression that some of the technical details might not have been finalized by the FCC. After quick inquiries, however, they learned that the FCC's Report and Order contained all of the data and standards that the agency intended to issue. This fear that the FCC hadn't decided completely on one of the five original systems field tested by the NSRC was partly the result of some manufacturers' decisions to 'play it safe.' These companies, anxious to be the first on the market with stereo receivers, had designed sets for each of the systems under consideration. Some had

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[1] U.S., Communications Act of 1934 as Amended, Sec. 303.

even gone so far as to set up pilot assembly lines for each receiver. Thus if the FCC had made substantial changes in the Zenith-GE system, these manufacturers would have been forced to, in effect, 'go back to the old drawing board.'

Reaction to Decision

The reaction of most broadcasters and electronics manufacturers was to applaud the FCC's decision to standardize on the GE-Zenith system. Some, however, had been caught off guard. One official of WABC-FM in New York City noted that many broadcasters had expected the FCC to approve the Crosby-Teletronics system rather than the one by Zenith-GE.[1] A typical reaction from the electronics industry came from Victor H. Pomper, the executive vice-president of the H. H. Scott Company, a producer of high fidelity components. Pomper was quoted by Broadcasting as being "delighted" with the decision. He stated that: "In years past, the FCC has occasionally acted hastily or improperly, but this time we feel the case was considered strictly on its merits and that a sound decision was reached."[2] However, all manufacturers were not completely happy with the FCC decision. Gardner Greene, the president of Browning Labs, another component manufacturer, complained that FM stations engaged in SCA

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[1]"FM Stations See Ad Boost From Stereocasting," Advertising Age, XXXII (May 22, 1961), p. 3.

[2]"Stereo FM Opens New Vistas," Business Week (April 29, 1961), p. 54.

activities would have to go to "great expense" to convert to stereo under the Zenith-GE system.[1]

FCC Stands Pat

The FCC, however, was ready to back up its decision. Harold L. Kassens, the chief of the FCC's aural existing facilities branch, quickly pointed out that the Zenith-GE system had only been chosen by the FCC after a long testing period. He reemphasized that an FM station could use the system for SCA broadcasts at the same time it was broadcasting in stereo. The NAB's engineering manager concurred with Kassens and stated that he considered the FCC decision to be a sound one.[2] The Broadcast Bureau of the FCC also came to the support of the Commissioners' decision. Its assistant chief, James E. Barr, told the Western Electronics Show and Convention in late August that the FCC had done its part to insure the highest quality possible in stereo broadcasting by establishing high standards in its selection of the Zenith-GE system. Now, he stated, it was up to the manufacturers and broadcasters to follow through. Barr noted that the FCC favored stereo because it would bring FM to the attention of the general public and perhaps increase the distribution of FM receivers in the United States.[3]

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[1] "Is Stereo FM's New Stronghold?" Broadcasting, LX (May 15, 1961), p. 44.

[2] Ibid., p. 44.

[3] "Stereo Gives FM Something Extra," op. cit., p. 81.

ELECTRONICS INDUSTRY

As was stated in the previous section, most electronics manufacturers greeted the FCC decision with enthusiasm. "We're convinced that for the electronics industry, it's the greatest thing since television," said the president of Zenith Radio, Joseph Wright.[1]

"FM stereo has one of the brightest futures in the field of home entertainment products," stated William Clemmens, marketing manager for GE's radio division.[2] But while Zenith and GE were smiling on the outside, events were seething beneath the surface.

A Patent Dispute Emerges

Two problems hit the giant manufacturers in less than a month after the FCC decision. The first was caused by the company that had lost out in the FCC decision, Crosby-Teletronics. While GE and Zenith both claimed to have developed the FCC approved stereo technique, neither had filed any basic patents on their system. Crosby-Teletronics, however, claimed that it had held a basic set of patents covering FM stereo for several years. To back up its claim, Murry G. Crosby, the president of Crosby-Teletronics, presented the patents he had been granted in 1958 for a

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[1] Wall Street Journal, op. cit., p. 1.

[2] "Is Stereo FM's New Stronghold?" op. cit., p. 44.

technique of transmitting FM stereo signals compatible with existing FM monophonic receivers. In the opinion of many electrical engineers, his patents were basic ones. At a technical symposium held on May 12, Crosby-Teletronics announced royalty rates of 50 cents per receiver for the first 25,000 units and 25 cents thereafter. For kits and adapters, the royalty was 30 cents for the first 25,000 units and 15 cents for any additional units.[1] By May 20, nearly two dozen radio receiver manufacturers, including such large companies as the Admiral Corporation, had applied for licenses to produce receivers under the Crosby patents.

GE and Zenith quickly refuted Crosby's claim. William Clemmens of GE stated: "I have been advised by our patent attorneys that we do not need a license under the Crosby patent for the G.E. system approved by the FCC." Zenith's Chief Engineer, J. E. Brown said bluntly: "Crosby's patent is not effective."[2] Brown later confessed, however, that he couldn't "understand how anything so new can be so thoroughly fouled up."[3] Crosby, himself, admitted that the validity of his patents would probably have to be tested in the courts, and on September 7, his company filed suit (against General Electric) in the U.S. District Court for

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[1] "Patent Discord Hits Stereo FM," Business Week (May 20, 1961), p. 124.

[2] "Feud in FM Stereo," Electrical Merchandising Week, XCIII (May 15, 1961), p. 4.

[3] "Patent Discord Hits Stereo FM," op. cit., p. 124.

the Southern District of New York. The charge stated that G.E. has infringed on " . . . a Crosby patent covering the method and equipment for the reception and broadcasting of stereophonic radio programs."[1]

GE-Zenith Dispute

While Zenith and GE may have been presenting a united front against Crosby-Teletronics, there was little sweetness-and-light between the two companies. In late April, a dispute arose between Zenith and General Electric when GE ran a full page advertisement in several national publications, including the Wall Street Journal, New York Times, and Home Furnishings Daily, with the bold headline: "Announcing . . . Stereophonic FM Radio Pioneered and Proved by General Electric." The advertisement went on to say in part:

> Last week a dramatic new advancement in radio became a reality. The Federal Communications Commission approved a General Electric developed system of FM stereophonic radio broadcasting . . . The General Electric Company, the leader in developing the broadcast system selected by the FCC will also be the leader in creating new radio receivers on which you will hear this fine home entertainment.[2]

Such a claim, with no mention of the word "Zenith," naturally upset that company. Joseph Wright, Zenith's president, immediately denounced the claims as "completely untrue,"

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[1] New York Times, September 8, 1961, p. 51.

[2] New York Times, April 24, 1961, p. 17.

and wired a complaint to the Federal Trade Commission "to investigate the matter and use its power to stop this unfair method of competition." Wright pointed out that Zenith engineers had been working on the FCC approved system for over three years. "Zenith was authorized on March 4, 1959 to put its system on the air experimentally . . ." while, " . . . on that date, GE was urging the adoption of a completely different system . . ." Wright then went on to say:

> It is incredible to us that GE, which made only minor, if any, contributions to the system as finally adopted, should now spend vast sums of money in full-page advertisements falsely claiming to be the sole and original developer of this new radio service.

On April 25, Wright wired GE Chairman, Ralph Cordiner, to correct the matter, but when no reply was forthcoming, Wright lashed out: " . . . this is part of a deliberate campaign of misrepresentation for the purpose of attempting to obtain an unfair commercial advantage . . . "

A reply was presented to Mr. Wright, but by the general manager of GE's radio and television devision, Hershner Cross. He replied, in part:

> Our claims of achievement . . . had been thoroughly reviewed prior to placing our advertising by our engineering personnel and attorneys. Your reference to our proposal as a "minor change" makes us believe some of the significant points in our proposed standards have not come to your attention. We feel that the acceptance by the FCC of the standards we employed in all of our experimental broadcasts and submitted to the FCC fully entitles us to the claims we are making.[1]

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[1] "Zenith Hits GE Ads, GE Defends Claims," Editor and Publisher, XCIV (May 13, 1961), p. 26.

Then, almost as quickly as it had started, the dispute ended. Officials for both companies apparently believed that they had effectively made their points and that there was little to be gained from continued fighting.

Most other manufacturers weren't too concerned about the two disputes, and they probably enjoyed the feuding from the sidelines. Since most set manufacturers had the basic knowledge needed to produce FM stereo equipment, the prevailing attitude seemed to be to let the combatants settle it in court. As long as detailed engineering proposals from GE and Zenith could be photostated at FCC offices and technical seminars were being held by the major companies, the other set manufacturers really didn't care to whom they paid their royalty fees.[1]

Plans For Set Production

Perhaps one of the biggest reasons for GE and Zenith ceasing their in-fighting was that both wanted to get down to the business of manufacturing and selling stereo FM receivers. Zenith's president commented in the middle of May that his company believed " . . . stereo FM will add fifty to seventy five million dollars to industry receiver volume in 1962 . . . and the full impact will not be felt for about two years."[2] Two areas of marketing were open to

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[1] "Feud in FM Stereo," op. cit., p. 4.

[2] Wall Street Journal, op. cit., p. 4.

manufacturers of FM stereo equipment. The first area was stereo adapters for FM monaural sets already in existence. Many manufacturers, in anticipation of the time when stereo standards would be established, had been installing multiplex jacks in the backs of their monaural sets for several years. The second area of marketing, of course, was a complete line of new FM stereo receivers.

At first glance, the stereo adapter market appeared to be a lucrative one. By the middle of 1961, there were an estimated 15 million FM receivers in the United States, and stereo adapters were expected to sell at anywhere from $25 to $100. But after the first glow of enthusiasm at the prospect of millions of dollars in sales faded, manufacturers began to take a more critical look at the proposed adapter market. When they did, they found the rather disquieting fact that as many as 65% of the FM receivers probably weren't worth adapting for stereo. As one manufacturer stated at the Crosby-Teletronics technical seminar: "It wouldn't make much sense to put a $100 adapter on a $20 set." When it was suggested that the adapter market would be popular among hi-fi bugs, another manufacturer commented: "But if they are real bugs, they'll want a whole new tuner designed for stereo . . ."[1] As a result, Zenith decided not to produce adapters, and General Electric only produced one designed

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[1] "Patent Discord Hits Stereo FM," op. cit., p. 124.

for its own monaural FM receivers. By the first of June, the set manufacturers had split into three major camps: those such as Zenith who had decided not to produce stereo adapters; those at the other end of the pole, such as RCA, who concentrated on marketing adapters for all FM receivers; and finally, the manufacturers who decided to market a limited number of adapters at the beginning and then turn to complete FM stereo receivers later.[1]

The manufacturers were also having trouble producing their complete lines of FM stereo receivers. One problem was that the FCC decision came at a time when the receiver manufacturers had already finalized their plans for most of the 1962 models. GE and Zenith, along with the other manufacturers, also faced problems in establishing and coordinating assembly lines for this entirely new product and in obtaining the new parts needed for circuits that only recently had been approved by the FCC. These problems forced General Electric to tell its dealers that it would have combination AM-FM-FM stereo-stereo phonographs on the market sometime in June, but that smaller FM stereo receivers would have to come later. Zenith told its dealers that it wouldn't have stereo consoles available until shortly after Labor Day and warned that table models would not be available for another ninety days after that. Most manufacturers faced the same

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[1] "Three FM Stereo Roads Converge in Chicago," Electrical Merchandising Week, XCIII (July 24, 1961), pp. 2-3.

problem of having no stereo models to show their dealers until late June or July and no sets for sale until fall.

The Chicken and The Egg

It may, perhaps, be asked why so much emphasis has been placed on the actions of receiver manufacturers. It must be remembered, however, that FM stereo was an entirely new product. Before June 1, 1961, there were no FM stereo receivers on the market and no FM stations broadcasting commercially in stereo. As a result, a basic problem arose; what should come first into a market, the set or the station? The trite question, "What's first, the chicken or the egg?" was facing both broadcasters and dealers. The FM broadcaster saw little reason to spend a large sum of money for stereo transmitters, studio equipment, and program material when nobody could listen to it. But by the same token, the retail radio dealer and the general public saw even less need to spend anywhere from $25 to $300 for a special stereo receiver when there weren't any local stations broadcasting in stereo. Thus the future of the FM broadcaster, and of FM stereo broadcasting, depended to a great extent on the decisions of the FM receiver manufacturer and retailer. This problem is examined in more detail in the next chapter.

BROADCASTING

Broadcaster Reaction

The reaction of broadcasters to the FCC's April 19 decision was similar to that of the electronics manufacturers. For example, Lawrence Gordon, vice-president of WBUF (FM) in Buffalo, New York, commented: "You have to sit down in front of the set and deliberately listen to get the stereo effect, and I don't think that a housewife with a houseful of kids is going to do it."[1] A Los Angeles broadcaster, however, said he regarded the FCC decision as, "the date AM died."[2] Although broadcasters disagreed over the value of FM stereo, they did agree that FM was still the 'poor sister' of AM. Despite an accelerated growth rate, from a low of 553 commercial stations in 1955 to about 800 in April, 1961, most FM stations were having trouble attracting the listener, and the advertiser. To combat this, FM broadcasters were looking for something that would catch the interest of the public and the advertiser. To them, stereo might just be that something. James Gabbert, co-owner of a San Francisco FM station, KPEN, stated what many broadcasters believed to be stereo's main selling point: "FM stereo is the new sound of broadcasting which has given FM something that AM cannot

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[1] Wall Street Journal, op. cit., p. 16.

[2] "Stereo FM Opens New Vistas," op. cit., p. 54.

provide."[1] Thus stereo boosters began arguing that FM stereo would be the one thing they needed for identification with advertisers and agencies. Many FM broadcasters also hoped to recapture the hi-fi fans who were lost when home stereophonic phonographs were introduced in 1958.

Decisions

The advent of stereo, however, brought the broadcasters new problems as well as new hope. What would stereo cost the station? Could it recapture that cost? Will advertisers buy it? Will the public buy it? Is it really an amazing new service? The decision of whether or not to broadcast in stereo often depended upon the FM station's programming policy. If the station was duplicating a key AM station, or broadcasting rock and roll, there was little immediate interest in stereo. Audiences of these stations were not necessarily interested in high technical standards and much of the program material would not be improved by the addition of stereo. There was, however, at least one exception. Herbert Mendelsohn, sales manager for WABC-FM, New York, reported that his station expected to adopt stereo before the end of the year. Although the FM affiliate had been duplicating the programming of its sister AM station, Mendelsohn stated: "We hope to adapt to stereo as soon as

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[1]"Stereo Gives FM Something Extra," op. cit., p. 81.

we can, but it still has not been determined when the transmitting equipment will be available and how much it will cost."[1] Usually, independent "good music" stations were the most eager to broadcast in stereo. "One hour after the government gave the green light . . . we were on the phone looking for stereo broadcasting equipment," reported Leo Hoarty, the general manager of WFFI (FM) in Norfolk, Virginia.[2] Independent broadcasters were naturally concerned about the cost of conversion to FM stereo. With no manufacturer yet having FCC approved equipment or price lists available, estimates of the cost of conversion to multiplex stereo ran from $1,000 to more than $4,000. For FM station operators who saw red ink on their books much more often than black, this was a sizeable amount of money. "There goes my lunch money," commented one station operator.[3]

Extent of Stereo Acceptance

At this early date, just how extensive were the decisions to, or not to, engage in stereo broadcasting? Only scattered surveys appear to have been made during April and May, and the reliability of their results is questionable. They do, however, give a general picture of broadcaster

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[1] "FM Stations See Ad Boost From Stereocasting," op. cit., p. 3.

[2] Wall Street Journal, op. cit., p. 1.

[3] "Is Stereo FM's New Stronghold?" op. cit., p. 44.

acceptance of FM stereo. One survey was conducted by the John B. Knight Company for the National Association of FM Broadcasters and released on May 1, 1961. With returns from 212 FM stations, the survey reported that approximately two out of five (41.8%) stations definitely planned to broadcast in stereo. Only one out of eight (12.5%) stated that they definitely were not planning on stereocasting. A majority of stations (45.7%) reported that they hadn't yet decided one way or the other.[1] A smaller survey conducted by the Wall Street Journal and published on May 16, reported even more optimism towards FM stereo. Of 50 FM officials contacted, 60% stated their stations planned to be broadcasting in stereo within six months; another 10% said they would be broadcasting in stereo within a year. The Journal also noted that most of the remaining FM broadcasters hadn't definitely ruled out FM stereo, but were simply undecided.[2] From these two small surveys, it does appear that perhaps about half of the FM broadcasters were planning to begin stereo operations sometime in the near future while most of the remainder had not made up their minds.

With this rather broad review of the broadcasting industry's expectations towards FM stereo completed, we will now study the industry more deeply. To do this, the

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[1] "Study Shows 41% of FM Stations Plan Stereo," Broadcasting, LX (May 1, 1961), p. 72.

[2] Wall Street Journal, op. cit., p. 1.

remainder of the chapter is divided into three segments: engineering, programming, and advertising.

Engineering

Immediately before the beginning of FM stereo broadcasting, both knowledge and equipment were limited. Stations engineers could do little except read the scattered material available about the technique and consult with various equipment manufacturers. Many stations planned to adapt their present multiplex equipment for stereo transmissions while others began searching for new equipment. No electronics manufacturer, however, had an actual stereo FM transmitter on the market, nor had any even received type acceptance from the Federal Communications Commission.[1] The FCC, however, decided to allow stations to begin stereo broadcasts with their existing multiplex equipment without any further authorization. The stations did, however, have to notify within ten days the Commission and the FCC Engineer in Charge of the radio district where they were located, that they were preparing to begin stereo broadcasts.

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[1]All broadcast transmitting equipment must receive "type acceptance" from the F.C.C. before the Commission will grant the manufacturer a license to produce the equipment for commercial broadcast use. Type acceptance is based on the results of tests made by the manufacturer and evaluated by the F.C.C. These tests are run to determine if the equipment is capable of meeting the applicable F.C.C. technical standards for broadcast transmission equipment.

Programming

While FM engineers were facing the problems of obtaining stereo equipment, FM program directors were beginning to have troubles of their own. Their biggest difficulty was to obtain quality and quantity in their stereophonic broadcast material. Stereo recordings had been available since 1958, but, of course, many of them featured identical selections by different artists. For FM stations with a limited programming range, this quickly resulted in a shortage of suitable recordings. Quality also proved to be a problem for the FM program director. Many of the early 'stereo' releases were not actually recorded in stereo, but consisted instead of older monaural selections 'electronically enhanced' for stereo. These 'stereo' selections were usually two channels of the same sound tract that had been varied somewhat in volume. Such recordings proved a poor substitute for the FM program director who knew the exciting realism that proper stereo recordings could provide. The FCC in its final Report and Order of April 19 noted another difficulty with stereo recordings. It reported that some stereophonic records failed to provide good monophonic reproduction when their two channels were blended by the L+R method. The FCC's only advice was for: "FM stations engaging in stereophonic broadcasting . . . to exercise appropriate discretion in the selection of program material."[1]

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[1]Federal Communications Commission, op. cit., p. 10.

Advertising

Probably the biggest concern of an FM broadcaster was whether the addition of stereo would increase his station's revenue. Advertisers had expressed some interest in stereo when the old AM-FM system was being used. The Ampex Audio Company, for example, used AM-FM stereo radio in 1959 and 1960 to promote its line of stereo tapes and recorders in the top ten national markets. The major theme of the Ampex campaign was, "Stereo sounds best on tape - tape sounds best on Ampex."[1] Another successful example occurred in Beverly Hills, California where two FM stations joined together to broadcast four hours a week of the Boston Symphony Orchestra. While noting that the stations' AM-FM stereo programs were sold out, Arthur K. Crawford, the commercial manager for one of the FM stations, also reported:

> We charge $100 for four minutes of commercials on regular FM broadcasts, but we get $425 for four minutes on stereo broadcasts. That's a devil of a premium. We're convinced the new FM stereo broadcasting will mean a real boost for our profits.[2]

Even the most enthusiastic broadcasters, however, did not expect to increase their advertising rates immediately after turning to stereo. Most believed that there would have to be a large number of receivers in their markets before many companies would be interested in stereo

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[1] "Ampex Schedules 10 City Stereo Radio Push," Advertising Age, XXX (September 28, 1959), p. 84.

[2] Wall Street Journal, op. cit., p. 1.

advertising. Although this wait for listeners was expected to take at least a year, commercial managers were enthusiastic about the long range outlook. They were quick to note that a stereo station would retain its regular monophonic listeners while adding an entirely new audience whose interest in FM had been aroused by stereo. The broadcasters were also quick to point out that much of the stereo audience would consist of a high-income, "quality" listener that advertisers would be willing to pay more to reach. J. A. Englebrecht, the president of an Evansville, Indiana, FM station, WIKY, stated his expectations bluntly:

> There's just one thing pushing us into FM multiplexing, and that's the desire to make money. We'll have a strong talking point with advertisers and we're sure it will gather listeners and consequently improve advertising rates.[1]

Many broadcasters expected the first spurt of stereo advertising to come from the manufacturers of stereo equipment. The broadcasters believed that these receiver manufacturers would be eager to reach the segment of the population that was already interested in the good sound reproduction of monaural FM radio. Others thought that stereo record manufacturers would advertise on FM stereo to demonstrate their records and tapes just as Ampex had done a few years earlier. Their hopes appeared, at least to some extent, justified. "We will use FM to advertise this new

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[1] Ibid., p. 16.

service," stated Williams Clemmens, the radio receiver marketing manager for General Electric.[1]

Manufacturers, the government, and broadcasters all had high hopes for FM stereo. Manufacturers had devoted much time and money to the development of FM stereo. The Federal Communications Commission, long under fire for setting aside a large part of the valuable radio spectrum for FM broadcasting, hoped that FM stereo would provide the boost needed to really start the industry moving. Broadcasters believed stereo might be the means of obtaining the listeners and advertisers needed to help their stations become financially solvent. Other broadcasters, interested in stereo's "good music" qualities, expected it to be the ultimate sound in radio broadcasting. Were these expectations justified? Has FM stereo been accepted by broadcasters, advertisers, and listeners? Chapter III reports on the growth and acceptance of FM stereo broadcasting since its birth on June 1, 1961.

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[1] "Is Stereo FM's New Stronghold?" op. cit., p. 44.

CHAPTER III

THE GROWTH

June 1, 1961 - 1964

> What's ahead for radio?
> If I had been asked that same question in 1939, I would have answered - FM broadcasting.
> Today, 23 years later, something new has been added and I say to you FM-Stereo is what's ahead for radio.[1]

On June 1, 1961, FM stereophonic broadcasting became a reality. On that date, two stations notified the Federal Communications Commission that they had begun stereo broadcasting. WGEM, the General Electric-owned station in Schenectady, New York, was the first FM station in the country to broadcast in stereo on a regular commercial basis. It conducted its first stereo transmission at midnight, Eastern Daylight Time. Zenith Radio Corporation's FM station in Chicago, WEFM, also began its stereo broadcasting at midnight; but being in the Central Daylight time zone, it followed WGFM by one hour.[2] Although not officially reported

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[1]Robert T. Bartley, FM Stereo-A Quality Service in the Public Interest, An address before the Electronic Industries Association Symposium, New York, June 26, 1962 (Washington: Federal Communications Commission, 1962), p. 1.

[2]Federal Communications Commission, "Broadcast Primer," February, 1964, p. 14.

by the FCC, a third FM station, KMLA, Los Angeles, also presented its first stereo broadcast at midnight, June 1 (Pacific time).[1] This was the inauspicious beginning of FM stereo; only three of the more than 800 FM stations transmitting stereo broadcasts to few, if any, stereo receivers. But FM stereo was to grow. It would not expand as fast as many had hoped, or predicted, but grow it would.

The same pattern will be followed in this chapter as in Chapter II. The chapter will commence with a review of the limited governmental role since June 1, 1961, followed by similar studies of the electronics manufacturers and broadcasters.

GOVERNMENT

"While FM stereo must be regarded as an adjunct to monaural FM service, the FCC is hopeful that it will add a new dimension to FM listening."[2]

When June 1, 1961 arrived, the Federal Communications Commission had completed the most difficult part of its job. Reports had been studied, arguments heard, and standards established. Two basic tasks remained for the FCC; police the technical standards of FM stations already broadcasting

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[1] Don Weage (KMLA Program Director), Los Angeles, letter, December 9, 1964, to the author.

[2] U.S., Federal Communications Commission, 27th Annual Report, 1961, p. 55.

in stereo, and promote FM stereo in an effort to make it more popular with both the broadcaster and the listener.

Policing

In the two months of heavy promotion before June 1, 1961, one of FM stereo's best selling points was the high technical quality of its sound. With the start of commercial stereo broadcasting, however, it soon became apparent to broadcasters, electronics manufacturers, and the FCC that there would be problems in keeping these standards high. In July, 1961, FCC Commissioner Robert E. Lee warned a group of receiver manufacturers that all the work done by the FCC and the NSRC to insure the high quality of FM stereo would be worthless if the equipment they produced did not meet the established technical standards. He also expressed the hope that the competition among the receiver manufacturers " . . . would not result in killing the goose that lay a beautiful golden egg."[1] A year later, Commissioner Bartley repeated Lee's warning:

> Whether the world continues to beat a path to the door of FM stereo depends largely, I believe, on whether its quality is maintained. Remember, in FM stereo, the quality's the thing! It is the very foundation of the medium.
> If you would have FM stereo reach the peak of its potential take your case to the people! Let their sense of hearing convince them that here is truly a new perception in program enjoyment . . . a new and

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[1] J. F. Meagher, "Stereo FM is Potential Bonanza," Advertising Age, XXXIII (July 24, 1961), p. 97.

> wonderful service in the public interest. But keep it in the public interest! Keep the quality high![1]

As more stations initiated stereo broadcasts, the FCC and set manufacturers began to receive complaints from retailers, servicement, and listeners that some stations were not transmitting properly. In an attempt to solve this problem, FCC staff engineers met with EIA representatives in October, 1962. At this meeting, the EIA agreed to establish a nationwide monitoring system that would assist the FCC in checking the transmissions of FM stereo stations. If the monitors discovered any transmissions that deviated from approved standards, they were to report the stations to the FCC for disciplinary action.

Promotion

In addition to many speeches such as the one cited in this report by Commissioner Bartley, the FCC used other measures to promote FM stereo. Its first action was to make certain that the word "stereo" would always be associated with the highest broadcast quality possible. In July, 1961, FCC Commissioner Robert E. Lee told a symposium conducted by the National Association of Music Merchants that the FCC would not consider standards for AM stereo in the near future. Lee commented: I for one am in no mood to even study, let alone approve, stereo in the AM band. I believe it would be

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[1]Bartley, op. cit., pp. 6-7.

contrary to the public interest if the term 'stereo' were attached to less than high audio quality."[1] On September 27, 1961, the FCC officially denied petitions by the Philco Corporation, RCA, and Kahn Research Laboratories for the institution of proceedings that would lead to the adoption of AM stereo standards. No action was taken on another petition by Philco that asked the Commission to study the feasibility of stereophonic sound for television.[2]

The FCC also broadened the base of FM stereo by calling for a discontinuance of AM-FM stereo broadcasts on the grounds that they were no longer necessary or desirable " . . . insofar as the monophonic listener is concerned."[3] On December 18, 1961, the FCC announced that it was also permitting educational FM stations to conduct stereo broadcasts. These noncommercial stations, naturally, had to follow the same technical requirements as commercial FM stations.

ELECTRONICS INDUSTRY

Admiral Corporation: "Fine development, excellent prospects."

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[1] Meagher, op. cit., p. 97.

[2] On November 12, 1964, the FCC instituted such an inquiry. The Commission invited comments on the desirability of stereo sound for television, methods of transmission and reception, availability of stereophonic program material, and program techniques that could be utilized.

[3] Federal Communications Commission, op. cit., p. 11.

Philco Corporation: "It's a good, good service, but it's a minor good business from our standpoint."

Radio Corporation of America: "It's an important extra, but I'm not sure we'll see a speed growth curve."

Zenith Radio Corporation: "Don't oversell this. Sell it as something fine. It will be a good, steady, solid product."[1]

Second Thoughts Develop

By July, 1961, second thoughts about the rapid success of stereo began appearing among the producers of FM stereo receivers. The above comment by Zenith contrasts sharply with the statement: "We're convinced that for the electronics industry it's the greatest thing since television," that Zenith's president, Joseph Wright, issued just one and one-half months earlier.[2] Convinced, perhaps, that an FM stereo boom was not going to start by itself, the industry began settling down to the job of selling FM stereo to dealers, consumers, and broadcasters. By the end of July, the EIA had begun mailing 100,000 copies of a booklet entitled "A New World of Broadcast Sound," to FM station owners and radio receiver dealers. The 15 page booklet, paid for by thirteen radio manufacturers, described FM

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[1]"Second Thoughts on FM Stereo," Electrical Merchandising Week, XCIII (July 10, 1961), p. 11.

[2]Wall Street Journal, op. cit., p. 1.

stereo and explained why it was superior to any other broadcast sound. It concluded on the optimistic note that: " . . . a demonstration, in dealer showrooms, will convince any listener . . . that this is truly a whole new world of broadcast sound."[1]

Manufacturers Start Advertising

The electronics manufacturers were also preparing to take their case to the consumer himself. By the first of September, General Electric had prepared an advertising campaign that included national magazines and co-operative advertising with local dealers. Most companies, however, conducted their advertising campaigns almost entirely on the local level, and often they were the first, and only, advertisers on a new stereo station. For example, when WTFM, New York, began stereocasting on November 25, 1961, twelve electronics companies were the first and only sponsors to sign with the station. Placing 26 week schedules of up to 40 spots per week on the station were: Admiral, DuMont, Emerson, General Electric, Grundig Majestic, Motorola, Pilot Radio, H. H. Scott, Stromberg-Carlson, Westinghouse, and Zenith.

Despite these advertising efforts, the 'chicken and egg' situation did begin developing after June 1. In many

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[1]Electronic Industries Association, A New World of Broadcast Sound, 1961, p. 15.

markets, dealers hesitated promoting FM stereo receivers until FM stereo broadcasts were available. FM broadcasters, in turn, were waiting for dealers to sell enough sets to justify the costs of converting to stereo. In an effort to overcome this cycle, Zenith advertisements in several national magazines urged "forward-looking" consumers to purchase FM stereo receivers even if there were no stereo stations in the community because local stations would soon catch up with the trend.[1]

It appears that when a station did begin broadcasting in stereo, receivers were eagerly snapped up by the listeners. When WHDA in Dover, New Jersey, began stereo broadcasts, local dealers quickly sold the few stereo sets they had on hand. The station was then so swamped with callers wanting to know where to purchase stereo receivers that it had to run advertisements in the local paper asking the eager listeners to be patient.[2] The manager of a Coral Gables, Florida station, WVCG-FM, reported that within a week after his station began stereocasting, over $150,000 in stereo FM receivers had been sold in the area. Thirty days after KPEN in San Francisco began stereo broadcasts in August, 1961, a survey reported that while complete stereo

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[1] "Is Multiplex Radio Ready to Explode?" Printers Ink, CCLXXVIII (February 9, 1962), p. 13.

[2] C. P. Gillmore, "What You'll Want to Know About FM Stereo," Popular Science, CLXXX (June, 1962), p. 78.

receivers were only available in limited numbers, more than 3,200 stereo adapters had been sold.[1]

Industry Uncertainty

Although FM stereo receiver sales were successful in some markets, receiver makers were still reluctant to resume their 'boom' talk of the previous spring. In early January, 1962, an RCA spokesman commented: "We feel that it is a good talking point for radio salesmen, but frankly we don't know what it's going to mean in terms of sales." A Motorola sales manager added: "No one really knows whether its going to be a big bonanza or a very small one. We're inclined to think stereo sales will grow rather slowly." While nearly a dozen electronics manufacturers were producing FM stereo receivers by 1962, well over 100 other radio manufacturers were not. The president of one of the smaller manufacturers, Mr. F. A. D. Andrea, stated that his company was holding back because: "It is only a slight improvement over ordinary radio. You have to listen very closely to tell the difference."[2] However, another of the smaller firms, Emerson Radio and Phonograph, became convinced that stereo radios were a coming consumer item and did go into the stereo receiver business. The company's advertising manager, Eugene Van Cive commented: "We do believe it's a mass market product and that FM

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[1] D. A. Loewing, "New Sound of Music," Barrons, LII (January 8, 1962), p. 16.

[2] Ibid., p. 3.

generally is going to be a bigger and bigger factor in radio."[1] Among the smaller manufacturers, Avery Fisher, president of the Fisher Radio Corporation, was the most enthusiastic over FM stereo's first six months: "We will have the best fourth quarter in our history, thanks largely to FM stereo."[2]

Listener Popularity

Just how popular was FM stereo by January 1962? Although the exact number of FM stereo receivers sold in the United States has never been determined, the December 6, 1961 issue of the Wall Street Journal reported that 50,000 stereo receivers had been sold in the first six months of stereo broadcasting.[3] Barrons, a national business and financial trade publication, offered an even more optimistic sales picture. In its January 8, 1962 issue, the publication estimated that from June 1, 1961 to January 8, 1962, anywhere from 50 to 100 thousand stereo receivers had been purchased in the U.S.[4] The EIA's Consumer Products Division later reported that during the mongh of January 1962, receiver manufacturers had produced 18,000 FM stereo sets. As

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[1] Is Multiplex Radio Ready to Explode?" op. cit., p. 14.

[2] Wall Street Journal, December 6, 1961, p. 1.

[3] Ibid., p. 1.

[4] Loewing, op. cit., p. 16.

more stations turned to stereo, set production increased. By December 1962, L. M. Sandwick, the staff director of the EIA's Consumer Products Division, reported that manufacturers were producing 70,000 sets a month. This rapid pace continued into 1963 with producers reporting another 70,000 sets assembled during April. In a report to the NAB in early April, 1963, Sandwick stated that more than 750,000 stereo units had been sold since the fall of 1961. He went on to predict that in 1963 sales would hit one million units for the first time; an increase of 233,000 receivers over the previous year. Sandwick stated that because of a disclosure problem his figures excluded table models and hi-fi components.[1]

Pulse Survey of Sets

As can be inferred from the above figures, reports as to the number of FM stereo receivers either manufactured or sold in the United States have been in general figures only. One of the most detailed estimates of set sales was contained in a ten market composite study of AM, FM, and TV conducted by The Pulse Incorporated for the N.A.F.M.B. The pulse survey, conducted from November, 1963 through February, 1964, was published on April 13, 1964. The ten FM markets surveyed were Boston, Chicago, Cleveland, Detroit, Los

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[1]"Giant Strides Ahead for FM?" Broadcasting, LXIV (April 8, 1963), pp. 92-4.

Angeles, New York, Philadelphia, Pittsburgh, San Francisco, and Washington. A total of 1893 completed interviews were used for the analysis.

The survey reported that 805 of the homes interviewed (42.5%) had at least one FM receiver. Of these 805 homes, 203 (34.0%) reported that at least one of their sets could receive FM in stereo. Another 10.5% replied that they did not know if their sets could receive stereo. If this survey is a representative sample, There would then be approximately 3,379,000 stereo receivers located within these ten markets (estimated by Pulse to contain 23,464,800 homes). This figure, much larger than the estimate given by Sandwick, is probably a more accurate picture since the survey counted all stereo receivers including the table models, adapters, and foreign models that Sandwick's figures did not include. If there were approximately 3,400,000 located in these ten markets alone, it is obvious that there was a considerably greater number spread throughout the country.

The Pulse survey also seemed to bear out the predictions of those electronics manufacturers who believed that there would only be a limited market for FM stereo adapters. Of the 273 stereo FM homes, the vast majority, 94.9%, reported that they had purchased their FM stereo receiver new. Only 2.9% reported that they had converted their phonograph or monaural FM radio in order to receive FM stereo.

Expected FM Radio Purchases

When the FM homes without a stereo receiver were asked if they planned to purchase a stereo receiver within the next year, only 4.0% stated that they definitely would. While another 14.3% answered that they "maybe will," the overwhelming majority, 81.7% replied that they definitely would not purchase a stereo receiver. However, the picture was somewhat brighter in non-FM homes. When the 1088 non-FM homes were asked if they planned to purchase an FM radio within the next year, 21.2% answered that they either "might" or definitely would" purchase an FM receiver. Of these 230 homes that answered positively, 47.4% stated that their purchase would be an FM stereo radio. Another 18.3% either didn't know or couldn't give an answer. Thus in this ten market area, at least half of the people planning on purchasing an FM receiver were planning on making that receiver an FM stereo radio.[1] By July, 1963, the word 'boom' was again being heard in the comments of national FM officials. "I believe over 50 million FM receivers will be sold within the next five or six years, and that the largest portion will have FM stereo capabilities," stated the president of the N.A.FM.B., James Schulke. Schulke, however, qualified his statement: "This will happen if manufacturers truly

[1]The Pulse Inc., "10 Market Composite Three Media Study," April 13, 1964, pp. 11-12.

recognize this market and do the merchandising, promotion, and advertising job necessary to exploit its potential.[1]

Patent Conflict Continues

While the sale of FM stereo receivers has improved through the years, the patent conflict surrounding FM stereo has not. Shortly after Crosby-Teletronics filed its patent infringement suit against GE in the fall of 1961, it was forced to file a petition of bankruptcy under Chapter 11 of the Bankruptcy Act. Subsequently, the Trustee in Bankruptcy for the company had the suit dismissed without prejudice because it lacked sufficient funds to prosecute the suit.

On February 25, 1964, the United States Patent Office granted GE a patent covering the " . . . stereophonic FM broadcasting system adopted in 1961 as the U.S. standard and now in nationwide use."[2] The patent, #3,122,610, was issued specifically to Antal Csicsatka, a Hungarian refugee who worked for GE's radio receiver department in Utica, New York. The patent covers home receivers, receiver kits, broadcast transmitters, and certain service equipment. GE immediately announced royalty rates of 50 cents per receiver, $50 per transmitter, and $1.00 for service equipment.

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[1]"And Now FM Will Have the Numbers Too," Broadcasting, LXV (July 29, 1963), p. 53.

[2]General Electric Company, Press Release, February 26, 1964.

Although the U.S. Patent Office may have been satisfied with the validity of GE's patent claims, the Trustee for Crosby-Teletronics was not. Because a dismissal without prejudice permits the plaintiff to refile the law suit at a later date, the Trustee in Bankruptcy refiled the patent infringement suit against G.E. late in the summer of 1964. Since the Federal District Court for the Southern District of New York has been extremely busy, General Electric expects that it may " . . . literally be a matter of two or three years before there is any decision, if the matter goes to trial."[1]

BROADCASTING

"The benefits of stereo are not readily distinguishable to the untrained ear unless the station is broadcasting the sounds of a ping-pong game."[2]

" . . . stereo, we feel, is as superior to monaural transmissions as is a Rolls Royce to the horse and buggy."[3]

" . . . advertising has gone up considerably since the station went into FM stereo."[4]

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[1]L. Mason Harter (G.E. Counsel), Syracuse, letter, November 18, 1964, to the author.

[2]Loehwing, op. cit., p. 16.

[3]"Engineers Can See FM Stereo Improving," Broadcasting, LXIII (October 22, 1962), p. 88.

[4]"FM Stereo: How it Looks to Dealers and Broadcasters in Ten Key Cities," Electrical Merchandising Week, XCIV (September 12, 1962), p. 12.

"Stereo is a big waste of money and time and we may take it off our broadcasting schedule."[1]

"Some receivers have a tiny light which glows when the set is playing stereo so the owner will know he is getting his money's worth."[2]

"Stereo, I think, is worthwhile, because any improvement in listening quality gives us more pleasure."[3]

Thus the argument has continued. Broadcasters, advertisers, and critics have all expressed opinions about the value and the future of FM stereo. But while the arguments over the value of FM stereo have continued, so has its growth. On June 1, 1961, three stations began broadcasting in stereo. By the end of that year, there were 51. A year later, 183 stations were on the air in stereo. Another 60 stations began stereocasting in 1963, and the first official FCC report, issued on August 31, 1964, stated that there were 279 stations broadcasting in stereo.

Although FM stereo has contunually grown both in number and as a percent of the total number of FM stations, it has not expanded as fast as most experts had hoped. On September 7, 1961, the New York Times reported that between 80 and 100 stations were expected to be broadcasting in

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[1] Ibid., p. 9.

[2] A. Bester, "New Age of Radio," Holiday, XXXIII (June, 1963), pp. 56-65.

[3] Joel Tall, "Quality Standards for Broadcasters," Saturday Review, XLIV (June 24, 1961), p. 33.

stereo before the end of the year. By October, 1961, the N.A.B. had become a little less optimistic. It predicted that 79 stations would be broadcasting in stereo by the end of 1961. The most optimistic prediction was made by L. M. Sandwick in April, 1963, when he stated that there would be 300 FM stereo stations by the end of that year; a number yet to be reached in the middle of 1964. The only prediction that underestimated the number of FM stereo stations was made by Printers Ink in February, 1962. The articles suggested that: " . . . there could well be over 100 [FM stereo stations] by the end of 1962."[1] In reality, there were almost twice that number on the air by the end of the year.

TABLE 1

GROWTH OF FM STEREO

Date	Number of FM stations	Number of FM stereo stations	Stereo as % of Industry
June 1, 1961	871[a]	3[b]	0.34%
Jan. 1, 1962	960	51	5.31%
Jan. 1, 1963	1081	183	16.93%
Jan. 1, 1964	1146	243	21.20%
Aug. 31, 1964	1202[a]	279	23.21%

[a]Estimates published by Broadcasting magazine; all other station numbers are official figures issued by the Federal Communications Commission.

[b]Figure includes KMLA, Los Angeles.

[1]"Is Multiplex Radio Ready to Explode?" op. cit., pp. 13-15.

For a more complete picture of the progress of FM stereo since June 1, 1961, events in the broadcasting industry will again be separated into the three broad categories used in Chapter II: engineering, programming, and advertising.

Engineering

"We feel like a guinea pig, or even a pioneer."
--Marshall M. Carpenter, president and general manager, WDTM (FM)[1]

As with most new inventions, FM stereo had a few "bugs" in it. One of the biggest problems facing FM station engineers was getting their new stereo equipment to produce the high quality transmissions expected from it. Most broadcasters realized that one of stereo's greatest assets was its proven ability to provide a superior transmission to the home. As a result, most station engineers took the extra time and effort needed to achieve this quality. A few, however, did not and the result was the formation of the EIA's monitoring committee in late 1962. Fortunately, most station engineers held opinions similar to that of Charles N. Duncan, the chief engineer of KGB-FM in San Diego, California: "We have a great deal of confidence in what we are doing and what we will be able to do in the future."

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[1]The Detroit News, August 2, 1961, p. 9-B.

Technical Problems

One of the early fears of station management was that the stereo equipment might be too complex and sensitive for use under normal broadcast conditions. However, these fears were soon dispelled; as the general manager of WASH-FM, Washington, D.C., pointed out: " . . . a good engineer can properly install and operate stereo station equipment." The chief engineer of WQXR-FM, New York City, Louis Kleinklaus, agreed with Dillard that stereo equipment could be made as reliable as other professional broadcast equipment. He also found that stereo equipment did not require any more attention than a monophonic installation, provided operational and maintenance patterns were properly devised and followed. Kleinklaus also reported that even after a relatively long period of time, most adjustments were confined to touching up the performance of the over-all system.[1]

In spite of his optimistic comments, Kleinklaus no doubt had the memory of a rather touchy incident in the back of his mind. When WQXR-FM began stereocasting on September 8, 1961, the station's management decided to hold a formal "sneak preview" for representatives of set manufacturers, retail dealers, and the press. Unfortunately, when the stereo receivers were switched on, the representatives heard more static coming from the two speakers than they did music.

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[1] "Engineers Can See FM Stereo Improving," op. cit.. p. 88.

After a rapid check by station engineers, the problem was discovered to be a defective amplifier in one of the speakers. The relieved management quickly reported that the interference was not the result of defective stereo transmissions.

Station engineers also faced the problem of stereo signals not being able to travel as far as monaural FM signals. Many stations discovered that when they initiated stereo broadcasts, their switchboards lighted up with complaints about poor reception. Some stations countered by obtaining permission to increase their power and raise their antenna height. In more densely populated areas, however, FCC regulations often prevented this alternative. Many stations then were forced to suggest to their listeners that they purchase a good antenna. KMLA had to face this problem with its Los Angeles audience. William Tomberling, the station's general manager, reported: "We found our listeners were getting us with a minimum amount of antenna for monophonic broadcasts. But when we went to stereo, they got noise. The problem was the antenna."[1]

The cost of conversion to stereo was a problem for many station managers. Although the costs of conversion naturally varied as to the size of the station and the quality of equipment purchased, the following estimate from the Collins Radio Corporation is fairly representative:

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[1]"FM Stereo: How It Shapes Up Now," Electrical Merchandising Week, XCIV (April 9, 1962), p. 7.

TABLE 2

STEREO EQUIPMENT COSTS

Stereo Multiplex Generator	$1,500.00
Control Console	3,550.00
Limiter	950.00
Two Stereo Cartridges (for turntables)	73.00
Two Stereo Recorder/Playback Units	1,600.00
Stereo Modulation Monitor	2,150.00
TOTAL	$9,823.00[a]

[a]Broadcast Equipment Catalog and Price List Number 42, Collins Radio Corporation, Dallas, Texas, 1964.

These basic costs do not consider the expense of re-stocking a station's record library with stereo recordings and tapes. The usual price of stereo recordings purchased directly from a distributor is $1.00 to $1.50 per 33 1/3 rpm album. Naturally, a station could spend much more in its conversion to stereo. Harold Tanner, manager of WLDM-FM in Detroit, reported that it cost his station over $100,000 "to do it right."[1]

Critical Reviews

Along with engineering problems associated with the conversion to stereo, broadcasters also had to face published

[1]"Stereo: Will It Be FM's Big Break?" Broadcasting, LXII (April 9, 1962), pp. 50-52.

comments from various 'critics.' High Fidelity magazine, after monitoring the stereo transmissions of WGFM in Schenectady, New York, reported: "Our net impression thus far is that the new system works - but that it could work a lot better." Although the first broadcasts had suffered from the background noise that was later reduced, but not eliminated, the magazine concluded: "We have no reason to doubt that these technical bugs will eventually be eliminated. . . . A system that has clearly demonstrated its ability to bring a new dimension to broadcast programs deserves at least the grant of patience."[1]

Other comments were more uncomplimentary. D. A. Loehwing, writing for Barrons, reported some "music purists" were criticizing stereo FM because it produced too much separation. Their argument was that for FM to achieve the stereo effect, the microphones had to be placed at least a dozen feet apart while in real life, "concert goers hear the music with ears placed a good deal closer together."[2] This, to say the least, is an inaccurate criticism of FM stereo. The microphones used in a stereo broadcast are not intended to replace the "ears" of the person attending a concert. Rather, the mikes are placed to transmit as realistically as possible the placement and volume of the orchestra. In the

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[1]"FM Stereo Progress Report," High Fidelity, XI (October, 1961), pp. 60-1.

[2]Loehwing, op. cit., p. 16.

home, the ears of the listener are still as close together as those of the actual concert goer.

Broadcasting, however, continued to show enthusiasm for the new medium. On July 29, 1963, it reported: "With the proper acoustics, receiving equipment, and antenna, the quality of FM stereo programs is outstanding. The comparison with monaural is dramatic."[1]

Programming

Program directors also had their share of problems in the early days of FM stereocasting. As was previously noted, many program directors feared the lack of stereo recordings would become an acute problem. While a shortage of good recordings did materialize for some stations with specialized programming, most were able to amass enough selections to broadcast in stereo for most of the day. WTFM in New York, with the help of European discs and tapes, had collected a stereo library of some 50,000 selections by November, 1961. By April of 1962, the manager of KODA-FM in Houston, Texas, was able to report that his station had enough material available for a stereo schedule of 18 hours a day.[2] Many times it was the lack of money, not the lack of recordings,

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[1] "And Now FM Will Have the Numbers Too," op. cit., p. 54.

[2] "Stereo: Will It Be FM's Big Break?" op. cit., pp. 50-52.

that kept a station from broadcasting a larger schedule of stereo programs.

Quality of Material

The quality of stereo recordings was another problem faced by programmers. In October, 1961, the N.A.B. warned stations and record manufacturers that only 75% of the stereo discs available were acceptable to monaural listeners. This difficulty was often caused by 'trick arrangements' that utilized channels recorded in separate studios to emphasize the stereo effect. While the resulting wide channel separation may have made interesting stereo entertainment, the channels often would not blend properly for an acceptable monophonic signal.[1] The monitors for High Fidelity, however, reached the opposite conclusion about the entertainment value of 'trick' stereo recordings. They found that when WGFM played a selection with exaggerated channel separation, the monophonic version of the broadcast sounded much "cleaner." The monitors expressed the hope " . . . that crudities in the selection of program material will vanish as the sophisticated listener makes his presence felt."[2]

Monitors for Consumer Reports reached some conclusions of their own after monitoring an unspecified number of stereo stations. They agreed with High Fidelity

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[1] "FM Stereo Progress Report," op. cit., p. 61.

[2] Ibid., p. 143.

" . . . that there was a considerable variability in the stereo quality of the program material used in stereo broadcasts." But rather than too much channel separation, the monitors found that some stereo recordings did not display enough of the stereo effect. "When such recordings are played on a FM stereo program, the results will be just as disappointing as when the records are played on a home machine." While the magazine warned its readers that they should not expect every FM stereo program to convey the stereo effect clearly, the report concluded: "The occasional disappointments during the test did not weaken CU's [Consumer Union's] conviction that FM stereo is well worth the music listener's interest."[1]

Stereo Usage

Although most FM stations continued to devote the majority of their broadcast schedule to music, some FM program directors began dreaming up other uses for the technique. WTFM, New York, which refers to itself as "the nation's first FM station to broadcast in stereo 24 hours a day," went on the air November 25, 1961, with a specialized 'Continental' programming format. The station offered European-flavored features and music presented by announcers with overseas broadcasting or entertaining experience. To provide this 24 hour service, the station reached agreements

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[1]"First Impressions of FM Stereo," Consumer Reports, XXVII (July, 1962), p. 319.

with several European broadcasters for the exchange of program tapes.

In the Spring of 1963, General Electric conducted one of the largest attempts to study the potential of stereo programming for the selling of a product. GE sponsored a series of four dramas and several Victor Borge musical programs over the QXR network of FM stations " . . . to learn exactly what dimensions stereo can add to drama." The series premiered on March 6, 1963 with Agnes Moorehead starring in "The Turn of the Screw." Following the initial program at three week intervals were Peter Ustinov starring in "Billy Budd," Joseph Cotten in "The Fall of the House of Usher," and finally, Cyril Ritchard and Dina Merrill in "Visit to a Small Planet." When the series was completed and audience reaction counted, James Sondheim, president of the QXR Network, commented: " . . . there is a large, enthusiastic nationwide audience for quality dramatizations on radio."[1]

WABC-FM, New York, made history on August 1, 1963 when it became the first network-owned FM station to provide separate stereo programming. With the exception of its news programs, all of the station's 6:00 PM to Midnight programming was transmitted in stereo. In announcing WABC-FM's shift to stereo, the president of ABC-Paramount, Leonard Goldenson, comments: "Through the excitement and richness of

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[1]"Advertisers Like Stereo," Broadcasting, LXV (July 29, 1963), p. 68.

stereophonic sound, we are adding an entirely new dimension of listening enjoyment to our New York FM service."[1] In August 1964, WLS announced that its FM affiliate in Chicago was going to be the first FM station to broadcast live sporting events in stereo. WABC-FM, however, achieved another stereo sports first on November 8, 1964 when it became the first FM station to broadcast a regularly scheduled, sponsored professional football game in stereo. The station used five microphones to broadcast the New York Jets-Buffalo Bills play-by-play action in stereo:

Mike #1: Shotgun mike on field focused on the action,

Mike #2: Play-by-play announcer, run parallel to field mike (#1),

Mike #3: Color announcer,

Mike #4: Crowd and band (broadcast over left channel),

Mike #5: Crowd (broadcast over right channel).

The sound of the game itself was always in the same position as the play-by-play announcer (left, center, or right) and moved up and down the field in relation to the football's position on the field. Alexander Smallens, Jr., WABC-FM station director, noted that the main advantages of broadcasting in stereo is stereo's ability to recreate the field

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[1] "And Now FM Will Have the Numbers Too," op. cit., p. 56.

of action for the home listener.[1] The game, which was broadcast monaurally by WABC-AM, seemed to bear out the prediction of David Polinger, station manager of WTFM. Polinger told the NAB in April of 1963: "We are blessed with the dynamic force in broadcasting, and I predict that AM-FM station owners will program their FM frequency and duplicate on AM."[2]

FCC Commissioner Bartley has summed up fairly well the breadth of radio programming that can be achieved through stereophonic sound:

> Stereophonic broadcasting opens up an opportunity for new talent and production techniques. These include new arrangements of musical numbers to take advantage of stereo's depth and separation qualities; new compositions reflective of the creative freedom which these qualities afford the composer; new stylings of orchestral and choral groups which adapt their artistry to stereo's potentials of shading, contrast, vibrance. It provides a new flexibility in dramatic production. Yes, even new markets for capturing and preserving all this on natural-as-life tapes, records, albums.[3]

Success of Stereo Programming

How successful have FM stereo stations been in attracting and holding a listening audience? As was pointed out earlier, a Pulse survey for ten of the nation's largest markets reported that approximately 14.4% of the 1893 homes interviewed had FM stereo receivers. When the FM and FM

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[1] "Alexander Smallens, Jr. (WABC-FM Station Director), New York, letter, December 11, 1964, to the author.

[2] "FM Stereo: How It Looks A Year Later," Electrical Merchandising Week, XCV (April 8, 1963), p. 29.

[3] Bartley, op. cit., p. 6.

stereo homes were questioned in more detail about their listening habits, the survey found that for both the previous day and the previous week, more FM stereo homes had listened to their radio than had monaural FM homes. For example, 46% of the monaural FM homes answered that they had listened to their radio sometimes during the previous day while 55.7% of the stereo homes reported their radio had been on during the previous day. This same difference of approximately 10.0% was also noted in the answers to the weekly listening question. In monaural FM homes, 66.2% reported that they had listened to their FM radio during the previous week. In contrast, 77.0% of the stereo homes reported that they had had their radio turned on.

The survey also reported that people in FM stereo homes listened to their radios longer than did people with monaural FM radios. Of the FM stereo homes interviewed, 20.5% stated that their radios had been operating for five or more hours during the previous day; 6.6% reported that they were on for ten hours or more. In the monaural FM homes, however, only 16.6% reported that their receivers were on for five hours or more; 4.5% stated that they were operating for ten hours or more. The picture was much the same when questions were asked about listening habits during the previous week. In the FM stereo homes, 50.1% listened ten hours or more; 23.6% had their radios on 30 hours or more; and 4.0% reported that in the previous week they had

had their FM stereo radios operating for 70 hours or more. In the monaural FM homes, 10.0% fewer people, (40.2%), had their radios on for ten hours or more; 16.1% estimated that they had listened for 30 hours or more; and 3.2% reported that they had listened for 70 hours or more.

The Pulse survey also gives FM stereo a slight edge in the number of homes during the specific hours of 10:00 AM to 3:00 PM and 8:00 PM to 10:00 PM. The survey found that during the 10:00 to 3:00 period on the previous day, 25.7% of the monophonic homes had had their sets turned on while a slightly larger number of FM stereo homes, 26.4%, had had their receivers playing. During the key evening hours of 8:00 to 10:00 PM, the spread was much wider; 18.3% of the monoaural receivers were turned on in comparison to 26.0% of the stereo receivers.[1]

Advertising

Shortly after stereo broadcasts had begun, John F. Meagher, vice-president for radio of the NAB, told an EIA symposium that the attitudes of advertisers and agencies towards FM stereo ranged from: "Stereo is the excitement the medium has been looking for," to "Stereo won't make that much difference; the FM listener is the same FM listener with or without stereo."[2]

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[1]The Pulse Inc., op. cit., pp. 3-5.

[2]Meagher, op. cit., p. 97.

Advertising Uncertainty

Thus the sales manager, like his counterparts in programming and engineering, had his problems too. When FM stations switched to stereo, their sales managers often expected stereo equipment manufacturers to spend large amounts of money advertising their lines of stereo receivers and adapters via FM stereo. However, some stations quickly discovered that such would not be the case. Only three months after the advent of stereo, one pioneer stereo station was already threatening to throw in the towel. WKFM, Chicago, reported to the New York Times that it was ready to cancel its 16 hours per week of stereo broadcasts because of the lack of advertisers. "We had hoped that General Electric or Magnavox or some other manufacturer would sponsor some of our stereo programs," a station spokesman stated. "After all, they have a lot to gain in that they want to sell their sets to our listeners. But they've got their heads in the sand." When the Times contacted the major receiver manufacturers about the problem, they conceded that they were under mounting pressure from stereo stations to sponsor more programs. One manufacturing executive, who preferred to remain anonymous, retorted: "Many stations want us to underwrite their conversion to stereo. We're not prepared to do this."[1] The spokesman for WKFM who complained to the New

[1] New York Times, September 7, 1961, p. 48.

York Times also failed to point out that the station had received some support from receiver manufacturers. On June 15, 1961, the Times reported that the H. H. Scott Company, a manufacturer of high fidelity components, was advertising in stereo over WKFM. Their commercials, which had announcers, trains, and ping-pong balls moving from one speaker to the other, carefully explained to the non-stereo listener what he was missing:

> If you were listening to this broadcast in stereo, you would actually hear the ball bouncing back and forth across your room. And you would hear all the beautiful music this station broadcasts with thrilling stereo realism - the first violins on the left - the second violins on the right.
> The music would virtually surround you.[1]

Other stations however were finding that some set manufacturers were willing to sponsor stereo programs. When WQXR-FM began stereocasting in early September, sponsorship of a weekly stereo program entitled "Adventure in Sound" was immediately purchased by a producer of stereo radio equipment, the Fisher Radio Corporation. As was noted earlier in this chapter, WTFM in New York had twelve receiver manufacturers signed up for a 26 week schedule when it began stereo broadcasting on November 25, 1961.

Some of the producers' reluctance to advertise was, of course, due to their problems in manufacturing and marketing a line of stereo receivers. These manufacturers saw

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[1] New York Times, June 15, 1961, p. 70.

little need for advertising products that had yet to be placed in their dealers' showrooms. L. M. Sandwick of the BIA noted this problem at the 1962 meeting of the NAB. He reminded FM broadcasters that the FCC order permitting stereo came after the new lines of equipment for the coming year had already been designed.[1]

A few record manufacturers also began experimenting with FM stereo as an advertising medium. London Records, RCA Victor, Angel, and Capitol Records were among the first advertisers to purchase time during WQXR-FM's stereo broadcasts.[2] While the advertising of stereo discs was limited, the decision of some record manufacturers to use FM stereo began to fulfill the hopes that many FM broadcasters had expressed earlier. (See p. 55 .)

The advertising picture, then, was not all black. KFMU (FM) Los Angeles, reported as early as September 4, 1961 that its billings were up $11,000 <u>because</u> of stereo. The owner of KFMU, International Good Music, Inc., also began urging more than thirty other FM stations that utilized its subscription program service (Heritage Music) to switch to stereo " . . . even though this will eventually make obsolete about $100,000 in monaural recordings we now use to make Heritage program tapes." The administrative

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[1] "Stereo: Will It Be FM's Big Break?" <u>op. cit.</u>, p. 52.

[2] "FM Stereo's Promo Puzzle," <u>Sponsor</u>, XV (September 18, 1961), pp. 37-38.

vice-president of IGM, John D. Tuttle, went on to note that: "Stereo is giving FM its first chance in a long time to grow in commercial stature; to sell something not so intangible as the quality of the audience."[1]

One Year Later

In spite of the early successes of some stations, such as KFMU (FM), a limited survey conducted by Electrical Merchandising Week and published on September 24, 1962, reported that many stations around the nation were still having trouble obtaining advertisers.

WBCN, Boston: " . . . the sponsors are backward. They have not awakened to FM stereo's possibilities."

WHFS, Washington: " . . . we're certainly not living off our advertising."

WFMT, Chicago: "We have noticed increased advertising, but it has come from people in the business. There has been no outside interest."

KMLA, Los Angeles: " . . . advertising has gone up considerably since the station went into FM stereo. The advertising is coming not only from set manufacturers and dealers, but from general time buyers."[2]

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[1]"Sponsor Asks: What's Ahead in FM Stereo for Advertisers?" Sponsor, XV (September 4, 1961), pp. 40-44.

[2]"FM Stereo: How It Looks to Dealers and Broadcasters in Ten Key Cities," op. cit., pp. 8-9.

Stereo Commercials

What types of stereo commercials and campaigns have been produced and how are they being used? A few excellent examples are those used by General Electric, Chevrolet, and RCA Victor in the early months of 1963. By sponsoring a series of top-flight stereo programs over the QXR network, as previously mentioned, GE wanted to learn if home appliances with a pleasant appearance and good performance could be effectively sold by stereo radio. GE and its agency, Young and Rubicam, tried a number of selling techniques on what it considered an audience of above-average intelligence. In follow-up research, GE learned that stereo commercials could do a 'visual' selling job; stereo radio could give the listener a visual image of the product! These 'adult' commercials were found to be especially effective in FM's atmosphere of relatively low commercial saturation and high listener involvement. However, GE's manager of advertising for its Radio-TV Division, Thomas Castle, warned: " . . . there's still a lot to be learned."

Chevrolet and its agency, Campbell-Ewald, confined their stereo experiments to an exclusive 26 week Detroit campaign. Chevrolet was interested in a campaign designed to discover how effectively FM stereo could sell automobiles in comparison to the other mass media. Chevrolet's agency used the opportunity to give its staff members a chance to work with stereo commercials. When the agency's staff actually

started to produce the stereo commercials, they quickly discovered some interesting problems. For example, how could they express the "jet smooth" theme of the Chevrolet in stereo? The problem was solved by recording jets taking-off and landing at Detroit's Metropolitan Airport. How do you best take advantage of the stereo effect to emphasize the wide variety of Chevrolet models available? This problem was solved in one of the commercials by having a customer stand at the right microphone anxious to purchase a specific Chevrolet model. However, a salesman at the left mike insists on mentioning all 31 Chevrolet models over the futile interruptions of the customer. When the salesman has finished, the customer replies, "You left out the Monza Club Coup."[1]

The Chevrolet stereo commercials provided problems for the recording engineers as well as the copywriters. In addition to maintaining the proper balance for broadcasting, the studio engineer must also make certain that the signals are sent out on the proper channels. For example, if the channels get mixed up, the announcer might seem to be driving from the right hand side of the car instead of the left.[2]

When the 26 week campaign was completed, Chevrolet and Campbell-Ewald would only comment that the stereo

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[1]A complete copy of this commercial is located in the Appendix.

[2]The Detroit News, April 14, 1963, p. 16-E.

commercials did a good job of creating an awareness of Chevrolet.[1] The president and general manager of WDTM (FM), Detroit, Marshall Carpenter, Jr., was more enthusiastic:

> The delighted listener response we received as a result of these stereo commercials is very revealing. As a result of these listener comments, I am convinced that not only is there a definite place for stereo commercials in broadcasting, but that it will be the preferred method in the future.

Carpenter also noted that other advertisers watched this "pioneering effort" with a great deal of interest.[2]

RCA Victor's 26 city stereo campaign over the QXR Network in early 1963 is an excellent example of how broadcasters had expected record manufacturers to utilize FM stereo. In the hour long RCA Victor series, entitled "RCA Victor Premier Showcase," the program's commercial slant, both in the 'official' commercial and the interview segments, was directed towards the company"s new recording technique called "Dynagroove." (At this time, RCA Victor was pushing "Dynagroove" in an attempt to obtain a larger slice of the adult long-play record market.) What made RCA Victor's FM stereo programs particularly important was that they represented a break in the company's policy of utilizing print and some spot radio advertising to promote its line of long-play records. In 1962, RCA Victor had spent over $6,000,000 for newspaper and magazine advertising while another $140,000

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[1] "Advertisers Like Stereo," op. cit., pp. 68-9.

[2] Variety, February 27, 1963, p. 24.

was set aside for spot radio advertising. Now the company was attempting a different type of radio campaign. While admitting that with RCA Victor using so many advertising media it was impossible to tell what caused a customer to purchase a specific record album, the account executive for RCA Victor, Robert C. McIntyre, noted that, " . . . the use of FM stereo at a national level will do a lot to help us sell records to an audience which has the income and the liesure time to enjoy them."[1]

Optimism

Although advertisers have not raced to jump on the FM stereo bandwagon, many broadcasters are still convinced that the future of FM is hinged to stereo. As early as April 1962, the general manager of KCMO-FM, Kansas City, E. K. Hartenbower, predicted that his station's billings would double in the next ten years. WABC-FM was so confident of FM stereo's ability to attract advertisers that it increased its commercial rates by 50% when it began broadcasting in stereo. WABC-FM's confidence was quickly justified. Alexander Smallens, Jr., WABC-FM station director, noted that after one year of stereo broadcasting, the station's audience jumped from an average of 5,100 homes per quarter hour to 21,000 homes. At the same time, sales were from

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[1] "New Sound From RCA Victor Gets FM Stereo Sendoff," Sponsor, XVII (April 1, 1963), pp. 43-4.

four to five times greater than the previous year's. Smallens stated that, "major clients never before in FM have joined WABC-FM since our initial stereo broadcast."[1] KFNB (FM) in Oklahoma City also found success with 'middle-of-the-road' stereo music and good news coverage. The station's general manager, Richard C. Corner, reported that their 24 hour stereo format " . . . is the only way we get good ratings and compete with AM stations for advertisers."[2] The manager of WTFM, New York, ably summed up this more optimistic outlook of FM broadcasters at the 1963 NAB meeting: "People are recognizing that FM stereo gives us advantages over AM."[3]

Radio Station KPEN

Now that the general progress of FM stereo since June 1, 1961 has been reported, how has an FM station made successful use of this electronic technique? One of the most widely reported success stories is that of KPEN. KPEN (FM), San Francisco, is a 46 kilowatt station broadcasting on the frequency of 101.3 megacycles. It was established on October 27, 1957 by two 22 year old men who had managed to scrape together $11,000 for the purpose of starting an FM station.

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[1] "New York FM Credits Success to Stereo," Sponsor, XVIII (August 31, 1964), p. 40.

[2] "Big Markets Offer Something For All," Broadcasting, LXVII (December 14, 1964), p. 68.

[3] "FM Stereo: How It Looks a Year Later," op. cit., p. 29.

In the Spring of 1961, KPEN offered a three page leaflet describing FM stereo. When the station received over 4,000 requests for it, the two owners, Gary Gielow and James Gabbert, realized that stereo broadcasting might be worth the investment. But in order for Stereo FM to be a commercial success, the owners realized that they would have to develop consumer interest in this completely new product. In the weeks before the initiation of KPEN's stereo broadcasts, the two owners worked extensively to sell local department stores and hi-fi shops on the potential profits in stocking FM stereo receiving equipment. The day before the station began stereocasting, the owners tried to interest the general public in FM stereo by placing full page advertisements in both San Francisco morning papers. When KPEN did begin stereocasting, on August 10, 1961, the co-owners also made certain that part of the station's fifty hour per week stereo schedule would be broadcast during store hours. "We did that purposely to help dealer demonstrations," stated Gielow.[1]

High Standards

Gielow and Gabbert realized that for FM stereo to be a success, they would also have to establish high programming and engineering standards. To achieve excellent technical

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[1] "FM Stereo's First Big Success," Electrical Merchandising Week, XCIII (September 25, 1961), p. 73.

standards, the owners demanded that their equipment receive continuous, high quality maintenance. The station's engineering staff finally modified the commercially produced studio and transmitting equipment to such an extent that it has become almost custom built. In an attempt to gain a wide range of listeners, the station's programming was kept as broad as possible. The program schedule included nearly every type of music with the exception of rock and roll. The owners also decided that the station's commercial copy had to keep from offending the listeners. As a result, singing commercials, bizarre sound effects, and hard sell copy are prohibited.

The two owners also paid special attention to the programs that might tempt customers in a store to purchase a stereo receiver. Gielow and Gabbert assumed that few people had really heard stereo and that most would not understand a technical explanation of FM stereo. As a result, the station programmed stereo music with especially good channel separation during store hours so that the dealer could actually demonstrate to his customers the difference between FM stereo and monaural receivers. Nearly all of KPEN's classical music programs began with light, familiar selections designed to prepare the audience for the heavier, lesser-known numbers that followed.

Success

And their efforts paid off. The station quickly gained advertisers and listeners. Within thirty days after the station began stereo broadcasting, San Francisco dealers reported that they had sold more than 3,200 stereo adapters. By June of the following year, an estimated 40,000-50,000 receivers and adapters had been purchased in the Bay area. By the end of the year, the number had risen to over 100,000.

After turning to stereo, KPEN found itself in the rating surveys for the first time; placing as high as fourth in the share of total AM-FM audience. One national magazine became so enthused over the listener response to KPEN that it reported: " . . . the entire stock of receivers vanished like snowflakes in a hot skillet . . . " when the station began stereocasting.[1]

In spite of the ban on certain types of commercials, advertisers also believed that KPEN's stereo broadcasts were worthwhile. The two owners told an EIA luncheon in January 1963 that two months after they inaugurated their stereo broadcasts, the influx of additional advertisers had paid for the outlay they incurred in purchasing the needed stereo equipment. By early September 1961, KPEN's limited commercial time was almost completely sold out through the following February. By the end of 1962, the owners could

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[1]Gillmore, op. cit., pp. 78-81.

claim that their station had 65 regular advertisers and that it was accounting for 55% of the gross revenue of all the FM stations in the San Francisco-Oakland market. The station, according to its owners, has never been in the red since it began broadcasting in stereo.

Not content to rest on their laurels, the station owners went ahead with plans for live drama and symphony programs. In late December 1962, the station scored a major first in the San Francisco area by broadcasting the San Francisco Symphony Orchestra live in stereo. The three hour broadcast was fully sponsored by Merrill, Lynch, Fenner, and Smith, and by the Safeway stores. The two owners could also boast of broadcasting "The Cadillac Hour;" the only FM program sponsored in the United States by the Cadillac Motor Car Division of General Motors. The same statement was true for the United States Lines and its program, "Relaxation."

While telling the EIA of their success, Gabbert and Gielow readily admitted that many stereo broadcasters needed help from receiver manufacturers with advertising and promotion guidance. The owners stated that stereo broadcasters could always use especially prepared advertising layouts, suggestions for news releases, and other promotional material. KPEN used these promotional and store merchandising tie-ins so effectively that the manager of Hales Department Store in San Francisco commented well before the Holiday Season that

stereo sales in his store were so high that it was "like Christmas week."[1]

In a speech before the Electronic Industries Association in early 1963, James Gabbert summed up the hopes of most FM broadcasters: "Stereo has put radio back into the living room for the first time since television."[2]

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[1]"Electronic Industries Association to Monitor Stereo FM: Poor Transmission Problems," Broadcasting, LXIII (December 3, 1962), p. 69.

[2]"FM Stereo Success Story: KPEN (FM)," Broadcasting, LXIV (January 14, 1963), p. 54.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND SUGGESTED RESEARCH

The foremost purpose of this study is to provide the first detailed historical account of the development and growth of FM stereophonic broadcasting. In the process of presenting this account, the thesis has also become a study of the people concerned with FM stereo. It reported their opinions, expectations, and controversies.

The preceding chapters of the study attempt to present the historical account of FM stereo without comment on the validity of the statements, arguments, and actions of the people involved. This chapter, however, will weigh their validity and present some conclusions in addition to providing a summary of what appear to be the most significant findings of the study and suggesting further research.

Summary of Findings

In addition to the findings that went into the actual writing of the history and growth of FM stereo broadcasting, two other facts have become apparent.

Perhaps the most important of the two facts was the discovery of the lack of published material about FM

stereophonic broadcasting. It appears that at the time of this thesis little research has been conducted in the area of FM stereo, nor have any books been written about broadcasting that even mention the topic of FM stereo. Although many periodicals devoted articles to FM stereo, some contained only superficial information and others were completely inaccurate. For example, the April 8, 1963 issue of Electrical Merchandising Week reported that WTFM, New York, planned to broadcast a rock and roll program in stereo from 7:00 until 11:00 P.M. The program, aimed at the teenage market, was designed to stimulate the sale of table model FM stereo radios.[1] However, in following up this article, the author received this reply from WTFM: "In answer to your query, the report you refer to is erroneous. WTFM has not changed its format and does not intend to do so."[2] To combat the problem of erroneous articles, the author has attempted to crosscheck as much of the information presented in this study as possible.

In the process of writing this thesis, it was also found that there is a lack of statistics as to the number of FM stereo receivers manufactured, or sold, in the United States. Only the vaguest estimates were ever reported in

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[1] "FM Stereo: How It Looks a Year Later," op. cit., p. 29.

[2] Don Russel (WTFM Program Manager), New York, letter, December 15, 1964, to the author.

trade publications, and industry groups such as the E.I.A. greeted the author's inquiries with stony silence. The only clue as to the reason for industry silence came in a letter from Hugh D. Hexamer, manager of press relations for General Electric's Radio and Television Division. "I believe you were unable to get information from E.I.A., in part, because of the association's security rules concerning data which would reveal any manufacturer's share of a specific industry."[1]

Conclusions

Based on the information reported in this study, several conclusions can be drawn.

No doubt the most vital conclusion that can be made is that FM stereo has been accepted by FM broadcasters and that it is growing in popularity. F.C.C. figures clearly demonstrate that an increasing number of FM stations are converting to stereo or are originally going on the air in stereo. While the growth is not as great as some of FM stereo's most ardent supporters might have desired, there is still growth.

It has also become apparent to this author that those with the largest stake in a new technique, such as FM stereo was in early 1961, often tend to exaggerate the most

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[1]Hugh D. Hexamer, Syracuse, letter, December 8, 1964, to the author.

about the future prospects of that technique. Thus before June 1, 1961, Zenith and GE officials were constantly issuing rosy comments about the future of FM stereo. At this same time, E.I.A. officials were always optimistic about the number of FM stereo receivers they expected to be sold while the NAB and NAFMB were equally over-optimistic about the number of stations that would begin broadcasting in stereo.

It also appears obvious that stereo is not making too great an impact on advertisers. Although little research has been done on the subject, the lack of trade publication articles on this topic would tend to make this conclusion valid. Certainly if advertisers were trooping to FM stations because of stereo, broadcasters would be as quick to spread the news as they were to tell about the few advertisers cited in this study. Silence, in this case, is just as much an admission as a printed report would be.

Considering events in the few years since the F.C.C. decision to select the Zenith-GE system over Crosby-Teletronics, the Commission's choice seems to have been the correct one. The selection of a system that allows 'storecasting' as well as stereocasting has been especially important because of the inability of many FM stations to remain solvent from advertising revenue alone. It appears evident that had the Crosby-Teletronics system been adopted, many FM stations would have had to forgo stereo for the additional revenue of 'storecasting.'

Stereo broadcasting alone, then, cannot solve the problems of FM broadcasters. Although many FM stereo stations such as KPEN have become successful, there is no conclusive proof that stereo broadcasting alone has resulted in that success. In fact, because many FM stereo stations such as KHFS, Washington, D.C., are not financial successes, there must be other factors involved. It appears that many factors result in the success or failure of an FM stereo station. Good programming, aggressive salesmen, and strong promotion are indeed just as much as stereophonic transmissions.

Certainly FM stereo has not pushed television out of the living rooms of most homes. The Pulse survey previously mentioned in this study does show, however, that people in FM stereo homes tend to listen more to FM radio than their counterparts in monaural FM homes. This certainly should give FM broadcasters an added impetus to 'sell' FM stereo to their listeners.

It appears, then, that FM stereophonic broadcasting has not reached the heights dreamed of by its most ardent supporters. Nor has it, for that matter, fallen flat on its face as its most ardent cynics expected. Instead, FM stereo has followed the path of slow growth. As the number of FM stations broadcasting in stereo slowly increased, so has receiver sales. FM stereo is following a middle course of

growth and acceptance that will be of benefit and service to an ever-increasing number of broadcasters and listeners.

Suggested Research

There are many vital areas of FM stereophonic broadcasting that need additional detailed research.

As was noted earlier in this chapter, there is a startling lack of knowledge as to the number of FM stereo receivers in the United States. Such information, it seems to this author, would be vital to such organizations as the NAFMB that are constantly attempting to sell the advantages of FM to advertisers.

A study of the impact that the initiation of stereo broadcasting has on an FM station would be of vital interest to FM broadcasters. This research would attempt to discover the effect of stereo on such aspects as a station's advertising revenue, number of listeners, and prestige in the community. The number of variables, however, would make it very difficult to do this study accurately.

For the law student who desires to specialize in patents, there is an excellent prospect for a thesis dealing with the continuing conflict between General Electric and Crosby-Teletronics over FM stereo patents.

The electrical engineer with an interest in history could conduct a detailed study of the systems, tests, and arguments presented to the N.S.R.C. and F.C.C. before the

selection of the Zenith-GE system of stereophonic broadcasting. While such a study may appear to be a 'second-guessing' of the F.C.C. decision, it would provide a much needed accurate condensation of information.

Other historical studies dealing with stereophonic sound could be done on the era of AM-FM stereo broadcasting or on the early experiments with FM stereo. For those with an eye towards the future, there could be a study of the feasibility of stereophonic sound for television.

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APPENDIX

APPENDIX

The following Chevrolet commercial, entitled, "Amazing Choice," was presented in May or June of 1962 for use on national radio. It was felt at the time, however, that the two voices playing against each other tended to blend together and create confusion. The commercial was later presented, slightly revised, for FM stereo in the expectation that the proper use of two speakers would give the needed separation of voices. The commercial was created by the Campbell-Ewald Advertising Agency.

CHEVROLET CENTRAL OFFICE
12-17-62
12-27-62 Adv. appvd. - 12-27-62
Eng. Appvd.
1-3-63 As Produced

C-CO-2-3393-SRT-90A
"AMAZING CHOICE"

LEFT SPEAKER

RIGHT SPEAKER

SOUND: CHEVY SHOWROOM DOOR OPENS. MAN ENTERS AND CROSSES TO RIGHT SPEAKER

SALESMAN: Good evening, sir.

CUSTOMER: Good evening.

SALESMAN: Welcome to our Chevrolet One-Stop Shopping Center. (FEELING HIM OUT)

(more)

CHEVROLET CENTRAL OFFICES :90
"AMAZING CHOICE"

LEFT SPEAKER	RIGHT SPEAKER
	Uh . . . Can I help you?
	CUSTOMER: (VERY MATTER OF FACT) Yes, I'd like to buy a car.
	SALESMAN: Well, you've come to the right place. Chevrolet has an amazing choice of cars for '63. Four entirely different kinds of cars, in fact . . . with a total of 33 models.
	CUSTOMER: (HIS MIND IS MADE UP) Yes, well I want the . . .
	SALESMAN: (CROSSING TO LEFT SPEAKER) Now over here we have . . .
SALESMAN: (COMPLETING CROSS OVER) the Chevrolet	CUSTOMER: (RIGHT AFTER WORD "CONVERTIBLE," SPEAKING OVER THE CONTINUING SALESMAN)

(more)

CHEVROLET CENTRAL OFFICES :90
"AMAZING CHOICE"

LEFT SPEAKER

Impala Sport Sedan.

And then we have

the Impala Sport Coupe,

Convertible,

(BEGIN TO FADE SALESMAN A BIT SO CUSTOMER'S LINES WILL EMERGE CLEARLY; THE SALESMAN, IN HIS READING, SEEMS TO SLIDE INTO A KIND OF AUTOMATIC RITUAL AS HE TICKS OFF THE VARI-OUS MODELS; WE CAN AL-MOST SEE HIM COUNTING ON HIS FINGERS.)

4-door sedan and two 4-

door station wagons. 2

Bel Air Sedans and 2

Bel Air Wagons. 2

Biscayne Sedans and

Biscayne Wagon. Chevy

Two offers the Nova

400 Sport Coupe, Con-

vertible, 4-door sedan,

and 4-door wagon. Then

you have the Chevy Two

300 2-door and 4-door

(more)

RIGHT SPEAKER

Uh...look...there's

no need to go

through the whole

list of 33 models.

I'll take the Im...

(STOPS COLD AND

LISTENS IN DISBELIEF)

CHEVROLET CENTRAL OFFICES :90
"AMAZING CHOICE"

LEFT SPEAKER	RIGHT SPEAKER
sedans and 4-door wagon...and the Chevy Two 100 2-door and 4-door sedans and 4-door wagon.	CUSTOMER: Good heavens, you certainly know your business, don't you?
SALESMAN: In the Corvair line, there's the Monza Convertible and 4-door Sedan...700 Club Coupe and 4-door sedan... 500 Club Coupe...and two Greenbrier Sports wagons. And don't forget (CROSSING BACK TO RIGHT SPEAKER)	CUSTOMER: (IMPRESSED) That is an amazing choice. But I'll still take the Jet-smooth Impala Convertible.
	SALESMAN: the two new Corvette Sting Rays!
	CUSTOMER: (SUDDENLY STERN AND AUTHORITATIVE) And don't you forget Corvair's Monza Club Coupe!

CHEVROLET CENTRAL OFFICES :90
"AMAZING CHOICE"

LEFT SPEAKER

RIGHT SPEAKER

SALESMAN: (STUNNED-HIS JAW DROPS) Hah?

CUSTOMER: You left it out.

SALESMAN: (SPORTINGLY-REGAINING HIS POISE QUICKLY) Why, I believe you're right. I only named 32 models and Chevrolet has 33.

CUSTOMER: (WEARILY) Could I buy that Impala Convertible now?

SALESMAN: (CHEERILY) Certainly, Sir. And what a wonderful choice of colors you have. There's...

CUSTOMER: (JUMPING IN, ALERTLY, TO CUT OFF ANOTHER RECITATION) Never mind, I'll take this

CHEVROLET CENTRAL OFFICES :90
"AMAZING CHOICE"

LEFT SPEAKER

RIGHT SPEAKER

blu-ish green one.

SALESMAN: (GETTING IN THE LAST WORD WITH A MINOR VICTORY OVER HIS WELL-INFORMED CUSTOMER-HAUGHTILY)

Sir, that's Azure Aqua.