The Economic Impact of Digital Audio Broadcasts on the Market for Recorded Music

by

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I. INTRODUCTION AND SUMMARY OF CONCLUSIONS

1. My name is Thomas M. Lenard. I currently am Senior Fellow and Vice President for Research at The Progress & Freedom Foundation (PFF), a non-profit research and education foundation that studies the digital revolution and its implications for public policy.

2. Before joining PFF in 1995, I was Vice President of a Washington D.C.-based economics consulting firm and served in senior economics positions in the federal government at the Office of Management and Budget, the Federal Trade Commission and the Council on Wage and Price Stability. I was a member of the faculty at the University of California, Davis and a visiting economist at the Brookings Institution. I have served as President and Chairman of the Board of Governors of the National Economists Club in Washington DC, and am currently a member of its board.

3. My research focuses on competition policy, telecommunications and other regulatory issues and I am the author or coauthor of numerous articles and books on these subjects. I have recently written and testified on the transition to Digital TV, which is a major communications policy issue and has many similarities with the subject addressed here—the transition to digital radio.[1] I received my B.A. from the University of Wisconsin and my Ph.D. from Brown University, both in economics.

4. I have been asked by the Recording Industry Association of America (RIAA) to prepare an economic analysis in connection with the Federal Communications Commission's

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[1] See "Accelerating the Transition to Digital TV: The Satellite Home Viewer Improvement Act Can Help," Progress on Point 11.4, The Progress & Freedom Foundation (February 2004); "No more delays on digital TV," (May 4, 2004) CNET.com; and Testimony before House Subcommittee on Telecommunications and the Internet, "Advancing the DTV Transition: An Examination of the FCC Media Bureau Proposal," (June 2, 2004).

Digital Audio Broadcasting (DAB) Proceeding.[2] As part of that proceeding, the FCC has issued a Notice of Inquiry (NOI) in response to concerns raised by RIAA that digital audio broadcasts may lead to "indiscriminate recording and Internet redistribution of musical recordings." I have been asked to respond to the following questions which are relevant to the issues raised in the NOI:

- Will the rollout of DAB create negative externalities or other market failures which can be reduced or minimized through appropriate action by the FCC?
- What is the extent of the market failure and what parties are likely to be most affected?
- Specifically, what is likely to be the effect of DAB on copyright holders, recording artists and free over-the-air radio broadcasters?
- What is the appropriate government response to this market failure?

5. A brief summary of my findings follows:

- The transition to DAB is moving rapidly in the rest of the world, and is now poised to take off in the United States. In part because of the particularly attractive characteristics of the "in-band on-channel" (IBOC) technology adopted by the FCC, the transition is likely to be rapid and to result in widespread if not ubiquitous coverage.[3]

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[2] Federal Communications Commission, Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service, Further Notice of Proposed Rulemaking and Notice of Inquiry ("DAB FNPRM and NOI", released April 20, 2004).

[3] The NPRM reports that "As of October 1, 2003, over 280 radio stations encompassing more than 100 markets have licensed iBiquity's technology and have begun digital audio broadcasting or are in the process of converting. Cumulatively, these markets include over 145 million listeners or nearly two-thirds of the Arbitron-ranked, listening public. Within each of the six cities – New York, Los Angeles, Chicago, San Francisco, Miami and Seattle – previously identified by iBiquity as launch markets for DAB, a minimum of ten stations and up to 18 stations have already licensed iBiquity's technology. Stations in 35 states as well as the District of Columbia and Puerto Rico

- The DAB rollout, while likely to have many benefits for consumers, is also virtually certain to exacerbate the erosion of copyright protection already being experienced by the music industry, unless appropriate content protections are included. The reason is that DAB, unlike traditional analog radio broadcasts, will represent a substitute for other forms of music distribution.
- Unlike video, many consumers prefer to experience repeat performances of their favorite music selections.[4] To satisfy this desire, they seek the ability to hear particular selections at the time and place of their choosing, i.e., to have "music on demand" (MOD). Traditionally, radio broadcasting has not provided an effective means for consumers to satisfy their demand for MOD. Instead, this demand has been fulfilled through the distribution by record companies of physical storage devices such as phonograph records, cassette tapes and compact discs (CDs). Recent advances in technology have created another channel: direct electronic distribution of the music content itself.
- In today's market, direct distribution generally takes two main forms: Licensed services, like iTunes, and unauthorized peer-to-peer (P2P) file swapping services, like KaZaA. Analysts expect direct distribution to play an increasingly important

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have demonstrated their commitment to digital audio broadcasting as well. Radio manufacturers have slowly begun selling digital radio receivers directly to the public this year." (NPRM at ¶ 13. Footnotes omitted.)

[4] Some consumers, particularly children, also prefer to experience repeat performances of video programs, but this aspect of demand is far weaker for video than for music. See, e.g., Randal C. Picker, "Copyright as Entry Policy: The Case of Digital Distribution," John M. Olin Law & Economics Working Paper No. 147 (2d Series), (available at www.law.uchicago.edu/lawecon/index.html) ,(p. 10: "In contrast [to video], prerecorded music has always been a sales business. In part, this is a function of how consumers use music and video. For music, repeat play is the norm, while for adults at least, one or two viewings of a video usually suffices (small children, in contrast, can watch the same Barney tape running in an endless loop). ... Ownership – or at least ready access – has always been an important feature of music.")

role in the future, including the development of additional direct distribution channels, such as "mobile music" (i.e., music delivered to cellular telephones).

- Unlike analog radio, DAB will provide a highly attractive means for consumers to acquire MOD – that is, it will be a direct substitute for, and thus a head-to-head competitor with, other channels of direct music distribution.[5] Specifically, without appropriate protections, consumers will be able to program their DAB receiver/recorders (including personal computers) to automatically search for desired songs, artists and genres, and then record them in CD quality to a storage device such as a hard drive or removable media. Through this mechanism, they will be able to create a large digital library of permanent sound recordings capable of being searched, stored, reproduced, and redistributed via the Internet or physical media.
- The FCC's decisions regarding the issues raised in the NOI will establish an institutional framework which will determine whether DAB most closely resembles iTunes, on the one hand, or KaZaA, on the other.
- In recent years, the recording industry has suffered immense economic harm as a result of P2P piracy. Despite efforts by the record companies to enforce their copyrights through litigation, consumers continue to engage in P2P piracy in large numbers. The primary reason is that unauthorized P2P services, unlike other distribution channels, allow consumers to acquire high-quality MOD for "free."
- P2P networks have been especially harmful to record companies because of the economic model upon which those companies are based. Record companies

invest substantial amounts of money in each artist and each new release—only a small fraction of which ever turn a profit. (Only one out of every twenty artists produces a hit within five to seven years of being signed.[6]) It is these few profitable releases that fund the rest of the costs of the industry. Moreover, it is these "hits" that are most often traded on P2P networks and "libraried" on CD-Rs and other digital storage devices.

- The rise and continuing significance of P2P piracy is a direct cause of the substantial drop in units shipped and revenues the music industry has experienced in recent years, and has contributed directly to reductions in employees, in the number of new artists signed and in the number of new music selections released.
- If DAB is allowed to proceed without appropriate protection for the music transmitted, it will constitute a nearly perfect substitute for P2P piracy. Indeed, from the perspective of a consumer seeking to acquire MOD, DAB will in several important respects be superior to unauthorized P2P services. Thus, unprotected DAB could inflict at least as much economic damage on the market for recorded music and legitimate music distribution in the future as unauthorized P2P services have inflicted in the past.
- Since the vast majority of record company income is based upon sales of CDs and other legitimate channels such as iTunes, if DAB (like P2P networks) allows consumers to obtain high-quality recorded music at virtually no cost, the record industry will be deprived of its primary source of income. This would constitute a

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[5] At the same time, of course, and for at least the immediate future, direct distribution channels will also continue to compete with traditional, physical distribution – i.e., CD sales.

[6] Steven S. Wildman, "An Economic Analysis of Recording Contracts," Michigan State University (July 22, 2002).

massive market failure that would inevitably have a serious impact on the entire music industry. Most importantly, it would almost certainly reduce further the number and variety of new sound recordings created annually by the recording industry, and perhaps force some recording companies out of business altogether. Thus, a problem clearly exists that requires government action.

- The propagation of unprotected DAB will harm other industries as well, including other legitimate distribution channels. For instance, advertiser–supported over-the-air radio will suffer as consumers "screen out" advertising and eventually begin to rely more heavily on static content previously recorded to their personal devices from DAB. Unprotected DAB will also impact adversely the new online music services (such as iTunes), as well as the new satellite radio services (XM and Sirius). Similarly, other nascent distribution channels, such as wireless mobile devices likely will be affected as developers question whether their new services, no matter how compelling, can compete successfully with "free"
- Unprotected DAB will also increase risks for participants in the music distribution sector, which may have a deleterious effect on investment and innovation. The continuing copyright infringement that will occur as a result of unprotected broadcasts will, in turn, create the risk of secondary liability for companies who develop products or provide funding in support of such activity (as in the Napster and MusicCity cases). Indeed, this market uncertainty could slow the rollout of DAB.
- And while <u>unprotected</u> DAB threatens these great <u>harms</u>, secure DAB will accrue to the benefit not only of the recording industry, but also broadcasters and

consumers, because it would provide the economic impetus to support continued expansion in the creation of sound recordings, as well as the various new business models surrounding their delivery. Appropriately protected DAB will speed the pace of change in the music distribution industry and further strengthen incentives for record companies and other market participants to innovate and adapt, and will do so in a way that preserves fundamental property rights required for the market to function.

- Secure DAB – if effected promptly – can be accomplished with relatively little cost to all parties. A technological solution to the security problem is almost certain to be the most cost-effective remedy available and it should be adopted sooner rather than later. Alternatives, such as litigation or some other enforcement strategy designed to deter unauthorized copying and redistribution, are likely to be ineffective or extremely costly.
- If the Commission delays taking appropriate action, the problem will become more difficult to resolve because there will be a stock of "legacy" consumer equipment without the requisite protections. Remedying the problem after such legacy equipment has penetrated the market will be challenging because (1) consumers effectively will be misled into believing that many sorts of copyright infringement enabled by DAB and associated electronics devices are legal, when they are not, and (2) it may be impossible to adopt "second-generation" equipment if it is not compatible with "first-generation" products.

6. These findings are the central conclusions of my analysis. The remainder of this report is organized into the following sections: Section II discusses how consumers use radio

vs. recorded music and provides an overview of the economics of the record industry. Section III provides background on DAB and its added functions, with an emphasis on how it differs from traditional analog radio. Section IV describes the existing problem of piracy on peer-to-peer (P2P) networks. Section V explores the potential for piracy on unprotected DAB, and why it will be an even greater problem than currently exists with P2P-based piracy. Section VI addresses the adverse effect unprotected DAB will have on free over-the-air broadcasting, other legitimate distribution channels and the market for recorded music generally. Section VII discusses the benefits of addressing the DAB security problem at the outset, before the technology is widely disseminated, and explains the advantages of a technological solution. Section VIII provides my conclusions.

II. THE MARKET FOR RADIO AND MUSIC DISTRIBUTION

A. Recorded Music is a "Multiple-Play" Consumer Good

7. In contrast to other entertainment goods, such as movies or novels, music is a good for which repeated plays are very important. Whereas consumers primarily make video recordings for "time-shifting" purposes—to be able to view a program at a more convenient time than when it is broadcast—the principal motivation for recording music is to build a library that is permanent and can be played multiple times.

8. Consumers want to have a library of recorded music that gives them the option of playing the music whenever and wherever they want—that is, to have "music on demand" (MOD). Indeed, this is the key difference between a radio broadcast and owning a CD. A CD has the MOD characteristic; radio does not.

9. Economists sometimes refer to this as "option value": "The radio broadcast of a song is...a free sample...provided when the DJ wants to broadcast it, not necessarily when you want to hear it. The value added by the CD version of the song is that it can be played when, where, and how you want it to be played. The CD has what economists call *option value:* you can exercise the option to play it where and when you want, unlike the radio broadcast of the same music....[T]he inconvenient version offered by the DJ is given away for free, while the user must pay for the convenient CD version."[7]

10. This is the reason that radio and the record industry have sometimes been described as having a "symbiotic relationship," with radio (through its airplay) providing the "inconvenient version" that increases the demand for recordings. As I discuss in Section V, DAB turns this relationship on its head.

B. Record Company Investments are Recouped Based upon a Minority of "Hits" from a Single Revenue Stream

11. Record companies invest vast amounts of money in producing thousands of new releases each year, but only a supra-minority of these releases are profitable; even fewer are "mega-hits." In other words, record company revenues are heavily dependent on the production of hit records. The hits must be profitable enough to compensate for the remainder that is not profitable.

12. Steven Wildman (Director of the Quello Center for Telecommunication Management and Law at Michigan State University) analyzed over 600 contracts signed by the five major record companies and recording artists, and found that "(a) the odds of success for a new artist are very low, (b) that labels invest considerable sums to record and

[7] Carl Shapiro and Hal R. Varian, *Information Rules: A Strategic Guide to the Networked Economy*, Harvard Business School Press (1999) at 87.

market albums by unproven new artists, and (c) that artists who have a hit album renegotiate their contracts for improved terms that require significant additional upfront commitments by the record labels."[8]

13. Wildman found that, for every 100 artists signed in a given year, only five had produced a hit (defined as a gold or platinum album) and only 10 were still under contract five to seven years later. For each artist who produced a hit, there were 14 who produced records that were not commercially successful and another five who didn't produce a record at all despite significant upfront costs borne by the record company.[9]

14. These costs have risen substantially in recent years. For artists who signed during 1994-1996, the average upfront cost for a first album was about $290,000 (in year 2000 dollars). For artists who signed in 2000, the average upfront cost had risen to $450,000 – an increase of 55 percent. Wildman found that the major labels spend a minimum of $6.3 million in upfront costs on albums that are not hits for every artist that produces a hit.[10]

15. Augmenting this impact is the fact that record companies rely almost entirely on a single stream of revenue – sales of recorded music, such as CDs. About 85 percent of record company revenues come directly from sales of CDs and other recordings.[11] Record companies are, therefore, extremely vulnerable to the effects of an assault on their primary source of revenue.

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[8] Steven S. Wildman, "An Economic Analysis of Recording Contracts," Michigan State University (July 22, 2002) at 7.

[9] Wildman at 7-10.

[10] Wildman at 10-11.

[11] Linda McLaughlin, "Recording Industry Revenues and Costs, 1991-2000," National Economic Research Associates (December 23, 2003).

16. In this regard, the music industry is different from movie distribution. Movies are typically released in different "windows," giving the studios more diversified sources of income. In 2000, theatrical releases accounted for only about 30 percent of film industry revenues, equally split between domestic and foreign releases.[12] Home video accounted for 38 percent of revenues, with pay cable, network TV, syndication, foreign TV and made-for-TV films accounting for the remainder. While DVD piracy is harmful to movie distributors, the loss is at least limited to one of many revenue streams.

17. Music companies' revenue streams are also limited by the limitations on their rights, especially in the United States. In the U.S., there is no general public performance right for sound recordings analogous to the rights that exist in Europe and elsewhere.

III. BACKGROUND ON DAB

A. DAB is a New Medium

18. Digital Audio Broadcasting (DAB) is a new music distribution medium capable of providing a range of new services. These services make DAB very different from what we are used to thinking of as radio.[13]

19. Unlike analog radio, DAB will provide a very attractive means for consumers to acquire MOD, which will put it in direct competition with other channels of music distribution—including both the legitimate online distribution services and the illegitimate P2P services. The critical question of whether DAB will more closely

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[12] Harold L. Vogel, *Entertainment Industry Economics, A Guide for Financial Analysis, fifth edition*, Cambridge University Press (2001) at 62.

[13] DAB FNPRM at ¶ 2. See also Report of Cherry Lane Digital LLC on Digital Audio Broadcasting for the Recording Industry Association of America, Inc. (June 2004). (Hereafter Cherry Lane Digital Report).

resemble the former than the latter will, to a large extent, be determined by the institutional framework established by the FCC in this proceeding.

20. The technology standard that will allow stations to start broadcasting in digital format is known as in-band, on-channel ("IBOC"). The IBOC technology was developed by iBiquity Digital Corporation with major funding from the broadcasting industry, and was selected as the preferred standard by the FCC in 2002.[14] iBiquity is now the sole developer of IBOC. Thus, at the present time, there is a single FCC-approved technology owned and licensed by a single provider.

21. DAB will support traditional advertiser-supported radio with improved sound quality: FM radio will sound like CDs, and AM radio will sound like today's FM.[15] DAB will use the spectrum more efficiently, which will enable it to provide a greater array of programming. The improvement in AM quality will enable broadcasters to offer greater choices of music programming that appeal to niche audiences.

22. That, however, is only the beginning of the increased functionality that DAB will offer. Here are some other differences between DAB and traditional analog radio:[16]

    - DAB receivers store data; analog radios do not.
    - DAB provides audio "on-demand;" analog radio does not.
    - DAB can provide customized programming; analog radio cannot.

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[14] Federal Communications Commission, *Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service, Report and Order* (2002).

[15] Transcript of interview of Robert Struble, CEO of iBiquity, by Mr. Phil Leigh, former Vice President of Raymond James & Associates, on Inside Digital Media (September 5, 2003) at 14-15.

[16] See "Report of Cherry Lane Digital LLC on Digital Audio Broadcasting for the Recording Industry Association of America, Inc.," (June 2004) (hereafter "Cherry Lane Digital Report") at 2, 4-12.

- DAB allows you to pause and then go back to where you left off; analog radio does not.
- DAB includes a program guide, telling the listener what's coming; analog radio does not.
- DAB is accompanied by meta-data indicating artist and title; analog radio generally is not.
- DAB isn't limited to audio; analog radio is.
- DAB is a "fat" data pipe; analog radio is not.

23. DAB will enable a completely new class of wireless data services that can transform radio into something very different from the radio we know today.[17] Robert Struble, CEO of iBiquity, envisions a new radio that it is "on-demánd" delivering a "personalized" bundle of services tailored to individual listener's preferences.[18] Struble gives the following examples of activities consumers will be able to perform with DAB:

- View scrolling information containing the names of the song and artist being played.
- Obtain weather alerts.
- Push a button to obtain traffic conditions customized to the consumer's route.
- Program their radios to listen to their favorite programs or artists.
- Purchase products—e.g., CDs, concert tickets etc.—related to the program to which they are listening.
- Record programs and artists and listen to them when convenient.

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[17] Cherry Lane Digital Report at 2.

[18] Struble transcript at 15.

- Program their radios to record specific programs, artists and genres of programming.

Some services will require a fee and some presumably will be advertiser supported. Struble envisions the market including "anything that can provide mobile information and entertainment."[19]

24. David Maxson and Paul Signorelli describe "[t]he new model for data flow in the IBOC environment [which] will put broadcasters in the business of selling bits of data and managing myriad data clients on their broadcast channels."[20] The IBOC data protocol will "offer[] the hooks necessary to create applications that do anything imaginable on this point-to-multipoint data service."[21] Appended to their paper is a list of over 90 examples of possible services that IBOC can offer. I include that list as Attachment 1 to this report.

25. Although DAB will have characteristics that overlap with those of traditional analog radio, it will also (as the list in Attachment 1 makes clear) have attributes that are currently associated with other products and services, including online music subscription services, online retailers, wireless phones, "home shopping" cable channels, personal digital assistants and even alarm services.

26. As an example of what DAB can do, the list of services in the Maxson-Signorelli paper includes the following:

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[19] Struble transcript at 19.

[20] David Maxson, Managing Partner, Broadcast Signal Lab, LLP and Paul Signorelli, CTO, Impulse Radio, Inc, "How Data Transmitted Over An IBOC Station Will Be Managed: Using a Gateway to Generate Data Revenue," (http://www.impulseradio.com/NAB_whitepaper.pdf) at 1.

[21] Maxson and Signorelli at 10.

- Broadcaster sends a music download to a device.
- Device uses profile to select downloaded music.
- Device writes downloaded music to a permanent storage device.

These three services are of the type that Maxson-Signorelli assume will be provided for a fee. The authors describe a "classification hierarchy [that] will give content and service providers assurance that their valuable content and services will be available only to those whom are authorized and used only in the manner allowed. Data could be permitted for one-time use, no-recording, pay per use, free use, or no-exporting to other devices, among others."[22]

27. This "classification hierarchy" represents a new business model similar to the legitimate online music distribution businesses that are now emerging, and creates the potential for DAB to function as a new entrant in the business of distributing MOD, potentially increasing competition, speeding innovation and offering new choices for consumers. But such a result will be possible only if DAB content is protected. In the absence of protection, IBOC technology will permit users to identify specific artists, tracks or genres and record them onto computer hard drives or other storage devices without making any payment to the copyright owner. A user could, in an automated fashion, and at virtually no cost, build an extensive library of recorded music tailored to his or her preferences. The value of the "classification hierarchy" would thus be obviated, as the "subscription" services it would enable would not be able to to compete with "free."

[22] Maxson and Signorelli at 10.

B. DAB Technology Provides a Range of New Features that Enable Piracy

28. DAB will allow the listener to turn the radio into an on-demand service with the same MOD characteristics that used to apply only to personally owned CDs. The new DAB equipment being produced and marketed shows clearly that illegitimate copying will be a problem. Device manufacturers are incorporating a host of options and features that allow the consumer to easily screen multiple frequencies for relevant content, record the content to drives or other media, store and sort the content in a variety of ways, and transfer it to storage devices or onto the Internet directly.

29. For instance, a new device called "The Bug" advertises the following features: (i) digital-quality sound and a greater number of stations; (ii) ReVu™, which allows the listener to pause, rewind and record live radio; (iii) playback of MP3 files; (iv) recording to SD Card or an external MiniDisc player; (v) alarm, sleep and timer record functions; and (vi) displays showing artist, song title, news, sports, etc.

30. Roberts Gemini offers its "RD1" portable receiver/recorder (available in the UK since November 2003), that rewinds and has digital record/playback using built-in memory or via external SD slot.

31. Many European DAB receiver/recorders are CD-R/RW compatible and have optical digital outputs and full remote control.

32. Blaupunkt is designing a second-generation DAB receiver/recorder that allows consumers to record transmission even if they don't push the record button at the beginning of a song or program.[23]

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[23] These and other products are reviewed in greater detail in the Cherry Lane Digital Report.

C. The Transition to DAB is Expected to be Rapid and Ubiquitous

33. The transition to digital radio is now poised to take off. Although the transition to Digital TV (DTV) has been painfully slow, the transition to DAB, once started, will proceed much more quickly. The IBOC technology allows broadcasters to use their existing spectrum to transmit analog and digital signals simultaneously. Thus, there is no need for the grant of additional spectrum to get through the transition, a process that has slowed the DTV transition. IBOC receivers are capable of receiving analog reception, hybrid reception and all-digital reception.

34. In addition (and also in contrast to DTV), with DAB there is no need to convert the underlying material to digital content because virtually all recorded music is already available in digital (i.e. CD) format. Moreover, the conversion costs for broadcasters are low—about $75,000 for the average radio station as compared with $4-5 million for the typical television station.[24] As of October 1, 2003, over 280 stations encompassing more than 100 markets covering over 145 million listeners have begun broadcasting DAB or are in the process of converting.[25] The costs for consumers are also relatively low, with receivers available for as little as $75.[26] Finally, the IBOC technology allows for both forward and backward compatibility—digital radios can receive both analog and digital broadcasts.[27] Current analog radios will be able to receive the analog

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[24] DAB FNPRM at 7 and Struble transcript at 20.

[25] DAB FNPRM at 6.

[26] Cherry Lane Digital Report at 12. Moreover, the costs of these products are likely to follow the pattern typical of digital electronic devices – that is, prices will fall as volumes increase.

[27] DAB FNPRM at 3.

portions of broadcasts for as long as broadcasters continue to broadcast in the hybrid mode.

35. Survey data indicate significant interest in digital radio on the part of consumers. According to a recent RIAA National Survey, even though only about 20 percent of adults are familiar with digital radio, about 48 percent expect to purchase one within the first year or two that they are on the market. This number will surely increase as digital broadcasts become a reality and as equipment makers start to market digital receivers.

36. The experience of other countries suggests that, once started, DAB will grow rapidly.[28] DAB is being rolled out in Asia, Europe and North America. Germany and the United Kingdom are the leaders in Europe. Germany has 150 digital stations and is projected to achieve 85-percent coverage of its population by the end of this year. In the UK, the penetration of digital receivers has been growing at an annual rate of 230 percent, and has reached over 500,000 units.

37. The need to secure DAB is a matter of concern in other countries where DAB has launched. IFPI, the international organization representing the recording industry and based in London, identifies the protection of DAB as one of its highest priorities. As in the United States, the recent advent of consumer devices that permit the searching and recording of selected sound recordings has created the threat of piracy in the United Kingdom and elsewhere, as well.[29] Indeed, Jay Berman, the Chairman and CEO of IFPI, states that because "recent technological developments will soon cause clear and severe damage to the economic interests of rights-holders, the establishment of the

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[28] Cherry Lane Digital Report at 12-13.

[29] See Declaration of Jay Berman, Chairman and CEO of the International Federation of the Phonographic Industry. (Hereafter Berman Declaration).

adequate technological and legal framework to ensure the protection of the DAB signal will be one of IFPI's highest-priority issues in the coming months."[30]

38. Because the rollout it is just getting started in the U.S., this is clearly the time for the FCC to address the DAB piracy issues and to adopt appropriate protections. The Commission can avoid the legacy problems that other countries may face by acting promptly on this issue.

IV. P2P'S IMPACT ON MUSIC PIRACY

A. Technological Progress Has Altered Music Distribution

39. Even before DAB, developments in technology have enabled unauthorized P2P services, such as KaZaA, Aimster and Morpheus to become vehicles for listeners to obtain MOD. The digitization of music content, the development of enhanced storage capacity (bigger hard drives) on computers, compression technology (MP3) and the widespread availability of broadband have combined to create a "black market" for online music. Listeners can obtain, store and disseminate – without payment – high-quality digital reproductions of popular musical recordings.

40. From 1999, when P2P software first became available, to 2003, record company sales dropped by more than 30 percent in terms of units shipped and about 19 percent in terms of dollar value.[31]

41. Perhaps even more important, given the significance of "hit" records to the industry's bottom line, sales for the top ten albums have fallen much more dramatically than

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[30] Berman Declaration at ¶ 8.

[31] See Nielsen, Inc., "Nielsen Soundscan and Nielsen BDS 2003 Year-End Music Industry Report," Press Release (December 31, 2003); Nielsen, Inc., "Nielsen Soundscan 2002 Year-End Music Industry Report," Press Release (January 3, 2003); Soundscan, "Soundscan 2001 Year End Music Industry Report," Press Release (January 3, 2002); and Soundscan, "Soundscan 2000 Year-End Music Industry Report," Press Release (January 3, 2001).

overall sales -- from 60 million in 2000 to 33 million in 2003, a drop of 45%. The top ten albums accounted for 7.7 percent of unit sales in 2000, but only 5.3 percent in 2003.[32]

42. Survey data show clearly that P2P has a negative effect on music sales. A survey undertaken by Peter D. Hart Research Associates for RIAA shows (a) by a two-to-one margin, consumers who download more purchase less, (b) 41 percent of the individuals who download from P2P services purchase less music, while only 19 percent purchase more, (c) 35 percent of music buyers aged 12 to 24 say the first thing they do when they hear a song on the radio is to download it for free, and (d) in the past three years, the amount of downloaded music that is burned to a CD has increased from 10 percent to 50 percent.

43. These results are further supported by at least two major economic studies. A paper by University of Texas economist Stan Liebowitz examines a number of alternative explanations for the decline in sales—including format changes, prices and incomes—and concludes that "MP3 downloads [on P2P networks] are causing significant harm to the record industry."[33] "No other explanations that have been put forward seem to be able to explain the decline in sales that have occurred since 1999."[34]

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[32] *Ibid.*

[33] Stan Liebowitz, "Will MP3 Downloads Annihilate the Record Industry? The Evidence So Far," University of Texas at Dallas (June 2003) at 29.

[34] Liebowitz at 3.

44. Likewise, a recent paper by University of Chicago economist Alejandro Zentner finds that downloading MP3 files reduces the probability of purchasing music by 30 percent. The effect is even higher for downloaders with broadband connections.[35]

45. Analyst reports reach similar conclusions. For example, a Forrester report finds that half of music downloaders say they purchase fewer CDs as a result, and concludes unauthorized file sharing has cost $700 million in lost sales.[36]

46. Besides a downturn in shipments and sales, the harm being caused by P2P networks can also be seen in artist rosters and new releases. In the past three years, many recording companies have taken the drastic step of reducing their artist rosters and annual new releases. According to confidential company data provided to me by RIAA, major companies have decreased their artist rosters by 20 to 30 percent since 1999, and new releases have fallen by similar proportions.

47. The downloading problem is showing up not only in the sales figures, but also in employment figures. A recent *Washington Post* article discussed the steps the five major record companies were taking to revive their "flagging fortunes" in the face of "declining CD sales, falling profits and pervasive piracy."[37] The downturn in jobs has been industry-wide and thousands have been laid off.[38]

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[35] Alejandro Zentner, "Measuring the Effect of Music Downloads on Music Purchases," Department of Economics, University of Chicago (April 2004).

[36] From Discs to Downloads, Forrester Research (August 2003); summary available at www.forrester.com/ER/Research/Report/Summary/0,1338,16076,FF.html

[37] Frank Ahrens, "A Major Change In Their Tunes – Sony-BMG Merger Faces Objections; Warner Slashes Costs," *The Washington Post* (May 28, 2004) at E1.

[38] See, in addition to fn. 36, "Vivendi Narrows Loss in First Quarter," latimes.com (May 28, 2004); "Sony Music President Announces Layoffs," New York Daily News (February 21, 2003); "EMI cuts 1,500 jobs after CD sales slump," Times Online (April 1, 2004); and "BMG restructuring its U.S. music operation," Associated Press (March 24, 2004); "Closings, Ch. 11 Filings Rampant In Retail," Billboard (December 27, 2003).

B. Piracy From Analog Broadcasts is Less Problematic

48. Before technology brought about digitized content, piracy and lost sales were much less of a problem to the recording industry. First, unlike digital files, analog reproductions generally created lower quality, less durable copies. Second, analog products were less capable of perfect, "exact" reproductions when used for derivative or serial copying. Third, the equipment for large-scale copying of analog product was typically much larger and more expensive (as opposed to digital products which require little more than a computer and an Internet connection to achieve the same effect). Fourth, and perhaps most significantly, analog content did not include the "metadata" that facilitates the convenient archiving and cataloguing of digital music, the almost effortless creation of genre-specific playlists, etc. As a collective result, therefore, there was a much lower prevalence of illegal production and distribution of analog works.

49. Most importantly, the theft of analog files is less threatening to record companies because the vast majority of their content is now digital (in both physical and online distribution channels). Analog copies, lower in quality and lacking the supplementary content available in digital formats, simply are not true substitutes for the vast majority of pre-recorded products sold annually around the world.

C. P2P Networks Are Particularly Harmful Because of the Economics of the Recording Industry

50. Unauthorized P2P networks have been especially harmful to record companies because of the economic model upon which those companies are based. As discussed in Section II, record companies invest substantial amounts of money in each artist and each new release – only a small fraction of which ever turn a profit.

51. As discussed above, it is sales of these profitable "hits" that have been most significantly affected by P2P piracy. This deprives the industry of its predominant source of revenues and profits and thereby threatens the economic viability of the industry.

52. Unauthorized P2P networks impact this primary source of revenue because they operate as a substitute for CD purchases. Through these networks, users can download high quality digital sound recordings and "burn" them to CD-Rs on a household computer. Such activity causes direct displacement of CD sales.

53. CD-R burning has become routine for the average home user in recent years. What used to be an expensive add-on is now standard equipment on most new computers. The amount of CD-R burning taking place is indicated by the dramatic increase in the sale of blank CDs. North American sales of blank CDs shot up by more than 30 percent in 2002, outstripping sales of music CDs by more than a two-to-one margin.[39]

D. Digital Piracy on P2P Systems Continues to Flourish, Despite Risks to Users, Demonstrating the Value of "Free" to the Consumer

54. Unauthorized P2P services continue to flourish and harm the music industry despite the high risks and other costs consumers face in using such services. A recent report by former Federal Trade Commission Chairman James C. Miller III concluded, "While P2P software is 'free' to download, it comes at a high and undisclosed price to consumers. Consumers 'pay' dearly for their use of this product through increased security vulnerabilities, reduced performance of their computers and lost privacy."[40]

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[39] International Recording Media Association data.

[40] Jeffrey A. Eisenach, Lisa Jose Fales, James C. Miller III, and Charles Webb, "Peer-to-Peer Software Providers' Liability Under Section 5 of the Federal Trade Commission Act," (April 27, 2004), at 1. (Hereafter "Miller Study.")

The Miller study finds that P2P software is often bundled with "spyware," that it results in a significant increase in the risk of downloading a computer virus and that it otherwise degrades the functionality of both the user's computer and his or her Internet connection. The FTC itself has raised such concerns, and in July 2003 issued a consumer alert warning consumers of the potential risks associated with file sharing software.[41] As the Miller study details, users of P2P software are aware of these problems and frequently complain about the non-monetary costs of using such services.[42]

55. Of course, another major consequence of using unauthorized P2P software to download copyrighted material is the risk of litigation. Due to the nature of such systems, it is possible for copyright owners to identify computers that serve as the source of copyrighted materials illegally made available for sharing. Starting in 2003, the music industry began suing individuals who engaged in significant amounts of P2P activity, and has now filed more than 2,000 such lawsuits.

56. Despite these risks to consumers, usage of unauthorized P2P networks remains high. During the week ended May 30, 2004, three of the top ten most popular downloaded programs on the Internet were unauthorized P2P software programs that enable piracy. These three programs (iMesh, Limewire and Morpheus) were downloaded over 930,000 during this one-week period alone.[43]

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[41] See www.ftc.gov/bcp/conline/pubs/alerts/sharealrt.htm.

[42] Miller Study at 18. (Citing consumer comments on KaZaA, from www.download.com, e.g., *"I had this on my computer for less than 2 weeks and during that time I got a virus that was not cleanable because it damaged so many files. I finally had to restore my computer after many hours of tech support and virus scanners that could not fix it. I would never recommend this to ANYONE!!"*)

[43] See www.download.com, viewed May 30, 2004. (iMesh, #5, 414,455; Limewire, #6, 347,318; Morpheus, #8, 168,443).

57. Likewise, the Pew Project on the Internet and American Life, in conjunction with Comscore Media Metrix, has released data showing that, while the efforts of recording companies to enforce their copyrights against illegal downloading have reduced downloading from its peak levels of 2003, "the number of people who say they download music files increased from an estimated 18 million to 23 million" between November-December 2003 and February 2004.[44]

58. The renewed growth of P2P piracy has occurred despite the emergence of legal online music services, such as iTunes and Rhapsody. Legal digital usage of online services tripled during 2003, increasing from 1.7 percent of CD buyers during the first quarter of 2003 to almost 5 percent a year later.[45]

59. Nonetheless, unauthorized P2P software remains a popular and widely utilized means of pirating copyrighted materials, despite the fact that it degrades computer functionality, exposes users to privacy risks and computer viruses, subjects infringers to potential litigation, and faces competition from sophisticated licensed online music providers. In light of these numerous risks and drawbacks, the only rational justification for the continued success of P2P networks is the overwhelming consumer attraction to free, digital music that can be selectively obtained and permanently stored – exactly the same attraction consumers will find with unprotected DAB (but with fewer drawbacks).

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[44] The data suggest that a sharp decline in KaZaA users has been balanced by increased use of alternative P2P services such as BearShare, Limewire and iMesh. See "Pew Internet Project and Comscore Media Metrix Data Memo," April 2004 (available at www.pewinternet.org/reports/pdfs/PIP_Filesharing_April_04.pdf).

[45] NPD Group.

V. UNPROTECTED DAB WOULD BE MORE ATTRACTIVE THAN P2P FOR UNAUTHORIZED COPYING

60. As discussed above, DAB will be a highly attractive means of obtaining MOD. If unprotected, it will, as P2P has done, cause substantial harm to the recording industry because it similarly permits, on a widespread scale, the unauthorized copying, storage and redistribution of copyrighted recordings. Indeed, DAB promises to be even more detrimental than P2P-based piracy because it will be easier and less costly (in a variety of ways) to use, and will offer an assortment of additional functions that improve a consumer's ability to acquire and redistribute unauthorized files.

61. DAB will reach a broader audience than P2P, because radio is a ubiquitous medium.[46] There are more than 11,000 commercial radio stations and another 2,500 educational stations. The average household has five radios, and the FCC estimates that, including radios in cars and workplaces, there are 800 million radios in use in the United States.[47] As an eventual replacement for analog radio, DAB can be expected to achieve very high penetration.[48]

62. By contrast, P2P downloading requires a computer and, for practical purposes, a broadband connection. According to the latest data, only 24 percent of adult Americans have high-speed access at home, and only 34 percent have high-speed access at home or at work.[49] Moreover, as discussed in Section III, even though only a small percentage

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[46] DAB FNPRM at ¶¶ 10-11.

[47] DAB FNPRM at ¶ 12.

[48] See DAB FNPRM at ¶17 ("Here, we anticipate that the more DAB receivers sold, the more radio stations will have an incentive to convert to DAB, and the cycle will repeat itself until all consumers have DAB receivers.")

[49] Pew Internet and American Life Project. (See www.pewinternet.org/PPF/r/121/report_display.asp, viewed June 15, 2004.)

of the population is familiar with digital radio, about 48 percent of adults expect to purchase one within the first two years they are on the market. This number can be expected to grow as digital radios are marketed and more people become familiar with them. Thus, digital-radio penetration is likely to exceed broadband penetration very quickly, and DAB usage is likely quickly to exceed P2P usage.

63. As also discussed in Section III, DAB will possess virtually all of the product attributes that make P2P services and other digital distribution channels substitutes for record sales. Like other digital distribution channels, DAB will allow consumers to search easily for the music of their choice and to record that music onto a variety of media. Indeed, DAB will provide functionality that is either virtually identical, or superior, to that of P2P services.

64. Some of the characteristics most likely to affect consumers' choices among competing channels for the digital distribution of MOD include:

- Searchability: The ability automatically to identify desired music, as opposed to having to manually listen to a flow of music (ala' traditional FM radio) in order to find and record the selections they want.
- Music Quality: The ability to acquire CD-quality music, as opposed to analog or low-bit-rate digital music (such as that on advertiser supported "webcasting" services).
- Metadata: The availability of embedded metadata necessary to allow for convenient digital archiving, cataloguing and searchability.
- DRM: Other things equal, consumers would prefer music with few or no technological limitations on redistribution.

- Bandwidth/Connectivity Demands: Other things equal, consumers would prefer a service that makes minimal demands on their computer broadband connections, or eliminates the need to pay for a broadband connection altogether.
- Spyware/Virus Implications: Other things equal, consumers would prefer a service that (unlike P2P services) does not put them at risk of exposure to spyware and/or computer viruses.
- Litigation Risk: Other things equal, consumers would prefer to acquire music without putting themselves at risk of litigation for copyright violations.
- Price: Last, but certainly not least, consumers would prefer to acquire their MOD for the lowest possible price – best of all, if possible, for free.

65. Consumers seeking to acquire MOD will judge the various digital distribution channels, including DAB, licensed online services, XM/Sirius, webcasting/streaming services and unauthorized P2P services, against these attributes.[50] The table below shows that unprotected DAB would be equal or superior to its competitors on every attribute.

[50] Future "mobile music" MOD distribution services (i.e., cellphone-based services) will be judged against these same attributes.

Key Attributes of MOD Direct Distribution Channels

	Unprotected DAB	P2P	Licensed Downloads	Webcasting/ Streaming	XM/Sirius	Traditional FM
Searchability	Yes	Yes	Yes	Yes	Yes	No
CD Quality Recording	Yes	Yes	Yes	No	No	No
Metadata	Yes	Yes	Yes	Yes	Yes	No
Spyware/Virus Free	Yes	No	Yes	Yes	Yes	Yes
No Broadband Required	Yes	No	No	No	Yes	Yes
Little or No Litigation Risk	Yes	No	Yes	Yes	Yes	Yes
DRM-Free	Yes	Yes	No	No	No	Yes
Free	Yes	Yes	No	Yes	No	Yes

66. DAB's attributes closely match those of unauthorized P2P services, and it is useful to examine the relationship between the two products in some detail:

- In terms of searchability, DAB will offer virtually identical functionality to that offered by unauthorized P2P services. Technologies already present in the marketplace will allow consumers to identify music they wish to copy and to program their DAB receiver-recorders (and/or DAB-enabled PCs) to seek and record a desired playlist.[51]
- The quality of music recorded from DAB will be comparable to (or exceed) that obtained through unauthorized P2P services, and it will come complete with the metadata needed for efficient archiving and cataloguing.

[51] Such capabilities are already available for the XMPCR, XM radio's plug & play PC receiver. (See, for example, www.xtremepcr.com/index.htm; www.xmnation.net/viewtopic.php?t=103&sid=5d4b8288b47955c0b7dae213375b5ed5; and http://www.xm411.com/phpbb/viewtopic.php?t=673). Also, and importantly, unprotected DAB will not be subject to the "self-protection" measures record companies are now employing against P2P piracy, such as "spoofing," which seek to reduce the efficiency of searching over unauthorized P2P networks.

- Unlike unauthorized P2P services, DAB will not impede the functionality of consumers' computers – that is, it will not come bundled with "spyware" nor will it subject consumers to an increased risk of computer viruses.
- DAB will not make demands upon the consumer's broadband connection, or even require the consumer to spend money to have an Internet connection of any kind.[52]
- Consumers who use DAB to pirate music will be at lower risk of litigation than P2P pirates, as they will be far more difficult, if not impossible, to identify.
- Just as with unauthorized P2P downloads, music recorded from unprotected DAB will be free from technological restrictions on copying or redistribution.
- Just as with unauthorized P2P services (and in contrast to all other distribution channels), unprotected DAB will allow consumers to obtain extensive MOD libraries "for free."

67. Consumers will also find that the most desirable music is readily available for recording on DAB. For example, I examined commercial playlists for three "mid-sized" radio markets – Birmingham, Alabama, Columbus, Ohio and Sacramento, California – to ascertain how frequently the most popular music (i.e, the music most likely to be pirated) is available for recording on current radio stations.[53]

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[52] The fact that DAB will not utilize Internet bandwidth would appear to be an important distinction. XM, for example, features prominently in its advertising for XMPCR the claim that "XM PCR doesn't hog bandwidth. In fact, it doesn't even require an internet connection. It's not Internet, it's Satellite Radio. And, it won't slow down your computer either." See www.xmradio.com/catalog/print/xmpcr.html.

[53] I obtained the relevant data in custom reports from Nielsen Broadcast Dada Systems (Nielsen BDS). According to its web site, "Nielsen Broadcast Data Systems is the world's leading provider of airplay tracking for the entertainment industry. Employing a patented digital pattern recognition technology, Nielsen BDS captures in excess of 100 million song detections annually on more than 1,200 radio stations in over 130 markets in the U.S. (including Puerto Rico) and 22 Canadian markets." See http://www.bdsonline.com/about.html.

68. This data has very real implications for the current P2P music pirate considering whether DAB will serve as an adequate substitute. Take for example one current "hit" song: "The Reason," by Hoobastank. In the two-week period ending June 7, this song was played on commercial radio 299 times in Birmingham, 327 times in Sacramento and 339 times in Columbus, i.e., at rates of every 67 minutes, every 62 minutes and every 59 minutes, respectively. In practice, then, someone who wished to acquire a CD quality copy of this song from DAB could expect to be able to do so, on average, in less than an hour from the time they instruct their DAB enabled computer or DAB receiver-recorder to search for and record the song.

69. Even less popular songs – e.g. those in the bottom half of the top 200 – generally were played several times per day. Thus, someone wishing to download, say, the top 200 songs would be able to instruct their DAB recorder-receiver (or DAB-enabled PC) to identify and record those songs, and expect to assemble the complete library in less than a day. This arguably is faster, depending on download speeds, than it would be possible to accomplish the same feat through an unauthorized P2P service.[54]

70. In summary, unprotected DAB will have every characteristic that has made unauthorized P2P services so attractive to some consumers, and so destructive of the market for recorded music, without any of its negative characteristics, such as spyware

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[54] It should also be noted that my estimates in this regard are conservative. The Nielsen data is limited to the top commercial stations in each market (9 each in Birmingham and Columbus, 16 in Sacramento), which comprise fewer than half the total stations reported by the FCC (37, 33 and 40, respectively). (See FCC, *Review of the Radio Industry, 2001*, Appendices D & F.) Further, the Nielsen data does not include college radio stations, which have much larger and more diverse playlists than commercial stations. [See, e.g., Comments of Collegiate Broadcasters, *In the Matter of Notice and Recordkeeping for Use of Sound Recordings Under Statutory License* (United States Copyright Office, Docket No. RM-2002), April 4, 2002, at p. 2. ("Many [college] stations are multi-formatted and the number of recordings played on the air can be immense compared to those of tightly formatted commercial stations.")

and the threat of litigation. From the perspective of the prospective music pirate, DAB really will be "P2P without the hassles."

VI. UNPROTECTED DAB WILL COMPETE UNFAIRLY AGAINST OTHER LEGITIMATE DISTRIBUTION CHANNELS AND SEVERELY DAMAGE THE MARKET FOR RECORDED MUSIC

A. Unprotected DAB Will Compete Unfairly Against Other Legitimate Distribution Channels

71. The same attributes that would make unprotected DAB superior to unauthorized P2P services for music piracy would also make it an unfair competitor against other legitimate music distribution channels.

72. Unprotected DAB would adversely affect advertiser-supported over-the-air radio for at least four reasons. First, listeners, having easy access to an illegally recorded music library containing all their favorites, would have much less interest in listening to radio. Second, listeners would likely have the ability to "screen out" or "skip through" advertising segments on DAB, thereby decreasing the value of such advertising.[55] Third, if the predicted adverse effect on the output of new works over time occurs, there will be a diminished supply of the new songs that over-the-air radio relies on to attract its audience. Fourth, record labels are unlikely to make new releases available to broadcasters in advance of their availability for purchase by consumers – as is the current practice – if they know the songs are going to be copied and redistributed even before the first legitimate copy is sold.

73. Unprotected DAB would also threaten the emerging business models that make legitimate use of the Internet for distributing music. There is now a long list of online

[55] Indeed, as a recent RIAA study notes, 82% of adults surveyed confirmed that they would use DAB to skip past commercials. For a discussion of the vulnerability of broadcasting to declines in advertising revenues, see Joe Flint, "Karmazon Leaves Viacom Post, Ending Stormy Marriage," Wall Street Journal, (June 2, 2004) at 1.

music services, such as Apple's iTunes, Musicmatch's Musicmatch Downloads, BuyMusic.com, Music Net@AOL, RealNetworks' Rhapsody and many more that account for a small, but growing, fraction of music sales. Analysts estimate the online market may grow to $250 million in 2004, still a very small part of the almost $12 billion music market.[56]

74. Unprotected DAB would be a direct competitor to these legitimate online services, because they both provide MOD.

75. Unprotected DAB would also be a threat to digital subscription radio, which is growing rapidly. The two major satellite providers – XM Satellite Radio Holdings and Sirius Satellite Radio – now have about two million subscribers between them. These services are able to preclude illegal copying through their ability to grant (or withhold) licenses to devices that receive their transmissions. Nevertheless, unprotected DAB would threaten these new services, because it would allow consumers to construct personalized playlists within their favorite genres and thus compete with the genre-specific programming that currently distinguishes satellite services from terrestrial broadcast radio.

76. Finally, unprotected DAB may threaten a whole host of new services that do not yet exist. For example, as briefly referenced above, wireless broadband will likely make mobile phones a significant channel for music distribution. According to Juniper Research, it is capable of "replacing the walkman and the PC and eventually the CD player at home—as the way of acquiring and playing music."[57]

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[56] Jon Healey and Jeff Leeds, "Online music alters industry sales tempo," *Los Angeles Times* (May 3, 2004).

[57] Juniper Research, "Musical Mobile," at http://www.juniperresearch.com/pdfs/white_paper_11_music.pdf

B. Unprotected DAB Will Alter the Relationship Between Consumers, Broadcasters and Music Producers and Severely Damage the Market for Recorded Music

77. As explained in Section II, consumers purchase CDs because they desire "music on demand" or MOD – the ability to listen to what they want, when they want. This characteristic is what differentiates a CD from the radio, and consumers have been willing to pay it.

78. Unless adequate protections are put in place, DAB will make MOD ubiquitously and conveniently available at no cost. If this happens, the economics of the music industry become untenable. Record companies won't be able to make the substantial investments required to produce and market new albums in the hopes that some small fraction of them will become hits if they can't then sell even the hits – because people can make high-quality copies off DAB for free. The P2P experience demonstrates that the most frequently pirated songs are the hit songs that are the financial lifeblood of the recording industry – the same songs, of course, which dominate the playlists of commercial radio.

79. Survey evidence indicates that unprotected DAB would fundamentally alter consumer habits, especially when it comes to purchasing recorded music.

80. I examined the results of a recent RIAA survey which asked consumers about DAB. Fewer than one in four adults under age 55 had heard "much or anything" about the technology. After hearing a description of the technology, however, nearly half (48%) indicated they are likely to purchase a DAB radio within the next one or two years.

81. The survey found that 65 percent of adults under 55 said they were likely to use unprotected DAB to program their radios to record songs from any station playing them – even while they were not listening – so that they could play the songs whenever they

chose. Over 70 percent said they were likely to store the music on a receiver, computer or MP3 player; and 50 percent indicated they were likely to transfer those songs to friends and family. Ultimately, and in light of all the benefits offered by DAB, over half (56%) indicated that they were less likely to purchase music once unprotected DAB became available.

82. Moreover, and not surprisingly, the people most likely to purchase a DAB receiver are the most intense consumers of music: 65% have paid to download music, 61% have made six or more music purchases in the last 2-3 months, and 58% use or own an MP3 player.

83. In summary, unprotected DAB will seem to customers of recorded music to be an irresistible offer, in effect a "digital free lunch." But as the Commission understands, "there ain't no such thing." The price of the illegal copying DAB will enable is the destruction of the framework of property rights which is vital to the functioning of this (or any) market.

VII. IT IS SOUND PUBLIC POLICY TO ENACT TECHNOLOGICAL PROTECTION MEASURES AS EARLY AS POSSIBLE IN ORDER TO INCREASE EFFICIENCY AND AVOID "LEGACY" ISSUES

A. Unprotected DAB Will Increase Market Uncertainty

84. Besides threatening existing and nascent industries, failure to provide content security to DAB at the beginning of its rollout will create uncertainty, which could dampen incentives to innovate and invest.

85. For example, companies may face potential legal liability for contributing to copyright infringement, even when they are not the direct infringers. Recent cases against Napster and other P2P services reveal that some content owners are willing to file suit

against companies that "contributorily" or "vicariously" support copyright infringement. Similarly, lawsuits have also been filed against venture capital firms that provide investment funding to companies that may be secondarily liable for infringement.

86. Regardless of the ultimate success of these lawsuits, they increase investment risk. This risk, unless offset by higher returns, will decrease investment and innovation. Companies will be more hesitant to direct research and development resources to areas that have significant legal risks in addition to the normal business risks.

87. Indeed, the increased risk and uncertainty may slow the rollout of DAB as consumer electronic companies and others weigh their possible legal exposure from infringement by end users.

B. The Benefits of Secure DAB are Large, and the FCC is the Only Entity Able to Provide Them

88. As should be clear from this report, the potential benefits of secure DAB are extremely large. Secure DAB would create increased competition, innovation and choice in the market for music distribution while maintaining a workable legal and institutional framework and enhancing the incentive to create new works. For this reason and others, secure DAB will help ensure the continued viability of advertiser-supported over-the-air radio. Secure DAB will allow for the continued growth and emergence of new legitimate music-distribution business models. Finally, secure DAB will reduce uncertainty in the marketplace, which will make for a smoother, less-costly transition to digital radio. All of these benefits will ultimately flow through to consumers.

89. If these benefits are to be realized, the FCC needs to act, because there is no market mechanism available that will solve this problem. The IBOC standard did not emerge

from a competitive market process, but instead was chosen by the Commission. It thus falls upon the Commission to ensure that the standard is employed in a manner that is conducive to the functioning of the marketplace. In this regard, the Commission should bear in mind two facts. First, the company that owns the FCC-approved standard – iBiquity – has substantial backing from major broadcasters and consumer electronics manufacturers. Second, the potential for standard-setting processes to be used to achieve unmerited competitive advantage or for other anticompetitive purposes is both well-understood and well-documented. Simply put, there is no mechanism by which competitive forces can counteract the market failures unprotected DAB will produce. Neither is there reason to believe that the other controlling parties – i.e., iBiquity and its investors – would have an incentive to correct these market failures on their own.

90. Thus, the FCC is the only entity in a position to move this problem to a solution. Because the potential benefits are so large, virtually any plausible, effective security measure adopted by the Commission would pass a benefit-cost test. The Commission's goal should be to choose a measure that is cost-effective—one that achieves the desired objectives of preventing automated "librarying" and dissemination of copyrighted works, while minimizing the costs to broadcasters, equipment manufacturers and consumers.

C. A Technological Standard Will Be Cost-Effective

91. Generally speaking, there are two broad classes of alternatives available. The first is a technological standard that broadcasters and equipment manufacturers would integrate into their equipment and that would provide protection from unauthorized copying of

content. The other alternative is to rely on a litigation/enforcement regime that would attempt to hold direct and/or indirect copyright infringers accountable.

92. A well-designed technological standard, such as encryption or an audio protection flag, will be more cost-effective than a litigation or enforcement alternative. If effected promptly, it should be possible to implement such a standard with relatively little burden on all parties.[58]

93. It is difficult to envision a litigation or enforcement regime that would be effective at producing the desired level of security. Identifying the individuals who illegally copy music from DAB is probably not feasible. This is in contrast to P2P piracy, where it is possible to identify infringers and sue them, as the music industry has done in selected cases. Even if identifying individual infringers were possible, it would be enormously costly to sue enough of them to have a significant deterrent effect. P2P piracy remains a significant problem, despite the music industry's lawsuits against individual infringers.

94. The other litigation/enforcement strategy would be to bring actions against either broadcasters or equipment manufacturers in an effort to hold them accountable for providing appropriate security. If such indirect liability actions were successful, the end result would likely be that the broadcasters and the equipment manufacturers would be required to adopt one of the technological standards under consideration. But, this would only happen after a long period of litigation and damage to the music industry.[59] When it did happen, it would be much more costly to implement.

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[58] See Jeff Hamilton, "Proposal for Copyright Protection in HD Radio," prepared for RIAA (June 2004).

[59] For a discussion of these issues, see William Landes and Douglas Lichtman, "Indirect Liability for Copyright Infringement: Napster and Beyond," Journal of Economic Perspectives, vol. 17, no. 2 (Spring 2003) at 113-124.

95. Thus, a technological solution is almost certain to be the most cost-effective available, and it should be adopted sooner rather than later. Delay in adopting a solution will raise its costs substantially, perhaps to the point where it may not be possible to devise an effective solution to the security problem.

96. Delay in adopting a security standard will create uncertainty in the music, broadcast and equipment sectors and among consumers and likely slow or impede the DAB rollout. The affected industry sectors will be unable to plan for the transition, and consumers may be hesitant to purchase receivers that may become obsolete. Delay in rolling out a new technology with large benefits for consumers is obviously costly.

97. The legacy equipment issue argues strongly in favor of early action.[60] If the Commission delays in adopting a standard, it will face the issue of an installed base of legacy equipment that does not incorporate any security standards. A new standard may interfere with the functioning of this equipment or render it obsolete, imposing significant costs on consumers. Indeed, it may be practically impossible to adopt "second-generation" equipment that is not compatible with "first-generation" products.

98. Alternatively, if the legacy equipment is allowed to function without any interference, it would present an ongoing security problem.[61]

VIII. CONCLUSION

99. DAB holds the potential to bring great benefits to consumers, but without appropriate protections, it will produce a massive market failure because it will provide a virtually

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[60] The Commission was rightly concerned about this issue when it considered content protection for DTV. See Federal Communications Commission, In the Matter of Digital Broadcast Content Protection, Report and Order and Further Notice of Proposed Rulemaking (released November 4, 2003).

[61] The legacy equipment problem is demonstrated by the issues now emerging with DAB in the UK. See Berman Declaration at ¶ 22.

costless way for a large number of consumers to obtain "music on demand" (MOD). The illegal copying of copyrighted music that will take place with unprotected DAB will be much greater than currently occurs with P2P file swapping.

100. As a result, unprotected DAB will threaten the economic viability of all sectors of the music industry: record companies, over-the-air broadcasters and other means of legitimately distributing music. All of this will ultimately be extremely detrimental to consumers.

101. For a variety of reasons, there is no available market-based corrective for this problem. Thus, a government response is required. The FCC is the only entity in a position to provide the institutional structure needed to assure that DAB develops as a legitimate service and not as a new-and-improved version of the illegal P2P services that already have caused so much damage.

102. Of the available alternatives, the economic arguments strongly favor a technological solution, which should be adopted as early as possible. Indeed, there do not seem to be other alternatives that would have any significant effect.

103. The market failures described above are not speculative, but rather are a predictable and unavoidable consequence of the rollout of unprotected DAB radio. Just as the FCC can predict with reasonable certainty that "the more DAB receivers sold, the more radio stations will have an incentive to convert to DAB, and the cycle will repeat itself until all consumers have DAB receivers,"[62] so it can be certain that the spread of unprotected DAB will substantially increase the piracy of recorded music.

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[62] DAB FNPRM at ¶17

Attachment 2

Appendix from David Maxon and Paul Signorelli,
"How Data Transmitted Over an IBOC Station Will be Managed:
Using a Gateway to Generate Data Revenue."

Appendix
Selected Examples of Use Cases

Use Case Code	Use Case Group	Use Case Function	Use Case Description
PAD001	PAD	Advertiser places visual advertisements	An advertiser places an ad during regular programming that is viewed on the screen of on a receiver by a user.
PAD002	PAD	Advertiser places supplemental audio advertisement with on-demand audio	An advertiser places an audio ad at the beginning and/or end of a piece of audio that is stored on the receiver and played by the request of the user.
PAD003	PAD	Advertiser enhances main program audio ad with visual data	An advertiser has data related to the information conveyed in the audio portion of an advertisement appear on the visual display of the receiver as the ad is heard by the user.
PAD004	PAD	Advertiser enhances program audio ad with supplemental audio data	An advertiser has supplemental audio data stored on a receiver for a period of time after an ad is aired to allow the user to retrieve pertinent information (such as prices, locations, phone numbers, etc.) related to the ad at a later time.
PAD005	PAD	Broadcaster enhances music programming with supplemental data	A broadcaster has data related to a song being aired appear on the visual display of the receiver.
PAD006	PAD	Broadcaster enhances music programming with supplemental audio data	A broadcaster has audio information related to a song stored on the receiver for a period of time it has aired to be played back upon request of the user.
PAD007	PAD	Broadcaster triggers visual traffic report on receiver	A broadcaster sends visual traffic information that is displayed on the receiver and viewed by the user.
PAD008	PAD	Broadcaster triggers visual weather report on receiver	A broadcaster sends visual weather information that is displayed on the receiver and viewed by the user.
PAD009	PAD	Broadcaster triggers visual news report on receiver	A broadcaster sends visual news information that is displayed on the receiver and viewed by the user.
DLS001	DLS	Broadcaster sends a music download to a device.	The broadcaster sends a special music service that consists of music that users can purchase by subscribing to the service.
DLS002	DLS	Device uses profile to select downloaded music	The device uses a profile to determine if the user is entitled to the music.
DLS003	DLS	Device writes downloaded music to a permanent storage device	Device selects music by profile from a download service and stores the information on a permanent storage unit on the device.
DLS006	DLS	Device plays music from a download service	User selects option to play download music and the device reads selections from the storage device, whether it is a CD, permanent storage, removable flash memory, etc., and plays them.
DLS008	DLS	Broadcaster sends a news download to a device	The broadcaster sends a special news service that consists of news that users can purchase by subscribing to the service.
DLS011	DLS	Service provider transmits an electronic version of a periodical	Service provider transmits an electronic version of a magazine or a newspaper that the device will then record for later viewing or hearing by the user.
DLS013	DLS	Service provider transmits an electronic version of a book	Service provider transmits an electronic version of a magazine or a newspaper that the device will then record if the user has subscribed for it, for later viewing or hearing by the user.
EAS001	EAS	User receives a warning about an emergency situation.	An emergency service provider alerts the community at large via one more IBOC stations.

EAS002	EAS	Send a weather alert	A weather alert is sent to a car alerting the driver to an impending weather event.
EPG001	EPG	Broadcaster transmits an electronic program guide of channel services	The broadcaster transmits a special service that indicates all of the services available on the channel and gives a description for each, and the user views them on the receiver.
EPG002	EPG	Receiver displays program guide information based upon device capability	The receiver scans the information in the electronic program guide and only displays the services that the device is capable of handling.
EPG003	EPG	Receiver displays program guide information based upon profile	The receiver scans the information in the electronic program guide and only displays the services that the user has indicated they are interested in by their profile.
EPG004	EPG	User selects a service from the electronic program guide	The user chooses a service from the electronic program guide and the device starts rendering that service.
FLM001	FLM	Fleet Management Schedule Distribution	A set of schedules and objectives for a specific fleet of vehicles is broadcast via the IBOC network.
FLM002	FLM	Request for mission status	A request for a status update from a specific fleet of vehicles is broadcast via the IBOC network.
LBP001	LBP	Broadcaster sends location encoded traffic information to be integrated with on-board GPS	A broadcaster sends traffic information encoded by zone and the user sees the traffic that is effecting their current zone and surrounding zones where the zone information is supplied by the on-board navigation system of the vehicle.
LBP003	LBP	Broadcaster sends location encoded ad information to be integrated with on-board GPS	A broadcaster sends an ad for a chain of stores or restaurants in a city encoded by zone and the user sees the information for a store or restaurant in their zone where the zone information is supplied by the on-board navigation system of the vehicle.
MSG001	MSG	Service provider sends a numeric page	Service Provider broadcasts a numeric page to an addressable device and the device with the matching address receives the message and displays it.
MSG002	MSG	Service provider sends a text page	Service Provider broadcasts a text page to an addressable device and the device with the matching address receives the message and displays it.
MSG003	MSG	Service provider sends updated stock quotes	Service provider sends updated stock quotes to addressable devices and the devices with appropriate addresses receive the messages and display them.
MSG004	MSG	Service provider sends updated financial information	Service provider sends updated financial news to addressable devices and the devices with appropriate addresses receive the messages and display the news.
MSG005	MSG	Service provider sends updated news information	Service provider sends news headlines to addressable devices and the devices with appropriate addresses receive the messages and display them.
MSG006	MSG	Service provider sends updated sports information	Service provider sends sports scores to addressable devices and the devices with appropriate addresses receive the messages and display them.
MSG007	MSG	Device uses profile information to customize messaging service	Device receives message service data encode by areas of interest and the device uses a service profile to display only the area of interest to the user.

LBP002	(LBP)	Broadcaster sends location encoded traffic information to be integrated with IBOC GPS	A broadcaster sends traffic information encoded by zone and the user sees the traffic that is effecting their current zone and surrounding zones where the zone information is supplied by an IBOC based GPS calculation.
MSG008	MSG	User receives a page and responds on a two-way network	The device receives a page via the IBOC network and displays it to the user, the user responds on a two-way network to the entity originating the page with the source address information included in the message.
LBP004	(LBP)	Broadcaster sends location encoded ad information to be integrated with IBOC GPS	A broadcaster sends an ad for a chain of stores or restaurants in a city encoded by zone and the user sees the information for a store or restaurant in their zone where the zone information is supplied by an IBOC based GPS calculation.
GPS001	(GPS)	User uses IBOC data to calculate global position	User uses IBOC broadcast data from three locations to triangulate global position.
ODP001	ODP	Broadcaster supplies on-demand visual traffic reports	A broadcaster sends visual traffic information that is stored on the receiver and viewed at the request of the user.
ODP002	ODP	Broadcaster supplies on-demand visual weather reports	A broadcaster sends visual weather information that is stored on the receiver and viewed at the request of the user.
ODP003	ODP	Broadcaster supplies on-demand visual news reports	A broadcaster sends visual news information that is stored on the receiver and viewed at the request of the user.
ODP004	ODP	Broadcaster sends an on-demand traffic report	A broadcaster sends a traffic report that is stored on the receiver and played back by the user at their request.
ODP005	ODP	Broadcaster sends an on-demand weather report	A broadcaster sends a weather report that is stored on the receiver and played back by the user at their request.
ODP006	ODP	Broadcaster sends an on-demand news report	A broadcaster sends a news report that is stored on the receiver and played back by the user at their request.
PER001	PER	Service provider personalization request to the user	A service provider sends a request using the IBOC network to users asking the user to personalize the service using criteria particular to that service.
PER002	PER	User receives customized services	A broadcaster sends a data service with information that is customized by areas of interest to the user, the receiver uses on on-board profile to only display information of interest to the user as indicated by the user.
PER003	PER	User enters profile information into the device manually	A user enters profile information for a service using the input of a receiver device.
PER004	PER	User enters profile information on a web server	A user enters profile information for a service at a web site and the receiver uses a two-way network connection to retrieve the profile.
PER005	PER	Service profile is permanently stored on the receiver	The device receives profile information and that profile is stored on a permanent storage unit on the device.
PER006	PER	Service profile is stored on a web site.	The device receives profile information and the information is posted to a web site using a two-way network connection.

PER007	PER	Service profile is stored on a removable flash memory card.	The device receives profile information and the information is stored on a flash memory card that can be removed from the device.
PER008	PER	Service profile is stored on a CD.	The device profile is written to a CD and the receiver reads the profile information from the CD.
PER009	PER	Service profile is stored on a tape.	The device profile is written to a tape and the receiver reads the profile information from the tape.
RCM001	RCM	Radio station conducts a contest	Radio station sends data eliciting a response to a contest from one or more users in order to win something where the user responds to the contest via a two-way connection on the device.
RCM002	RCM	Radio station conducts a poll	Radio station sends data eliciting a response to a poll question from one or more users where the users responds to the contest via a two-way connection on the device.
RCM003	RCM	Radio station conducts a poll integrated with profile information	Radio station sends data eliciting a response to a poll question from one or more users where the users responds to the contest via a two-way connection on the device and the device transmits profile information back to the station.
RCO001	RCO	Service provider sells pre-recorded audio	The service provider transmits data that allows the user to purchase pre-recorded audio that is associated with the song or artist being played by the radio.
RCO002	RCO	Service provider sells concert tickets	The service provider transmits data that allows the user to purchase concert tickets that are associated with artist being played by the radio.
RCO003	RCO	Guest author sells a book	The broadcaster transmits data that allows the user to purchase a book by a guest being interviewed by the on-air personality.
RCO004	RCO	Radio station conducts promotion on behalf of a guest	The broadcaster transmits data promoting events on behalf of an artist whose song is being aired, or who is being interviewed by on-air personality.
RCO005	RCO	Retailer sells advertised merchandise	A retailer transmits data that allows the user to purchase merchandise related to the advertisement is being played on the radio.
RCO006	RCO	User conducts purchase via the device	The user interacts directly with the device to engage a commerce transaction.
RCO007	RCO	User manually inputs commerce instructions on the device	The user uses buttons on the receiver to initiate the commerce transactions.
RCO008	RCO	User uses voice response to initiate a commerce transactions	The user uses a voice response capability of a device to initiate a transaction.
RCO009	RCO	Device conducts transaction via a two-way connection	The device transmits the purchase instructions to an appropriate service provider using a two-way network connection and responds back to the user as to the result.
RCO010	RCO	Device conducts transaction via a flash memory card	The device records the purchase instructions to an appropriate service provider using a removable flash memory card which is later placed in a machine with a two-way network connection to transmit the information to the service provider.
RCO011	RCO	Device conducts a sale via bluetooth	The device transmits the purchase instructions to a machine with a two-way network connection using bluetooth. The purchase instructions are sent by the machine to the service provider.

RCO013	RCO	User requests more information on a product	The user interacts with the device to request more information about a portion of the broadcast such as an ad, a song, a guest, a station promotion, etc.
SAS001	SAS	Broadcaster transmits a free supplementary music program	A broadcaster sends secondary audio program consisting of a different selection of music than the main audio programming that the user can optionally choose to listen to.
SAS002	SAS	Broadcaster transmits a for-fee supplementary music program	A broadcaster sends a secondary audio program consisting of music that the user can subscribe to by entering an authorization code into the listening device.
SAS003	SAS	Broadcaster transmits a free supplementary news program	A broadcaster sends a secondary audio news program that the user can optionally choose to listen to.
SAS004	SAS	Broadcaster transmits a for-fee supplementary news program	A broadcaster sends a secondary audio news program that the user can subscribe to by entering an authorization code into the listening device.
SAS005	SAS	Broadcaster transmits a free supplementary weather program	A broadcaster sends a secondary audio weather program that the user can optionally choose to listen to.
SAS006	SAS	Broadcaster transmits a for-fee supplementary weather program	A broadcaster sends a secondary audio weather program that the user can subscribe to by entering an authorization code into the listening device.
SAS007	SAS	Broadcaster transmits a free supplementary traffic program	A broadcaster sends a secondary audio traffic program that the user can optionally choose to listen to.
SAS008	SAS	Broadcaster transmits a for-fee supplementary traffic program	A broadcaster sends a secondary audio traffic program that the user can subscribe to by entering an authorization code into the listening device.
SAS009	SAS	Broadcaster transmits a supplementary location based traffic program.	A broadcaster sends a secondary traffic program than is encoded with zone information and the user will hear the traffic information that effects the zone they are in and surrounding zones.
SDS001	SDS	Broadcaster transmits a free data news program	A broadcaster sends a data news program that the user can optionally choose to view on the receiver.
SDS002	SDS	Broadcaster transmits a for-fee data news program	A broadcaster sends a data news program that the user can subscribe to by entering an authorization code into the receiving device.
SDS003	SDS	Broadcaster transmits a free a data weather program	A broadcaster sends a weather program that the user can optionally view.
SDS004	SDS	Broadcaster transmits a for-fee data weather program	A broadcaster sends a data weather program that the user can subscribe to by entering an authorization code into the receiving device.
SDS005	SDS	Broadcaster transmits a free data traffic program	A broadcaster sends a data traffic program that the user can optionally view.
SDS006	SDS	Broadcaster transmits a for-fee data traffic program	A broadcaster sends a data traffic program that the user can subscribe to by entering an authorization code into the receiving device.
SDS007	SDS	Broadcaster transmits a location based traffic program.	A broadcaster sends a data traffic program than is encoded with zone information and the user will see the traffic information that effects the zone they are in and surrounding zones.
TEL001	TEL	Update service station information	The on-board service station information for the city or region a car is traveling in is updated via an IBOC network.

TEL002	TEL	Send a telematics weather alert	A telematics weather alert is sent to a car's telematics weather system on the IBOC network.
TEL003	TEL	Update point-of-interest information	The on-board point-of-interest information for the city or region a car is traveling in is updated via the IBOC network. This information includes names, locations, phone numbers, and even menus.
TEL006	TEL	Stolen car retrieval	A telematics message is sent via the IBOC network to cars in a city or region asking for a specific car to report its location via its two-way network where the car or cars being asked to respond have been stolen.
TEL009	TEL	Request traffic pattern information from vehicles by zone	A message is broadcast via the IBOC network asking vehicles to respond with location information via their two-way connection if they are in the zone indicated in the message.
TEL011	TEL	Update navigation information	Updates to the on-board guidance database for a region a car is traveling in are made via the IBOC network.
TEL012	TEL	Update traffic information for on-board navigation system	Traffic information is broadcast via the IBOC network that is coded by zone so that the on-board guidance system of the car can help a vehicle avoid potential traffic jams.
TEL014	TEL	Vehicle theft countermeasures initiation	A user notifies the police vehicle was stolen and a message is sent to the vehicle via an IBOC network to initiate the on-board theft countermeasures.
TSS001	TSS	Service provider encodes a portion of the broadcast for recording purposes	Service provider encodes a portion of a broadcast so that a device can determine the beginning and end of a program so that the device may record and label the program.

Bibliography

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[iv] *ibid.*