DIGITAL AUDIO BROADCASTING

HEARING

BEFORE THE

SUBCOMMITTEE ON
TELECOMMUNICATIONS AND FINANCE

OF THE

COMMITTEE ON
ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

NOVEMBER 6, 1991

Serial No. 102-100

Printed for the use of the Committee on Energy and Commerce



U.S. GOVERNMENT PRINTING OFFICE

54-738 WASHINGTON : 1992

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-038383-8

F/W Pub. Law 102-563

COMMITTEE ON ENERGY AND COMMERCE

JOHN D. DINGELL, Michigan, *Chairman*

JAMES H. SCHEUER, New York
HENRY A. WAXMAN, California
PHILIP R. SHARP, Indiana
EDWARD J. MARKEY, Massachusetts
AL SWIFT, Washington
CARDISS COLLINS, Illinois
MIKE SYNAR, Oklahoma
W.J. "BILLY" TAUZIN, Louisiana
RON WYDEN, Oregon
RALPH M. HALL, Texas
DENNIS E. ECKART, Ohio
BILL RICHARDSON, New Mexico
JIM SLATTERY, Kansas
GERRY SIKORSKI, Minnesota
JOHN BRYANT, Texas
RICK BOUCHER, Virginia
JIM COOPER, Tennessee
TERRY L. BRUCE, Illinois
J. ROY ROWLAND, Georgia
THOMAS J. MANTON, New York
EDOLPHUS TOWNS, New York
C. THOMAS McMILLEN, Maryland
GERRY E. STUDDS, Massachusetts
PETER H. KOSTMAYER, Pennsylvania
RICHARD H. LEHMAN, California
CLAUDE HARRIS, Alabama

NORMAN F. LENT, New York
CARLOS J. MOORHEAD, California
MATTHEW J. RINALDO, New Jersey
WILLIAM E. DANNEMEYER, California
DON RITTER, Pennsylvania
THOMAS J. BLILEY, JR., Virginia
JACK FIELDS, Texas
MICHAEL G. OXLEY, Ohio
MICHAEL BILIRAKIS, Florida
DAN SCHAEFER, Colorado
JOE BARTON, Texas
SONNY CALLAHAN, Alabama
ALEX McMILLAN, North Carolina
J. DENNIS HASTERT, Illinois
CLYDE C. HOLLOWAY, Louisiana
FRED UPTON, Michigan

JOHN S. ORLANDO, *Chief of Staff*
JOHN M. CLOUGH, JR., *Staff Director*
MARGARET A. DURBIN, *Minority Chief Counsel/Staff Director*

SUBCOMMITTEE ON TELECOMMUNICATIONS AND FINANCE

EDWARD J. MARKEY, Massachusetts, *Chairman*

JAMES H. SCHEUER, New York
MIKE SYNAR, Oklahoma
W.J. "BILLY" TAUZIN, Louisiana
RALPH M. HALL, Texas
DENNIS E. ECKART, Ohio
BILL RICHARDSON, New Mexico
JIM SLATTERY, Kansas
JOHN BRYANT, Texas
RICK BOUCHER, Virginia
JIM COOPER, Tennessee
THOMAS J. MANTON, New York
C. THOMAS McMILLEN, Maryland
RON WYDEN, Oregon
RICHARD H. LEHMAN, California
CLAUDE HARRIS, Alabama
JOHN D. DINGELL, Michigan
(Ex Officio)

MATTHEW J. RINALDO, New Jersey
CARLOS J. MOORHEAD, California
DON RITTER, Pennsylvania
THOMAS J. BLILEY, JR., Virginia
JACK FIELDS, Texas
MICHAEL G. OXLEY, Ohio
MICHAEL BILIRAKIS, Florida
DAN SCHAEFER, Colorado
JOE BARTON, Texas
NORMAN F. LENT, New York
(Ex Officio)

HERBERT H. BROWN, *Chief Counsel/Staff Director*
LARRY IRVING, *Counsel*
LISA GURSKY, *Policy Analyst*
CATHERINE REID, *Minority Counsel*

CONTENTS

Page

Testimony of:

Abel, John D., executive vice president, National Association of Broadcasters 4

Bennet, Douglas J., president, National Public Radio 29

Box, Alan L., chairman, National Association of Broadcasters Digital Audio Broadcasting Task Force 42

Holmes, John R., director, Audio Systems Business Unit, Delco Electronics Corp 6

Shapiro, Gary J., group vice president, Consumer Electronics Group, Electronic Industries Association 15

DIGITAL AUDIO BROADCASTING

WEDNESDAY, NOVEMBER 6, 1991

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS AND FINANCE,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:45 a.m., in room 2123, Rayburn House Office Building, Hon. Edward J. Markey (chairman) presiding.

Mr. MARKEY. Today the subcommittee will begin an inquiry into the state of emerging and advanced radio technologies. Recent breakthroughs in digital communications herald a new era for radio broadcasters, receiver manufacturers, and consumers.

This morning we will witness a demonstration of the exciting potential of digital audio broadcasting, radio data systems, and other technologies and services which promise to revolutionize the radio broadcasting industry.

Many industry observers tend to underestimate the ongoing importance of radio in our lives. As the American people focus their attention and their expenditures on the alphabet soup of new communications technologies, including VCR's, HDTV, CD's and DAT, we risk losing sight of the unique and essential role broadcast radio historically has played, and will continue to play, as a provider of news, information and entertainment.

Consider these facts. In a typical week, 96 percent of all Americans age 12 and up listen to radio. The average person tunes in to radio programming for 3 hours every day. If today is an average day, radios will play for 1 hour and 20 minutes in homes across the Nation. And revealingly, 41 percent of adults aged 18 and over select radio over television and newspapers as their primary source of morning news. These statistics should not be surprising when we consider that there are 557 million radio sets in the United States, or more than two per person. Americans own more radios than any other mass media device.

Despite the continuing importance of radio in our daily lives, however, radio broadcasters are facing a number of serious challenges. Consumers are demonstrating a preference for high quality digital radio, and are increasingly purchasing compact discs, digital cable radio services, and more recently, digital audio tapes. In this environment, AM and FM broadcasters, still limited to lower-quality analog technology, stand to lose competitive ground, including audience and advertising revenues. Many radio broadcasters, as a result, have embraced the potential of digital audio broadcasting, which offers the promise of crystal-clear and interference-free

audio as a method of ensuring the preservation of radio broadcasting.

While DAB offers hope for all radio broadcasters, it may hold particular promise for AM broadcasters, who have been hit hardest by the economic recession and the emergence of superior quality audio products and services. AM's share of the radio audience has fallen from nearly 100 percent in the 1960's to 60 percent in 1975, less than 25 percent today.

Further, according to the National Association of Broadcasters, half of all AM stations presently are operating at a loss. DAB, which theoretically may enable AM stations to broadcast a digital signal with technical standards and coverage area equal to, or nearly equal to, FM stations, could assist AM broadcasters in their struggle to regain audience share. As we will hear later this morning, the issue of AM/FM parity is the subject of much debate.

The emergence of DAB has raised several other questions and issues as well. Amongst them, will DAB require a new spectrum allocation? Should DAB be delivered terrestrially or by way of satellite, or both? Should existing broadcasters be given a preference for DAB licenses, or should the field be open to other groups, particularly minorities and women which historically had been under-represented in broadcasting.

These are difficult questions, but ones which must be answered before American broadcasters and consumers can participate fully in the digital broadcasting revolution. Already the FCC has begun to focus attention on the radio broadcasting industry in general and on DAB in particular.

This subcommittee, as part of our ongoing oversight function, will continue to review these issues to ensure that the implementation of DAB and other emerging radio technologies is consistent with the public interest.

I know that the radio broadcasting and consumer electronics industries also have serious concerns regarding these issues. I applaud NAB and EIA for their leadership in advancing the level of public debate. NAB and EIA's activities will hasten the introduction of technologies and policies to benefit both American broadcasters and consumers.

In addition, I want to commend my good friend from New Jersey, the ranking minority member of the subcommittee, Mr. Matt Rinaldo, for his continued leadership on issues affecting the radio broadcasting industry. Over the past several Congresses, Mr. Rinaldo introduced several radio related bills and has been committed to ensuring the preservation of our unique system of locally based broadcast radio.

Before concluding, I want to note that later today I am joining with the full committee chairman, Mr. Dingell, as a cosponsor of legislation designed to curb abuses regarding time brokering agreements. Mr. Dingell and I have been concerned for a long time about the effects of such agreements on the radio broadcasting industry and believe that congressional action is necessary to correct existing FCC policy.

We are fortunate to have such a distinguished panel of witnesses. I welcome them and look forward to their testimony as we catch a

glimpse of what the future will hold for the radio industry and its audience.

That concludes the opening statement of the Chair.

The Chair recognizes the ranking minority member, the gentleman from New Jersey, Mr. Rinaldo.

Mr. RINALDO. Thank you very much for your kind comments, Mr. Chairman.

I also want to take this opportunity to commend you for scheduling the committee's first hearing on emerging radio technologies, including digital audio broadcasting, or DAB.

In the last decade, we witnessed the emergency of cable and satellite technology as well as the development of high definition television—HDTV. Indeed, given all the changes in the video industry, it may appear that radio's impact has diminished in today's entertainment and information marketplace.

Yet, radio has remained our most intensely personal and innovative mass medium. Along with the advent of digital audio broadcasting and other exciting technological developments, radio has the potential of becoming as technologically advanced as any other media.

Clearly, the development of DAB is the most exciting challenge facing the radio industry today. With the ability to deliver compact disc quality sound, better frequency response, less interference in spectrum efficiency, DAB represents a revolutionary technology with the potential to strengthen radio's ability to compete in today's fast-paced entertainment and information marketplace.

However, along with the promises of new services and choices, come new controversies and policy decisions. These technological advances come at a time when the radio industry is under severe financial stress. It is crucial, therefore, that DAB be implemented carefully into today's radio system so as not to undermine the locally based system of American radio stations which have served our communities so well.

The technologies which will be discussed and demonstrated by today's witnesses, represents some of the exciting and challenging changes facing the radio industry during the coming years.

Today's hearing is the first of several sessions this subcommittee will hold to examine the public policy issues surrounding the implementation of this new technology. These issues include spectrum allocation, transmission standards, technology transition, and the impact of digital technology on existing AM and FM radio stations.

Mr. Chairman, thanks again for holding this hearing, and I want to welcome all of our distinguished witnesses, and yield back the balance of my time.

Mr. MARKEY. The gentleman's time has expired.

Are there any other members seeking recognition at this time for the purpose of making an opening statement?

[No response.]

Mr. MARKEY. The Chair does not see at this time any other members seeking recognition.

We will then go to our first panel. We will ask them, if they could, to please keep their opening statement down to 5 minutes so that the members will be able to question them.

The first panel consists of Mr. John Abel, who is executive vice president of the National Association of Broadcasters, and Mr. John Holmes, director of the Audio Systems Business Unit of Delco Electronics Corporation.

Welcome to the two of you. Mr. Abel, whenever you are ready, please begin.

STATEMENTS OF JOHN D. ABEL, EXECUTIVE VICE PRESIDENT, NATIONAL ASSOCIATION OF BROADCASTERS, AND JOHN R. HOLMES, DIRECTOR, AUDIO SYSTEMS BUSINESS UNIT, DELCO ELECTRONICS CORP.

Mr. ABEL. Thank you, Mr. Chairman. My name is John Abel. I am Executive Vice President of Operations for the National Association of Broadcasters. I am pleased to be here to tell you about some exciting new radio broadcasting technologies that will improve the services that radio broadcasters provide to their listeners.

There are three broadcasting technologies that I will cover, two that deal with improvements to existing AM and FM service, and the last being digital audio broadcasting. Let's begin with AM.

As you know, AM radio has had its technical problems over the years. There are three problems here: AM transmission standards deteriorated over the years, there's been increased environmental interference to AM transmissions, and AM receiver quality was not as high as it should have been. I am pleased to say that both the radio broadcasting and receiver manufacturing industries have been working together in the past 2 years to address these three problems. First, we were successful in getting the FCC to improve the technical AM transmission standards. Second, we have made the FCC aware of the problems created by too much environmental and high tech interference that causes problems for AM transmissions. And, finally, we have worked with the receiver manufacturing industry to improve the quality of AM radio receivers.

We had to make certain that AM radio receivers could receive the higher quality transmissions authorized by the FCC. NAB and the Electronic Industries Association have jointly developed standards for AM radio receivers and we have selected a certification mark, called AMAX, that will communicate to consumers that these new AM radios meet high quality receiver standards. These AMAX receivers are being manufactured as we speak, some are on the market today and many will be coming to market in early 1992.

These new receivers include a broader bandwidth, noise blanking technology to reduce the environmental interference, an external antenna capability and will include the expanded AM band capability. These new receivers, coupled with the FCC's actions to improve AM radio technical standards will result in higher quality AM radio service for America's radio listeners.

Another new improvement technology for FM radio is called Radio Broadcast Data Systems, or RBDS. RBDS is a technology whereby FM stations can transmit data to "smart" receivers, enabling these receivers to perform a variety of automatic functions. Again, to implement this technology requires that FM radio broadcasters alter their transmissions slightly and FM receiver manufac-

turers build new RBDS receivers. Some of the potential consumer benefits of RBDS include: Emergency alerting capabilities which may supplement the Emergency Broadcast System; consumer scanning and tuning by station format instead of by frequency; traffic announcement and information services; and an LCD display on receivers to display new information such as traffic, news, weather, emergency information, and so forth.

In essence, RBDS gives FM broadcasters access to new data services that they can transmit to consumers.

Finally, I'd like to explain a little about the newest radio broadcasting technology that is still under development, but promises to provide even higher quality service to America's radio listeners. This new radio technology is Digital Audio Broadcasting, or DAB.

DAB is the transmission of computer code over the aid. Current AM and FM broadcasting technology is analog. DAB has three major benefits for consumers and broadcasters:

First, the obvious benefit is that DAB will provide compact disc quality audio to be transmitted over the air free to consumers.

The DAB transmission sounds better because DAB contains more information than current AM and FM transmissions. DAB permits broadcasting to be as good as current compact discs. In fact, we often refer to it as CD quality broadcasting.

The second major benefit is greatly reduced or total elimination of the interference that plagues AM and sometimes FM broadcasting. I'm sure you're familiar with the AM interference, but there is growing FM interference caused by reflections of transmissions off of high rise buildings and other structures. Some forms of DAB will totally eliminate this interference. Obviously, this will be a significant benefit to broadcasters and radio listeners.

The third benefit of DAB is that it will permit the broadcasting of data, to significantly increase the services that broadcasters can provide to consumers. Since the computer code is nothing more than bits of data, some of which will be changed to sound at the receiver, but other bits could represent stock and commodity quotations, maps, coupons, specialized news, emergency information, and a host of other data that could be received not by audio DAB receivers, but instead, by computers or specially built data receivers. Those are the three major benefits.

Now, how can DAB be broadcast? DAB can be broadcast by terrestrial transmitters and by satellite or some combination of both. In the terrestrial mode, DAB could be broadcast by using new spectrum or by using the current spectrum allocated to broadcasting, although there are many obstacles to both of these alternatives. DAB in the United States has only been demonstrated in spectrum other than current FM spectrum. DAB can certainly be broadcast by satellites, but again, the satellite broadcasters will need new spectrum.

In all cases, whether we are talking about satellite or terrestrial DAB, the consumer will need to purchase a new receiver. No existing receivers will be able to receive DAB transmissions. Terrestrial broadcasters will need to build new transmissions facilities, but these facilities will not be very costly.

Finally, we in the radio broadcasting industry are committed to working with the receiver industry to improve the quality of serv-

ices and sound that we transmit. We look forward to the day when we can transition to digital audio broadcasting and provide an even higher quality of sound and new data services for America's radio listeners.

Thank you.

Mr. MARKEY. Are you going to put on a little demonstration?

Mr. ABEL. Yes, we can do the demonstration now or we can wait until after Holmes. It's your pleasure.

Mr. MARKEY. Why don't we do part of the trade show now and then we'll come back and we'll do Mr. Holmes—his part of it as well.

Mr. ABEL. All right. We have a demonstration of AM quality sound, FM quality sound, and digital audio sound. The headphones over here will not reach up to the platform. If you want to come down and listen on the headphones, although we do have it by speakers as well. I think you will be able to tell the difference.

Mr. MARKEY. Without the headphones, let's go.

[Audio demonstration.]

Mr. MARKEY. Why don't we keep the music going and the next witness can begin his testimony—that would be nice.

There is a roll call on the Floor. I don't know how the other members would like to handle this, maybe we should break? OK, we'll take a brief break here and we will be right back.

[Brief recess.]

Mr. COOPER [presiding]. We will resume the hearing.

Chairman Markey has, unfortunately, been delayed temporarily but he will be rejoining us.

The second witness will be Mr. John Holmes, Director of Audio Systems Business Unit of Delco Electronics Corporation. Mr. Holmes.

STATEMENT OF JOHN R. HOLMES

Mr. HOLMES. Thank you.

On behalf of Delco Electronics, I would like to thank the subcommittee for this opportunity to present our views on the subject of digital audio broadcasting and its impact on the consumer electronics industry. Delco Electronics is the world's largest manufacturer of automotive radios, supplying a variety of audio products to makers of automobiles, trucks and agricultural machinery.

Delco has been a member of the NC Committee, which established AMAX standards for improved AM receivers. And, today, we are the only manufacturer of AMAX certified AM stereo receivers. As such, we are deeply concerned with the needs and wants of the traveling public.

Digital audio broadcasting—DAB—represents potentially the most important development in mobile entertainment, information and data services since the advent of radio itself in the late 1920's. This opportunity is the result of rapidly developing technology in a number of areas. These technologies include high-speed integrated circuits to process digital information, compression techniques that allow more efficient use of radio spectrum and transmission methods that provide remarkable improvements in noise immunity. Achievements of this potential requires the cooperation of broad-

casters, broadcast equipment manufacturers, receiver manufacturers and government.

Delco Electronics has done extensive market research into the requirements of mobile radio listeners. Audio fidelity and noise immunity are as important to our customers as is product reliability. This has led us at Delco Electronics to take an active role in applying digital radio technology that will deliver consumer value.

Further, DAB holds the potential to deliver important data communications services demanded by the emerging Intelligent Vehicle Highway System initiative. The same technology that delivers quality audio can also provide detailed traffic congestion updates and other valuable information to drivers. These proposed new services can improve safety, increase mobility and reduce emissions resulting from congestion on America's highways.

Delco Electronics is laying the groundwork to compete internationally in new radio technologies. We are investigating each of the proposed systems publicly announced by digital audio proponents. We have developed a working digital audio test system suitable for over-the-air evaluation of a variety of system trade-offs. Delco Electronics is active in cooperative efforts to establish standards for DAB. In short, we believe we are doing our part to maintain U.S. competitiveness in this new technology.

Of course, there is much more to international competitiveness than simply having the right technology. DAB raises the question of cross-industry and international cooperation, spectrum allocation and impact on broadcasters. Expanded U.S. private sector investment in DAB will depend on signals from both government and industry that show support for early establishment of this new service. Cooperation and joint action by industry and government are necessary.

In order to deliver DAB to the mass market, many industry segments must cooperate. Broadcasters must transmit DAB signals. Consumer electronics firms, such as the one I represent, must supply the marketplace with receivers. Semiconductor companies must provide specialized components for these receivers. All of this is possible only if these activities conform to a single standard that ensures compatibility of all these critical elements.

Although several system proponents are working on technology that would permit DAB transmission in the existing FM band, many technical questions remain, and it may be necessary to allocate new spectrum for the service. Any consideration of new spectrum is likely to involve both civil and government spectrum use issues. European, Canadian and Mexican agencies are already engaged in discussion of spectrum allocation for digital audio broadcast. The U.S. involvement in this interagency and international issue is critical.

In summary, Delco Electronics believes digital audio broadcasting will make possible a dramatic improvement in audio broadcast quality to the motoring public and has the potential to provide a valuable information link for emerging Intelligent Vehicle Highway System initiatives.

We further believe DAB is a driving force behind advanced technologies for the consumer electronics industry and the strategic semiconductor sector. If DAB is established internationally years

prior to introduction in the United States, our international competitiveness would be put at risk while the public would be denied access to an important new service.

We at Delco Electronics are committed to support development of digital audio broadcast as an important benefit to the motoring public and we look forward to working with all interested parties in the advent of audio technologies.

Thank you.

Mr. COOPER. Thank you very much, Mr. Holmes.

About how much would a DAB receiver cost in an automobile if we were able to buy one today?

Mr. HOLMES. I don't have that answer. We are in the process of early development of the DAB technology in the receiver and I really don't have that answer.

Mr. COOPER. I guess today it might even cost more than the car if it were that rare a commodity.

I would presume, like most electronic items, even if the initial cost were high, it would soon decrease substantially, so that it would soon be affordable.

Is that in your projections that DAB receivers would soon be affordable by the average car customer?

Mr. HOLMES. That would be our expectation. But the development of the technology and the application of the technology would make it a consumer product in an achievable price range.

Mr. COOPER. What is the average price of a car radio today? What would DAB be competing against in terms of dollars? What's a good AM/FM cassette system right now made by Delco?

Mr. HOLMES. Of course, the average price of a receiver will vary according to the features and functions that the receiver has available to it. But if you're talking an average high quality receiver with an AM/FM cassette, you're in the neighborhood of a couple hundred dollars.

Mr. COOPER. So you would expect, to reach a mass market, DAB would have to come down somewhere in the range of a couple hundred dollars to spark widespread consumer demand?

Mr. HOLMES. I think that would be a logical assumption.

Mr. COOPER. How about on the issue of standard-setting, are other companies that make radios in agreement with your views on standard-setting?

Mr. HOLMES. I haven't come prepared to discuss the views of other companies. I think that's best left to them to bring out.

Mr. COOPER. But Delco does not intend to use the issue of standard-setting to hurt your competition in the radio building business?

Mr. HOLMES. No, that is not our concern. What we want to do is provide our customers—the motoring public—with the best quality sound that can be made available that they consider to be within their range of value.

Mr. COOPER. Why don't we move now to a demonstration of your system, if that's all right with you, so that we can hear your product.

[Audio demonstration.]

Mr. COOPER. Thank you very much for that demonstration.

I would assume when you're talking about a traffic alert, you're talking about an area-wide alert such as a hurricane, or tornado or something, and not a wreck on a bridge or something?

TECHNICIAN. The hurricane or tornado would be what is determined an emergency alert, like the emergency broadcast system that's used today. A traffic alert—just like the guys in the plane saying, the Wilson Bridge is at a standstill. If you want to hear those traffic alerts and you're listening to a CD then your radio would automatically switch to that for the convenience of the listener.

Mr. COOPER. Would the police be able to use it to tell you when you're being stopped for speeding?

Thank you for that fine demonstration.

Mr. Abel, can you give us some estimate of what it would cost for an average AM or FM station to give up for these new technologies?

Mr. ABEL. For AMAX, to improve AM radio, it's relatively inexpensive. Depending upon the age of the station, it could be as low as $10,000 or $15,000. For RBDS, on an FM station to do something like this it could be in the neighborhood of $15,000 to $20,000. And for a DAB station, depending upon how old, again, the station is and how much digital equipment they have in the station, we estimate that it would be someplace between $50,000 and $150,000 for a station to currently switch from its analog transmission—or add to, I should say—its analog transmission a DAB system. Again, this would depend on what kind of system is selected and how much digital audio equipment is already inside the station. About 80 percent of stations today already use compact disc players on the air and already broadcasting some digital but it's not received in a digital form, nor is it transmitted in a digital form.

Mr. COOPER. What sort of sequence should we expect a local broadcaster getting this new equipment and then hoping that cars and homes in his broadcast area get the new equipment? Or would we expect a market penetration of the new equipment of 10, 20, or 30 percent before the local broadcaster geared up to offer the new services? What's the sequence?

Mr. ABEL. With respect to digital audio broadcasting, there would have to be a transmission standard that would be selected and the FCC would have to go through a standard-setting process to establish the transmission standard. In that process, the receiver manufacturing industry would have a role to play in that process and would, we assume, have a digital audio broadcasting receiver, digital audio receiver, available at about the same time the transmission standard. It is not possible for the receiver industry to make a receiver until a transmission standard has been selected.

As far as the AMAX, that has been a cooperative effort between the Electronics Industry Association and NAB, between broadcasters and manufacturers. And as you heard Mr. Holmes say, they already have AMAX receivers on the market and we anticipate several others to be on the market in early 1992.

As far as RBDS, we are in the process of setting a technical standard for RBDS that involves, again, both broadcasters and receiver manufacturers to implement this technology.

Mr. COOPER. Let me make sure I understand.

The FCC is not involved in setting the RBDS standards right now?

Mr. ABEL. They will be at some point. But at this point, this is really operating in the so-called sub-carrier sideband of an FM station. And we are not prepared to go to them yet with the precise standard but we anticipate that happening very quickly.

Mr. COOPER. In setting DAB standards, would you anticipate industry groups getting together to discuss possible specifications before you went to the FCC?

Mr. ABEL. That is most likely the case that happens, the two industries would get together on what is a likely standard or what is the best standard for broadcasters and what would be the best standard for receiver manufacturers, and then go to the FCC with a request to establish the standard.

Mr. COOPER. But on AMAX there's already agreement, in fact, there are already receivers in the field, and there's no dissent?

Mr. ABEL. No, the FCC was heavily involved in setting a—AMAX is something again that both broadcasters do and receiver manufacturers—and we went to the FCC and petitioned them to improve the technical standards for AM radio. Some they did on their own initiative at the FCC and also at the request of industry to improve the technical standards for AM, which they did, broader bandwidth, and so forth.

And at the same time, the receiver manufacturers then were involved in making sure that they built a receiver which could receive this improved technical standard for AM.

Mr. COOPER. How much does an AMAX receiver cost right now?

Mr. ABEL. I'd have to ask Mr. Holmes.

Mr. COOPER. Mr. Holmes?

Mr. HOLMES. There are receivers that are certified stereo receivers and those are in the order of $300 to $500—somewhere in there.

Mr. COOPER. Do you sell any non-AM stereo receivers now, any old-fashioned AM receivers, or are they all AM stereo?

Mr. HOLMES. No, we still sell AM receivers.

Mr. COOPER. How do the sales compare between an old-fashioned AM and AMAX AM? Are the consumers seeking out AMAX or AM stereo receivers?

Mr. HOLMES. There hasn't been a great consumer demand for AM stereo as we had anticipated it might have been when we came on the market with it in 1985. However, there are significant sales and our customers out there in certain markets do prefer AM stereo receivers.

Mr. COOPER. Can you give me an estimate of what the market penetration would be for AM stereo receivers?

Mr. HOLMES. No, I don't have that number with me. I can provide that for the record.

[The information follows:]

800,000 units, with AM stereo receivers; 16–17 percent of Delco annual production.

Mr. COOPER. I have no further questions at this time. I don't know if my colleague from Pennsylvania would like to ask some questions at this point, but I'd be happy to defer to him.

Mr. RITTER. Thanks, Mr. Chairman.

Mr. Holmes, you have mentioned the importance of a single transmission standard for DAB, and I would like to ask you, does it matter economically whether a U.S. oriented proponent system is selected as a standard for DAB, economically for the United States for our industry, for our workers?

Mr. HOLMES. I think where we're adding this emerging technology is that there are a number of alternatives that can be considered, and there are a number of technical issues that are concerned with each of those alternatives.

And for me to try to assess one against the other now would be premature, economically or otherwise. I really don't have an answer for that.

Mr. RITTER. So you couldn't alert us as to what the consequences might be on the broadcast industry or the consumer electronics industry in the United States?

Mr. HOLMES. Only to the extent that I believe there is a need for a standard, there is a need for cooperation among the various parties involved in this to do this in a timely manner such that we are able to bring the technology to the marketplace consistent with what might be happening in other countries so that we can maintain competitiveness in this technology.

Mr. RITTER. There's the in-band versus L-band discussion. The NAB is interested in the Eureka 147 standard, as I understand, and it is pushing that. Yet, that's an L-band standard and we all know that the question of spectrum allocation, many, these days—the administration and some of us in Congress—have been looking at the idea of competitive bidding for a new spectrum disposing the old lottery system.

Your proposing the L-band, does that not conflict somewhat with NAB-stated policy to be open to all comers in this area? Somehow it seems to me it's kind of missing out on in-band competitors.

Mr. ABEL. First of all, I'd like to set the record straight with respect to Eureka being totally an L-band system. It can operate in any bands, at least any bands below about 1.7 or maybe even as high as 2 Gigahertz, but certainly a lower level spectrum is better than high level spectrum. But it could operate in the FM band as well.

Mr. RITTER. So the Eureka standard presently out there would work in-band?

Mr. ABEL. It would work in-band. It would have to be modified significantly and it would lose a lot of the benefits that it currently has.

It's really a trade-off between narrow band and broad band. In the narrow band application, by definition you'll lose some applications that you would have better implementation in a broad band system. So we're talking about differences of bandwidth, really, not so much of the spectrum.

Mr. RITTER. But don't you think that given all the competition for spectrum and all the potential uses that seem to grow each year that there's going to be some reticence to taking new spectrum and giving it to broadcast entertainment?

Mr. ABEL. I fully understand that and I think that is an important consideration and it may turn out that in fact in-band is a

better application of this, certainly from a spectrum utilization point of view.

I think that translates then into what benefits do you get and also what is the cost of the receiver? What is the cost of implementing such a system where you are trying to preserve the existing AM and FM broadcasting as well.

Mr. RITTER. It's my understanding that there are several U.S. groups that are proposing, or at least developing, in-band systems.

Doesn't the support of the Eureka 147, essentially L-band system, set aside the possibility that American companies would be doing this and that this would be good for U.S. competitiveness to have a presence in this new technology?

Mr. ABEL. I think it will be good for American competitiveness if we have the right system and we have a system in fact that is adopted on ideally, I suppose, from the consumer electronic standpoint—it would be better if it were a system that had a worldwide application.

To some extent there's even some benefits in broadcasting if there were a worldwide application—at least something in a similar vein.

As it turns out, Eureka is a system that has many U.S. patents in it. It is something which has been assimilated from patents all over the world by, as it turns out, European engineers.

It can have benefits for U.S. companies. It may not turn out that way in the end. We don't know whether many of the so-called in-band systems, including a Eureka in-band system——

Mr. RITTER. Who are some of the American players?

Mr. ABEL. Who are some of them?

Gannett, CBS and Group W have probably the single largest one in a project called Project Acorn; a company called Lincom.

Mr. RITTER. Of course, none of those are technology developers, though; they're users. Well, CBS has some still engineering, but it has been cut way back. And Gannett, obviously, does not produce technology. And Group W is a group of stations.

Mr. ABEL. Group W is a part of Westinghouse.

Mr. RITTER. Right.

Is it Westinghouse that is developing technology there?

Mr. ABEL. No, they have, I believe, agreements. You'd have to ask them. But I believe they have agreements with some technology developers, though, in the United States.

Mr. RITTER. Mr. Holmes, would you like to comment on this competitiveness issue as to what happens if it's an American standard versus a European standard?

Mr. HOLMES. Again, I think that's where the work needs to be done, is to consider all the options that are available to us, be they American or European, from all angles with the involvement of broadcasters, equipment manufacturers, receiver manufacturers, and industry trade groups.

Mr. RITTER. Is that being done now?

Mr. HOLMES. To some extent, it is starting to be done. There is a subcommittee in EIA that has recently been formed that is beginning to consider the standard impacts and all the associated technical concerns with that.

Mr. RITTER. So you really don't have a comment at this point as to how this might play out?

Mr. HOLMES. No, I don't.

Mr. RITTER. Should we be giving every opportunity to the U.S. industry to come up with a standard here, or what? What are your thoughts?

Mr. HOLMES. Again, I believe that the United States has an opportunity here to look at all the problems associated with introduction of the DAB technology and to put forth a recommendation for a standard. Whether it's consistent with international standards or not, is yet to be seen. We really haven't emerged that far in the discussions to decide that.

Mr. RITTER. How about on the subject of timeliness? Would we be better off going with the European standard in order to be expeditious about getting DAB into our homes and our cars?

Mr. HOLMES. I would rather not comment on that. I believe the timeliness issue really has to do with getting together and working towards a common standard regardless of what that standard is.

Mr. RITTER. Mr. Abel, do you want to comment on that?

Mr. ABEL. I think it's undecided at this point. The FCC's action last week, in terms of identifying a satellite spectrum for DAB, would severely disadvantage our industry if satellite were to get off the ground at an early stage, with whatever standard, would certainly put us at a disadvantage in terms of terrestrial broadcasters being able to provide this service, because we're not close to a terrestrial standard at all.

If, on the other hand, we go through another 3 or 4 years of trying to search for the proper standard, whatever it might be, we may end up with a better system in the end.

Mr. RITTER. Plus, you also don't want to end up like AM stereo?

Mr. ABEL. Right, that's the trade-off.

My own view is that we probably will see DAB happen in other parts of the world more rapidly than we would here. Our only concern is whether satellite would happen so rapidly here that it would put us at a severe disadvantage.

Mr. RITTER. The satellite standard, would that be a comprehensive standard that could apply nationwide?

Mr. ABEL. One would think that it would almost have to be if it were satellite application. And to some extent, if they were able to establish their standard quickly and start broadcasting in it, they certainly don't have the same problem of being able to accommodate existing users.

Mr. RITTER. But they'd lose the local capability and local service employees?

Mr. ABEL. Right.

Mr. RITTER. Thank you, Mr. Chairman. I yield back.

Mr. COOPER. Thank you, Mr. Ritter.

Let me ask a few questions about satellite receivers.

Mr. Holmes, does Delco make satellite receivers for cars or homes, or is it planning on making such receivers?

Mr. HOLMES. No, we don't, and we don't have any immediate plans.

Mr. COOPER. You're not interested, even though the FCC, last week, opened up some spectrum for that use, it's not a commercial opportunity that interests your company?

Mr. HOLMES. We're interested in providing our customers, which is really the motoring public, with high quality audio. We will investigate any opportunities that we have in providing that for our customers.

Mr. COOPER. Is it technically possible to provide an automobile passenger with high quality audio through a satellite-based receiver?

Mr. HOLMES. I'm really not prepared to answer that today.

Mr. COOPER. Mr. Abel, you had said earlier that retrofit in AM station might cost $10,000 or $15,000 for AMAX, or $40,000 or $50,000 for RBDS or whatever.

As I understand it, two satellites could cover the whole United States with radio sound. Which is more cost-effective, to have two satellites or to retrofit every antenna in the United States or every local station with the new technology. I realize the value of localism and things like that, but just looking purely at cost in terms of delivering radio sound, which is cheaper?

Mr. ABEL. I would argue that it's cheaper for terrestrial broadcasters to do it. And, in fact, it would be better for terrestrial broadcasters to do it I think from both consumers standpoint and a terrestrial broadcasting standpoint.

Satellites do not last very long. They last about 7 to 10 years. As I refer to them, tall towers that fall down faster. When we build a terrestrial tower it lasts at least 70 years. We don't know how long some of these towers will last. But these satellites only last 7 to 10 years; they're expensive to build. They don't always work when they get up there. They sometimes fail and they don't last beyond 7 to 10 years and have to be replaced.

So over the long term, in terms of being able to provide the widest variety of service and preserving localism at the same time, I think it's less expensive for terrestrial broadcasters to do it.

Mr. RITTER. Would the chairman yield on that?

Mr. COOPER. I'd be happy to yield.

Mr. RITTER. Is there a possibility for certain services like, you would think, National Public Radio, which seems to come out of a couple of locations in any event, to be on a satellite of this sort, and this would exist side-by-side with the terrestrial?

Mr. ABEL. We have national satellite services today—I mean, national networks, including NPR that provide national service. I would argue that many NPR services—I know you have someone on the following panel—provide local service as well.

Mr. RITTER. The question, then, was more specifically, are there not services that could exist side-by-side?

Mr. ABEL. Probably there are.

Mr. RITTER. Digital audio coming from satellite existing side-by-side with FM.

Mr. ABEL. The key question can local broadcasters compete in that kind of environment? We don't know that yet. We would be able to if we have the same opportunity the satellite broadcaster in providing DAB.

Mr. RITTER. Thank you, Mr. Chairman.

Mr. COOPER. I thank the gentleman for his question.

I have no further questions, unless one of the panelists would like to add something.

This panel is dismissed and we will welcome the second panel. Thank you, gentlemen, for your excellent testimony.

Mr. Gary J. Shapiro, group vice president, Consumer Electronics Group of the Electronic Industries Association; Mr. Doug Bennet, president of National Public Radio, and Mr. Alan L. Box, president of EZ Communications, Incorporated. He's also chairman of the National Association of Broadcasters DAB Task Force.

The first witness will be Mr. Shapiro, if you will proceed.

STATEMENTS OF GARY J. SHAPIRO, GROUP VICE PRESIDENT, CONSUMER ELECTRONICS GROUP, ELECTRONIC INDUSTRIES ASSOCIATION; DOUGLAS J. BENNET, PRESIDENT, NATIONAL PUBLIC RADIO; AND ALAN L. BOX, CHAIRMAN, NATIONAL ASSOCIATION OF BROADCASTERS DIGITAL AUDIO BROADCASTING TASK FORCE

Mr. SHAPIRO. Mr. Chairman, Congressman Ritter, I appreciate being invited to appear before you today to discuss developments in radio technologies, the activities of the consumer electronics manufacturers, and related issues of public policy.

I'm especially pleased to follow the testimony of John Holmes, who sits on my Board of Directors.

Some 60 million radios are sold each year in this country, and a typical American family owns some six radios. Using figures that Chairman Markey provided earlier, Americans today will listen to about a half billion hours of radio.

We are now on the verge of entering a new age of radio, an age which has the potential to combine the best features of local broadcasting, national service and superb sound. Given the importance of radio in our lives, this hearing is very timely.

As our name implies, the Consumer Electronics Group of the Electronic Industries Association represents the leading manufacturers of the electronic products that entertain and inform American consumers. We have been the trade association representing this industry for 67 years. In fact, we started out in 1924 as the Radio Manufacturers Association.

The benefits brought to the American consumer by the consumer electronics industry are largely a product of market forces. However, it is through industry consensus and standard-setting that technologies are often brought to market. EIA sets some 100 electronics standards each year, and we've had many successes at EIA from the RS-232 or the EIA-232 report on the back of almost every computer to television stereo.

Our industry's intensely competitive in the success or failure of new products and new technology is decided primarily by the American consumer. We have a strong interest in preserving consumer access to the newest technologies and fostering a statutory and regulatory environment that is conducive to continued innovation.

At EIA we are working on the radio service of tomorrow—as has been described earlier—digital audio radio. We believe in the

future of digital radio. We are committed to promoting the prompt and orderly introduction of DAR in the United States.

To realize the potential of digital radio and to avoid a repeat of our experience with AM stereo, we advocate adoption of a single transmission standard. We believe the FCC should select a system based on industry consensus and grounded in considerations of technical merit, economic practicality, and consumer benefits.

Among the technical criteria we believe important are CD quality sound, freedom from multipath and other interference, and the increasing of digital sub-carriers to carry program information and other useful data.

Of course, adoption of DAR should proceed in a manner that recognizes the continuing importance of the services provided by terrestrial broadcasters. But at the same time, delivery of digital radio via satellite or cable must also be permitted.

The potential consumer benefits and unifying effects of national radio service are too large to be ignored.

To help ensure the DAR system proponents receive objective and fair testing, we created a DAR subcommittee last August which will initiate such activities as DAR system technical analysis, comparative testing, system selection, and standards development.

The subcommittee held an organizational meeting on October 18, chaired by a representative of Delco, and the level of interest was encouraging. This meeting attracted representatives from 30 different organizations including receiver manufacturers, chip producers, proponents and broadcasters.

Of course, it's way too early to know precisely how DAR will evolve. Many questions remain unanswered. We, therefore, believe that the FCC acted in a timely and prudent fashion when it initiated an inquiry on DAR; and, similarly, we think this hearing is very appropriate.

We see one of our important contributions as providing an open technical forum in which all sides may express their views. From this activity we believe a DAR standard built on industry-wide consensus can evolve.

One of the most pressing questions is whether DAR will need to be a completely new radio service with its own spectrum allocation, or whether it might somehow be an evolution of the existing radio broadcast services.

At this point in time, there are simply too many questions regarding necessary spectrum compared to the number of answers available.

We are encouraged by the Commission's announcement regarding DAR spectrum allocations strategy for the 1992 World Administrative Radio Conference. While the United States now seems poised to advance the 2.3 Gigahertz band at the 1992 Conference, the FCC announced also that other frequency bands may be considered on post-WARC agendas.

We still believe the United States should keep its options open as it participates in this World Conference, because we must ensure that digital audio radio spectrum is available.

The fact is, if DAR cannot be accommodated in existing challenges, spectrum must be made available elsewhere. The U.S. con-

sumer cannot, and should not, be denied access to this wonderful technology because of spectrum concerns.

As to Radio Broadcast Data System, I am pleased to share with you some more information regarding this new feature which you've just heard demonstrated. In the near future we expect dealers will be selling radio receivers capable of tuning themselves automatically.

Based on a system currently implemented in Europe, this system involves the transmission of extra digital information along with normal FM programming.

Much of the information that I would describe is in my written statement and has been covered earlier so I will not repeat it. But it does describe the specific attributes and benefits of RBDS, which are multifold and only limited by the imagination of the broadcasters and the receiver manufacturers.

In terms of developments in AM radio, we've taken many numerous efforts over the years to help rejuvenate AM radio. We've worked with broadcasters and with the FCC in the hope of breathing new life into this important radio service.

I am pleased to report that a breakthrough appears to be at hand with the action by the FCC regarding actions that broadcasters must take in the AM broadcasting area as well as AMAX.

Most new models of AM radios already incorporate the ability to tune or receive the expanded band recorded by the FCC and a growing number of radios, especially car radios, include the capability of receiving AM stereo as well as other AM enhancements described in my written statement.

Many of these improvements are results of agreements reached with the National Radio Systems Committee, a committee established jointly by the National Association of Broadcasters and EIA.

Voluntary cooperation between the broadcast and consumer electronics industries to the NRSC has been multifaceted and mutually beneficial, and we fully expect that these will translate into tangible improvements in the quality of AM and FM radio the consumer hears.

The foregoing is far from a complete description of the activities of EIA and its members in the field of radio services and equipment. But this report does illustrate the continuing responsiveness of our industry to changes in technology, market conditions, and public policy concerns.

I am pleased to have had the opportunity to report on some of our activities. I hope you will agree that we are taking a responsible, progressive role in shaping the radio environment for the remainder of this century and the beginning of the next.

We look forward to a continuing dialogue with this subcommittee as we continue our efforts toward the goals we share.

Mr. COOPER. Thank you very much, Mr. Shapiro.

[Testimony resumes on p. 29.]

[The prepared statement of Mr. Shapiro follows:]

PREPARED TESTIMONY OF
GARY J. SHAPIRO
GROUP VICE PRESIDENT
ON BEHALF OF
CONSUMER ELECTRONICS GROUP
ELECTRONIC INDUSTRIES ASSOCIATION

Before the
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Telecommunications and Finance

OVERSIGHT HEARING ON THE
PUBLIC POLICY IMPLICATIONS OF
EMERGING AND ADVANCED RADIO TECHNOLOGIES

November 6, 1991

Mr. Chairman and Members of the Subcommittee:

My name is Gary Shapiro. I am group vice president of the Electronic Industries Association Consumer Electronics Group. I appreciate being invited to appear before you today to discuss current developments in radio technologies, the activities of consumer electronics manufacturers, and related issues of public policy.

Some 60 million radios are sold each year in this country, and the typical American family owns an average of six radios. We are on the verge of entering a new age of radio -- an age which has the potential to combine the best features of local broadcasting, national service and superb sound. Given the importance of radio in our lives and the new era in radio we are entering, this hearing is timely.

Our association and its members have a record of innovation, competition, service, quality, and value that I believe will hasten the arrival of the new age of radio. If I may, Mr. Chairman, I would now like to present an overview of a number of our efforts involving radio services.

INTRODUCTION OF EIA/CEG

As our name implies, the Consumer Electronics Group of the Electronic Industries Association (EIA/CEG) represents the leading manufacturers of the electronic products that entertain and inform American consumers. These companies manufacture, sell, and service a wide variety of devices, including radio and television receivers, VCRs, video cameras, compact disc players, loudspeakers and numerous other products.

EIA has been the leading consumer electronics industry trade group for 67 years. In fact, we started out in 1924 as the Radio Manufacturers Association. We sponsor forums for the development of industry standards; we participate in the formation of public policy at all levels of government; we compile and publish market information; and we disseminate consumer information and respond to consumer inquiries.

In these and other endeavors, our mission has been to enhance the ability of the consumer electronics industry to satisfy the American consumer. Today, consumers enjoy a dizzying array of products and services that provide entertainment and information. Consumer electronics products are the essential means of access to records, tapes, compact discs, radio and television broadcasts, and cable television programming, to say nothing

of new services being delivered by terrestrial and satellite microwave facilities.

The benefits brought to the American consumer by the consumer electronics industry are largely a product of market forces. The industry is intensely competitive, and the success or failure of new products and new technologies is decided primarily by the American consumer. EIA has a strong interest in preserving consumer access to the latest products and in fostering a statutory and regulatory environment that is conducive to continued innovation.

The subjects we are discussing today are ones as to which we encourage Congressional interest and oversight. It is important for the Subcommittee to keep abreast of what is happening in the marketplace, in the laboratory, and at the Federal Communications Commission. Your oversight can help ensure that the regulatory framework remains suited for present and anticipated market conditions. Hearings such as this can provide the basis for legislative action, should it become necessary for Congress to take corrective measures.

RADIO OF THE FUTURE: DIGITAL AUDIO RADIO

At EIA we are working on the radio service of tomorrow: digital audio radio. Building on the great success of the compact disc, it now appears possible to deliver CD-quality service over radio waves as well. Consumers have come to know and to love the exceptional sound quality of compact

discs, and we are eager to see how best to extend these benefits to radio services.

EIA and its members believe in the future of digital radio. We are committed to promoting the prompt and orderly introduction of DAR in the United States.

To realize the potential of digital radio and avoid a repeat of our experience with AM stereo, we advocate adoption of a single transmission standard. We believe the FCC should select a system based on industry consensus and grounded in considerations of technical merit, economic practicality, and consumer benefits. Among the technical criteria we believe important are compact disc-quality sound, freedom from multipath and other interference, and inclusion of digital subcarriers to carry program information and other useful data.

Of course, adoption of DAR should proceed in a manner that recognizes the continuing importance of the services provided by terrestrial broadcasters. But at the same time, delivery of digital radio via satellite or cable must also be permitted. The potential consumer benefits and unifying effects of national radio service are too large to be ignored. National digital radio services must exist side-by-side with terrestrial radio service.

To help ensure DAR system proponents receive objective and fair testing, we created a new DAR Subcommittee under EIA's R-3 (Audio Systems)

Committee. That Subcommittee, created last August, will initiate such activities as DAR system technical analysis, comparative testing, system selection, and standards development.

The Subcommittee held an organizational meeting on October 18, and the level of interest was encouraging. This first meeting attracted representatives from 30 different organizations including receiver manufacturers, chip producers, proponents and broadcasters. We are excited about the potential this process holds.

Of course, it is far too early to know precisely how DAR will evolve. Many fundamental questions remain unanswered -- just as was the case five years ago when industry and policymakers were first beginning to consider advanced television. We therefore believe that the FCC acted in a timely and prudent fashion when it initiated an inquiry on DAR, an inquiry in which EIA and numerous other parties shared their preliminary thinking on a range of issues.

We see one of our important contributions as providing an open technical forum in which all sides may express their views. From this activity we believe a DAR standard built on industry-wide consensus can evolve.

One of the most pressing questions is whether DAR will need to be a completely new radio service, with its own spectrum allocation, or whether it might somehow be an evolution of the existing radio broadcast services.

Some parties believe that the spectrum needed for CD-quality sound will require a new allocation in the L-band (1500 MHz) or S Band (2500 MHz), while others hope that DAR will be able to be accommodated on existing FM channels (88-108 MHz), or simulcast within traditional analog FM broadcast signals. At this point in time, there are many more questions than answers.

We are encouraged by the Commission's recent announcement regarding DAR spectrum allocations strategy for the 1992 World Administrative Radio Conference. While the United States now seems poised to advance the 2.3 Gigahertz band at the 1992 World Administrative Radio Conference, the FCC announced that other frequency bands may be considered on post-WARC agendas.

We still believe the United States should keep its options open as it participates in the World Administrative Radio Conference. We must ensure that digital audio radio spectrum is available.

The fact is, if DAR cannot be accommodated in existing channels, spectrum must be made available elsewhere.

RADIO BROADCAST DATA SERVICE

I am also pleased to share with you information regarding an important new feature of radios which will soon become available.

- 7 -

In the very near future, dealers will be selling radio receivers capable of tuning themselves automatically, thanks to a new radio service called RBDS (Radio Broadcast Data System), a demonstration of which you saw earlier this morning.

Based on a system currently implemented in Europe, this system involves the transmission of extra digital information along with normal FM programming.

Each participating station broadcasts a special code identifying the broadcaster and a surprising amount of information about the nature of the programs being transmitted.

RBDS receivers are then able to interpret the information being transmitted from one or more nearby FM transmitters that handle the same program (such as National Public Radio or a particular ballgame), compare signal strengths, and tune the set to the strongest signal.

This is only one example of the many information functions RBDS will be able to provide. Other applications will include:

- the ability of the radio to search for a particular broadcast format such as sports, classical, news, rock, or jazz, each of which will have a unique identity code transmitted with the program as part of the RBDS data;

- switching from CD or cassette, or even an "off" state, to an emergency or traffic alert;

- diplaying ancillary information on an LCD, printing it or even "speaking" it through an electronic voice synthesizer; and

- transmission of time and date signals to reset clocks in receivers or turn on a recorder to tape a program for later listening, automatically switching to preset tone or volume settings for speech or music.

The technical portion of the RBDS standard is based on an existing international standard but the National Radio Systems Committee is currently involved in defining the features and levels of implementation best suited for the American consumer marketplace.

RECENT DEVELOPMENTS IN AM RADIO

EIA has over the years undertaken numerous efforts to help rejuvenate AM radio. We have worked with broadcasters and with the FCC in the hope of breathing new life into this important radio service. Finally, I am pleased to report, a breakthrough appears to be at hand.

As the Subcommittee is well aware, the Federal Communications Commission has recently taken several important steps in its "AM Improvements" proceeding, MM Docket No. 87-267.

Most particularly, it has established procedures for the licensing of new AM radio frequencies (1605-1705 kHz), which over time will lead to relief of the intolerable congestion that currently causes problems in the existing AM band (535-1605 kHz). Other measures being taken by the Commission include encouraging voluntary agreements to reduce interference within the AM broadcast band, changing technical standards in ways that will reduce interference, and creating incentives that should lead more broadcasters to begin broadcasting in AM stereo.

Changes in the AM broadcast environment are a necessary precondition to increased consumer enjoyment of the AM radio service, and it appears that the Commission has, quite properly, focused its resources on the broadcast side of the equation. I want to emphasize, however, that manufacturers of AM receivers are also doing their part.

Most new models of AM radios already incorporate the ability to tune, or receive, the expanded band. A growing number of radios, especially car radios, include the capability of receiving AM stereo. A growing percentage of AM receivers includes a standard "deemphasis" characteristic that mirrors a "preemphasis" standard used by broadcasters. Some AM receivers now incorporate an ability to switch between two different reception bandwidths. This allows consumers to enjoy greater frequency response (better audio fidelity) when channel spacing conditions permit, rather than being limited to the lower performance that results when narrow receiver bandwidth is dictated by worst-case conditions of channel congestion and interference.

Many of the improvements being adopted by broadcasters and receiver manufacturers are a result of agreements reached within the National Radio Systems Committee, a committee established jointly by the National Association of Broadcasters and EIA. Voluntary cooperation between the broadcast and consumer electronics industries through the NRSC has been multifaceted and mutually beneficial, and we fully expect that these will translate into tangible improvements in the quality of AM and FM radio the consumer hears.

Joint cooperative efforts are by no means limited to the NRSC. Perhaps one of the more exciting by-products of cooperation between EIA and NAB is the AMax program that was announced just this summer. Broadcasters and receiver manufacturers have agreed on a list of desirable criteria for radios that receive AM broadcasts, and receivers that meet these criteria can be marketed with the AMax (or AMax Stereo) certification mark. Broadcasters have committed to supply millions of dollars worth of advertising to build consumer awareness of the significance of the AMax logo, creating powerful incentives for receiver manufacturers to deliver better AM radios.

AMax-certified receivers already exceed the performance expectations of the FCC's "reference receiver" proposal and we applaud the Commission's recent decision to leave receiver design-performance tradeoffs to the marketplace. We are confident that the success of the AMax program will stand as a model of industries cooperating with each other <u>voluntarily</u>, compelled by competition, rather than reacting to regulatory requirements.

We are very proud of the effort we have put into this program. We are hopeful that it will be a success for broadcasters, manufacturers, retailers, and -- most importantly -- consumers. AM radio service will not be revitalized overnight, but the decline of AM radio can be halted -- and ultimately reversed. Our industry is playing a significant role in working toward that objective.

OTHER ONGOING ACTIVITIES

We are also working to improve AM and FM receivers. For example, last week in New Jersey an EIA committee met to update the voluntary standard for measuring the performance of AM and FM receivers. The AM receiver standard was set in 1958 and the FM receiver standard was last updated in 1975. We believe that almost all receivers sold by our members report their qualitative performance in accordance with the methods described in these existing standards. But given technological improvements over the years, many of the performance specifications and methods of measurement need updating.

CONCLUSION

The foregoing is far from a complete description of the activities of EIA and its members in the field of radio services and equipment. But this report does illustrate the continuing responsiveness of our industry to changes in technology, market conditions, and public policy concerns.

I am pleased to have had the opportunity to report on some of our activities. I hope you will agree that EIA and its members are taking a responsible, progressive role in shaping the radio environment for the remainder of this century and the beginning of the next. We look forward to a continuing dialogue with this Subcommittee as we continue our efforts toward the goals we share.

Mr. COOPER. The next witness will be Mr. Bennet. And on behalf of the chairman of the subcommittee, I would like to commend you and PR's leadership for your role and the development of DAB. Mr. Bennet.

STATEMENT OF DOUGLAS J. BENNET

Mr. BENNET. Thank you very much, Mr. Chairman, and thank you for the opportunity to testify. I'd ask that my full statement be put in the record and I will summarize it now.

Just as decisions made in the 1920's and 1930's govern what Americans hear on the air today, so the choices we make as digital technology is introduced will define radio service in the 21st century.

The committee has an opportunity for a significant reassessment and a fresh start to create an industry with new standards of public service, public access, and efficient use of a public resource—the spectrum.

What will be the highest uses of radio broadcasting in the future? How much spectrum should be allocated for radio broadcast?

How much should be allocated for business use and how much for public use? How much for broadcast entertainment, as Congressman Ritter said before? Who benefits? Who pays? Who is subsidized?

All of these questions have been addressed before. They were decided, when we needed pioneers to exploit the broadcast spectrum—in an age when scarcity of anything was hardly imagined; at a time when the melting pot was thought to be concocting a superior and distinctly homogenous American culture.

Yes, the decisions were made: broadcasting in America was to be a business—a business amply subsidized with free use of broadcast spectrum even after spectrum grew scarce and other business media became plentiful. Public broadcasting was almost an afterthought.

This time around, Mr. Chairman, in a world turned upside down, there are compelling reasons to put the public first. With the opportunity at hand for more channels, Congress and the FCC should allocate plenty of room for public use of spectrum and technology, even room for services we cannot today foresee.

It is too early to tell which of the various digital radio systems will be technically viable. Therefore, the goal of public policy at this point should be to keep options open as technologies evolve, moving gradually toward a much larger number of channels for public use.

For example, if some of other additional channel capacity resulting from digital technology is used for parallel services by existing broadcasters during the transition, it should be made available for public use when the transition ends.

The stakes for public radio in the transition are particularly high. Public radio, in the new digital era, cannot be once again an afterthought. An ample set-aside is necessary early in the process to ensure that public radio's present allocation is protected and then increased.

If digital audio broadcast offers the potential for many more public channels, how could America use them? Even public radio as we know it today—surprisingly robust for an afterthought, perhaps, but an afterthought, nonetheless, needs more channels to do the job that Congress and the public expect of it.

But I invite the committee to look ahead to the possibilities that public service radio can offer at the start of the next century, just about when digital technology will be coming on line.

Think about a multi-ethnic America, groping for common civic values, and at the same time cherishing its cultural diversity.

Will there be enough public channels so minority communities can really have a piece of the action—really speak by, for, and about themselves? Or will they still be broadcast to by advertising-driven commercial services? Radio call-in programs have begun to make the medium interactive.

How many interactive public radio forums would be useful in Chicago, Los Angeles or New York by the year 2000?

Will there be an urgent need for more radio information services in a society that is multilingual but with—sad to say—a high rate of illiteracy?

How many people will want to learn English as a second language using radio?

Mr. Chairman, all of these services are needed and it may not be too much to say that the success of our society may depend on them. They can be offered very inexpensively through radio, provided the channels are available. They will not be provided by commercial radio unless they are able to produce a return for advertisers.

I want to emphasize particularly the public service potential of direct satellite broadcast, which becomes viable with digital technology.

In conventional terrestrial broadcasting, many potentially valuable public services are squeezed out simply because there are too few beneficiaries within listening distance.

Direct satellite broadcasts, available everywhere in the country, have the potential to solve this problem. English-as-a-second-language practice sessions would have too few users to work in most local markets, but it is not hard to imagine a nationwide audience large enough to justify several channels.

The same economies of scale will work for reading services for the visually impaired, foreign language services, or cultural and information programming.

"A nice idea, but those are the listeners who will be the last to get digital receivers," you will hear.

No, Mr. Chairman, those are the people who can be the first to get digital receivers—those for whom these new public services are the most important.

Subsidies to get receivers into their hands is just part of a decision to public needs first—subsidies which will, incidentally, help all of broadcasting by accelerating the conversion to digital technology.

Let me conclude by emphasizing that the prospect of digital audio broadcasting need not create difficult trade-offs between public and commercial broadcasting. Additional channels mean we

can satisfy the public needs I have outlined without reducing business access to the spectrum.

The committee should establish two priorities, Mr. Chairman: seize this chance to increase the number of radio broadcast channels and make public service the top priority.

Thank you.

Mr. COOPER. Thank you very much, Mr. Bennet.

[Testimony resumes on p. 42.]

[The prepared statement of Mr. Bennet follows:]

Statement of

DOUGLAS J. BENNET

PRESIDENT

NATIONAL PUBLIC RADIO

Mr. Chairman, thank you for the opportunity to testify.

The radio broadcast industry in the United States is poised at the beginning of a new era because of digital radio technology. Choices made in the near future will determine the shape of this new era for the radio industry. Although much about this technology is unsettled, we know the changes it brings will be great and the transition from our present system will not be easy. Nevertheless, it is clear that this is the direction in which we must go.

Just as decisions made in the 1920's and 1930's govern what Americans hear on the air today, so the choices we make as digital technology is introduced will define radio service in the 21st century.

This new technology holds the promise of an expansive new era in American broadcasting. The committee has an opportunity for significant reassessment and a fresh start -- to create an industry with new standards of public service, public access and efficient use of a public resource, the electromagnetic spectrum.

What will be the highest, best uses of radio broadcasting in the future? How much spectrum should be allocated for radio broadcast use in a digital radio environment? How much of that should be allocated for business use and how much for public use? How do we create a climate for rapid adoption of this robust new technology? Who benefits ... who pays ... who is subsidized?

All of these questions have been addressed before, starting in the 1920's. They were decided, some by default, when we needed pioneers to exploit the broadcast spectrum --- in an age when scarcity of anything was hardly imagined. It was a time when no one could have foreseen the technological opportunities now before us -- the cost of developing and exploiting them or the enormous financial returns they can generate.

They were made at a time when education was done in school, a time when men went to work and many women stayed home ... a time when the "melting pot" was thought to be concocting a superior and distinctly homogeneous American culture.

Yes, the decisions were made: broadcasting in America was to be a business -- a business amply subsidized with free use of broadcast spectrum even after spectrum grew scarce and other business media became plentiful. Public broadcasting was almost an afterthought.

This time around, Mr. Chairman, in a world turned upside down, there are compelling reasons to put public service first. With the opportunity at hand for more channels, Congress and the FCC should allocate plenty of room for public use of spectrum and technology, even room for services we cannot today foresee.

In this context, let me say something about digital technology itself and the unprecedented opportunities it offers for additional public service.

I. DIGITAL TECHNOLOGY: POTENTIAL AND TRANSITION

Primarily because of its spectrum efficiency, digital technology has the potential to expand substantially the number of radio signals even within the present spectrum allocation. Additional spectrum would permit direct service from satellite to receiver, a potentially transforming advantage for public services, as I will discuss further on.

The CD sound quality of digital, which the Committee has just heard, virtually dictates that digital broadcast technologies be adopted if radio is to compete with other aural media like compact discs, cassette players, digital audio tape players and digital cable radio. There is no choice. The question is how to help the transition occur.

Today, spectrum scarcity limits our ability to develop and deploy new communications technologies, including digital radio broadcasting. Many systems have been proposed to deliver digital radio using different parts of the spectrum, but they are at varying stages of development and spectrum in which some propose to operate may not be available.

Over the past year, six different systems have been proposed for transmitting DAB within the existing AM and FM bands. Under review are basically two approaches: an on-channel or adjacent channel "piggyback" digital signal, or an "interstitial" (between channels) method. These systems have not yet been demonstrated in

a mobile environment. Some of these systems might provide less than CD-quality sound and less resistance to interference.

While the FCC has indicated a decided preference for implementing terrestrial DAB within the spectrum currently allocated to broadcasting, it has also decided that satellite delivered DAB should be introduced in the U.S. market. However, S-band frequencies, which have just been endorsed in the draft U.S. position on WARC and appear to be only appropriate for satellite-to-home usage, have not yet been tested under any real-life conditions.

It is too early to tell which of the various digital radio systems will be technically viable, provide the most additional channels, or offer the best opportunity for an orderly transition. Therefore, the goal of public policy at this point should be to keep options open as technologies evolve, moving gradually toward a much larger number of channels for public use. For example, if some of the additional channel capacity resulting from digital technology is used for parallel services by existing broadcasters during the transition, it should be made available for public uses when the transition ends.

The stakes for public radio in the transition are particularly high. The investment by Congress, stations, and the American public in existing public radio assets is substantial. Congress has invested approximately $621 million in public radio equipment and programming, which has been matched by nearly two billion dollars in individual, state, and private contributions. A

substantial portion of the American public has come to count on the news, information, and cultural programming offered by public radio. It is imperative not only that existing public radio stations continue to be viable, but also that public radio be able to take advantage of the public service enhancements digital technology offers.

It is important to realize that although 20 percent of the FM band is reserved for use by all noncommercial entities, only about one-third of the reserve spectrum has been assigned to public radio stations. In addition, there are several technical problems with the current reserved FM band. The one that probably hampers public radio service most is TV-6 restrictions, which greatly limit public radio coverage in many markets. Public radio's fate in the new digital era cannot be once again an afterthought. An ample set-aside is necessary early in the process to ensure that public radio's present allocation is protected and then increased.

Once a system has been chosen and spectrum identified, Congress and the FCC must consider a reservation for existing broadcasters, public and commercial, whose expertise and competitive needs will be one of the engines driving the transition to digital technologies.

At the same time, Congress must address the reality that spectrum is no longer abundantly available and that the public interest may best be served -- once a transition is underway -- by recovering from business users the market value of this scarce resource. Public radio and other public interests should continue

to be exempt in any plans for spectrum auctions or other ways of assigning value to spectrum. Public radio funds should be directed at programming and facilities, rather than spent on bidding against commercial interests, or each other, for opportunities to bring new public services to Americans.

II. EXPANDED PUBLIC RADIO SERVICE FOR THE 21ST CENTURY

If digital audio broadcasting offers the potential for many more public channels, how could America use them?

Even today, public radio service is unavailable to approximately 14 percent of the population -- in places like Allentown, Pennsylvania, Lake Charles, Louisiana and Beaumont, Texas because there is no spectrum, and in sparsely populated rural areas because conventional broadcasting is not economical for so few people. Large metropolitan areas often have more than one public radio station, but ethnic and racial diversity means millions of people are substantially underserved. A station may air programming targeted to one or more ethnic groups, but one station cannot meet the needs of all.

The Public Radio Expansion Task Force concluded that public radio will be unable to fulfill its mission without the development of multiple program streams and multiple stations in large urban areas. A substantial body of excellent programming is not aired in many communities simply because the supply of programming greatly exceeds the capacity of stations to deliver it. One report

submitted to the Expansion Task Force estimated that fully 60 percent of the programming distributed by the public radio satellite system competes for a mere 10 percent of the local carriage "windows." This means that popular national programs such as MORNING EDITION, ALL THINGS CONSIDERED, and MARKETPLACE, along with local programs, effectively take up 90 percent of available local air time. Many programs tailored to specific interests, such as the "Public Radio Law Show," "Pickleberry Pie" and "We Like Kids!" for children, "Noticiero Latino," and "AIDS in Focus" are heard in only a small number of markets because most stations' schedules cannot accommodate them.

So even public radio as we know it today -- surprisingly robust for an afterthought, perhaps, but an afterthought nonetheless -- needs more channels to do the job Congress and the public expect of it.

I invite the Committee to look ahead to the possibilities public service radio can offer at the start of the next century, just about when digital technology will be coming on line. Can one imagine new uses for an aural medium as inexpensive and accessible as radio?

Think about a multi-ethnic America, groping for common civic values, and at the same time cherishing its cultural diversity. Will there be enough public channels so minority communities can really have a piece of the action --- really speak by, for, and about themselves? Or will they still be broadcast to by advertiser-driven commercial services?

Radio call-in programs have begun to make the medium interactive. How many interactive public radio forums would be useful in Chicago, Los Angeles or New York by the year 2000? Three or four? Eight or ten? We don't know the number, but we do know that if we don't make room for them now, they won't be possible then.

Will there be an urgent need for more radio information services in a society that is multilingual but with (sad to say) a high rate of illiteracy? Information about health, parenting, nutrition ... kids' programs ... readings for the visually impaired ... all services that give listeners some choice. These are things we do a little bit of now; things for which radio is uniquely well suited.

How many people will want to learn English as a second language via radio? The Chinese have done it. The Voice of America teaches English over the radio in other countries every day. Will we preserve the capacity to do the same for our own citizens?

Mr. Chairman, all of these services are needed and it may not be too much to say that the success of our society may depend on them. They can be offered very inexpensively through radio, provided the channels are available. They will not be provided by commercial radio unless they are able to produce a return for advertisers.

I want to emphasize particularly the public service potential of direct satellite broadcast to radio receivers, which becomes viable with digital technology. A broadcast program has to reach

enough interested listeners to justify its airing. In conventional terrestrial broadcasting, this means that many potentially valuable public services are squeezed out simply because there are too few beneficiaries within listening distance of the radio tower.

Direct satellite broadcasts, available everywhere in the country, have the potential to solve this problem because taken together, small groups of isolated people add up to very large audiences. For example, English-as-a-second language practice sessions would have too few users to work in most local markets, but it is not hard to imagine a nationwide audience large enough to justify several channels for various levels of proficiency. The same economies of scale will work for reading services for the visually impaired, foreign language services, or cultural and information programming for groups of people with special needs scattered across America.

I want to make clear that we are not talking about moving any of our current programming, such as ALL THINGS CONSIDERED or MORNING EDITION, to a satellite-to-listener service. NPR is committed to the existing system of distribution of its programs to local stations nationwide. We are prepared, however, when satellite distribution is authorized by the FCC, to create new public services for those now unserved or underserved.

"Nice idea, but those are the listeners who will be the last to get digital receivers," you will hear. No, Mr. Chairman, those are the people who can be the first to get digital receivers -- those for whom these new public services are the most important.

Subsidies to get receivers into their hands is just part of a decision to put public needs first -- subsidies which will, incidentally, help all of broadcasting by accelerating the conversion to digital technology.

The Committee will be pleased to know that the Corporation for Public Broadcasting has initiated a major study to identify public service opportunities that will be possible in a digital radio environment.

Let me conclude by emphasizing that the prospect of digital audio broadcasting need not create difficult trade-offs between public and commercial broadcasting. Additional channels mean we can satisfy the public needs I have outlined without reducing business access to spectrum. Commercial broadcasters are concerned about competition, both from new entrants and from direct satellite broadcasts, so I hope they will support the proposition that the nation reserve for public service uses the additional capacity digital offers.

Mr. Chairman, some of the technical issues surrounding adoption of digital audio broadcasting are complex, but this complexity should not be allowed to obscure the valuable public asset it can represent. Nor should the uncertainties surrounding the technology deter the Committee from establishing two priorities: seize this chance to increase the number of radio broadcast channels, and make public service the top priority.

Mr. COOPER. The next witness will be Mr. Alan Box.

STATEMENT OF ALAN L. BOX

Mr. Box. Thank you, Mr. Chairman. I am Alan Box, a member of the NAB Radio Board of Directors and chairman of the NAB's Digital Audio Broadcasting Task Force.

I'm delighted to be here to discuss this evolving technology with you as high definition television has the potential to upgrade our current TV broadcasting system, DAB has similar potential to provide greater clarity, fidelity, and interference-free service to the American radio audience.

As radio broadcasters, we naturally want to provide the best quality audio we can to our listeners and we're working hard to develop the potential DAB offers.

The development of DAB is important for a number of reasons: First, the way in such a system is implemented, either by a terrestrial broadcasting satellites, or a combination thereof, will have a major impact on both our industry and the American people.

For years, the FCC has licensed radio stations based on the concept of local service. This system has created over 12,000 radio stations today, serving every community in the Nation with a wide variety of programming, much of it locally produced. That local component of American radio is at the heart of our industry and it is a system that has served our Nation well for over 60 years. As the FCC moves forward on DAB, we believe it is most important to maintain that structure of local stations licensed to serve the public interest.

I hope you will agree that to allow satellite DAB service to supplant existing broadcasters by making our stations obsolete would not be in the public interest, nor would a system that would wholly upset the competitive balance among stations which are now providing local service.

We've been actively engaged in the looking at various DAB technology proposals and we continue to solicit others. Some would require frequency allocations and new broadcast spectrums; others might use existing spectrum bands for DAB. We want to remain flexible on that issue.

We've worked closely with the Eureka group from Europe, which has a highly developed DAB system. We are also looking at in-band solutions to the DAB question and anxiously await their development as well as proposals from other groups who are developing different systems.

The key, though, as with HDTV, is to set a standard for the best system for America's needs and desires. That is why we believe that through evaluating competing technical and policy proposals we can arrive at a system that will be best tailored to our system of terrestrial broadcasting and will most benefit American companies and listeners.

We are encouraged by the attitude of flexibility, which the FCC has shown thus far in its view of terrestrial DAB. We remain concerned, however, that the recommendation to place DAB in S-band frequencies, which was announced last week as the U.S. position at

the upcoming World Administrative Radio Conference, might pave the way for satellite broadcasting ahead of our terrestrial needs.

I mentioned potential needs for new spectrum a moment ago. I would be remiss if I did not thank you, Mr. Chairman, the subcommittee, and Chairman Dingell for your efforts in pushing H.R. 531 through the House this summer. This legislation is important in providing the spectrum broadcasters may need in the future for both HDTV and DAB.

There are many thorny issues which still need to be resolved in the next few years besides maintaining localism and developing a DAB technical standard, we are looking at such issues extending DAB opportunities to all AM and FM stations a timetable for the DAB deployment and how to enhance our current analog broadcasting signals with digital over a period of time.

We do not have all the answers to these and many other questions yet, but our Task Force is hard at work at developing an industry consensus on these concerns.

We also caution you against being misled by those special interests who are seeking to use DAB as an excuse to create new performance rights in recorded music.

Congress has already looked at the relationship between radio broadcasters and the music industry and determined that a proper balance exists. There is no evidence that the emergence of DAB requires any new set of rules between us and we would urge you to reject such appeals.

In closing, let me say that although we are still in DAB's infancy, many of us in the radio business are excited with the prospect of being able to provide CD quality, interference-free radio service to our listeners.

The American people have enjoyed the many offerings of radio for generations and DAB offers the next generation even greater service and enjoyment.

Thank you.

[Testimony resumes on p. 57.]

[The prepared statement of Mr. Box follows:]

WRITTEN TESTIMONY OF

MR. ALAN L. BOX, PRESIDENT
EZ COMMUNICATIONS, INC.

Thank you, Mr. Chairman, for the opportunity to appear at today's hearing on Digital Audio Broadcasting and its future. I am Alan Box, President of EZ Communications in Fairfax, Virginia, which owns and operates a total of 14 radio stations around the nation. I am also Chairman of the National Association of Broadcasters' (NAB) Digital Audio Broadcasting Task Force, which has been actively working on DAB issues for many months, and a member of NAB's Radio Board of Directors.

In my testimony today, I want to look at several key aspects to the development of this emerging broadcasting technology. First, I want to discuss briefly what DAB is and how it works. Second, I want to elaborate on how NAB has responded to this new technology and our view of it. Third, I want to discuss why the development of DAB is so important to our industry and our nation. And finally, I will look at how we think U.S. policy makers should work to help us make DAB a reality for the American listening public.

Let there be no mistake: NAB supports the evolution of analog AM and FM broadcasting systems into a fully digital system of broadcasting in a way that is least disruptive to the service now being provided to the public. We hope you also will support this goal.

DAB -- Bringing CD-Quality Sound to American Radio Listeners

Just as the development of color television has enhanced the quality of service provided by the American television industry, DAB promises to enhance the service of the radio industry. Digital sound has many advantages over traditional sound systems we now use.

In 1982, compact discs or CDs were first introduced to audiophiles. In just nine short years, 28 percent of American homes have a CD player.[1] In 1989 (the most current figures available), 36 percent of all consumer dollars spent on pre-recorded music were spent on CDs, with cassette tapes accounting for about 50 percent and only 8 percent for record albums. In addition, digital audio tape (DAT) is now on the market, as well as mini-disc systems and digital compact cassettes. CD players and DAT machines are now available in some automobiles as well.

In addition, cable television systems have begun marketing digital audio systems for home use. This so-called "digital cable audio" is being marketed by three audio services, which offer listeners from 19 to 30 different channels of music for a cost of between $7 and $11 extra per month on their cable bills.

Digital audio is also a key component of every High-Definition Television (HDTV) system being tested. Clearly, once HDTV becomes a reality, digital audio will be a component of the final system chosen as the standard for transmission.

Currently, AM and FM radio stations transmit in analog form. This form of transmission is particularly subject to interference between the transmitter and the receiver.

---

[1] Electronic Industries Association U.S. Sales, June, 1991 at 25.

But digital audio is different. It more closely resembles computer data in that it is transmitted as a carefully-constructed series of binary codes. Thus, every piece of data within the signal either represents a zero or a one. Given that all the music or voices can be broken down into this simple digital code, the receiver can then distinguish between what is pure music or voice and what is noise or interference, and can then screen out that noise and interference. The result is the kind of sound you get from a CD player, but instead, over your radio, either at home or in your car.

Digital coding also allows the signal to actually correct errors incurred in the transmission process at the receiving end, which further enhances the quality. And through the ability of the transmitter to break down the digital data into many smaller signals within a given radio channel, such problems as multi-path can be eliminated (that is, where echoes of a signal off tall buildings or other obstructions cause more than one signal to reach the receiver). In short, digital audio provides the listener with a significantly higher quality sound and one which is free from many of the problems which plague analog audio transmissions from time to time.

Digital audio is here. DAB is clearly on the horizon. The only questions are how we will move forward to arrive at a system which is standardized and which can best benefit the American listening public.

How NAB Has Responded to the DAB Challenge

Just as NAB has been a leader in the TV industry in the development of HDTV, so, too, have we taken the lead in the development of terrestrial DAB. And, just as NAB has helped fund and participate in the Advanced Television Test Center, which is helping the FCC pick an HDTV standard within the next several years, we have created a Digital Audio Broadcasting Task Force to look at DAB and the issues it raises.

As chairman of that task force, I can tell you that we have two main goals. First, we want to create the DAB system that is best for American listeners, and which will provide them with the highest quality audio system anywhere. Second, we want to ensure that radio broadcasters can participate in this new technology so as to improve the quality of the local service which we provide to that audience. We believe the creation of any new DAB system which would adversely affect service from America's 12,000 radio stations would not be in the public interest. And, we believe that, as pioneers of the industry who have made large investments over the years developing a state-of-the-art communications system, we deserve a priority opportunity to participate in advanced technologies affecting our future.

In developing a DAB system, our Task Force has looked at two possibilities. Either DAB service could be offered within the frequencies already assigned to radio stations, which we refer to as "in-band," or DAB could be authorized to use new spectrum not currently being used for broadcasting. Obviously, following last Friday's announcement by the FCC which

essentially deferred consideration of any new spectrum for our terrestrial broadcasters, our immediate attention must be directed toward "in-band" development.

The NAB DAB Task Force welcomes any and all proponents of DAB technology. We have had presentations of various technologies made to us and will continue to entertain any and all proponents of various systems. We realize that we should fully participate in DAB and be the driving force behind the proper construction of the framework for that technology. Further, the only way for American radio manufacturers and industry players to keep a leg up in the race to develop DAB is to move forward with a plan to create the best DAB system possible and to implement it in the public interest through existing local, terrestrial radio stations.

We know DAB can work very well in both stationary and mobile environments. As an example, the Eureka 147 system has been demonstrated twice for broadcasters -- once this spring at our all-industry NAB Convention in Las Vegas, Nevada, and again at our Radio 1991 Convention in San Francisco this September. So far, the reviews have been excellent. At our conventions, we had DAB, AM and FM transmitted to a bus driving around the city. Riders could then hear the differences in quality and interference levels between the three audio systems. We also had a booth at each convention hall where one could listen to the DAB programs.

In short, NAB has taken a leadership role in this emerging technology. We have developed a task force which has aggressively looked at the issue from many perspectives and laid out parameters for moving forward. This task force has spent many long hours in numerous meetings, perhaps more than any NAB committee in history, to attempt to manage, from our industry's perspective, the evolution of DAB. We have seized the initiative in seeking the use of spectrum for DAB, especially including the possible utilization of existing AM and FM spectrum.

Key Issues Facing DAB

Why is DAB so important to American radio broadcasters? And what are some of the key issues we need to address?

Advancing Localism

Ever since passage of the Radio Act of 1927, the United States has relied upon one given in its radio licensing policies -- local radio (and TV) stations are licensed to serve their communities in the public interest. It is this local system of broadcasting which has become the envy of the world, and which other countries (notably emerging democracies in Eastern Europe) are now looking to as they develop their own privately-run radio industries. You will recall that earlier this year, NAB provided four volumes of examples to this subcommittee of public service work done by local broadcasters as part of their serving the public interest.

Yet a number of new DAB entrants seek to provide DAB service by satellite, providing no local programming whatsoever. If such satellite services are allowed to preclude the ability of local radio stations to convert to DAB and continue providing their local services, then the public interest, we believe, will not be served.

It is not unreasonable to see a future where satellite DAB services are in operation. As DAB receivers hit the consumer market, local AM and FM radio stations are not yet transmitting in digital. As listeners, already desirous of digital sound, move to satellite DAB, the ability of local radio stations to hold their audience and the advertisers who seek these listeners is lost. The erosion of local radio service could have disastrous consequences to our members, but also to thousands of cities and towns nationwide.

Local stations have public interest obligations through their FCC license, something which no other media have. America's 12,000-plus radio stations provide local communities with countless hours of local news, public affairs, and public service each and every day of the year. Important weather bulletins, disaster warnings, traffic and school information, and discussions of local community activities and issues such as alcohol abuse, illiteracy, infant mortality and homelessness all occur because radio stations are locally-licensed and operated. These activities serve the needs of millions of Americans. Yet, none of these services would be provided by a satellite-delivered DAB signal.

Satellite services are, by their very nature, national or regional services with little or no local component. If satellite service develops absent contemporaneous terrestrial DAB development, the local radio industry, already mired in an industry-wide recession, could be put at an even more significant disadvantage. DAB is vital to providing and improving local service, and must not be allowed merely to supplant local analog radio service through satellite providers. Again, we stress that, as pioneers of the industry in which we have invested billions, and with a history of local service unmatched by any one else, we deserve a priority opportunity to participate in the advanced technologies that affect our future. We are witnessing more countries moving to a decentralized system of mass media communications that imitates our domestic system of broadcasting. We must be doing something right.

That is why NAB has opposed applications for satellite service filed with the FCC, and why we must insist on terrestrial-based radio stations having access to any new spectrum with potential use for DAB.

By relying upon the system of existing broadcasters who have been awarded licenses in a thoughtful process, taking into account numerous public interest factors and geographically spaced around the nation, we can provide upgraded DAB service to the American people without having to re-invent the wheel.

The Need for a Uniform DAB Standard

A second concern is the need to set an industry-wide standard for DAB transmissions and receivers. Anyone who has witnessed the problems with AM stereo development knows all too well what could happen if DAB goes the same way.

Just as the FCC realized that HDTV standard setting was the best approach with that television technology, so, too, do we need a single standard for DAB. Once that standard is found, all manufacturers can begin making radios to that standard. All radio stations will then have the assurance they need to invest the significant resources they will need in order to convert to DAB.

Before any systems are put into place, we must have a standard set that takes into account the need to create the best DAB service for all Americans.

Copyright Concerns

While the issue is not within this subcommittee's direct jurisdiction, copyright concerns also threaten the ability of DAB to blossom and flourish.

Already, the recording industry has suggested that widespread DAB would lead to massive home taping of pre-recorded music, thus causing a decline in sales and lost revenues.

and has also suggested that DAB should somehow serve as a rationale to adopt performance rights in sound recordings for all broadcasters. With respect to the Recording Industry Association of America's (RIAA) copying concerns, the Audio Home Recording Act of 1991, introduced by Congressmen Jack Brooks and William Hughes, which would provide for anticopying codes and royalty fees on digital audio recorders and blank tapes, should address those concerns.

With respect to RIAA's theory that DAB somehow justifies performance royalties for sound recordings, let me state that broadcasters already pay over $300 million in music copyright fees which go to the copyright holders of the music which they broadcast (i.e., the songwriters, composers and publishers). To suggest that another copyright fee to the record company and/or performers on top of those fees will only add to that rather significant burden.

But beyond that, Congress has looked at this issue previously and recognized that a true balance exists between radio broadcasters and the recording industry. Radio stations receive a benefit by airing sound recordings, while simultaneously, the performers receive a tremendous benefit from the exposure which such airplay provides.

In fact, at this year's Country Music Association awards, six were given to radio for its effort in this field. Additionally, a recent lawsuit in California by Motown Records stated that:

"...sales of new records to the public are generated largely by air play on various radio stations throughout the United States."[2]

There is no evidence today to demonstrate that this mutually beneficial relationship has changed significantly or that it would change under DAB. Indeed, it is highly speculative to assume, as the Recording Industry Association of America has done, that DAB will lead to fewer discs or tapes being sold. Similar fears were raised when FM stereo came along, yet today the recording industry is more successful than ever before in history.

We must not allow unjustified demands for additional music royalties to subvert what is in the best interests of the American listening public -- CD quality sound through digital audio broadcasting.

DAB -- Where Do We Go From Here?

Mr. Chairman, our industry is working hard to capitalize on any and all technical benefits we can make available to the public and we realize DAB is an important improvement.

[2]Motown Record Company v. MCA, Inc., Superior Court of the State of California, filed May 14, 1991 (Complaint, paragraphs 20-21).

The radio industry is already showing its commitment through the efforts to develop prototypes of DAB systems. We want that to continue. Only through a thorough development process can the best DAB system evolve. This process should continue unfettered. We certainly hope you will support our efforts.

Preserving localism is of paramount importance throughout all of our activities on DAB. I know your subcommittee shares our view that local broadcasters are the best servers of the public interest. It seems that much of the interest in satellites centers around the ability to provide broad nationwide coverage. But our system of locally-based, over-the-air radio stations already provides such coverage with a mix of local, regional and national programming. The enhancement of DAB would provide an ideal vehicle for maintaining that diverse programming. If, however, the decision of our government supports the establishment of a new satellite DAB service with no local component, is making that type of service available worth the economic destabilization it will create in our own local broadcast environment? It seems we stand to lose more than we gain.

I thank you and full committee Chairman Dingell for your leadership on H.R. 531, which was approved by the House on July 9 of this year. This legislation begins the process of re-allocating spectrum for private and commercial uses, such as DAB, in the future. It has broad, bipartisan support and NAB's enthusiastic endorsement.

Through the efforts of our NAB task force, as well as the entrepreneurial spirit exhibited by DAB system developers, we are looking at some exciting developments and possibilities for digital audio broadcasting down the road. We ask only for your encouragement as we move forward toward DAB deployment in the not-too-distant future.

In closing, Mr. Chairman, the radio industry is hard at work to make DAB a reality. We have many issues to resolve before a final decision can be made, but we are confident the problems are solvable and the new technology deliverable.

When Marconi first transmitted his primitive wireless decades ago, he could not have had an inkling about the advancements that would occur in that medium. Today, radio remains a constant companion for nearly every American every day, providing news, music and information. Tomorrow, DAB promises to make that service even better in communities large and small across this nation and around the world.

Again, I appreciate the opportunity to bring you up-to-date on this exciting new development in our industry, and look forward to your questions.

Mr. COOPER. Thank you very much for the excellent testimony. The Chair will proceed with a few questions of his own.

Mr. BOX, I hate to be too parochial but I represent a district in Tennessee that's produced a large number of country music stars, and these people do get concerned when it is technically possible to broadcast digital sound that could then be recorded without any diminution in sound quality and that tape in turn could be mass produced to subvert record sales.

So it's hard for folks like me to understand why this new technology, with its CD quality capability, isn't a new and different threat to the legitimate copyright holders of this very, very valuable software.

We like to brag that Nashville is the software capital of the world because we feel that we produce the most coveted software on the planet since country music is the most popular form of listening entertainment.

Why isn't this a new and different threat to these song writers and performers?

Mr. BOX. I can appreciate your concerns and also admire your taste in music.

DAB coming about for American broadcasters would not be significantly different than people's ability now to tape off of CD's, to make copies of any number of——

Mr. COOPER. But you have to buy a CD. You would not have to buy the song you heard and liked over the radio.

Mr. BOX. Sure, and the same concern was there when FM came about many years ago, and it didn't develop into a problem then at that point.

Mr. COOPER. Those tapes are not infinitely reproducible without diminution in sound quality. If you tape it from a tape of an FM broadcast, you don't get as good a tape, right?

Mr. BOX. It's also a process that you have to go through.

Years ago when FM came about, the quality of FM was as good as, if not better than vinyl recordings. The same will be true with DAB. But we don't see where that potential is that great and is that dangerous to those stars that we promote day in and day out for free as well.

Mr. COOPER. Mr. Shapiro wanted to add something, I believe.

Mr. SHAPIRO. Mr. Chairman, before you is legislation called the Home Audio Recording Act, which addresses many of your concerns. In fact, the Serial Copy Management System, which is part of that, would prevent serial copying off of digital radio using a tape. And part of that Home Audio Recording Act, which we have agreed with the music industry to support, does contain a royalty for every blank tape purchased.

So in terms of multiple copies off of a digital radio, I think that that is addressed in the Home Audio Recording Act.

Mr. COOPER. I was glad to see that long awaited consensus between the manufacturers and the performers, songwriters. But you are, at least, convinced that that law would cover digital audio radio.

Mr. SHAPIRO. It would cover recording off of a digital audio radio, yes.

Mr. COOPER. Mr. Box, why isn't it a conflict of interest for the NAB to own ownership share of Eureka? Why doesn't that make it harder for you to be completely neutral as to which technical standard would be adopted?

Mr. Box. First, for the record, the NAB doesn't own any interest in Eureka. We have contemplated a business relationship that would allow us to share in royalties if that were at some point adopted as the standard.

We felt from the start, and particularly from a Task Force point of view, that we wanted to avoid a lot of issues that had come before us, such as AM stereo, and seek to bring DAB to the American broadcast system quickly and correctly.

We were intrigued with what Eureka had to offer. We felt that it was a proper way to bring this about. I don't feel that it is a conflict of interest and all the dealings that I have had to work with with DAB through the NAB and as a broadcaster, I think it has helped us bring DAB about in a way that's going to be technically superior than had we not had that relationship.

Mr. COOPER. Let me understand. NAB has a contractual arrangement so that if Eureka is adopted as the standard, you could benefit financially? If it is not, then you would not benefit?

Mr. Box. Actually what NAB has is a letter of intent to enter into a contract that would involve some sort of sharing of royalties. It would also include Canada and Mexico and perhaps other countries and organizations in this part of the world. That's yet to be negotiated but that's what's contemplated.

Mr. RITTER. Would you yield?

Mr. COOPER. I'd be happy to yield to the gentleman.

Mr. RITTER. But it appears that NAB's selection of that standard and then the United States' selection of that standard, which NAB is promoting, would benefit NAB, so how can NAB be effectively neutral on standard selection?

Mr. Box. From the outset, NAB tried to make it as clear as possible that our goal was to bring about the technology in a proper way. The NAB has told its members and made it public through trade press that the financial aspects of DAB are another thing. They've even stated at times that they had no intention of being the final player in that, that they would sell those rights off to other people, to other broadcasters or other interests.

The important aspect was to be able to manage for American broadcasters the way that DAB might be brought about.

Mr. RITTER. But don't you see how it appears?

Mr. Box. I do see how it appears.

Mr. RITTER. I yield back.

Mr. COOPER. I thank the gentleman for his questions.

I take it, then, that NAB does not have any letter of intent or contract regarding any other technology, any other competing technology? So it's only if Eureka is chosen that something might happen?

Mr. Box. That's correct.

Mr. COOPER. And you're still convinced of the soundness of that decision in that Eureka is the best system, technologically the most advanced, has all the attributes that you wanted in a technological system?

Mr. Box. DAB, in the little over a year and a half that I've been involved with it, has evolved and changed in many ways. And particularly given the decision by the Commission last week as to their position as it relates to the upcoming WARC, it looks to me as though our focus is going to have to be on in-band. Eureka does not necessarily have the same technological advantages in in-band that it did in terms of DAB and other spectrum.

So to answer your question, I am not as convinced personally that Eureka has the lead that it once did. I do think they are highly developed. They are very well funded. They seem to show a greater commitment toward having the resources and the desire to develop a system than some of the other proponents, and I would expect that they'd be a player in the long run.

Mr. COOPER. In making these decisions, whether it's standard-setting or the value placed on localism and the quality of current local services, I can't help but think it's most appropriate to ask consumers to make those decisions because they often know better and do a better job than government does, or that industry does, or that trade associations do. Is it inappropriate to ask consumers to help us make those decisions?

I understand the local broadcasters concerns that their franchise be preserved and the claim is often made that localism justifies the franchise. Because Mr. Bennet pointed out, oftentimes there are slices of community that might not be large enough to deserve much local attention in an individual market, particularly from a financially-strapped station that's oftentimes having to reduce even its existing local services, not enhance them, due to revenue problems.

Isn't it appropriate to ask the American people, the consumers, the voters, to help us make these decisions instead of us sitting here pretending we know more than they do?

Mr. Box. I think it's very appropriate. The broadcasters have had a long history of every time there's a new piece of equipment that comes out, a new gizmo that might make it sound better for the consumers, for the listeners, we're the first to jump on these things. It happens every day. It's happening this week in our company, there's a new piece of gear out that we're fighting over to be the first to have, to deliver higher quality, better sound.

I think it's very appropriate to ask the consumers. I think the consumers would tell you that they would love to have interference-free, multipath-free, high quality sound, that of a CD; that they could receive in tunnels, that they could receive in places where they can't get it now, in hilly markets, in mountainous areas.

I'm sure that they would have a voice that very much parallels ours.

Mr. COOPER. Then why was it a mistake for the FCC to make the decision last week to go ahead and give satellite a chance?

Mr. BOX. It's a mistake only in that it has the possibility to pave the way for satellites at a quicker pace than it would for our current system of broadcasting.

Mr. COOPER. But nothing is stopping you from getting together with broadcasters and manufacturers and setting some sort of

standard and going ahead with your own terrestrial broadcast plans, right?

Mr. BOX. We've been working very hard to do that. The only thing that stops us is technology.

Mr. COOPER. Is it technology stopping you or human indecision about appropriate technology?

Mr. BOX. It's both. If we were to focus our efforts in in-band or even more specific, in-band on channel, we don't know yet that it's technically possible to bring about digital broadcasting for AM stations in a way that's fair for AM stations.

We need a lot to work on that, a lot more needs to be done.

Mr. COOPER. I hope you don't take this question wrong because this would certainly be the bastion of incumbency, if there is one, but I wonder sometimes if incumbents deserve protection. Just because you have an old franchise doesn't mean you unnecessarily deserve a new franchise. Sometimes franchises expire. The buggy whip manufacturer shouldn't be kept in business forever.

It's hard sometimes to distinguish between—like, take the EIA, it started out as the Radio Manufacturers Association—you would certainly be reluctant to have that name for your current operations; it would be much too limiting. You've been able to grow and evolve but some businesses aren't able to do so.

We're asked all the time to preserve the privileged position of incumbents, including ourselves sometimes. But that doesn't mean it's the right thing to do.

Mr. BOX. You and anybody that wants that opinion is certainly entitled to it. There's nothing that I can see that's broken about the radio broadcast industry today.

Mr. COOPER. AM is not making money—that's broken.

Mr. BOX. But AM can be improved through digital.

Mr. COOPER. If we slow up satellite?

Mr. BOX. And there's a lot of good AM service out there today that could be improved through digital.

Mr. COOPER. If we slow up satellite and if we do some other things.

Mr. BOX. I don't think we've ever asked anybody to slow up satellites.

We would like to have equal footing. We would like to be able to compete with that new service. The Task Force and NAB, as far as I know, never asked anybody to delay it.

Mr. COOPER. But I thought you were critical of the FCC decision to go ahead with the S-band allocation; you thought that was moving too fast.

I inferred that you would like them to go slower. If it were within your power, you wouldn't——

Mr. BOX. No, I'm not necessarily asking that they go slower. I think the FCC has made an assumption that in-band will work, and I hope that it will. But we don't know that yet.

Mr. COOPER. I've taken probably far too much time. I'd be happy to yield to the gentleman from Pennsylvania.

Mr. RITTER. I thank the gentleman.

Continuing on his question, if in-band didn't work, would you opt for curtailing the satellite use?

Mr. BOX. I think our efforts, if in-band didn't work, would be to find other solutions to the problem.

Mr. RITTER. Without slowing down satellite?

Mr. BOX. I don't think that our position as the National Association of Broadcasters is one that we focus on slowing down other industries.

Mr. RITTER. I think Mr. Abel, before you, said that the Eureka 147 system seemed to be equally applicable, or nearly applicable, to in-band as it would be to L-band.

Do you agree with that?

Mr. BOX. I do agree with that. It solves many of the needs for FM broadcasters. It is not yet certain what it would do for AM broadcasters.

Mr. RITTER. Any other opinions from other panelists on that? Is that accepted?

Mr. SHAPIRO. We simply don't know at this point which of the proponent systems will work and which won't, although there are many viable systems going on almost every week. That is what we're trying to look at and develop an industry consensus on, but we can't determine yet.

In terms of the FCC action, whether it was appropriate or not, it's appropriate in that there is spectrum being allocated. In terms of whether that's the appropriate spectrum, we don't know yet, because none of these systems have had full-scale testing.

Mr. RITTER. Does EIA have a position on the royalty arrangement between NAB and Eureka?

Mr. SHAPIRO. No, we don't. To us, NAB is simply a proponent of a system or in the shoes of one, and there are several proponents and we welcome their participation in our committee; in fact, they have been participating.

Mr. RITTER. In your opinion, what are the prospects for in-band CD's on quality development in a short timeframe?

Mr. SHAPIRO. I'd be the last person to be qualified to judge that. I just don't think we'll know in the next 12 months what is possible and what is not. I think there's an analogy to HDTV in that 5 years ago when we started looking at it we didn't know what technologies would emerge and what algorithms and compression techniques would be developed. And we've been very fortunate that several have, that have put the United States ahead of the rest of the world in HDTV.

In terms of what's happening with digital audio broadcasting, the same type of arrangement could happen in the next couple of years.

Mr. RITTER. What is your opinion of the FCC's S-band allocation decision? You appreciate the fact that they have allocated some spectrum to this new technology?

Mr. SHAPIRO. Yes.

Mr. RITTER. Does this decision have impact in your eyes in the development of L-band or in-band, or is it, in your opinion, just too early to tell and it's good to have something out there, somebody doing something?

Mr. SHAPIRO. Our intention, in terms of our committee, is to look at all the different proposed systems. The fact that the FCC has indicated that for the purposes of the World Administrative Radio

Conference they're taking this approach, I'm not sure that will affect how we look at different systems because the FCC, in that same opinion, as I understand it—in the same release—indicated that they would look at other alternatives after that, or they implied that. I think it's continuing to develop and we're obviously watching very closely.

Mr. RITTER. Mr. Bennet, you talked about common unifying values that somehow the National Public Radio could provide for America, that this would be a unifying force and all that.

We don't really have value oriented public facilities in public stations. Usually the marketplace defines what our values will be, and unifying values will be. As a matter of fact, you'd find a lot of people—a fan of Public Radio have disagreed with it remarkably on some occasions and loved it on others.

I don't necessarily see you or anyone in the position of creating the public values radio network, especially funded by taxpayer money.

Mr. BENNET. I appreciate the opportunity to clarify that point. I may have spoken too quickly in an effort to summarize my testimony.

My point was not at all that National Public Radio or public radios as constituted to any way offer the consensus values. My point was that in a society that I think will be searching hard, as this one is, for those consensus values. There's a good piece in the business section of the Post on that question, on how you do it in a multicultural context.

My idea is that you need to, to provide two kinds of forums. One is a forum in which you can work out that sort of civic consensus, and the other is vehicles where people can still hear their own culture and articulate their own cultural values.

I'm not arguing for a moment that that is Public Radio's mission. I am arguing on behalf of what I see as a somewhat fractured public at this point that we're going to need both opportunities as a society.

Mr. RITTER. I think in theory you're absolutely right. But still there's a large contingent, probably upon this Hill as well, that think that public radio values are not necessarily theirs, and have some remarkable disagreements with public radio.

Mr. BENNET. I think that's a different question, which I'd also be happy to address. But for purposes of this discussion, I think it's very important to separate those.

Mr. RITTER. I'm not sure I've got the separation clear.

Mr. BENNET. One is the question of national values, having nothing to do with radio; but civil values, how do you hold a diverse society together and make it feel positive about its future instead of disillusioned as everybody says we do feel now.

The other question I hear you asking is, does National Public Radio hold an editorial opinion or seek to advance an agenda.

The answer to that is, no, we do not, in either case—but they're really quite separate.

Mr. RITTER. I think we're getting off on a tangent here and we will probably conduct this discussion in some other forum.

Mr. Chairman, at this point I yield back. Thank you.

Mr. SCHEUER [presiding]. Mr. Bennet, let's talk about set-asides. In your testimony you state, and I quote, "An ample set-aside is necessary early in the process to ensure that public radio's present allocation is protected and then increased."

Now, tell us, how big is ample?

In comments you submitted to the FCC a year ago, National Public Radio requested that the Commission reserve 20 percent of the spectrum allocated for any new digital radio system for the exclusive use of public radio.

Does that 20 percent figure still represent NPR's current thinking?

Mr. BENNET. Mr. Chairman, the 20 percent figure has a noble history in broadcasting. The history is that it was considered and rejected when AM spectrum was allocated and considered and accepted when FM spectrum was allocated in the 1940's as the digital prospect arose.

I felt we needed to declare the importance of a set-aside and the 20 percent figure had a certain historical resonance.

We also made the point that it was 20 percent for public radio. At this point, only about a third of the FM 20 percent is actually used for public radio.

My views on this have evolved in the following way: I think that as we come to see what may turn out to be the potential of this new technology for expanding service, that I don't know what the limit is, and, therefore, my testimony to you today is to give priority to public services—and as I said in the testimony, even public services that we can't imagine today.

I know that goes against the conventional thinking and I know it would be easier to put a label on it. I leave the 20 percent on the table for your consideration.

I am not prepared at this point to put an upper limit on public nor a lower limit on business.

Mr. SCHEUER. All right, you prefer to wait and see what the need is, what the challenge is, what the opportunity may be?

Mr. BENNET. Because I think that there are going to be decisions made as we go along here. If we make a policy decision to open up as much space as we can for these kind of services without hurting others, it will have some implications for the choice of technology, yes.

Mr. SCHEUER. Mr. Box, will you support a set-aside for public radio? And if you would, would a 20 percent set-aside seem appropriate and acceptable to you?

Mr. BOX. If new spectrum were needed, we would have no problem with the set-aside for public radio to put a limit on it at this point. I think it's also early, at this point it seems that our focus is such that we're not looking at new spectrum so it may be an issue that we don't have to address.

Mr. SCHEUER. Mr. Bennet, most of us assume that DAB is being developed mainly to improve the sound quality of radio broadcasting and to make it more attractive to consumers of audio products such as compact discs and DAT's.

However, as you demonstrate in your testimony. DAB could have another important effect on public radio.

If satellite DAB systems are developed, individual radio super stations, capable of transmitting signals to be received virtually anywhere in the United States, could offer programming on a national scale.

Why is this capability particularly attractive to public radio?

To what uses would NPR put satellite DAB? And specifically, how would NPR use DAB technologies to fulfill its mandate to reach unserved or underserved audiences?

Mr. BENNET. Let me start out by making clear that one thing we would not do is put our present services that go through local terrestrial stations on the satellite. We are very firmly rooted in the grass roots because of the way our stations are funded by listeners and so forth, so the economics and the philosophy of the present public broadcasting system is one in which we would continue to use satellites to reach our stations.

The problem that we face in an effort to provide public service is there are a great many public needs that exist in small pockets of people where it's not efficient to reach them with terrestrial broadcast.

The idea I've advanced in the testimony is that satellite services could solve that problem provided that you can probably subsidize the radio receivers.

So we think there's a very wide set of public services that are urgently needed by individuals who are isolated from each other that could be provided by somebody—it needn't even be National Public Radio. We're taking the lead on it because I'm not unfearful that nobody else will, but it's not even something that we try to claim for National Public Radio. It's just something that the country should treat itself to.

Mr. SCHEUER. Mr. Bennet, you suggest in your testimony that satellite DAB could be used to deliver programming and services suited to the needs of ethnic and racial minorities nationwide. For example, your testimony highlights how satellite DAB would aid National Public Radio to deliver radio programs designed to teach English as a second language.

Now, why would satellite DAB and National Public Radio be particularly attractive as a means of serving minority audiences? What kind of minority programs or services could be delivered using satellite DAB which would not be provided otherwise over terrestrial DAB or the current radio system?

Mr. BENNET. Wherever there is a minority audience which is too small to sustain a terrestrial service—there are just too few people to sustain a terrestrial service—in that case the satellite service becomes a very attractive option.

You referred to English as a second language, there's no way that you can do terrestrial broadcast in our present public radio economy of language programs. But we know from the example of China that you can learn English—and I'm talking about not learning Chinese, but English as a second language in China over the radio.

And given the fact that we're going to have a very large number of multilingual citizens, there should be 6 or 8 channels at various levels of proficiency that you can tune into.

Now there's some problems with it because of the receivers. I mean going beyond the issues that you've heard discussed today, to make that work really well, you'd like to have a portable receiver capable of receiving that terrestrial system. But I've seen enough technological wizardry in the last 10 or 15 years to believe that my colleagues here can achieve that.

So that you can be on the job with a portable radio, doing your work, earning your living, and studying English. This can be done with this technology.

Mr. SCHEUER. Mr. Shapiro?

Mr. SHAPIRO. Yes, I would echo many of the comments that Mr. Bennet has made.

The fact is that terrestrial delivery of radio is very big time. It's a big thing that could affect our country in many different ways. It goes to the segmented populations that were described by Mr. Bennet and it goes to the history of broadcasting and how it used to be the unified national experience; but no longer is because of the great diversity out there.

You could look to examples of successful television broadcasting through cable where you've had to create a national network of black entertainment television, for example.

There is a need out there for some type of segmented programming on a national basis, which just simply cannot be served today because of our present system of terrestrial distribution of radio.

The fact is that people do spend a tremendous amount of time listening to radio, as Chairman Markey pointed out earlier, and I think these people should be able to be served on a national basis.

I have a concern that if we maintain the status quo and say, yes, we must forever protect the interest of terrestrial broadcasters and not allow satellite delivery of radio services, we will be poorer off as a Nation.

Mr. SCHEUER. What is the relationship between the percentage of people who presume we would listen to English-as-a-second-language instructional programs on NPR radio as compared to the number of people who would benefit by watching them on public television?

Mr. BENNET. I don't think there's a way to make a comparison. Television is a very expensive medium for lots of things—it has wonderful uses where it's appropriate. The reason I mention English as a second language is because of the worldwide proof that radio is a viable mechanism for that. You don't really need to do it with television, as I understand it that's the case, and; second, it's portable.

Mr. SCHEUER. Thank you very, very much.

I yield to the chairman.

Mr. MARKEY. I thank the gentleman very much.

I apologize—we have the minor matter of the banking industry of the United States that Mr. Dingell and I are trying to handle as the Banking Committee continues to caucus across the corridor. And we are trying, as you can imagine, to formulate an appropriate response to their latest decisions for later implementation today and for the House deliberations. So I apologize to you but we were, unfortunately, compelled to tend to those matters.

Let me ask you this, Mr. Shapiro. In your testimony you note that EIA has created the Digital Audio Radio Subcommittee as an open technical forum in which all sides may express their views.

Is the creation of such a subcommittee a common EIA response to a new technology or does it suggest concern about the impartiality of others with regard to DAB?

Mr. SHAPIRO. Mr. Chairman, EIA sets about 100 electronics standards each year, so we have engineering committees meeting all the time that are EIA committees.

In the past, with broadcast standards we have these different mechanisms depending on the technology and the particular circumstances. With television stereo we formed a Cross-Industry Committee. We have an existing committee with the National Radio Systems Committee.

Mr. MARKEY. Let me be more specific, then.

Does the creation of this subcommittee indicate a concern on the part of EIA about NAB's potential proprietary interest in Eureka?

Mr. SHAPIRO. I wouldn't raise it to a level of concern. I just think that many of the people involved——

Mr. MARKEY. What level would you raise it to?

Mr. SHAPIRO. We felt it was more appropriate that we have a neutral ground where a proponent—NAB proponents just as any other company with a proprietary interest. But I might add, that some of our own members are often proponents in terms of our standards-setting committee.

Mr. MARKEY. How should we view this potential NAB-Eureka partnership?

Mr. Shapiro?

Mr. SHAPIRO. I was hoping you'd pass off that question.

The fact is in the trade association world out there, as the economy tightens and companies consolidate, the industry is very tight, and every trade association is looking to additional revenue sources.

To represent the industry, and it's NAB's perogative as an association, at least in my view, to become an affiliate of a proponent.

Mr. MARKEY. Mr. Bennet?

Mr. BENNET. From National Public Radio's point of view, we felt it was better not to be too closely associated with any particular technology until the technologies evolved, and that has served us well.

Mr. MARKEY. Mr. Bennett, in his testimony, Mr. Box asserts that local broadcasters, in fulfillment of their public interest obligations, provide substantial local public service and public affairs programming, including weather bulletins, disaster warnings, traffic and school information, and discussion of local community activities and issues.

He further suggests that these services would not be provided to communities through a nationwide DAB satellite service.

Do you have any comment with regard to NAB's concern about the loss of localism, which is potentially possible, Mr. Bennet?

Mr. BENNET. I think the concerns are different, Mr. Chairman. Public radio, because of the way it's come up, is so closely rooted at the grass roots, as I said to Congressman Scheuer earlier, that we think the present balance between national and local services is

sustainable; in fact, it's hard for us to see another way that it might work. So we don't perceive a threat from satellite broadcast, whereas, we do see enormous potential for serving isolated audiences, as I say in my testimony.

My observation about broadcasting of radio, particularly, in the United States is that it has been terrificly resilient, and I would hope that commercial broadcasters would figure out, as they have in the past, new ways to cement themselves in their local community so that what I consider to inevitable technology is not painfully damaging to them.

Mr. MARKEY. Mr. Shapiro? Same question.

Mr. SHAPIRO. In terms of the issue of locals versus satellite delivery, I think it's incredibly important that we go to national delivery of radio. But at the same time, I do think we have to recognize the contributions of local broadcasters. Localism is very important and it's a long, established tradition.

On the other hand, I think there can be coexistence with national delivery.

I might also add, if I may, Mr. Chairman, that the National Association of Broadcasters going to affiliate with one proponent is not necessarily bad. I think there is a possibility of one point in time where I think everyone agrees that a one-world standard approach in the abstract be most desirable, and there was a potential it appeared for that.

But as other systems came forward and as other developments occurred, there are many systems out there which are being proposed. So EIA would be premature to say this system is better than any other system. And that's simply what we're trying to look at.

And back to your other question in terms of localism, if I may, we do have a major opportunity here and I think as long as we allow satellite delivery, I think we'll be better off.

Mr. MARKEY. But on the other hand, there is a tension here because of the cost of ensuring that this satellite delivered technology is compatible with the local public radio stations. This raises the question as to whether or not the NPR perspective and the local public radio station perspective are on the same sheet of music here. That is, it seems to me that there's some tension here—that's what's good for NPR isn't necessarily good for local public radio stations if the costs are so high that national DAB is implemented at the expense of the local public radio stations.

Mr. Bennet?

Mr. BENNET. There are two dimensions of this question.

One, as the chairman knows, National Public Radio is the local stations; I mean, they vote for our Board, I work for those station managers. What we produce and what we do is to a considerable measure for their benefit. We also try to represent a broader public radio interest in the country.

Point two, and separately, to achieve the benefits of the direct satellite broadcast that I outlined in my testimony would take some additional public investment, which is just not realistic to assume that it's a sharing of the present public investment in radio.

The proposition that I've offered the committee is that using radio to meet those kinds of needs in a situation where you have

more spectrum in a digital age is going to be a highly economic way to do it. If you think about English as the second language issue as a classroom proposition, there's no way.

Mr. MARKEY. We authorized $200 million 3 years ago to replace public broadcasting's national satellite, the connection system. As I remember it, that was for the purpose of taking care of this issue for the next 10 to 12 years.

If the advent of DAB requires an additional Federal allocation, will that be on top of the additional money or will it come out of that money which has already been allocated for the satellite interconnection system?

Mr. BENNET. It would be in addition—100 percent in addition to that. As you will remember, the satellite interconnection replacement system that Congress funded for all of public broadcasting included two transponders for public radio, which gives us the capacity to deliver a digital signal to our stations, because we anticipated at that time that we would need at least that capacity. Because of the standardization issues discussed here this morning, it's impossible that those transponders would be suitable for us in the digital direct satellite broadcast environment we're talking about.

But again, the question is, would this technology forces upon us is costly compared to what? And this is a very inexpensive way——

Mr. MARKEY. Inexpensive. What kind of money are we talking about?

Mr. BENNET. We don't know the number but radio broadcast has always been one of the least expensive—by orders of magnitude—least expensive ways to reach people. And there's no reason, I don't think, to assume that this is not going to be the case now.

Mr. MARKEY. So we're talking about $1 million additional or $100 million extra?

Mr. BENNET. You may be talking about some billions of dollars to meet the public needs that I'm talking about. You're talking about not just the satellite cost, whatever that turns out to be—you're talking about the terrestrial transmission cost. We've heard estimates of up to $150,000 for existing stations. But I'm talking about a lot more stations owned by minorities and minority communities, for example.

And beyond that, the question of jump-starting this process by putting direct satellite receivers in the hands of people who probably can't afford——

Mr. MARKEY. Did you say billions?

Mr. BENNET. I know that the number is shocking in these halls, but, yes.

Mr. MARKEY. In terms of public commitment to this issue?

Mr. BENNET. The public services. I'm not talking about National Public Radio; I'm not talking about the public radio system as we now know it.

I'm talking about an option that is truly available for delivering a whole set of public services that don't now exist in this country in an efficient way.

Mr. MARKEY. Mr. Box, according to your testimony, NAB believes strongly that existing broadcasters must be accorded a preference in the distribution of DAB licenses.

Is NAB concerned that all broadcasters, AM and FM alike, have the ability to provide DAB?

Mr. Box. Yes, we are. We feel it's got to be for all AM and FM radio stations.

Mr. MARKEY. What is the likelihood that all AM and FM broadcasters will have this ability?

Mr. Box. I think it is likely.

As I pointed out, some of the technology is still developing, but the indications that we have today are that a system such as that can be developed.

Mr. MARKEY. OK.

Last week the FCC announced an intention to seek an S-band allocation for DAB.

Will this decision have an impact?

Mr. Box. It has an impact in certain ways. Their decision certainly clarifies the direction for satellite interest and where they'll be because it speaks to that in the S-band and what I assume we would interpret as terrestrial repeaters for satellite.

From our perspective, it says that we must focus now our attention on the development of good in-band systems and see if that can be done.

Mr. MARKEY. So that's the NAB's next step?

Mr. Box. It really is the best alternative at this point.

Mr. MARKEY. Let's sum up then. Let's give each one of you 1 minute to tell us what you want us to remember, the Congress, as we're moving forward on this subject.

As you can see, the members here are fascinated by the issue. What I'd like to do is have each of you, if you could, just to give us the 1-minute compelling pitch that the Chair of the subcommittee will use to raise the intensity level of the rest of the members on this subject.

Let's begin with you, Mr. Shapiro, then to you, Mr. Bennet, and to you, Mr. Box.

Mr. SHAPIRO. Mr. Chairman, thank you.

My 1-minute compelling pitch is that digital radio is the wave of the future and we should get on it.

In terms of what I'd like you to remember, is that when you travel across the country, you will be able to listen to your Massachusetts St. John's—I forgot which school—basketball games all across the country because you'll have that service.

Mr. MARKEY. Thank you.

Mr. Bennet?

Mr. BENNET. I was just about to support Mr. Shapiro's position but we don't think basketball works too well on radio. Golf is also not good on radio.

My compelling 30-second remaining statement is that there is an opportunity here for much more service. There's an opportunity to think about what we're hearing on radio differently. I'm talking about commercial as well as public.

The public radio system as we know it embraces this new technology with delight. We see great possibilities.

And with respect to the chairman's calculus of billions, I would respectfully submit that the recovery possibilities here exceed any cost of providing this service.

Mr. MARKEY. Thank you.

Mr. Box?

Mr. BOX. Mr. Chairman, thank you very much.

My 1-minute pitch is that DAB is well on the way, it's evolving, it's needed.

The important aspects of this, to me, seem to go beyond the technical—the technical guys seem to work these things out very well. It's the policy issues that concern us. There are a lot of radio stations today, perhaps too many—and we have a troubled industry. And we're an industry that is embracing this new technology, but with the understanding that we have to move forward very carefully.

Localism has been used a lot here. It's an important issue. It's not one that should be thrown away. It means a great deal, not only to the listeners but to the advertisers, and we think that balance needs to be protected.

Mr. MARKEY. Thank you, Mr. Box, very much.

We're going to work as closely as we can with each of the witnesses today and the interests which they represent.

The Chair has a tremendous amount of concern that this issue receive the amount of attention which it deserves. We will continue to push as hard as we can to ensure that the resources are there and that the benefits to the public are understood.

And notwithstanding the other diversions which have captured the attention of the subcommittee members this morning, I can promise you that the Chair and the staff have got this on a front burner and we're going to continue to move forward very aggressively on it.

We thank each of you for your participation.

This hearing is adjourned.

[Whereupon, at 12:10 p.m., the hearing was adjourned.]

O

54-738 0 - 92 (70)