S. HRG. 102-908

THE AUDIO HOME RECORDING ACT OF 1991

HEARING

BEFORE THE

SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS

OF THE

COMMITTEE ON THE JUDICIARY UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

S. 1623

A BILL TO AMEND TITLE 17, UNITED STATES CODE, TO IMPLEMENT A ROYALTY PAYMENT SYSTEM AND A SERIAL COPY MANAGEMENT SYSTEM FOR DIGITAL AUDIO RECORDING, TO PROHIBIT CERTAIN COPYRIGHT INFRINGEMENT ACTIONS, AND FOR OTHER PURPOSES

OCTOBER 29, 1991

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THE AUDIO HOME RECORDING ACT OF 1991

TUESDAY, OCTOBER 29, 1991

U.S. SENATE,
SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:05 a.m. in room 226, Dirksen Senate Office Building, Hon. Dennis DeConcini (chairman of the subcommittee) presiding.

Also present: Senator Leahy.

OPENING STATEMENT OF HON. DENNIS DeCONCINI, A U.S. SENATOR FROM THE STATE OF ARIZONA

Senator DECONCINI. The subcommittee will come to order.

Senator Hatch is on the floor on the Civil Rights bill. He plans to join us shortly, so I'm going to proceed with his acquiescence.

Today we will take testimony concerning the Audio Home Recording Act of 1991. I introduced this legislation on August 1, and I'm pleased that just in that short period of time I've had 28 members of the Senate join me as cosponsors, including five members of the subcommittee that is hearing this bill today.

S. 1623 represents a historical compromise among traditionally opposing segments of the entertainment and electronic industries. As in all such compromises, all parties had to give a little to gain a little. I think that the compromise on which this legislation is based is fair and appropriate. I believe it represents sound public policy and is consistent with U.S. intellectual property laws.

The biggest winner if this legislation is adopted and becomes law will be the American consumer, who will gain access to a wider variety of better, more technologically advanced, and cheaper electronic equipment on which to play and record a greater variety of high-quality sound recordings.

I've been involved with the issue of home taping and its effects on the entertainment industry since 1981. A lot has changed in the last 10 years; a lot has stayed the same. Many of you who are here today were in this room on November 30, 1981, when I chaired a hearing on another bill I introduced on a similar issue. That bill never passed. Although many of us thought at the time that the various industries had more to gain by cooperating with each other than by fighting among themselves, it was difficult to envision a day when all of the competing voices would be urging the same legislative approach to the particular issue before us. May I congratu-

late all of you on your decision to work together to solve this problem.

I well understand the concerns among the creative community that the introduction of digital recording technology into widespread use in the United States will drastically worsen what they already perceive as the severe problem of displaced sales caused by home taping. I also understand why the electronics industry would want to resolve the issue of the legality of and Congress' reaction to home taping by digital recorders without lengthy and costly litigation.

While I know from many discussions I've had with both sides—or all sides—over the last 10 years that each is absolutely sincere in its belief that it is right and would ultimately prevail in litigation. However, I wholeheartedly believe that all of us are better off with a negotiated solution. Most importantly, it is especially advantageous to consumers that we resolve the problem here and now, because through the approach taken in S. 1623, they will have immediate access to the new digital recording technologies as well as access to recording copyrighted material on digital media.

I'm pleased that I was able to participate in the process that led to this historic compromise, and I'll insert the balance of my statement in the record that goes into the particular legislation in greater detail.

[The prepared statements of Senators DeConcini, Hatch, and Grassley follow:]

STATEMENT OF SENATOR DENNIS DeCONCINI

JUDICIARY COMMITTEE

SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS

AUDIO HOME RECORDING ACT OF 1991, S. 1623

OCTOBER 29, 1991

The subcommittee will hear testimony today concerning the Audio Home Recording Act of 1991. I introduced this legislation on August 1, and I am pleased that I have been joined by 28 of my colleagues, including 5 members of the subcommittee, as cosponsors of this bill.

S. 1623 represents a historic compromise among traditionally opposing segments of the entertainment and electronics industries. As in all such compromises, all parties had to give a little to gain a little. I think that the compromise on which this legislation is based is fair and appropriate. I believe it represents sound public policy and is consistent with U.S. intellectual property law. The biggest winner, if this legislation is adopted, will be the American consumer who will gain access to a wider variety of better, more technologically advanced and cheaper electronics equipment on which to play and record a greater variety of higher quality sound recordings.

I have been involved with the issue of home taping and its affect on the entertainment industry since 1981. A lot has changed in the last 10 years; a lot has stayed the same. Many of you who are here today were in this same room on November 30, 1981, when I chaired a hearing on another bill I introduced on a similar issue. Although many of us thought at that time that the various industries had more to gain by cooperating with each other than by fighting among themselves, it was difficult to envision a day when all of the competing voices would be urging the same legislative approach to the issue. May I congratulate all of you on your decision to work together.

I well understand the concerns among the creative community that the introduction of digital recording technologies into widespread use in the United States will drastically worsen what they already perceive as the severe problem of loss of sales

caused by home taping. I also understand why the electronics industry would want to resolve the issue of the legality of and Congress' reaction to, digital recording without lengthy and costly litigation. While I know from many discussions I have had with both sides over the last 10 years, that each is absolutely sincere in its belief that it is right and would ultimately prevail, I wholeheartedly agree that all of us are better off with a negotiated solution. Most importantly, it is especially advantageous to consumers that we resolve this problem here and now, because through the approach taken by S. 1623, they will have immediate access to the new digital recording technologies as well as access to prerecorded copyrighted material on digital media. I am pleased that I was able to participate in the process that has led to this historic compromise.

S. 1623 provides for an exemption from copyright infringement liability for a consumer for digital and analog audio taping for private, noncommercial use. This provision clears the way for the introduction of new improved recording technologies by eliminating any marketplace uncertainty over the legality of audio home taping. The legislation would establish a compensation system that would impose royalties on all digital recording equipment sold or manufactured in the United States. The royalty fee would be 2% of the value of each digital audio recorder with a minimum of $1 and a cap of $8 for single deck machines and a cap of $12 for dual deck. In addition, a 3% royalty would be applied to digital audio blank media, including compact disks, digital compact cassettes and minidisks. The legislation also specifies how these royalties will be distributed by the Copyright Royalty Tribunal, as well as allowing the benefactors to develop a non-governmental organization to take over the distribution role. The legislation will also require that all consumer quality digital audio recording equipment sold in the U.S. be equipped with the Serial Code Management System (SCMS) which prevents the making of subsequent digital copies of copies that have already been made of digital material.

STATEMENT OF SEN. ORRIN HATCH

SENATE JUDICIARY COMMITTEE

SUBCOMMITTEE ON PATENTS, COPYRIGHTS, AND TRADEMARKS

HEARING ON S. 1623: AUDIO HOME RECORDING ACT OF 1991

Thank you, Mr. Chairman, for convening today's hearing on this timely and important subject. The legislation embodied in S. 1623 represents an agreement among all segments of the music industry of a highly contentious issue that has divided them for years. For many of us in Congress, it is also identifies a solution that we have urged for many years to resolve this issue. I am particularly pleased that the parties themselves have been able to agree on a solution without the federal government's having to impose a remedy. It is preferable that business and industry negotiate solutions to their problems rather than look to Congress to solve them. Government is better able then to fulfill its important function of protecting the public interest while encouraging marketplace solutions to business problems.

The United States leads the world in technological innovations and creativity, and we are foremost in the area of creating entertainment--books, art, movies, and music. Our intellectual property laws have fostered an environment in which people are encouraged to engage in and are rewarded for their creative efforts.

One issue, however, that we have been unable to resolve is the issue of how the copyright law should deal with private non-commercial taping of sound recordings. I have favored creating a system of royalties that would compensate copyright owners and artists for royalties they lose because of lost sales. Others have argued that such a system should only be created if there is proof that home taping does indeed result in lost sales for sound recordings. Until the agreement that is the basis for this legislation was reached, the issue had proven to be unresolvable.

The primary beneficiary of the agreement that this legislation embodies is the American music consumer. The dispute between the hardware manufacturers and the music industry has prevented listeners from accessing the latest technologies. Unlike most of the rest of the world, most U.S. music fans have been unable to buy digital audio tape equipment and prerecorded digital audio tape. Newer technologies such as mini-compact disks, digital audio cassettes and recordable compact disks are on the horizon, but their availability has been threatened and the availability of compatible software to play on them has been stalled by this dispute. S. 1623 clears the way for these exciting new technologies to become widely available to American consumers.

I believe that S. 1623 will benefit all segments of the music software and hardware industry. Electronics manufacturers will be able to introduce new recording technologies without worrying about the possibility of copyright infringements suits and with the knowledge that copyrighted material will be made available in the new digital formats. Copyright owners, songwriters, musicians, and performers will be compensated through a royalty system for the use of the copyrighted material. In addition, the bill also requires the use of a Serial Code Management System (SCMS) to prevent serial copying of copyrighted material. The SCMS allows unlimited copying of original source material, but prevents the copying of copies.

S. 1623 is comprehensive and flexible insofar as it will apply to all digital recording technologies. I am pleased that the parties were able to agree to a prospective solution that will encompass all digital recording technologies.

Mr. Chairman, I believe that this legislation is a fair solution to a complicated problem. It has benefits for all involved, including, first and foremost, the consumer. While I am pleased, like you, to be an original cosponsor of S. 1623, the Audio Home Recording Act of 1991, I hope that today's hearing will produce useful criticism of the legislation and insights as to how Congress might most effectively proceed in this area.

PREPARED STATEMENT OF HON. CHARLES E. GRASSLEY, A U.S. SENATOR FROM THE STATE OF IOWA

I am glad we are holding hearings on this legislation so soon after it was introduced. It is quite appropriate that we move the bill forward with dispatch, given the years it has taken to arrive at a wise and equitable solution to the digital audiotape issue.

I have cosponsored the Audio Home Recording Act because I believe it strikes a proper balancing of the interests of consumers and the holders of copyrights. I see that most of our witnesses this morning concur in that assessment, and look forward to hearing them articulate their support. I also am open to suggestions about how the legislation might be fine-tuned to make it an even more effective solution.

On this subcommittee, we are constantly faced with the challenges developments in technology pose to the traditional conceptualization of intellectual property rights. Fortunately, we have usually been able to find a fair and reasonable way to deal with such novel issues. This is such a case. By using the Serial Copy Management System to limit copying, along with a structured royalty schedule and a limitation on litigation, we have been able to craft an effective protection of the rights of copyright holders without abrogating the rights of consumers.

In addition to placing limits on litigation, the bill is notable in its use of alternative dispute resolution mechanisms to address disagreements between parties. As one who likes to keep the courts clear and encourage alternative dispute resolution, I am glad the bill allows for binding arbitration.

I look forward to hearing from your witnesses.

Senator DECONCINI. We'll now hear from Mr. Ralph Oman, the Register of Copyrights.

Mr. Oman, we welcome you once again and thank you again for your steadfast cooperation in these matters, and we're pleased to have Dorothy Schrader, your general counsel, with you. Please proceed.

STATEMENT OF HON. RALPH OMAN, REGISTER OF COPYRIGHTS, LIBRARY OF CONGRESS, WASHINGTON, DC, ACCOMPANIED BY DOROTHY SCHRADER, GENERAL COUNSEL

Mr. OMAN. Thank you very much, Mr. Chairman.

I want to add my voice to your voice and the mounting chorus that's singing praise to the audio hardware industry and the music industry. They have reached a historic compromise on the new digital audio technology, and as you said, this compromise is good news for everyone who enjoys music. It's in many ways, Mr. Chairman, a tribute to your leadership that we've come this far in the 10 years that you mentioned.

The compromise does represent a great breakthrough. For the first time, the equipment manufacturers have recognized that unbridled home taping injures the men and women who create the music. We see a growing consensus that some limits on home

taping is appropriate. Congress now has a golden opportunity to create an environment in which this new technology can reach its full potential. Politically, the time to act is now.

Your bill, Mr. Chairman, cuts with what I see as a surgical precision. It does not overreach. It does not cramp the taping habits of teenage America, who still use the analog format. These teenagers have little disposable income anyway, so it's harder to make the case that home taping displaces sales. They would not always buy prerecorded tapes if they couldn't copy.

But that's not the case with digital audiotapes, Mr. Chairman. We're dealing here with a very expensive, high-end technology. Only a serious audiophile with a large disposable income will buy the machines at $800 a copy. Only he or she has the money to pay $25 per prerecorded DAT tape. He or she insists on the best quality. With the DAT machines, the serious music lover can make perfect copies for the digital tape deck in the Mercedes. Without the DAT machine, he or she would by that extra tape. So in the digital format, copying does displace sales.

The sooner you act, Mr. Chairman, I'd say the better. If we act now, we will be climbing on an international bandwagon. Today 17 countries have laws to compensate copyright owners for the private copying of their music. The lack of a royalty hurts our composers and music publishers and our record companies especially hard overseas. Many countries allow home taping royalties for a foreign copyright owner only if the foreigner's country pays their citizens royalties in return, so Americans now get the short end of the stick. Your bill would make our people eligible for their fair share of these foreign royalties.

That the United States has taken so long to get on that bandwagon really amazes our trading partners. They just can't understand why the United States, the greatest producer in the world of popular music, has not passed home taping legislation. Without that domestic legislation, our trade negotiators have to sit at ring side while others champion, often halfheartedly, the cause of composers and record companies.

Once you pass your bill, Mr. Chairman, Ambassador Hill will come out swinging. She will insist on equal treatment, and she will use our economic muscle to convince other countries to get on the royalty bandwagon. We will finally be free to advance our national self-interest overseas, and we will earn millions of dollars that we now lose.

Once this bill is enacted, Mr. Chairman, digital technology will take off. The U.S. public will get all the prerecorded tapes it needs to justify the expense of buying the DAT machine. The price of machines will fall if more people buy them, and the price of the tapes will fall, since record companies will not have to keep prices high to compensate for income lost to home taping.

The Copyright Office supports the bill, Mr. Chairman. I have suggested a few minor technical improvements in my written statement. They are intended mainly to streamline the whole process and to cut out redundant paperwork.

I commend the parties for their historic compromise and recommend favorable action by the Congress. The proposal seems sound, fair, balanced, and workable. All creative and proprietary interests

are accommodated by the compromise. Consumers will benefit from the full blossoming of this extraordinary new technology. As prices fall and more and more works are issued in the digital format, the public will benefit. The record companies also will sell more records and tapes, and the public and the broadcasters will have more music to enjoy. Everyone seems to benefit. At last the American creators will also share the profits of this wonderful technology as well as the equipment manufacturers.

I'd be pleased, Mr. Chairman, to answer any questions now or in writing, and I thank you for this opportunity to appear before the subcommittee.

[The prepared statement of Mr. Oman follows:]

Statement of Ralph Oman
Register of Copyrights and
Associate Librarian for Copyright Services
Before the Subcommittee on Patents, Copyrights and Trademarks
Senate Committee on the Judiciary
102nd Congress, First Session

The effect of unauthorized home taping on copyright proprietors has been discussed repeatedly during the last decades. At the heart of these discussions is the basic question of whether or not an author should be compensated for the unauthorized taping of copyrighted programs. Most of these discussions focused on analog duplication, and several countries have already determined that a royalty or tax should be imposed for the analog duplication of sound recording for commercial or personal use.

Senator DeConcini introduced S. 1623, on August 1, 1991. An identical bill, H.R. 3204, has been introduced in the House. Both bills are known as the Audio Home Recording Act.

The bill implements both a royalty payment system and a serial copy management system for digital audio recording. This legislation would also require manufacturers and importers of digital audio recording equipment who distribute digital audio recorders and blank digital audio recording media to make special royalty payments. The royalties, two percent for digital audio recorders and three percent for blank digital audio media, would be administered by the Copyright Office and distributed to claimants by the CRT.

In addition to royalty and SCMS provisions, the proposed legislation insulates consumers from infringement suits for home copying. Legal actions for copyright infringement based on private, non-commercial audio recording of either digital or analog phonorecords would be prohibited. The technical requirement regarding SCMS and the royalty provisions would apply to digital, not analog, audio recorders and blank digital audio recording media. Video recording equipment and media would not be affected, nor would dictation machines, telephone answering machines, or professional model digital audio recording equipment.

Although previous bills met with opposition from various interest groups, this year's bill has the definite advantage of agreement among three major affected groups, the record industry, music publishers and songwriters, and the consumer electronics industry. The provision of a royalty will not only alleviate some of the concerns of American musicians and composers but also those of the international copyright community.

The Audio Home Recording Act proposal represents a historic compromise that apparently takes account of all affected interests. The legislation will have a positive impact on protection for United States authors and copyright owners worldwide. American authors will now be able to claim their fair share abroad.

The Copyright Office fully endorses the principles of the proposed AHRA and recommends favorable action by the Congress.

Statement of Ralph Oman
Register of Copyrights and
Associate Librarian for Copyright Services
Before the Subcommittee on Patents, Copyrights and Trademarks
Senate Committee on the Judiciary
102nd Congress, First Session

October 29, 1991

Mr. Chairman and members of the Subcommittee, I am pleased to appear before this distinguished body. Thank you and your staff for the opportunity to appear here today and testify on S. 1623.

On July 11, 1991, representatives of the audio hardware and music industries announced their agreement to seek legislation clarifying rights of consumers, manufacturers, and copyright holders in light of advancements in digital technology. Senator DeConcini introduced S. 1623, on August 1, 1991. An identical bill has been introduced in the House. Both bills are known as the Audio Home Recording Act (AHRA). [1]

The bill implements both a royalty payment system and a serial copy management system for digital audio recording. This legislation would require manufacturers and importers of digital audio recording equipment and those who distribute digital audio recorders and blank digital audio recording media to make special royalty payments. The payment would be two percent for digital audio recorders, based on the manufacturers' price of the equipment, and three percent for blank digital audio media. The legislation also specifies payment caps and a floor. The fund would be administered by the Copyright Office and distributed to claimants by the Copyright Royalty Tribunal (CRT).

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1 Representatives Brooks and Hughes introduced H.R. 3204 on August 4.

In addition to royalty provisions, the proposed legislation contains a provision applying to consumer protection for home copying, and a requirement to include the Serial Copy Management System in consumer digital audio recorders. Legal actions for copyright infringement based on private, non-commercial audio recording of either digital or analog product would be prohibited. The technical requirement regarding SCMS and the royalty provisions would apply to digital, not analog, audio recorders and blank digital audio recording media. Video recording equipment and media would not be affected, nor would dictation machines, telephone answering machines, or professional model digital audio recording equipment.

The path to S.1623 has been a long one with several roadblocks that seemed almost insurmountable until the interested parties removed the barriers as they did in the July compromise. Before analyzing the bill and giving the Copyright Office position on S. 1623 as drafted, I would like to briefly sum up the background leading to this legislation.

I. HISTORICAL BACKGROUND

For many years, composers, lyricists, and musicians have become increasingly uneasy over the threat that technological advancements pose to their income, especially the advancements that make copying of their work easier. The 1971 Sound Recording Act made sound recordings copyrightable under federal copyright law for the first time, effective February 15, 1972. The legislative history of the Act is often cited to support the position that Congress intended to leave home audiotaping unrestricted. The House Report stated:

> In approving the creation of a limited copyright in sound recordings it is the

> intention of the Committee that this limited copyright not grant any broader rights than are accorded to other copyright proprietors under the existing title 17. Specifically, it is not the intention of the Committee to restrain the home recording, from broadcasts or from tapes or records, of recorded performances, where the home recording is for private use and with no purpose of reproducing or otherwise capitalizing commercially on it. This practice is common and unrestrained today, and the record producers and performers would be in no different position from that of the owners of copyright in recorded musical compositions over the past 20 years. [2]

This language did not appear in either the Senate Report to the Sound Recording Act or the committee reports accompanying the 1976 omnibus revision of the copyright law. Both commentators and copyright proprietors maintain that this omission was intentional and supports their position that private copying of audio tapes is not a fair use. [3]

The conflict between consumers and copyright proprietors over home taping intensified during the early eighties when the courts were considering whether or not the use of videocassette recorders to tape off the air infringed the copyright of the owner of the material being taped. The courts had a difficult time resolving this issue. In the complex "Betamax" litigation, [4] the copyright owners of motion pictures taped off the air

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2. H.R. Rep. No. 487, House Committee on the Judiciary, 92nd Cong., 1st Sess. 7 (1971).

3 See Nimmer, Copyright Liability for Audio Home Recording: Dispelling the Betamax Myth, 68 Va.L.Rev. at 1509-1510.

4 Universal City Studios, Inc. v. Sony Corp., 464 U.S. 417 (1984) rev'g 659 F.2d 963 (9th Cir. 1981), rev'g 480 F. Supp. (C.D. Ca. 1979).

alleged that the sale of the Betamax videocassette recorder constituted contributory copyright infringement by presenting the means to infringe. Plaintiffs asserted that Sony sold videocassette recorders (VCRs) with the knowledge that they would be used to make copies of copyrighted works. The district court ruled in favor of Sony and the other defendants; the appellate court reversed, but the Supreme Court ultimately ruled in favor of Sony, finding that such taping was a fair use. The Court based its decision on two grounds. First, section 107 of the Copyright Act was interpreted to permit taping for purposes of delayed viewing -- "time-shifting." Second, copyright owners had voluntarily broadcast these programs over the airwaves for home viewing.

The "Betamax" decision is limited as a precedent. It does not answer all of the questions posed by private copying. For example, it does not deal with copying for the purpose of building a videotape library, or off-air taping of cable and pay television programming. "Betamax" answers even fewer questions respecting audio home taping because different assumptions prevail vis-a-vis videotaping and audiotaping. Individuals replay audiotapes more frequently than they do videotapes; they tape with the intention of retaining audiotapes, and consequently collect large personal libraries of audiotapes. Most consumers use videotape as blank tape, recording over or erasing a program once it has been viewed.

After careful examination of the opinions and conclusions of the commentators and its own review of the legislative history, the Copyright Office concludes that there does not exist an exemption for home recordings in the current Copyright Act, nor is there conclusive evidence demonstrating

that Congress intended home recording to be a sanctioned fair use under the current Act. Thus, the question of whether home taping is a fair use of the prerecorded works copied must be determined in accordance with section 107 of the Copyright Act.

While the Copyright Office acknowledges that there does exist some legislative history from the 1971 Sound Recording Act suggesting that home taping of sound recordings is permissive, the Office is not convinced that such history survived the general revision of the copyright laws in 1976. The Home Recording Rights Coalition (HRRC) has put forward two theories as to why the 1971 Sound Recording Act protects home taping activities: special exemption and fair use. [5] The special exemption position is based on the House report to the Sound Recording Act, quoted above. The fair use argument is principally supported by a floor statement of Rep. Kastenmeier: "On page 7 of the [1971 House] report, under 'Home Recordings,' Members will note that under the bill the same practice which prevails today is called for; namely, this is considered both presently and under the proposed law to be fair use." [6]

The Copyright Office resists the characterization of the 1971 House Report as creating a special exemption for home taping. The Office believes that had Congress wished to exculpate home taping from copyright liability, it would have expressly done so in the statute. Furthermore, the Office does

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5 See HRRC comments submitted in response to the Copyright Office's Notice of Inquiry published in the Federal Register on October 24, 1990. 55 FR 42916 (1990).

6 117 Cong. Rec. 34,748-49 (1971).

not believe that the "Home Recordings" provision of the 1971 House Report was intended to either create or recognize a special exemption. This report noted that home taping was "common and unrestrained," and that copyright holders in sound recordings under the bill would be "in no different position from that of the owners of copyright in recorded musical compositions over the past 20 years." The report intentionally equated the rights of copyright holders in sound recordings with those of the underlying musical works. Obviously, there was no recognized exemption for home taping of musical works in the 1909 Copyright Act -- only the provisions of the fair use doctrine. It, therefore, seems likely that the House Report was referring to home taping as a recognized fair use of a sound recording, but not as an activity specifically exempted from the protections of the copyright laws.

That the House Report was referring to home taping as a fair use, rather than an exempted activity, is further supported by the floor statement of Representative Kastenmeier. Kastenmeier called specific attention to the "Home Recordings" passage in the House Report, and stated that the practice of home taping "is considered both presently and under the proposed law to be fair use." Kastenmeier's statement and the House Report do not seem to be a pronouncement that home taping per se is fair use, but rather a recognition that, at the time of passage of the Sound Recording Act, home taping for private purposes could constitute a fair use of a copyrighted work.

Given the Copyright Office's view that the House Report and Kastenmeier statement were offered in 1971 as a recognition of then existing law as to the permissibility of home taping as fair use, it must be determined what significance, if any, the statements have on current

copyright law. The Office notes several criticisms offered against the statements: namely, that the Senate did not join the House Report in 1971 and that the statements are confined to sound recordings only as an amendment of the 1909 Act. However, the most important issue is to what extent the statements survived, or have relevance, to the 1976 Copyright Act.

The HRRC argues that because the Congress made clear in the 1976 Act that it intended to continue the doctrine of fair use as developed under the 1909 Act, and that it declared home taping for private use to be a fair use in 1971, then home taping remains a fair use under the present law. This position, however, seems to attach undue importance to the 1971 Kastenmeier statement and House Report. As noted above, the Kastenmeier statement and House Report indicate a recognition of existing fair use law, not a legislative pronouncement as to what the law would be in the future. It is interesting to note that none of the parties to this proceeding, nor the legal commentators, offer evidence demonstrating how home copying of prerecorded works were treated by the courts under a fair use analysis prior to 1971. Furthermore, although the House Report and Representative Kastenmeier stated that they were articulating the current law, they too offered no cases or support for their position. This is not surprising since there was no case dealing expressly with the issue of home taping of prerecorded works for personal use. Although home audio taping was "common and unrestrained," no copyright owners had pursued an infringement action. The House Report and the Kastenmeier statement arguably can be seen as no more than an opinion as to how home taping should be treated under a fair use analysis, rather than a recognition of existing law.

Because the fair use status of home taping was not clearly established in the law at the time of the 1971 Sound Recording Act, the House Report and the Kastenmeier statement have diminished significance. Indeed, as Professor Nimmer candidly points out, "[t]he most one can fairly attribute to the House Report, then, is an opinion that home recording constitutes fair use." [7] We must put the language of the 1971 House Report in its legal context because fair use was solely a judicial doctrine in 1971, and the courts had not ruled whether or not all home recording constituted fair use.

Even if one assumes that, with respect to sound recordings, Congress adopted the position in 1971 that home taping constituted fair use, the evidence suggests that such a position did not survive the general revision of the copyright laws in 1976. First, while Congress adopted wholesale in 1976 many sections of the 1971 House Report on sound recordings, the passage regarding home recordings was pointedly omitted. Obviously the legislators in 1976 were aware of the language, but chose deliberately not to incorporate it into the 1976 Committee Report. Second, while it is true that Congress stated in 1976 that it did not intend to "change, narrow or enlarge" the fair use doctrine "in any way," [8] the fair use status of home taping was undecided at the time of passage. This would explain why the 1976 House Report stated "[i]t is not intended to give [taping] any special status under the fair use provision or to sanction any reproduction beyond the normal and reasonable limits of fair use." [9]

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7 Nimmer, supra note 3, at 1511.

8 H.R. Rep. No. 1476, 94th Cong., 2d Sess. 65-66 (1976).

9 Id. at 66.

Finally, Congress did not express any categorical findings as to the fair use status of home taping nor did it give any indication that fair use should be decided in a manner other than in accordance with the provisions of section 107. The 1976 House Report stressed that fair use determinations remain with the courts, not Congress, and must be done on a case-by-case basis: "Beyond a very broad statutory explanation of what fair use is and some of the criteria applicable to it, the courts must be free to adapt the doctrine to particular situations on a case-by-case basis."[10] Copying activities such as home taping are therefore never per se fair use, but must be evaluated according to the particular circumstances of the activity. [11] The Copyright Office, therefore, does not find any evidence suggesting that Congress intended home taping to be broadly permitted as fair use under the current Copyright Act.

In summary, the Copyright Office views home audio taping as a practice consisting of varying activities for different purposes. Some reasons and activities may have legitimate claims to fair use, but a large amount of home taping is likely to have an impact on the market for prerecorded copyrighted works that will negate a fair use defense. While individual acts of taping may cause infinitesimal amounts of harm, the collective impact may be significant. The copyright holder is often left without means of redress because the private nature of home taping makes the

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[10] Id.

[11] S. Rep. No. 473, 94th Cong., 2d Sess. 66 (1976). ("The committee does not intend to suggest, however, that off-the-air recording for convenience would under any circumstances, be considered fair use.")

costs of identifying tapers great while the potential returns are too small to be worth pursuing in court. The Copyright Office therefore concludes that an upfront royalty and monitoring system is the best solution to guarantee that in a rapidly advancing technological era, copyright owners are properly compensated for the use of their works.

Although Congress considered home taping proposals frequently during the last decade, it did not enact a legislative solution. The parties seemed to have reached a working arrangement in regard to home video rentals and home video taping was resolved at least partially in the "Betamax" litigation. The question was never settled as to home audio taping.

The debate over home audio taping intensified in the furor over the introduction of the DAT recorder in the United States in 1987. Digital audio tape (DAT) was introduced with hopes for enormous success. But acceptance in the United States has been lukewarm. The recording industry was concerned about piracy since first generation DAT machines could reproduce an infinite number of perfect copies. Writers and publishers advocated establishing royalty provisions to compensate copyright owners for unauthorized copying of their works. The recording industry urged the consumer electronics industry to fit equipment with special circuitry that would prevent unauthorized copying.

Since home taping royalty legislation was not enacted, representatives of copyright interests directed Congress's attention to technological solutions. Congress considered a number of hypothetical copy prevention systems including the CBS Copycode system. That system removed a narrow band of frequencies from the audio signal, making possible the defeat

of unauthorized copying. Many questions were raised about the efficacy of the Copycode system, leading Congress to request the National Bureau of Standards (NBS) for a study. NBS tested this copy prevention system and found that it did not achieve its stated purpose.

Joint hearings were held in Congress to address the problems posed by DAT. The Recording Industry Association of America (RIAA) was concerned that this new technology would enable a consumer to make a digital master as good as the record producer's own, make an unlimited number of perfect copies, and thus displace sales. The consumer electronics industry, represented by the Electronics Industry Association (EIA), was willing to adjust its DAT machines to prevent digital-to-digital copying but was unwilling to render the DAT recorder incapable of copying prerecorded digital recordings.

As a result, the Chairmen of the two respective Congressional subcommittees [12] asked the RIAA and the EIA to attempt to resolve the dispute among themselves. On July 28, 1989, these groups announced a worldwide software/hardware agreement to make joint recommendations to governments respecting DAT recorders. S. 2358 and H.R. 4096 incorporated that agreement. Those bills were notable for being the first agreement reached between the longtime opposing interested parties on this issue.

S. 2358 and H.R. 4096 would have implemented a Serial Copy Management System (SCMS) for digital audio tape recorders. The Serial Copy Management System proposed for the DAT recorder would allow perfect digital

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[12] The Senate Subcommittee on Patents, Copyrights, and Trademarks and the House Subcommittee on Courts, Intellectual Property, and the Administration of Justice.

copies to be made from a compact disc, but not allow further copies to be made from those copies. This system was endorsed by the recording industry and the consumer electronics industry, but not by songwriter and publisher groups.

Last year I appeared before another Senate Subcommittee (on Communications) to testify on S. 2358, the Digital Audio Tape Recorder Act of 1990. That bill had two purposes: to provide U.S. consumers the opportunity to enjoy the technological advancement in sound recordings afforded by the use of digital audio tape (DAT) recorders and to also give the manufacturers of such recorders and producers of sound recordings a measure of protection.

Groups representing songwriters and music publishers opposed the agreement and the resulting legislation. The opposing groups were in favor of a royalty solution, one which was last considered in the 99th Congress, following the Supreme Court's decision in the "Betamax" case. In fact, several songwriters filed suit against Sony Corp. seeking a declaration, inter alia, that unauthorized home audio taping on DAT recorders of copyrighted musical compositions is unlawful under the Copyright Act. Sammy Cahn v. Sony Corporation, 90 Civ. 4537 (S.D.N.Y. 1990). As a result of the July 1991 agreement, that suit has been settled and plaintiffs have sought dismissal.

This year's bill has a definite advantage over earlier bills proposing only a technological solution. S. 1623 implements a royalty that will not only alleviate some of the concerns of American musicians and composers but also the international copyright community.

II. SUMMARY OF THE AUDIO HOME RECORDING ACT

A. General provisions

The proposed Audio Home Recording Act (AHRA) of 1991 (S. 1623) implements two systems -- a technological solution and a royalty-compensation solution -- in response to the copyright policy issues presented by digital audio recording technology.

The technological solution mandates that digital audio recorders must be engineered to implement the serial copy management system (SCMS) in order to be imported, manufactured, or distributed in the United States. SCMS circuitry programs digital recorders to read encoded information that permits the recorder to make one copy from original digital source material, but not to make copies of copies.

The royalty solution places an obligation on importers and manufacturers who distribute digital audio recorders and media in the United States. The proposed royalty rate is two percent of the "transfer price" for recorders and three percent for media (blank tape, etc.). The rates are subject to a per unit cap of $8 and a per unit floor of $1 for recorders, unless the machine is dual port, for which the cap is $12. The royalty system operates as a statutory or compulsory license, administered by the Copyright Office (which collects the money and has a role in verification of audits) and the Copyright Royalty Tribunal (which adjusts the royalty caps on recorders and distributes the money to entitled claimants, in accordance with pre-set allocations among record companies, featured artists, music publishers, songwriters, and performers' unions).

The technical requirements and royalty obligation apply only to digital audio recording technology. Neither applies to any analog audio recording products, or to professional equipment, telephone answering machines, dictating machines, video recording product, or computer equipment. The AHRA also prohibits copyright infringement actions regarding either digital or analog recording products, unless copies are reproduced for direct or indirect commercial advantage. Copying by a consumer for private, noncommercial use is not actionable.

The Copyright Office can deduct its administrative costs from the royalties collected, before depositing the money in interest-bearing U.S. securities for later distribution with interest by the Copyright Royalty Tribunal. As an alternative to collection of royalties by the Copyright Office and distribution of royalties by the Tribunal, at least two-thirds of the claimants to the Sound Recordings Fund and Musical Works Fund may reach a negotiated collections-distribution agreement. The negotiated agreement can vary the statutory provisions for collection, distribution, and verification but cannot change the royalty rates or the percentage allocated to each group.

B. Sectional Analysis of S. 1623

1. Basic Provisions

S. 1623, the "Audio Home Recording Act of 1991," would amend portions of Chapter 8 of title 17 U.S. Code, and add a new Chapter 10 of title 17.

The Act would reach both phonorecord taping and taping of broad-

casts and other transmissions. [13] §1001(a)(1)(definitional section). "Digital audio recording devices" would not include professional model products and dictation machines, answering machines and other audio recording equipment designed and marketed primarily for fixation of nonmusical sounds. §1001(a)(3).

Similarly, the term "digital audio recording medium" would not include material objects embodying sound recordings (unless embodied to evade obligations of the Act), objects used to copy motion pictures, or other audiovisual works or nonmusical literary works (e.g. computer programs or databases).

An "interested copyright party" would be 1) the owner of the exclusive right to reproduce a sound recording, 2) the legal or beneficial owner of such a right, or 3) an association or organization representing 1) and 2) or engaged in licensing rights in musical works to music users on behalf of writers and publishers.

An "interested manufacturing party" would be a person that imports or manufactures digital audio recordings devices or media in the United States, or an association of such persons or entities.

The bill would not limit, expand, create, or otherwise affect any right or remedy under the Copyright Act. §1002(b). Private home copying of copyrighted works by a consumer for noncommercial use would not constitute infringement. §1002(a).

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[13] A "transmission" includes "any audio or audiovisual transmission, now know or later developed, whether by a broadcast station, cable system, multipoint distribution service, subscription service, direct broadcast satellite, or other form of analog or digital communication."

2. Prohibition on Certain Infringement Actions

The Act would prohibit the institution of copyright infringement actions, or actions under section 337 of the Tariff Act of 1930, based on manufacture, importation or distribution of digital or analog audio recorders or blank audio media, or the use of those recorders or media for making phonorecords. Private consumer copying for noncommercial use would be specifically permitted, but the making of one or more reproductions for direct or indirect profit would be actionable. §1002(a).

3. Obligation to Make Royalty Payments

Importers and manufacturers distributing digital audio recorders and blank media in the United States would be required to file notices and statements of account, and to pay a royalty. §1011(a).

Within 45 days after first distribution, an importer or manufacturer would be required to file notice with the Register of Copyrights. §1011(b). After such filing, they would submit to the Register, on a quarterly basis, royalty payments and statements of account specifying (by product category, technology utilized, and model) the number and transfer price of all recorders and blank media distributed during the quarter. §1011(c). Importers and manufacturers would also be required to file a cumulative annual statement of account, certified by an independent certified public accountant. §1011(d).

Those entitled to receive royalty payments would have the right to verify statements of account once a year through an independent audit process. §1011(e)(1). All parties, in the event of a dispute, would have access to the documents on which the audit was based. §1011(e)(3). Copyright

parties would pay for the audit, unless there was an annual royalty underpayment of 5 percent or more, in which case the importer or manufacturer would pay reasonable audit costs. §1011(f). Quarterly and annual statements of account and information from audits would be considered confidential trade secrets. §1011(h).

4. Calculation of Royalty Payments

The royalty payment for recorders would be 2%, and for blank media, 3% of the transfer price. The recorder royalty rate would be subject to a per unit cap of $8 and a per unit floor of $1. Machines having two or more recorders would have a $12 cap. The caps (but not the basic royalty rates) could be adjusted upwards after five years if 20% or more of the royalty payments were at the cap, but the floor would be fixed. Only the first person to manufacture and distribute, or import and distribute, devices or blank media would be required to pay the royalty. §1012.

5. Deposit of Royalty Payments and Deduction of Expenses

As with the compulsory licenses in the Copyright Act, the Register of Copyrights would receive royalty payments and, after deducting expenses, deposit the balance in the U.S. Treasury. §1013.

6. Entitlement to Royalty Payments

Royalties would be distributed to persons whose musical work or sound recording had been distributed to the public in phonorecords or transmissions, and who filed a claim. §1014(a)(1)-(2).

7. Allocation of Royalty Payments to Groups

The royalty pool would be initially divided into a Sound Recordings Fund and a Musical Works Fund. The first fund would get 2/3 of the royalties;

the second, 1/3 (divided equally between music publishers and songwriters). §1014(b)(1)-(2). Royalties would be distributed to music creators and copyright owners on the basis of record sales and airplay. §1014(c).

8. Procedures for Distributing Royalty Payments

During the first two months of each year, interested parties would file a claim for royalties with the Copyright Royalty Tribunal [CRT]. Parties within groups could negotiate for a proportionate division of royalties. §1015(a).

Within thirty days after the claims period closed, the CRT would determine if there was a royalty controversy. If not, it could authorize distribution. §1015(b).

In the event of a controversy, the CRT would hold a proceeding to resolve any disputes. §1015(c).

9. Negotiated Collection and Distribution Arrangements

Copyright and manufacturing parties could negotiate an alternative system to that in the bill for collection, distribution and verification of royalties. These negotiations could not alter royalty rates, the division of royalty payments or the notice requirement. §1016(a).

A negotiated arrangement would have to be approved by the CRT, after a determination that at least 2/3 of each group of interested parties was represented. §1016(b).

10. The Serial Copy Management System

No person could import, manufacture or distribute a digital audio recording or interface device not conforming with the Serial Copy Management System (SCMS). §1021(a). Nor could anyone circumvent or bypass the SCMS,

§1021(b), or encode phonorecords with inaccurate information design to improperly affect the operation of the SCMS. §1021(c).

No one would be required to transmit or otherwise communicate copyright status information, but if they did so it would have to be done accurately. §1021(d).

11. Implementing the Serial Copy Management System

Within ten day after enactment of the bill, the Secretary of Commerce would publish an SCMS technical reference document in the Federal Register. §1022(a). However, the Secretary could waive or provide alternative standards. §1022(b)(1)-(4).

12. Remedies

Interested copyright or manufacturing parties, or the U.S. Attorney General, could bring an action for violation of the Act in federal district court. §1031(a).

Courts would be empowered to grant temporary or permanent injunctions, damages, costs against parties other than the United States, attorney's fees and other equitable relief. §1031(b)(1)-(5).

Persons found not to have paid, or to have underpaid, royalties would pay damages and interest, in addition to the royalties. §1031(c).

13. Award of Damages

Statutory damages for failure to file a notice or statement of account, or to pay a royalty payment could be awarded up to $100 per device, and $4 per medium. §1031(d)(1)(A)-(B).

For importation, distribution or manufacture of a recording or

interface device without the SCMS system, damages could be awarded up to $1,000,000. §1031(d)(2).

For SCMS violations, parties could receive actual damages, §1031(d)(2)(A), or statutory damages of at least $1,000 and no more than $10,000 per device. §1031(d)(2)(B)(i). For improper encoding of phonorecords, parties could recover damages of at least $10 and no more than $100 per violation. §1031(d)(2)(B)(ii). For inaccurately transmitting information accompanying transmissions in digital format, parties could recover at least $10,000 and no more than $100,000. §1031(2)(B)(iii).

For willful violations of notice or statement of account filings, statutory damages could be increased to at least $100 and no more than $500 per device, and at least $4 and no more than $15 per recording medium. §1031(d)(3)(A).

There would be a $5,000,000 cap for willful SCMS violations, §1031(d)(3)(B), and a $250 floor for innocent violations. §1031(d)(4).

But, with a limited exception, only one action and one statutory damage award could be permitted against each party. §1031(e)(1).

A party bringing an action would have to serve a copy of the complaint upon the Register of Copyrights within ten days of service on the defendant. §1031(e)(2).

If actual damages were awarded, only a single award of a violator's profits would be made and allocated among parties. Also, statutory damages would be reduced by the amount of actual damages awarded. §1031(e)(3).

Awards of overdue royalties and damages would be deposited with the

Register of Copyrights or as authorized by a negotiated arrangement. §1301(f).

A court could impound recording devices, audio interface devices, phonorecords or other devices involved in an SCMS violation. §1031(g).

Injunctions against the distribution of professional models and other exempt devices by manufacturers or importers could not be granted, unless a court found that the exemption determination was unreasonable. §1031(h).

As part of a final judgment or decree, a court could order the remedial modification or destruction of articles involved in an SCMS violation. §1031(i).

A definitional section explicates the terms "complaining party" and "device." §1031(j).

14. Binding Arbitration

Interested manufacturing and copyright parties could agree to binding arbitration. §1032(a).

The Register of Copyrights would prescribe regulations, after consultation with interested copyright parties, coordinating decisions about and representation in dispute arbitration. §1032(b).

Unless otherwise agreed to by the parties, the dispute would be heard by a panel of three arbitrators -- one chosen by each of the parties, the third chosen by the other two arbitrators. §1032(b)(2).

The panel would render a final written decision within 120 days of arbitrator selection. The Register of Copyrights would publish the decision in the Federal Register within ten days of receipt. §1032(b)(3).

Arbitration proceedings would be consistent with title 9, §1032(b)(4), and other interested copyright and manufacturing parties could intervene in an arbitration proceeding. §1032(c).

The arbitration panel could protect proprietary technology and information. §1032(d)(1).

Panels could be terminated based on their determination that bad faith was involved in initiating the proceeding, or that the technology or product at issue was not sufficiently developed or defined to permit an informed decision about it. §1032(d)(2).

If it was determined that royalty payments would be due through the date of the arbitration decision, the panel could order their deposit. §1032(d)(3).

Subject to limited exceptions, arbitration proceedings would preclude civil actions and remedies. §1032(e).

Parties would bear their own arbitration costs and attorney's fees, except where it is determined that a *non*-prevailing party proceeded in bad faith; in that case the prevailing party could be awarded attorney's fees.

The Act would be effective January 1, 1992, or the date of enactment, if later.

III. ECONOMICS OF HOME TAPING

There have been several reports on the economic consequences of home taping. The Copyright Office has recently submitted to Congress its own

report on copyright implications of digital audio transmissions. [14] Each of these studies consider whether or not copyright owners should be compensated for unauthorized taping of copyrighted materials, and if so, how.

A. The Brennan Analysis

Economic commentator Brennan proposes a royalty solution to the home taping problem. [15] Brennan reports that uncompensated home taping reduces demand for the product and therefore affects the prices that composers can charge for their works. In a market where unauthorized reproduction is impossible, the composer could charge a fee commensurate with the value the user places on the work. [16]

Brennan also notes that a royalty system is not without drawbacks. Unless specifically crafted to avoid such effects, those using digital audio tapes for noninfringing purposes will pay as if they were producing copyrighted music. If one attempts to define two categories of tapes -- one for speech and noncopyrighted material and another for music -- individuals and manufacturers would no doubt be able to circumvent them easily. [17]

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[14] The Register of Copyrights, Report On Copyright Implications of Digital Audio Transmission Services, October, 1991.

[15] Brennan, "An Economic Look at Taxing Home Audio Taping," Journal of Broadcasting & Electronic Media, Volume 32, Number, 1, Winter 1988, pp. 89-103.

[16] Brennan, 90.

[17] Brennan, 92-93.

Moreover, royalty rates would remain constant regardless of different kinds of use. This does not take into account different consumers' habits: some tape for substitution purposes -- perhaps to give recordings to friends, etc; others duplicate for enhancement purposes--to make a tape for use in a different location -- the car, or a different configuration -- a Walkman, or to customize a tape by compiling selections of favorite songs from different albums. Even though a composer may want to charge additional fees for this enhanced value, it might be argued that the royalty should not be the same as it would for overt substitution. [18]

On the one hand, the additional cost of making the music available to an additional person through home taping is zero -- the home taper supplies the labor and raw material. On the other, the copyright system rewards the composer with added revenue when additional persons receive copies of the author's work. Unauthorized taping therefore represents expected earnings lost, possibly affecting the long-run cost to the listening public, the beneficial owners of copyright, authors and creative artists, and the legal owners of copyright, publishers, and record companies. [19]

Brennan also asks "if royalties are desirable, who should pay them?" Aside from charging them to the consumer, there appears to be no alternative. If there is less than full competition, record companies with excess profits might absorb the royalty costs. However, a seller who absorbs

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18. Brennan, 94-95.

19. Brennan, 96.

the cost of royalties without offsetting profits will incur losses, and may eventually have to withdraw from the market. [20]

"The purpose of royalties is to tighten the link between the value listeners place on copyrighted works and the returns to composers," according to Brennan, who goes on to acknowledge that, "It is as proper for consumers to pay for copyright music they value as it is for them to pay for other commodities they desire." [21]

B. Office of Technology Assessment Study: Effects of a Ban on Home Taping

The Office of Technology Assessment (OTA) studied copyright and home copying in the context of the status of the law both domestically and internationally, the policy alternatives available to Congress, and the economic effects of a hypothetical ban on audio home copying. In an attempt to place a price tag on the enjoyment of musical works OTA economists measured society's satisfaction. To do this, an economist Mannering used "compensating variations" to measure how much money a consumer would have to receive after a hypothetical ban on copying to be as satisfied as before the ban. Using a compensating variation of $1.62, Mannering concluded that the consumer would have to be paid $16.20 to be as well off, in the short term, as before the ban took place.

From a copyright perspective, this data suggests that consumers might pay an additional fee for making near-perfect copies via DAT if not for

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20. Brennan, 101.

21. Brennan, p. 101.

all home taping. If consumers pay royalties on DAT hardware or software, such payments would constitute some degree of compensation for lost royalties that authors, composers, and creative artists would have earned had copies of their works been sold by record companies. Otherwise, it appears that creative professionals are simply subsidizing the general public. The copyright system should provide economic rewards for authors who contribute intellectual property for the benefit of society. The works are then added to the public domain when the term of copyright protection expires.

The OTA study projected the effect of a home taping ban on consumer welfare in the short term, that is, for about one year. For this period, the OTA examined the effects on three constituencies if home taping is banned. It found that 1) recording industry revenues would increase; 2) blank tape sales would decrease; and 3) consumer economic welfare would decrease. Although the OTA seems to treat all three parties as equally entitled to the benefits of copyright property, consideration of beneficial and legal copyright ownership strongly suggests that this is not the case.

The OTA admitted that choosing an appropriate balance of harm between consumers and copyright proprietors is a political decision, not a technical one, and one in which the public has a stake. If the public places any value on homemade tapes, the benefit of any financial reward in exchange for that value should go to the persons who originated the property and who are responsible for contributing the value the public derives from it.

The OTA concluded that

> [A]lthough home taping may reduce the recording industry revenues, a ban on home audio taping would be even more harmful to consumers, and

> would result in an outright loss of benefits to society, at least in the short term [in the $2-3 billion range.] The longer term consequences of such a ban are less clear, and would depend on [a variety of factors.] [22]

C. The Copyright Office Study: Report on Copyright Implications of Digital Audio Transmission Services

On October 1, 1991, the Copyright Office submitted its report on the copyright implications of digital audio transmissions. [23]

The Office posed two sets of questions in its Notice of Inquiry about compensation for copying in the context of digital audio broadcast and cable technology.

> 1. Would a copyright owner have the practical ability to negotiate with the owners/operators of digital audio services for compensation of his/her works? If not, could representatives of copyright owners, such as performing rights organizations, accomplish this task?
>
> 2. Should a royalty be placed on recording materials, such as blank tapes, or on digital recording equipment itself, to be distributed among copyright claimants? If so, who would be responsible for administering this process? [24]

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22. U.S. Congress, Office of Technology Assessment, Copyright and Home Copying: Technology Challenges the Law, OTA-CIT-422, p. 207, (Washington, D.C.: U.S. Government Printing Office, October 1989).

23 This report was in response to a request for a study for the Chairman of this subcommittee, Senator Dennis DeConcini and the Chairman of the House Subcommittee, Representative William J. Hughes.

24 Question three and four in the Office's Notice of Inquiry. 55 Fed. Reg. 42,916, 42,917 (1990). Note: All comments were submitted to the Copyright Office before the historic agreement that the recording and electronics industries reached on July 11, 1991.

The American Society of Composers, Authors and Publishers (ASCAP) supported imposition of a domestic royalty system that could also be implemented internationally. ASCAP volunteered its services in administering such a system. In specific reply to the first questions set out above, ASCAP claimed it is not feasible for individual copyright owners to negotiate with audio service providers to compensate them for losses due to home taping. It also asserted that the performing rights organizations have "the ability to undertake the licensing and distribution activities on behalf of the creators and copyright owners of the works rendered, if asked and authorized to do so." [25] In addition, ASCAP states that it is not the DAB service providers that will be making unauthorized copies of works, but rather, home tapers, whose activity cannot practically be monitored. "[I]n all fairness, it is the listeners who are ultimately profiting from the recording and who should, therefore, pay for it." [26]

ASCAP believes that the fairest solution for all parties would be payment of royalties on taping equipment and blank recording tape. It notes that such systems are already in effect in many other nations, and have been suggested for establishment in the coming years for members of the European Community. Songwriters, performers, and music and sound recording rights owners would benefit from such a system. If approved by Congress, "existing music licensing groups could easily handle the collection and distribution of these royalties." [27]

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25 ASCAP comments at 7.

26 ASCAP comments at 8.

27 ASCAP comments at 10.

Broadcast Music, Inc. (BMI) also stated that copyright owners or representative performing rights organizations do and will continue to have the practical ability to negotiate with digital audio services' owners or operators. BMI has already completed negotiations with two digital cable audio services for payment to its clients for transmissions of their works, and similar agreements could be made with digital broadcast service owners. [28] BMI suggested that royalties "to account for whatever home taping is likely to result from DAB transmissions could be imposed upon either blank tape or digital recording equipment manufacturers or sellers to be remitted to the Copyright Royalty Tribunal or other appropriate agency for distribution..." based on an "industry-negotiated formula for division among participants." [29] In its reply comments BMI stated that compensating artists by placing a royalty on blank tape and/or recording equipment would encourage and compensate artists without placing unfair burden upon consumers. [30]

In its comments the Copyright Coalition urged Congress to enact legislation to establish a home audio taping royalty system. A royalty system would not interfere with introduction of new recording technologies, nor would it unduly impede consumers' abilities to tape at home, according to the Coalition. Systems are in place internationally that seem to work, and

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28 BMI comments at 2.

29 Id.

30 BMI reply comments at 10.

could serve as models. If not a royalty, a compulsory license could be established to "authorizing the practice of home audio taping in exchange for a modest royalty on recorders and/or blank tapes. The rate could be set by the Congress, or by the Copyright Royalty Tribunal" [31] to ensure fairness to all interested parties. Administration of the system could be conducted by existing performing rights societies. The Coalition stressed that the mechanical Serial Code Management System (SCMS) alone, even if implemented, could not curb home copying from digital sources, but that SCMS may be effective as part of an overall compensation framework.

The Recording Industry Association of America (RIAA) did not propose any particular royalty system in its comments, but instead lobbied heavily for a performance right in sound recordings, saying that "performance royalties from the countless broadcasts of these recordings (referring to recordings that don't become "hits", but continue to get airplay) would provide deserved and needed income to . . . artists and musicians." [32] In general the AFL-CIO Department of Professional Employees, American Federation of Musicians, and American Federation of Television and Radio Artists supported RIAA's comments.

Strother Communications, Inc. (SCI), a proponent of a terrestrial, over-the-air digital audio broadcasting system, supported the idea that performers and copyright owners should be fairly compensated for transmission of works by DAB operators. However, SCI maintained "that the

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31 Copyright Coalition comments at 19.

32 RIAA comments at 15.

existing mechanisms by which such compensation is determined and paid by radio stations will continue to be adequate for that purpose. Thus, in the case of recorded music programs, performers' and copyright owners' compensation can be handled under the auspices of ASCAP and other performing rights organizations, exactly as it is today." [33]

CD Radio, Inc., a developer of integrated satellite and terrestrial delivery of digital audio services, also claimed that copyright owners and their representatives can negotiate for compensation for digital programming "exactly as is done today for AM, FM and TV transmission." [34] CD Radio, Inc. said that "royalties should not be placed on tapes or recording equipment if this discriminates against the development of digital audio radio." [35] General Instrument Corporation, a manufacturer and supplier of electronic products, systems and components, took a similar view regarding negotiations for compensation, commenting that it is too early to tell whether or not royalties on hardware or tape are needed.

The Home Recording Rights Coalition (HRRC) was opposed to the concept of imposing royalties on recording media or digital recording equipment. Briefly, in response to question three, the HRRC contended that as a practical matter, copyright owners or their representatives can

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[33] SCI comments at 2.

[34] CD Radio comments at 3.

[35] Id.

negotiate with DAB owners and operators for compensation for DAB transmissions.

HRRC stated that royalties are not necessary. "Any royalty tax, whether collected through technical monitoring devices or through old-fashioned taxation, would be unwarranted and unfair and would impose costs on all consumers, whether they tape or not." [36] A cornerstone of their anti-royalty argument is the proposition that "digital media are no different from their analog counterparts in fact or as a matter of copyright law." [37] HRRC adds that performance royalties for commercial users, such as broadcasters, dance club operators, and restaurant operators, should certainly be considered before placing a royalty on private home taping activity. [38]

The New York Patent, Trademark and Copyright Law Association contended that placing a royalty on recording materials is not "an appropriate solution to the copyright infringement problem, if there is one," because "it imposes a tax on the purchasers or users of these devices (recording equipment) who do not violate copyright laws and that does not seem acceptable." [39]

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36 Id.

37 HRRC reply comments at 2 (emphasis omitted).

38 Id. at 36-37.

39 New York Patent, Trademark and Copyright Law Association, Inc. comments at 4.

The National School Boards Association (NSBA) does not support royalties on blank tapes. In fact, NSBA continued, "we, in education, will demand an exemption from this tax." [40]

CBS, Inc. took no particular view on any proposed royalty system, but instead merely noted that compensation arrangements can be made that "do not place requirements or restrictions on broadcasters" and would be "adequate to satisfy the concerns and needs of the recording industry, performers, and copyright holders." [41]

In its initial comments the National Association of Broadcasters (NAB) stated that current data about copying of musical works and its effects on copyright owners is contained in the Office of Technology Assessment's 1989 study, and does not support creating a new royalty applicable to broadcasters that use digital technology. These points were reiterated in NAB's reply comments. NAB's sentiments were generally supported by Cox Broadcasting as well as stations KKYY-FM, KDKB-FM, KEGL-FM, and KLSY-AM-FM.

Not all of the commentators addressed the royalty issues raised by the Copyright Office. Of those who did ASCAP, BMI, and the Copyright Coalition strongly supported placing a royalty on blank tape and/or equipment. The Home Recording Rights Coalition opposed such a solution just as strongly. The Recording Industry Association of America chose to discuss payments for performers instead of reiterating its past position on home taping royalties. Among those commentators falling in between were those who

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40 NSBA comment at 3.

41 CBS, Inc. comments at 6.

felt consideration of the topic was premature (General Instruments), felt any payments should be negotiated by the parties (CD Radio, Inc.; New York Patent, Trademark and Copyright Law Association), felt compensation could be handled by existing mechanisms (Strother Communications), or felt that their organization should be exempt from any such payment (NSBA, NAB.)

Uniformly, commentators advocating establishment of a royalty system in sound recordings pointed to the fact that many other nations have established such systems that could be used as models. In its initial comments the Copyright Coalition provided a report on home audio taping royalties, issued in January 1990 by the European Mechanical Rights Bureau. In addition, culture ministers from the European Community have discussed recommendations for protecting performers' and producers' rights in their works. [42]

Although the commentators who addressed the royalty issues did so from different perspectives, most of those who responded did feel that some kind of compensation was warranted. They simply did not agree on what that compensation should be.

IV. INTERNATIONAL DISCUSSIONS

A. Reaction to the SCMS Proposal

The European Economic Commission (EEC), does not find the 1989 Athens agreement regarding an SCMS technological solution to be a sufficient answer to the question of how to protect the holders of copyrights and

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42. Clark-Meads and Hennessey, EC Ministers Hear Copyright Concerns, Billboard (Dec. 1, 1990) at 64. A discussion of this material can be found in the next section.

neighboring rights from digital home copying. [43] Other technologies, such as recordable and erasable compact discs, loom on the horizon, and they feel that it is necessary to develop technical systems which cover these aspects of digital recording.

Additionally, the question of how to remunerate rightsholders remains unresolved. The EEC does not believe that levies are the best solution for digital home copying, but recognizes the necessity of paying for the use of protected works. Accordingly, the Commission has concluded that the best solution is a technical system which not only limits copying, but also ensures direct payment by the consumer for each digital copy made -- for example, a credit card system. [44]

The International Federation of the Phonographic Industry has said that it will continue to lobby governments and governmental bodies for remuneration for private copying through a royalty on blank analog and digital tapes and/or recording equipment. [45]

As part of the Athens agreement, the European hardware industry undertook to accept any political decision about royalties on blank DAT tapes and equipment. The signees of the pact formally agreed to "accept the principle of royalties and ... not oppose efforts by the recording industry to secure legislation to implement such royalties." By contrast, Japanese firms would only acknowledge that the issue is important to recording

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43. Letter from Commissioner Bangemann, Vice President, EEC, to Ian Thomas, IFPI Secretariat (November 2, 1989) ["Bangemann letter"].

44. Bangemann letter at 3.

45. Id.

interests. They consented to "explore the feasibility of a technical mechanism or alternative system for private copying remuneration in future digital recording devices, although such a discussion would not constitute acceptance by the hardware industry of the principle of royalties." [46]

B. Compensation for Home Taping Under Foreign Laws

The effect of unauthorized home taping on copyright proprietors has been discussed repeatedly during the last decades. [47] At the heart of these discussions is the basic question of whether or not an author should be compensated for the unauthorized taping of copyrighted programs. Legislatures have debated whether or not authors should be compensated for such copying[48] and if so, what the proper remuneration should be, whether it should apply to both the software and the hardware, whether it should take the form of a royalty or a tax, and how the monies generated should be allocated.

Most of these discussions focused on analog duplication, and several countries have already determined that a royalty or tax should be imposed for the analog duplication of broadcast or cable programming or any sound recording for commercial or personal use. Some countries have already provided for digital copying in their compensation schemes.

As of August, 1991, at least seventeen countries had enacted legislation to compensate copyright owners for unauthorized private copying

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46. S. Dupler, "DAT Accord is Reached, but Questions Linger," Billboard, 1, 87 (August 5, 1989).

47. OTA Report at 103-135.

48. Dillenz, The Remuneration for Home Taping and the Principle of National Treatment, Copyright (June, 1990) pp. 186-193.

of their works. These countries include: Argentina, Australia, Austria, the Congo, the Federal Republic of Germany, Finland, France, Gabon, Hungary, Iceland, the Netherlands, Norway, Portugal, Spain, Sweden, Turkey, and Zaire. Bulgaria introduced a blank tape levy in April 1991 apparently to facilitate trade with their western trading partners. Several other countries including Belgium, Denmark, and Italy, are considering such legislation. [49] Recently the Electronic Industries Association of Japan preliminarily approved plans for home taping royalties for digital hardware. A royalty structure will reportedly be established in 1992. At that time Japan's copyright law will be amended to reflect the new agreement. [50]

The countries that do add royalties or taxes to either the software or hardware have developed different schemes. A review of these schemes reveal that some countries, such as Austria, France, and Sweden, place the royalty on the tapes, some, such as Norway and Spain, on both the tapes and the equipment. As can be expected, both the amount of the royalty and the distribution schemes differ. But most of the countries which have developed royalty systems require that a significant part of the royalties goes to authors and other copyright proprietors. Distribution facts vary according to the formula a country chooses. [51]

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49. See App. I. Information for this chart came from the Report by European Mechanical Rights Bureau (BIEM), Distribution of Audio/Video Home Taping Royalties, January 1990; Survey by International Federation of the Phonographic Industry, 1990 Survey of Tariffs for the Public Performance of Phonograms, November 1990; WIPO, Copyright, Sept. 1990 at Text 1-01; 3 Copyright Laws and Treaties of the World, UNESCO, Supplement 1979-1980; 3 Copyright Laws and Treaties of the World, UNESCO, Supplement 1987-1988.

50. McClure, Japanese Hardware Group Supporting Digital Royalty, Billboard, (Sept. 14, 1991) at 5.

51. See also App. I.

Most countries with a high level of intellectual property protection have realized that there is considerable loss to legitimate copyright owners when home tapers copy works without compensating the copyright proprietor. But only a few of these countries go beyond national interests and make distributions to foreign authors.

Compensation for home or private taping has also been the topic for discussion within the World Intellectual Property Organization, among members of the Universal Copyright Convention, and by various other groups representing countries such as the European Economic Commission (EEC). [52] While no compensation system is perfect, some international organizations are now advocating harmonization of such systems, at least as far as establishing a method to balance the interests of the authors of works and users of those works so as to encourage continued creation of new work as well as promoting international unity and distribution. The European Commission met in August 1991 to discuss, among other things, harmonization of copyright law in the European Community. Among the topics of discussion was the value of works lost to piracy of both U.S. and E.C. materials. Proposals are imminent for increasing copyright protection and stimulating commercial sales within the E.C. [53] The European Commission already has before it two proposals. One would grant writers, performers, and producers

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52. See Statement of Ralph Oman Before the Subcommittee on Communications of the Senate Committee on Commerce, Science and Transportation, 101st Congress, Second Session, June 13, 1990 at 31 for a discussion of the EEC position on compensation for digital home copying.

53. Riddell, Euro Commission Reports "Great Urgency" On Copyrights, Billboard, (Sept. 14, 1991) at 80.

the right to authorize or forbid the loaning or renting out of works protected by copyright. The second proposal would require adhesion by all the Member States before the end of 1992 to the Berne Convention for the Protection of Literary and Artistic Works as updated by the Act of Paris, and the Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations. The European Community has also stated that it will submit a proposal to "harmonize the national systems of remuneration for private copying of films, video cassettes, records, audio cassettes and compact discs by way of a levy on blank tapes by the end of 1991." [54]

Concluding that digital tape recorders would stimulate home taping since the technology would permit one to make perfect copies easily, the E.C. concluded in its 1988 Green Paper that urgent action was needed to protect copyright proprietors. [55]

Review of the systems developed in other countries for compensating authors for home taping should be persuasive in determining that it is time for the United States Congress to legislate in this area.

V. OBSERVATIONS OF THE COPYRIGHT OFFICE

The Audio Home Recording Act proposal represents a potentially historic compromise among the recording, music, and electronics industries

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54. Commission sets out copyright work programme, Common Market Reporters, Release 672, Jan. 91, para. 95,690 at 51,989.

55. Commission of the European Communities, Green Paper on Copyright and the Challenge of Technology--Issues Requiring Immediate Action, para. 3.91, p. 127 (June, 1988).

and among the representatives of musical performers and consumers. The Copyright Office is pleased to note that the bill apparently brings under its umbrella all affected interests. The legislation will have a positive impact on protection for United States authors and copyright owners worldwide. Many countries collect royalties on recording equipment and media, but distribute the royalties to their foreign authors only on the basis of reciprocity. American authors will now be able to claim their fair share abroad.

The AHRA includes several innovative features. The proposed allocation of royalties based on fixed percentages is new in the United States copyright law, but the system has precedents in foreign copyright laws. It is common to allocate the compulsory license fees among various groups, especially when different authors and copyright owners create the works of authorship. Sound recordings -- the subject matter of the AHRA-- involve two copyright owners in virtually every case. The composer of the music or music publisher owns the underlying music; the record company owns the separate copyright in the recorded sound. The contribution of performers to the creation of the recording is also unique; their creativity warrants recognition through a share of royalties.

Another innovative feature is implementation of the SCMS. The proposal incorporates an existing technical standard, but would be flexible enough to cover new standards as they are approved by the Secretary of Commerce. The basic elements of the technical requirements seem reasonable and workable. The bill achieves both the certainty of known standards and the flexibility of accommodating future developments. It is not technology specific.

The proposal necessarily includes technical definitions regarding the equipment and media subject to the royalty system and the SCMS. The preliminary analysis of the Copyright Office is that the technical definitions are clear and properly exclude the products not intended to be covered. Further analysis may lead to fine-tuning of the definitions, but we see no major problems now.

The overall structure of the proposal seems workable. The provisions are carefully drafted. The Copyright Office at this time would suggest some adjustments regarding time limits set by the proposal, and we have some questions about the procedures relating to filing statements of account, confidentiality procedures, and verification of the statements.

1. **Effective date**. Since the proposal requires new regulations and administrative procedures by the Copyright Office, we recommend a period of two months following enactment as the effective date of the law. The present draft gives a date certain (January 1, 1992). If it is not possible to legislate a grace period for implementation of the law, at a minimum the bill must be amended to make clear when the 45 day period (for reporting thte manufacture, importation, and sales of recording equipment or media) begins to run in relation to the effective date of the law. Does the 45 day period apply to the equipment and tape sold before the effective date? We recommend that the law specify 45 days after the effective date, even with respect to manufacture, importation, and sales that occur before the effective date.

We also recommend that this reporting requirement be in effect for two years and then sunset. Our experience under the cable license shows that

any relevant information can be reported on the statements of account, once the licensing system has been in operation for a few years.

2. Time limits for binding arbitration. SEC. 1032 regarding arbitration requires action by the Register of Copyrights within ten days of the receipt of certain requests or reports. The ten day period may be reasonable where the Register must simply publish in the Federal Register a document already prepared by the arbitral panel, as in paragraph (b)(3) of SEC. 1032. Where the Register must analyze or summarize a document, as in paragraph (c) of SEC. 1032, the ten day period may not be sufficient. We recommend a 30 day period to carry out this task.

3. Quarterly and annual statements of account. SEC. 1011 (c) requires the filing of quarterly Statements of Account and payment of royalties. This proposal contrasts with the semi-annual filing of Statements under the existing cable and satellite carrier licenses, sections 111 and 119 respectively, of the Copyright Act. The Copyright Office has concerns about the reasonableness of filing four times each year, as well as an annual filing pursuant to SEC. 1011 (d). We prefer two semi-annual filings on a calendar year basis, because this would be administratively more efficient. However, if only a small number of manufacturers or importers file Statements, then the quarterly filings may not be unduly burdensome. We may require additional employees to process quarterly filings and this added expense will decrease the royalty pot. The beneficiaries should weigh this consideration in deciding the frequency of the reports, as well as the burden on the manufacturers and importers. The Office questions, in any case, the relationship between the quarterly and the annual statements. Will

verification of the annual statements require amendments of the quarterly filings to correct errors?

4. Verification procedure. The proposal establishes a detailed verification procedure for auditing the accuracy of the Statements of Account. None of the existing compulsory license requires verification of the Statements of Account. The Copyright Office does not object to the proposed verification. We have concerns about the administrative costs of the procedure and the difficulties associated with preserving the confidentiality of the audits, given the involvement of public officials in the procedure.

Above all, we have concerns about the imposition of a criminal sanction on employees of the Office and the Copyright Royalty Tribunal regarding disclosure of "confidential trade secret information" contained in the statements of account. The Office might support a nondisclosure clause without criminal sanctions attached to the provision, if the Congress is persuaded that trade secret information is contained in the statements of account. The Office is not persuaded at this point that trade secret information will be disclosed. In the case of United States businesses, we are inclined to think that the information required by the statement of account would be disclosed to the public in business reports and other public filings. We would like to have comment from the industry about the need for confidentiality. We also are unclear what information on the statements of account may properly be released to the public. The statements of account filed in relation to the existing cable compulsory license are public documents. Section 1011(h) seems to make the digital audio statements of

account confidential documents. The Office requests a more detailed justification of the need to prohibit public access to these statements.

5. Alternative filing dates. Section 1011(c)(3) permits an election by the manufacturer or importer to file either on a calendar year or fiscal year basis. This provision would be administratively burdensome to the Copyright Office. We would not know when filings would be made. We could not plan our work, which is a practical necessity given the other statutory licenses administered by the Copyright Office. The statement of account filing periods should be precise and specified by the statute or regulations. We favor filings on a calendar year basis.

6. Annual statements of account. Section 1011(d) requires filing an annual statement of account in addition to the quarterly filings. The Office recommends against the duplicative effort involved in annual as well as periodic filings. Given our preference, we would favor semi-annual filings exclusively. In any event, we recommend against an annual filing. In addition to the obvious duplication of effort in examining and processing annual reports, the discrepancies between the annual and periodic reports will cause confusion and wrangling.

7. Royalty credits for returns. Section 1012(c) allows manufacturers and importers to deduct "the amount of any royalty payments already made on digital audio recording devices or media" that are "returned to the manufacturer or importer as unsold or defective merchandise" or "exported by the manufacturer or importer or a related person." The policy of allowing returned merchandise as a credit against royalties enormously complicates the

calculation of royalties. The Copyright Office strongly questions the policy justification for a credit for returns.

We would think the relatively small percentage of returned merchandise does not warrant the tremendous administrative burden of allowing credits for returns. Any inequity should be addressed in setting the statutory royalty rates.

As introduced, the credits can be taken during any accounting period, several years after the actual returns occur. The possibilities for fraud and mischief are substantial. The Copyright Office favors a policy of no credit for returned merchandise. If the provision is not dropped, it should be amended to establish a reasonable time limit, such as one calendar year, for taking the credit. As an alternative, you might want to keep the credit for returns in the law for two years to establish a statistical pattern, and then sunset it and allow the CRT to make the adjustment subsequently.

8. Relationship of Copyright Office to Copyright Royalty Tribunal. Section 1013 directs the Register to submit to the CRT "such information as the Tribunal shall require to perform its function under this chapter." In the case of the cable license, the Office and the CRT have developed a working relationship that involves the submission of monthly reports. The Copyright Office recommends adoption of the same practice for this new license. We recommend that the last sentence of section 1013 be amended to read as follows: "The Register shall submit to the Copyright Royalty Tribunal, on a monthly basis, a financial statement reporting the amount of royalties available for distribution."

9. Distribution of royalties absent a dispute. Section 1015(b) requires the CRT to make a determination whether or not a controversy exists concerning distribution of royalties within 30 days after the close of the claiming period. The Copyright Office recommends a 120 day time period instead of 30 days. If there is no controversy, the distribution can be made quickly after the four month period. It seems burdensome, however, to require the CRT to make its determination in a mere 30 days, which includes the necessary notice in the Federal Register, a public comment period, and evaluation by the CRT. The 30 day period also presents problems for the Copyright Office since we are required to prepare reports relating to distribution of the royalties.

10. Revolving fund accounts. The Copyright Office requests the specific statutory or regulatory authority to establish revolving fund accounts, or alternatively, the authority to close out a fund account after a reasonable period, such as three years. Under the cable license, the Office maintains separate accounts for each calendar year since 1978. Some accounts have only a few dollars in them. It would be more efficient to roll the accounts over into another year rather than maintain separate accounts indefinitely.

CONCLUSION

The Copyright Office fully endorses the principles of the proposed AHRA. We commend the parties for their historic compromise, and recommend favorable action by Congress. The proposal seems sound, fair, and workable. All creative and proprietary interests are accommodated by the compromise.

Consumers will benefit both from the diversity of creative works and from new recording technologies. The record companies will sell more products. The public will have more music to enjoy. Everyone seems to benefit. At last, the American creators will share the profits from this wonderful technology, not just the equipment manufacturers.

APPENDIX I

COUNTRY	1. Royalty Paid On	2. Who Collects?	3. How Distributed?	4. Basis for Royalty
ARGENTINA	Recording Equipment, Blank Tapes	SADAIC	Authors 45%; Performing Artists 25%; National Art Fund 25%.	N/A
AUSTRALIA	Blank Tapes	AUSMUSIC	N/A	N/A
AUSTRIA	Blank Tapes	AUSTRO-MECHANA	Authors 56%; Producers 24%; Artists 20%.	Analog & digital
CONGO	Blank Tapes	BCDA	N/A	N/A
FINLAND	Blank Tapes	TEOSTO	Minister of Education annually approves distribution plan giving a percentage to authors, artists, producers. No fixed percentages.	Analog & digital
FRANCE	Blank Tapes	SACEM/SORECOP	Authors 50%; Producers 24; Artists 25%.	Analog & digital
GABON	Blank Tapes	ANPAC	10% for cultural and welfare purposes.	Analog & digital
GERMANY (FGR)	Recording Equipment, Blank Tapes	ZPU	Authors 58%; Producers/Artists/Others 42%.	Proposed digital to be 4 times higher
HUNGARY	Blank Tapes	ARTISJUS	Authors 50%; Artists 30%; Producers 20%.	N/A
ICELAND	Recording Equipment, Blank Tapes	IHM	Authors 46%; Producers 27%; Artists 27%.	Analog & Digital
NETHER-LANDS	Blank Tapes	STEMRA	N/A	Proposed for digital only

COUNTRY	1. Royalty Paid On	2. Who Collects?	3. How Distributed?	4. Basis for Royalty
NORWAY	Recording Equipment, Blank Tapes	NKAF	N/A	N/A
PORTUGAL	Recording Equipment, Blank Tapes	SPA	Authors; Artists/Performers; Producers; State Cultural Promotion Fund. No Percentages available.	N/A
SPAIN	Recording Equipment, Blank Tapes	SGAE	Training/Promotion of young artists 20%; remainder: Authors 40%; Performers 30%; Producers 30%	Proposed for Digital only
SWEDEN	Blank Tapes	Dist. by STIM, IFPI, SAMI	Authors 40%; Performers 30%; Producers 30%.	N/A
TURKEY	Blank Tapes	Ministry of Culture & Tourism	N/A	N/A
ZAIRE	Recording Equipment, Blank Tapes	N/A	N/A	N/A

Senator DECONCINI. Mr. Oman, thank you very much, and again, we thank you for your splendid cooperation at the Copyright Office. We really appreciate it. The many comprehensive studies that we've requested, you've always responded.

On the topic of digital audio broadcasting within the study, you give considerable attention to the issue of home taping, and I know in your statement you have quite a lengthy, detailed explanation of this particular problem. Could you please summarize your findings regarding the legal status of home taping, just so we have it on the record here this morning, of recorded musical works?

Mr. OMAN. Certainly, Mr. Chairman. Let me refer to page 4 of my written statement where we analyze the impact of the *Betamax* decision.

In my view, the *Betamax* decision is a very limited precedent. It does not answer all of the questions posed by private copying. Obviously, the decision was focused on the video home taping aspect of the problem and not on the audio home taping. The difference in the two media are extremely important. In the case of video taping, it's been determined that there is less of an impulse to library, less of an impulse to keep copies once they've been made. It really is used primarily for time shifting purposes, and this is even more the case now where we have video tape rental shops on every street corner, and people do not have to build a library of their favorite movies to watch them at their leisure. They can just go to the corner store and get what they want, watch it, and return it.

The *Betamax* decision did not get into the audio home taping issue, and it's my perception that the result would probably have been different if they had. The courts seemed to stress very much the fact that video home taping was done for time-shifting purposes, they relied on this aspect of it for their decision, and they said that that was a fair use under the copyright laws. But in the case of audio home taping, that is not the case. It's not used for time-shifting purposes. It's used primarily to record and play over and over and over again the same piece of music.

That is my understanding of the law as developed under the *Betamax* case, Mr. Chairman.

Senator DECONCINI. Thank you very much. In your report, you indicate that the OTA had "estimated that over one billion pieces of music are copied every year in this country alone." That's the quote from your statement. According to ASCAP, estimates result in music industry losses of as much as $1.9 billion per year. Are you aware of any other studies or estimates of the losses sustained by the music industry as a result?

Mr. OMAN. Well, Mr. Chairman, you've mentioned the OTA study. That was accomplished several years ago, and that did document extensive home taping. I think their estimate was that we have approximately 100 million people who tape at home, and that is a large percentage of the American population, 40 percent of the population. There was a study done in connection with the Senate consideration of these issues back in the mid-1980's. The study was conducted by Mr. Greenspun, and I think he is one of your witnesses today, and you might want to ask him to verify some of the figures that were presented by ASCAP.

Senator DECONCINI. Thank you. Have you reviewed the ASCAP study, Mr. Oman?

Mr. OMAN. Yes, we have, and we think that it——

Senator DECONCINI. Do you find it to be pretty accurate, in your judgment, or sound?

Mr. OMAN. I think it's a serious study, and they have made an important contribution to the information available on the subject. I wouldn't want to—I have not independently verified their conclusions, but they seem sound and logical.

Senator DECONCINI. You didn't find any observations there that, from your standpoint, were obvious errors?

Mr. OMAN. No, we did not.

Senator DECONCINI. Thank you. Thank you, Mr. Oman, very much.

Thank you, Ms. Schrader.

We'll now turn to our first panel, which will be Ms. Debbie Gibson, recording artist—we're pleased to have her with us; Mr. John Roach, chairman of Tandy Corp. of Fort Worth, TX; and Ms. Linda Golodner, executive director of the National Consumers League.

We'll start with you, Ms. Gibson.

STATEMENT OF DEBORAH GIBSON, RECORDING ARTIST, POP STAR, LOS ANGELES, CA

Ms. GIBSON. Good morning, Mr. Chairman and members of the subcommittee. My name is Deborah Gibson. I'm a song writer and performer. I'm a member of ASCAP, and today I'm proud to represent song writers and music performers from around the world.

I'd like to thank you all for the opportunity to speak to you about the Audio Home Recording Act, and I'd like to thank Senator DeConcini for introducing S. 1623.

Let me tell you first how I became interested in a career in music. I guess you could say that from the time I could talk, I had the dream of being on the stage. When I was 8 years old, I bought my first pop album, which was Billy Joel's "52nd Street." One year later I saw him in concert, and ever since that day, I knew that I wanted to be a writer/artist like him.

My parents and I set up a recording studio for me in our basement at home in Long Island, and I practiced and wrote songs and auditioned and shopped my tapes around. I was fortunate enough to be signed to a recording contract when I was 16 with Atlantic Records. The song that became my first hit really summed up my feelings about my success. It was called "Only In My Dreams," and it was a single off my first album, "Out of the Blue," which also launched three other Top 5 singles, including a song that went to No. 1, "Foolish Beat."

By the way, the RIAA certified this album triple-platinum, and to those RIAA representatives who are here today, I still say thank you.

My second album, "Electric Youth," was a No. 1 album, with two gold singles: "Electric Youth" and "Lost in Your Eyes." It was also certified multiplatinum, and I certainly was very encouraged.

But it's the title of my third and most recent album that I'd like to focus on, because it's called "Anything is Possible." That's certainly the story of the popularity of my records to date, the great people I've worked with, and the fact that I've been part of a system that gives young people an incentive to follow their dreams. That's why I'm here today, to make certain that others like me will have the same opportunity to follow their dreams.

By supporting S. 1623, you're protecting the future of all song writers and artists and that of an entire music industry. Let me explain how the Audio Home Recording Act of 1991 can accomplish this.

I was born into a musical era that was both the best of times and the worst of times. Because of the wonders of modern technology, there are more outlets than ever before for playing music, and because of that fact, my hits were truly worldwide hits in every sense, for which I'm very grateful. But on the other hand, the music trades and consumer press carried stories about countless financial losses due to unauthorized copying of our records both at home and abroad, and unfortunately those losses were not just press items. They were real.

I, along with other song writers and performers, worried, would we ever have the same chance at success as those who came before us? More important, would there be an industry left for us to be a part of? S. 1623 removes these sizable fears, because it compensates us for the losses we'll suffer from copying by digital audio equipment. There's certainly no doubt that the digital recording machines will generate more copying of our records than ever before. We all know how much copying went on with analog machines, which made imperfect copies of the original. Can you imagine how much more will go on with machines that make perfect copies of the original? I can, and that's why I'm scared, and I'm not alone.

Digital audio technology is a great advance. Our music sounds better than we ever imagined possible. All of us who write and perform applaud it. But we don't want to see the hard-won protections for creators and performers of music that have come about over the past century stripped away.

As I understand it, the present law does not deal adequately with the problem of how we would be paid for the perfect copies that would be made of our copyrighted musical works. As a result, all factions in the entertainment business, including the hardware and software industries, worked hard and long to achieve the compromises which address the interests of all of us and, most important, of the public. The public benefits when creators are encouraged to create and when the fruits of technology are there for the public to enjoy. We believe that your bill S. 1623 embodies the protections we so desperately need. It provides an updated legislative framework that will assure fair compensation for creators and a stable business climate for everyone.

There's also another concern. Several other countries have already responded to the problem of unauthorized copying of music through use of a royalty like the one proposed in S. 1623. Some of these countries do not protect foreign authors unless their governments also have this kind of legislation. In fact, in a recent report to this subcommittee, our own Register of Copyrights, Ralph Oman,

has stated that 17 nations have a royalty provision similar to the one in your bill. I'd hate to think that American creators won't be receiving any home taping royalties from those countries because the United States doesn't provide the same kind of protection.

S. 1623 is a wonderful solution. It represents a compromise resulting from years of controversy and negotiations. It enables a new recording technology to enter the United States. It provides for a modest royalty on digital tapes and recording equipment. It also contains a computer chip that prevents copies of copies to be made, thereby reducing our losses.

I may be young, but I've worked very hard for the success I've had to date. My entire family has worked just as hard, as my sister Karen, who is here with me today, will verify. I've staked my future on music, and I'm giving it everything I've got. I want to keep working at what I love, to concentrate on my writing and performing, without worrying about whether I will be paid for the copying of my music or whether the industry I'm so happy to be in will survive.

Let me sum up the impact of S. 1623 by quoting, if I may, from a lyric I wrote. "There is a world of endless resources. There is a mind full of outrageous dreams. There's a place where the two meet. Anything is possible." S. 1623 proves that anything is possible by bringing all the different parts of our industry together to arrive at legislation that will nurture the incentive to create.

Mr. Chairman, I greatly appreciate the opportunity of presenting my views to you. Thank you.

[The prepared statement of Ms. Gibson follows:]

STATEMENT OF *DEBORAH GIBSON,*

POPULAR SONGWRITER AND RECORDING ARTIST,

ON S. 1623, THE "AUDIO HOME RECORDING ACT OF 1991"

BEFORE THE

SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS

OF THE

U.S. SENATE COMMITTEE ON THE JUDICIARY

TEN O'CLOCK A.M.

TUESDAY,

OCTOBER 29, 1991

Good morning, Mr. Chairman and members of the Subcommittee.

My name is Deborah Gibson. I'm a songwriter and performer. I'm a member of ASCAP, and today I am proud to represent songwriters and music performers from around the world.

I'd like to thank you all for the opportunity to speak to you about the Audio Home Recording Act, and I'd like to thank Senator DeConcini for introducing S.1623.

Let me tell you how I became interested in a career in music. I guess you could say that from the time I could talk - I had the dream of being on the stage. When I was eight, I bought my first pop album, which was Billy Joel's "52nd Street." One year later, I saw him in concert and ever since that day, I knew that I wanted to be a writer/artist like him.

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I was fortunate to be signed to a recording contract, when I was 16, with Atlantic Records. The song that became my first

hit really summed up my feelings about my success. It was called "Only in My Dreams," and it was a single off my first album, "Out of the Blue" which also launched three other top five singles, including a song that went to No. 1: "Foolish Beat." By the way, the RIAA certified this album triple-platinum - and to those RIAA representatives who are here today, I still say thank you.

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But it's the title of my third and most recent album that I'd like to focus on - because it's called "Anything Is Possible." That's certainly the story of the popularity of my records to date, the great people I've worked with - and the fact that I've been part of a system that gives young people an incentive to follow their dreams.

And that's why I'm here today. To make certain that others like me will have the same opportunity to follow their dreams.

By supporting S.1623, you are protecting the future of all songwriters and artists - and that of the entire music industry.

Let me explain how the DAT bill can accomplish this. I was born into a musical era that is both the best of times and the worst of times. Because of the wonders of modern technology, there are more outlets than ever before for playing music - and because of that fact, my hits were truly worldwide hits in every sense - for which I'm very grateful.

On the other hand, the music trades and consumer press carried stories about countless financial losses due to unauthorized copying of our records - both at home and abroad. And, unfortunately, those losses were not just press items - they were real.

I, along with other songwriters and performers worried - would we ever have the same chance at success as those who came before us? More important - would there be an industry left for us to be part of?

S.1623 removes these sizeable fears because it compensates us for the losses we will suffer from copying by digital audio equipment.

There's certainly no doubt that the DAT machines will generate more copying of our records than ever before. We all know how much copying went on with analog machines, which made imperfect copies of the original. Can you imagine how much more will go on with machines that make perfect copies of the original? I can - and that's why I'm scared. And I'm not alone.

Digital Audio technology is a great advance - our music sounds better than we ever imagined possible. All of us who write and perform applaud it. But we don't want to see the hard-won protections for creators and performers of music that have come about over the past century stripped away.

As I understand it, the present law does not deal adequately with the problem of how we would be paid for the perfect copies that would be made of our copyrighted musical works.

As a result, all factions of the entertainment business including the hardware and software industries worked hard and long to achieve the compromises which address the interests of all of us and, most important, of the public. The public benefits when creators are encouraged to create and when the fruits of technology are there for the public to enjoy.

We believe that your bill, S.1623, embodies the protections we so desperately need. It provides an updated legislative framework that will assure fair compensation for creators and a stable business climate for everyone.

There's also another concern. Several other countries have already responded to the problem of unauthorized copying of music through use of a royalty like the one proposed in S.1623. Some of these countries do not protect foreign authors unless their governments also have this kind of legislation. In fact, in a recent report to this Subcommittee, our own Register of Copyrights, Ralph Oman, has stated that 17 nations have a royalty

provision similar to the one in your bill. I'd hate to think that American creators won't be receiving any hometaping royalties from those countries because the United States doesn't provide the same kind of protection.

S.1623 is a wonderful solution. It represents a compromise resulting from years of controversy and negotiations; it enables a new recording technology to enter the United States; it provides for a modest royalty on digital tapes and recording equipment; it also contains a computer chip that prevents "copies" of copies to be made, thereby reducing our losses.

I may be young - but I've worked very hard for the success I've had to date. My entire family has worked just as hard - as my sister, Karen, who is here with me today will verify. I've staked my future on music - I'm giving it everything I've got. I want to keep working at what I love; to concentrate on my writing and performing without worrying about whether I will be paid for the copying of my music - or whether the industry I'm so happy to be in will survive.

Let me sum up the impact of S.1623 by quoting, if I may, from a lyric I wrote: "There is a world of endless resources. There is a mind full of outrageous dreams. There is a place where the two meet. Anything is possible." S.1623 proves that anything is possible by bringing all the different parts of our industry together to arrive at legislation that will nurture the incentive to create.

Mr. Chairman, I greatly appreciate the opportunity of presenting my views to you. Thank you.

Senator DECONCINI. Ms. Gibson, thank you very much, and we're pleased to have you representing ASCAP and the artists. It's very nice of you to take the time to be here, and I'm sure your fellow artists appreciate you taking the time.

I know also Morton Gould, the president of ASCAP, was here. I want to pay particular thanks to him for all the time that he has given to this committee and to ASCAP and the artists that they represent, and also their Washington representatives who have helped us put this together.

We'll next hear from Mr. John Roach, who is the chairman of Tandy Corp.

Mr. Roach, before you testify, I want to pay particular thanks to you as an industry leader for assisting and finding a compromise here that I assume is good for your industry or you wouldn't be here in support of this bill. Obviously there were many tugs and pulls by your industry on which way to go to find some kind of negotiated settlement, and I compliment your business and the business community for having this innovative approach and coming up with a real compromise that works for everybody.

STATEMENT OF JOHN V. ROACH, CHAIRMAN, TANDY CORP., FORT WORTH, TX

Mr. ROACH. Thank you, Mr. Chairman. Certainly I'm very pleased that this day of hearings has arrived on this compromise.

Tandy is America's largest consumer electronics retailer. We're America's largest consumer electronics manufacturer. We have over 20 manufacturing plants in the United States opened in the last 20 years, while many in this industry have exited the country. We employ about 37,000 in the United States. We do business with over 60 million Americans each year, and our sales are in excess of $4.5 billion annually.

We have 7,400 retail stores. These stores operate under the name of Radio Shack, McDuff, Video Concepts. We sell everything from batteries to personal computers to audio recorders, tapes, and recording accessories. We also have opened a chain of stores called The Edge in Electronics to represent the latest in state-of-the-art electronics and even today are opening something called Computer City Super Centers to feature America's best-selling brands—I emphasize America's best-selling brands—of computers.

So I'm pleased to testify in support of S. 1623. I know that other witnesses will lay out the longstanding controversy that this compromise puts to an end; therefore, I think I would like to direct my comments to what the Audio Home Recording Act means to the consumer electronics manufacturer and retailer and, ultimately, to the customer.

Let me begin by saying from the very outset that there's nothing more important to the vitality and robustness of the consumer electronics industry than technology. It keeps manufacturers manufacturing, retailers retailing, and consumers consuming. And just as important, new audio technology is what keeps the recording industry recording. Yet in the past few years, it's been very difficult for audio. Sales have been flat for manufacturers and retailers and not the best for recording companies, either. In fact, since the introduction of the compact disc in the 1980's, we have not had an exciting new audio technology. So there has been for several years a recession in our industry and a recession in new technology.

Unfortunately, the United States, as we all know, has been losing its edge in producing consumer electronics products. More and more manufacturers have gone overseas and taken many jobs with them. But Tandy has a resolve and is obsessed with recapturing the edge in American electronics.

Tandy has been looking forward to this dawning of the digital audio era just to put a renewed emphasis in manufacturing in the United States. Digital recorders offer the consumer the ability to

make digital recordings of superb quality, a tremendous advance over the analog decks of today.

In particular at Tandy, we've been working to develop the market for digital compact cassettes, a technology that we have been developing in conjunction with Phillips, Europe's largest consumer electronics company. This new digital tape format plays and records crisp, clear digital sounds, plus DCC tape decks are designed to be backward compatible so that consumers can also use their existing analog cassettes in these tape decks. DCC therefore promises to be a dynamic and exciting new audio format.

Yet we have been hesitant to manufacture and market this or other digital recording technologies in recent years. It's just been too risky because of the threat of litigation. The introduction of digital audiotape or DAT recorders is a perfect example. Two weeks after the delayed introduction of DAT recorders in the U.S. market, a group of music publishers and song writers sued the manufacturers for contributory copyright infringement. Well over a year later, the DAT format still lacks significant software support or distribution in the United States.

Faced with the threat of litigation and uncertain market environments, manufacturers and retailers have been very hamstrung. Yet without any new products in the windows, consumers have little to entice them to visit our stores or those of other retailers. Clearly this impasse has been in no one's best interest, so we have been very willing to make a deal.

Over the years, as you, Mr. Chairman, have worked hard to bring the interested parties together and protect the consumer in that process, the music and the consumer electronics industry representatives have been encouraged by you and the Senate Commerce Committee and other Senators to make a compromise, and today I can report gladly that we have a compromise, and as a result of your leadership, this subcommittee has the historic compromise in the form of a bill before you. The act is an equitable solution. It promises everyone a share in the benefits of the digital audio revolution. This legislation enables consumers to make recordings for their own private, noncommercial use, eliminates manufacturer or retailer liability for alleged copyright infringement, and fosters music industry support of a new generation of digital recording formats.

Of special importance to Tandy is the protection the bill would afford manufacturers and retailers from copyright infringement actions based on consumer audiotaping practices. This would create a more stable environment for the introduction of new products and formats and allow us to focus on marketing strategies instead of legal strategies. In addition, the legislation expressly provides that consumers have the right to use both digital and analog recorders to make recordings at home, removing any legal uncertainty our customers may have felt about whether they can make copies of prerecorded albums or broadcasts for their private use. In exchange, of course, for this, the bill requires the manufacturer to pay a royalty on the sale of digital recorders or blank tapes or other digital media. These royalties would go into a special fund for distribution to music creators and copyright holders.

Now, it's not any secret that the paying of royalties to the music industry is not something that the hardware industry or I personally particularly relish. But Tandy, like other manufacturers, both pays and receives royalties under circumstances where the company paying is not actually convinced that it infringes. So as a manufacturer, Tandy is gladly willing to pay their bill in order that we can pass your bill.

In sum, if the past few years have taught us anything, it is that with our legal feuding, we have gotten little in the way of new technology, leaving our shelves bare, our stores empty, and in my view, a modest royalty is a small price to pay to break the digital deadlock and to guarantee consumers the right to record with both digital and analog devices.

Immunity from copyright infringement suits would allow Tandy and others as well as retailers throughout the market to sell new digital audio recording products without fear of legal challenge and to make new digital products more attractive to consumers. The bill provides strong incentives for the recording companies to release new albums as well. And if we pass this bill, I'm glad to say that Tandy will manufacture digital compact cassette recorders in Fort Worth, TX. The manufacture of a new consumer electronics product in this country from day 1 is a phenomena that we have not seen in the last 15 years. We'll also make digital compact cassette tapes in California and, of course, sell through retail stores in every State.

So I believe that consumers, retailers, manufacturers, and the music industry all stand to benefit from the Audio Home Recording Act. It's a fair deal for all of us, and we appreciate your support and hope that the bill passes without delay.

[The prepared statement of Mr. Roach follows:]

STATEMENT OF
JOHN V. ROACH
CHAIRMAN OF THE BOARD
TANDY CORPORATION

Supporting S. 1623
THE AUDIO HOME RECORDING ACT OF 1991

before the
Senate Judiciary Committee
Subcommittee on Patents, Copyrights & Trademarks

October 29, 1991

Mr. Chairman and Members of the Subcommittee:

My name is John Roach. I am chairman of the board, chief executive officer, and president of Tandy Corporation. Tandy is a Texas-based company that manufactures and sells business and consumer electronics products. We are proud that Tandy is the largest U.S.-headquartered consumer electronics company in the business. We have 20 factories nationwide, employ over 27,000 people in the United States, and do business with over 50 million Americans each year. Last year, Tandy's sales exceeded 4.5 billion dollars.

The 7,400 Tandy stores and dealers comprise the nation's largest chain of consumer electronics stores. Most of these stores, which operate under the name of Radio Shack, Scott, McDuff and VideoConcepts, sell a diverse product line that includes everything from batteries to personal and business computers, as well as a wide array of audio recorders, audio tape, and recording accessories. Just last year, we began opening a new chain of stores -- the Edge in Electronics -- with a more upscale image and a state-of-the-art product line. And this week we are opening our first Computer City Supercenters which will feature America's best selling brands of computers including IBM, Apple, Tandy, Compaq, and AST.

I am honored to appear before you today to testify in support of S. 1623 -- the Audio Home Recording Act of 1991. I know that other witnesses will recount the long-standing home taping controversy and the historic compromise this bill represents. Therefore, I think it would be most helpful if I focused my testimony on what the Audio Home Recording Act

means to consumer electronics manufacturers and retailers -- and ultimately, to our customers.

Let me begin by saying at the very outset that there is nothing more important to the vitality and robustness of the consumer electronics industry than new technology. It is what keeps manufacturers manufacturing, retailers retailing, and consumers consuming. And just as importantly, new audio technology is what keeps the record industry recording.

Yet the past few years have been difficult for audio; sales have been flat for manufacturers, retailers, and record companies alike. In fact, since the introduction of the compact disc in the early 1980s, we have not had any exciting new technology on our shelves to capture the imagination of consumers. Put another way, the last decade has been recessionary not only for the economy but for new technology as well.

Unfortunately the United States has been losing its edge in producing consumer electronics products. More and more manufacturers -- and with them, more and more jobs -- have gone overseas. That's why at Tandy we have become so obsessed with recapturing the "Edge in Electronics."

Tandy has been looking forward to the dawning of a new digital audio era as just the development to put American consumer electronics manufacturing back on the map -- and to bring customers back into our retail stores. Digital recorders offer consumers the ability to make digital recordings of superb quality -- a tremendous advance over conventional analog tape decks. In particular, Tandy has been working to develop and market the digital compact cassette or "DCC" -- a new digital tape format that plays and records with crisp, clear digital sound. Plus, DCC tape decks are designed to be "backward compatible," so that consumers can also use them to play back their existing collection of analog cassette tapes. DCC promises to be a dynamic and exciting new audio format.

Yet frankly, Tandy has been hesitant to manufacture and market this

new product. In recent years, introducing new consumer audio products has become risky business.

Last year's introduction of digital audio tape or "DAT" recorders is a case in point. Two weeks after the introduction of DAT recorders in the U.S. market, a group of music publishers and songwriters sued the manufacturer for contributory copyright infringement. Well over a year later, the DAT format still lacks full software support from the music industry.

Faced with the threat of litigation and an uncertain market environment, manufacturers and retailers have felt hamstrung. It seems crazy that our marketing budget should have to include a contingency for legal fees and court costs just so we can introduce a new audio product. Yet without any new products in the windows, consumers have little to entice them to come into our stores. Clearly this impasse has been in no one's interest.

So we've struck a deal.

Over the years, Mr. Chairman, you have worked hard to bring the interested parties together, yet protect the consumer in the process. Similarly, last year, when music and consumer electronics industry representatives were before the Senate Commerce Committee, your fellow Senators asked us to work out a compromise. Today, I can report that we have. We have sat down with members of the music industry and negotiated a compromise we believe is fair. As a result of your leadership, this Subcommittee has this historic compromise in the form of the bill before you today.

The Audio Home Recording Act is an equitable solution that promises everyone a share in the benefits of the digital audio revolution. This legislation enables consumers to make recordings for their own private, noncommercial use, eliminates manufacturer or retailer liability for

alleged copyright infringement, and fosters music industry support for the new generation of digital recording formats.

Of special importance to Tandy is the protection the bill would afford manufacturers and retailers from copyright infringement actions based on consumer audio taping practices. This would create a more stable environment for the introduction of new products and formats, allowing us to focus more on marketing strategies and less on litigation strategies.

In addition, the legislation expressly provides that consumers have the right to use both digital and analog recorders to make recordings at home, removing any legal uncertainty our customers may have felt about whether they can make copies of prerecorded albums or broadcasts for their private use.

In exchange for these assurances, the bill requires manufacturers to pay a royalty on the sale of digital recorders and blank digital tapes or other digital media. The royalties would go into a special fund for distribution to music creators and copyright holders.

It is no secret that paying royalties to the music industry is not something I particularly relish. But Tandy, like other manufacturers, both pays and receives royalties under circumstances where the company paying is not actually convinced that it infringes. As a manufacturer, Tandy is willing in this case to pay <u>their</u> bill to pass <u>your</u> bill.

In sum, if the past few years have taught us anything it is that for all our legal feuding we have gotten little in the way of new technology, leaving our shelves bare and our stores empty. In my view, a modest royalty is a small price to pay to break the digital deadlock and to guarantee consumers the right to record with both digital and analog devices. Immunity from copyright infringement suits would allow Tandy and other manufacturers and retailers to market new digital audio recording products without fear of legal challenge. And, to make these new digital

products more attractive to consumers, the bill provides strong incentives for record companies to release new albums in new formats.

Consumers, retailers, manufacturers, and the music industry all stand to benefit from the Audio Home Recording Act. It's a fair deal for all of us. We deeply appreciate your support and urge you to pass this bill without delay.

Thank you.

Senator DECONCINI. Mr. Roach, thank you very much. It just occurred to me that the one group we don't have as opponents here are the lawyers. [Laughter.]

We want to be sure we'll leave the record open for them to file their opposition based on what you tell us that your company has been involved in.

Mr. ROACH. Well, I think they've had their day. [Laughter.]

Senator DECONCINI. We're now pleased to have Ms. Linda Golodner, the executive director of the National Consumers League, a longstanding consumer advocate in the United States who has thousands of members and has been before this committee and contributed immensely in putting forth the consumer perspective in these types of issues.

We're pleased to have you.

STATEMENT OF LINDA F. GOLODNER, EXECUTIVE DIRECTOR, NATIONAL CONSUMERS LEAGUE, WASHINGTON, DC

Ms. GOLODNER. Thank you, Mr. Chairman. I think there probably are a few lawyers in this room. [Laughter.]

Senator DECONCINI. You don't think we have to worry about them?

Ms. GOLODNER. No.

I'm Linda Golodner, executive director of the National Consumers League. The league is a nonprofit membership organization founded in 1899, with members throughout the country from every State and every walk of life. The league is concerned not only with the quality, availability, and price of goods and services, but we're also concerned that those who produce and create services and goods are paid a decent wage and work under safe and healthful conditions. Because of these principles, the National Consumers League feels that those highly skilled and talented people who create and produce music should be properly rewarded for their work.

We support S. 1623 because it is a balanced and much-needed solution to the home taping debate that is now entering its third decade. We believe that the bill serves the consumer well and urge the subcommittee to endorse it.

It is not often that a representative of consumer interests can share a panel with industry and state that what is good for industry is good for the American consumer, but today is such a day. S. 1623 is the result of give-and-take of all parties concerned in crafting a solution to the thorny problem of digital home taping. We know that in order to resolve a complex matter such as this, each party has to be willing to make some concessions, at the same time ensuring that particular interests are substantially acknowledged and protected. We believe that this legislation balances all those concerns.

This bill will benefit consumers, because it will break the stalemate between the music industry and the consumer electronics industry over the home taping issue and, as a result, increase consumer choice. Music industry representatives have stated that some record companies have been reluctant to produce recordings in digital form because they are concerned that digital audio recording equipment will undermine the market for their products. Consumer electronics manufacturers have spoken of their reluctance to bring new products into the marketplace in this uncertain climate.

Consumers are the biggest losers in this situation, because they have been deprived of the benefits of new technology and the enjoyment of new music. Everyone benefits from a resolution that breaks this impasse—the music industry, the consumer electronics industry, and especially the consumer. The clear benefit will be the increase in consumer options in prerecorded music and electronic equipment.

Many people may think of recording artists as very highly paid and may not realize that for every success, there have been many, many years of building a career, sometimes unpaid years of training and gaining experience. Artists endure these years because of the promise that they can recoup with just a few big hits.

The National Consumers League does not consider this bill as just another bill to fatten a rich industry, but as a genuine compromise to reward the many talented artists who create music with just compensation for their work. This bill will also remove the legal cloud hanging over home copying. Neither Congress nor the courts have set a clear signal on this question, so Americans who do tape music at home and the manufacturers and retailers who sell to them do so without the comfort of knowing one way or the other whether they can be held liable for such activities. This bill clears the air. It removes liability for analog as well as digital home taping. On that score, it is long overdue and much welcome.

Finally, we believe this bill is theoretically sound, as it is based on a time-tested and constitutionally mandated copyright scheme which rewards innovation in order to foster creativity. That system serves not only the copyright holder but the American public at large, because it ensures a steady supply of new creative products, such as music. Innovation cannot be properly rewarded and encouraged where technology is allowed to undermine the financial incentives for creativity. This bill will help protect those financial incentives and advance the interests of the American consumer by unleashing this new technology that allows for the enjoyment of digitally recorded music.

Of course, each of the three concerned groups—the music industry, the consumer electronics industry, and the consumer—must concede something in exchange for the benefits reaped. For the increase in consumer choice and the removal of liability for home taping, the manufacturers or importers will pay a royalty which may be passed on to the consumer on digital audio recording equipment and recording media. Critical to consumer support for this measure is that the royalties are both modest and capped. We recognize that royalties are a necessary component of the overall scheme and believe they are a fair exchange for the clear benefits the bill provides.

We urge support of S. 1623, which is a reasonable solution to a difficult problem and a fair deal for industry and the consumer alike.

Thank you, Mr. Chairman.

[The prepared statement of Ms. Golodner follows:]

STATEMENT OF
LINDA F. GOLODNER, EXECUTIVE DIRECTOR
NATIONAL CONSUMERS LEAGUE

BEFORE THE
SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS
SENATE COMMITTEE ON THE JUDICIARY

S. 1623 THE AUDIO HOME RECORDING ACT OF 1991

OCTOBER 29, 1991

Mr. Chairman and Members of the Subcommittee, I am Linda Golodner, Executive Director of the National Consumers League. The National Consumers League is a nonprofit membership organization, founded in 1899, with members throughout the country, from every state and from every walk of life. The League is concerned not only with the quality, availability, and price of goods and services, but that those who produce and create services and goods are paid a decent wage and work under safe and healthful conditions. Because of these principles, the National Consumers League feels that those highly skilled and talented people who create and produce music should be properly rewarded for their work.

We support S. 1623 because it is a balanced and much needed solution to the home taping debate that is now entering its third decade. We believe that the bill serves the consumer well, and urge the Subcommittee to endorse it.

It is not often that a representative of consumer interests can share a panel with industry representatives and state that what is good for the

industry is good for the average American. But today is such a day. S. 1623 is the result of give and take among all parties concerned in crafting a solution to the thorny problem of digital home taping. We know that in order to resolve a complex matter such as this, which implicates a broad range of players in disparate ways, each party has to be willing to make some concessions, at the same time ensuring that particular interests are substantially acknowledged and protected. We believe that S. 1623 balances all those concerns.

This bill will benefit consumers because it will break the stalemate between the music industry and the consumer electronics industry over the home taping issue and, as a result, increase consumer choice. Music industry representatives have stated that some record companies have been reluctant to produce recordings in digital form because they are concerned that digital audio recording equipment will undermine the market for their products. Consumer electronics manufacturers have spoken of their reluctance to bring new products into the marketplace in this uncertain climate. Consumers are the biggest losers in this situation, because they are deprived of the benefits of new technology and the enjoyment of new music.

Everyone benefits from a resolution that breaks this impasse -- the music industry, the consumer electronics industry and, especially, the consumer. For consumers, the clear benefit will be the increase in consumer options in prerecorded music and electronic equipment. Many people may think of recording artists

as very highly paid and may not realize that for every success, there have been many, many years of building a career -- sometimes unpaid years of training and gaining experience. Artists endure these years because of the promise that they can recoup with "a few hit records." The National Consumers League does not consider this bill as "just another bill to fatten a rich industry," but as a genuine compromise to reward the many talents and artists who create music and just compensation for their work.

This bill will also remove the legal cloud hanging over home copying. Neither Congress nor the courts have sent a clear signal on this question, so Americans who do tape music at home, and the manufacturers and retailers who sell to them, do so without the comfort of knowing -- one way or the other -- whether they can be held liable for such activities. Not only does this bill clear the air, but it comes down on the decidedly right side of this important question: it removes liability for analog as well as digital home taping. On that score, it is long overdue and much welcome.

Finally, we believe this bill is theoretically sound, as it is based on a time-tested and constitutionally mandated copyright scheme which rewards innovation in order to foster creativity. That system serves not only the copyright holder, but the American public at large -- the consumer -- because it ensures a steady supply of new creative products such as music. Innovation cannot be properly rewarded and encouraged

where technology is allowed to undermine the financial incentives for creativity. This bill will help protect those financial incentives and advance the interests of the American consumer by unleashing the new technology that allows for the enjoyment of digitally recorded music.

Of course, each of the three concerned groups -- the music industry, the consumer electronics industry and the consumer -- must concede something in exchange for the benefits reaped. For the increase in consumer choice and the removal of liability for home taping, the consumer will pay a royalty on digital audio recording equipment and recording media. Critical to consumer support for this measure, however, is that the royalties are both modest and capped. We recognize that royalties are a necessary component of the overall scheme and believe they are a fair exchange for the clear benefits the bill provides.

We urge your support of S. 1623, which is a reasonable solution to a difficult problem and a fair deal for industry and consumer alike.

Thank you, Mr. Chairman. I would be more than happy to answer any questions you may have.

Senator DECONCINI. Ms. Golodner, thank you very much for your testimony. It's very helpful to us today.

I do want to ask a few questions of the panel. If I could, I'll start with you, Ms. Gibson.

Some critics of the bill argue that the Serial Copy Management System that we're talking about here will hamper a struggling artist's ability to make demonstration copies of their music. Have you heard any concerns about this, or do you have an opinion about what an aspiring recording artist will do with this?

Ms. GIBSON. Well, I think it can only help, just because a struggling artist is going to use it to make their finished master for their demo, and they'll be able to make cassette copies from it to

distribute to whoever they need to distribute it to, so I don't see how it can hurt. The Serial Copy Management—that's the chip that prevents copies to copies. A struggling artist in the demo stage has no reason to make copies to copies to copies of DAT. In fact, I think it helps that they're the only one who can own their original.

Senator DECONCINI. It's also been said that the Serial Copy Management System will result in a degradation of the quality. In your experience, has that Serial Copy Management System compromised the quality?

Ms. GIBSON. In my experience, no, and also I believe for professional use that won't be an issue for the professional- quality DAT machines. But the digital audio recording equipment that's available to the consumer, like I said, I don't believe that lessens the quality of the sound in any way.

Senator DECONCINI. That's what we have been told. I just was wanting an opinion from a performer.

Ms. GIBSON. Well, from my ears, no.

Senator DECONCINI. It doesn't.

Ms. GIBSON. No.

Senator DECONCINI. Thank you very much.

Mr. Roach, who holds the patent on the Serial Copy Management System?

Mr. ROACH. It's in the public domain.

Senator DECONCINI. It is in the public domain?

Mr. ROACH. Yes.

Senator DECONCINI. You indicated that Tandy intends to manufacture its own CMS chips, or you're already doing that?

Mr. ROACH. Well, we will manufacture the digital recorders. It's initially planned to source those chips from others. In fact, initially they'll be sourced from Europe, but it's my belief they'll be readily available throughout the world.

Senator DECONCINI. Nobody has a corner on that that you know of?

Mr. ROACH. No. I think in general those chips or that circuitry will be encompassed in larger chips that handle the overall sound processing problem, and I don't view that as being a problem in the development of the industry.

Senator DECONCINI. Is there anything that prohibits your company if you decide you want to manufacture those chips?

Mr. ROACH. No.

Senator DECONCINI. You could do it if you decided that you needed to do it for a supplier?

Mr. ROACH. We could manufacture and we may manufacture those chips as a part of a larger chip at a later date. That's just not our initial need.

Senator DECONCINI. Some critics, Mr. Roach, have claimed that foreign-owned companies are so involved in this competitive business that you're in and that you are the major American manufacturer that is successfully competing against the foreign companies. Why do you support legislation that critics assert will benefit foreign competitors perhaps even more than yourself?

Mr. ROACH. Well, technology really does not follow boundaries in this world from a development standpoint or from a marketing standpoint, and I think manufacturers around the world who wish

to participate in digital recording will have now a greater incentive to do so, because this legislation makes clear that not only technologies that are currently planned to be introduced but other digital recording technologies can be freely introduced for audio purposes. So I don't really feel like this is an issue between foreign and domestic. I think this is a win-win for everybody.

Senator DECONCINI. Thank you.

Ms. Golodner, you mentioned about a cap being on these royalties, which I agree with you is certainly—at least you know how much the consumer is going to pay. Do you think the consumer on the street realizes they're going to pay a royalty, or do you think the consumer, from your perspective, just kind of thinks it's kind of built into the price and somebody else is paying?

Ms. GOLODNER. Well, actually it will be built into the price.

Senator DECONCINI. I know. I just want to know what the mindset that you think that the consumer——

Ms. GOLODNER. I think that the consumers will treat the marketplace with this new technology the same way they treat the marketplace right now. They'll walk into Mr. Roach's stores and decide whether or not the price is right or walk across the street where it might be cheaper, and they'll make decisions——[Laughter.]

Senator DECONCINI. No, it's the other way. They'll walk across the street to Tandy where it's cheaper.

Ms. GOLODNER. They're still going to compare prices. They're going to compare quality and look for the best deal.

Senator DECONCINI. And the caps here as well as the legislation specifically says what the ceiling will be and what the maximum will be, you're satisfied that that's not going to be detrimental to the consumer?

Ms. GOLODNER. Yes, we are, and it is just a few cents for tapes, and with the cap in there for the machines, we feel this is just a one-time price that consumers will pay.

Senator DECONCINI. Thank you very much.

I will perhaps ask if Senator Hatch has any questions, he might send them to you for responses. I appreciate very much your testimony today and your support of this legislation.

Our next panel will be composed of Mr. Jay Berman, president of the Recording Industry Association of America; Mr. Gary Shapiro, the group vice president of the Consumer Electronics Group, Electronics Industry Association; and Mr. Edward Murphy, president and CEO of the National Music Publishers' Association and president and CEO of the Harry Fox Agency.

Gentlemen, let me, just for time's sake, compliment all three of you here. I know you'd like to hear it one at a time, but just because of the time of the hearings, I do want to truly thank you, from the standpoint of what I believe is a public interest as well as your own interest of who you represent, for the time you have put in and the seriousness with which you have taken suggestions from some of us and the ability to work a compromise here in the spirit of giving up something. I'm sure—and I know enough about it—that each of you would like to have had a larger piece of this in respect to who you represent, but I'm very, very complimentary of these leaders here, and I think those who you represent are well served by the type of work that you've done.

We'll start with you, Mr. Berman.

Mr. BERMAN. I'll actually defer to Mr. Murphy.

Senator DECONCINI. OK. We'll go with Mr. Murphy, then.

STATEMENT OF EDWARD P. MURPHY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NATIONAL MUSIC PUBLISHERS' ASSOCIATION, AND PRESIDENT AND CHIEF EXECUTIVE OFFICER, THE HARRY FOX AGENCY, NEW YORK CITY, NY

Mr. MURPHY. Thank you, Mr. Chairman and members of the subcommittee.

I am president and CEO of the National Music Publishers' Association, and I serve as chairman of the © Copyright Coalition. I'm here today to describe why the organizations I represent enthusiastically support swift passage of S. 1623, the Audio Home Recording Act of 1991. I'll try to explain along with my colleagues, Mr. Gary Shapiro, group vice president of the Consumer Electronics Group of the Electronics Industry Association, and, of course, Jay Berman, president of Recording Industry Association of America, why this proposed legislation is so important to so many people and how it achieves a consensus between the parties before you today.

In so doing, I am hopeful it will become clear to the subcommittee that a delicate balance has been struck between the need to get exciting new technologies in the hands of consumers, on one hand, and the need to protect the vital interests of the music creators and copyright owners, on the other hand. This balance of interests represents an historic achievement, which, if enacted into law, will put to rest a decade-long controversy that has consumed the time and energy of many people in industry and government while delaying the availability to the public of the marvelous new means for enjoyment of music.

Now, Mr. Chairman, I would like to describe briefly the © Copyright Coalition, the concerns raised by digital home taping, the background on the historic compromise, and the win-win-win nature of the legislation before you.

The © Copyright Coalition was founded in October 1989 and consists of over 30 copyright advocacy groups, including the National Music Publishers' Association; the American Society of Composers, Authors, and Publishers; Broadcast Music, Inc.; the Song Writers Guild of America; the Authors Guild; and the Dramatists Guild. All told, the © Copyright Coalition represents tens of thousands of individuals and businesses that share the goal of promoting and protection of copyrights in musical works.

The coalition was originally founded to give a new and distinct voice to that part of the creative music community which has long sought what, in its view, is a fair compensation for home taping of copyrighted musical works. Initially we organized to oppose legislation introduced in the last Congress which would have relied solely on technical restrictions—namely the Serial Copy Management System—to address the copyright issues raised by digital audiotape, or DAT, technology. In part due to our objections, members of Congress urged the various interests to go back to the negotiating table and to return when we had a consensus in hand.

The coalition's enthusiastic support for the Audio Home Recording Act of 1991 stems from its comprehensive approach to audio home taping issues. The proposed legislation incorporates the critical royalty component, and it extends to all digital audio recording technologies, not just to DAT.

I need not recount for the subcommittee the long history of legal and economic charges and countercharges that have surrounded the issues of audio home taping, the competing studies and reports, the competing interpretations of those studies and reports, and so on. Moreover, I think that the witnesses before you today strongly believe it is time to move beyond those charges and countercharges. Indeed, it is essential to do so if we are to convince Members of Congress that the Audio Home Recording Act should become the law of the land.

Since the interests I represent would be beneficiaries under the proposed legislation, however, it is important for me to note that, in our view, the bill is founded upon the need to uphold the intellectual property rights and economic well-being of the American music industry. In a nutshell, we believe that the threat posed to music industry by unrestrained, uncompensated digital home taping is enormous.

By and large, individual record companies and music publishers have declined to support digital audio recording technologies such as DAT for fear of furthering the unregulated advance of technologies that they believed were capable of putting them out of business. In the absence of prerecorded music and facing the prospect of copyright infringement lawsuits, consumer electronics manufacturers understandably chose to limit the sale of digital audio recording products in the United States, products that became available overseas, especially in Japan. Everyone was the loser in this confrontational scenario. Our challenge then was to find a way out of this fundamental impasse.

As I mentioned earlier, after a contentious hearing in June of last year on the so-called SCMS bill, which took place before the Senate Commerce Committee's Subcommittee on Communications, a number of Members of Congress urged music industry and consumer electronics representatives to put aside their differences, go back to the bargaining table, and return to Congress with a compromise of all interested parties. The hundreds of hours of talks among the interested groups ultimately produced a broad compromise, which was announced on July 11 of this year.

Under this compromise, the various parties announced their joint support for a comprehensive and detailed legislative solution to the U.S. audio home taping problem. At the same time, an announcement was made that the lawsuit initiated by song writers and music publishers has been withdrawn without prejudice, thereby clearing the way for a joint effort by all parties in support of the legislative compromise. The Audio Home Recording Act of 1991 embodies the compromise agreed upon by the © Copyright Coalition, the recording industry, and the consumer electronics manufacturers.

As such, the bill represents a win-win-win proposition. First, music copyright owners will receive some compensation for digital home copying of their works, and safeguards against multigenera-

tional copying will be provided through incorporation in each digital recording device of SCMS technology. Second, the legal cloud that has hung over the digital recording technology is removed, and the manufacturers and importers will be free to market the products without concern over copyright infringement lawsuits.

As a result of this carefully balanced package, consumers are the big winners. By removing the fear of infringement actions against manufacturers, importers, and consumers, the bill paves the way for widespread distribution of exciting new digital audio recording products and prerecorded music as soon as they become available. Indeed, the legislation provides immunity against infringement lawsuits not only in the area of digital audio copying, but also in the area of analog audio copying, and without a royalty obligation being placed upon manufacturers or importers of analog recorders or blank media.

In addition, the bill reflects the U.S. commitment to the Berne Convention principles and to the concept of a strong international intellectual property protection. The use of intellectual property rights currently accounts for a major segment of the U.S. GNP, and it is vital that the United States remain an international leader in the protection of such rights. By enacting this legislation, the United States will join more than a dozen other nations which have already adopted a royalty system to provide fair compensation for home recording of musical works and sound recordings protected by copyright. Moreover, with the adoption of this legislation, we'll be able to argue more forcefully and persuasively that similar legislation should be adopted in countries where no royalty system presently exists, such as in Japan, where discussions about the issues have gone on for years without results.

I'm very proud to have helped engineer a compromise among industry groups whose past encounters on this issue have been well documented. I'm also very pleased that the process of tough negotiations has produced a great respect for one another and the interests and the industries that we represent. The push by Members of Congress was a strong catalyst in getting us to sit down and to talk to one another. Indeed, we would not be here today if it were not for the wise counsel of this body. Now that a compromise has finally been reached, it is our hope that Congress will act swiftly to pass this legislation and to send it to the President for signature.

In sum, this bill represents a comprehensive solution to a complicated legal and economic problem. There will be no cost to the U.S. Government associated with this legislation, and the benefits to music creators, copyright owners, electronics manufacturers, and consumers will be enormous. Without the bill, consumer access to digital audio recording technologies in the United States will continue to be problematic at best. In our view, the Audio Home Recording Act of 1991 possesses all the characteristics of a piece of legislation that serves the public good. We look forward to working with members of this subcommittee to address any questions or issues which may arise and hopefully to achieve enactment of this vital addition to the Copyright Act.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Murphy follows:]

Summary of the

Statement of Edward P. Murphy
President, National Music Publishers' Association, Inc.
on behalf of the © Copyright Coalition

Before the Subcommittee on
Patents, Copyrights and Trademarks
Senate Committee on the Judiciary

October 29, 1991

I am here today to express strong support for S. 1623, the Audio Home Recording Act of 1991. I am here on behalf of the © Copyright Coalition, which consists of over thirty copyright advocacy groups that share the goal of promoting the protection of copyrights in musical works.

The Audio Home Recording Act embodies an historic compromise concerning digital audio recording technology among representatives of songwriters, music publishers, record companies, recording artists, consumer electronics manufacturers, and consumer groups. The Act would put to rest a decade-long controversy that has consumed the time and energy of many people in industry and government, while delaying the availability to the public of exciting new means for the enjoyment of music.

The Act would:

(1) provide music copyright owners with some compensation for the digital home copying of their works, along with technical safeguards against multi-generational digital copying of those works;

(2) provide electronics manufacturers, importers, and consumers with immunity against copyright infringement lawsuits, both for digital and analog audio recording devices;

(3) promote U.S. leadership in the international protection of intellectual property rights by, among other things, bringing the U.S. in line with other countries that have already adopted royalty systems in this area; and

(4) help to preserve the predominant international position of the American music industry.

In sum, the Act is a "win-win-win" proposition. It is an outgrowth of past urgings by members of Congress that the various interested parties return to the negotiating table, and that they come back to Congress with a consensus solution to the issues and challenges presented by digital audio recording technology. We believe that the Act is very much in the public interest. We look forward to working with the members of the Subcommittee to address any questions or concerns that may arise, and, hopefully, to achieve enactment of this vital addition to the Copyright Act.

Statement of Edward P. Murphy
President, National Music Publishers' Association, Inc.
on behalf of the © Copyright Coalition

Before the Subcommittee on
Patents, Copyrights and Trademarks
Senate Committee on the Judiciary

October 29, 1991

Mr. Chairman and members of the Subcommittee, my name is Edward P. Murphy. I am president and CEO of the National Music Publishers' Association, Inc. ("NMPA"), and I serve as Chairman of the © Copyright Coalition. I am here today to describe why the organizations I represent enthusiastically support swift passage of S. 1623, the Audio Home Recording Act of 1991. We are deeply appreciative of this opportunity to urge swift passage of the Act, which means so much for U.S. consumers; for the writers and artists who create American music; for the music publishers and record companies that bring the music to the marketplace; and for the consumer electronics companies whose products convert the music into the listening pleasures that mean so much in our daily living.

My purpose today is to explain, along with my colleagues on this panel, why this proposed legislation is important to so many people and how it achieves a consensus between the parties before you today. In so doing, I am hopeful it will become clear to the Subcommittee that a delicate balance has been struck between the need to get exciting new technologies in the hands of consumers, on the one hand, and the need to protect vital interests of music creators and copyright owners on the other hand. This balancing of interests represents an historic achievement, which -- if enacted into law -- will put to rest a decade-long controversy that has consumed the time and energy of

many people in industry and government, while delaying the availability to the public of exciting new means for the enjoyment of music.

To be given the opportunity to help shape and craft this historic consensus has been a great privilege for me. The tremendous challenges that had to be overcome have required the best that our government and private sector can produce. During the long and difficult process that has led us to this consensus, the organizations I represent -- and I personally -- have greatly appreciated the experience of working with this Subcommittee, and the major contribution you have made to achieving the compromise before you.

And now, Mr. Chairman, I would like to describe briefly the © Copyright Coalition; the concerns raised by digital audio home taping; the background on our historic compromise; and the "win-win-win" nature of the legislation before you.

I. The © Copyright Coalition

The © Copyright Coalition was founded in October 1989, and consists of over thirty copyright advocacy groups, including the National Music Publishers' Association, the American Society of Composers, Authors and Publishers, Broadcast Music, Inc., The Songwriters' Guild of America, the Authors' Guild, and the Dramatists' Guild. All told, the © Copyright Coalition represents tens of thousands of individuals and businesses that share the goal of promoting the protection of copyrights in musical works.

The Coalition was originally founded to give a new and distinct voice to a segment of the creative music community that has long sought what it views as fair compensation for home taping of copyrighted musical works.

Initially, we organized to oppose legislation introduced in the last Congress which would have relied solely on technical restrictions -- namely, the Serial Copy Management System -- to address the copyright issues raised by digital audio tape (or "DAT") technology. In part due to our objections, members of Congress urged the various interests to go back to the negotiating table, and to return when we had a consensus in hand.

The Coalition's enthusiastic support for the Audio Home Recording Act of 1991 stems from its comprehensive approach to audio home taping issues. The proposed legislation incorporates the critical royalty component, and it extends to all digital audio recording technologies, not just to DAT.

II. Challenges Posed by Digital Audio Home Taping

I need not recount for this Subcommittee the long history of legal and economic charges and countercharges that have surrounded the issue of audio home taping -- the competing studies and reports, the competing interpretations of those studies and reports, and so on. Moreover, I think that the witnesses before you strongly believe that it is time to move beyond those charges and countercharges. Indeed, it is essential to do so if we are to convince members of Congress that the Audio Home Recording Act should become the law of the land.

Since the interests I represent would be beneficiaries under the proposed legislation, however, it is important for me to note that, in our view, the bill is founded upon the need to uphold the intellectual property rights and economic well-being of the American music industry. In a nutshell, we believe that the threat posed

to the music industry by unrestrained, uncompensated digital home taping is enormous.

Unlike the copies created by analog recording devices found in most American homes today, digital copies are perfect clones of the original -- even after many generations of copies have been made. Thus, a copy of a copy of a copy sounds as pristine as the original source material. We believe that analog home taping already causes great damage to music industry sales and income; we also believe that the dawning era of digital audio recording technology would, without appropriate safeguards, dramatically increase the harm to such sales and income.

Since the introduction of digital audio recording technologies promised substantial new product sales for the consumer electronics industry, the economic stakes were raised on both sides. By and large, individual record companies and music publishers have declined to support digital audio recording technologies such as DAT -- generally refusing to voluntarily license the release of pre-recorded music in such formats -- for fear of furthering the unregulated advance of technologies that they believed were capable of putting them out of business. In the absence of pre-recorded music, and facing the prospect of copyright infringement lawsuits, consumer electronics manufacturers understandably chose to limit the sale of digital audio recording products in the United States -- products that became available overseas, especially in Japan.

Everyone was a loser in this confrontational scenario: the consumer electronics manufacturers that wanted to market new technologies in which they had already invested substantial sums of money; the music creators and

copyright owners that saw an exciting new means of delivering music to the public; and, last but far from least, the American consumer, who was being denied the benefits of the new digital age of audio technology. Our challenge, then, was to find a way out of this fundamental impasse.

III. History of The Compromise

As I mentioned earlier, after a contentious hearing in June of last year on the so-called "SCMS bill," which took place before the Senate Commerce Committee's Subcommittee on Communications, a number of members of Congress urged music industry and consumer electronics representatives to put aside their differences, go back to the bargaining table, and return to Congress with a compromise that included all interested parties.

Thereafter, representatives of the © Copyright Coalition, the recording industry, and the consumer electronics industry began regular meetings to determine if such a compromise were possible. I must say that the initial meetings were very difficult and did not leave much room for optimism that a solution was possible. Because of the importance of resolving these issues, however, we pressed on through many hours of frank -- and sometimes heated -- debate.

I think it is fair to say that, especially as time went on, the various interested parties were not unmindful of the stakes involved in a copyright infringement lawsuit filed by certain songwriters and music publishers in July of last year. The lawsuit had been brought with the support of the © Copyright Coalition, and followed clear warnings from

music publisher and songwriter interests that legal action would be taken against any company importing digital audio recorders in large numbers prior to the enactment of adequate safeguards. When one consumer electronics company began importing DAT hardware into the U.S., songwriters and music publishers sued to preserve what we viewed as our fundamental rights.

Whether because of or in spite of the lawsuit, these hundreds of hours of talks among the interested groups ultimately produced a broad compromise, which was announced on July 11 of this year. Under this compromise, the various parties announced their joint support for a "comprehensive and detailed legislative solution to the U.S. audio home taping problem." At the same time, an announcement was made that the lawsuit had been withdrawn by the plaintiffs without prejudice, thereby clearing the way for a joint effort by all parties in support of the legislative compromise.

IV. The Bill is a "Win-Win-Win" Proposition

The Audio Home Recording Act of 1991 embodies the the compromise agreed upon by the © Copyright Coalition, the recording industry, and the consumer electronics manufacturers. As such, the bill represents a "win-win-win" proposition. First, music copyright owners will receive some compensation for digital home copying of their works, and safeguards against multi-generational copying will be provided through the incorporation in each digital recording device of SCMS technology. Second, the legal cloud that has hung over digital recording technologies is removed, and manufacturers and importers will be free to market new

products without concern over copyright infringement lawsuits.

As a result of this carefully balanced package, consumers are big winners too. By removing the fear of infringement actions against manufactureres, importers, and consumers, the bill paves the way for widespread distribution of exciting new digital audio recording products and prerecorded music as soon as they become available. Indeed, the legislation provides immunity against infringement lawsuits not only in the area of digital audio copying, but also in the area of analog audio copying -- and without royalty obligations being placed upon manufacturers or importers of analog recorders or blank media.

Although my colleagues are better positioned to describe the employment benefits of the bill, it strikes me that this legislation will likely serve to stimulate the creation of American jobs, not only in service-related sectors, but in manufacturing as well. In particular, perhaps it is not too soon to suggest that this leglislation will contribute to the maintenance of a more vibrant U.S. consumer electronics manufacturing sector, a part of our economy that could well use the incentives that the bill provides.

It should also be noted that, because the bill extends to all analog and digital audio copying devices, whether now known or later developed, Congress will be spared from having to review the copyright laws each time a new audio recording format is introduced.

In addition, the bill reflects the U.S. commitment to Berne Convention principles and to the concept of strong international intellectual property protections. Intellectual property-based industries currently account for

a major segment of the U.S. GNP, and it is vital that the U.S. remain an international leader in the protection of intellectual property rights. By enacting this legislation, the U.S. will join more than a dozen other nations that have already adopted royalty systems to provide fair compensation for home recording of musical works and sound recordings protected by copyright. Moreover, with the adoption of this legislation, we will be able to argue more forcefully and persuasively that similar legislation should be adopted in countries where no royalty system presently exists -- such as in Japan, where discussions about the issue have gone on for years without result.

It is also important to note that certain nations that have already enacted home audio taping laws provide royalty benefits to U.S. music creators and copyright owners only on a reciprocal basis. Other nations may soon adopt similar reciprocity requirements. By enacting the Audio Home Recording Act, Congress will ensure that American music creators and copyright owners will be able to collect the foreign home taping royalties that are rightfully due them. Moreover, the national treatment principle incorporated in the legislation will hopefully encourage other countries to reject the idea of reciprocity requirements in this area.

As domestic industry after domestic industry has fallen victim to increasingly rigorous international competition, musical products remain a flagship of American exports, and one of the few consistent areas of trade surplus. It is, and should be, a matter of great national pride that American music is dominant throughout the world. Of course, this is not pre-ordained, but comes about because the environment here in the U.S. encourages creativity through the protection of intellectual property rights.

Absent continuation of such an environment, this industry could suffer the same fate as others about which we were equally confident of our "competitiveness" in the not-too-distant past.

V. The Narrow Focus of the Bill

While the Audio Home Recording Act of 1991 incorporates the many complex facets of the compromise among the industries, careful drafting has narrowly focused the bill on home audio copying.

The draft legislation specifically excludes from its scope non-audio technologies, where copyright and technical concerns are different from those raised by audio recording technologies. In particular, it is important to note that the bill carefully excludes both audiovisual and computer equipment and media (such as vcr's, videocassettes, PCs, and related software). Even in the area of audio recording techologies, the bill excludes audio recording devices which do not implicate the home taping of copyrighted works, such as dictating machines and telephone answering machines.

VI. Conclusion

As is always the case in a difficult compromise, each party gave up some of what it sought in order to achieve something that all can support. Thus, the bill is not absolutely perfect from any group's perspective, but it nevertheless has the enthusiastic support of composers and lyricists, music publishers, record companies, recording artists, electronics manufacturers and importers, and

various consumer groups (including the Home Recording Rights Coalition).

I am very proud to have helped engineer a compromise among industry groups whose past encounters on this issue have been well documented. I am also very pleased that the process of tough negotiations has produced a greater respect for one another and the interests of the industries that we represent. The push by members of Congress was a strong catalyst in getting us to sit down and talk to one another. Indeed, we would not be here today were it not for the wise counsel of this body. Now that a compromise has finally been reached, it is our hope that Congress will act swiftly to pass this legislation and send it to the President for signature.

In sum, this bill represents a comprehensive solution to a complicated legal and economic problem. There will be no cost to the U.S. Government associated with the legislation, and the benefits to music creators, copyright owners, electronics manufacturers, and consumers will be enormous. Without the bill, consumer access to digital audio recording technologies in the U.S. will continue to be problematic at best. In our view, the Audio Home Recording Act of 1991 possesses all the characteristics of a piece of legislation that serves the public good.

We look forward to working with the members of this Subommittee to address any questions or issues that may arise, and, hopefully, to achieve enactment of this vital addition to the Copyright Act.

Thank you, Mr Chairman.

Senator DECONCINI. Mr. Murphy, thank you indeed for your fine statement of support and explanation and also your leadership in putting together this legislation.

Before we proceed with the other panelists, I'll be glad to yield to my friend and colleague who is a cosponsor of S. 1623 and is the leader here in this body on the protection of technology in the patent and copyright area, and I'll be glad to yield to the Senator from Vermont.

Senator LEAHY. Thank you, Mr. Chairman. I just ask unanimous consent that a full statement of mine be put in the record.

Senator DECONCINI. So ordered.

[The prepared statement of Senator Leahy follows:]

OPENING STATEMENT
SENATOR PATRICK LEAHY
HEARING ON S. 1623
AUDIO HOME RECORDING ACT OF 1991
SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS
OCTOBER 29, 1991

Mr. Chairman, in the last several decades we have witnessed what seems to be a permanent revolution in consumer electronics. As one innovation has followed another, we have all come to take for granted products that a few years ago were unheard of -- VCRs, camcorders and compact discs, whose clarity of sound made all of our record collections instantly obsolete.

Meanwhile, the software for all of this marvelous new gadgetry -- for consumers at home and the world over -- is produced right here -- in Hollywood and Motown, in New York and Nashville, in Chicago and New Orleans. I read in Jay Berman's testimony that the companies he represents manufacture and distribute nearly half of all sound recordings sold worldwide. Indeed, if America has a competitive advantage in the new world economy, it is undoubtedly in the products of the mind -- the movies and software and sound recordings that we create for the rest of the world.

But the pace of technological change puts pressure on our laws to keep up. And when our laws fail to do this, the result can be the kind of logjam that has stymied the spread of digital audio technology in this country.

That is why I am pleased to be an original co-sponsor of Chairman DeConcini's Audio Home Recording Act. I am glad that the various interested parties were able to reach an agreement that is fair to the creative community of composers and performers, to the recording and electronics industries, and to consumers.

For years now, new digital recording technologies have made it possible to create flawless copies of digital masters. Yet these new technologies are not widely available to American consumers because of the stalemate that existed between the music and the consumer electronics industries. Creative artists were concerned that they would receive little compensation for their work if unlimited digital copies could be made of their pre-recorded music without adequate legal safeguards. Consumer electronics manufacturers were concerned that they would face copyright infringement lawsuits if they sold digital audio recorders in the United States. And there was, in fact, litigation when such recorders were imported for sale.

As a result of the legal deadlock, American consumers have been unable to enjoy the benefits of digital home recording technology. New products have been stuck in the pipeline because our laws have not kept up with changes in technology.

The Audio Home Recording Act of 1991 would break the stalemate by providing a stable legal environment for emerging digital audio technologies. Hardware manufacturers will be able to introduce new digital recording equipment without fear of liability for copyright infringement. Creators and copyright owners of pre-recorded music will receive compensation for digital copying of their music. American consumers will gain access to the most advanced audio recording technologies in the world. And finally, the bill will clarify the right of consumers to copy pre-recorded music for their private, non-commercial use -- within the limits prescribed by the Serial Copy Management System.

This is not a perfect bill. But it will provide benefits to millions of American consumers. It will break the legal logjam that has hampered the introduction of digital audio recorders into U.S. markets for several years. We have not let legal barriers stand in the way of other new technologies -- such as VCRs, personal computers, modems, and fax machines -- and as technological change continues at an exhilarating pace, we must make sure that our laws adapt flexibly and rapidly.

Mr. Chairman, I want to thank you for holding these hearings. This is one of the most intensely debated issues to come before the Patents Subcommittee in years. Your leadership has been essential in facilitating agreement between those who create our music and those who create the products that bring that music to us.

I know that songwriters, musicians, recording companies, music publishers, and consumer electronics manufacturers have worked hard on this issue. I am pleased that they stayed at the bargaining table and reached a compromise. I hope that the interested parties will continue working together in the future. And I look forward to hearing from the witnesses who have gathered to speak on this important legislation.

Senator LEAHY. Also, I want to thank you for holding these hearings. The fact that a compromise appears to have been worked out is in large part due not only to the actions of the people testifying here today, but also to your willingness to keep moving forward with legislation. I think this will break the legal logjam that we've seen, so I'm glad we're having the hearings, and I'm glad that the song writers, the musicians, the recording companies, the music publishers, and the consumer electronics manufacturers and everybody else stayed at the bargaining table long enough to get a compromise and make it that much easier to go forward.

So I compliment you, Mr. Chairman.

Senator DECONCINI. Well, I thank you, Senator Leahy, and I appreciate your early support of this legislation and also your staff and your involvement in encouraging our friends here on all sides to put together something short of us going out on our own, which we have on occasion done, not always in the best interest of everybody but trying to address a public need, and your leadership is greatly appreciated.

Senator DECONCINI. Mr. Berman, would you like to testify now?

Mr. BERMAN. I'll defer again.

Senator DECONCINI. Whenever you're ready, Mr. Berman.

Mr. BERMAN. I'm so intrigued by the testimony, I'm perfectly willing to.

Senator DECONCINI. Would you like to come back tomorrow? I'll be glad to extend these hearings tomorrow for you. [Laughter.]

Senator LEAHY. Are you having a good time, Jay, is what he's asking you.

Senator DECONCINI. Mr. Shapiro?

STATEMENT OF GARY J. SHAPIRO, GROUP VICE PRESIDENT, CONSUMER ELECTRONICS GROUP, ELECTRONICS INDUSTRY ASSOCIATION, WASHINGTON, DC

Mr. SHAPIRO. Thank you, Senator DeConcini.

Mr. Chairman, Senator Leahy, my name is Gary Shapiro. I'm the group vice president of the Electronics Industry Association's Consumer Electronics Group, one of the industry groups that participated actively in working toward the compromise embodied in the bill before you. I also have the honor of serving as the chairman of the Home Recording Rights Coalition, of which EIA is a member. Thank you for inviting me to testify today.

I am pleased to convey the unqualified support of both EIA and the Home Recording Rights Coalition for the Audio Home Recording Act of 1991. The Consumer Electronics Group of the Electronics Industry Association represents the leading manufacturers of electronics products that entertain and inform American consumers. The Home Recording Rights Coalition is a coalition of consumers, retailers, and manufacturers of recording products. Since its founding 10 years ago, the Home Recording Rights Coalition has sought to preserve the rights of consumers to make noncommercial home recordings for private use.

I have been personally involved in the issue of home recording for more than 10 years. I was with you, Mr. Chairman, in this room on November 30, 1981, and since then, it is a tribute to you, Mr. Chairman, that you have continued for the last decade to urge all interested parties to find a reasonable compromise that serves the consumer interests and that you have introduced legislation embodying such a compromise in the legislation before you.

In my view, the Audio Home Recording Act is significant because it forever ends the debate over private, noncommercial audio home recording, and it opens the door to a vibrant market for new digital audio technologies. The act will encourage record companies and music publishers to support this new digital audio technology enthusiastically, and it means that digital audio recorders will be appearing on retailers' shelves as products rather than in court as exhibits. The royalty rates set by this legislation are lower than anything proposed in the past, and they are limited to the new consumer-model digital audio recorders and media and do not affect existing analog recorders or media at all.

Even with these benefits, it still required some soul-searching after years of opposition to support a bill that includes a royalty provision. We continue to believe that consumers have the right to use their own recorders to record for private, noncommercial purposes any signal they have lawfully acquired. We endorse the Audio Home Recording Act because it permits consumers to make first-generation digital audio recordings of any lawfully acquired signal. It promotes certainty in the courts, predictability in the marketplace, and new choices for consumers. We therefore urge its expeditious enactment.

If I may, Mr. Chairman, I would like to summarize briefly why this particular compromise is worthwhile from the perspectives of consumers, retailers, and manufacturers.

First, the prohibition on copyright infringement actions is very important to consumers, manufacturers, and retailers. Our broad support for the Audio Home Recording Act is based largely on section 1002. That section provides specifically that the copying of a phono record by a consumer for private, noncommercial use is not for direct or indirect commercial advantage and is therefore not ac-

tionable. For retailers, this means they can now order stocks of new generations of home recorders; for manufacturers, it means they can plan large-scale product development; and for consumers, it means they can have access to these new technologies, and it forever removes the cloud of doubt over the legality of these products.

No one can really predict what sorts of products American consumers will buy; however, one thing seems certain: consumers ought to be able to choose freely among the best products that technology can provide.

Mr. Chairman, you said the biggest winner here is the American consumer, and I agree with you. So far, the controversy and uncertainty over audio home recording has only denied consumers the chance to choose among these new formats which will be supported by economies of scale and marketing commitment. With enactment of this legislation, I see an immediate future with new hardware technologies, new software choices, and prices declining as mass market volume is achieved, just as has happened with other major consumer electronics breakthroughs.

Audio retailers need these new products. With the Nation in a recession, our retailers are struggling. Today their customers are reading about these new technologies and prototypes, and so they are less interested in the excellent recording products on the shelves now, yet these new high-tech products are not generally available.

This legislation does have the support of such retailer groups as the National Association of Retail Dealers of America and other retailers. They support it because it promises to transform the market, giving them new products to sell at reasonable prices and without imposing upon them or their customers any paperwork or collection of funds. For manufacturers, the act is also a reasonable compromise. Manufacturers support this bill because it does not degrade or devalue their own intellectual property rights in favor of any other rights. It elevates their costs, but only slightly and in a highly predictable manner. In this sense, it is not much different from the routine licensing compromises made over conflicting assertions of patent and other intellectual property rights to which businesses agree every day.

The act is also very carefully circumscribed in its provisions and its effect. It covers only consumer-model digital audio recording devices designed or marketed for the primary purpose of making copies of audio recordings. The following products are not digital audio recording devices under this legislation: today's analog cassette tape recorders, personal computers, VCR's, multimedia devices, answering and dictating machines, and professional products.

Nobody is more concerned than we about the possibility of an incorrect or overly broad interpretation of this legislation, either directly or in terms of precedent. We can say with confidence that the bill comports with its intention—that is, the royalty obligation and serial copying limitation govern only recorders and blank media that are in the marketplace explicitly or primarily for the purpose of consumer digital audio recording from music albums. Thus, VCR's, computers, and other devices that may be capable of digital audio recording are not covered by the bill unless the capa-

bility for consumer music copying makes all other capabilities of the recording devices secondary.

Likewise, the events and circumstances leading to this proposed compromise are complex and unique. We definitely do not view this bill as a precedent for legislation in any other field or about any other products, nor do we view this legislation as promoting or favoring any particular digital or analog audio recording format, proposed or existing, new or old. This bill holds the door wide open for everyone. Who succeeds and who fails will be determined in the marketplace, which is as it ought to be.

Before concluding, Mr. Chairman, I wish to salute you for your decade of leadership on the home recording front. We know you have worked long and hard to be fair to everyone, especially the American consumer. We believe the Audio Home Recording Act of 1991 is a worthwhile and necessary compromise to break the stalemate over digital audio home recording. Having been urged by Congress to find common ground from which to promote new technology and enhance music creativity, we now look forward to working with you to enact this historic compromise.

Thank you.

[The prepared statement of Mr. Shapiro follows:]

STATEMENT OF
GARY J. SHAPIRO
GROUP VICE PRESIDENT
CONSUMER ELECTRONICS GROUP
ELECTRONIC INDUSTRIES ASSOCIATION

Before the
United States Senate
Committee on the Judiciary
Subcommittee on Patents, Copyrights and Trademarks

Supporting S. 1623
THE AUDIO HOME RECORDING ACT OF 1991

October 29, 1991

Mr. Chairman and Members of the Subcommittee:

My name is Gary J. Shapiro. I am group vice president of the Electronic Industries Association's Consumer Electronics Group, one of the industry groups that participated actively in working toward the compromise embodied in the bill before you. I also have the honor of serving as chairman of the Home Recording Rights Coalition (HRRC), of which EIA is a member. Thank you for inviting me to testify today. I am pleased to convey the unqualified support of both EIA and the HRRC for the Audio Home Recording Act of 1991.

The Consumer Electronics Group of EIA represents the leading manufacturers of 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.

The HRRC is a coalition of consumers, retailers and manufacturers of recording products. Since its founding a decade ago, HRRC has sought to preserve the rights of consumers to make noncommercial home recordings for private use.

I have been personally involved in the issue of home recording for

more than ten years. It is a tribute to you, Mr. Chairman, that you have continued for the last decade to urge all interested parties to find a reasonable compromise that serves the consumer interest, and that you have introduced legislation embodying such a compromise in the form of the Audio Home Recording Act.

In my view, the Audio Home Recording Act is significant because it ends the debate over private, noncommercial audio home recording, opening the door to a vibrant market free of legal concerns:

- The Act will encourage record companies and music publishers to support new digital audio technology enthusiastically. As we learned with the phenomenal growth and acceptance of the digital compact disc, when the music industry feels it has a stake in new devices its support can benefit everyone.

- The Act means that new digital audio recorders will be appearing on retailers' shelves as products, rather than in court as exhibits. For too long the public has paid the costs of controversy, and suffered from the absence of new products.

- The royalty rates set by this legislation are lower than anything proposed in the past, and are limited to new consumer-model digital audio recorders and media.

Even with these benefits, it still required some soul searching, after years of opposition, to support a bill that includes a royalty provision. We continue to believe that consumers have the right to use their own recorders to record, for private noncommercial purposes, any signal they have lawfully acquired. We endorse the Audio Home Recording Act because it permits consumers to make first-generation digital audio recordings of any lawfully acquired signal. It promotes certainty in the courts,

predictability in the marketplace, and new choices for consumers. We therefore urge its expeditious enactment.

If I may, Mr. Chairman, I would like to elaborate on why this particular compromise is worthwhile from the perspectives of consumers, retailers and manufacturers.

The Prohibition on Copyright Infringement Actions Is Important to Consumers Manufacturers and Retailers

Mr. Chairman, our broad support for the Audio Home Recording Act is based largely on Section 1002 of the Act. This section provides that no legal action may be brought alleging infringement of copyright based on the manufacture, importation, or distribution of digital audio recording devices or media, or of analog audio recording devices or media, that are not used for commercial purposes.

Section 1002 provides, specifically:

> "[T]he copying of a phonorecord by a consumer for private, noncommercial use is not for direct or indirect commercial advantage, and is therefore not actionable."

Thus, the source or motive for such home taping is irrelevant. This legislation clearly provides that private home audio recording cannot be the subject of any copyright-based legal challenge.

What this means is that retailers can now order stocks of new generations of home recorders without concern that supplies might suddenly be cut, or prices sharply elevated, because of threatened litigation or other uncertainties in the marketplace. It means that manufacturers can plan large scale product development, introduction and marketing campaigns without worrying about the precise recording uses to which consumers will put home audio recorders.

S. 1623 Will Mean Wider Choices
and Better Prices for Consumers

No one can really predict what sorts of products American consumers will buy. However, one thing seems certain: consumers ought to be able to choose freely among the best products technology can provide.

So far, the controversy and uncertainty over audio home recording has only denied consumers the chance to choose among new formats supported by economies of scale and marketing commitment. With enactment of this legislation, I see an immediate future with new hardware technologies, new software choices, and prices declining, as mass market volume is achieved -- just as has happened with other major consumer electronics breakthroughs.

Audio Retailers Need New Products
and Support this Legislation

With the nation in recession, our retailers are struggling. But even before the present recession, retailers specializing in audio components were having a particularly tough time. Today, their customers read about new technologies and prototypes, so are less interested in the excellent recording products on the shelves now. Yet the new, high-tech products are not generally available.

Another key proponent of S. 1623 is the National Association of Retail Dealers of America (NARDA). Like EIA, NARDA opposed previous legislation that would have imposed royalties on consumer recorders and blank tape. However, NARDA and many other groups support S. 1623 because it promises to transform the market, giving them new products to sell at reasonable prices. Retailers also insist that any legislation should not embroil their stores or their customers in paperwork, or the collection of funds. This bill avoids any such entanglements.

For Manufacturers, the Act
Is A Reasonable Compromise

Manufacturers support the Audio Home Recording Act because it does not

degrade or devalue their own intellectual property rights in favor of any other rights. It elevates their costs, but only slightly, and in a highly predictable manner. In this sense, it is not much different from routine licensing compromises, made over conflicting assertions of patent and other intellectual property rights, to which businesses agree every day. The fact that a manufacturer agrees to a reasonable compromise does not mean that a manufacturer accepts that its product is or was infringing. It allows a manufacturer to get on with business, which is how it best serves the consuming public.

The Audio Home Recording Act is Carefully Circumscribed in its Provisions and Effect

This legislation covers only consumer model "digital audio recording devices" designed or marketed for the primary purpose of making copies of audio recordings. The following products are not digital audio recording devices under the bill:

-- Today's analog cassette tape recorders;

-- Personal computers, videocassette recorders and multimedia devices;

-- Answering and dictating machines; and

-- Professional products as would be used by professional musicians or recording studios.

Nobody is more concerned than we are about the possibility of an incorrect or overly broad interpretation of this legislation, either directly or in terms of precedent. We and the other industry representatives involved have consulted with representatives of other groups and industries to ensure that we have not overlooked anything in this respect.

With the benefit of these extensive consultations, we can say with confidence that the bill comports with its intention -- that is, the royalty obligation and serial copying limitation govern only recorders and blank media that are in the marketplace explicitly or primarily for the purpose of consumer digital audio recording from music albums. Thus, VCRs, computers, and other devices that may be capable of digital audio recording are not covered by the bill, unless the capability for consumer music copying makes all the other capabilities of the recording device secondary.

Similarly, the events and circumstances leading to this proposed compromise are complex and unique. We definitely do not view this bill as a precedent for legislation in any other field, or about any other products. Nor do we view this legislation as promoting or favoring any particular digital or analog audio recording format, proposed or existing, new or old. This bill holds the door wide open for everyone. Who succeeds and who fails will be determined in the marketplace, which is as it ought to be.

Before concluding, Mr. Chairman, I wish to salute you for your decade of leadership on the home recording front. We know you have worked long and hard to be fair to everyone, especially the American consumer. We believe the Audio Home Recording Act of 1991 is a worthwhile and necessary compromise to break the stalemate over digital audio home recording.

Having been urged by Congress to find common ground from which to promote new technology and enhance music creativity, we now look forward to working with you to enact this historic compromise.

Thank you.

Senator DECONCINI. Mr. Shapiro, thank you very much, and I think it is important to note what this doesn't apply to, and that's certainly my understanding, and I appreciate you emphasizing that. I think it's very important, and I think your leadership played a major role in breaking the deadlock here.

Mr. Berman, we're pleased to have you with us.

STATEMENT OF JASON S. BERMAN, PRESIDENT, RECORDING INDUSTRY ASSOCIATION OF AMERICA, WASHINGTON, DC

Mr. BERMAN. Mr. Chairman, Senator Leahy, I've listened, and I'm convinced, so there's really hardly anything I can say. [Laughter.]

Senator LEAHY. A complete switch in position. Is that what you're saying?

Mr. BERMAN. Yes.

Senator DECONCINI. But you will, won't you?

Mr. BERMAN. Indeed. [Laughter.]

I spent 10 years of my life in this room. I won't forego the opportunity again.

Mr. Chairman, Senator Leahy, my name is Jay Berman. I am president of the Recording Industry Association of America. RIAA is the trade association of U.S. record companies. Our member companies create, manufacture, and distribute approximately 95 percent of the prerecorded music sold in the United States and account for nearly half of all the sound recordings sold worldwide.

As the song goes, "It is a long and winding road," and as you have heard, it was indeed a long and winding road that brought us here today. But we are here today, united in purpose to urge enactment of S. 1623.

I'm reminded of Oscar Wilde, who once said, "Don't say you agree with me. I always feel that it must be wrong." In this case, however, we all do agree, and I feel that it must be right.

This bill reflects a compromise among groups who have not always been on the same side of the home taping issue, but what brings us here today is the realization that we are all in the music business in the sense that we are all in the business of bringing music into people's lives—into their homes, their cars, or wherever else they may enjoy it. The music industry and the consumer electronics industry need each other to accomplish that. We need each other to ensure that when our customers want to enjoy the recorded talents of Bruce Springsteen or the late Miles Davis or Leonard Bernstein, it is accessible to them in a format that brings the listener as closely as possible to the experience of being right there in the recording studio with that artist. That is the beauty of digital audio recording technology, and that is the benefit it offers.

For the music industry, however, there have been risks as well as benefits inherent in digital technology. Digital audiotape and other digital audio recording formats, such as DCC, minidisc, and recordable CD, now make possible digital—as opposed to analog—copying. The result is a perfect clone with the same brilliant sound quality as the original, and unique to digital copying, every subsequent copy of that copy, whether the first or the 1,000th generation, will be as perfect as the prerecorded original.

Even prior to the time we became aware of the impending introduction of DAT technology, the music industry had been urging Congress to enact a royalty bill that would compensate the industry for revenue losses due to home taping. At that time, the opposition of the electronics manufacturers proved formidable. Despite our best efforts, we were unable to reach a compromise. The resulting impasse, however, did keep DAT out of the hands of consumers. Some record companies indicated that they were reluctant to introduce their works in digital formats where these machines could become in effect copying factories.

Congress urged us to work out a legislative compromise, and so in 1988, the recording industry sat down with representatives from the consumer electronics industry. Our negotiations culminated in the so-called Athens Agreement of June 1989. In that agreement, the two industries committed themselves to a course of growing cooperation, our own modest version of perestroika. In my view, Mr. Chairman, it set us on the path that led us here today.

Not everyone felt that that agreement jointly to advance legislation to address serial digital copying, last year's S. 2358, represented enough progress. Some, including a number of our friends in Congress and in the industry, felt that the agreement did not go far enough for two reasons. First, it was format-specific. It addressed only DAT rather than digital audio recording technology. Second, it did not yet provide for royalties. At that time, we viewed the Athens Agreement as the first step in a process that hopefully would lead to royalties. However, the pace of technology quickened, and it became clear that Congress needed to legislate a single, comprehensive approach to this problem.

So we joined hands with our colleagues in the music industry and sat down once again with our new friends in the consumer electronics industry and developed a compromise solution. As you can see today, and as I firmly believe, we were successful. S. 1623 will facilitate access by consumers to new generations of digital technologies. It removes the possibility of infringement lawsuits, and it will encourage the creation and production of new music by providing creators and copyright owners of prerecorded music with modest compensation for digital audio copying. It means that tomorrow's recording star, whoever he or she may be, has better odds in a very chancy and risky business.

The bill also addresses the serial copying issue. It requires nonprofessional digital audio recording equipment to contain Serial Copy Management circuitry, SCMS. That circuitry would prevent the making of digital copies from digital copies. We need SCMS, because the royalties provided for in this bill do not begin to approach what we believe to be our actual financial losses from home taping. And, of course, nothing would happen to prevent digital cloning.

Mr. Chairman, I want to emphasize the broad support enjoyed by S. 1623, and a list of all of those organizations supporting this bill is attached to my testimony.

It is not often, Mr. Chairman, that we have the opportunity to amend the copyright law in anticipation of the strains that come with the benefits of new technology. More often, as you know, the law lags behind technology. This legislation presents a unique op-

portunity to harmonize the law simultaneously with an important advance in recording technology. S. 1623 is unique in another way as well. It is a generic solution that applies across the board to all forms of digital audio recording technology. Congress will not be in the position after enactment of this bill of having to enact subsequent bills to provide protection for new forms of digital audio recording technologies.

Mr. Chairman, I hope you and your colleagues will act expeditiously on S. 1623. We need to have the law in place as soon as possible. New digital recording equipment is arriving in the United States already. Manufacturers, as you have heard, have made major new product announcements for 1992. Swift action is also needed to demonstrate to both the European Community and to Japan, both of which are currently considering similar measures, that American leadership remains firm in protecting intellectual property interests of U.S. industries like ours, industries whose products are in great demand worldwide.

Mr. Chairman, as you know, article 1, section 8, empowers Congress to enact copyright laws. The constitutional purpose that underlies that is to promote the dissemination of information via protection. S. 1623 represents a truly unique opportunity for Congress to enact a statute that clearly meets the dual foundations upon which this grant of constitutional authority exists—to protect and to promote.

Thank you.

[The prepared statement of Mr. Berman follows:]

HEARING ON S. 1623
OCTOBER 29, 1991
SUMMARY OF STATEMENT OF JASON S. BERMAN
PRESIDENT, RECORDING INDUSTRY ASSOCIATION OF AMERICA

The Recording Industry Association of America urges your support for the Audio Home Recording Act of 1991, a bill that reflects the fruits of negotiation and compromise among constituencies who have not always been on the same side of the home taping issue. S. 1623 enjoys broad support within the music industry.

For many years, the music industry has been deeply concerned about what we believe to be the devastating impact of home taping. That impact can only be exacerbated by the introduction of digital audio recorders. Digital audio recording technology permits digital-to-digital home copying -- the transfer of digital codes from a digital original, such as a CD, onto a digital audio tape. The result will be a new copy -- a perfect clone -- with the same brilliant and perfect sound quality as the original.

Through protracted negotiations with the consumer electronics industry, we finally reached agreement to seek legislation on the two fundamental issues of concern to the music industry -- serial copying and some measure of compensation for losses due to home copying. The bill that you are considering today establishes a modest royalty and requires nonprofessional digital audio recording equipment to contain circuitry that would prevent the serial copying of digital copies of prerecorded music.

S. 1623 is a "generic" solution that applies across the board to all digital audio recording technologies. Thus, Congress will not be in the position, after enacting this bill, of having to enact subsequent bills for new forms of digital audio recording technologies.

Congress has, in S. 1623, a unique opportunity to protect our musical heritage -- and our musical future -- by preserving creative incentives within the framework of a new technology. This legislation benefits not only the music and consumer electronics industry, but, most importantly, the public who will have access to the best sound quality the market can offer for prerecorded music. For all of these reasons, we urge your support for S. 1623.

STATEMENT OF JASON S. BERMAN
PRESIDENT, RECORDING INDUSTRY
ASSOCIATION OF AMERICA

BEFORE THE
SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS
SENATE COMMITTEE ON THE JUDICIARY

S. 1623: THE AUDIO HOME RECORDING ACT OF 1991

October 29, 1991

Mr. Chairman and members of the Subcommittee, my name is Jason S. Berman, and I am the President of the Recording Industry Association of America. RIAA is the trade organization representing the interests of American record companies. Our member companies create, manufacture and distribute over 95 percent of the prerecorded music sold in the United States and nearly half of all sound recordings created worldwide.

I am pleased to have the opportunity to appear before you today with my colleagues on the subject of digital audio recording technology and to urge your support for S. 1623, The Audio Home Recording Act of 1991. As you already know or certainly will surmise from the witnesses seated here with me, Gary Shapiro of the Electronic Industries Association and Ed Murphy of the National Music Publishers Association, the bill reflects negotiation and compromise among constituencies who have not always been on the same side of the home taping issue.

I've always viewed our past feuds with a sense of irony because I don't know of two more interdependent industries than the consumer electronics and music industries. Without music, the consumer electronics industry's products would be no more than boxes of chips and circuits. Without their equipment, the public would

have no way to enjoy our music. That's what brings us here today -- our mutual interest in making sure that our customers can have access to music through the latest technologies.

THE HOME TAPING PROBLEM AND DIGITAL AUDIO RECORDING

Mr. Chairman, for many years, the music industry has been gravely concerned about what we believe to be the devastating impact of home taping on the economics of our industry. The harmful effects of home taping hit hardest those on the front lines of the music industry -- the musicians, producers, record retailers, songwriters, artists, music publishers and record companies -- whose livelihoods are directly dependent on sales of prerecorded music. The impact is acutely felt by record companies because record sales are virtually the companies' only source of income and because of the substantial investment they must make in each record without knowing in advance, of course, whether it will soar to the top of the charts or languish, unsold, in the retailers' racks or in our warehouses. As you know, Mr. Chairman, only 15 percent of all recordings released make back their costs, thus putting enormous pressure on the "hits" to subsidize new artist development. It is the hits, of course, that are most commonly taped.

It is our view that home taping presently displaces about one-third of the industry's sales. A 1989 report by the Office of Technology Assessment concluded that one billion musical pieces are copied every year in this country. Although there are many interpretations of the results of that study, even conservative estimates of the extent of the damage

caused by home taping calculate the possible lost revenues at nearly $1 billion per year. By any measure, the problem is bad enough with existing analog tape recording technology. About five years ago, however, there emerged a new technology, digital audio tape ("DAT"), that threatened to exacerbate the home taping problem unless Congress acted.

DAT is, in essence, the tape version of compact disc ("CD") technology. It is the first wave of digital audio recording technology -- to be closely followed by digital compact cassettes ("DCC"), mini-disk technology ("MD") and recordable compact disc ("CD-R") machines and other formats that, quite possibly, haven't even been conceived of yet. All of these devices record and play digitally. The use of digital codes means that the musical sounds you hear when you play a digitally recorded work are remarkably pure and noise-free -- no static, no distortion.

The particular potential threat that digital audio recording technology poses from the music industry's perspective is that it permits digital-to-digital home copying -- the transfer of digital codes from a digital original such as a CD onto a digital audio tape. The result will be a new copy -- a perfect clone -- with the same brilliant sound quality as the original. And every subsequent copy of that copy, whether the first, the hundredth, or the thousandth, will be just as perfect as the prerecorded original.

This potential for making perfect clones from an original and for making exact copies of those perfect clones is unique to digital technology. In contrast, the sound quality of copies made on the analog audio

cassette recorders that most people have in their homes today quickly degrades from one generation to the next so that analog serial copying has a built-in quality limitation that discourages it.

Prior to the time we became aware of the imminence of DAT technology, the music industry had, for many years, been urging Congress to enact a royalty bill that would compensate for revenue losses due to home taping. The opposition of the consumer electronic manufacturers, at that point, proved formidable. We moved on to explore the possibility of technological solutions. We did not find any solution that could be implemented unilaterally by the music industry, so we turned to Congress for legislation that would require the consumer electronics manufacturers to place certain circuitry in their DAT machines. Once again, our efforts were stymied by a lack of consensus among the affected industries on the need to do something about the home taping problem.

By that time it had become clear that the issue had reached a stalemate: The debate over the legal status of home taping had introduced sufficient uncertainty into the marketplace to have discouraged consumer electronics manufacturers from bringing their new products to consumers. The impasse was keeping new technology out of the hands of consumers and some record companies indicated that they were reluctant to introduce their works in digital formats where these same machines could be used to destroy their market. Both sides began hearing from our friends in Congress urging us to attempt to work out a legislative solution cooperatively -- to suggest to Congress a compromise

that would address the legitimate concerns of the stakeholders -- and, most importantly, bring the benefits of these digital audio technologies to the public. Both sides realized the urgency of acting.

At that point, in 1988, representatives of the recording industry sat down to talk with representatives of the consumer electronics industry to see whether there was sufficient common ground between us to reach a mutually satisfactory solution. For more than a year, we talked through our respective concerns and our mutual interests. That process culminated in the so-called Athens Agreement in June of 1989 in which we and our one-time opponents agreed to work together for passage of legislation that would address the problem of digital serial copying on DAT and, importantly, to continue to talk about the problem of home taping and the challenges presented by future technologies as they evolved. This was the first step in a process of growing cooperation between the two industries.

Mr. Chairman, not everyone concurred that our agreement jointly to advance Serial Copy Management System ("SCMS") legislation, last year's S. 2358, represented substantial progress, but it was the right first step. Some, including our partners in the songwriting and music publishing community and a number of our friends in Congress, felt that the agreement did not go far enough, for two reasons: First, it addressed only DATs, rather than digital audio recording technology generically. Second, it did not provide for royalties.

It became clear, particularly as the new DCC technology was revealed during consideration of that

legislation, that a step-by-step approach to legislation was not practical for the marketplace or for Congress. So we joined hands with our colleagues in the music industry and sat down once again with our new friends in the consumer electronics industry. As you can see today, that exercise was successful.

The bill that you are considering today establishes a royalty system that will help offset financial losses due to home taping. The royalties will be distributed through the Copyright Office and the Copyright Royalty Tribunal to the various constituencies affected by home taping including the artists, songwriters and backup musicians and vocalists, record companies and music publishers.

The royalty is a modest one: two percent of the wholesale price or customs value of nonprofessional digital audio recording equipment (with a cap generally of $8 per unit and a floor of $1 per unit) and three percent of the wholesale price or customs value of blank digital audio recording media, such as digital audio tape. Analog recording devices and analog tape would not be affected by the royalty.

The bill also requires nonprofessional digital audio recording equipment to contain Serial Copy Management System ("SCMS") circuitry that would prevent the making of second and subsequent generation digital copies of copyrighted music -- no digital copies of digital copies. We need the SCMS provision because the royalties provided for in the bill will not even approach what we believe to be our actual financial losses -- and, of course, would do nothing to prohibit digital cloning, always a foremost concern of the music

industry. SCMS defuses this most uniquely dangerous threat posed by digital audio recording devices.

THE BENEFITS FLOWING FROM THE COMPROMISE

Mr. Chairman, enactment of this legislation will benefit all of the affected constituencies. Others will speak today about how the bill will affect their own industries. I will confine most of my remarks to the benefits that we see accruing to the music industry, but first, a few words about the benefits to the music industry's customers -- consumers in general -- are in order.

S. 1623 will eliminate the legal uncertainty about home audio taping that has clouded the marketplace. The bill will bar copyright infringement lawsuits for both analog and digital audio home recording by consumers, and for the sale of audio recording equipment by manufacturers and importers. It thus will allow consumer electronics manufacturers to introduce new audio technology into the market without fear of infringement lawsuits, and it will help encourage the creation and production of new music by providing creators and copyright owners of prerecorded music modest compensation for the digital audio copying of their music.

In short, the legislation will facilitate access by consumers to new generations of digital audio technologies and music. It ends the impasse between the music industry and the consumer electronics industry. A compromise is in everybody's interest, most especially the consumer interest.

The American music industry stands to benefit in numerous ways from passage of this legislation.

First and foremost, S. 1623 acknowledges the seriousness of the home taping issue and addresses it in a comprehensive way. The royalty combined with the SCMS approach goes right to the heart of the two basic problems -- loss of revenues and digital cloning. The royalty system will not completely offset losses due to home taping, but it helps.

Further, S. 1623 is a "generic" solution in that it applies across the board to all digital audio recording technologies. Congress will not be in the position after enacting this bill, as it might have been with prior bills, of having to enact subsequent bills for new forms of digital audio technologies.

Moreover, enactment of this legislation will ratify the whole process of negotiation and compromise that Congress encouraged us to undertake. Our common support of this bill is a major accomplishment, one which would not have occurred without your support and leadership, Mr. Chairman.

THE BROAD SUPPORT FOR S. 1623

I want to emphasize, Mr. Chairman, the broad support enjoyed by S. 1623. It is supported by the organizations represented on this panel and by many others including the National Consumers League, the Home Recording Rights Coalition, the American Federation of Musicians, the American Federation of Television and Radio Artists, the National Association of Recording Merchandisers, which represents the retailers, and the Department of Professional Employees of the AFL-CIO. A

complete list of music industry organizations and others that support the legislation is attached to this statement. The bill also enjoys bipartisan support among your colleagues, Mr. Chairman, as does its companion measure in the other chamber. A summary of the proposed legislation is also attached.

CONCLUSION: THE NEED FOR ENACTMENT

Congress has, in S. 1623, a unique opportunity to protect our musical heritage -- and our musical future -- by preserving creative incentives within the framework of new technologies.

Enactment of S. 1623 will bring U.S. law into line with that of over a dozen other countries such as France, Germany and Australia, where prerecorded music is a major consumer product, and where royalty systems are already in place. As the world's leading producer of prerecorded music, it is fitting that the U.S. join the ranks of those countries affording such protection to prerecorded music. Indeed, the principle of national treatment embodied in this bill will enhance U.S. efforts to share in the collected royalties from overseas home copying pools.

For all of these reasons, we urge your support for S. 1623.

Thank you, Mr. Chairman and members of the Subcommittee. I would be happy to answer any questions you may have.

Coalition members as of October 28, 1991

The following groups have pledged their support of S. 1623, The Audio Home Recording Act of 1991

Dept. of Professional Employees-AFL-CIO

American Federation of Musicians

American Federation Television and Radio Artists

American Society of Composers, Authors and Publishers

Broadcast Music, Inc.

Car Audio Specialists Association

Consumer Recording Rights Committee

Electronic Industries Association

Home Recording Rights Coalition

International Society of Certified Electronics Technicians

National Association of Independent Record Distributors & Manufacturers

National Academy of Recording Arts & Sciences

National Association of Retail Dealers of America

National Association of Recording Merchandisers

National Academy of Songwriters

National Consumers League

National Electronic Sales & Services Dealers Association

National Music Council

National Music Publishers Association

National Retail Federation

Nashville Songwriters Association International

Professional Audio Retailers Association

Recording Industry Association of America

SESAC

Songwriters Guild of America

Senator LEAHY [ASSUMING CHAIR]. Thank you.

I'm going to leave here in just a minute because we do have a rollcall vote, and the 5-minute bell has just rung. For those of you who don't understand, the 5-minute bell means we have 8 minutes left in the vote. [Laughter.]

How we calculate that, I have no idea.

Mr. Berman, you said in your testimony that home taping displaces about a third of industry sales. How do you arrive at that kind of a figure?

Mr. BERMAN. Well, I actually didn't say it displaces a third of industry sales. My guess is it displaces over $1 billion of industry sales in the United States.

Senator LEAHY. Well, how do you reach that figure?

Mr. BERMAN. We've done enough surveys of home tapers, and in fact, Senator Leahy, if you look at blank tape sales in the United States, there are some 370 million units of blank tapes sold in the United States annually. You look at the way that is promoted, and it's promoted as a device for taping music. The tape manufacturers are perfectly willing to accept the fact that that's the purpose of the tape.

Senator LEAHY. Of course, for a long time, people bought tapes because the music companies and the manufacturers themselves, when they were selling tapes, were usually doing it on really inferior tape. They were charging full price, but for inferior tapes. I know my own kids would oftentimes buy music and retape it onto a better tape so the thing would last for more than two or three plays.

Mr. BERMAN. I have no doubt that in the early days of the cassette that was a problem. I don't believe it's a problem today. It's not the way tape is marketed, and it doesn't take a rocket scientist to figure out what people are doing with that many blank tapes.

Senator LEAHY. How do you respond to the critics who say that the consumer is going to have to pay for the compromise reached between the electronics manufacturers and the music industries and that they're ending up, in effect, paying twice?

Mr. BERMAN. First of all, the legislation imposes the burden on the manufacturer of blank recording media and equipment. What happens after that will be a function of the marketplace. I'm not sure that in any event the consumer will end up paying. It's a very highly competitive business, and I'll leave to Gary and to John Roach and the others what may end up happening. The fact is that if the consumer does end up paying, the consumers end up paying for the privilege of taking the product that someone like Debbie Gibson has created and at least compensating her in some way for having access to that music. So it's a very small price to pay.

Senator LEAHY. I'm going to have to go vote, but I'm going to submit a few questions for the record, one of which would be whether you feel, all of you, that copying for personal use—for example, copying a CD so you could put it on digital audiotape to play in your car—is a fair use under the Copyright Act?

Mr. BERMAN. Are you asking for my personal opinion?

Senator LEAHY. Yes.

Mr. BERMAN. I believe it is not a fair use under the Copyright Act. But that's the beauty of this bill. It resolves that issue.

Mr. SHAPIRO. I think Mr. Berman and I have respectfully agreed to disagree on some of these questions, but the point of this legislation is we're moving forward in putting those disagreements behind us, because it would take years for a court to answer that question, and we can't wait that long, and neither can the American consumer.

Mr. BERMAN. I agree with that answer.

Senator LEAHY. I will submit this. I don't mean to ask you to answer right off the top of your head, because I think all three of you see the impact of the question. So, I will submit it for the record, and I would like you to think carefully on the response.

We'll stand in recess for a few minutes until either Senator DeConcini or I return.

[Recess.]

Senator DECONCINI [resuming Chair]. The committee will come to order.

I apologize for the interruption and thank the Senator from Vermont, Mr. Leahy, for continuing the hearings.

Let me address some questions, if I may, before we go to the next panel.

Mr. Murphy, what is the legal status of home taping in the European Community and also in Japan?

Mr. MURPHY. Senator, there are a number of countries that have already adopted legislation. Particularly notably, in Germany and in France, we already have royalty compensation schemes in place, and we have a number of other countries in Europe, over a dozen now, that have some different schemes already, as I said, in place. The EC is expected to come out with a directive within the next few months which will be a recommendation to place a royalty scheme in all the EC countries.

Senator DECONCINI. What about Japan?

Mr. MURPHY. Yes, they do. In Japan, currently there's no legislation there, but, of course, there are signs and we're all hopeful that there may be some change in legislation to bring a royalty bill forward. But currently there is no legislation. In fact, it's the reverse. Under the laws of Japan, it is legal at the current time to make home copies.

Senator DECONCINI. It is legal?

Mr. MURPHY. Yes, it is. Yes, sir. And there is discussion within the government and outside parties, the copyright coalition in Japan, that they will be looking toward changing that law. We're hopeful that they will, and we'll be over there shortly to see if we can help bring that process forward.

Senator DECONCINI. Are you aware of any effort on behalf of the Trade Ambassador Hill—Special Representative Hill, rather—on trade regarding the North American treaty between Canada, the United States, and Mexico to include any of this?

Mr. MURPHY. We have brought the matter certainly to Ms. Hill's office and to their attention, and we do understand that there's a strong interest on their part in moving this home taping bill forward in all quarters, hopefully when we get it passed here in the United States. It would certainly be a great leadership position for us.

Senator DECONCINI. Thank you. Will the lawsuit against Sony be reinstated, in your opinion, if this bill does not pass?

Mr. MURPHY. Well, that's very problematical. It's possible to reinstate a lawsuit if the bill is not passed, but it certainly is not our hope and desire. We would wish to certainly have this bill pass and move forward and not look behind us.

Senator DECONCINI. Thank you.

Mr. Shapiro, what do you expect the cost will be of the new generation of digital recording equipment, such as the DCC or the minidisc?

Mr. SHAPIRO. These products often come in initially at a higher cost, around the $1,000 level, but some of the announcements recently have indicated they could be $500 or $600 within the first year. Once the economies of scale are realized, the prices generally do come down in consumer electronics.

Senator DECONCINI. Will the SCMS inhibit digital recording of noncopyrighted material, such as recording of your own child's musical involvement, like piano lessons or a piano concert, that you might want to do at home?

Mr. SHAPIRO. Well, in fact, the SCMS is a system. It's not really a chip or a proprietary technology. It's a method of getting a result, and the result is very clearly specified. And I might point out that it does not at all affect the quality of the music or the sound in any way, because it's purely digital, and it's just a digital signal buried in all the other signals.

But in terms of it affecting something which is not copyrighted, it basically goes to second generation, not first generation, and in those rare circumstances where you might have to mix or something else like that to try to use different generations and combine them, you have several alternatives as a consumer. First, of course, you could always go to analog or you could use just analog products. One company has announced the availability of a digital microphone, and using that microphone, you can indicate that it's not copyrighted material, so it can be copied over and over and over again.

Senator DECONCINI. I see. Thank you. You mentioned you were here 10 years ago when we went through this, and as pleased as I am to see this group together, can you just give me your opinion of what finally brought you all together?

Mr. SHAPIRO. I think it was a strange confluence of circumstances, Mr. Chairman. You and several of your colleagues had certainly urged us increasingly strongly to get together. We have a technology, digital technology, which has floundered on the marketplace for the last few years in part because of the lack of support of the music industry and in part because of concern over unresolved legal questions, and the leadership of John Roach and some of my colleagues around the table was extremely important. And I think there was the feeling that it was time to put this thing behind us. The time was right. We were in a digital deadlock, if you will, and that confluence of factors led to this very strong compromise, and I think it's the right thing to do. I think right now there are several companies waiting and ready to market products, and we're hearing from consumers who are ready to use them.

Senator DECONCINI. Mr. Berman, I think in your statement you kind of laid out the history of how we came about it. What was the straw that finally brought it about, in your judgment, from your industry's point of view?

Mr. BERMAN. Well, Mr. Chairman, as you know, we've been up here for many, many years. I think it was, as Gary said, a whole set of circumstances, the fact that in our most recent appearances we were urged very strongly by yourself and other members of this committee and the Senate Commerce Committee not to come back until we had given it the old college try and produced a comprehensive solution.

In the past, we'd been so caught up in the arguments about the legal status—and they remain unresolved—that it was very difficult to even talk to each other. I think the decision that we all made, and principally under John Roach's leadership, which was a kind of business acumen that was brought to it, was to say let's forget about the past, let's forget about arguing about the legality or illegality for the moment, and let's try to look to the future, and I think it was that sense that we had to get beyond where we were that led all of us to give a little bit to get a lot.

Senator DECONCINI. Thank you, Mr. Berman.

I do at this point want to pay particular compliments to Senator Inouye and Senator Hatch and Senators Gore and Leahy and D'Amato and many others who have urged, as I have, that you do this. We urge you to do a lot of things, and I'm sure glad you took us up on this one.

Mr. BERMAN. So am I.

Senator DECONCINI. It makes our life easier, I can assure you.

Some critics, Mr. Berman, have expressed concern that this bill will encompass video recording, and I think it's clear that that's not the case. While the bill has been drafted to apply to audio recording only, do you see any intentions or any designs or any interpretation that could be otherwise?

Mr. BERMAN. I do not.

Senator DECONCINI. And have you ever discussed this bill with the Motion Picture Association?

Mr. BERMAN. I most certainly have.

Senator DECONCINI. And what's their reaction to the bill? Can you share that?

Mr. BERMAN. I believe actually that on the day that we had a press conference in New York to announce the historic nature of our compromise, Mr. Valenti, on behalf of the MPAA, issued a statement wishing us well and saying he was watching the developments, but I don't believe, as I think Gary has pointed out, that there's anything in this bill that would give comfort to anybody else. The bill is designed to deal specifically with audio recording technology, and it represents an agreement that is confined to all digital audio recording technologies.

Senator DECONCINI. Do you think this bill, assuming we pass it, will be helpful and can be used as a model in other countries?

Mr. BERMAN. Well, that's the critical ingredient. I think it reestablishes the U.S.' leading role in the world as a protector of intellectual property rights. It is a uniquely American agreement. It represents the forces that were at work in the United States. There

are different forces at work in different places; however, I have no doubt in my mind that passage in the United States will lead quickly to enactment of a similar, if not identical, bill in Japan. It would provide great impetus to the directive that Mr. Murphy mentioned, which should be forthcoming shortly, in the European Community to harmonize copyright protection, though I believe that the European system will have substantial differences.

It will lead—you mentioned the North American Free Trade Agreement. The second stage of copyright reform in Canada is supposed to include the question of royalties for home taping. I believe U.S. action will provide great impetus for that. So I see this as a critical link in the process of going forward.

And just to remind everyone, these are our products that are being taped not only in the United States, but around the world. So it will provide an important message.

Senator DECONCINI. Do you agree with that, Mr. Shapiro?

Mr. SHAPIRO. Well, in terms of what happens with the rest of the world, it's very difficult for me to comment. The United States is kind of my territory.

Senator DECONCINI. I know. I just thought, you know, with whatever contacts you have overseas—you must have some—if you think that this would be received as some model to be used. I'm just looking for an opinion.

Mr. SHAPIRO. I think it's fair to say that countries across the world are watching the developments here with great interest, and I think it is important that the United States take the lead in this type of legislation, because, as Jay and Ed indicated, we are a very significant exporter of copyrighted products, and I think it's important, because the rest of the world does look to us in terms of what we do.

Senator DECONCINI. Mr. Murphy, do you concur with that?

Mr. MURPHY. Of course I agree, and I think a role model, particularly for Japan, is very, very important. We have been given indications by people in Japan that they're watching very closely these proceedings and they would in fact adopt something very, very close to what we've put forward here. Yes, sir.

Senator DECONCINI. Gentlemen, thank you very much for your testimony this morning. It's extremely helpful and will get us on our way here.

Our last panel will be Mr. Philip Greenspun, research assistant at the Massachusetts Institute of Technology; and Mr. Frank Beacham, a print journalist from New York City.

Gentlemen, would you please join us? Gentlemen, thank you for being with us today. We appreciate your input in this legislation. We know that there are other opinions regarding S. 1623, and we welcome hearing from you.

Would you like to begin, Mr. Greenspun?

STATEMENT OF PHILIP GREENSPUN, RESEARCH ASSISTANT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA

Mr. GREENSPUN. Thank you, Mr. Chairman.

Well, I'm from the MIT Department of Electrical Engineering. Everyone else has said something about their organization. I guess

all I can say is that MIT is known worldwide as probably the finest engineering school in East Cambridge. [Laughter.]

People talk about concerns over copyright infringement as spawning this bill. I will start there.

I guess I'd like to read a quote here. "The most sensitive ear could not detect the slightest difference between the tone of the singer and the tone of the mechanical device." Metropolitan Opera soprano Anna Case found that "everybody, including myself, was astonished to find that it was impossible to distinguish between my own voice and Mr. Edison's recreation of it." Now, they weren't speaking of Kiyoaki Edison, designer of DAT machines, but of Thomas Edison, inventor of the Diamond Disk phonograph. This was in 1915, and it was a purely acoustic technology that didn't even depend on electricity.

I maintain that digital audio technology will not change the amount of copyright infringement in America, and Mr. Oman pointed this out. He said that the teenagers will continue using these $49 boomboxes, and he said that the audiophiles will buy these things and copy. Well, even the current DAT machines are actually inferior in quality in many ways to the best cassette decks, Nakamichi cassette decks, which audiophiles already own, and the new technologies that are being proposed now are inferior to Nakamichi cassette decks. So I don't see who's going to buy this except for computer users, because this new media is ideal for storing computer data.

Americans would rather buy than copy. Despite ample tools distributed throughout this country for copyright infringement, Americans bought $6.5 billion worth of recordings last year. I think it's premature to say that America is full of people who are intent on not paying for their music.

I'd like to say that copyright exists to promote the progress of the arts so that society benefits. Copyright was created not to enrich authors, but because it was thought that society as a whole would benefit if authors could earn more money from their creations. Let's see if S. 1623 will benefit society.

Consider first the case of a small American firm manufacturing digital audio equipment. To implement the SCMS as required by this bill, a small American company would most likely have to buy chips from foreigners. I understand that Mr. Roach's $4 billion company hasn't had much trouble getting the chips, but in a decade of designing consumer electronics and industrial electronics, I can tell you that it can be very difficult to get things that the Japanese don't want to sell you. Sony will beat down your door trying to sell you memory chips. Federal Express will come every day with engineering data books, samples, and prices. But when I tried to buy TV tuners, it was a different story. I had to pay $100 apiece for 2,000 TV tuners that are incorporated in products that cost $200. A recent GAO study confirms my personal experience.

S. 1623 will enable foreigners to decide who in America may enter the digital audio business and what prices they charge for their products.

Let's consider that you are in fact making digital audio recorders. You manage to get the chips, and the digital audio recorders are rolling out of your factory in Peoria. Let's also assume you

manage to hire an army of lawyers and accountants to romance the new bureaucracy created by S. 1623. You'll file your quarterly reports, annual reports, and pay royalty tax. Where does the tax go? A lot of it goes into the pockets of your biggest competitors, Sony and Matsushita, since they own CBS and MCA Records. S. 1623 changes you from a small-time manufacturer into a financier of the Japanese electronics and software oligopoly.

What if the Japanese don't want to compete with you and won't sell you chips? Well, you file chapter 7, but you don't mourn your dead business, because you really wanted to be a country-western star. So you move to Nashville to make your first CD.

Now, here's where I guess I don't agree with the other witnesses. You in fact do need to copy music back and forth between two machines many times in order to make a master tape. You even need to do this if you make a video recording. If you do a video of your daughter's wedding, for example, if you don't want all that raw footage, then you're going to have to copy that onto another recorder, and if you later decide that you don't in fact like the way you edited that, if you want to make another copy with certain scenes removed, you have to copy it again. You have to copy, copy, copy, copy, copy.

For someone who can't afford one of these new, fancy digital microphones that was mentioned, they won't be able to buy low-cost consumer digital audio recorders. They'll have to buy expensive professional ones, which would increase the barrier to entry in the already concentrated record industry, making it harder for individuals and small American companies to compete with large, foreign-owned companies. Slightly increased revenues for established companies and artists would not make up for the loss of variety and opportunities for newcomers.

Well, if consumers, American manufacturers, and most artists are hurt by this bill, who benefits? The lawyers filing that one particular suit against Sony may lose, but I would claim that the rest of them will win. You can buy machines today that can record the digital audio, analog video, or both from the same tape. My reading of the bill leaves me uncertain whether these things are covered or not. Are the machines and media subject to royalty tax? Only years of litigation can decide these issues. It's not at all clear-cut, and it will become less so in the future.

The multimedia revolution in computers will make S. 1623 appear laughably shortsighted. In the 16 months since I last testified before Congress on this issue, more than five new technologies capable of storing both digital audio and computer data have been introduced.

Digital audio stores music as ones and zeros. Digital video is stored the same way. So are spreadsheets and documents. This started out as a bunch of ones and zeros on my Macintosh. Computers today store digital data on consumer video tape and consumer digital audiotape. Every indication is that within the next 5 years, computers and home stereos will use identical recording media, as indeed they already do in some cases. Blank media will be subject to royalty tax by S. 1623, so every time an American uses his computer, he's going to pay a tax to Japanese conglomerates that own record companies but also happen to manufacture computer equip-

ment. So American audio consumers and American computer users will be subsidizing Japanese companies that compete with our computer industry.

Computers subvert the intent of this bill in more ways than one. Last year George Wilson and I, the two electrical engineers testifying, proved that anyone could defeat SCMS with a handful of common electronic parts. By the time there are enough digital audio recorders in America to contribute to a copyright infringement, even the cheapest personal computers will be able to read and write digital audio. A 10-line computer program would then suffice to defeat SCMS. Will Apple have to mark every Macintosh prominently with the letter "P"?

The most egregious effect of S. 1623 will be on blind Americans who purchase a disproportionate amount of audio recorders and blank tape. Digital audio offers tremendous promise to the blind not because of sound quality, but because of convenience, indexing, and the ability to store dozens of hours of a talking book on one tape. Blind people mostly record audio letters and talking books, so it is unfair that S. 1623 forces them to pay a tax to foreign-owned record companies or even fellow Americans like Michael Jackson.

SCMS is a particularly nasty thorn in the side of blind consumers. When SCMS prevents a digital copy from being made, the sighted consumer notes the flashing "Congress says you can't do this" on the front panel and switches to the analog input. He then sets the recording level by watching two level meters while adjusting a knob. The sighted consumer ends up with a nearly perfect copy as opposed to a perfect bit-for-bit copy. A blind consumer cannot see the flashing SCMS indicator. Even if he did understand why the machine wasn't recording, he wouldn't be able to see the level meters. S. 1623 prevents blind people from using consumer digital audio recorders for noninfringing purposes.

I found so much to dislike in this bill that I wrote 20 pages of testimony with dozens of points as compelling as the ones I've mentioned. I even suggested a scheme of my own for compensating copyright holders that takes advantage of rather than fights technological progress. As my time is up, however, I'll close by restating my central theme.

Does S. 1623 benefit society? Will Michael Jackson produce better music if S. 1623 increases his income by 1 percent? Or will we be deprived of a future Michael Jackson because an unknown artist could not afford a professional digital recorder? If S. 1623 makes a composer slightly wealthier, will that make up for an increased trade deficit, lost American jobs, and inconvenienced, poorer consumers? Is it worth shipping millions of extra dollars to reduce copyright infringement by a few percent or to shift it from digital machines to my boombox? Should computer users in America be subsidizing computer vendors in Japan by paying royalty tax to Sony and Matsushita? Should blind Americans suffer inconvenience and pay taxes to Matsushita, Phillips, and Sony for the privilege of recording their own voice?

Thank you for inviting me here.

[Mr. Greenspun submitted the following material:]

October 29, 1991

SUMMARY OF
AUDIO HOME RECORDING ACT OF 1991

The Audio Home Recording Act of 1991 prohibits legal actions for copyright infringement based on private, noncommercial audio home recording (both analog and digital), but not if the recordings are made for commercial advantage.

The Act also implements two systems to address digital audio home recording: a royalty system and the "Serial Copy Management System." These royalty and technical requirements of the Act are limited to digital audio recording technology, and do not apply to analog audio recording products, professional model equipment, telephone answering machines, dictating machines, or video recording or computer equipment.

Prohibition of Suits

The Act prohibits the institution of actions for copyright infringement based on the manufacture, importation or distribution of digital or analog audio recorders or blank audio media, or the use of those recorders or media for making phonorecords. However, the prohibition does not apply with respect to infringement by virtue of the making of one or more reproductions for direct or indirect commercial advantage. The Act specifically provides that the copying of a phonorecord by a consumer for private, noncommercial use is not actionable.

The Royalty System

The Act places a royalty payment obligation on importers and manufacturers who distribute digital audio recorders and blank digital audio recording media in the United States. The royalty payment is

- for digital audio recorders, two percent (2%); and
- for blank digital audio media, three percent (3%)

of the "transfer price" -- the actual entered value at U.S. Customs (exclusive of any freight, insurance and applicable duty) or the manufacturer's price (FOB the manufacturer and exclusive of any sales or excise taxes). The royalty rate on recorders is subject to a per unit cap of $8 and a per unit floor of $1. For machines that have two or more digital audio recorders, the cap is $12. Upon petition, the caps are to be adjusted upward prospectively after five years (if 20% or more of the royalty payments are at the cap). The basic 2% and 3% royalty rates and the $1 floor are fixed. Only one royalty payment is due for any device or medium.

Entitlement to Royalty Payments

The royalty payments are to be deposited with the Register of Copyrights for distribution by the Copyright Royalty Tribunal to qualifying interested copyright parties

who file claims. The parties that may file claims are (1) an owner of the exclusive right to reproduce a sound recording of a musical work that has been embodied in a phonorecord that has been distributed to the public (i.e., a record company); and (2) a legal or beneficial owner of, or the person that controls, the right to reproduce in a phonorecord a musical work that has been embodied in a phonorecord distributed to the public (i.e., a music publisher or songwriter).

Notice and Verification

The Act requires an importer or manufacturer to file a notice with the Register of Copyrights within 45 days after first distribution of a product type subject to royalty. Thereafter, it must submit to the Register, on a quarterly basis, appropriate royalty payments and statements of account specifying (by product category, technology utilized, and model) the number and transfer price of all digital audio recorders and blank digital audio media distributed during the quarter.

Annual statements of account, certified by an independent certified public accountant, are also to be filed with the Register. Those entitled to receive royalties, along with representative associations, will have the right to verify statements of account filed by any importer or manufacturer once a year through a coordinated audit process using independent auditors. The Act protects the confidentiality of sensitive business information filed with the Register.

Distribution of Funds

The royalty payments are to be distributed like other compulsory or statutory royalties under the Copyright Act: interested copyright parties seeking payments will file claims with the Tribunal for their appropriate share of the payments. Parties are encouraged to agree voluntarily to the division of royalties, but the division must be consistent with the initial allocations set forth below. The reasonable costs incurred by the Copyright Office and Tribunal in administering the Act are deducted from the fund prior to the distribution of royalties.

Each year the royalty pool will be divided initially into a "Sound Recordings Fund" and a "Musical Works Fund," and subsequently allocated further. The Sound Recordings Fund will receive two-thirds of the total royalty pool, and the Musical Works Fund will receive one-third (which will be divided equally between music publishers and songwriters).

In total, the allocation of royalty payments will result in the following approximate percentage shares:

Record Companies	38.40%
Featured Artists	25.60
Music Publishers	16.67
Songwriters	16.67
American Federation of Musicians	1.75
American Federation of Television and Radio Artists	.92

Royalty payments are to be distributed to music creators and copyright owners on the basis of record sales and, in some cases, airplay.

Negotiated Alternatives

The Act allows for negotiated arrangements for the collection, distribution and/or verification of royalty payments if at least two-thirds of the claimants in each of the three claimant groups (record companies, music publishers and songwriters) agree to the arrangement. The statutory collection and verification procedures will always be available to importers and manufacturers who do not participate in negotiated arrangements, and the Tribunal is to ensure that alternative distribution procedures are available to claimants who do not participate in the voluntary system. The Tribunal will always retain jurisdiction to address objections to the negotiated arrangement.

The Serial Copy Management System

The Act requires that digital audio recorders imported, manufactured or distributed in the U.S. incorporate the Serial Copy Management System ("SCMS"). SCMS circuitry programs digital audio recorders to read certain information encoded in digital audio source material that tells the recorder whether to allow the material to be digitally copied without limitation, to allow the material to be copied only once, or to prohibit any copying. SCMS will permit an unlimited number of first generation copies to be made from an original copyrighted digital recording. Generally, however, the copies may not be copied (i.e., no second-generation copies). The Act also prohibits the importation, manufacture or distribution of any device, and the performance of any service, the primary purpose of which is to circumvent SCMS.

Remedies for Violations

Under the Act, actions for violations of the royalty or SCMS requirements are to be brought in federal district court. The Act authorizes courts to grant temporary and permanent injunctions, award damages, direct the recovery of costs and attorney's fees, and grant other equitable relief such as impoundment of digital audio recorders in violation of SCMS requirements.

Statutory damages for royalty payment violations may range from a nominal level up to $100 per digital audio recorder and up to $4 per blank digital audio medium. Courts are to increase damages in the case of willful violations to between $100 and $500 per digital audio recorder and between $4 and $15 per blank digital audio medium.

Actual or statutory damages will be awarded in an action for SCMS violations, but will not exceed a total of $1,000,000 (excluding actual damages that may be awarded to a complaining manufacturer or importer). Statutory damages for digital audio recorders in violation of the SCMS requirements and for devices involved in circumvention of SCMS will be between $1,000 and $10,000 per recorder or

device. Statutory damages for encoding phonorecords with inaccurate information will be between $10 and $100 per phonorecord. Courts may increase damages for any willful violations by an amount up to $5,000,000, and may reduce damages for any innocent violations to an amount not less than $250.

Only a single action may be brought and only a single award of statutory damages may be made for any violation. The Act provides for the publication of notice and liberal intervention to ensure that all interested parties have an opportunity to participate. Any damages awarded to interested copyright parties will be deposited with the Register of Copyrights and distributed by the Copyright Royalty Tribunal to royalty claimants.

Alternative dispute resolution procedures are also available under the Act. Binding arbitration proceedings may be initiated by mutual consent of the parties to the dispute at any time, or by either party prior to the first distribution of a product subject to dispute.

Prepared by the
Digital Audio Recording Technology Coalition

Philip Greenspun's Testimony Against the Audio Home Recording Act of 1991

(before the Subcommittee on Patents, Copyrights and Trademarks, Senate Judiciary Committee)

I am against S-1623 because it will

- not "promote the progress of the arts," the constitutional justification for expanding copyright

- artificially restrain the American computer industry, which, in the absence of legislation, would use the same blank media as digital audio recorders

- force American computer users to subsidize Japanese computer vendors, in the form of taxes paid on computer data storage media that will flow into the pockets of Sony and Matsushita

- destroy an emerging American industry manufacturing digital audio products and cause a substantial loss of manufacturing jobs

- hinder small American-owned record companies in their efforts to compete with large record companies, all of which are foreign or foreign-owned

- help create a Japanese monopoly on manufacturing digital audio equipment

- injure consumers, especially blind consumers (who do a disproportionate amount of audio recording), by subjecting them to price discrimination and taxes on computer data storage and noninfringing audio storage. Most of the benefits from these injuries would flow to foreign conglomerates such as Matsushita, Philips and Sony.

- increase the trade deficit as Japanese manufacturers and foreign-owned record companies displace American suppliers

Illustrations of the harm done to Americans by S-1623

Joe Audiophile makes a live recording of his church's choir with his $500 "consumer" DAT recorder. A local CD manufacturer offers to press 100 CD's from the tape for members of the congregation for $500. Using a friend's "consumer" DAT recorder, Joe tries to copy passages back and forth until a one hour master tape is produced. He cannot because his DAT recorder has Serial Copy Management System (SCMS). Joe must now pay $5000 for two "professional" DAT recorders identical to the one he already owns but without SCMS. The Japanese receive a windfall profit of $4000; the trade deficit increases by $5000; there is no effect on infringement.

June Wu has just finished designing a computer for American Laptop that will compete with units made by Sony and Matsushita. June's design uses compact, inexpensive Mammoth Magnetics magneto-optical disks for data storage. Without following each customer home, Mammoth Magnetics cannot determine whether the disks are "most commonly used for the purpose of making digital audio copied recordings" (§1001 (4)(A)). Mammoth's lawyers and accountants advise Mammoth to play it safe, collect royalty tax, and file quarterly reports under S-1623. June's customers thus pay a little extra every time they buy disks for their American Laptops. Who gets this money? A substantial portion goes to American Laptop's chief competitors, Sony and Matsushita, because they own two of the largest record companies.

Jerry Teenager is a copyright criminal. He owns a $50 boombox with two cassette transports similar to the one I brought here today. He buys some prerecorded cassettes but also buys blank tapes and copies his friends' cassettes with his boombox. He is perfectly satisfied with the quality of recordings he makes effortlessly onto $1 tapes. Jerry is not going to run out and spend $1000 on a digital recorder and CD player so that he could copy $15 CD's onto $10 blanks. Jerry has a fixed budget for music and, even if home taping were eliminated, would not spend substantially more on prerecorded material. Unless he tries to get a job in the American computer or consumer electronics industry, Jerry's life will be completely unaffected by passage of S-1623; the record companies will not be able to get any more money out of Jerry, with or without S-1623.

Julia Pirate is a copyright criminal. She sells 2,000,000 Michael Jackson cassettes every year. Julia's profit is $3 million/year. She paid $5000 for a "professional" DAT recorder because she understood that $500 consumer machines are hobbled by an act of Congress. DAT isn't useful in her piracy career, so she keeps her machine on her 75' sailboat. Commercial piracy will not be affected by S-1623; Julia gave $4500 in windfall profit to a Japanese company and added $4500 to the trade deficit.

Jack Vicious flips burgers by day and is a guitarist in the punk group Twisted Weasels by night. The Twisted Weasels made a profit of $53.22 last year from 15 performances. Instead of listening to live Weasels, people would rather buy a recording of a popular foreign group on CBS/Sony records. Jack hopes to change that by buying a digital audio recorder and pressing a CD. But passage of S-1623 means he has to spend big bucks for a useful machine. Jack can't afford a "professional" recorder and the Twisted Weasels are doomed to obscurity.

Jill Engineer runs Jilltronics, a 100-employee digital audio equipment manufacturer. Jill has to innovate to compete against a vertically integrated Japanese oligopoly that controls both hardware and software. After passage of S-1623, Jilltronics is forced to re-engineer its products, although it barely has enough cash to operate as is. Every day, Jill fends off salespeople from Motorola, National Semiconductor and Texas Instruments touting their integrated circuits ("microchips"). Japanese vendors also call to offer her memory chips and other components used in computers and industrial products. These same firms are the only source of SCMS chips inexpensive enough to use in a consumer product. Yet, when Jill asks about them, everything suddenly becomes "difficult." Requested literature arrives after 11 weeks. After more than 30 telephone calls, Jill finally gets a quote: $100 for an input/output set of digital audio interface chips that implement SCMS. Jill has just discovered what the General Accounting Office recently concluded: because a chipset costs less than $2 to produce and is incorporated in low-cost, mass-market products does not mean that the Japanese will sell them to Americans.

Unable to meet the requirements of S-1623, Jill lays off 80 of her employees and starts advertising non-SCMS products to professionals only, taking care to scratch a "P" on the front panel of each. Meanwhile, Jill tries to raise enough

capital to build her own SCMS chips and return to the consumer market. Financiers won't even call her back because S-1623 allows people to sue Jilltronics for things over which it has no control (e.g. "the occupations of its purchasers" and "the uses to which it is put" -- §1001 (10)(B)(vii) and (viii)). Jill struggles along without capital until Nippon-California Records, owned by one of Jill's hardware manufacturing foreign competitors, sues Jilltronics for $6 million. It seems that 100 of Jill's customers were only "semi-professionals" and copied some CD's onto "party tapes". Unable to afford litigation, Jilltronics files Chapter 7. An American business has been destroyed; 100 Americans have lost their jobs; tens of thousands of Jilltronics customers must now buy imported equipment, thus increasing the trade deficit.

Holden Pierpont Preppie IV made his money the old-fashioned way: he inherited it. While a student at Harvard, he identifies a need for a record company to serve "discriminating classical music lovers" with recordings of young, unknown American artists: Snob Sounds. Snob Sounds's competitors are Sony/CBS, MCA (Japanese-owned), RCA (German-owned), Philips, EMI, Decca, and Deutsche Grammaphon (all European). To his competition, the $100,000 price of a Sony multitrack machine is chicken feed. However, Snob Sounds can only afford two microphones and hence shops for DAT machines. Passage of S-1623 means that Holden has to spend five times as much as he expected for his recording equipment. Furthermore, every time Holden buys a blank tape or a digital recorder, he pays a royalty tax that goes into the pockets of his huge foreign-owned competitors. Snob Sounds originally planned ten releases in its first year but can only manage three because of increased expenditures on DAT machines. Snob Sounds folds because it doesn't make a big enough initial impact. Holden goes to work for Daddy's bank and his four employees collect unemployment. The Japanese receive tens of thousands in windfall profits on Snob Sounds's DAT equipment; big, foreign record companies are protected from an innovative competitor; struggling American artists lose an outlet for their work.

Jane Pollyanna comes up with a brilliant idea for making inexpensive, high-quality digital audio recorders for consumers. Despite facing competition from a Japanese hardware/software cartel with unlimited capital, Jane succeeds in getting financing, building machines, hiring lawyers and accountants to comply with S-1623, and selling consumers. Her idea is so much better that even Sony and Matsushita are forced to re-engineer their products.

Fortunately for them, every time someone buys one of Jane's recorders, royalty tax is paid to Sony and Matsushita's software arms. This money can be used to squelch Jane's company in many ways. With full control of hardware and software, the Japanese could simply advertise a new incompatible standard. Hit recordings henceforth would only be available on analog cassettes and this new media. No matter how many units Jane sold, software would no longer be produced for her machine. With nothing to play on Jane's machines, consumers go back to buying Japanese.

Short-term Effects of S-1623

A Stone Around the Computer Industry's Neck

Vast consumer markets create cheap data storage devices, e.g. audio and video recorders. This has often worked to the advantage of tiny American computer companies without sufficient capital to manufacture sophisticated mechanisms. Some of the first microcomputers used standard analog cassette recorders in place of the floppy disk drives common today. Many small American firms manufacture high-capacity computer tape drives based on consumer video and DAT transports. There is no way to distinguish between blank media used for audio and computer data storage. A tax that discourages the efficient development and use of computers in the United States is unlikely to make our economy more competitive worldwide.

Unemployment in the American Digital Audio Industry

Although Japanese firms will continue to dominate the consumer electronics industry, the increased popularity of digital audio equipment represents an opportunity for American firms. From an electrical engineer's point of view, there is little difference between a digital audio processor and the computer peripherals that Americans have successfully built for decades. By being creative, small American firms should be able to compete with huge Japanese firms. Economies of scale can be realized on much smaller volumes of digital audio equipment than with televisions, CD players or VCR's. Digital audio equipment can be produced in the same American factories that build computers.

Most American audio equipment manufacturers are small and lack the resources to engineer custom integrated circuits (IC's). The large Japanese companies that dominate consumer electronics have ample resources to develop IC's that implement the Serial Copy Management System (SCMS) mandated by the proposed S-1623. By controlling the supply of SCMS IC's, the Japanese can control which American firms enter the market and at what retail price. After a decade building electronics in America, I have learned that, when I need a computer component, the Japanese are the world's most aggressive salesmen. When I need components critical to manufacturing consumer electronics, they either flatly refuse to sell, gently explain that "the guys in Japan will say no", don't return calls, withhold engineering data, or quote outrageous prices after weeks of delay. The recent GAO study, *International Trade — US Business Access to Certain Foreign State of the Art Technologies,* confirms my personal experience.

American digital audio manufacturers will be forced to choose between paying exorbitant prices to foreigners for SCMS chips or being sued for violating S-1623. Most American audio manufacturers are barely profitable— the cost of re-engineering their products to comply with S-1623 *even if SCMS IC's were free and widely available* will put them out of business. Mandating SCMS or any other particular technology gives a tremendous amount of market power to mass producers, i.e. the Japanese. Furthermore, the administrative burden of filing reports, hiring auditors, studying the law, and keeping track of "orders of the Secretary of Commerce under §1022(b)" will fall more heavily on small domestic manufacturers than on large foreign ones.

Unemployment Among American Musicians and Record Producers

While it is nice to think that Americans have a monopoly on creativity, a trip to a record shop reveals that most of the recordings are from foreign and foreign-owned firms and that many of the artists are foreign as well. S-1623 puts some money into the pockets of large foreign record companies and successful artists of all nationalities, but only by taking it from small American firms and unknown American artists.

New record companies and average musicians are among the most cash-starved of all Americans. They are at a tremendous competitive disadvantage compared to established companies and artists. Recording stars earn money

from concerts, movies, endorsements and licensing; some of these opportunities are so lucrative that artists might do well giving away recordings free in order to get more movie and advertising contracts. By contrast, an unknown artist must produce a hit CD before any of the opportunities become available. S-1623 makes digital audio recorders capable of mastering CD's substantially more expensive, thus creating a new barrier to entry in an already concentrated industry. There will be fewer jobs for American artists and employees of American record companies. Slightly increased revenues for established record companies will not make up for the loss of variety and opportunities for newcomers.

Full Employment for Lawyers

Undergraduates at MIT often ask me for career advice. Since engineers make the same real salary they did in 1970, I usually tell avaricious students to become doctors. After reading S-1623, I am considering recommending law school. This bill would create a new government bureaucracy to be romanced by legal specialists with quarterly reports, annual reports, claims for payment, auditor's reports, and pleas for clemency. Simply interpreting "technical reference documents" and "orders by the Secretary of Commerce under §1022(b)(1), (2) or (3)" might constitute a lucrative business.

Litigation is a sure path to riches for attorneys and S-1623 does not disappoint in this regard. Consider the case of Tiny Tunes, a small record company that mistakenly sets a single bit on a CD release incorrectly and thus violates §1021(c), rather unfortunate since §1031(d)(3)(B) provides for damage awards of up to $5,000,000. Misfortune for Tiny Tunes may be good fortune for its attorneys, who can charge any price to keep Tiny Tunes from being bankrupt by an S-1623 lawsuit.

At least Tiny Tunes knows where it stands. Parts of S-1623 are so vague that nobody will be able to manufacture digital data storage devices or blank media *of any kind* without hiring an army of lawyers. In particular, the factors that distinguish a professional from a consumer unit are absurd, including such items as the letter "P" on the outside of its packaging, how it is marketed, and whether or not it has certain connectors. In practice, many professionals use consumer equipment and many consumers use professional equipment.

Sony even coined a word for consumers who buy professional-quality equipment: *prosumers*.

In the event that packaging, marketing and connectors are not vague enough, S-1623 states that a court may consider "the occupations of the purchasers of the recorder and the uses to which the recorder is put." Thus, a company may be sued at anytime because of factors entirely beyond its control and the company with the most lawyers will win. (Who can afford more lawyers, big Japanese companies or small American ones?)

Consumers will be Bled; Japanese will Prosper

S-1623 will force manufacturers to charge more for "professional" recorders that lack SCMS but cost about the same to produce as "consumer" recorders. Musicians, audiophiles, amateur recordists and professionals may have to pay over $1000 extra per machine just so they can go about their business. This is pure unearned profit for recorder manufacturers and will add to the trade deficit. If manufacturers got together to engage in this kind of price discrimination, they would be sued for violating anti-trust laws. With S-1623 forcing big foreign consumer electronics firms to make extra profit, consumers will have no recourse.

Was Blind but Now I See (... what my Senator has done to me)

Blind Americans purchase a disproportionate amount of audio recorders and blank tape. Digital audio equipment offers tremendous promise to the blind, not because of sound quality, but because of convenience, indexing, and the possibility of low-fidelity, long-playing tapes and disks. It is possible that special digital audio recorders might be designed for the blind that would not fit the definition of "digital audio recording device" in §1001(3). However, such a machine would have to use consumer media and therefore blind consumers would be paying royalty tax on media. Since blind people mostly record audio letters and talking books, it is unfair that they should have to pay a tax to foreign-owned record companies or even fellow Americans such as Michael Jackson.

SCMS is a particularly nasty thorn in the side of blind consumers. When SCMS prevents a digital copy from being made, the sighted consumer notes

the flashing "Congress says you can't do this" on the front panel and switches to the analog input. He then sets the recording level by watching two level meters while adjusting a knob. The sighted consumer ends up with a "nearly perfect" copy as opposed to a "perfect bit-for-bit" copy. A blind consumer cannot see the flashing SCMS indicator. Even if he did understand why the machine wasn't recording, he wouldn't be able to see the level meters and make a high-quality analog recording. S-1623 prevents blind people from using consumer digital audio recorders for non-infringing purposes.

Americans get a Cold Fish in the Face

For decades, Americans have responsibly used photocopiers, VCR's, analog tape recorders and computers, all of which can be used to infringe copyright. Digital audio recorders can be used for hundreds of legitimate purposes. Congress's own Office of Technology Assessment determined that most home taping is non-infringing. No one has demonstrated any compelling need for this legislation, which robs American Peters to pay Japanese Pauls. Consider a taxpayer already reeling from the cost of bailing out the S&L industry. He walks up to his expensive new digital audio recorder, on which he has paid a tax, inserts a blank tape, on which he has paid a tax, inserts a tape of his daughter's school orchestra and tries to make a copy. The machine flashes a sign saying "your Congress decided that you couldn't be trusted with this technology." It all adds up to a cold fish in the face.

Copyright for Sound Recordings

> *The Congress shall have power to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.* — United States Constitution, Article I, §VIII

The right to not be murdered is an intrinsic right. Copyright, however, is an artificial concept created by the government to promote the progress of the arts *so that society benefits.* Copyright was created not to enrich authors but because it was thought that society as a whole would benefit if authors could earn more money from their creations.

Successful authors often have interests at odds with those of society. For example, progress in the software development industry is being stifled by vigorous assertion of "Look and feel" copyrights, which keep innovators from competing with the likes of Lotus and Apple. Businesses cannot afford to adopt newer, superior products because their employees would have to learn completely different user interfaces. The shareholders of Lotus and Apple are well-fed, but not enough to compensate society for the sting of monopoly prices and, even worse, lost productivity due to use of obsolete products.

Even a centuries-old industry such as publishing demonstrates that the strongest possible copyright is not optimal for society. Millions of copyrighted documents are Xeroxed every day. Why not tax photocopiers and blank paper? Infringement could even be halted altogether by banning photocopiers or requiring that every copy result in a FAX transmission to a central copyright bureau. Any of these schemes might increase the quality and/or quantity of authorship. However, most would agree that the costs to society would outweigh any benefits. Indeed, unknown authors are the ones who benefit most from low-cost photocopying because it has made self-publishing practical.

Record companies do not have an inalienable right to squeeze every possible nickel out of American consumers. Any debate over whether to strengthen copyright for music must be decided on the basis of whether society will be better off overall. Will Michael Jackson produce better music if S-1623 increases his income by 1%? Or will we be deprived of a future Michael Jackson because an unknown artist could not afford a "professional" digital recorder? If S-1623 makes a composer slightly wealthier, will that make up for an increased trade deficit, lost American jobs and inconvenienced, somewhat poorer consumers? Is it worth shipping millions of extra dollars to Japan to reduce copyright infringement by a few percent (or to shift it from digital machines to cassette decks)? Should we pass laws that enrich foreign-owned record and consumer electronics conglomerates at the expense of American companies and consumers?

Where's the Fire?

"The most sensitive ear could not detect the slightest difference between the tone of the singer and the tone of the mechanical device," said a critic after hearing a live tenor and then a recording of the same man. Metropolitan Opera soprano Anna Case found that "everybody, including myself, was astonished to find that it was impossible to distinguish between my own voice, and Mr. Edison's re-creation of it." They were speaking not of Kiyoaki Edison, designer of DAT machines, but of Thomas Edison, inventor of the Diamond Disk phonograph. This technological wonder of 1915 was not digital but *acoustic*, i.e. purely mechanical with no electricity.

The vast majority of people are extremely uncritical judges of sound quality. Most claims of improved sound quality amount to little more than advertising hype. Yuppies abandoned LP's for CD's because CD's are more convenient, not because of perceived higher sound quality. In many ways CD's have more distortion than LP's. The perception of higher sound quality was achieved through advertising, not engineering.

Popular music so frequently copied by teenagers is particularly undemanding of recording systems. Radio stations in large cities often play music where the loudest sound is only twice as loud as the softest; the cheapest cassette recorder can hold a range of 1000 to 1. For most people, using a digital audio recorder for copyright infringement instead of a cassette recorder is about as much of an improvement as owning a Ferrari instead of a Chevy in a traffic jam. You get to pay $1000 instead of $100 for the machine, $10 instead of $1 for the tape and no one can hear the difference.

Digital audio recorders are not dramatically more convenient than cassette recorders and the current generation being proposed by Sony and Philips offers lower sound quality than the best cassette recorders. Consequently, there is no reason to expect anyone except the Sharper Image set to rush out and buy these toys. After 15 years of extensive promotion, only 20% of American households contain CD players. Only a small fraction of these chose to buy one equipped with the digital output necessary to make digital-to-digital copies. Digital Audio Tape (DAT) machines, which sponsors of last year's DAT Bill were certain would entice all Americans into massive infringement, have been on the market for three years. Yet cassette-based units still

outsell DAT by more than 100 to 1. The newest offerings from overseas are not even as good as DAT, recording only about 25% as many bits/second. Sound quality fanatics already own 10-year-old Nakamichi cassette decks that will outperform these latest digital gizmos.

In the 16 months since I last testified before Congress on this issue, more than five new technologies capable of storing both digital audio and computer data have been introduced. By the time there are enough digital audio recorders in America to significantly contribute to copyright infringement, the multimedia revolution in computers will have made the fine distinctions among devices made in S-1623 laughable ("Is your Apple Macintosh MultiFrotz 2000 prominently marked with the letter 'P' on the front?", "Do you use your Panasonic Home Datavault more for recording nonmusical literary works, data bases, or other audiovisual works?", "Where was that 500 Gigabyte floppy disk you bought advertised? In *Audio* magazine? You'd better pay your royalty tax.")

Why Nothing Resembling S-1623 Could Ever Work

How to Circumvent SCMS or Any Other Scheme for $10

At last year's DAT Bill hearing, Mr. Leonard Feldman of the Leonard Feldman Electronic Labs testified that the SCMS system would be difficult to defeat. I testified that, in 1989, I inadvertently built a circuit that defeats SCMS and most likely any other copy restriction system. In an effort to simplify the design, only bits that affect sound quality were preserved. My circuit comprised only four chips, costing a total of under $10. Mr. George Wilson of Stanley Associates testified at the same hearing that he purposely built a device to circumvent SCMS that cost under $50 completely packaged. Both of us testified that, although an undergraduate electrical engineering background was necessary to design circumvention equipment, no specialized knowledge or components were necessary to construct such devices.

In the long run, it will be possible to circumvent any copy restriction or debit card system with a single $1 "programmable logic device" chip. All a consumer would have to do is copy a program from a magazine article and spend ten minutes connecting the chip to RCA phono jacks and a $5 Radio Shack power supply. Before the decade is out, as part of the multimedia revolution,

virtually all personal computers will be able to read and write digital audio. A simple 10 line computer program would then suffice to defeat copy restrictions with the cheapest personal computer.

Why Media Taxes Won't Work

Media taxes won't work in the long run either. I once designed a machine that used video tape to store digital data. The same machine and tape could be used to store computer data, 80 simultaneous phone conversations, digital audio, talking books for the blind or television programs. You can buy 8mm and SVHS video recorders today that are capable of recording eight or more hours of digital audio on a single $8 tape. There is no way of determining what these machines are "most commonly used by consumers" for. Should SVHS and 8mm video tapes be taxed? How about the machines? Perhaps a few years of litigation over the intent of Congress as embodied in S-1623 might help.

It will never seem fair to Americans to pay a tax on media that is primarily used for noninfringing activities. In the coming decades, every American is going to be storing, receiving, transmitting and manipulating digital data every day. Consumer digital data storage equipment will be ubiquitous. This equipment won't know or care whether the data being stored is audio, video, text, phone messages or still photographs. Less than 1% of the data will be copyrighted material that is outside of "fair use."

Even if people could be convinced that a tax on blank media was fair, distributing it in the manner proposed by S-1623 is hardly likely to be perceived as fair, or to promote progress in the arts. Firstly, people often copy records that are out of print. Giving money to companies and artists who have recently sold records rather misses the point. Secondly, musicians and composers who need help are those who have not benefited from massive advertising, superstar promotion, movie roles, and Pepsi ads. Giving money to artists according to the number of records sold ensures that each receives an insignificant amount. Michael Jackson gets $100,000, which he might earn for a single concert; Mikael Jaacksen, Minnesota's most popular polka composer, receives $1.37, which is also what he typically earns for a performance.

Finally, the "elephant in the room" is the question of why the record companies should get anything from royalty taxes. The fact that Americans are paying money to foreigners isn't so bad. Nor is the fact that users of American-made computers will be financing competing foreign computer vendors each time they buy blank media. What hurts is that record companies are part of vertically-integrated conglomerates that already make money every time a consumer makes any kind of recording. Sony and Matsushita sell blank media, every possible kind of analog or digital data storage device, and ancillary audio equipment. Philips manufactures recorders and other audio equipment, plus gets licensing fees for blank media that it standardized. Consumers who copy need to buy blank tape, a device for copying, and other devices for enjoying the copy. Unless the 12-year-old who copied a Michael Jackson song off the radio would have been willing to pay $15 for the Sony CD, Sony probably benefits from the copying because it sells media, recorders, amplifiers, and loudspeakers.

Fair Long-term Compensation of Copyright Holders

The most obvious way to compensate copyright holders for their efforts is the way they are paid now. The vast majority of Americans apparently think original recordings are worth $5-15 apiece. Some value the convenience of buying from a record store over borrowing from a friend or library. Some find that copying simply isn't worth the trouble. Some think that copying is unfair. Some value the booklet and other printed material that accompany the original. By capitalizing on the preceding factors and exercising some creativity, record companies will no doubt always be able to sell billions of dollars worth of original recordings.

Any technological fix to compensate artists and songwriters will be easy to circumvent. Consequently, the best systems are those where the consumer realizes no benefit from circumvention. If we decide that musical performance and composition should be additionally rewarded by society, let us pay for them out of the general budget. One need then only survey consumers to find out what is being played and pay artists accordingly. We should keep in mind that consumer and society realize no benefit when a recording is copied. A songwriter should get more if his song is copied and played 200 times than if copied and played once.

Automatic Surveying of Consumers

Automatically surveying consumers should be straightforward. Almost all music played at home passes through a *preamplifier*, which is either a separate box or a circuit within a receiver. If one assumes that music is played 24 hours/day, 365 days/year, that the average song lasts three minutes and that at most 1000 billion songs need be distinguished, then a modest one megabyte of storage is necessary to store a year's worth of data on what was played. Every 12 months or so, the consumer would be reminded by the preamplifier to hook it up to a telephone line so that it could send in a report on what was played since the last report. A Census Bureau computer would determine how much to pay each artist.

Is this system feasible? Yes, but it will take a few years to implement. Firstly, musical sources need to be tagged. CD's, DAT's, digital broadcasts and other digital sources are already equipped for such tagging. LP's and cassette recorders present difficulties, but the whole premise behind the clamor for S-1623 is that such analog sources are soon to be supplanted. In European countries, FM radio transmissions are tagged so that people can program car stereos to "look for some classical music". Implementing a similar scheme here would allow royalties to be paid based on radio listening and also allow consumer conveniences.

Secondly, it would be necessary to insure that the system is proof against fraud. Although consumers have no incentive to defraud the system, artists do. An artist could theoretically feed bogus information to the central computer that his songs were being played hundreds of thousands of times. Public-key encryption, a technology that came into widespread use in the 1980s, would likely make it impossible for an artist to substantially corrupt the system.

Thirdly, it would be necessary to insure that mandating the inclusion of specific technologies in preamplifiers does not injure American manufacturers of preamplifiers. Phasing in the system over several years would be helpful in itself. Funding a public-domain implementation of the technology would be even more helpful. The very existence of a public-domain implementation would ensure that no chip maker, foreign or American, would charge very much for survey chips.

By the time musical sources were tagged and a substantial number of consumers ready to purchase digital preamplifiers, the marginal cost of adding an electronic surveying system will be minimal and certainly lower than the cost of adding a debit card reader (a scheme proposed by the Register of Copyrights last year). Plug-in modules could be employed for systems such as car stereos that are not easily connected to telephones.

Note that the existence of a nationwide survey would mean that copyright holders and consumers could work together to ensure the widest possible distribution of copyrighted material. A teenager who distributed tapes of his favorite songs would be aiding the songwriters and musicians: every time one of his friends played a tape, the copyright holders would get more money. Most consumers would be happy to take a few minutes a year to call in their data since it means that their favorite artists will benefit. It is possible that music distribution will become more efficient and that, out of the $6.5 billion Americans currently pay for recordings, a greater percentage would go to artists.

Note also that a survey system deals fairly with the question of compensating creators of out-of-print recordings. Only a tiny fraction of all recordings are still in print. If a media tax or debit card system is supposed to compensate record companies for taping that displaces purchases, why is it fair for a consumer to pay to copy one of the 99% of recordings that are no longer available? Yet if one decides that society should support artists whose work is being enjoyed by the public, it is perfectly natural and fair to compensate holders of copyright in out-of-print recordings. This would benefit new musicians and songwriters whose recordings may become out-of-print before achieving widespread public exposure.

I am not necessarily advocating a comprehensive surveying system. As an engineer, it is not for me to say whether society should spend more to encourage musical composition and performance or whether composers and performers should get more and record industry middlemen less. However, as an engineer, I urge that the Congress not mandate half-baked technology that is destined to fail to serve artists or consumers and that will cost American jobs. Technology can be used to efficiently measure specific usage of copyrighted material and compensate copyright holders accordingly; it is

painful to see an easily-side-stepped blunderbuss such as SCMS being seriously considered.

Helping the Recording Industry

It is not clear that Congress should do anything to artificially stimulate the recording industry. With annual U.S. revenues of $6.5 billion, it is not clear that Americans could or should be coerced into paying more for prerecorded music. Every dime that goes into CD's or royalty taxes might have been spent on something else. Now that the record companies are foreign-owned, money spent elsewhere is more likely to employ Americans than money spent on CD's or handed over to Sony, Matsushita, and Philips.

However, even if one accepts the premise that the record industry is not getting its fair share of the American consumer's income, S-1623 is bad legislation. There are more obvious ways for the record industry to increase its sales than by running to Congress demanding passage of S-1623 and taxes on blank tape.

Record companies could *innovate*. This is supposed to be a creative industry. Selling decades-old technology and then begging for government assistance is not particularly creative. CD's were designed in the 1970's and, although offering convenience and ease of handling, have higher distortion in many ways than LP records made in the 1950's. Millions of audiophiles worldwide continue to play vinyl LP's and put up with their shortcomings because of the CD standard's unavoidable distortion. Ford and IBM would not be very successful if they offered their 1950's and 1970's models in the 1990's.

It is feasible to produce a "Super CD" containing more information and hence less distortion than 1970's CD's. Sony, Matsushita, and Philips would reap large profits as consumers purchased both Super CD's and Super CD players from them. All the currently envisioned consumer digital audio recorders would be unable to duplicate the sound quality of Super CD's and the whole issue addressed by this bill, i.e. the threat of perfect copies, would be moot.

Record companies could innovate in non-technological ways. Since CD's cost so little to produce, companies could give away free CD's. Every Rolling Stones or Beatles CD would come packaged with a CD from an unknown

artist likely to appeal to the same listeners. At a cost of $1 per CD, unknown artists would be introduced to millions of listeners. Copying both the featured and "freebie" CD onto, say, DAT tape would be pointless at a cost of two hours of time and $20 in blank tape.

In the old days, when LP sales sagged, record companies splurged on posters, cover art and other printed material. High-volume color printing is inexpensive and hard to duplicate by consumers. Any consumer wanting the printed material would be forced to purchased the original CD. Record companies charge more and deliver less than they did in the 1950's. Why can't they try more elaborate packaging, cover art, posters, booklets, coupons for concert tickets, mini-biographies of popular artists, etc.?

Finally, if their creative juices run dry, record companies could lower prices. CD's cost about the same to produce as LP records but are priced almost twice as high. There is currently no incentive to copy an in-print CD onto current digital audio media since the blank costs about as much as the CD. If prices on CD's are gradually reduced to the level of LP prices, no economy-minded person will infringe using a digital recorder for decades. Most people I know have a fixed budget for recordings and tend to spend a constant amount every time they walk into a record store: if CD's are half price, they buy twice as many. Thus, it is not clear that lowering prices would substantially reduce profits.

For decades, publishers have innovated to compete against duplication technology. Book and magazine publishers have successfully responded to potential competition from photocopiers by printing higher-quality materials in color. Anyone with a personal computer and a hard disk can make a perfect copy of a $300 program in ten seconds, without even spending a penny on blank media. If one accepts the reasoning of S-1623's proponents, Microsoft would be a bankrupt shell instead of being worth $16 billion. There is no evidence that digital audio represents a unique challenge.

Conclusion

S-1623 is bad legislation. The Act will not encourage authorship, will hinder the use of computers in the U.S., will force American computer users to subsidize Japanese computer vendors, will create a new government bureaucracy whose mission will become undefinable with the next generation of computer data storage devices, will destroy the only realistic chance America has to get back into consumer electronics, will help create a Japanese monopoly on the manufacture of digital audio equipment, will make it more difficult for small American record companies to compete with foreign-owned giants, will injure consumers (especially blind consumers), and will increase the trade deficit.

Appendix A: Software and the Trade Deficit

A number of witnesses and Senators at last year's DAT Bill hearing implied that if we could reduce the trade deficit by encouraging authorship and increasing copyright holders' income. Even if every American could compose like Mozart and perform like Pagannini and copyright infringement were eliminated worldwide, we would still have to find other ways to reduce the trade deficit. Consumers have a fixed small budget for musical entertainment: exporting songs won't make up for importing cars. For every American who buys a Lexus, his counterpart in Japan must buy 3,000 CD's. The cold facts are that, as much of a symbol of American creativity as it may be, the record industry is a $6.5 billion drop in the bucket of a multi-trillion dollar economy. General Motors has more revenue in one month than the entire record industry does in one year.

(Large or small, the record industry now sends it profits overseas to foreign parents. Thus, increasing record sales is not a very efficient way to reduce the trade deficit. Americans who want to share in the success of our creative community should buy stock in Matsushita, Philips, and Sony.)

Appendix B: Helping Songwriters

Songwriters get about five cents per song on a CD, cassette or LP. The production cost of a CD and LP is about the same, yet the record companies get twice as much for the CD. (That three companies distribute virtually all the record-

ings, even those from "independent labels", in the United States may contribute to the industry's success in getting consumers to pay $15 for a $1 item).

Before coming to Congress because they think they aren't getting their fair share from consumers, perhaps the songwriters should try to get their fair share from the record companies. If CD's were priced the same as LP's, consumers would buy considerably more; record industry revenues would be comparable, consumers would enjoy larger music collections and songwriters would get much more money. Songwriters could bring down the price of CD's by starting their own discount record label, outside of the current distribution troika. Alternatively, the songwriters might negotiate a higher fee for songs distributed on higher-profit media.

Appenix C: Witness Background

My name is Philip Greenspun. I am in the Ph.D. program in electrical engineering and computer science at MIT and have worked full-time as an engineer or computer scientist since 1978. Prior to nestling into the groves of academe, I developed electronic and software products for large organizations such as Hewlett-Packard. After six years of working for others, I embarked on a quixotic effort to build things in Massachusetts, starting five companies since 1984 and burying two. The surviving three have grown to employ over 100 people and have annual sales of over $10 million.

I have designed numerous circuits for recording digital audio, analog video and analog audio. With colleagues from the MIT Department of Electrical Engineering and Computer Science, I have physically constructed circuits that interpret SCMS-encoded digital audio signals.

Classical music has been one of my passions since the mid-1970's. My indulgences include a Boston Symphony Orchestra subscription and 2000 LP records. I was born in 1963, raised in Bethesda, Maryland, and graduated from MIT in 1982 with an S.B. in mathematics.

Senator DECONCINI. Mr. Greenspun, thank you very much.
Mr. Beacham?

STATEMENT OF FRANK BEACHAM, PRINT JOURNALIST, NEW YORK CITY, NY

Mr. BEACHAM. Mr. Chairman, as a producer of audio and video programs and a writer who follows technology issues, I come here today to voice opposition to the Audio Home Recording Act.

The assumption is made that this compromise is good for the consumer. Supposedly it will free up prerecorded software on new digital audio formats and stimulate the sales of digital audio recording and playback equipment. But in fact, it taxes the consumer, limits the consumer's ability to use recording devices, and paves the way for a new generation of audio equipment which is sonically inferior to the current compact disc and DAT formats. The compromise also sets a dangerous legal precedent which could easily be extended to a new generation of video recorders.

Organizations supporting the bill contend we should go along with this industry compromise because it acknowledges the consumer's right to tape for private, noncommercial purposes. We are also told the royalty rates are modest and would apply only to digital recorders and media, and we are told passage of this legislation will spur music industry enthusiasm for new recording formats. I think the only people who will really benefit from this legislation are electronic equipment manufacturers, the music industry, and their retailers.

Under this proposed legislation, the consumer pays a royalty to the music industry but gets nothing in return. The insidious SCMS copy protection system, which affects the dubbing of personal as well as prerecorded software, will be required in every consumer digital recording device. Since an estimated 73 percent of home taping does not involve prerecorded music, why should consumers have to put up with limitations on their recording equipment just to protect the music industry from copyright infringement? Worse yet, why should consumers suffer limits on top of royalty fees for equipment and tape?

Of course, none of this will stop the serious tape pirate who can buy slightly higher priced professional equipment, which under the bill would neither be limited by SCMS nor subject to the royalty fee. If the music industry really wants to stop its CDs from being copied digitally, it could easily put flags in the digital signal which would stop all copying. But a Government study has found that about one quarter of prerecorded purchases were made after the consumer heard the artist or recording on a homemade tape. One gets the feeling the music industry wants it both ways.

The legislation has another interesting side effect. For the first time, the law would encourage a new generation of digital audio equipment which is clearly inferior in sonic quality than that of the current generation. In a way, this is an antitechnology bill. Unlike the compact disc and DAT tape formats now available, the upcoming digital compact cassette and minidisc formats employ a data compression technique which is based on assumptions about human hearing. Data which is deemed inaudible is not recorded,

thus requiring less data storage space on the media. Though the manufacturers of the new formats contend most consumers will not hear the difference, many engineers have publicly expressed doubt and fear that the new formats will actually degrade their recordings.

The record industry likes the new formats because each offers less sonic quality than their master recordings, and objectionable artifacts from data compression appear in multigenerational copies. The DAT format, which uses no data compression, has been unsuccessful as a consumer product in part due to continuing legal actions by the music industry against equipment manufacturers. However, the sound quality of DAT is so good that many professionals now use it for mastering high-quality commercial releases. The record industry does not want this kind of recording quality in the hands of consumers.

The legislation also ventures into some other untouched areas. For example, the bill lists criteria that distinguish consumer equipment from professional equipment. It makes it illegal to sell a device that will modify a piece of equipment that evades the SCMS system and keeps royalty payment accounts a secret to protect equipment manufacturers from having their sales figures made public.

Under the Audio Home Recording Act, everybody gets a piece of the pie except the lowly consumer. Thoughtful users of audio and video equipment had better start asking some hard questions about this proposed legislation before it's too late. If this industry compromise is made into law, the Government will, for the first time, start dictating to citizens how they may and may not use home recording devices.

Thank you.

[Mr. Beacham's prepared statement and background data follow:]

Statement by Frank Beacham to the
Subcommittee on Patents, Copyrights and Trademarks
Oct. 29, 1991

Mr. Chairman and members of the subcommittee. As a producer of audio and video programs and a writer who follows technology issues, I come here today to voice opposition to the Audio Home Recording Act.

The assumption is made that this compromise is good for the consumer. Supposedly it will free up pre-recorded software on new digital audio formats and stimulate the sales of digital audio recording and playback equipment.

But, in fact, it taxes the consumer, limits the consumer's ability to use recording devices and paves the way for a new generation of audio equipment which is sonically inferior to the current compact disc and DAT formats. The compromise also sets a dangerous legal precedent which could easily be extended to a new generation of video recorders.

Organizations supporting the bill contend we should go along with this industry compromise because it acknowledges the consumer's right to tape for private, non-commercial purposes. We are also told the royalty rates are modest and would apply only to digital recorders and media. And we are told passage of this legislation will spur music industry enthusiasm for new recording formats.

I think the only people who will really benefit from this legislation are electronic equipment manufacturers, the music industry and their retailers.

Under this proposed legislation, the consumer pays a royalty to the music industry but gets nothing in return. The insidious SCMS copy protection system which affects the dubbing of personal as well as pre-recorded software will be required in every consumer digital recording device.

Since an estimated 73% of home taping does not involve pre-recorded music,* why should consumers have to put up with limitations on their recording equipment just to protect the music industry from copyright infringement? Worse yet, why should consumers suffer such limits on top of royalty fees for equipment and tape?

Of course, none of this will stop the serious tape pirate who can buy slightly higher-priced "professional" equipment, which, under the bill, would neither be limited by SCMS nor subject to the royalty fee.

If the music industry really wants to stop its CD's from being copied digitally, it could easily to put "flags" in the digital signal which would stop all copying. But a government study* has found that about one-quarter of pre-recorded purchases were made after the consumer heard the artist or recording on a home-made tape. One gets the feeling the music industry wants it both ways?

The legislation has another interesting side effect. For the first time, the law would encourage a new generation of digital audio equipment which is clearly inferior in sonic quality than that of the current generation. In a way this is an anti-technology bill.

Unlike the compact disc and DAT tape formats now available, the upcoming digital compact cassette (DCC) and mini-disc (MD) formats employ a data compression technique which is based on assumptions about human hearing. Data which is deemed inaudible is not recorded, thus requiring less data storage space on the media.

Though the manufacturers of the new formats contend most consumers will not hear the difference, many engineers have publicly expressed doubt and fear the new formats will actually degrade their recordings. The record industry likes the new formats because each offers less sonic quality than their master recordings and objectionable artifacts from data compression appear in multi-generational copies.

The DAT format, which uses no data compression, has been unsuccessful as a consumer product in part due to continuing legal actions by the music industry against equipment manufacturers. However, the sound quality of DAT is so good that many professionals now use it for mastering high quality commercial releases. The record industry does not want this kind of recording quality in the hands of consumers.

The legislation also ventures into some other untouched areas. For example, the bill lists criteria that distinguishes consumer equipment from professional equipment, it makes it illegal to sell a device or to modify a piece of equipment that evades the SCMS system and keeps royalty payment accounts a secret to protect equipment manufacturers from having their sales figures made public.

Under the Audio Home Recording Act, everybody gets a piece of the pie except the lowly consumer. Thoughtful users of audio and video equipment had better start asking some hard questions about this proposed legislation before it is too late. If this industry "compromise" is made into law the government will for the first time start dictating to citizens how they may and may not use home recording devices.

Frank Beacham
163 Amsterdam Ave. #361
New York, NY 10023
(212) 873-9349

*(U.S. Office of Technology Assessment, 1989 study)

Frank Beacham

Background Data

Current:

Independent writer, director, producer of radio, television, film, theatre and print projects.

Recent project highlights:

Columnist/Writer--Pen a monthly column -- **VideoCraft** -- for TV Technology magazine. Serve as contributing editor to Video magazine. A regular contributor of articles on radio broadcasting and audio issues to Radio World magazine.

Author--**"ASC Video Manual,"** a complete handbook on professional video production and location sound techniques for the American Society of Cinematographers. The book, to be published in early 1982, is the video companion to the ASC Manual for Cinematographers.

Writer/Director--**"The Orangeburg Massacre,"** a one-hour radio drama on the killing of black college students by white highway patrolmen in South Carolina in 1968. Starring David Carradine, Blair Underwood and James Whitmore. Program aired nationally in February on the American Public Radio network. Winner of 1991 Gold and Silver Medals for Best History and Social Issues program in international radio competition of the New York Festivals.

Writer/Director--**"Theatre of the Imagination: The Radio Days of Orson Welles"** This one-hour radio special -- narrated by Leonard Maltin -- on Orson Welles and the Mercury Theatre will air this Halloween on the American Public Radio network. Also produced, with Richard Wilson, a six-hour retrospective audio production of the Mercury broadcasts from 1937 to 1947. This collection, titled "Theatre of the Imagination: Radio Stories by Orson Welles and the Mercury Theatre," is in current national release by The Voyager Co./Janus Films.

Writer/Editor--**"Hollywood Chronicles: The Great Movie Clowns"** Wrote and edited a 30-minute television program on Mack Sennett, Charlie Chaplin, Harold Lloyd, Buster Keaton, Laurel & Hardy, the Marx Brothers & W.C. Fields. Episode aired on The Discovery Channel (cable).

Earlier Employment Experience
Staff writer/reporter for United Press International, Miami Herald, Post-Newsweek television stations and Gannett Newspapers. Editor and Bureau Chief at Gannett. Television Producer in Miami, Fl and Los Angeles, CA.

Education:

B.A. in Radio and Television, 1969, University of South Carolina. Winner of scholarship from S.C. Broadcaster's Association in 1966. Post-graduate studies at UCLA, University of Southern California and American Film Institute in film producing, directing, acting, story analysis/development, and screenwriting. Screenwriters Program at UCLA. Studied story structure with Robert McKee and film directing with Wynn Handman, Paul Gray, Ronald Neame, Ted Post and Judith Weston.

Senator DECONCINI. Thank you, Mr. Beacham.

Let me start with you, Mr. Greenspun. You've provoked a couple of questions here I'd like to ask you.

You stated that the Audio Home Recording Act will not promote the progress of the arts; however, we've heard from numerous witnesses, and I've talked to many who didn't testify here in favor of the bill who represent those who are artists and in the music industry. You've heard some of them, too. Do you still feel that those who represent the creative elements of the music industry are misguided in their support of this bill?

Mr. GREENSPUN. I believe that it helps successful artists, but it does that only by taking money out of the pocket of striving artists.

Senator DECONCINI. How does it take money out of the pocket of the striving artist?

Mr. GREENSPUN. It makes home recording equipment that's usable for making a demo tape and the accompanying media more expensive and therefore adds a barrier to entry for a striving musician. If you're talking about an 18-year-old who has no job and is hoping to make it in the music industry, a $5,000 professional digital recorder is a significant expense.

I also think the way the money is distributed doesn't promote progress in the arts, because if you distribute money—I don't have a solution to this, mind you, but it's a problem—if you just distribute money on a per-recording basis, it all goes to the most popular artists, who are already getting money from Pepsi commercials, from movies, from endorsements, from licensing. They have so many ways of getting money that they could probably give away their recordings for free and still be very wealthy.

Senator DECONCINI. Do you advocate that, that they give away something that they own?

Mr. GREENSPUN. No. I'm just saying that Michael Jackson is going to get a check for $100,000, which is what he makes for a single concert, and that with my own limited musical talents, I would probably get a check for $1.37.

Senator DECONCINI. But you don't think that Michael Jackson is entitled to that because of his performance skills and his following and his reputation?

Mr. GREENSPUN. Well, he's probably entitled to more than he even gets now, but I question whether taking it from the user of a Macintosh computer is the best way to compensate Michael Jackson. As I said, my own——

Senator DECONCINI. You think this takes away from the Macintosh computer user?

Mr. GREENSPUN. I think that 10 years from now, in the absence of regulation, you would certainly see the front end of a Macintosh taking the same kind of media as——

Senator DECONCINI. But there's no question in your mind now that it doesn't have anything to do with that Macintosh computer today?

Mr. GREENSPUN. It absolutely does. I would say that a comparable number of DAT machines have been sold for computer data storage as for computer use.

Senator DECONCINI. Do you know that for a fact? I don't.

Mr. GREENSPUN. I would say in dollars it's a fact, yes. Well, let me put it this way. Every time I go into a computer room, I see a DAT.

Senator DECONCINI. How do you arrive at that figure? Can you help us substantiate that? It's very important if you can.

Mr. GREENSPUN. It's wandering through the halls of MIT where there are zillions of computers. I see lots of DAT backup drives. Every time you open Mac World or PC World or any magazine, there are ads for these machines.

Senator DECONCINI. But you have no study or anything to demonstrate that?

Mr. GREENSPUN. No. But when I walk around with my audiophile friends, none of them have DAT recorders, because they don't sound as good as their old analog cassette machines.

Senator DECONCINI. Let me ask you another question. You were critical of the DAT bill introduced last April, and you testified, as you will remember, that it would, I think your testimony said, "destroy the only realistic chance America has to get back into consumer electronics." That's taken from your statement. Do you still feel that way after hearing the testimony from the chairman of Tandy Corporation, a major competitor in this area and an American manufacturer?

Mr. GREENSPUN. Well, as major as they are, they're only a tenth the size of Matsushita, so while I respect him, I guess I would have to stick to my position that basically any mandated technology solution gives a lot of market power to mass producers. The more restrictions you put on what a device must be, it gives power to people like Sony and Matsushita that have their own IC fab lines and takes it away from startup companies that might want to start it. Basically they can decide that the quantity 1-million price for Tandy and for themselves is $1 and that the quantity 10,000 price, which would be something like what an American manufacturer would want, the typical small company, would be $50, and you could sue them, but they'd say, "Well, it costs more to deal with the small guy, so we're marking it up by a factor of 50."

Senator DECONCINI. No, but he said he could—I don't know if you heard him. Mr. Roach said they could produce them themselves.

Mr. GREENSPUN. They could, because they're a $4 billion company, but I don't—I mean, I can design an SCMS chip myself, and in fact, I have built digital audio receiver and transmitter chips. However, to put it on an integrated circuit would take $100,000 or more of capital, which I don't have, and I think the American companies that are currently making digital audio equipment don't have that kind of cash.

Senator DECONCINI. Mr. Beacham, you stated, I believe, the quote that "The DAT format has been unsuccessful as a consumer product in part due to continuing legal actions by the music industry against equipment manufacturers."

Mr. BEACHAM. Right.

Senator DECONCINI. I happen to agree with that statement. Doesn't this fact lead you to believe that a compromise embodied in the bill before us today is the most practical way to bring DAT technology to the consumer to do away with the litigation?

Mr. BEACHAM. Sir, I don't believe that this legislation will promote the DAT format, because I think the DAT format is too good for its own self-survival. This is the reason we have the two new formats, the DCC and the MD, which I think will be the vehicle that will be used for prerecorded music software. I would like to think that the DAT format would be also, but it is already being relegated to a professional format, and I believe it will stay that way.

Senator DECONCINI. Well, I appreciate that statement. Going back to your statement, you say "due to the continuing legal actions by the music industry." Now, there's not going to be legal action if this becomes law.

Mr. BEACHAM. Certainly, that's correct.

Senator DECONCINI. How does that play into your——

Mr. BEACHAM. Well, I think that if all legal action is stopped and there is no threat to DAT at all, I still do not think it will be promoted as a music delivery format because of its superior quality.

Mr. GREENSPUN. May I add something to that, Mr. Chairman?

Senator DECONCINI. Certainly.

Mr. GREENSPUN. I really would disagree that DAT has failed because of litigation per se. I think only in that record companies haven't released much prerecorded software in this format. If you accept Mr. Oman's argument and the argument of the proponents of this bill that this thing is so great that people are going to rush out and buy it to make copies of CD's, well, they've been able to do that for years. It was available through mail order, and then last year Sony put it into widespread distribution, and it's been a flop because people apparently are not willing to pay very much money in order to copy. They would rather own the original.

The other thing is that digital audio is used synonymously with perfect sound and something new and great. Well, I guess the example—all of you use digital audio every day. Whenever you make an AT&T long distance call, that's digital audio. Speaking for myself, I'll keep my Boston Symphony subscription rather than listening to them over my speakerphone.

Senator DECONCINI. Mr. Beacham, you also stated that "The sound quality of DAT is so good that many professionals now use it for mastering high-quality commercial releases," and then you continue by saying "The record industry does not want this kind of recording quality in the hands of the consumer." Of course, this bill is designed to place superior recording technology into the hands of the consumer, and the recording industry fully supports it. How do you conclude that the recording industry wants consumers to have inferior recording equipment?

Mr. BEACHAM. The new technologies that are being promoted, the MD and the DCC format, use an algorithm technology.

Senator DECONCINI. Algorithm?

Mr. BEACHAM. Yes, it's a process that uses part of the data, not all of the data. The current formats that we enjoy, the compact disc and the DAT, do not do this. There is, though, a small difference in the quality. There is some degradation when you use this technology. It is especially prevalent when you make copies, because these algorithms apparently multiply in multiple generations.

Now, you asked me, does this bill support a better technology? In fact, this bill will be launching two inferior technologies. Engineers are already voicing some concern over the quality. I have an article here, "Engineers Hesitant to Accept New DCC and Minidisk Formats," which was in a professional trade publication in October. There is some debate going on among engineers as to whether these formats are in fact going backward.

Senator DECONCINI. Why do you think the recording industry would promote this if it isn't getting the best technology to the consumer? Why would they not want consumers to have the best recording technology? I'm interested in that.

Mr. BEACHAM. I find it a bit mystifying. If I were them, I would want the best quality.

Senator DECONCINI. I would, too.

Mr. BEACHAM. But I don't——

Senator DECONCINI. Shouldn't they oppose this bill, then?

Mr. BEACHAM. Well, we should—I think Mr. Roach's company said we would a couple of years ago be having a recordable compact disc. We didn't get that, and, you know, I wonder why. I understand there will be one, and it will be a professional product. It at one time was talked about to be a consumer product. I think what's happening here is that we are, as a result of this legislation, getting some new formats that are going to help prevent duplicating and piracy by creating a first generation that's OK for most consumers, but the ability to copy it will sound pretty horrible.

Senator DECONCINI. Do you think the consumer will buy it?

Mr. BEACHAM. I don't know. I don't know.

Senator DECONCINI. I mean, assuming you're right here, then it will fail, and so be it, because that's our market system.

Mr. BEACHAM. Yes, I think that's certainly open to question. I don't know that they'll find it's worth the investment, and it's also confusing. It's more new formats.

Mr. GREENSPUN. May I answer a piece of your question?

Senator DECONCINI. Certainly.

Mr. GREENSPUN. Two. First of all, I think consumers will buy this MD format, the recordable CD from Sony, because it's an ideal way to store computer data. The computer industry has been waiting for a really cheap recordable optical disc. The second thing is your question about how can inferior technologies be introduced. If you look back historically, every new recording technology that was introduced——

Senator DECONCINI. Excuse me. It wasn't how could it; it was why would they want inferior technology? I can't find a motive here why they would want to do what you two are saying.

Mr. GREENSPUN. Oh, I wouldn't say there's a motive, but sound quality is irrelevant to the acceptance by consumers of new technology. Discs replaced Edison cylinders. You know they sounded worse. LP records replaced 78 records, even though the sound quality was lower. Prerecorded cassettes effectively replaced LP records in the 1970's, even though the quality was worse.

Senator DECONCINI. You've got better ears than I do. Was the quality worse?

Mr. GREENSPUN. Yes.

Senator DECONCINI. Oh, OK. I thought the quality was better, but maybe I don't hear very well.

Mr. GREENSPUN. No, prerecorded cassettes are more convenient. Many of these things were either——

Senator DECONCINI. Are CD's worse?

Mr. GREENSPUN. CD's have more distortion in many ways than LP records made in the 1950's, but they're more convenient. So are cassettes. Cassettes were more convenient than LP's, LP's were more convenient than 78's, 78's were more convenient than the Edison cylinders, and they were backed by more advertising money and so forth. So the sound quality thing is a canard. It really has almost nothing to do with——

Senator DECONCINI. I'm not an expert, Mr. Greenspun, but I have CD's, and I have LP's, and I have 78's, and, boy, the CD's are much better quality.

Mr. GREENSPUN. I think they probably are better quality than 78's. If you have a well-adjusted turntable, though, most——

Senator DECONCINI. I've got a well-adjusted turntable.

Mr. GREENSPUN. Most audiophiles still listen to LP records. If you look at what sits in front of a really expensive pair of loudspeakers, you'll mostly find that it's a turntable.

Senator DECONCINI. I guess I've got to get my hearing checked. I haven't witnessed that.

Gentlemen, thank you very much. You've given us a different perspective, and I appreciate that.

Senator Hatch was unable to be with us today due to the negotiations on the Civil Rights bill that he's involved in, and we will have his full statement in the record at the appropriate place at the beginning of these hearings.

Thank you, gentlemen, very much.

[Whereupon, at 12:13 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

APPENDIX

PROPOSED LEGISLATION

II

102D CONGRESS
1ST SESSION

S. 1623

To amend title 17, United States Code, to implement a royalty payment system and a serial copy management system for digital audio recording, to prohibit certain copyright infringement actions, and for other purposes.

IN THE SENATE OF THE UNITED STATES

AUGUST 1 (legislative day, JULY 8), 1991

Mr. DECONCINI (for himself, Mr. INOUYE, Mr. HATCH, Mr. KENNEDY, Mr. LEAHY, Mr. BURNS, Mr. GORTON, Mr. GORE, Mr. GRASSLEY, Mr. D'AMATO, Mr. CRANSTON, and Mr. BREAUX) introduced the following bill; which was read twice and referred to the Committee on the Judiciary

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A BILL

To amend title 17, United States Code, to implement a royalty payment system and a serial copy management system for digital audio recording, to prohibit certain copyright infringement actions, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Audio Hóme Recording Act of 1991".

SEC. 2. IMPORTATION, MANUFACTURE, AND DISTRIBUTION OF DIGITAL AUDIO RECORDING DEVICES AND MEDIA.

Title 17, United States Code, is amended by adding at the end the following:

"CHAPTER 10—DIGITAL AUDIO RECORDING DEVICES AND MEDIA

"SUBCHAPTER A—DEFINITIONS, PROHIBITION OF CERTAIN INFRINGEMENT ACTIONS, AND RULES OF CONSTRUCTION

"SUBCHAPTER B—ROYALTY PAYMENTS

"SUBCHAPTER C—THE SERIAL COPY MANAGEMENT SYSTEM

"SUBCHAPTER D—REMEDIES

"SUBCHAPTER A—DEFINITIONS, PROHIBITION OF CERTAIN INFRINGEMENT ACTIONS, AND RULES OF CONSTRUCTION

"§ 1001. Definitions

"As used in this chapter, the following terms and their variant forms mean the following:

"(1) A 'digital audio copied recording' is a reproduction in a digital recording format of a phonorecord, whether that reproduction is made directly from another phonorecord or indirectly from a transmission.

"(2) A 'digital audio interface device' is any machine or device, now known or later developed, whether or not included with or as part of some other machine or device, that supplies a digital audio signal through a nonprofessional interface, as the term 'nonprofessional interface' is used in the Digital Audio Interface Standard in part I of the technical reference document or as otherwise defined by the Secretary of Commerce under section 1022(b).

"(3) A 'digital audio recording device' is any machine or device, now known or later developed, whether or not included with or as part of some other machine or device, the recording function of which is designed or marketed for the primary purpose of, and that is capable of, making a digital audio copied recording for private use, except for—

"(A) professional model products, and

"(B) dictation machines, answering machines, and other audio recording equipment that is designed and marketed primarily for the

creation of sound recordings resulting from the fixation of nonmusical sounds.

"(4)(A) A 'digital audio recording medium' is any material object, now known or later developed, in a form commonly distributed for use by individuals (such as magnetic digital audio tape cassettes, optical discs, and magneto-optical discs), that is primarily marketed or most commonly used by consumers for the purpose of making digital audio copied recordings by use of a digital audio recording device.

"(B) Such term does not include any material object—

"(i) that embodies a sound recording at the time it is first distributed by the importer or manufacturer, unless the sound recording has been so embodied in order to evade the obligations of section 1011 of this title; or

"(ii) that is primarily marketed and most commonly used by consumers either for the purpose of making copies of motion pictures or other audiovisual works or for the purpose of making copies of nonmusical literary works, including, without limitation, computer programs or data bases.

"(5) 'Distribute' means to sell, resell, lease, or assign a product to consumers in the United States, or to sell, resell, lease, or assign a product in the United States for ultimate transfer to consumers in the United States.

"(6) An 'interested copyright party' is—

"(A) the owner of the exclusive right under section 106(1) of this title to reproduce a sound recording of a musical work that has been embodied in a phonorecord lawfully made under this title that has been distributed to the public;

"(B) the legal or beneficial owner of, or the person that controls, the right to reproduce in a phonorecord a musical work that has been embodied in a phonorecord lawfully made under this title that has been distributed to the public; or

"(C) any association or other organization—

"(i) representing persons specified in subparagraph (A) or (B), or

"(ii) engaged in licensing rights in musical works to music users on behalf of writers and publishers.

"(7) An 'interested manufacturing party' is any person that imports or manufactures any digital audio recording device or digital audio recording medium in the United States, or any association of such persons.

"(8) 'Manufacture' includes the production or assembly of a product in the United States.

"(9) A 'music publisher' is a person that is authorized to license the reproduction of a particular musical work in a sound recording.

"(10)(A) A 'professional model product' is an audio recording device—

"(i) that is capable of sending a digital audio interface signal in which the channel status block flag is set as a 'professional' interface, in accordance with the standards and specifications set forth in the technical reference document or established under an order issued by the Secretary of Commerce under section 1022(b);

"(ii) that is clearly, prominently, and permanently marked with the letter 'P' or the word 'professional' on the outside of its packaging, and in all advertising, promotional, and descriptive literature, with respect to the device, that

is available or provided to persons other than the manufacturer or importer, its employees, or its agents; and

"(iii) that is designed, manufactured, marketed, and intended for use by recording professionals in the ordinary course of a lawful business.

"(B) In determining whether an audio recording device meets the requirements of subparagraph (A)(iii), factors to be considered shall include—

"(i) whether it has features used by recording professionals in the course of a lawful business, including features such as—

"(I) a data collection and reporting system of error codes during recording and playback;

"(II) a record and reproduce format providing 'read after write' and 'read after read';

"(III) a time code reader and generator conforming to the standards set by the Society of Motion Picture and Television Engineers for such readers and generators; and

"(IV) a professional input/output interface, both digital and analog, conforming to standards set by audio engineering organizations for connectors, signaling formats, levels, and impedances;

"(ii) the nature of the promotional materials used to market the audio recording device;

"(iii) the media used for the dissemination of the promotional materials, including the intended audience;

"(iv) the distribution channels and retail outlets through which the device is disseminated;

"(v) the manufacturer's or importer's price for the device as compared to the manufacturer's or importer's price for digital audio recording devices implementing the Serial Copy Management System;

"(vi) the relative quantity of the device manufactured or imported as compared to the size of the manufacturer's or importer's market for professional model products;

"(vii) the occupations of the purchasers of the device; and

"(viii) the uses to which the device is put.

"(11) The 'Register' is the Register of Copyrights.

"(12) The 'Serial Copy Management System' means the system for regulating serial copying by digital audio recording devices that is set forth in the technical reference document or in an order of the Secretary of Commerce under section 1022(b), or that conforms to the requirements of section 1021(a)(1)(C).

"(13) The 'technical reference document' is the document entitled 'Technical Reference Document for Audio Home Recording Act of 1991,' as such document appears in the report of the Committee on the Judiciary to the Senate reporting favorably the bill which upon enactment made the amendment adding this chapter.

"(14)(A) The 'transfer price' of a digital audio recording device or a digital audio recording medium is—

"(i) in the case of an imported product, the actual entered value at United States Customs (exclusive of any freight, insurance, and applicable duty), and

"(ii) in the case of a domestic product, the manufacturer's transfer price (FOB the manu-

facturer, and exclusive of any direct sales taxes or excise taxes incurred in connection with the sale).

"(B) Where the transferor and transferee are related entities or within a single entity, the transfer price shall not be less than a reasonable arms-length price under the principles of the regulations adopted pursuant to section 482 of the Internal Revenue Code of 1986, or any successor provision to such section 482.

"(15) A 'transmission' is any audio or audiovisual transmission, now known or later developed, whether by a broadcast station, cable system, multipoint distribution service, subscription service, direct broadcast satellite, or other form of analog or digital communication.

"(16) The 'Tribunal' is the Copyright Royalty Tribunal.

"(17) A 'writer' is the composer or lyricist of a particular musical work.

"(18) The terms 'analog format', 'copyright status', 'category code', 'generation status', and 'source material', mean those terms as they are used in the technical reference document.

"§ 1002. Prohibition on certain infringement actions

"(a) CERTAIN ACTIONS PROHIBITED.—

"(1) GENERALLY.—No action may be brought under this title, or under section 337 of the Tariff Act of 1930, alleging infringement of copyright based on the manufacture, importation, or distribution of a digital audio recording device or a digital audio recording medium, or an analog audio recording device or analog audio recording medium, or the use of such a device or medium for making phonorecords. However, this subsection does not apply with respect to any claim against a person for infringement by virtue of the making of one or more copies or phonorecords for direct or indirect commercial advantage.

"(2) EXAMPLE.—For purposes of this section, the copying of a phonorecord by a consumer for private, noncommercial use is not for direct or indirect commercial advantage, and is therefore not actionable.

"(b) EFFECT OF THIS SECTION.—Nothing in this section shall be construed to create or expand a cause of action for copyright infringement except to the extent such a cause of action otherwise exists under other chapters of this title or under section 337 of the Tariff Act of 1930,

or to limit any defenses that may be available to such causes of action.

"§ 1003. Effect on other rights and remedies with respect to private home copying or otherwise

"Except as expressly provided in this chapter with respect to audio recording devices and media, neither the enactment of this chapter nor anything contained in this chapter shall be construed to expand, limit, or otherwise affect the rights of any person with respect to private home copying of copyrighted works, or to expand, limit, create, or otherwise affect any other right or remedy that may be held by or available to any person under chapters 1 through 9 of this title.

"SUBCHAPTER B—ROYALTY PAYMENTS

"§ 1011. Obligation to make royalty payments

"(a) PROHIBITION ON IMPORTATION AND MANUFACTURE.—No person shall import into and distribute in the United States, or manufacture and distribute in the United States, any digital audio recording device or digital audio recording medium unless such person—

"(1) records the notice specified by this section and subsequently deposits the statements of account and applicable royalty payments for such device or

medium specified by this section and section 1012 of this title, or

"(2) complies with the applicable notice, statement of account, and payment obligations under a negotiated arrangement authorized pursuant to section 1016 of this title.

"(b) FILING OF NOTICE.—

"(1) GENERALLY.—The importer or manufacturer of any digital audio recording device or digital audio recording medium, within a product category or utilizing a technology with respect to which such manufacturer or importer has not previously filed a notice under this subsection, shall file a notice with the Register, no later than 45 days after the commencement of the first distribution in the United States of such device or medium, in such form as the Register shall prescribe by regulation.

"(2) CONTENTS.—Such notice shall—

"(A) set forth the manufacturer's or importer's identity and address,

"(B) identify such product category and technology, and

"(C) identify any trade or business names, trademarks, or like indicia of origin that the importer or manufacturer uses or intends to use

in connection with the importation, manufacture, or distribution of such device or medium in the United States.

"(c) FILING OF QUARTERLY STATEMENTS OF ACCOUNT.—

"(1) GENERALLY.—Any importer or manufacturer that distributed during a given quarter any digital audio recording device or digital audio recording medium that it manufactured or imported shall file with the Register, in such form as the Register shall prescribe by regulation, a quarterly statement of account specifying, by product category, technology, and model, the number and transfer price of all digital audio recording devices and digital audio recording media that it distributed during such quarter.

"(2) TIMING, CERTIFICATION, AND ROYALTY PAYMENTS.—Such statement shall—

"(A) be filed no later than 45 days after the close of the period covered by the statement;

"(B) be certified as accurate by an authorized officer or principal of the importer or manufacturer;

"(C) be accompanied by the total royalty payment due for such period pursuant to section 1012 of this title.

"(3) PERIOD COVERED.—The quarterly statements of account may be filed on either a calendar or fiscal year basis, at the election of the manufacturer or importer.

"(d) FILING OF ANNUAL STATEMENTS OF ACCOUNT.—

"(1) GENERALLY.—Any importer or manufacturer that distributed during a given calendar or fiscal year (as applicable) any digital audio recording device or digital audio recording medium that it manufactured or imported shall also file with the Register a cumulative annual statement of account, in such form as the Register shall prescribe by regulation.

"(2) TIMING AND CERTIFICATION.—Such statement shall be filed no later than 60 days after the close of such calendar or fiscal year, and shall be certified as accurate by an authorized officer or principal of the importer or manufacturer.

"(3) INDEPENDENT REVIEW AND CERTIFICATION.—The annual statement of account shall be reviewed and, pursuant to generally accepted auditing

standards, certified by an independent certified public accountant selected by the manufacturer or importer as fairly presenting the information contained therein, on a consistent basis and in accordance with the requirements of this chapter.

"(4) RECONCILIATION OF ROYALTY PAYMENT.—The cumulative annual statement of account shall be accompanied by any royalty payment due under section 1012 of this title that was not previously paid under subsection (c) of this section.

"(e) VERIFICATION.—

"(1) GENERALLY.—

"(A) The Register shall, after consulting with interested copyright parties and interested manufacturing parties, prescribe regulations specifying procedures for the verification of statements of account filed pursuant to this section.

"(B) Such regulations shall permit interested copyright parties to select independent certified public accountants to conduct audits in order to verify the accuracy of the information contained in the statements of account filed by manufacturers and importers.

"(C) Such regulations shall also—

"(i) specify the scope of such independent audits; and

"(ii) establish a procedure by which interested copyright parties will coordinate the engagement of such independent certified public accountants, in order to ensure that no manufacturer or importer is audited more than once per year.

"(D) All such independent audits shall be conducted at reasonable times, with reasonable advance notice, and shall be no broader in scope than is reasonably necessary to carry out the purposes of this subsection in accordance with generally accepted auditing standards.

"(2) INDEPENDENT CERTIFICATION.—The results of all such independent audits shall be certified as fairly presenting the information contained therein, on a consistent basis and in accordance with the requirements of this chapter and generally accepted auditing standards, by the certified public accountant responsible for the audit. The certification and results shall be filed with the Register.

"(3) ACCESS TO DOCUMENTS IN EVENT OF DISPUTE.—In the event of a dispute concerning the amount of the royalty payment due from a manufac-

turer or importer resulting from a verification audit conducted under this section—

"(A) any interested manufacturing party audited pursuant to this subsection, and its authorized representatives, shall be entitled to have access to all documents upon which the audit results under this subsection were based; and

"(B) any representative of an interested copyright party that has been approved by the Register under subsection (h)(2) of this section shall be entitled to have access to all documents upon which the audit results under subsection (d) of this section were based, subject to the limitations of subsection (h)(2) of this section.

"(f) COSTS OF VERIFICATION.—

"(1) The costs of all verification audits that are conducted pursuant to subsection (e) of this section shall be borne by interested copyright parties, except that, in the case of a verification audit of a manufacturer or importer that leads ultimately to recovery of an annual royalty underpayment of 5 percent or more of the annual payment made, the importer or manufacturer shall provide reimbursement for the reasonable costs of such audit.

"(2) Except as may otherwise be agreed by interested copyright parties, the costs of a verification audit conducted pursuant to subsection (e) of this section shall be borne by the party engaging the certified public accountant. Any recovery of royalty underpayments as a result of the audit shall be used first to provide reimbursement for the reasonable costs of such audit to the extent such costs have not otherwise been reimbursed by the manufacturer or importer pursuant to this subsection. Any remaining recovery shall be deposited with the Register pursuant to section 1013 of this title, or as may otherwise be provided by a negotiated arrangement authorized under section 1016 of this title, for distribution to interested copyright parties as though such funds were royalty payments made pursuant to this section.

"(g) INDEPENDENCE OF ACCOUNTANTS.—Each certified public accountant used by interested copyright parties or interested manufacturing parties pursuant to this section shall be in good standing and shall not be financially dependent upon interested copyright parties or interested manufacturing parties, respectively. The Register may, upon petition by any interested copyright party or interested manufacturing party, prevent the use of a par-

ticular certified public accountant on the ground that such accountant does not meet the requirements of this subsection.

"(h) CONFIDENTIALITY.—

"(1) GENERALLY.—The quarterly and annual statements of account filed pursuant to subsections (c) and (d) of this section, and information disclosed or generated during verification audits conducted pursuant to subsection (e) of this section, shall be presumed to contain confidential trade secret information within the meaning of section 1905 of title 18 of the United States Code. Except as provided in paragraphs (2), (3), and (4) of this subsection, neither the Register nor any member, officer, or employee of the Copyright Office or the Tribunal, may—

"(A) publicly disclose audit information furnished under this section or information contained in quarterly or annual statements of account, except that aggregate information that does not disclose, directly or indirectly, company-specific information may be made available to the public;

"(B) use such information for any purpose other than to carry out responsibilities under this chapter; or

"(C) permit anyone (other than members, officers, and employees of the Copyright Office and the Tribunal who require such information in the performance of duties under this chapter) to examine such information.

"(2) PROCEDURES FOR ACCESS TO BE PRESCRIBED BY REGISTER.—(A) The Register, after consulting with interested manufacturing parties and interested copyright parties, shall prescribe procedures for disclosing, in confidence, to representatives of interested copyright parties and representatives of interested manufacturing parties information contained in quarterly and annual statements of account and information generated as a result of verification audits.

"(B) Such procedures shall provide that only those representatives of interested copyright parties and interested manufacturing parties who have been approved by the Register shall have access to such information, and that all such representatives shall be required to sign a certification limiting the use of the information to—

"(i) verification functions under this section, and

"(ii) any enforcement actions that may result from such verification procedures.

"(3) ACCESS BY AUDITED MANUFACTURER.—Any interested manufacturing party that is audited pursuant to subsection (e) of this section, and its authorized representatives, shall be entitled to have access to all documents filed with the Register as a result of such audit.

"(4) ACCESS BY CONGRESS.—Nothing in this section shall authorize the withholding of information from the Congress.

"§ 1012. Royalty payments

"(a) DIGITAL AUDIO RECORDING DEVICES.—

"(1) The royalty payment due under section 1011 of this title for each digital audio recording device imported into and distributed in the United States, or manufactured and distributed in the United States, shall be 2 percent of the transfer price. However, only the first person to manufacture and distribute or import and distribute such device shall be required to pay the royalty with respect to such device.

"(2) With respect to a digital audio recording device first distributed in combination with one or more devices, either as a physically integrated unit or as separate components, the royalty payment shall be calculated as follows:

"(A) If the digital audio recording device and such other devices are part of a physically integrated unit, the royalty payment shall be based on the transfer price of the unit, but shall be reduced by any royalty payment made on any digital audio recording device included within the unit that was not first distributed in combination with the unit.

"(B) If the digital audio recording device is not part of a physically integrated unit and substantially similar devices have been distributed separately at any time during the preceding 4 quarters, the royalty payment shall be based on the average transfer price of such devices during those 4 quarters.

"(C) If the digital audio recording device is not part of a physically integrated unit and substantially similar devices have not been distributed separately at any time during the preceding 4 quarters, the royalty payment shall be

based on a constructed price reflecting the proportional value of such device to the combination as a whole.

"(3) Notwithstanding paragraph (1) or (2) of this subsection, the amount of the royalty payment for each digital audio recording device or physically integrated unit containing a digital audio recording device shall not be less than $1 nor more than the royalty maximum. The royalty maximum shall be $8 per device, except that for a physically integrated unit containing more than one digital audio recording device, the royalty maximum for such unit shall be $12. During the 6th year after the effective date of this chapter, and no more than once each year thereafter, any interested copyright party may petition the Tribunal to increase the royalty maximum and, if more than 20 percent of the royalty payments are at the relevant royalty maximum, the Tribunal shall prospectively increase such royalty maximum with the goal of having no more than 10 percent of such payments at the new royalty maximum.

"(b) DIGITAL AUDIO RECORDING MEDIA.—The royalty payment due under section 1011 of this title for each digital audio recording medium imported into and distributed in the United States, or manufactured and distribut-

ed in the United States, shall be 3 percent of the transfer price. However, only the first person to manufacture and distribute or import and distribute such medium shall be required to pay the royalty with respect to such medium.

"(c) RETURNED OR EXPORTED MERCHANDISE.—

"(1) In calculating the amount of royalty payments due under subsections (a) and (b) of this section, manufacturers and importers may deduct the amount of any royalty payments already made on digital audio recording devices or media that are—

"(A) returned to the manufacturer or importer as unsold or defective merchandise; or

"(B) exported by the manufacturer or importer or a related person.

"(2) Any such credit shall be taken during the period when such devices or media are returned or exported, and the basis for any such credit shall be set forth in the statement of account for such period filed under section 1011(c) of this title.

"(3) Any such credit that is not fully used during such period may be carried forward to subsequent periods. If any returned or exported merchandise for which a credit has been taken is subsequently distributed, a royalty payment shall be made as specified under subsection (a) or (b) of this section,

based on the transfer price applicable to such distribution.

"§ 1013. Deposit of royalty payments and deduction of expenses

"The Register shall receive all royalty payments deposited under this chapter and, after deducting the reasonable costs incurred by the Copyright Office under this chapter, shall deposit the balance in the Treasury of the United States, in such manner as the Secretary of the Treasury directs. All funds held by the Secretary of the Treasury shall be invested in interest-bearing United States securities for later distribution with interest under section 1014, 1015, or 1016 of this title. The Register shall submit to the Copyright Royalty Tribunal, on a quarterly basis, such information as the Tribunal shall require to perform its functions under this chapter.

"§ 1014. Entitlement to royalty payments

"(a) INTERESTED COPYRIGHT PARTIES.—The royalty payments deposited pursuant to section 1013 of this title shall, in accordance with the procedures specified in section 1015 or 1016 of this title, be distributed to any interested copyright party—

"(1) whose musical work or sound recording has been—

"(A) embodied in phonorecords lawfully made under this title that have been distributed to the public, and

"(B) distributed to the public in the form of phonorecords or disseminated to the public in transmissions, during the period to which such payments pertain; and

"(2) who has filed a claim under section 1015 or 1016 of this title.

"(b) ALLOCATION OF ROYALTY PAYMENTS TO GROUPS.—The royalty payments shall be divided into two funds as follows:

"(1) THE SOUND RECORDINGS FUND.—66⅔ percent of the royalty payments shall be allocated to the Sound Recordings Fund. The American Federation of Musicians (or any successor entity) shall receive 2⅝ percent of the royalty payments allocated to the Sound Recordings Fund for the benefit of nonfeatured musicians who have performed on sound recordings distributed in the United States. The American Federation of Television and Radio Artists (or any successor entity) shall receive 1⅜ percent of the royalty payments allocated to the Sound Recordings Fund for the benefit of nonfeatured vocalists who have performed on sound recordings distributed

in the United States. The remaining royalty payments in the Sound Recordings Fund shall be distributed to claimants under subsection (a) of this section who are interested copyright parties under section 1001(a)(6)(i) of this title. Such claimants shall allocate such royalty payments, on a per sound recording basis, in the following manner: 40 percent to the recording artist or artists featured on such sound recordings (or the persons conveying rights in the artists' performances in the sound recordings), and 60 percent to the interested copyright parties.

"(2) THE MUSICAL WORKS FUND.—

"(A) 33⅓ percent of the royalty payments shall be allocated to the Musical Works Fund for distribution to interested copyright parties whose entitlement is based on legal or beneficial ownership or control of a copyright in a musical work.

"(B) Notwithstanding any contractual obligation to the contrary—

"(i) music publishers shall be entitled to 50 percent of the royalty payments allocated to the Musical Works Fund, and

"(ii) writers shall be entitled to the other 50 percent of the royalty payments allocated to the Musical Works Fund.

"(c) ALLOCATION OF ROYALTY PAYMENTS WITHIN GROUPS.—If all interested copyright parties within a group specified in subsection (b) of this section do not agree on a voluntary proposal for the distribution of the royalty payments within such group, the Tribunal shall, pursuant to the procedures specified in section 1015(c) of this title, allocate such royalty payments based on the extent to which, during the relevant period—

"(1) for the Sound Recordings Fund, each sound recording was distributed to the public in the form of phonorecords; and

"(2) for the Musical Works Fund, each musical work was distributed to the public in the form of phonorecords or disseminated to the public in transmissions.

"§ 1015. Procedures for distributing royalty payments

"(a) FILING OF CLAIMS AND NEGOTIATIONS.—

"(1) During the first 2 months of each calendar year after the calendar year in which this chapter takes effect, every interested copyright party that is entitled to royalty payments under section 1014 of this title shall file with the Tribunal a claim for pay-

ments collected during the preceding year in such form and manner as the Tribunal shall prescribe by regulation.

"(2) All interested copyright parties within each group specified in section 1014(b) of this title shall negotiate in good faith among themselves in an effort to agree to a voluntary proposal for the distribution of royalty payments. Notwithstanding any provision of the antitrust laws, for purposes of this section such interested copyright parties may agree among themselves to the proportionate division of royalty payments, may lump their claims together and file them jointly or as a single claim, or may designate a common agent to receive payment on their behalf; except that no agreement under this subsection may vary the division of royalties specified in section 1014(b) of this title.

"(b) DISTRIBUTION OF PAYMENTS IN THE ABSENCE OF A DISPUTE.—Within 30 days after the period established for the filing of claims under subsection (a) of this section, in each year after the year in which this section takes effect, the Tribunal shall determine whether there exists a controversy concerning the distribution of royalty payments under section 1014(c) of this title. If the Tribunal determines that no such controversy exists, it shall au-

thorize the distribution of the royalty payments as set forth in the agreements regarding the distribution of royalty payments entered into pursuant to subsection (a) of this section, after deducting its reasonable administrative costs under this section.

"(c) RESOLUTION OF DISPUTES.—If the Tribunal finds the existence of a controversy, it shall, pursuant to chapter 8 of this title, conduct a proceeding to determine the distribution of royalty payments. During the pendency of such a proceeding, the Tribunal shall withhold from distribution an amount sufficient to satisfy all claims with respect to which a controversy exists, but shall, to the extent feasible, authorize the distribution of any amounts that are not in controversy.

"§ 1016. Negotiated collection and distribution arrangements

"(a) SCOPE OF PERMISSIBLE NEGOTIATED ARRANGEMENTS.—

"(1) Notwithstanding sections 1011 through 1015 of this title, interested copyright parties and interested manufacturing parties may at any time negotiate among or between themselves an alternative system for the collection, distribution, or verification of royalty payments provided for in this chapter.

"(2) Such a negotiated arrangement may vary the collection, distribution, and verification procedures and requirements that would otherwise apply, including the time periods for payment and distribution of royalties, but shall not alter the royalty rates specified in section 1012(a)(1) or (b) of this title, the division of royalty payments specified in section 1014(b) of this title, or the notice requirement of section 1011(b) of this title.

"(3) Such a negotiated arrangement may also provide that specified types of disputes that cannot be resolved among the parties shall be resolved by binding arbitration or other agreed upon means of dispute resolution. Notwithstanding any provision of the antitrust laws, for purposes of this section interested manufacturing parties and interested copyright parties may agree among themselves as to the collection, allocation, distribution, and verification of royalty payments, and may designate common agents to negotiate and carry out such activities on their behalf.

"(b) IMPLEMENTATION OF A NEGOTIATED ARRANGEMENT.—(1)(A) No negotiated arrangement shall go into effect under this section until the Tribunal has deter-

mined, after full opportunity for comment, that the participants in the negotiated arrangement include—

"(i) at least two-thirds of all individual interested copyright parties that are entitled to receive royalty payments from the Sound Recordings Fund,

"(ii) at least two-thirds of all individual interested copyright parties that are entitled to receive royalty payments from the Musical Works Fund as music publishers, and

"(iii) at least two-thirds of all individual interested copyright parties that are entitled to receive royalty payments from the Musical Works Fund as writers.

"(B) For purposes of subparagraph (A) of this paragraph, the determination as to two-thirds participation shall be based on annual retail sales of phonorecords in which musical works or sound recordings of musical works are embodied. One or more organizations representing any of the types of individual interested copyright parties specified in the first sentence of this subsection shall be presumed to represent two-thirds of that type of interested copyright party if the membership of, or other participation in, such organization or organizations includes two-thirds of that type of interested copyright party based on

annual retail sales of phonorecords in which musical works or sound recordings of musical works are embodied.

"(2) Notwithstanding the existence of a negotiated arrangement that has gone into effect under this subsection—

"(A) any interested manufacturing party that is not a party to such negotiated arrangement may fully satisfy its obligations under this subchapter by complying with the procedures set forth in section 1011 of this title; and

"(B) the Tribunal shall ensure that alternative distribution procedures are available for any interested copyright party that is not a party to such negotiated arrangement.

"(c) MAINTENANCE OF JURISDICTION BY TRIBUNAL.—Where a negotiated arrangement has gone into effect under this section, the Tribunal shall maintain jurisdiction to hear and address any objections to the arrangement that may arise while it is in effect, and to ensure the availability of alternative procedures for any interested manufacturing party or interested copyright party that is not a participant in the negotiated arrangement.

"SUBCHAPTER C—THE SERIAL COPY MANAGEMENT SYSTEM

"§ 1021. Incorporation of the serial copy management system

"(a) PROHIBITION ON IMPORTATION, MANUFACTURE, AND DISTRIBUTION.—

"(1) No person shall import, manufacture, or distribute any digital audio recording device or any digital audio interface device that does not conform to the standards and specifications to implement the Serial Copy Management System that are—

"(A) set forth in the technical reference document;

"(B) set forth in an order by the Secretary of Commerce under section 1022(b) (1), (2), or (3) of this title; or

"(C) in the case of a digital audio recording device other than a device defined in part II of the technical reference document or in an order issued by the Secretary pursuant to section 1022(b) of this title, established by the manufacturer (or, in the case of a proprietary technology, the proprietor of such technology) so as to achieve the same functional characteristics with respect to regulation of serial copy-

ing as, and to be compatible with the prevailing method for implementation of, the Serial Copy Management System set forth in the technical reference document or in any order of the Secretary issued under section 1022 of this title.

"(2) If the Secretary of Commerce approves standards and specifications under section 1022(b)(4) of this title, then no person shall import, manufacture, or distribute any digital audio recording device or any digital audio interface device that does not conform to such standards and specifications.

"(b) PROHIBITION ON CIRCUMVENTION OF THE SERIAL COPY MANAGEMENT SYSTEM.—No person shall import, manufacture, or distribute any device, or offer or perform any service, the primary purpose or effect of which is to avoid, bypass, remove, deactivate, or otherwise circumvent any program or circuit which implements, in whole or in part, the Serial Copy Management System in a digital audio recording device or a digital audio interface device.

"(c) ENCODING OF INFORMATION ON PHONORECORDS.—(1) No person shall encode a phonorecord of a sound recording with inaccurate information relating to the category code, copyright status, or generation status

of the source material so as improperly to affect the operation of the Serial Copy Management System.

"(2) Nothing in this subchapter requires any person engaged in the importation, manufacture, or assembly of phonorecords to encode any such phonorecord with respect to its copyright status.

"(d) INFORMATION ACCOMPANYING TRANSMISSIONS IN DIGITAL FORMAT.—Any person who transmits or otherwise communicates to the public any sound recording in digital format is not required under this subchapter to transmit or otherwise communicate the information relating to the copyright status of the sound recording. However, any such person who does transmit or otherwise communicate such copyright status information shall transmit or communicate such information accurately.

"§ 1022. Implementing the serial copy management system

"(a) PUBLICATION OF TECHNICAL REFERENCE DOCUMENT.—Within 10 days after the date of the enactment of this chapter, the Secretary of Commerce shall cause the technical reference document to be published in the Federal Register.

"(b) ORDERS OF SECRETARY OF COMMERCE.—The Secretary of Commerce, upon petition by an interested manufacturing party or an interested copyright party, and

after consultation with the Register, may, if the Secretary determines that to do so is in accordance with the purposes of this chapter, issue an order to implement the Serial Copy Management System set forth in the technical reference document as follows:

"(1) FUNCTIONALLY EQUIVALENT ALTERNATIVES.—The Secretary may issue an order for the purpose of permitting in commerce devices that do not conform to all of the standards and specifications set forth in the technical reference document, if the Secretary determines that such devices possess the same functional characteristics with respect to regulation of serial copying as, and are compatible with the prevailing method for implementation of, the Serial Copy Management System set forth in the technical reference document.

"(2) REVISED GENERAL STANDARDS.—The Secretary may issue an order for the purpose of permitting in commerce devices that do not conform to all of the standards and specifications set forth in the technical reference document, if the Secretary determines that—

"(A) the standards and specifications relating generally to digital audio recording devices and digital audio interface devices have

been or are being revised or otherwise amended or modified such that the standards and specifications set forth in the technical reference document are not or would no longer be applicable or appropriate; and

"(B) such devices conform to such new standards and specifications and possess the same functional characteristics with respect to regulation of serial copying as the Serial Copy Management System set forth in the technical reference document.

"(3) STANDARDS FOR NEW DEVICES.—The Secretary may issue an order for the purpose of—

"(A) establishing whether the standards and specifications established by a manufacturer or proprietor for digital audio recording devices other than devices defined in part II of the technical reference document or a prior order of the Secretary under paragraph (1) or (2) of this subsection comply with the requirements of subparagraph (C) of section 1021(a)(1) of this title; or

"(B) establishing alternative standards or specifications in order to ensure compliance with such requirements.

"(4) MATERIAL INPUT TO DIGITAL DEVICE THROUGH ANALOG CONVERTER.—

"(A) GENERALLY.—Except as provided in subparagraphs (B) through (D), the Secretary, after publication of notice in the Federal Register and reasonable opportunity for public comment, may issue an order for the purpose of approving standards and specifications for a technical method implementing in a digital audio recording device the same functional characteristics as the Serial Copy Management System so as to regulate the serial copying of source material input through an analog converter in a manner equivalent to source material input in the digital format.

"(B) COST LIMITATION.—The order may not impose a total cost burden on manufacturers of digital audio recording devices, for implementing the Serial Copy Management System and the technical method prescribed in such order, in excess of 125 percent of the cost of implementing the Serial Copy Management System before the issuance of such order.

"(C) CONSIDERATION OF OTHER OBJECTIONS.—The Secretary shall consider other rea-

soned objections from any interested manufacturing party or interested copyright party.

"(D) LIMITATION TO DIGITAL AUDIO DEVICES.—The order shall not affect the recording of any source material on analog recording equipment and the order shall not impose any restrictions or requirements that must be implemented in any device other than a digital audio recording device or digital audio interface device.

"SUBCHAPTER D—REMEDIES

"§ 1031. Civil remedies

"(a) CIVIL ACTIONS.—Any interested copyright party or interested manufacturing party that is or would be injured by a violation of section 1011 or 1021 of this title, or the Attorney General of the United States, may bring a civil action in an appropriate United States district court against any person for such violation.

"(b) POWERS OF THE COURT.—In an action brought under subsection (a) of this section, the court—

"(1) except as provided in subsection (h) of this section, may grant temporary and permanent injunctions on such terms as it deems reasonable to prevent or restrain such violation;

"(2) in the case of a violation of section 1011 (a) through (d) or 1021 of this title, shall award damages under subsection (d) of this section;

"(3) in its discretion may allow the recovery of full costs by or against any party other than the United States or an officer thereof;

"(4) in its discretion may award a reasonable attorney's fee to the prevailing party as part of the costs awarded under paragraph (3) if the court finds that the nonprevailing party has not proceeded in good faith; and

"(5) may grant such other equitable relief as it deems reasonable.

"(c) RECOVERY OF OVERDUE ROYALTY PAYMENTS.—In any case in which the court finds that a violation of section 1011 of this title involving nonpayment or underpayment of royalty payments has occurred, the violator shall be directed to pay, in addition to damages awarded under subsection (d) of this section, any such royalties due, plus interest calculated as provided under section 1961 of title 28, United States Code.

"(d) AWARD OF DAMAGES.—

"(1) SECTION 1011.—

"(A) DEVICE.—In the case of a violation of section 1011(a) through (d) of this title in-

volving a digital audio recording device, the court shall award statutory damages in an amount between a nominal level and $100 per device, as the court considers just.

"(B) MEDIUM.—In the case of a violation of section 1011(a) through (d) of this title involving a digital audio recording medium, the court shall award statutory damages in an amount between a nominal level and $4 per medium, as the court considers just.

"(2) SECTION 1021.—In any case in which the court finds that a violation of section 1021 of this title has occurred, the court shall award damages calculated, at the election of the complaining party at any time before final judgment is rendered, pursuant to subparagraph (A) or (B) of this paragraph, but in no event shall the judgment (excluding any award of actual damages to an interested manufacturing party) exceed a total of $1,000,000:

"(A) ACTUAL DAMAGES.—A complaining party may recover its actual damages suffered as a result of the violation and any profits of the violator that are attributable to the violation that are not taken into account in computing the actual damages. In determining the vio-

lator's profits, the complaining party is required to prove only the violator's gross revenue, and the violator is required to prove its deductible expenses and the elements of profit attributable to factors other than the violation.

"(B) STATUTORY DAMAGES.—

"(i) DEVICE.—A complaining party may recover an award of statutory damages for each violation of section 1021(a) or (b) of this title in the sum of not less than $1,000 nor more than $10,000 per device involved in such violation or per device on which a service prohibited by section 1021(b) of this title has been performed, as the court considers just.

"(ii) PHONORECORD.—A complaining party may recover an award of statutory damages for each violation of section 1021(c) of this title in the sum of not less than $10 nor more than $100 per phonorecord involved in such violation, as the court considers just.

"(iii) TRANSMISSION.—A complaining party may recover an award of damages for each transmission or communication

that violates section 1021(d) of this title in the sum of not less than $10,000 nor more than $100,000, as the court considers just.

"(3) WILLFUL VIOLATIONS.—

"(A) In any case in which the court finds that a violation of section 1011(a) through (d) of this title was committed willfully and for purposes of direct or indirect commercial advantage, the court shall increase statutory damages—

"(i) for a violation involving a digital audio recording device, to a sum of not less than $100 nor more than $500 per device; and

"(ii) for a violation involving a digital audio recording medium, to a sum of not less than $4 nor more than $15 per medium, as the court considers just.

"(B) In any case in which the court finds that a violation of section 1021 of this title was committed willfully and for purposes of direct or indirect commercial advantage, the court in its discretion may increase the award of damages by an additional amount of not more than $5,000,000, as the court considers just.

"(4) INNOCENT VIOLATIONS OF SECTION 1021.—The court in its discretion may reduce the total award of damages against a person violating section 1021 of this title to a sum of not less than $250 in any case in which the court finds that—

"(A) the violator was not aware and had no reason to believe that its acts constituted a violation of section 1021 of this title, or

"(B) in the case of a violation of section 1021(a) of this title involving a digital audio recording device, the violator believed in good faith that the device complied with section 1021(a)(1)(C) of this title, except that this subparagraph shall not apply to any damages awarded under subsection (d)(2)(A) of this section.

"(e) MULTIPLE ACTIONS.—

"(1) GENERALLY.—No more than one action shall be brought against any party and no more than one award of statutory damages under subsection (d) of this section shall be permitted—

"(A) for any violations of section 1011 of this title involving the same digital audio recording device or digital audio recording medium; or

"(B) for any violations of section 1021 of this title involving digital audio recording devices or digital audio recording media of the same model, except that this subparagraph shall not bar an action or an award of damages with respect to digital audio recording devices or digital audio recording media that are imported, manufactured, or distributed subsequent to a final judgment in a prior action.

"(2) NOTICE AND INTERVENTION.—Any complaining party who brings an action under this section shall serve a copy of the complaint upon the Register within 10 days after the complaining party's service of a summons upon a defendant. The Register shall cause a notice of such action to be published in the Federal Register within 10 days after receipt of such complaint. The court shall permit any other interested copyright party or interested manufacturing party entitled to bring the action under section 1031(a) of this title who moves to intervene within 30 days after the publication of such notice to intervene in the action.

"(3) AWARD.—

"(A) GENERALLY.—Except as provided in subparagraph (B), the court may award recov-

ery of actual damages for a violation of section 1021 of this title pursuant to subsection (d)(2)(A) of this section to each complaining party in an action who elects to recover actual damages.

"(B) LIMITATIONS.—

"(i) If more than one complaining party elects to recover actual damages pursuant to subsection (d)(2)(A) of this section, only a single award of the violator's profits shall be made, which shall be allocated as the court considers just.

"(ii) If any complaining interested copyright party or parties elect to recover statutory damages pursuant to subsection (d)(2) of this section in an action in which one or more other complaining interested copyright parties have elected to recover actual damages, the single award of statutory damages permitted pursuant to paragraph (1) of this subsection shall be reduced by the total amount of actual damages awarded to interested copyright parties pursuant to subsection (d)(2)(A) of this section.

"(f) PAYMENT OF OVERDUE ROYALTIES AND DAMAGES.—The court may allocate any award of damages under subsection (d) of this section between or among complaining parties as it considers just. Any award of damages that is allocated to an interested copyright party and any award of overdue royalties and interest under subsection (c) of this section shall be deposited with the Register pursuant to section 1013 of this title, or as may otherwise be provided pursuant to a negotiated arrangement authorized under section 1016 of this title, for distribution to interested copyright parties as though such funds were royalty payments made pursuant to section 1011 of this title.

"(g) IMPOUNDING OF ARTICLES.—At any time while an action under this section is pending, the court may order the impounding, on such terms as it deems reasonable, of any digital audio recording device, digital audio interface device, phonorecord, or device specified in section 1021(b) of this title that is in the custody or control of the alleged violator and that the court has reasonable cause to believe does not comply with, or was involved in a violation of, section 1021 of this title.

"(h) LIMITATIONS REGARDING PROFESSIONAL MODELS AND OTHER EXEMPT DEVICES.—Unless a court finds that the determination by a manufacturer or importer that

a device fits within the exemption of subparagraph (A) or (B) of section 1001(3) of this title was without a reasonable basis or not in good faith, the court shall not grant a temporary or preliminary injunction against the distribution of such device by the manufacturer or importer.

"(i) REMEDIAL MODIFICATION AND DESTRUCTION OF ARTICLES.—As part of a final judgment or decree finding a violation of section 1021 of this title, the court shall order the remedial modification, if possible, or the destruction of any digital audio recording device, digital audio interface device, phonorecord, or device specified in section 1021(b) of this title that—

"(1) does not comply with, or was involved in a violation of, section 1021 of this title, and

"(2) is in the custody or control of the violator or has been impounded under subsection (g) of this section.

"(j) DEFINITIONS.—For purposes of this section—

"(1) the term 'complaining party' means an interested copyright party, interested manufacturing party, or the Attorney General of the United States when one of these parties has initiated or intervened as a plaintiff in an action brought under this section; and

"(2) the term 'device' does not include a phonorecord.

"§ 1032. Binding arbitration

"(a) DISPUTES TO BE ARBITRATED.—Any dispute between an interested manufacturing party and an interested copyright party shall be resolved through binding arbitration, in accordance with the provisions of this section, if—

"(1) the parties mutually agree; or

"(2) before the date of first distribution in the United States of the product which is the subject of the dispute, an interested manufacturing party or an interested copyright party requests arbitration concerning whether such product is or is not a digital audio recording device, a digital audio recording medium, or a digital audio interface device, or concerning the basis on which royalty payments are to be made with respect to such product.

"(b) ARBITRAL PROCEDURES.—

"(1) REGULATIONS FOR COORDINATION OF ARBITRATION.—The Register shall, after consulting with interested copyright parties, prescribe regulations establishing a procedure by which interested copyright parties will coordinate decisions and representation concerning the arbitration of disputes. No

interested copyright party shall have the authority to request, agree to, or (except as an intervenor pursuant to subsection (c) of this section) enter into, binding arbitration unless that party shall have been authorized to do so pursuant to the regulations prescribed by the Register.

"(2) PANEL.—Except as otherwise agreed by the parties to a dispute that is to be submitted to binding arbitration under subsection (a) of this section, the dispute shall be heard by a panel of three arbitrators, with one arbitrator selected by each of the two sides to the dispute and the third arbitrator selected by mutual agreement of the first two arbitrators chosen.

"(3) DECISION.—The arbitral panel shall render its final decision concerning the dispute, in a written opinion explaining its reasoning, within 120 days after the date on which the selection of arbitrators has been concluded. The Register shall cause to be published in the Federal Register the written opinion of the arbitral panel within 10 days after receipt thereof.

"(4) TITLE 9 PROVISIONS TO GOVERN.—Except to the extent inconsistent with this section, any arbitration proceeding under this section shall be con-

ducted in the same manner, subject to the same limitations, carried out with the same powers (including the power to summon witnesses), and enforced in the courts of the United States as an arbitration proceeding under title 9, United States Code.

"(5) PRECEDENTS.—In rendering a final decision, the arbitral panel shall take into account any final decisions rendered in prior proceedings under this section that address identical or similar issues; and failure of the arbitral panel to take account of such prior decisions may be considered imperfect execution of arbitral powers under section 10(a)(4) of title 9, United States Code.

"(c) NOTICE AND RIGHT TO INTERVENE.—Any interested copyright party or interested manufacturing party that requests an arbitral proceeding under this section shall provide the Register with notice concerning the parties to the dispute and the nature of the dispute within 10 days after formally requesting arbitration under subsection (a) of this section. The Register shall cause a summary of such notice to be published in the Federal Register within 10 days after receipt of such notice. The arbitral panel shall permit any other interested copyright party or interested manufacturing party who moves to in-

tervene within 20 days after such publication to intervene in the action.

"(d) AUTHORITY OF ARBITRAL PANEL TO ORDER RELIEF.—

"(1) TO PROTECT PROPRIETARY INFORMATION.—The arbitral panel shall issue such orders as are appropriate to protect the proprietary technology and information of parties to the proceeding, including provision for injunctive relief in the event of a violation of such order.

"(2) TO TERMINATE PROCEEDING.—The arbitral panel shall terminate any proceeding that it has good cause to believe has been commenced in bad faith by a competitor in order to gain access to proprietary information. The panel shall also terminate any proceeding that it believes has been commenced before the technology or product at issue has been sufficiently developed or defined to permit an informed decision concerning the applicability of this chapter to such technology or product.

"(3) TO ORDER RELIEF.—In any case in which the arbitral panel finds, with respect to devices or media that were the subject of the dispute, that royalty payments have been or will be due under section 1011 of this title through the date of the arbitral de-

cision, the panel shall order the deposit of such royalty payments pursuant to section 1013 of this title, plus interest calculated as provided under section 1961 of title 28, United States Code. The arbitral panel shall not award monetary or injunctive relief, as provided in section 1031 of this title or otherwise, except as is expressly provided in this subsection.

"(e) EFFECT OF ARBITRATION PROCEEDING ON CIVIL ACTIONS AND REMEDIES.—Notwithstanding any provision of section 1031 of this title, no civil action may be brought or relief granted under section 1031 of this title against any party to an ongoing or completed arbitration proceeding under this section, with respect to devices or media that are the subject of such an arbitration proceeding. However, this subsection does not bar—

"(1) an action for injunctive relief at any time based on a violation of section 1021 of this title; or

"(2) an action or any relief with respect to those devices or media distributed by their importer or manufacturer following the conclusion of such arbitration proceeding, or, if so stipulated by the parties, prior to the commencement of such proceeding.

"(f) ARBITRAL COSTS.—Except as otherwise agreed by the parties to a dispute, the costs of an arbitral proceeding under this section shall be divided among the par-

ties in such fashion as is considered just by the arbitral panel at the conclusion of the proceeding. Each party to the dispute shall bear its own attorney fees unless the arbitral panel determines that a nonprevailing party has not proceeded in good faith and that, as a matter of discretion, it is appropriate to award reasonable attorney's fees to the prevailing party.".

SEC. 3. TECHNICAL AMENDMENTS.

(a) FUNCTIONS OF REGISTER.—Chapter 8 of title 17, United States Code is amended—

(1) in section 801(b)—

(A) by striking "and" at the end of paragraph (2);

(B) by striking the period at the end of paragraph (3) and inserting "; and"; and

(C) by adding the following new paragraph at the end:

"(4) to distribute royalty payments deposited with the Register of Copyrights under section 1014, to determine, in cases where controversy exists, the distribution of such payments, and to carry out its other responsibilities under chapter 10"; and

(2) in section 804(d)—

(A) by inserting "or (4)" after "801(b)(3)"; and

(B) by striking "or 119" and inserting "119, 1015, or 1016".

(b) DEFINITIONS.—Section 101 of title 17, United States Code, is amended by striking "As used" and inserting "Except as otherwise provided in this title, as used".

(c) MASK WORKS.—Section 912 of title 17, United States Code, is amended—

(1) in subsection (a) by inserting "or 10" after "8"; and

(2) in subsection (b) by inserting "or 10" after "8".

SEC. 4. EFFECTIVE DATE.

This Act, and the amendments made by this Act, shall take effect on the date of the enactment of this Act or January 1, 1992, whichever date is later.

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United States Senate
COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

The Honorable Ralph Oman
Register of Copyrights
Library of Congress
Washington, D.C. 20540

Dear Register Oman:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

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RESPONSES TO ADDITIONAL QUESTIONS FROM SENATOR LEAHY ON DIGITAL AUDIO TAPE LEGISLATION

QUESTION 1. Some critics say that this agreement sets a troubling precedent. They say that if copyright holders in the music industry can get royalties on the machines that copy their music, other copyright holders may demand a royalty on the machines that play and record the material they create -- be it computer programs, or, in the future, digital video. Do you believe this legislation creates a troubling precedent?

ANSWER: No. This legislation does not create a troubling precedent. First, by its terms, S. 1623 limits its potential for creating any precedent -- good or bad. Section 1003 of the bill states that:

> Except as expressly provided in this chapter with respect to audio recording devices and media, neither the enactment of this chapter nor anything contained in this chapter shall be construed to expand, limit, or otherwise affect the rights of any person with respect to private home copying of copyrighted works, or to expand, limit, create, or otherwise affect any other right or remedy that may be held or available to any person under chapters 1 through 9 of this title.

Thus, the bill eliminates possible interpretations of newly created or greater rights based on its provisions. This is so not only for computer programs and audiovisual works, but also for analog home recordings of music. But for the specific rights created within the bill, copyright owners should fare no better or worse under this legislation than under existing law.

In addition, digital audio recording devices are defined in such a way as to exclude audiovisual works and computer programs. Thus, the bill is narrowly drawn and insulated against broad application by its terms.

Second, precedent regarding home copying royalties is already established. The laws of seventeen other countries, including most western European countries, provide remuneration to authors of musical works and sound recordings for home copying. Japan and several other countries are also considering such legislation. I believe the international community will be greatly influenced in favor of home copying legislation if this bill is enacted. But rather than setting new precedent, S. 1623 fits neatly into the prevailing scheme in industrialized countries of dealing with home copying of musical works recorded on phonorecords.

QUESTION 2. Some say that copying for personal use -- for example, copying a CD to a digital audiotape for use in your car -- is a "fair use" under the Copyright Act. Do you agree? If such copying is a "fair use," do you believe that consumers should still have to pay a royalty for such use?

ANSWER: The copyright law gives four factors that a court is to use to determine whether or not a particular use is fair: (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work.

With respect to the first and second factors, taping for use in a car would not be for educational purposes, ordinarily, but rather for entertainment. Courts are disposed less favorably toward fair use respecting entertainment uses as opposed to educational and informational uses. The third factor, if the entire work were copied, would also weigh against fair use. The Supreme Court (Harper & Row v. the Nation Enterprises, 471 U.S. 539 (1984)) has indicated that the fourth factor, the effect of the use upon the potential market for or value of the copyrighted work is of paramount importance. The making of multiple copies would seem to have a negative impact on the market for copyrighted works since a person who might have purchased two recordings -- just as a person may purchase two copies of the same book -- would purchase only one.

In the Betamax case (Universal City Studios v. Sony, 464 U.S. 417 (1984) the Supreme Court indicated that while home taping for the purpose of viewing a broadcast program at another time (known as "time-shifting") fell within fair use, taping for the purpose of making permanent copies ("librarying") was given no such exemption. Copying a CD to a digital audiotape for use in a car digital audio system, would seem to fall outside the Betamax guidelines since a permanent copy is retained.

As you know, fair use is for judicial determination, so my opinion is advisory. Howver, applying the case law and the statutory fair use factors to this question, I cannot say that the making of permanent copies of copyrighted works for personal use is fair.

United States Senate
COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Mr. John V. Roach
Chairman, Tandy Corporation
1 Tandy Circle
Fort Worth, Texas 76102

Dear Mr. Roach:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

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Enclosure

Question for John Roach from Sen. Leahy

Question: Can you describe how the failure up until now to reach an agreement on digital home taping affected the ability of manufacturers to bring digital recording equipment to the American market? Has this equipment been more readily available in overseas markets?

Answer: Digital recording technology has been available for a number of years in DAT format. Other digital formats for both tape and disk are fairly recent developments. Because of the opposition to digital home taping by the music industry until now, the DAT format was not supported with pre-recorded software, a requisite ingredient for a successful digital successor to the very popular analog cassette currently in use. Further, litigation, both filed and threatened, against digital recording equipment manufacturers virtually paralyzed the advancement of the products in the U.S. Tandy Corporation has worked on two digital recording technologies for several years, but could not introduce them in the uncertain legal environment. The Audio Home Recording Act settles forever the right of the consumer to make home recordings for non-commercial purposes, and thus, the liability of a manufacturer for contributory copyright violation. Also, music industry cooperation in supporting at least one new music format is assured. Enactment of the Act will assure that American consumers have access to advanced audio technologies and pre-recorded music contemporaneously, if not in ahead of the rest of the world.

United States Senate

COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Ms. Linda Golodner
Executive Director
National Consumers League
815 15th Street, N.W., Suite 928-N
Washington, D.C. 20005

Dear Ms. Golodner:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

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National Consumers League
Founded 1899

815 15th Street NW • Suite 928-N • Washington, DC 20005 • (202) 639-8140

Linda F. Golodner, Executive Director

November 18, 1991

The Honorable Patrick J. Leahy
United States Senate
Committee on the Judiciary
Washington, DC 20510-6275

Dear Senator Leahy:

This letter is in response to your supplemental question for inclusion in the hearing record on the Audio Home Recording Act of 1991. Your question: There are critics of this legislation who claim it is bad for consumers since it puts some restrictions on home taping and requires the payment of a royalty, the cost of which will be passed on to consumers. How do you respond to such critics?

The agreement reached by the consumer electronics and music industries and creative artists on the subject of digital audio recording technology opens the door for consumers to finally be able to enjoy access to this exciting new technology. Passage of the legislation will also mean that the cloud of illegality of home taping will be lifted for consumers.

The royalty required of the manufacturer or the importer to be added to both equipment and tape may well be passed on to the consumer at point of sale. As you know, the amount for each tape is estimated to be pennies and for the equipment will be a one-time capped charge. However, it is important to be aware of the realities of this marketplace. We all know that the record and tape industry and the electronics industry is highly competitive. Simply by opening the newspaper or walking through a shopping center a consumer can easily determine who is giving the best price for the purchase of equipment and tapes. If the price is not right one week, you can just wait for holiday and special sales to get the price you want. Quite frankly, we don't expect this competitive environment to change. The consumer should still be able to comparatively shop and get the best deal available.

For additional comments on this subject, please refer to the testimony I presented to the subcommittee on October 29, 1991. If you would like additional information or wish further clarification of our position, please let me know.

Sincerely,

LINDA F. GOLODNER
Executive Director

United States Senate
COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Mr. Jay Berman
President, Recording Industry Association of America
1020 19th Street, N.W., Suite 200
Washington, D.C. 20036

Dear Mr. Berman:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

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Enclosure

ANSWER TO QUESTION FROM SENATOR PATRICK LEAHY

1. As I understand it, the time may soon be here when music is broadcast digitally. At that point, consumers will have the ability to make a digital recording without ever buying the sound recording in the first place. How does your industry propose to tackle that problem?

Answer. The advent of new digital technologies, including digital audio broadcasting, does indeed present a threat to the recording industry. Furthermore, this threat goes far beyond the mere ability to make a digital copy without purchasing the original sound recording. Services that provide instantaneous access to CD-quality music, such as digital audio cable and pay per listen, will eliminate the need to even make a copy -- the consumer essentially can have the recording "delivered" directly into the home. In addition, consumers will actually pay a subscription fee to the offerors of these services, taking money out of their pockets that would otherwise be spent to purchase records. These services will then be in a position to exploit our product for a profit without any clear obligation to compensate us. As such, to protect the holders of the sound recording copyright, we would urge Congress to pass legislation creating a right of public performance for sound recordings.

Recently, the Copyright Office issued a report requested by Senator DeConcini on the copyright implications of digital audio transmission services. In this report, the Register reiterated the Copyright Office's longstanding recommendation that Congress establish a perfcrmance right in sound recordings. The basis for the Copyright Office's recommendation is three-fold. First, new digital audio transmission technologies are likely to fundamentally change the manner in which sound recordings are marketed to and enjoyed by listeners, to the detriment of the sound recording copyright owner. Second, even in today's marketplace, the Copyright Office has recommended a performance right for sound recordings. Specifically, the Copyright Office's report concludes generally that there is no economic justification for depriving copyright owners of sound recordings of the same rights afforded to owners of all other classes of copyrighted works that can be publicly performed.

RECORDING INDUSTRY ASSOCIATION OF AMERICA, INC.
1020 Nineteenth Street, N.W. ■ Suite 200 ■ Washington, D.C. 20036 ■ Phone: (202) 775-0101 ■ Fax: (202) 775-7253

And third, the absence of a performance right in the United States places us in stark contrast to established and growing worldwide norms, impairs our trade negotiators' credibility when they seek enhanced respect for intellectual property principles among our trading partners, and impedes the U.S. recording industry's access to international performance right royalty pools.

In conclusion, we fully support S. 1623 as the appropriate solution to the difficult issue of audio home recording. At the same time, however, digital audio transmission technologies pose additional challenges to the rights of sound recording copyright owners beyond the home copying issues addressed by S. 1623. Accordingly, we encourage Congress to separately establish a performance right for sound recordings.

Respectfully submitted,

Jason S. Berman
President

United States Senate
COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Mr. Gary Shapiro
Group Vice-President, Consumer Electronics Group
2001 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

Dear Mr. Shapiro:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

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Recording Industry Association of America	(C) Copyright Coalition	Electronic Industries Association, Consumer Electronics Group

JOINT ANSWER TO QUESTION FROM SENATOR PATRICK LEAHY

1. Some say that copying for personal use -- for example, copying a CD to a digital audiotape for use in your car -- is a "fair use" under the Copyright Act. Do you agree?

If such copying is a "fair use," do you believe that consumers should still have to pay a royalty for such use?

Answer: Questions as to the circumstances under which private, noncommercial copying by individuals may be considered "fair use" under the Copyright Act are among those that had previously caused controversy among the parties that have endorsed the Audio Home Recording Act. (Interests represented by Mr. Berman and Mr. Murphy would say "No" in response to the first question; those represented by Mr. Shapiro would say "Yes".)

But our joint response today is that the controversy posed by this question is avoided by enactment of the Audio Home Recording Act. Section 1002 specifically provides that making such a copy " ... by a consumer for private, noncommercial use is ... not actionable." Consumers would gain a major benefit under the Act, since the threat of litigation over whether such copying is a "fair use" would be removed, and consumers' access to new digital audio technologies is likely to be enhanced.

All of us believe that the system provided for in S. 1623 for the payment of modest royalties is an appropriate mechanism to resolve a longstanding and complex legal controversy and to avoid the costs and uncertainties of litigation. Moreover, it bears emphasis that the Act does not provide that consumers pay royalties, based on particular instances of copying or otherwise. Rather, it provides that manufacturers and importers pay royalties based on sales of equipment and media to consumers.

We believe the compromise of interests embodied in the Act is fair to all, and in the public interest.

Respectfully submitted,

Jason S. Berman President Recording Industry Association of America	Edward P. Murphy President National Music Publishers' Association, Inc.	Gary J. Shapiro Group Vice President Consumer Electronics Group (EIA/CEG)

United States Senate

COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Mr. Edward P. Murphy
National Music Publishers' Association
The Harry Fox Agency
205 East 42nd Street
New York City, New York 10017

Dear Mr. Murphy:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

Sincerely,

Dennis DeConcini

DENNIS DeCONCINI
Chairman
Subcommittee on Patents,
Copyrights and Trademarks

DDC/ma
Enclosure

Recording Industry
Association of America

JOINT ANSWER TO QUESTION FROM
SENATOR PATRICK LEAHY

Question

The so-called "Athens Agreement" reached between the recording industry and the electronics industry in 1989 provided that digital audio recorders had to be built with the Serial Copy Management System, but did not provide for royalty payments. How do you respond to critics who say that it is unfair to consumers to require both the SCMS -- which limits the extent of home taping -- and a royalty?

Answer

We believe that any criticism of the Audio Home Recording Act as unfair to consumers overlooks the major benefits to consumers from passage of the bill. The bill would permit consumers to copy prerecorded music for private, noncommercial use without fear of copyright infringement litigation. Indeed, the immunity from lawsuit extends to both analog and digital copying, even though the bill imposes no royalties and no copying restrictions in the analog area (which is the dominant audio recording technology in the marketplace today).

Moreover, there is nothing unfair or duplicative about SCMS combined with royalty payments. SCMS restricts only the ability to make "second generation" copies of prerecorded music (i.e., copies of copies). It does not restrict the making of "first generation" copies (e.g., copies from the original CD, cassette, or record). Thus, under SCMS, a consumer who purchased a CD in a local retail store could still use his digital audio recorder to make multiple digital copies of that CD.

From the music industry's perspective, however, "first generation" digital copying of copyrighted music does cause major economic harm to songwriters, music publishers, performing artists, and record companies. Digital copying permits the creation of copies that are audibly indistinguishable from the original CD, cassette, or record. The royalty payments contemplated

under the bill are very modest in the context of "first generation" digital copying, particularly when compared to royalty systems in place in other nations.

It is important to recall that the key reason the "Athens Agreement" was not supported throughout the music industry was because it did not contain a royalty component. Although some segments of the music industry supported the "Athens Agreement" as a useful first step in responding to the introduction of digital audio tape (DAT) technology, the rapid appearance of other digital audio recording technologies has clearly suggested the need to find a comprehensive solution that applies to all such technologies.

Upon closer analysis, therefore, it should be clear that SCMS and royalties are designed to deal with distinct issues within the context of audio home recording. Together, SCMS and royalties provide an essential blend of remedies. Without some protection against serial copying, the music industry would have urged much higher royalty payments. In fact, as was noted earlier, the royalty payments contemplated by the proposed legislation are significantly less than those typically adopted in other countries to address audio recording technologies.

In closing, it should be reemphasized that the consumer would enjoy key benefits under this legislation, including unfettered access to the latest digital audio recording technologies. We believe that the compromise contained in the bill is fair to all, and that it is very much in the public interest.

Respectfully submitted,

Edward P. Murphy/for

Edward P. Murphy
President
National Music Publishers'
Association, Inc.

Jason S. Berman/for

Jason S. Berman
President
Recording Industry
Association of America

United States Senate

COMMITTEE ON THE JUDICIARY
WASHINGTON, DC 20510-6275

November 6, 1991

Mr. H[illegible] Beacham
163[illegible]erdam Avenue #361
New [illegible] City, New York 10023

Dear Mr. Beacham:

Thank you for taking time out of your busy schedule to testify at the hearing on the Audio Home Recording Act of 1991. The members of the subcommittee are appreciative of having the benefit of your views, and your input will be extremely valuable to us as we consider this issue in the months ahead.

As mentioned during the hearing, Senator Leahy has enclosed some supplemental questions for inclusion in the hearing record. Please return the questions with your answers to the attention of Mara Mallin by November 18, 1991. Also, I encourage you to include any additional information that you feel will be beneficial to the hearing record, the general public and to the members of Congress.

Again, I thank you for your participation in the hearing. I look forward to working with you in the future.

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Chairman
Subcommittee on Patents,
Copyrights and Trademarks

DDC/ma
Enclosure

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Answer to written question by Senator Patrick Leahy to Frank Beacham

Sen. Patrick Leahy: Given the tremendous copying potential of digital audio technology, how do you respond to the claim that copyright owners could suffer serious harm if home taping were completely unlimited?

Frank Beacham: As a creator and producer of audio-visual programs, I know that every work I release for sale to the public -- in digital form or not -- will be copied by someone. This is a fact of life in our society and no known copy protection system will stop it. All copyright owners suffer some degree of harm from copyright infringement.

That said, I vigorously oppose any copying restriction on consumer digital audio recorders. The SCMS copy protection system mandated by S.1623, while having a negative effect on consumers, will have no impact on reducing copyright infringement.

SCMS is like a cheap window lock for the professional tape pirate who engages in copyright infringement for profit. Whether small or big time operator, SCMS presents no obstacle to these individuals. The small timer will still knock off inferior analog audiocassette copies. Audio quality is of no consideration here. The serious pirate, on the other hand, can easily purchase "professional" digital audio equipment for a few dollars more and make unlimited pristine digital copies. SCMS is bypassed altogether in professional equipment.

The only impact SCMS will have is on the consumer's ability to creatively use digital recording equipment for personal purposes. SCMS cripples digital equipment for the home recordist by limiting the number of generations which can be made with consumer-produced software. If S.1623 is enacted, a significant number of recording hobbyists and aspiring musicians who need to edit their

recordings will be denied the benefit of digital recording technology. I discuss this limitation in more detail in my written follow-up statement to the subcommittee.

I feel the copyright issue in digital recordings as presented by the music industry is a non-issue. Digital recording technology offers copyright owners significant advantages for their own copy protection over traditional analog recording methods. If the producer of a commercial recording wants to prohibit a direct digital copy from being made, this can be easily accomplished by placing a digital "flag" in the recording which will prevent all digital-to-digital copying. If the harm of digital copyright infringement is so serious to copyright holders, why don't they simply block it at the source?

The answer, of course, is the music industry does not want to stop all copying. This would hurt record sales, as the 1989 report of the U.S. Office of Technology Assessment found. The music industry only wants the big pirates stopped, not the little guy helping them make sales by dubbing copies for friends. Since SCMS clearly does not affect pirates, why cripple consumers with such questionable technology?

Yes, Senator Leahy, digital audio technology offers tremendous copying potential. But this copying capability poses no additional harm whatsoever to the music industry. If the music industry chooses to do so, it can stop digital copyright infringement cold by simply coding all releases to prevent digital copies. S.1623, which will adversely affect consumers, is simply a ploy to increase sales for a few wealthy corporations in these difficult economic times.

Follow-up Statement by Frank Beacham to the
Subcommittee on Patents, Copyrights and Trademarks
Nov. 13, 1991

Mr. Chairman and members of the subcommittee. I wish to submit the following additional information for the record concerning my opposition to the Audio Home Recording Act.

First, there is the issue of the tax this legislation imposes on consumers of digital recording equipment and media. The industry likes to portray this added fee as a "royalty" which will be paid by the equipment manufacturer, not the consumer. However, no part of the proposed legislation requires this fee be taken from the profits of the manufacturers.

Any reasonable assessment of this legislation will determine that the tax -- and that's what it is, a tax -- will be passed on to the consumer in the final purchase price of hardware and media.

One supporter of S.1623, Bob Heiblim, president of Denon of America, expressed concern in an August 21, 1991 article by John Gatski in Radio World, a trade publication, about whether members of Congress could be persuaded to support this legislation.

> "Heiblim said members of Congress may remember that the companies now supporting the levies are the same ones who opposed them in years past. He said Congress could be wary of support from companies who once opposed royalties on a right-to-tape principal, but now support the levies because they want to make money from a larger DAT market." (Exhibit 1)

The electronics industry -- having done a total flip-flop on this issue -- agreed to support an unprecedented tax on consumers so that it's member companies can boost sales in a stalled economy.

In a paper presented to the Audio Engineering Society on Oct. 8, 1991 in New York, G.C. Wirtz of Philips Consumer Electronics B.V. gave a key reason Philips decided to create the digital compact cassette (DCC):

> "Hardware sales have stabilized over the last couple of years. Most market segments, apart from stereo headphones, are in a replacement phase. We see no growth." (Exhibit 2)

Mr. Wirtz said the most important reason to market the new digital consumer cassette format is "to maintain the business level in cassette over the nineties."

In taxing the consumer on the sale of digital recording devices and media, the assumption is made that the only significant use for such equipment by the consumer is for listening to pre-recorded music released by the major recording and publishing companies. This act of taxation also assumes the consumer will violate copyright laws when in the possession of digital recording equipment.

Both of these assumptions are false and absurd. But it doesn't stop there. The industry -- after collecting it's tax -- then wants to cripple the consumers' use of the newly purchased digital recording equipment.

Never before in the short history of the consumer electronics industry has legislation been enacted which restrains the development of new technology to protect the narrow interests of a few wealthy corporations. The arrogance and greed behind this so-called "industry compromise" boggles the mind.

The means to cripple consumer digital recording devices is called the serial copy management system (SCMS). It prevents multigeneration copies of all recorded material including those made by the consumer. That means -- after collecting a tax on the recorder and the tape -- the music and electronics industries are then preventing consumers from editing or copying recordings made in their own living room.

In the April, 1990 issue of TV Technology magazine, Mario Orazio discussed the implications of SCMS on consumer recorders. After noting SCMS would do absolutely nothing to stop pirating, he spotlighted a group of creative consumers who will be damaged by the copy protection scheme.

> "There's one group for whom it is devastating, and that is the semi-pros -- the garage recording studios, perhaps.
>
> Semi-pros, almost by definition, can't afford professional equipment. If they buy digital audio gear, it's probably because they like its multigenerational performance.
>
> With the asinine forced copyright assertion through analog inputs, however, they'll be restricted to two generations, which is hardly enough to edit anything. As far as I can tell, this is the function of SCMS: to prevent entry-level production facilities from using digital audio." (Exhibit 3)

Of course, SCMS affects many other potential consumer applications. It, in effect, limits the use of digital consumer recording devices anytime multiple generations of a recording are needed. In the coming age of multimedia computers, SCMS could become a major disabling factor in the production of desktop audio/video presentations for home and business.

In a brief conversation on Oct. 29, 1991 with John Roach, Chairman of Tandy Corporation, I suggested a scenario in which an SCMS-restricted recording could thwart the use of a Tandy multimedia computing system.

I proposed to Mr. Roach that I want to make an electronic album in which I take the digitally-recorded voices of family members and edit them with digitized photographs to make a "multimedia" family history which I can display on my Tandy computer. I asked Mr. Roach how I can go past two generations of digital audio editing on his Tandy system if SCMS is employed in my digital tape recorder.

Mr. Roach responded that he considers multimedia production a professional application which should not be done on consumer equipment. If this is so, I question why Tandy's 1992 Radio Shack catalog is promoting the multimedia PC "revolution" for consumers. The advertising slogan says: "At Radio Shack, the future of multimedia is here today."

Touting that multimedia offers tremendous possibilities for "even the average consumer," the Radio Shack advertising proclaims "in addition to furnishing superb, photographic-quality images and sparkling animation, multimedia PCs are able to play and mix digital audio, recorded stereo sounds and MIDI music. In fact, multimedia is the next step in the evolution of the PC." (Exhibit 4)

I suspect that if this legislation becomes law and the upcoming generation of consumer recorders fail in the marketplace that Mr. Roach and others supporting this industry compromise will be back before Congress asking that the Home Recording Act be repealed. They might argue SCMS is limiting the capabilities of consumer multimedia computer products.

Shortsighted, ineffective and crippling technologies like SCMS are being promoted in order that a few people can make a quick buck over the next decade. SCMS will not stop a single tape pirate and will limit the legitimate and creative use of digital recording technology by consumers.

If the music industry's actual goal is to stop the piracy of digital media, it can do so immediately without the aid of new legislation. A "flag" can be placed in any commercial digital recording that will block anyone from making a digital copy. This method is foolproof and inexpensive. So why isn't the recording industry taking this step to prevent piracy?

The answer may be found in a 1989 study titled *Copyright and Home Taping* by the U.S. Office of Technology Assessment. The report found that about one-quarter of pre-recorded music purchases were made after the consumer first heard

the artist or recording on a home-made tape.*

This prompts one to think that the music industry likes a little piracy, but not too much.

We are told that passage of the Audio Home Recording Act is essential to the success of the new digital compact cassette (DCC) and mini-disc (MD) consumer formats. If S.1623 fails, we are warned, these formats will not get the necessary support from the music industry needed for success in the consumer marketplace.

Since when do we pass laws to enhance the prospects of commercial success for speculative consumer electronics products? These new formats should live or die on their merits and not be propped up by artificial forces.

But there is more here than meets the eye. S.1623 has another unstated, but very real effect, on technology. Both of these new consumer audio delivery systems represent a step backward in the sonic quality and multigenerational flexibility from the current CD and DAT formats. Without the boost of S.1623 both formats will almost certainly fail in the marketplace.

Why are these formats sonically inferior to current technology? Unlike the compact disc and DAT tape formats now available, the DCC and MD formats employ a data compression technique which is based on assumptions about human hearing. Data which is deemed inaudible is not recorded, thus requiring less data storage space on the media.

Though the manufacturers of the new formats contend most consumers will not hear the difference, engineering professionals have publicly expressed doubt and fear the new formats will actually degrade their recordings.

In an Oct. 1991 article titled "Engineers Are Hesitant to Accept New DCC and Mini-Disc Formats" in Pro Sound News, engineer Jim Berry of HBR Audio, Lowell, MA was quoted as saying:

> "We are being bombarded with formats and none of them particularly improve the quality of the finished product. The designers of new formats are doing the engineers and the consumer a disservice by not designing high sonic quality into their standards." (Exhibit 5)

Why would the music industry want to support new music delivery systems inferior to what is now available? In that same Pro Sound News article, writer Andrea M. Rotondo reported:

> "Data compression also solves a major headache for the record labels. They are able to support a recordable CD format while banishing fears that the product would be of equal quality to a master recording." (Exhibit 5)

Ken Pohlmann, professor of music and director of the Music Engineering Program at the University of Miami in Coral Gables, Fl. also addressed sonic quality in the August, 1991 issue of Mix magazine. On the question of why not create a recordable CD instead of an entirely new format, Pohlmann wrote:

> "Record labels simply would not tolerate a recordable CD that matched the sound quality standards of the professional master recording. Instead, they might support a new format of slightly lower sound quality (specifically, non-cloned data). Handily, data compression also solves that problem." (Exhibit 6)

Sony, for its part, is not even claiming the MD format meets CD sound quality standards.

In the Aug. 1991, issue of Popular Science, writer Dennis Normile reported:

> "The Mini Disc system, though, is designed for listening anywhere -- with headphones, in a boom box, or in a car audio system -- where there's a potential for background noise. This format is not earmarked for audiophile hi-fi equipment you would savor in a quiet listening room. Sony executives admit the

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> sound quality of their Mini Disc won't quite match that of CD's." (Exhibit 7)

In an article titled "Audio Format Confusion" in the Sept. 1991 issue of Radio-Electronics, writer Brian C. Fenton posed a question about the sonic quality of audio compression, a technology used in both the MD and DCC formats:

> "Can a recording that 'leaves out 80% of the bits' sound as good as a CD? In theory, if all you're leaving out is things you can't hear, then yes. In practice, we don't know yet. At Sony's announcement (of MD), they demonstrated a prototype by playing some pop-rock for a half minute or so. It sounded OK, we guess, considering that the listening environment was a crowded hotel meeting room. No A/B comparisons were provided between CD and MD. Sony claims that 'only 2% of the population will be able to hear the difference.'" (Exhibit 8)

Another major unanswered question about the MD and DCC formats is their multigenerational dubbing capability. Though both formats employ SCMS copy protection which prevents digital copying, many engineers feel the data compression used to make recordings will even result in poor analog copies.

In an informal poll of audio engineers, I could find no one who had been allowed to do multigenerational tests with either the MD and DCC formats. Will the dubbing capability of these new formats be even as good as conventional analog cassettes? No one seems to know. Are we in for another unpleasant surprise when these formats are unleashed on unsuspecting consumers?

As has been widely reported, the record industry likes the MD and DCC formats because each offers less sonic quality than their master recordings.

The DAT format, which uses no data compression, has been unsuccessful as a consumer product in part due to legal action by the music industry against equipment manufacturers. However, the sound quality of DAT is so good that

many professionals now use it for mastering high quality commercial releases.

Would passage of S.1623 revive the DAT format in the consumer market? Few industry observers think so because the record industry does not want this kind of recording quality in the hands of consumers.

A June 19, 1991 New York Times article titled "Advance in CD's Starts a New Battle" by David E. Sanger reported:

> "The industry, worried that DAT would enable recording pirates to make perfect copies of compact disks, worked out an electronic protection plan that satisfied neither consumers nor manufacturers. Sony is now repositioning DAT for music professionals and audiophiles, not for the mass market." (Exhibit 9)

A look around the room during the hastily-called Oct. 29, 1991 Senate hearing on S.1623 provided clear evidence of who is advocating the legislation. The proponents are a group of lobbyists for the music, recording and equipment manufacturing industries. Consumers and audio professionals were conspicuously absent.

S.1623 is an ill-conceived quick fix for a stagnant sector of the consumer marketplace. The flip-flop position on royalties by the electronic equipment manufacturers revealed how quickly they will sell out their own customers to make an extra dollar.

And, of course, lurking on the sidelines are the video software lobbyists, waiting anxiously for the audio industry to pave the way for a "royalty" on a new generation of digital video recorders and media. If S.1623 is enacted, it will set a dangerous precedent for a new wave of taxation on consumers, not by government but by private industry.

Digital audio equipment is used by a wide range of consumers and businesses

throughout America. Such equipment is as likely to be found in the local radio station as it is in a living room sound system. The vast majority of users of this technology have not heard of this proposed legislation nor or are they aware of its content.

Slanted pro-industry reporting by a timid and ineffective trade press has contributed to the general impression that the "industry compromise" is good for the consumer. It is hoped that the prospect of new taxation on consumers in an election year will prompt legitimate news organizations to take a closer look at the real implications of S.1623.

A honest evaluation finds that S.1623 taxes consumers with no return benefit, deprives consumers of their rights to freely use digital taping equipment and encourages the development of a new generation of inferior audio recording technology.

Frank Beacham
163 Amsterdam Ave. #361
New York, NY 10023
(212) 873-9349

*Other general findings of the *Copyright and Home Taping* report and a historical summary of the industry agreement are found in "The DAT Pact" by Brian C. Fenton in the Nov., 1991 issue of Popular Electronics. (Exhibit 10)

DAT Royalty Agreement Reached

by John Gatski

WASHINGTON Professional digital audio recording devices will not be directly affected by a recent recording industry/manufacturer agreement requiring royalty levies on consumer digital audio recorders and blank media, if such an agreement passes into law.

After several years of resisting royalty proposals for DAT recorders, manufacturers have finally agreed to music publishers' demands for a royalty fee system that could be distributed to publishers and artists.

The agreement, made in July, covers DAT as well as the upcoming Digital Compact Cassette (DCC) from Philips and the Sony Mini-Disc.

Pushing for quick action

Supporters of the digital audio royalty agreement have been pushing to get legislation introduced into Congress very quickly. At press time, action was hoped for as early as late July or the first part of August.

DAT supporters said they hope the agreement finally settles the four-year-old controversy over copyright that has sharply curtailed the product's market penetration.

Key industry players including the Electronic Industries Association (EIA) and the Recording Industry Association of America (RIAA) agreed to support an eight percent levy on recorders with an $8 limit on single decks and $12 on dual decks. Blank tapes would be subject to a three percent fee.

The agreement also calls for legislating the Serial Copy Management System (SCMS), the Philips-developed technology that does not allow a direct digital DAT recording of a CD to be copied. DAT manufacturers tried unsuccessfully to get SCMS legislated as a way around royalty fees on hardware and tapes in 1990.

Professionals definitely would benefit from the legislation . . .

Professional DAT recorders, consumer audio tape recorders and video recorders that have digital recording capability would not be subject to the fees on recorders, or the SCMS provision, according to the agreement.

Agreement details, however, are not clear as to whether professional stores selling DAT blank tapes would be subject to the levy or whether such tapes would be exempt.

EIA Consumer Electronics Group VP Gary Shapiro said the issue of tape levies is not spelled out as clearly as the exemption on professional recorders, but the intent of the agreement is to also exempt professional tapes or digital discs.

Professionals definitely would benefit from the legislation if it allows manufacturers to aggressively market DAT products, according to industry analysts.

A major consumer demand for DAT will mean lower prerecorded tape and accessory prices that will benefit both pros and consumers. Right now, DAT is a minimal product in the consumer tape recorder market, garnering much of its sales from the professional realm, according to market surveys.

Reverse the trend

Many analysts blame the lagging sales on timid DAT marketing due to the music publishers' legal threats.

Music publishers had threatened companies with litigation if they brought DAT decks into the country with direct CD copying capability, unless some type of royalty system was employed. Their argument focused on DAT's ability to copy CDs "perfectly," thus decreasing consumer demand for pre-recorded music.

The publishers did follow through on one suit in 1990, following Sony's introduction of a line of SCMS-equipped consumer DAT recorders. That suit has been dropped as part of the new agreement.

Despite apparent industry consensus, which often impresses Congress, a digital audio recorder royalty law's passage is not totally assured, according to Denon of America President Bob Heiblim, who supports the levies.

Denon produces both professional and consumer DAT recorders and a professional CD recorder.

An amicable agreement

"I think that this agreement is very, very good," Heiblim said. There is a real value in being able to sell this stuff. If this is the only way to do it, so be it."

But, he cautioned, "we don't know if it will pass."

Heiblim said members of Congress may remember that the companies now supporting the levies are the same ones who opposed them in years past. He said Congress could be wary of support from companies who once opposed royalties on a right-to-tape principal, but now support the levies because they want to make money from a larger DAT market.

Also, Heiblim noted, if the royalty law was challenged in court, it could be struck down, based on the 1974 U.S. Supreme Court precedent that upheld private use of video recorders.

Heiblim added, however, that similar royalty systems have been put in place in European countries such as Germany, and they work.

Even though initial reaction from manufacturers has indicated that they would absorb the royalty fee costs if the law is passed, the cost is likely to be passed on to consumers, according to one DAT manufacturer.

Audio industry analysts predict, however, that a levy added onto a consumer DAT or other type digital recorder's price will not be the determining factor in buying the product—except when comparison shopping.

Digital Compact Cassette: Background and System Description 3215 (I-2)

G. C. Wirtz
Philips Consumer Electronics B.V.
Eindhoven 5600 JB, The Netherlands

8M/I-2

Presented at the 91st Convention 1991 October 4–8 New York

AES

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DIGITAL COMPACT CASSETTE

background and system description

Author: G.C. Wirtz, Philips Consumer Electronics B.V.
Eindhoven - The Netherlands

In this speech I would like to cover why and how DCC was developed, and provide you with a system description.

Why and how did Philips embark on the development of DCC?
Most of you probably know that Philips was with the forerunners of the DAT development. This development started in the period of time that digital electronics became an option in consumer electronic products.
It was logical to consider next to the CD-system, digital alternatives for a tape system.

In time more companies joined in the discussion which ultimately resulted in a big standardization conference for the R-DAT system in which 83 companies participated.

It were predominantly crews from research and pre-development who were involved with the standardization. CD was not yet in the market and digital technology was not yet commonly understood.
From a product or market point of view the preconditions seemed clear: Digital technology was supposed to deliver better quality. So the effort was to concentrate on top sound quality.

In the mid eighties the standard and the technology was ready to be implemented into products. For the first time market issues were addressed at length. The picture was not encouraging.

First products were very expensive, price-wise more in line with new video-products than with an audio recorder.
Moreover, research and development had been concentrating on the recorder application. Technically that was the most eye-catching function. And was not the analogue tape system called a compact cassette recorder? Underrating the playback side of the new system went as far as that software manufacturers were excluded from the DAT discussions.
By the time the DAT technology was standardized it proved to be a problem to manufacture music tapes with the required flexibility, speed and price.

Being the inventor of the Compact Cassette system, back in 1963, Philips had experienced the necessity to create pre-recorded music tapes to sufficiently stimulate the cassette system.
In the first 7 years Compact Cassette was in the market as a recording system, and sales were developing only very slow. It was the worldwide introduction of pre-recorded cassettes which started to boost growth.

Stimulated by the pre-recorded musicassette the compact cassette system developed into a mass portable playback system. Because of the large scale application by consumers of all kinds of portable playback players the demand for recorders increased.

Today we see a market for compact cassette which for 75% consists of portable playback units. This market is driven by the sales of pre-recorded cassettes at an annual level of around 1 billion. At the other hand, recordability is an essential feature of the system. Whether or not applied by all consumers, it does deliver the promise that tapes for playback can be

easily obtained. As an indication of the importance to provide the recording option look at the market for radio cassette recorders, where we sell tonnes of millions of units with a recording function which often never is used.

In our view, replacement of the musicassette by DAT is not possible. DAT is too much developed as a top quality recorder for stationary use. Without pre-recorded cassettes, sales of (portable) players can not develop. Without portable players, sales of recorders are only of interest for recording freaks. In addition the costprice projections of the system are not in tune with the compact cassette market.

Learning from our DAT experience we started to define the ideal system to replace the musicassette.
This time, however, we worked the other way around; first the essential system ingredients were defined. Later the technology to built such a system was looked for.
That's where the start of DCC can be defined.

Three questions were central in the analysis of defining the ideal system:

* Why innovate the cassette system?
* What in the cassette system needs to be innovated?
* How should this innovation take place?

Why innovate?

The fact that a variety of new technologies are becoming available cannot be the only reason for innovation. As long as everybody is happy with the current analogue system there is little reason for

change. Looking at the massive annual sales quantities of cassette (2.6 billion) and cassette machines (180 million) it would seem everybody is very happy with the analogue system. If, however, we look at market trends we get a different picture.

Hardware sales have stabilized over the last couple of years. Most market segments, apart from stereo headphones, are in a replacement phase. We see no growth. Consumers are merely replacing existing cassette functions which indicates that the cassette players are purchased more to complete an audio system than as the main attraction. The predominant reason why consumers include the cassette function in their choice is because they have so many cassettes. Average every household has a library of 50 to 60 cassettes.

Sales of pre-recorded cassettes have been constantly growing over the last decades. But, as has been forecasted by some, sales growth levelled off in 1989 and went into decline since.

This picture is familiar to us. By the end of the seventies we saw the same trend for the markets of LP and turntables. Several years before the introduction of the CD, consumers started to loose interest in the LP, reflected in a declining sales level. Sales volumes of turntable remained stable for a number of years (People still possessed extensive libraries of LP's) but then also started to decline. We call it the life cycle of a music carrier. After being in the market for three decades the consumer starts to loose interest despite the constant flow of brand new music titles. This by the way underlines that the consumer is not only buying the musical contents; the physical presentation of the carrier is also relevant.

If musicassette is losing interest will CD replace the musicassette?
Certainly not. Also here we have valuable experience. When by the end of the seventies LP started to decline some expected that the musicassette would easily compensate for the lost sales quantities.
MC was booming over that period of time (very similar to CD now) and MC could just take over from LP. In reality nothing of the kind happened.
The main reason is that there is not one music market but two: a dual carrier market:

- The disc for active, foreground use in the home
- Cassette for the road.

The consumer is perceiving both media as different, not compatible. The main differences are:

- The disc, as the foreground medium, often used actively where of course the random track access is very important. The disc with its jewel like image, which makes it the collectors format. The CD is even perceived as vulnerable, precious, although the technology is rather robust. But people do not even like fingerprints on their disc because they <u>want</u> to see it as precious.

- The tape is much more used as a background medium, passively e.g. when driving your car. With cassette the issue is much more to provide continuously and as long as possible a musical background. The related image is of a much more sturdy, robust carrier you feel comfortable with to throw through your car, which is simple to operate with one hand.

The reason for innovation is in short: We see a tape system with a specific function in the market, which is massively used in a very passive way but which despite its large volume is losing interest.
Here we ran into the second question.

What is to be innovated?

It is good to realize that an annual sales volume of 2.6 billion underlines a tremendous popularity; after the lightbulb, Compact Cassette is probably the most successful consumer electric product. Cassette, therefore, must have a lot of attractive features which should be maintained in the new system. Market research indeed indicates that most features like seize, weight, playing time, way of operation of the cassette system score very high. Basically there are three points which rate low:

- Image
  Cassette lost its appeal. It is no longer seen as the miraculous device which will operate everywhere, but as an old-fashioned piece of plastic without any shine or attractiveness.
  It is pre-dominantly because of image why cassette starts to loose ground.

- Soundquality
  The sound quality is perceived as out of range with modern audio equipment. It is important to refer to the average sound quality perception which is not the high-end-Hifi-deck-with-Dolby and a high grade cassette but a low cost deck with a lot of wow and flutter, and a lot of distortion, tape hiss an lack of stereo image.

- Durability
  Cassette warp, tapes are breaking or otherwise get jammed.

  To select the technology for this innovation is not obvious. A wealth of options exists, as can be seen by the great number of announcements of new recording systems over the last 2 years: one

every 4 months. Central is the decision to go tape or disc.
It is possible to make tape or disc functionally to a large extend overlapping by adding extra electronics.
E.g. a disc system by nature not shock-proof, can be improved by adding a lot of solid state memory; a tape system, by nature a streamer and not a random access technology, can be improved by powerful winding motors, solid state memory chips and clever μ processor control.
It is, however, obvious that such extras do not help to reach low cost markets. The new technology must, however, have a costprice perspective to ultimately replace the entire compact cassette system, including the low cost applications. Price levels for these applications are very tough targets.
From the perspective of the recording industry it is essential that the new system has the prospective to integral substitute the musicassette; a new carrier in the market will in first instance just increase operational costs because of extra inventory and obsolescence. If ultimately introduction price levels are dropping the new carrier must replace the old one. With this in mind it is only logical to go for tape, which by nature better fits the tape driven compact cassette system.

But there is another even more important reason to use tape: the issue to maintain the business level in cassette over the nineties.

Here we run into the third question:

How to innovate MC?

Replacing the MC is different from the LP/CD case.
The purchase behaviour for cassette makes a consumer on average only buy 3.5 cassettes in the first year when he bought himself a new cassette player.
For compact disc this number is 10 discs. The dual carrier character of the market extends to a much more passive buying behaviour in case of cassette for which more hardware in use is required.
Cassette sales are generated by 1 billion cassette machines in use. This enormous park needs to be converted into the new digital machines sufficiently fast. But after nine years of exceptional success there are "only" 120 million CD players in use, considerably less than the 180 million cassette players sold every year. Sales of the new digital cassette hardware have to develop at least 3 x as fast as what was accomplished with CD, if we are to maintain the business level in cassette.
The only way to make hardware sales develop 3 x as fast as the CD case is by making the new technology backwards compatible: The new machine must include a compact cassette function to playback the analogue cassette. This implies that the new system is not only addressing the typical innovator, the guy who will always buy what is new, but also the regular consumer of which each year 180 million come to the shop to replace their existing cassette machine.
Any new, not compatible technology would at least require 10 to 15 years to grow into mature market quantities. In replacing the musicassette, however, it is not just the issue to build up the new market, it is also the issue to build up with sufficient speed, to compensate for what we loose in analogue cassette business.

Let me next address some of the system specification points.
Next to a backwards compatible tape system the other main specification points for the new DCC system are derived by looking to the market.

The system shall again include the main four ingredients of the actual analogue compact cassette system:

- pre-recorded cassettes together with
- blank cassettes which will be recorded predominantly on
- home cassette decks and a great variety of
- portable cassette players to playback music wherever the consumer goes.

Moreover, all these options must be available from the start to make it an interesting system for the consumer.

Portable, outdoor application, specifies not to stretch recording density and use standard low coercive tape. In the DCC system we apply as a minimum a wave length on tape of 1 μ. In addition a large portion of error correction is applied, and a metal slider shall provide additional physical protection.

The requirement for pre-recorded software makes the use of high speed duplication necessary. This specifies a linear track format.

The need to (quickly) reach mass markets and therefore attractive costprice levels specifies the application of relaxed mechanical tolerances, to limit the number of tracks to 8 and to use as much as possible existing CC mechanisms which are available at very cost effective price levels.

The requirement to reach top end HiFi markets specifies a CD sound quality. Comparing the rate between CD, 1.5 Mbit/s, and a system as specified before indicates:
8(tracks)x{1μ(wavelength)x4.7(cm/s)(tapespeed)}=768 Kbit/s

A 47% error correction leaves 384 k bit/s for the audio information.

Consequently a new coding has been developed which is 4x as efficient as the traditional PCM encoding used in CD. The new coding is called PASC for Precision Adaptive Subband Coding.
Half of the required efficiency improvement comes from application of a more intelligent coding language. The other half from a drastic change of principle. The encoder no longer tries to follow the characteristics of the analogue microphone signal, but instead the signal is modeled in accordance with the receiver, the human ear.
Bits are allocated to the signal in order of priority in how far information from the signal is relevant or audible.

The concept of both allocating maximum coding room for the most audible parts and no coding room for inaudible parts, makes it possible to simultaneously improve efficiency and sound quality.

The PASC coding measures a frequency range of 5 Hz up to 22 kHz, dependent on the sampling rate which can be 32, 44.1 or 48 kHz.

Total harmonic distortion including signal to noise specifies up to 92 dB and dynamic range up to 18 bits or 108 dB.
This does not specify, however, the sound quality.
An indication for the sound quality are blind tests in which CD sound and DCC sound are to be identified. Sofar we did not find people who could identify any music fragments we used in the blind tests. We therefore specify the sound quality of the DCC system as identical to compact disc.

It is the new DCC cassette which is to create a new appeal. The basic dimensions of the cassette have not been changed; they prove to be ideal, just large enough to present itself as a serious software carrier but small enough to fit the average shirt pocket. The cassette is somewhat slimmer shaped and completely flat. All DCC players will be autoreverse by standard. The cassette therefore only requires holes to access the reel spindles at one side. The top is completely closed. In the case of a pre-recorded cassette a paper graphic artwork is sealed under a transparent window. Cassette and window are fused together by means of ultrosonic welding thus providing a rigid construction. By standard DCC cassettes have to fulfil strict requirement on temperature stability up to 90°C. This, in combination with specification points on tape strength, the metal slider for extra tape protection and the error correction capacity, shall greatly enhance the durability of the DCC cassette.

Read and write of the 8 music tracks plus auxiliary track is done by means of thin film head. It is possible to integrate in one head chip the magneto resistive heads with the 9 recording heads and the 2 heads for read-out of the conventional analogue cassette.

The track width on tape is 185 μ m for each of the 8 tracks. Read-out heads are only 70 μ m in height, which reduces the sensitivity to misalignment and azimuth errors significantly below that of compact cassette.

The data format on tape is similar but different from the main data in the 8 music tracks and the auxiliary data on the auxiliary track.

Data are grouped into tape frames. Each of the 8 tracks carries 32 tape blocks per frame, where a tape block contains 51 tape symbols of 10 bits. The 10 bit symbols are generated by the 8 to 10 modulator to create DC-free code.

Every tape block starts with a header of 3 symbols, for synchronisation and frame and block address. The remaining 48 symbols carry the PASC audio data, system information and parity symbols for error detection and correction. At tape block level a C_1 error correction code is applied which is capable of correcting 4 error symbols per tape block.

At frame level a C_2 error correction code is added. The distribution of the symbols for the C2 code is "ideally" distributed over the tape, which results in a "honey-comb" pattern.

At maximum the C_2 code can correct 6 errors which could not be corrected at C_1 level. Because of the physical distribution over the tape drop outs with a diameter up to 1.45 mm can be corrected or alternatively a complete missing track can be corrected.

PASC symbols are also distributed over the tape in a way to prevent burst errors and allow for concealment of uncorrectable errors.

For the auxiliary track the bit rate is only 12 k bits/s (against 96 kbits/s for the music tracks).

The number of tape blocks is therefore reduced with 1/8 to 4. To enable easy detection during high speed search, the tape blocks 1 and 3 are recorded at marker location to create an envelope. Therefore, marker positions can be detected without the need to decode the complete auxiliary code.
The auxiliary track contains many features similar to those specified in DAT like start-flags, track numbers and time codes. The pre-recorded cassette contains a table of contents with precise location information of the tracks.
The DCC system includes a standard for text information on tape. On pre-recorded cassettes text information is programmed in the system area of the main data area. The technical capacity of this system is 400 characters per second. Information is grouped per item; 255 different items can be defined. Some items are standardized e.g. album title, track titles, table of content, artist credentials and song lyrics.
The text information system can also fulfil the growing demand for more background information and enhance users friendliness in finding the desired music track.

DCC is a system which could easily be talked on for the next couple of hours. There are other presentations planned during this conference on the DCC encoding and on the textmode system. Together with this presentation I hope we have provided you with a fair amount of information.

Some of Digital Audio's Dilemmas

by Mario Orazio

SOMEWHERE OUT THERE *You Might Not Have Noticed* . . . that your ancient sync pulse distribution amplifiers may be perfect for your latest equipment, that home recordings might have copyright asserted on them, that SMPTE isn't the only organization with standards problems, and that all of the above has to do with digital audio.

You remember digital audio: it's what's recorded on Compact Discs, digital audio tape (DAT), videocassettes (with and without encoders), and both the D-1 and D-2 digital video formats. JVC has even announced a new technique that allows two channels of full quality (48 kHz sampling, 16-bit) digital audio to be recorded—in *addition* to video and hi-fi stereo—on an S-VHS tape.

That's what most people think of when they think of digital audio: recording. There are also some digital mixers, equalizers, reverbs, editors and the like, but I want to get *really* basic. I'm going to tell you about digital *wires*.

Okay, I'm kidding. There's no such thing (I hope), but there has to be a way to get digital audio out of one device and into another without making it become analog in the process.

Actually, there are two popular standards. One is called AES/EBU (Audio Engineering Society/European Broadcasting Union) and the other is called SPDIF (Sony/Phillips Digital Interface Format) or EIAJ (Electronic Industries Association of Japan). The first is professional and the second consumer, but they're remarkably similar.

Both allow for audio to be sampled at zero at 32 kHz sampling lasts precisely as long as a sync pulse at 48 kHz sampling, which makes it kind of hard to find sync.

Everything to this point is the same between the formats. Now they get different. AES/EBU starts out at around five volts; SPDIF/EIAJ starts at around half a volt. That's supposed to be because we professionals are much more careful with high frequency signals that might radiate interference than consumers are.

AES/EBU is balanced; SPDIF/EIAJ is unbalanced. So the AES/EBU connectors you see are standard XLR connectors, while the SPDIF/EIAJ connections are usually RCA phono plugs and jacks.

So far, so good. Unfortunately, while the SPDIF/EIAJ format uses 75 ohm transmission impedance, AES/EBU specifies 110 ohm sources and 250 ohm loads. The idea is that you can use tees or y-cables to connect up to four loads to a single source without much trouble.

Huh? Folks, what we have here is a failure to communicate. Anyone who has graduated Video 101 knows that if you tee branches off a video feed of any distance, you get reflections. So AES/EBU expects some poor data receiver that's having a hard enough time figuring out a 32 kHz zero isn't really 48 kHz sync to have to deal with teed reflections, too? Yah.

Masked Engineer

And that's not all. It's pretty easy to get its own sync generator and could genlock to a video signal or black.

Go on. Look around your plant. You probably have some pulse DAs you thought you couldn't even give away. Well, they're not your ancient, useless pulse DAs anymore. Now they're your AES/EBU digital audio distribution amplifiers, and they work great!

Of course, all of this just gets the receiver at the input of an AES/EBU device to identify the bits correctly. Figuring out what to do with the bits is something else again. That data validity bit, for example, seems to be treated differently by every manufacturer (and sometimes by different products of the same manufacturer). The standard doesn't tell you what to do with it.

Even the parity bit seems too confusing for all manufacturers to deal with. The channel status bit (384 per data block) seems overwhelming! It can tell receivers what the sampling rate is supposed to be, whether emphasis was used (and what type) and whether the audio is mono or stereo, for example. It has not just one but two time codes, and it even has its own code for error checking.

But some pieces of gear generate this stuff, and some don't. Some look for them in the data stream, some don't, and some don't have the foggiest idea what to do with them if they're there.

See NEXT PAGE

Now (pulse DAs) are

be digitally copied by an SCMS-equipped DAT recorder.

The scholars who worried about SCMS, however, came up with a scenario where someone buys a CD and feeds its *analog* audio to the input of a DAT. If that DAT had no copyright assertion, why, millions of generations of copies might be made from it.

So, instead, any recording on an SCMS-equipped DAT recorder from the analog inputs becomes considered original copyright-asserted material, allowing only one more generation to be made. The tape may be baby's first words, but Congress will slap copyright protection on it.

And Congress doesn't plan to fool around. They're talking about penalties in the range of $10,000 per device and $100,000 per transmission (for when HDTV and digital audio broadcasting have us feeding direct digital audio to consumers). Judges are allowed to hike the fine by $5,000,000 if someone's nasty, but they can't drop it below $250 even if someone was just ignorant of the law's provisions.

Who loses?

Just whom would this law affect? Well, theoretically, it was designed to prevent one person from buying a CD, copying it, passing the copy to a friend who copies it and so on. SCMS *does* prevent that, as long as everyone uses DAT recorders and makes digital connections between machines. If someone finds their DAT won't copy something, all they need to do is connect the machines via their analog spigots.

SCMS doesn't affect pirates, since all SCMS controls is the number of *generations* that can be made, not the number of copies. SCMS allows a pirate to make, say, 100 digital copies in 100 passes on one machine, or (using video DAs, of course) 100 digital copies in one pass on 100 machines.

SCMS won't even be noticeable to the consumer who just wants to make copies of CD songs in a certain order to play in a car.

analog in the process.

Actually, there are two popular standards. One is called AES/EBU (Audio Engineering Society/European Broadcasting Union) and the other is called SPDIF (Sony/Philips Digital Interface Format) or EIAJ (Electronic Industries Association of Japan). The first is professional and the second consumer, but they're remarkably similar.

Both allow for audio to be sampled at

Now (pulse DAs) are your AES/EBU digital audio distribution amplifiers . . .

32 kHz, 44.1 kHz (the CD rate) or 48 kHz (the D-I/D-2 rate). Both organize each sample of each channel into a 32-bit subframe, consisting of four bits of sync at the beginning and four bits for such purposes as data validity indications, user information, channel status (more later) and parity (for error checking) at the end. You'll notice that leaves 24 bits, and, yes, Virginia, that's how many you can use for audio, if you want to.

Two channels (64 bits) form a frame in both formats, and 192 frames form a data block (thus, the single-channel status bit in each subframe becomes 384 bits per block). Biphase mark encoding is used, meaning every bit (one or zero) involves a level shift, and a one has two level shifts. To identify sync, a special pulse lasting 1.5 bits is used.

Bit by bit

So, if you sample at 48 kHz, you need to be able to pass pulses at a rate of 48,000 (samples per second) × 64 (bits per sample—in a frame) × 2 (level shifts per bit for a one), or about 163 nanoseconds per pulse (by comparison, a single cycle of the NTSC color subcarrier lasts 279 nanoseconds). On the other hand, if you sample at 32 kHz, a sync pulse lasts about 732 nanoseconds.

That's quite a range. Furthermore, a

ure to commutate. Anyone who has graduated Video 101 knows that if you tee branches off a video feed of any distance, you get reflections. So AES/EBU expects some poor data receiver that's having a hard enough time figuring out a 32 kHz zero isn't really 48 kHz sync to have to deal with teed reflections, too? Yah.

And that's not all. It's pretty easy to get a 75 ohm patch bay. It's not so easy to maintain 120 ohms between the big wires in a microphone cable and the tiny ones in a patch bay. Guess what? More reflections.

The worst source of reflections is simply connecting two pieces of equipment together over typical professional distances (say, the length of a properly dressed cable going between an edit suite and a machine room, or about 50 feet). With typical cable propagation velocities, the duration of a half-bit one-pulse is about as long as it takes a signal to travel 100 feet. So a zero leaves a 110 ohm source, bounces off a 250 ohm load 50 feet later, bounces off the source again, and shows up at the receiver as who-knows-what when it gets back.

Some manufacturers, sensing the problem, have made their inputs a nice, matching 110 ohms. Sure enough, that works better. Unfortunately, a 110 ohm input violates the standard.

Of course, someone (not you, of course), just for the simple expedient of making things work, might *intentionally* violate the standard. Suppose baluns (for matching impedance and balance) were used so AES/EBU signals could travel via ordinary video coax and patch bays.

Now the problem is in distribution. If tees don't work, distribution amplifiers are necessary, but a video DA won't pass the kinds of levels AES/EBU calls for. A pulse DA, however, will.

For those of you who haven't been in the business long enough to qualify for the Order of the Iron Test Pattern, pulse DAs were devices used to distribute video sync, at a level for four volts peak-to-peak, back in the days before every video device had

stereo, for example. It has not just one but two time codes, and it even has its own code for error checking.

But some pieces of gear generate this stuff, and some don't. Some look for them in the data stream, some don't, and some don't have the foggiest idea what to do with them if they're there.

Consumer status

The consumer situation is easier. Only a few of the channel status bits are used, but two of them—bits C and L—are lulus.

As you know from high school civics, the function of the U.S. Congress was to stimulate the economy by creating the lobbying industry. And, just as no one has ever found a magnetic monopole, there's no such thing as a lobbyist without another lobbyist who has the opposite viewpoint.

Lobbyists for record companies spread the alarm in Congress about the possibility that DAT recorders could allow perfect digital copies of CDs so no producer (who might otherwise have lots of money for campaign contributions) would ever be able to sell more than one copy of a record.

The appropriate anti-lobbyists, from the consumer electronics industry, countered with the argument that keeping DAT out of the U.S. would destroy the economy, violate the First Amendment and, perhaps worst of all, anger potential voters.

The first product of this lobbyist/anti-lobbyist clash was the CBS-developed Copycode system, a technique for encoding audio so that a consumer could listen to it but couldn't record it. The National Bureau of Standards shot that down in flames as creating audible defects and not really preventing recording.

The latest product is something called SCMS (serial copy management system). Bits C and L say whether copyright has been "asserted" on the material and, if so, whether a copy can be made.

A CD with copyright asserted allows only one generation of digital copy to be made. A DAT made from that CD cannot

one finds their DAT won't copy something, all they need to do is connect the machines via their analog spigots.

SCMS doesn't affect pirates, since all SCMS controls is the number of *generations* that can be made, not the number of copies. SCMS allows a pirate to make, say, 100 digital copies in 100 passes on one machine, or (using video DAs, of course) 100 digital copies in one pass on 100 machines.

SCMS won't even be noticeable to the consumer who just wants to make copies of CD songs in a certain order to play in a car, for example. And SCMS won't affect professionals, because professional machines don't need SCMS.

What's a professional machine? Oh, a long time was spent on that issue. One of the criteria is whether the machine uses XLR connectors or not.

Semi-pros hit hardest

Have you noticed so far that SCMS doesn't seem to do anything? Well, that's not exactly true. There's one group for whom it is devastating, and that is the semi-pros—the garage recording studios, perhaps.

Semi-pros, almost by definition, can't afford professional equipment. If they buy digital audio gear, it's probably because they like its multigenerational performance.

With the asinine forced copyright assertion through analog inputs, however, they'll be restricted to two generations, which is hardly enough to edit anything. As far as I can tell, *this* is the function of SCMS: to prevent entry-level production facilities from using digital audio.

The current bill is being co-sponsored by Rep. Henry Waxman (D-Calif.) who seems to be in the recording industry camp, Rep. Al Swift (D-Wash.) who seems to favor the consumer electronics industry and Rep. Jim Cooper (D-Tenn.) whose home state capital is Nashville.

It's still just a bill, and only in the House, so you've got some time to put your two cents in on this one. The way I figure it, if SCMS passes, there'll probably be a lot of consumer DAT machines sprouting XLR connectors.

Write Mario Urazio c/o TVT.

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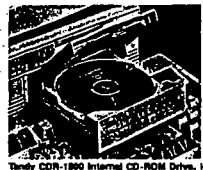

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Beacham Exhibit #5

Sonic Integrity; 1 Step Forward, 2 Steps Back

Engineers Are Hesitant to Accept New DCC and Mini-Disc Formats

By Andrea M. Rotondo

NEW YORK—Sonic quality has come a long way since those early days of needle drop recordings. Today's engineer has the advantage of being able to produce a recording of high sonic integrity via the multitudes of professional recording gear available. Every step in the recording chain is carefully considered to insure accurate sound reproduction. New software formats however, are not as interested in accurate sonic replication as many engineers would hope.

Owner/chief engineer Jim Berry, of HBR Audio in Lowell, MA, said, "We are being bombarded with formats and none of them particularly improve the quality of the finished product." Berry went on to say that studio recordings are currently reaching technical and creative heights never before imagined.

"The designers of new formats are doing the engineers and the consumer a disservice by not designing high sonic quality into their standards," Berry noted. "The new DCC and Mini-Disc aren't bad formats but they do not raise the quality of duplicated products either."

All of this talk of new formats, namely the DCC and the Mini-Disc, have left many engineers wondering if the quality of their work will be carried over to the software version of the consumer's choice. After all the advances in professional audio, will the consumer market support formats which actually detract from the original quality of a recording? Engineers are feeling as if they are taking one step forward and two steps back with the introduction of DCC and MD.

Both the DCC and the MD employ data compression which according to Van Webster, president of Webster Communications in Los Angeles, "makes a lot of assumptions."

Data compression also solves a major headache for the record labels. They are able to support a recordable CD format while banishing fears that the product would be of equal quality to a master recording. Data compression works in conjunction with the threshold of human hearing. It sets a threshold frequency of what it believes the ear can and cannot hear. If audio signal is present which is deemed inaudible, then it is not recorded. This translates into a narrow bandwidth.

Others state that data reduction technology is such that these techniques can be used without creating inferiority. According to Ken Pohlmann, coordinator of the Sound Recording program at the University of Miami, "Given today's technology, if you want to be able to record and erase 74 minutes on a disc that's as small as the MD or tape that's as cheap to manufacture as the DCC, something has to give. The only choice is to reduce the amount of data being stored. Data compression technology is quite sophisticated and I think for many, many applications people will be unable to tell the difference between the CD and the two other formats."

A seminar entitled Low Bit-Rate Audio Coding will discuss this type of technology during the AES Convention, October 6 at 7 PM. Pohlmann will be hosting the seminar. The panel will include author John Eargle; Louis Fielder, Dolby Labs; Bart Lacanthi, BNL Research; Stephen Smyth, Audio Processing Technology; John Stautner, Aware and Raymond Veldhuis, Philips Research.

The DCC format boasts that it is compatible with analog cassettes. The compatibility is a one-way street, however. The DCC player will play back existing analog tapes but analog decks will not play back DCC tapes.

All of this could spell trouble for both

NEW FORMATS

(continued from page 16)

the professional recording engineer's psyche and the consumer's value-per-dollar ratio. However, Webster believes that sound quality will be a minor issue in the consumer market. "The consumer has never made their decisions in the marketplace based on audio quality," remarked Webster. "They have always made their decisions based on convenience and cost." Berry agreed that the consumer rates portability over performance. "People chose the cassette over the LP because of the format's portability."

According to Webster, neither format will find its way into the professional market. While a recordable CD would be welcome in studios the world over, the Mini-Disc just isn't up to snuff. Webster said, "The MD will not win over the pro market in its present form. The pro market needs a broader bandwidth disc-based system."

Howard Johnston, owner/chief engineer at Different Fur Recording in San Francisco, concurred. "I think the Sony MD will be successful as a format that you carry around with you," said Johnston. "I don't think that either the DCC or MD will take the place of the compact disc, however, or enter the pro market because the specs of these products are less than those of the CD." Johnston went on to say that the MD has the advantage of its small size, recordability and random access. "It doesn't have the negative aspects of tape moving across tape heads which presents problems," concluded Johnston.

At White Crow Audio in Burlington, VT, owner/chief engineer Todd Lockwood is looking forward to makir sound quality comparisons betweer DCC and the MD. Although he bel that the DCC holds more prom the format of choice for the consu he wondered if the quality of the product is at a high enough level. Lockwood used the example of DAT to prove his point. "DAT is a good format but it is not a particularly good solution to the needs of the professional," said Lockwood. "There was no reason why the DAT cassette had to be so tiny. Making the tape twice as wide would have probably reduced the error rate quite a bit."

by Ken C. Pohlmann

MD

No, it doesn't stand for Medical Doctor. It doesn't stand for Mogen David, or even Mad Dog. It stands for Mini Disc. One look at Fig. 1 explains the name. The Mini Disc is a 2.5-inch optical disc format. It stores 74 minutes of stereo digital audio with a frequency response of 5 Hz to 20 kHz, a dynamic range of 105 dB, and a sampling frequency of 44.1 kHz. Data is encoded with EFM, and error-protected by CIRC. But MD is not CD-compatible. It employs data compression. And it is completely recordable and erasable.

The Mini Disc is the latest brainchild of Sony and is clearly targeted at the analog cassette market, as well as any new formats with similar targets, specifically the Philips DCC digital cassette format. The MD is a consumer product that has the potential of redefining the economics of music retailing, and takes us all one step closer to the day when tape sheds its mortal coil and goes to that great head gap in the sky.

MD attempts to snatch the Holy Grail of audio media: high sound quality, random access, durability, portability, convenience, shock resistance and recordability. Cassette tape comes close, but ultimately fails, especially in terms of sound quality and random access. The CD fares well in these criteria, but is not as portable as one would like and is not recordable. MD proposes to merge analog cassette tape (emphasizing the portability of a Walkman-type concept) and compact disc, resulting in a high-fidelity, portable, recordable medium.

The MD system employs two kinds of media: magneto-optical media for recordable blank discs and CD-type optical media for prerecorded software. The magneto-optical drive (MOD) technology in MD is similar to others already in use, but brings some clever ideas to the party. For example, it allows overwriting, whereby previously recorded data can be erased and new data written simultaneously. As with other MOD systems, a magnetic head is positioned over the laser source and on the opposite side of the disc. To record, the laser heats the magnetic surface beyond its Curie point at 400° F so that the polarity of the heated magnetic spot is directed by the bathing magnetic field. As the disc rotates, the heated spot moves away and cools, and the magnetic information is stored. The size of the recorded spot is determined by the reversal cycle of the modulating magnetic field, as opposed to methods in which the laser is turned on and off. Because the laser source is always on, the controlling circuitry is simplified.

The MOD disc is built on a polycarbonate substratum, with a terbium ferrite cobalt recording layer covered by a reflective aluminum layer and top protective layer. The terbium ferrite cobalt recording layer changes polarity with 80 Oersteds—about one-third the coercivity of other MOD media; this is important because the magnetic head does not touch the media, and the need for stronger fields at the recording layer would necessitate higher heat generation and power consumption. The magnetic head itself is said to be particularly power-efficient, and able to perform polarity reversals at a rate of 100 nanoseconds per cycle.

The dual-function, 0.5 milliwatt laser can operate with both recordable and read-only MD media. Its design is essentially taken from a conventional CD pickup, with the addition of a MOD analyzer. When using a MOD disc, the pickup distinguishes the polarization angle of the reflected light, which is determined by the magnetization of the recording layer. The MOD analyzer converts the polarization angle into a light intensity, and light is directed to two photodiodes; these signals are subtracted to generate a positive or negative readout signal. When playing back a CD-type disc, the pickup reads the intensity of the reflected beam as

modulated by the pit surface. The signal from the photodiodes is summed to generate a readout signal. In either case, the optical disc is captive in a protective caddy; the total package weighs about 0.6 ounces. The small disc size means quick access—less than one second to any data.

ATRAC (Adaptive Transform Acoustic Coding) data compression is used to encode data on MD, reducing the data rate to nearly one-fifth, from 1.41 megabits per second to 0.3 megabits per second. During recording, analog signals are sampled at a rate of 44.1 kHz and quantized with a conventional A/D converter. The ATRAC encoder divides this PCM data into segments in intervals up to 20 milliseconds long. Fourier transform software analyzes the waveform data in each segment and generates corresponding frequency component data. Using psychoacoustic modeling, the system identifies the audio components that are audible and encodes them, assigning bits as needed according to the amplitude of audible frequency components. Other inaudible material is discarded.

This method is based on the workings of the human ear; sound below a certain level cannot be detected, and low-level signals are masked by high-level signals at a similar frequency. In addition, as overall sound level increases, the ear is relatively less sensitive. These inaudible components can be removed with minimal sound degradation. Following ATRAC encoding, data undergoes CIRC and EFM encoding and is recorded to disc along with subcode and address information. The data track is recorded with constant linear velocity of 1.2 to 1.4 meters per second, depending on playing time, as on the CD.

During playback, following CIRC and EFM decoding, frequency information is deciphered by an ATRAC decoder, and the 20-millisecond intervals are reconstructed into digital waveform data. This data is then processed by a conventional D/A converter.

Data compression provides another important feature. As noted, while the data rate off the disc is 1.41 megabits per second, the ATRAC decoder requires only 0.3 megabits per second. This low rate permits efficient use of a

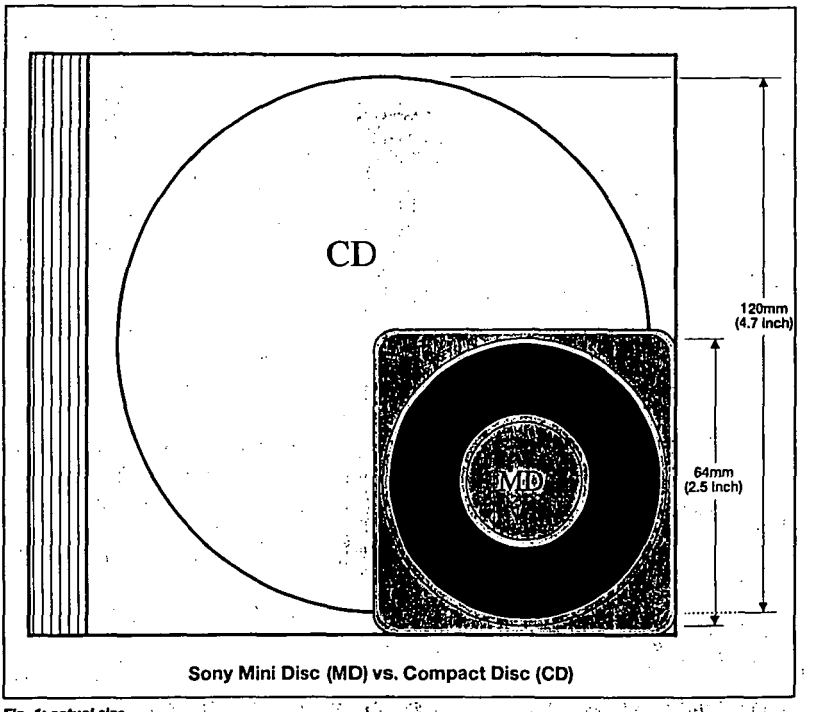


Fig. 1: actual size

look-ahead buffer; a 1-megabit memory chip placed between the pickup and decoder could store three seconds of real-time audio. Data enters the buffer faster than it leaves; when the buffer is full, the pickup stops reading data until the buffer is ready to accept more data. If the player mistracks, the pickup has ample time (three seconds) to return to the correct tracking position. This is facilitated by a sector-repositioning method in which address information is placed in the recorded bit stream every 13 milliseconds. When the pickup mistracks, the system detects the wrong address and returns the pickup to the correct address position. In other words, thanks to the low data rate, look-ahead buffer, and sector repositioning, the MD is essentially immune to shock and vibration during both recording and playback.

One question you might ask: Why develop an entirely new format, instead of a recordable CD? First, Sony wanted a more portable product, a disc of smaller diameter. Data compression provides for this. More importantly, record labels simply would not tolerate a recordable CD that matched the sound quality standards of the professional master recording. Instead, they might support a new format of slightly lower sound quality (specifically, non-cloned data). Handily, data compression also solves that problem. In addition, unlike a recordable CD format, MD brings an entirely new opportunity to sell prerecorded material; depending on your point of view, this is either good news or bad news. What will happen to recordable CDs? Don't worry, these will be as common in studios as DAT recorders. In fact, they will probably replace DAT recorders.

> The MD takes us all one step closer to the day when tape sheds its mortal coil and goes to that great head gap in the sky.

Some other things you'll want to know: The MD is slated for market introduction in late 1992. Prerecorded playback-only MD discs "can" be manufactured using existing CD pressing facilities. The MD standard will include the Serial Copy Management System (SCMS) in which first-generation digital copies are enabled, but not second-generation copies. Price? Only vague statements: "Initial pricing will make the Mini Disc an affordable product for personal audio customers. The price of blank recordable media will be comparable to analog metal tape."

Although Sony is loath to admit it, their announcement of MD as the recording format of the future signals that company's abandonment of DAT as a mass market product. In other words, although there might be room for DAT as a pro and high-end niche product, Sony's new view of the consumer audio market only has room for two systems: CD as the heir apparent to LP, and MD as heir apparent to the analog cassette. No, I haven't been able to do any critical listening to MD yet. When I do, I'll get back to you. ■

Ken Pohlmann is professor of music and director of the Music Engineering Program at the University of Miami in Coral Gables, Fla.

COMING IN 1992

POCKET-SIZE RECORDER PLAYS MUSIC ON A MINI

Just when you thought the familiar silvery compact disc was all you needed in terms of audio, along comes yet another incompatible recorded music format. The latest format, Sony's take-along Mini Disc music system, combines features of CDs and Walkman-type portable cassette machines. Both the Mini Discs and another new format scheduled to appear next year, digital compact cassettes, bring the advantages and disadvantages of computer technology to music recording and playback. The growing variety of audio hardware promises a confusing battle for market domination.

Miniaturization has been the key goal in designing the Mini Disc system. If Sony engineers succeed in cramming all the components into the mock-ups shown recently, you will have a choice of two exceptionally compact machines: a recorder about the size of today's portable cassette recorders or a tiny playback-only machine that fits into your shirt pocket with room to spare. In addition to extreme compactness, the machines give you one-second access to any music selection on the 2.5-inch discs, plus the advantages of digital audio technology compared with standard cassettes (see A Growing Menu of Incompatible Audio).

The development of prerecorded and erasable Mini Discs involves the refinement of four technologies:

- Digital-audio compression that uses five times less data than standard compact discs for 74 minutes of audio—with some loss of music fidelity.
- A technique for erasing and recording Mini Discs at the same time, using magnetism and laser heating.
- A small laser that helps erase and record discs, or illuminates both prerecorded and erasable discs for playback.
- A memory feature that enables you to handle the machines roughly—even jog with them—without causing audible interruptions.

If Sony markets its Mini Disc system next year as scheduled, it will be a first for most of these technologies in audio products. Except for the memory feature, however, similar technologies have already appeared in other prototype disc recorders not yet sold (see Erasable Discs Revisited).

The new Mini Discs are mounted in plastic cases with metal shutters, much like 3.5-inch diskettes used in personal computers. This protects the discs and makes them easier to handle, an important advantage for a portable audio system.

To achieve their goal of storing the same amount of music —74 minutes—on Mini Discs as conventional compact discs, Sony engineers had several options. "One possibility," said Katsuaki Tsurushima, "was to develop some completely new recording mechanism. But another option was to use digital technology to manipulate and compress electronic signals."

Sony settled on a compression scheme that takes advantage of two particular limitations of human hearing: the threshold of hearing, referring to the decibel level below which humans can no longer detect sound vibrations; and the masking effect that occurs when loud and soft sounds with similar frequencies strike the ears simultaneously and the soft sound isn't recognized.

During Mini Disc recording, the incoming analog signal is sampled and digitized much like it is in existing CD technology. But then the compression encoder analyzes the data and selects only those digital signals representing sounds the human ear is likely to hear. Address information, which helps the laser find its place on the disc when there's an interruption, and error correction data are added and the digital signals are recorded onto the disc.

Sony's compression scheme squeezes the same amount of data into one-fifth the space of conventional digital recordings with only a slight loss in sound quality after it's decompressed, the company claims. Demonstrations of Mini Disc audio have so far been too restrictive to allow for comparisons with other audio media. However, one Sony engineer

Playback-only Sony Mini Disc machines are expected to be palm size, like this nonoperational mock-up.

DISC

By DENNIS NORMILE

said that about two percent of the population, especially musicians and audiophiles, might be able to hear the differences between full-range CD recordings and the uncompressed audio from Mini Discs. The Mini Disc system, though, is designed for listening anywhere—with headphones, in a boom box, or in a car audio system—where there's a potential for background noise. This format is not earmarked for audiophile hi-fi equipment you would savor in a quiet listening room. Sony executives admit the sound quality of their Mini Disc system won't quite match that of CDs.

Compression has another advantage over developing a special recording technology to store CD-quality on a 2.5-inch disc: Music publishers will be able to use current CD-recording equipment to produce prerecorded Mini Discs, making it easier to put a variety of titles on store shelves.

Although the same laser can play back music from both *prerecorded and erasable Mini Discs, the record-playback* technologies for the two discs are completely different. The new prerecorded discs use the same optical technology as present CDs in which pits are formed on a metallic disc surface at the factory. These pits disrupt a laser beam during playback, making its reflection strong or weak to correspond with digital ones and zeros, respectively.

By contrast, the recordable discs use magneto-optical technology. "If you look closely, you can tell the difference," says *Tsurushima, holding up both types of Mini Discs. From the* back the two discs appear the same. Along one edge is a sliding metal shutter that gives the laser access to the disc from below. But while the front of the prerecorded disc is smooth, the recordable disc has another shutter.

"For magneto-optical recording, it's necessary to have a [magnetic] head above the disc," Tsurushima explains. With the magneto-optical technology used for erasable Mini Discs, a laser briefly heats a microscopic spot on the disc's magnetic layer. *The high temperature (about 400 degrees F) makes* it easier to reorient the magnetic polarity at the spot with a magnetic recording head. After the spot cools, its polarity is difficult to change unless it is reheated. The magnetic polarity of the spots encircling the disc corresponds to the ones and zeros of digital music data.

When magneto-optical recordings are played, the laser's power is reduced and its light is polarized and trained on the magnetized spots. When the polarized light interacts with the *magnetic field of the spots, a phenomenon called the Kerr ef*fect, the polarization plane of reflected light is twisted slightly. It's analogous to throwing a stick at one angle onto a sheet of

ERASABLE DISCS REVISITED

Disc machines designed to record hi-fi audio aren't new. The giant Dutch company N. V. Philips showed a prototype compact disc recorder in 1982. And at a European audio-video show two years ago, about 20 varieties of recordable CDs appeared. (Recordable disc formats include permanent recordings that can't be erased.) But the history of erasable-disc announcements and their availability in stores has been dismal. Among the reasons: Representatives of the music industry, fearing a loss of revenue from recordings made with highly accurate digital technology, have successfully blocked or delayed many new recorder entries with threats of copyright infringement lawsuits.

But technology can be a problem too. Early in 1988, Tandy Corp. in Fort Worth, Texas, announced an erasable CD called THOR. While Tandy's disc venture is more than a year behind its on-sale schedule, a spokesman says the project is still under way, although he declines to estimate an on-sale date. Tandy isn't giving any details, but if early reports about THOR are accurate, Tandy's erasable disc is based on a rare technology, dye-polymer recording ("Coming: CD Recorder," July '88). In this technique, a record-play laser heats a polymer layer on the disc, causing tiny pits to form. During playback, the pits disperse laser light, producing a blinking pattern needed for digital audio. To erase a THOR disc, another laser heats and softens an adjacent polymer layer, which flattens the pits. Researchers must perfect this flattening stage, because inadequate smoothing of the pits limits how many times a disc can be erased.

While the dye-polymer blend gives THOR discs a brilliant blue color, the vast majority of erasable discs have a muddy-brown hue from their thin coating of a magnetic iron-oxide-based powder. The technology for such magneto-optical discs is well established: For recording, laser heating and magnetism from a coil creates microscopic regions of different magnetic polarities. During playback, the magnetic polarity of one of these regions twists the optical polarity of light reflected from it, which identifies the original recorded pattern.

Last year, the French company Thomson Consumer Electronics showed a laboratory prototype of a magneto-optical disc recorder ("Electronics Newsfront," Oct '90). Some of Thomson's technology is strikingly similar to that used in Sony's Mini Disc. But because the two machines are designed for different functions—hi-fi recording at home versus Sony's take-along personal format—there are also major differences in the hardware. First, both recorders can play prerecorded and erasable discs. Thomson's machine handles ordinary compact discs. And because the Thomson recorder is designed for 4.7-inch CDs, it doesn't need the extreme five-to-one data compression Sony employs to squeeze a CD's 74 minutes of music onto its 2.5-inch discs. As a result, Thomson's recorder achieves the full range of fidelity possible with the 16-bit data resolution used for CDs. But to extend the recording time in its machine, Thomson includes a long-play mode based on four-to-one data compression. That compression reduces music fidelity, although Thomson, like Sony, claims few people can detect the missing music data. Few, of course, have had the opportunity.

Both the Sony and Thomson machines record by sending data signals to a magnet above the disc while heating tiny points on its ultra-thin recording layer from below the disc with a laser. The recording materials are also similar: a blend of the rare-earth terbium, cobalt, and iron compounds.

Thomson has not been able to agree upon a disc standard with N. V. Philips, which originated both the compact disc and compact cassette. Philips is promoting its own digital compact cassette format ("The Second Coming of the Digital Cassette," June). "But later this year," says a Philips spokeswoman, "we will offer a small compact disc recorder for the professional market." Philips hasn't priced the machine yet, but the spokeswoman speculated songwriters and musicians might pay more than $5,000 for a recorder based on the CD format. This machine, however, will probably use write-once disc technology, which permanently pits discs, rather than erasable disc technology. "Once a solution to the copyright problem has been reached," says the spokeswoman, "a compact disc recorder for the consumer market will be introduced."—*John Free*

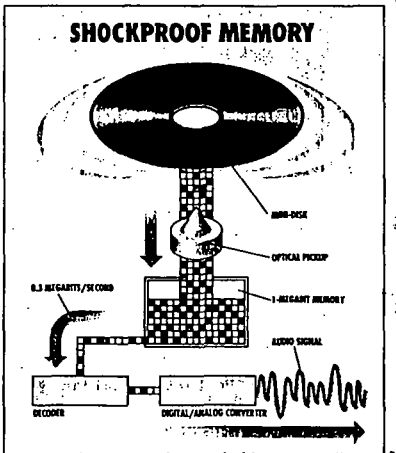
ice and having it bounce off at a different angle. An analysis of the light with detection circuits registers the magnetic polarities of the spots, reconstructing the recorded ones and zeros.

Two technologies were especially important in the development of the portable, battery-powered magneto-optical recorder, says Sony. The first is the magnetic medium of terbium ferrite cobalt used on the erasable Mini Discs. Terbium is a rare-earth element, and ferrite is the iron oxide also used on magnetic tape. For data storage, this material can be magnetically switched with one-third the power needed for the conventional magneto-optical discs used by the computer industry. Second, Sony developed a high-efficiency magnetic recording coil and driving circuit that can reverse polarity within about 100 billionths of a second (see diagram on facing page).

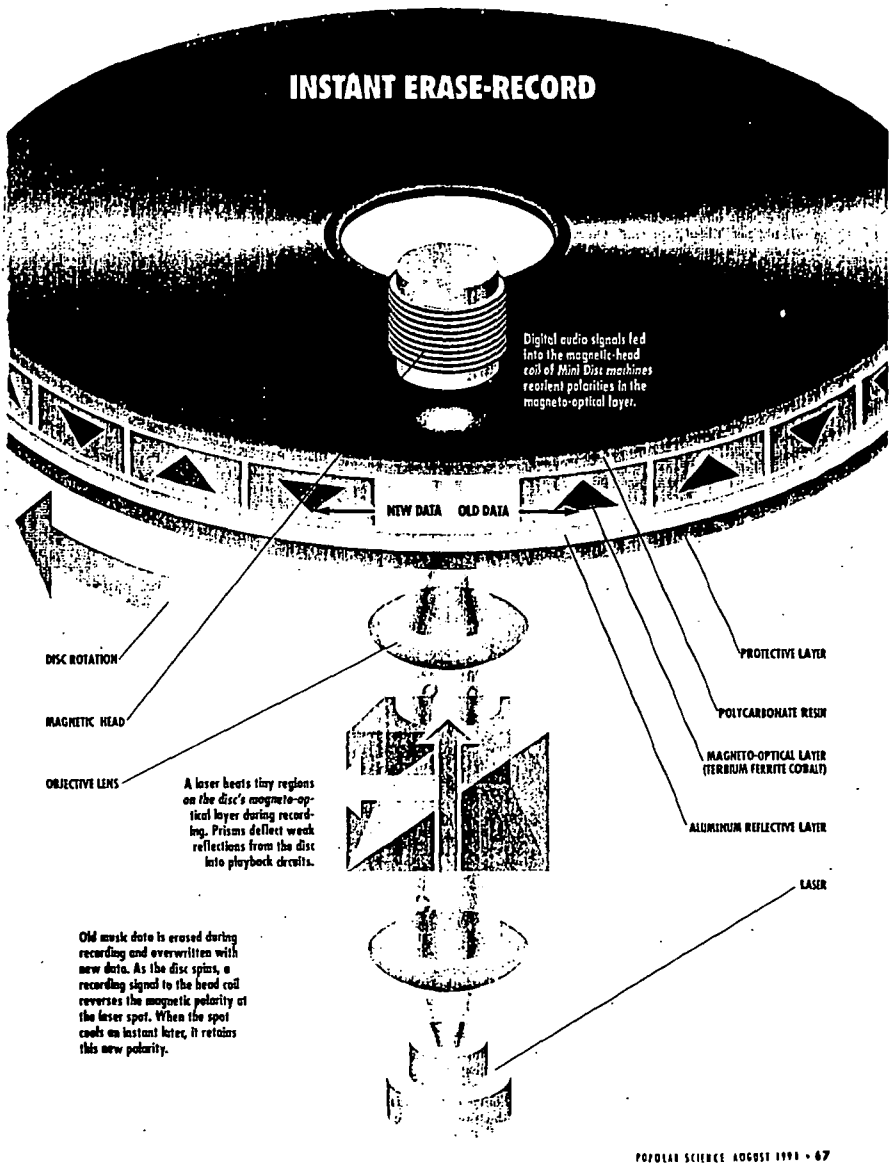
Here's why this combination now makes portable disc recording possible: Because the magnetic recording coil needs little power and the terbium ferrite cobalt can be magnetically reoriented with little power, a battery can supply the required energy. Moreover, the rapid reversal rate of the new magnetic head makes it possible to erase old data and record new information simultaneously in one disc rotation. As a result, the Mini Disc recording mechanism is simpler and more compact.

This one-rotation erase-record sequence differs from most previous magneto-optical drives, which require a separate step to erase the disc before new data can be written. This separate erasing stage involves either a time-consuming rotation of the disc over the laser combined with magnetic signals to reorient the magnetic layer or separate lasers operating at the same time, one for erasing and one for recording.

One final challenge in creating a disc machine that operates on the go: overcoming the skips and distortions that result from mistracking. A problem with existing portable CD players is that jarring them throws the optical pickup out of position. Rather than try to prevent mistracking, the



A memory chip stores up to three seconds of data streaming off Mini Discs. When the optical pickup is jarred off track, music data continues playing from this buffer memory.


INSTANT ERASE-RECORD
Digital audio signals fed into the magnetic-head coil of Mini Disc machines reorient polarities in the magneto-optical layer.
NEW DATA
OLD DATA
DISC ROTATION
MAGNETIC HEAD
OBJECTIVE LENS
A laser heats tiny regions on the disc's magneto-optical layer during recording. Prisms deflect weak reflections from the disc into playback circuits.
Old music data is erased during recording and overwritten with new data. As the disc spins, a recording signal to the head coil reverses the magnetic polarity at the laser spot. When the spot cools an instant later, it retains this new polarity.
PROTECTIVE LAYER
POLYCARBONATE RESIN
MAGNETO-OPTICAL LAYER (TERBIUM FERRITE COBALT)
ALUMINUM REFLECTIVE LAYER
LASER

Mini Disc system compensates with a buffer memory.

To demonstrate this memory feature, Tsurushima picks up a laboratory version of a Mini Disc player and shakes the machine as it plays music. Instead of the rasping sound you would expect as a laser is thrown off track, the music continues uninterrupted. Next he pries open the lid of the player, pulls the disc out, holds it up briefly, and then pops the disc back into the machine. Remarkably, not a beat is missed. Once again he pulls out the disc, but this time he waits several seconds. Finally the music stops. "That was just to show you the sound wasn't coming from somewhere else," he says.

The trick to this playback tenacity is that the optical pickup reads data from discs more than four times faster than is necessary for real-time playback. Data read from the disc flows into a one-megabit buffer memory at the rate of 1.4 megabits per second. But the decoder circuits converting this data into sound only need a 0.3-megabit-per-second flow of data. This enables the one-megabit buffer memory to hold three seconds of music information (see drawing on page 66).

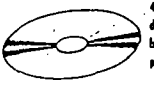
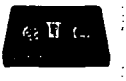
If the optical pickup is jarred out of position, the flow of correct data from the memory to the digital-analog converter continues as long as the pickup resumes proper reading within three seconds. When mistracking occurs in an Mini Disc player—as in conventional CD machines—counting circuits detect the abrupt change in address information recorded periodically with the music data. The laser pickup then quickly repositions itself using the address information registered just before the interruption.

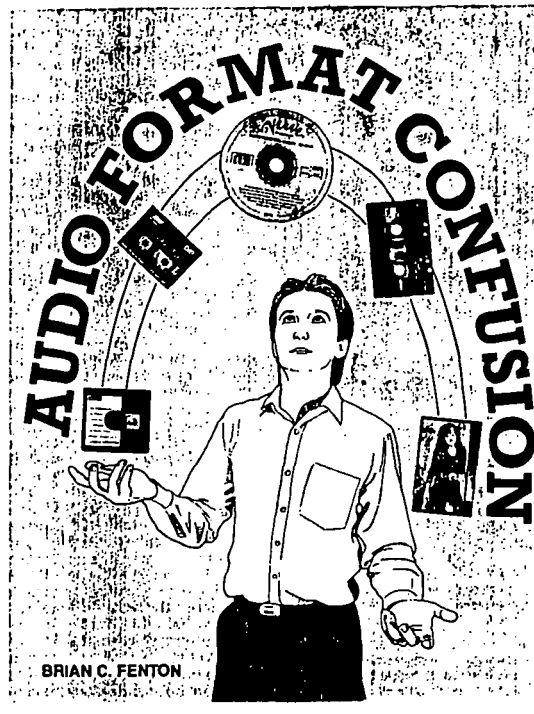
Although the Mini Disc technology has been established, the equipment is still being refined. Sony is also negotiating with music companies and other equipment manufacturers to broaden the use of the new format. One concession to the interests of music companies and recording artists is that Mini Disc machines will include a serial copy management system. This digital encoding scheme, also included on the newest digital tape formats, allows you to make one recording of prerecorded material, but blocks the recording of additional copies. Sony has not disclosed the Mini Disc player or recorder prices.

But just as the CD has driven LPs to near extinction, the new 2.5-inch discs may eventually replace standard compact cassettes. Sales of prerecorded cassettes have been declining in industrialized countries, according to data from the International Federation of the Phonographic Industry. Sony's researchers claim that listeners are dissatisfied with the sound quality of cassettes after growing accustomed to CDs. The design goal for Mini Discs, therefore, was to achieve the portability, recordability, and shock resistance of the Walkman, but with the quick random access and nearly the sound quality of CDs.

With the range of audio formats now available, consumers face a daunting choice selecting audio equipment. Sony intends to support all the format, even the digital compact cassette format developed by N. V. Philips of the Netherlands. Stay tuned as the battle lines are drawn.

A GROWING MENU OF INCOMPATIBLE AUDIO

FORMAT	FEATURES	PRO	CON
 MINI DISC	2.5-inch digital prerecorded optical and magneto-optical discs. Designed for Walkman-type use. Due in 1992.	Recordable. Compact, portable player/recorder. Anti-shock memory. Rapid access to bands. No-wear recording.	Data compression sacrifices fidelity. Limited titles initially.
 COMPACT DISC	4.7-inch prerecorded digital optical disc. For high-quality home/car playback only.	Full 16-bit fidelity (wide dynamic range). Rapid access to bands. Wide range of titles.	Mistracks when players are jarred. Non-recordable.
 COMPACT CASSETTE	⅛-inch-wide tape; fixed record/playback head. For home and portable use.	Extended recording times. Wide variety of inexpensive titles.	Limited dynamic range, tape hiss, speed and pitch changes, tape damage and wear. Slow access to bands.
 DIGITAL COMPACT CASSETTE	8 digital-audio tracks in each direction, with auto-reverse standard. Fixed record/playback heads. For home and portable use. Due in 1992.	Digital encoding eliminates pitch-change, hiss, low dynamic range problems. Machines also play standard compact cassettes. Shutter protects tape.	Data compression sacrifices fidelity. Tape damage and wear. Slow access to bands. Limited titles initially.
 DIGITAL AUDIO TAPE	⅛-inch-wide tape. Spinning record/playback heads. High-quality home and portable use. Professional recording.	Full 16-bit record/playback fidelity (wide dynamic range).	Complex, costly machines. Few prerecorded titles. Slow access to bands. Tape damage and wear.
 LP RECORD	Grooved 12-inch discs. Mechanical-electrical playback. For home use.	Wide range of inexpensive titles available.	Restricted dynamic range. Susceptible to dirt, scratches, and wear.



Two new digital audio formats—Sony's Mini Disc and Philips' Digital Compact Cassette—promise to battle each other as they create consumer confusion.

IT'S BEEN LESS THAN A DECADE sense the compact disc was introduced. In that short time, the CD has brought high-quality audio reproduction to the masses, and taught us to appreciate good sound. We're not exaggerating when we say that the CD has changed the *way we listen* to music.

It's rare for a new technology and format to catch on so quickly—especially one that threatens to make its predecessors obsolete. CD was a success not only because of consumer acceptance, but because it also offered something to manufacturers, recording companies, and retailers.

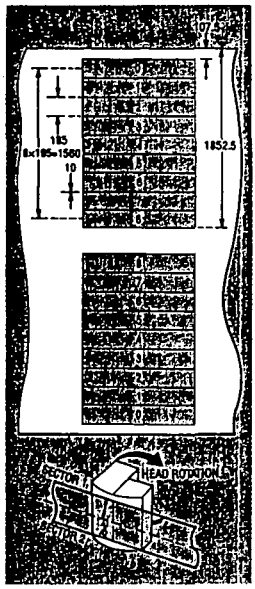
It wasn't the CD's "gee whiz" appeal—nor was it the promise of *perfect audio reproduction*—that caused sales to catch fire. It was *convenience*. When compared to the LP that it replaced, CD's were a dramatic breakthrough. They can store more audio in a package a fraction of the size. They can be lent to even your most careless friends without getting scratched. They even play back more conveniently, because you can skip tracks that you don't want to listen to, or re-arrange the order in which the songs play back.

It's convenience, also, that makes the venerable compact cassette our music medium of choice. (Cassettes outsell CD's by a ratio of about 1.5:1.) They fit in your shirt pocket, and they stand up reasonably well to abuse. They're ideal for use in a car or in a personal stereo because they're relatively immune to shocks. So what if they can't come close to the audio quality of a CD or even an LP?

How about DAT?

In the belief that consumers had fallen so much in love with the idea of digital audio because of their exposure to CD, Japanese manufacturers reasoned that Digital Audio Tape (DAT) would be to the CD what the compact cassette was to the LP. Unfortunately, it didn't work out that way for a number of reasons. First, the record industry, spearheaded by the RIAA (Recording Industry Association of America), threatened lawsuits against any Japanese manufacturer who exported the DAT machines to the U.S. The RIAA was concerned about DAT's potential to make virtually perfect copies of CD's. (They seemingly missed the fact that, for most people, cassettes do the same thing. And despite that, *pre-recorded* cassettes have outsold both LP's and CD's combined since 1982! They've outsold blank tapes as well.) The threats of lawsuits were enough to stop DAT dead in its tracks, despite considerable accolades for the format in the audio and general press.

Although some DAT machines were available on the "gray market" of unofficially imported goods, DAT officially arrived in the U.S. market last year—with generally disappointing results. Whether it was the years of delay, the taint of the lawsuits, the expense of the machines, or the lack of pre-recorded software that have killed DAT in the consumer market, we'll never know for sure. Perhaps DAT failed because



EIGHT TRACKS OF MUSIC DATA are contained on each "side" of the Digital Compact Cassette, as shown in *a*. (All dimensions shown are in micrometers.) The DCC head shown in *b* is manufactured using thin-film techniques. It contains a set of 8 digital recording and playback heads as well as two analog playback heads.

it doesn't offer the avarage consumer anything that they're not already getting from their favorite compact cassettes.

Although the compact cassette—even with its inherent problems—is just fine for most people, Philips, the originators of the compact cassette, was convinced that the format could be improved, and that consumers would buy into the updated format. Thus, DCC, the Digital Compact Cassette, was born.

Enter DCC

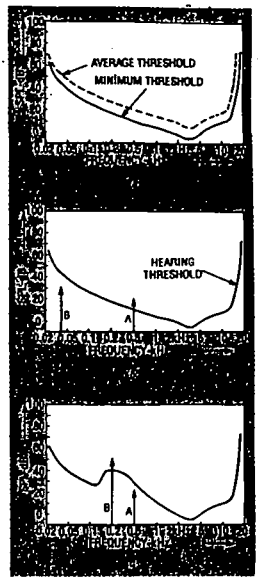
In January of this year, Philips announced that "a new era of audio reproduction has started." DCC, a digital extension of the compact cassette, would offer "the best opportunity available for consumers and industry to enter into the field of digital recording." Tandy Corporation announced that they would be the first U.S. licensee of Philips' technology, and would introduce a home recording deck in late 1992.

The most important feature of DCC is that it doesn't make the familiar cassette obsolete. All DCC players will play back existing analog cassettes, so even when you make the jump to DCC, you can still listen to your existing library of tapes. (You won't, however, be able to record analog cassettes on your DCC machine, or play DCC tapes on your standard cassette deck.) That "backward compatibility" could convince some consumers to upgrade to DCC even though they like what they already have. After all, an upgrade won't just give them better sound, but as we'll see, more convenience as well.

A DCC deck is essentially a standard cassette recorder that includes some extra digital electronics and a new head design. The dimensions of a DCC cassette are essentially the same as that of a standard cassette, but the digital cassette's sides are flat—the case doesn't get fatter where the head enters the shell. Also, since the DCC standard demands that all DCC players feature auto-reverse, there's never a need to flip the tape over, so you don't need to have holes for the reels on both sides of the cassette. That means that one full side of the cassette can be used for information and graphics—something the recording companies love.

The spool holes and the tape surface are protected against dust and fingers by a sliding metal cover, which also locks the tape hubs. There's no need for an carrying case, so the digital cassette is easier to use and store, especially in a car.

The key to maintaining compatibility with standard cassettes is a new thin-film semiconductor head, manufactured using a process similar to that used for integrated circuits. The first layer of the head contains one set of 9 magneto-resistive heads for digital playback, and a pair of similar heads for analog playback. On the second head layer is one set of 9 integrated



PHILIPS' PASC ENCODING ignores sounds that are below the hearing threshold (*a*). Of the signals shown in *b*, only A would be recorded because B, below the hearing threshold, would not be heard. The hearing threshold, however, varies dynamically depending on what other signals are present. In *c*, signal B has altered the threshold, making A inaudible.

recording heads for digital recording. We'll see shortly why 9 digital heads are required.

PASC makes it work

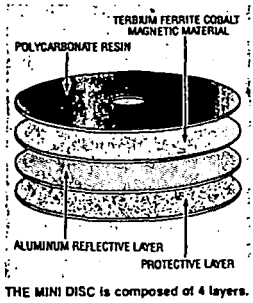
The key to the DCC system is the a new digital coding technique called PASC, or precision adaptive sub-band coding. The goal of PASC is to produce a signal equivalent to that of a CD. The results? A dynamic range better than 105 dB, and a total harmonic distortion, including noise, of less than 0.0025%.

PASC is based on two important phychoacoustic principles. The first is that we can hear sounds only if they're above a certain level, called the hearing threshold. The second is that loud signals mask soft ones by raising the hearing threshold.

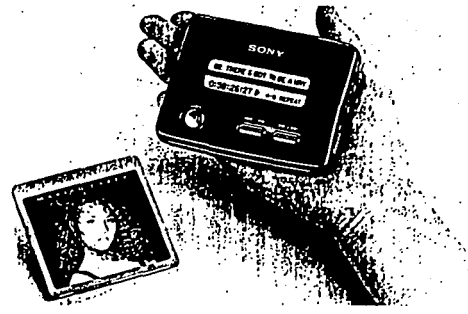
The hearing threshold, as you might expect, varies from person to person. Even a very sensitive ear, however, won't be able to hear a sound if it is masked by a louder sound. (You couldn't, for example, hear an unamplified violin at a rock 'n' roll concert!) The theory behind PASC's efficiency can be expressed by the question, "If you can't hear it, why record it?"

During encoding, the PASC processor analyzes the audio signal by splitting it into 32 subband signals. By continuously taking into account the dynamic variations of the hearing threshold, the PASC processor encodes only the sounds that will be audible to the human ear. Each subband is allocated the number of bits that are required to accurately encode the sound within it. If a subband doesn't require any bits—because it contains sounds that are masked, for example—its bits are re-allocated to other subbands so that the sounds within them can be encoded more accurately. On average, the PASC system needs to encode only one quarter the number of bits that a CD or DAT encoder would to reproduce a given audio signal.

The encoded data is multiplexed into an 8-channel data stream, and error-detection and -correction codes are added. The eight channels are recorded on 8 parallel tracks on the DCC tape. The ninth track can be used to carry auxiliary data, such as song titles, recording times, and the like). The auxiliary track could be used to generate hundreds of characters of text per second, so decks could include readouts for song lyrics or other information about the selection.



THE MINI DISC is composed of 4 layers.



A PROTOTYPE MINI DISC player and a pre-recorded disc.

DCC, an elegant extension of the most popular music carrier we have, seemed to be a sure-fire hit. It had something for everyone, including hardware manufacturers, record companies, retailers, and consumers. It now appears, however, to have run up against a formidable competitor: Sony's Mini Disc.

Sony's Mini Disc

In May of this year, in what seemed to be a deliberate attempt to derail DCC before it got moving, Sony announced a brand new recordable audio format, the Mini Disc or MD. Sony, however, denied that their MD was meant to compete with DCC. In response to the question of what MD replaces, the President of Sony Corporation of America answered "We are replacing nothing. We are Creating new markets."

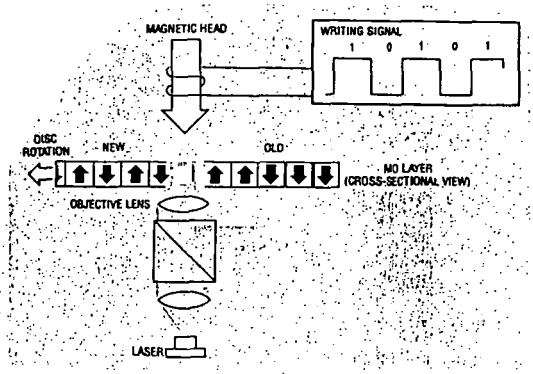
The Mini Disc format is specifically designed for portable applications (personal stereos, boom boxes, etc.) and is slated for introduction, conveniently, in late 1992—the same time that DCC decks are due. The disc, about 2½ inches in diameter, looks—and acts—like a cross between a compact disc and a micro floppy computer disk. Like a compact disc, the Mini Disc is an optical medium—it is read by a laser and can store up to 74 minutes of digital audio. Like a floppy disk, the mini disc can be magnetically recorded again and again.

How did they manage to get the same capacity as a CD on a disc that has about ¼ the surface area? Interestingly, by treating audio in much the same way as DCC does. Sony's encoding scheme, which is called ATRAC, or adaptive transform acoustic coding, is also based on the psychoacoustic principles regarding the threshold of hearing and the masking effect.

Because the ATRAC encoder ignores sounds that fall below the threshold of hearing (which varies dynamically because of signal masking) it can encode data five times more efficiently than CD or DAT systems. That's even better than DCC's 4:1 advantage!

Can a recording that "leaves out 80% of the bits" sound as good as a CD? In theory, if all you're leaving out is things you can't hear, then yes. In practice, we don't know yet. At Sony's announcement, they demonstrated a prototype by playing some pop/rock for a half minute or so. It sounded OK, we guess, considering that the listening environment was a crowded hotel meeting room. No A/B comparisons were provided between CD and MD. Sony claims that "only 2% of the population will be able to hear the difference."

The Mini Disc is constructed of four layers, including a newly developed magnetic layer of terbium ferrite cobalt. Since magneto-optical discs can't come in contact with the recording heads, it's important that the magnetic material be able to



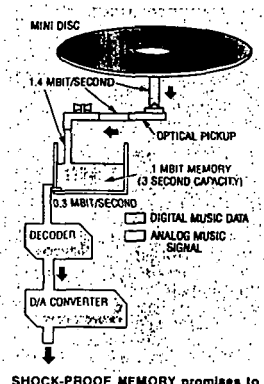
MAGNETO-OPTICAL OVERWRITE TECHNOLOGY. When the magnetic layer is heated by the laser, it becomes possible for the magnetic head to change its polarity. The polarity is then detected by the laser during playback by noting the direction of reflection.

change polarity when subject to a very small magnetic field. The new material fills the bill.

The Mini Disc requires both a laser and a magnetic head for recording. When the magnetic layer is heated by the laser (to a temperature of about 400°F), it loses its coercive force—that is, it becomes very easy to magnetize. The head then supplies a magnetic field to set the material's magnetic polarity. When the heated spot cools, the new polarity is "locked in" and, thus, the digital data are recorded.

Sony's Mini Disc has a couple of advantages over other optical recording methods. The structure of the head is much simpler because the laser can be on continuously during recording and playback. And the low-coercivity of the magnetic material greatly reduces the power required, making portable operation feasible.

One feature of Mini Disc touted by Sony is that the portable Walkman players will have "shock-proof memory." One of the problems with current portable CD players is that they don't work too well unless they're standing still. Any sharp jarring causes the laser to mistrack. Mini Disc players shouldn't suffer from that problem because data is read off the disc at a rate far faster than required by the ATRAC decoder, creating a data buffer of



SHOCK-PROOF MEMORY promises to make Mini Disc an ideal portable format. Since the data is read off the disc far faster than required by the ATRAC decoder, a buffer as long as three seconds is created.

three seconds. If the laser mistracks, the listener won't hear it. The buffer will feed data to the decoder while the laser finds its way back to the right spot. Sony's announcement included a demonstration where a prototype player was shaken vigorously without any audible result. The prototype continued to play even after the disc was removed until the 1-megabit buffer was empty! Of course, there's no technological reason why portable CD players couldn't offer their own shock-proof memory buffer. But since the buffer would have to be 5 times the size, it would add greatly to the cost.

Who wins?

Ever since we forecast that DAT would be a sure-fire success, we've been reluctant to make predictions. But let's look at some of the issues involved, and how DCC and MD stack up.

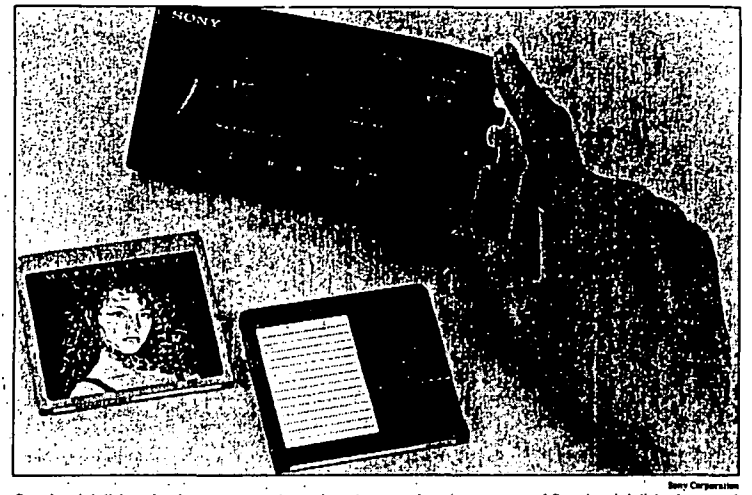
For consumers—assuming that both formats offer high-quality audio—DCC has the decided advantage in that existing libraries of cassettes won't be obsolete. Both formats have the potential to supply such convenience features as song title and lyric readouts, but MD offers much faster random access of tracks. Although it's too early to say for sure, prices for home DCC decks should be under $500 when introduced, while a portable MD player is expected to cost around $400. For consumers, we give DCC a slight edge.

The recording companies will have a hard time taking sides. Both technologies will use the serial copy management system or SCMS, an anti-piracy system. Manufacturers will be able to duplicate DCC at 64 times normal speed on equipment similar to what is now used for standard cassettes. Mini Disc players will be able to play back not only magneto-optical discs, but pre-recorded optical discs as well—discs manufactured using the same process as is used for CD's. Various recording companies have expressed support for each format. Which way will the record companies go? For us, it's too close to call.

Hardware manufacturers should prefer DCC because standard tape transports can be used. Retailers, always reluctant to have to stock the same titles in various formats, are dreading the thought of re-vamping their stores to accommodate either DCC or MD.

What about you? In the long run—since both formats seem destined to compete with each other for your money—it's you who will decide whether DCC or MD is the personal recording format of the 90's and beyond. R-E

Beacham Exhibit #9



Sony Corporation

Sony's mini disk technology removes the major advantage that tape enjoys over compact disks: the tiny, "rewritable" disks can be used to record as well as play. A prototype of Sony's mini disk player and recorder is shown with a plastic-encased prerecorded disk, left, and a similar blank recordable disk.

Advance in CD's Starts a New Battle

By DAVID E. SANGER

Special to The New York Times

TOKYO, June 18 — When the compact disk emerged from the laboratory as a consumer product in the mid-1980's, recording companies hated it. It would confuse consumers and ruin the recording business, they said. Today, records are indeed near extinction, but the recording business has doubled since CD's, with their scratch-free, hiss-free digital clarity, went on sale eight years ago.

Now the battle is about to be fought again — this time over compact disks that record. The industry is choosing sides over a new technology called MD, for mini disk, a variant of the compact disk that the Sony Corporation is betting will make its own Walkman obsolete.

The MD, or mini disk, can record as well as play.

Only two and a half inches in diameter, about the size of soda can tops, the disk is not only made for portables but is also "rewritable," meaning that data stored on it, whether music or digits, can be changed. With that innovation, the one great advantage of tapes over compact disks is about to be wiped away. Sony is not saying yet, but when production of the player-recorders begins next year, they are expected to cost about $400.

For a decade, the CD that can record has been one of the Holy Grails of the electronics industry, and Sony is hardly the only entrant. Toshiba, Philips N.V. of the Netherlands, I.B.M., and many others have been building prototypes, and there are already some specialty systems on the market as disk drives for computers — taking advantage of the huge storage capacity of what the industry calls "optical disks."

But Sony is attempting a classic Japanese strategy: It is quickly forcing new, cutting-edge technolgy into a relatively inexpensive consumer product in hopes that big manufacturing volume will cut production costs

Continued on Page D7

BUSINESS TECHNOLOGY

A Compact Disk Advance Starts a

Continued From First Business Page

and leapfrog the company over the rest of the industry.

It is a high-risk approach that in the past has had some broad successes — most recently with lightweight consumer video cameras — and a few crashing failures.

And once again, the recording industry (except for Sony Music) and many of Sony's competitors are protesting vociferously, contending that what is good for the march of technology could prove disastrous for the business.

The fate of the MD over the next few years may well determine more than just the profits of the consumer electronics industry. Rewritable disk technology — of which the mini disk is just one variation — has innumerable uses beyond music. The most important may be in computing, where optical compact disks, known as CD-ROM's, are already coming into use because they can store far more data than magnetic disks. But unlike mini disks, CD-ROM's cannot record data.

A variant of the new mini disk, with its small size, would have obvious applications to laptop computing.

For now, Sony says its only immediate interest is the audio market. "To expand the market for the compact disk, we needed a much smaller disk that could be used outdoors," said Terusaki Aoki, who heads Sony's tape and disk products division and until recently ran its research and development programs. "And, of course, we needed recording capability."

So far, small size and recording capability have been available only with floppy disks and audio and video tape. These rely on thin layers of particles that are magnetically read or altered to play or record. In compact disk technology, lasers pick up reflected light from a disk's finely pitted surface, and these optical signals are converted it into a stream of digital 0's and 1's. The compact disks can store far more information.

Now, the race between magnetic and optical technologies is on. The first problem for the optical researchers was to shrink the disks,

The one great advantage of tapes over CD's is about to be wiped away.

and players, to no more than the size of cassette tapes and Walkmans. Ordinarily, a mini disk the size of the one Sony developed would store far less data than a standard-size, five-inch compact disk, which can play about 74 minutes of music. But Sony's new compression technology can jam the same amount of music into a fifth the space, partly by cutting out frequencies that cannot be detected by the human ear. The price: audio quality that is a bit lower than on ordinary compact disks.

In the future, similar technology may be used to compress the data

For the Scientist, Electronic Notebooks

The days of the traditional laboratory notebook may be almost over. As scientists and engineers do more and more of their work on computers, the task of keeping data in a handwritten notebook has become cumbersome and impractical. How can a scientist enter a complex, three-dimensional color model into a notebook?

Researchers at the Baylor College of Medicine in Houston have come up with an electronic alternative, the Virtual Notebook System, or VNS, a software package that turns a computer work station into a multimedia lab notebook that can accept not only text but also sound, electronic mail, photographs and still video images. The software can also receive faxes, allowing data from them to be incorporated into the lab notes.

More important, VNS easily ties into a computer network, which makes the lab notebook mobile. A scientist who is traveling can call up the notebook on any work station, regardless of brand. It also allows scientists to share their notebooks with selected colleagues anywhere in the world using any type of computer running the popular X Windows operating system that I.B.M., Apple, Digital Equipment and others use to control their computers' basic functions.

The Virtual Notebook System borrows a key concept from airline reservations systems: a change made by one user is seen immediately by all. According to Kevin Long, a Baylor reseacher and one of the developers of VNS, program users can amend the notes in Texas and colleagues running the program in California, New York or Hong Kong will immediately see these changes on their own screens. This feature is particularly valuable to teams of

Tom Kleen

The notebook program can automatically monitor and collect data from other sources, like a computerized news wire. A researcher can instruct his system to find articles on any subject.

Baylor has created a commercial subsidiary, Groupwork Systems Inc., to sell the notebook program for about $2,500. Mr. Long foresees potential applications including the processing of insurance claims and litigation support. The system has already been sold to BP Research, a unit of

New Battle

needed for video images, so that videodisks — long a hit product in Japan — will no longer need to be the size of pizza platters.

Then there is the jogging problem. While audio tape easily absorbs bouncing and jostling, the delicate laser pickups in portable CD players sometimes skip. In MD machines, special circuitry feeds 3 seconds of music into a one-megabit memory chip before it is played — meaning that if the music appears garbled, the machine has time to recover and read it again. "Even if you take the disk out, the music plays on for a few seconds," Mr. Aoki said.

The last trick was to design a way to record data without using gobs of electricity, because the MD will be used in battery-operated portables. Some other systems require two lasers — one for erasing data by heating up a spot on the disk to 400 degrees Fahrenheit, one for recording. One-laser systems need several rotations of the disk to perform the same job, which takes time. The Sony system, using a single laser, can perform these operations in a single pass over the disk.

Philips's Cassette

While the technology has been much admired, the MD itself has not. The biggest critic is Philips, Sony's one-time ally in CD's. Next year, around the time that the mini disk appears on the market, Philips is bringing out the digital compact cassette, or DCC.

Like digital audio tape, the technology that Sony and other electronics makers here have tried to promote for years, the cassettes have nearly the sound quality of compact disks. But unlike digital audio tape or mini disk machines, the new digital cassette players will also play the billions of conventional cassette tapes that have been sold over the past two decades.

Some Fear Industry Ruin

Some are already complaining that Sony, by leaving consumers dizzy with yet another incompatible technology, is risking ruin for the industry. Alain Levy, who heads Philips's recording business, Polygram Records, says Sony "thinks the rest of the world is like Japan" — in love with the compact disk and willing to buy the latest technology. The percentage of the population that owns CD players in gadget-happy Japan is far higher than anyplace else.

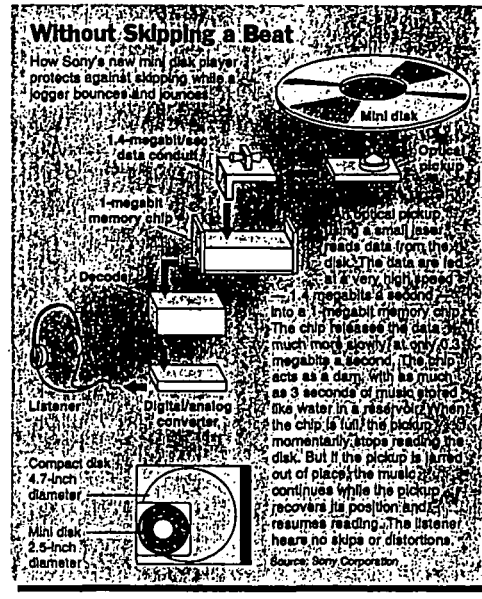
"We can sell a lot more tapes, and a lot more CD's, without confusing the world with a new format," Mr. Levy said. Among his new allies is Sony's archrival, the Matsushita Electric Industrial Company.

The winner will be whichever format attracts the most software — whether M.C. Hammer and Mozart drift to the Sony camp or the Philips one. Sony's record on promoting new formats is spotty at best. The failure of Betamax to attract good programs ultimately led to its failure as a videocassette format. That shortcoming started Sony on its buying spree in recent years, starting with CBS Records and moving on to Columbia Pictures.

Yet even with CBS Records and all its top-selling titles in hand, Sony was unable to make digital audio tape a success. Last year, when digital audio tape sales were expected to boom, only 150,000 players were sold.

The industry, worried that DAT would enable recording pirates to make perfect copies of compact disks, worked out an electronic protection plan that satisfied neither consumers nor manufacturers. Sony is now repositioning DAT for music professionals and audiophiles, not for the mass market.

The same piracy worries surround the new mini disks. Technologically, the mini disks are superior products: faster, cleaner and more durable than tape. Whether that will be enough to make it a winning product is hardly a sure bet.



The New York Times

Growth Hormone Suit Ends

Special to The New York Times

SAN FRANCISCO, June 18 — Genentech Inc. said today that it had reached an agreement with Hoffmann-La Roche Inc. and the Hormone Research Foundation to drop litigation over a patent dispute involving human growth hormone.

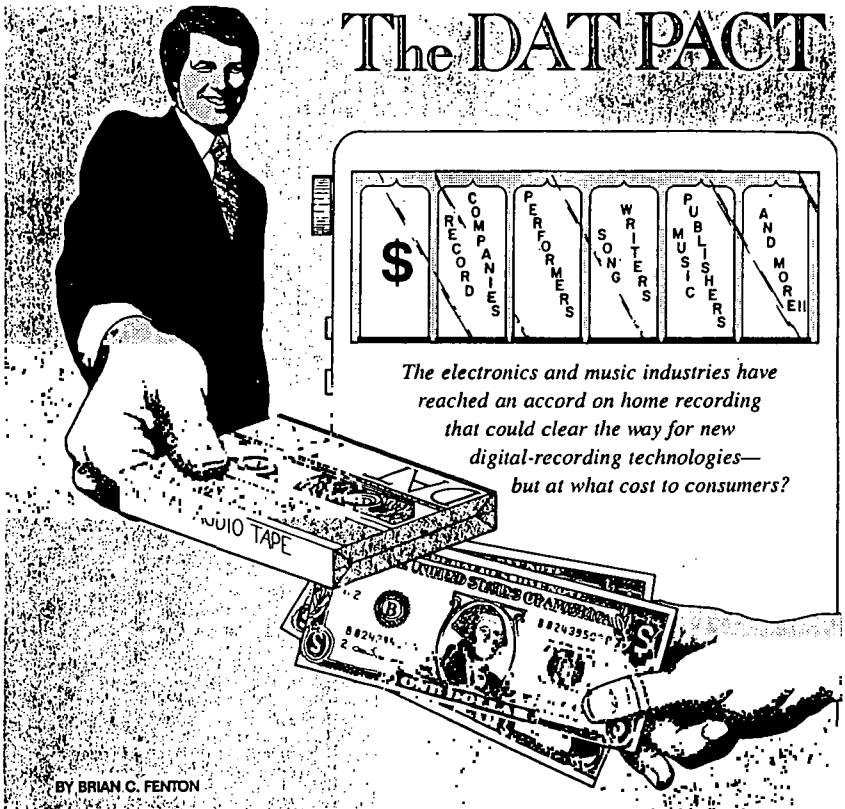
The foundation, based in Seattle, had licensed a patent on the hormone to Roche, which in 1988 sued Genentech, contending that Genentech's Protropin brand of genetically engineered growth hormone infringed the patent.

But the suit was made moot when Roche Holding Ltd., the Swiss parent company of Hoffmann-La Roche, acquired a majority interest in Genentech in February 1990.

Todd Chairman Leaving

SEATTLE, June 18 (AP) — The chairman of the Todd Shipyards Corporation, David W. Wallace, said he would resign late this summer. Mr. Wallace helped guide Todd through a Chapter 11 bankruptcy reorganization, completed in January.

The DAT PACT



The electronics and music industries have reached an accord on home recording that could clear the way for new digital-recording technologies—but at what cost to consumers?

BY BRIAN C. FENTON

Just as we were ready to write off digital audio tape (DAT) as a mass-market failure, we were again reminded how difficult it is to predict the future of consumer electronics. After more than a decade of intra-industry fighting, the electronics manufacturers, recording companies, songwriters, music publishers, and performers have reached an agreement that could pave the way for DAT's entrance as a mass-market item. Ironically, DAT may owe its new shot at life to two new, competing digital formats, Philips' Digital Compact Cassette (DCC) and Sony's Mini Disc (MD), which were introduced earlier this year.

History Repeats? Although consumers [illegible] new technology, as it [illegible]—I was introduced more than five years ago in Japan. Before DAT could be brought to the U.S., however, threats of lawsuits from the recording industry forced manufacturers to hold back. When Sony finally did introduce a DAT deck here in June of last year, they were promptly sued by the National Music Publishers Association. (That suit has been dropped as part of the recent agreement.)

After a slow start, the DAT format has finally caught on in Japan. Sales in the U.S., however, have been poor at best. [illegible] recording companies, who were worried about the potential [illegible] could make [illegible] perfect copies of copyrighted recordings, chose not to support DAT. Since no prerecorded software was available, consumers—more than satisfied with standard cassettes—saw little need to buy DAT decks despite their impressive hi-fi capabilities.

DAT is not the first electronic product to enter the market under the shadow of legal action. A similar situation arose in 1975 when Sony introduced their Betamax videocassette recorder. The movie industry was very worried about the potential competition of VCR's, and

the threat of financial losses brought about by home taping. Universal Studios and Walt Disney Productions sued Sony, alleging copyright infringement in 1976.

Although a U.S. District Court ruled in 1979 that home video taping for private use didn't constitute copyright infringement, the ruling was reversed by a U.S. Court of Appeals. Congress stepped into the controversy in 1981, introducing legislation that would overturn the Appeals Court decision. Later, a bill was introduced that would place royalty taxes on VCR's and blank video cassettes. Congress did not act on either bill.

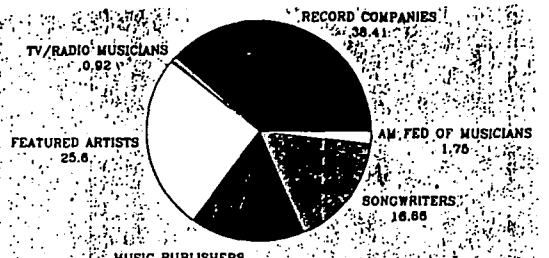
In 1982, the U.S. Supreme Court was petitioned to resolve the home video-taping question. Initial hearings were heard in January 1983, and one year later, the Supreme Court ruled that home video taping does not constitute copyright infringement. Ironically, Hollywood now makes more money from the release of movies on videocassette than it does from theatrical releases!

Not a Good Answer? Despite the Supreme Court ruling, the video- and audio-recording industries continued to seek legislation that would impose royalties on cassette decks and VCR's as well as blank tapes. Bills were introduced in Congress that would impose royalties as high as 25% on recorders and at least 1 cent per minute on blank tape! Other alternatives were offered, including the requirement that anti-taping chips be built into recording decks. (Studies done on the anti-taping chip by the National Bureau of Standards concluded that it was not an acceptable solution because it seriously degraded the music quality.)

The introduction of DAT to the U.S. at the January 1987 Consumer Electronics Show got the recording industry even more worried, even though no company announced definite sales plans. A bill that would impose a 35% tariff on imported DAT recorders was introduced in Congress, but that also died.

Although Congress took no action on any of the bills introduced, the Recording Industry Association of America (RIAA) did—they threatened to file a lawsuit against any manufacturer who sold DAT in the U.S.

In an attempt to find out how serious a "problem" home taping was, the Office of Technology Assessment undertook a study and issued a report, *Copyright and Home Taping*, in 1989.



Although the royalty agreement spells out the percentages that each group should receive, we're cynical enough to assume that a good portion of the collected royalties will go to administering the collection and distribution of the funds. Payment to the record companies and artists will be made according to sales.

The report, concluded that, even though "home taping may reduce the recording industry's revenues, a ban on home audio taping would be even more harmful to consumers and would result in an outright loss of benefits to society... in the billions of dollars." Some of the more interesting findings included:

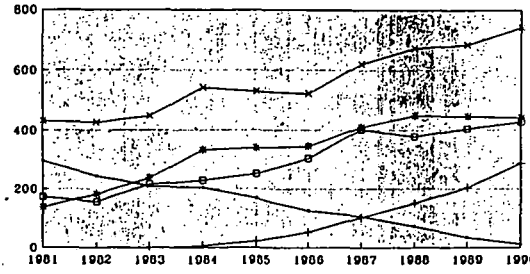
- Almost three quarters (73%) of home taping "occasions" do not involve pre-recorded music. Instead, they include the taping of family members, lectures, band practices, answering-machine messages, etc.
- Most (72%) home-recorded tapes of copyrighted material were made from the taper's own music collection. Another 9% (for a total of 81%) were made from material owned by other family members. The main reason for the taping was "place shifting." That is, home recorders made tapes of CD's so they could be played in a car's cassette player, *Walkman*, etc. The second most popular reason that home tapers made cassette copies was to make custom tapes with only the songs that they wanted, in the order they wanted them.
- About one quarter of pre-recorded purchases were made after the consumer heard the artist or recording on a home-made tape. (For example, a friend said, "Hey, listen to this song from this great new CD I just bought—you just *gotta* hear it!")
- If home tapers were not able to record, at least three quarters of home tapes would not be replaced by sales of prerecorded music.

After the report was issued, both camps went back into negotiations. The Digital Audio Tape Recorder Act of 1990, introduced in Congress early in the year, seemed to be the compromise that would finally "legitimize" the digital audio-tape recorder. Both sides realized that it was time to start working together. As the president of the RIAA testified before Congress, "Without our music, their products are worthless, but without their machines, no one can listen to our music."

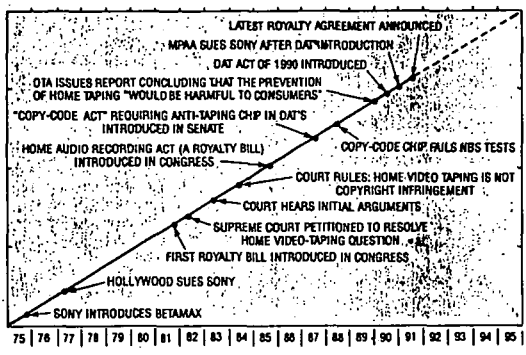
The "DAT Act" called for the inclusion of SCMS, the Serial Copyright Management System, in all digital audio recorders. (See the sidebar elsewhere in this article.) The bill, if passed, still did not promise to be a definitive end to the home taping question (despite the Supreme Court's Betamax decision). The bill, in fact, said, "...this Act does not address or affect the legality of private home copying under the copyright laws."

In the eyes of the recording industry, the bill was a compromise that sought to preserve the status quo by making DAT home taping equivalent to analog home taping—that is, you can only make first generation copies. (Second-generation cassette recordings are substantially worse than the preceding generation.)

The "DAT Bill" turned out not to be the answer we all were waiting for because of opposition from other factions within the music industry. The National Music Publishers Association (NMPA); the Songwriters Guild of America (SGA); and the American Society of Composers, Authors, and Publishers (ASCAP)—who called themselves the "Copyright Coalition"—strongly opposed the bill



What's at stake? Shown here are sales, in millions of units, of various prerecorded media and blank cassettes over the last decade or so. Note that, although few things are easier than making a cassette recording, pre-recorded cassettes still outsell blank ones. Both far outsell CD's.



The long road: A brief history of the trials and tribulations of the digital audio tape recorder.

and instead wanted to continue to press for royalties. As a result, the bill died in subcommittee, and Congress took no action before it adjourned for the year.

Even without an official bill to "legitimize" it, DAT finally arrived in the U.S. in June of last year when Sony began officially importing and selling SCMS-equipped decks. Almost immediately, a class-action suit was brought against them by the NMPA. The suit was enough to keep other manufacturers from following Sony's lead, and although units from other manufacturers are now available (see Gizmo, elsewhere in this issue, for a review of one such unit from Sharp), DAT sales fell far short of projections.

The Royalty Pact. Despite all the fighting, both sides knew that, without some sort of agreement, everyone had a lot to lose. The hardware manufacturers had the capability to produce new decks that they knew they could sell. The recording industry—though not admitting it publicly—knew that new formats are good for business. (Sales were virtually flat before the introduction of the CD in 1982.) Both sides were talking—in secret—in the spring of this year.

The impetus for the talks was likely that the hardware manufacturers were not so much trying to clear the way for DAT as they were looking for a way to ensure that Digital Compact-Cassette and Mini-Disc recorders could enter the market without the same obstacles that hindered DAT. John Roach, Chairman of Tandy Electronics (which earlier had committed to introducing DCC to the U.S. in 1992) appears to have been instrumental in getting the two camps to come to agreement.

Like the agreement reached in 1990, the pact would require that all digital consumer recorders contain SCMS circuitry. For the first time, however, royalty payments would be required on the sale of all consumer digital recorders and on blank tapes. On recorders, the payment would be 2% of the manufacturer's price, with a minimum royalty of $1, and a maximum of $8 ($12 for dubbing decks). On blank digital tapes, the royalty would be 3%.

The royalty payments would be collected by the U.S. Copyright Office and distributed—after deductions for the administrative overhead, of course—by the Copyright Royalty Tribunal into two unequal funds. One fund would be for the persons who own the copyright for the musical work, and the other for the copyright owners of the sound recording.

The total royalty pool would be divided up as follows: The record companies would get 38.41%; featured artists, 25.6%; songwriters, 16.66%; music publishers, 16.66%; the American Federation of Musicians (which represents non-featured musicians), 1.75%; and the American Federation of Television and Radio Artists (which represents non-featured vocalists), 0.92%. It is unclear to us whether there is any cap on the administrative overhead that can be collected by the various groups who must distribute the monies to the artists and copyright holders. Although no studies have shown that the more popular music is the most recorded, royalty distributions would be based on recording sales; that means that the largest-selling artists would receive the largest payments.

The pact marks the first time that the hardware manufacturers have agreed that the payment of royalties should be required for home taping. It also marks the first time that the recording industry has agreed that consumers can make

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THE DAT PACT

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copies of copyrighted recordings for private, noncommercial use without the threat of copyright-infringement suits.

Analog tapes are not covered. Nor are video cassette recorders, even those with PCM (pulse-code modulation) digital-audio capabilities. The recording industry has agreed to stop pressing for royalties on the sale of blank analog cassettes. We expect, however, that the video industry—which has also pressed for royalty payments—is watching the action closely.

The royalty pact has the blessing of numerous groups, many of whom have rarely agreed in the past. Besides the EIA and the RIAA, the list includes the National Music Publishers Association (NMPA); the AFL-CIO Department of Professional Employees; the American Federation of Musicians (AFM); the American Federation of Television and Radio Artists (AFTRA); the American Society of Composers, Authors, and Publishers (ASCAP); Broadcast Music, Inc. (BMI); the National Academy of Songwriters (NAS); the National Association of Retail Dealers of America (NARDA); the National Consumers League (NCL); the Nashville Songwriters Association International (NSAI); and the Songwriters Guild of America.

There's only one group that has still to be convinced: Congress. If the pact reached by the various organizations isn't put into law by Congress, things will be right back where they started. Without a law, it's likely that some manufacturers will refuse to pay royalties. That, of course, will lead to more lawsuits, questions, refusal by recording companies to support the new digital formats, and, ultimately, stalled sales.

Time, however, is tight. With the rollout of DCC due early in 1992, it is imperative to both sides that Congress act before the end of the year. As we go to press, no sponsors for a bill have come forward in either House. Congress, however, has historically resisted royalties because they raise the prices of electronic products. However, because previous adversaries are coming to Congress with a detailed pact—and, apparently, with no industry dissenters—it would seem that only consumer groups will fight any proposed legislation. So far, none has come forward to do so, despite the "definitive" study by the Office of Technology Assessment that showed that home taping did not hurt the recording industry. ■

SCMS—The Serial Copy Management System

SCMS is a system that allows DAT, DCC, Mini Disc, and other digital recorders to make direct, digital-to-digital copies of compact discs and other digital sources. It prevents, however, those copies from being copied digitally.

A DAT deck with SCMS reads coding information—including a "category code" and a copy-inhibit flag—from the digital subcode channels of the source material. If copies are not permitted, the deck will not record the source material. If they are, the deck will insert new subcodes in the recording, which will indicate whether future copies are permitted.

For now, DAT decks will be free to make unlimited analog copies from any source. Digital copies of those analog recordings, however, still can't be made after the first generation. It is still unclear whether digital-audio broadcasts (or cablecasts) will be recordable digitally.

Digital Compact Cassette decks and Mini Disc recorders will also contain SCMS, even though the audio encoding used in each of those formats makes it unlikely that second-generation recordings would sound very good even if they could be made. ■