

CD Radio is committed to ensuring the interoperability of satellite DARS receivers and will work with other DARS providers who are implementing systems to attain this goal.

In addition, CD Radio believes that the Commission need not address the specifics of receiver tunability. CD Radio expects that satellite DARS receivers will be fully tunable in the sense that consumers can select the service provider of their choice. CD Radio could achieve such tunability remotely through the service channel, but is unsure why this is necessary. The design and implementation of such receivers is a technical matter that will easily be resolved between licensees and receiver manufacturers. Needless to say, manufacturers will be reluctant to ramp up production on a receiver with only a limited market that cannot meet economies of scale. Hence, given the number of pressing concerns involved in promptly licensing satellite DARS, the FCC should not expend precious time or resources on the technical details surrounding tunability.<sup>215</sup>

**D. Satellite DARS Licensees Should Be Permitted to Use Different Data Rates to Provide a Diversity of Programming**

CD Radio supports the *NPRM's* proposal to permit DARS licensees to implement a mix of audio formats at variable data rates. Because satellite DARS is a new and unproven service, both consumer and provider interests will be best served if the FCC allows providers sufficient flexibility to experiment with a number of audio formats.

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<sup>215</sup> Appendix E hereto includes CD Radio's recommended rewrite of the *NPRM's* proposed rule (*see* proposed 47 C.F.R. § 25.144(b)(2)(ii)).

Data rates and programming content are matters best left to the marketplace for several reasons. First, it is naive to assume that optimal data rates and programming formats for satellite DARS can be determined years in advance of consumer use of the service. Second, the fluidity of the traditional radio market and its ever-changing formats strongly suggest that this is an area particularly ill-suited to a static regulatory proclamation.

Third, licensees must be allowed to experiment in order to serve consumer preferences. In this regard, CD Radio notes that another applicant proposes to provide a higher data rate to offer an increased quality audio service, thus targeting the audiophile niche of the market. CD Radio has proposed a data rate of 128 kbps to transmit CD-quality audio, but anticipates that it will use lower data rates for non-music programming, such as voice channels for ethnic, cultural and instructional programming. Only the listening public can say which data rates are "right."<sup>216</sup> Hence, the Commission should follow the policy it established in the DBS context where it relied on a competitive market as the most effective means of ensuring that service is provided in the public interest.<sup>217</sup>

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<sup>216</sup> CD Radio notes that the proposed definition of "satellite DARS" unintentionally might limit the service to the provision of "compact disc quality audio programming." Proposed 47 C.F.R. § 25.201. As listed in Appendix E, this definition should be changed (by deleting the words "compact disc quality") to reflect the *NPRM's* tentative conclusion that variable data rates and programming content are permissible.

<sup>217</sup> *DBS*, 90 F.C.C.2d at 706-07 (competitive market will ensure program diversity); *see also* Competition in the Interstate Interexchange Marketplace, 6 F.C.C. Rcd 5880, 5881-82 (1991) (increased competition for interstate interexchange services reduces the need for regulatory intervention). Appendix E hereto includes CD Radio's recommended rewrite of the *NPRM's* proposed rule (*see* proposed 47 C.F.R. § 25.144(b)(2)(iii)).

The *NPRM* also asks how receivers could adjust to variable coding rates.<sup>218</sup> Suffice it to say that the decoder in a satellite DARS receiver can be designed to recognize and handle multiple data rates. This can be accomplished by self recognition, by service channel commands, or both. As with receiver tunability, this is an issue that will be addressed and resolved efficiently by private industry.<sup>219</sup>

E. The Commission's Rules Should Facilitate the Use of Terrestrial Gap Fillers to Optimize Satellite DARS Coverage

Even though CD Radio will employ satellite and frequency diversity to improve its coverage, some terrestrial gap fillers will still be necessary to maximize coverage. Thus, the rules governing terrestrial gap fillers should be sufficiently liberal to easily allow satellite DARS licensees to optimize their coverage. CD Radio favors rules that permit flexible use of terrestrial gap fillers to retransmit signals received from operating satellite DARS systems on the same frequency and using the same bandwidth as the satellite transmitters. By adopting such rules, the Commission will ensure satellite DARS service in areas poorly served (*e.g.*, urban canyons) by satellite signals.

For similar reasons, gap fillers should be permitted on the same frequencies as satellite transmitters. These frequencies have been allocated to DARS and "complementary

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<sup>218</sup> *NPRM*, ¶ 54.

<sup>219</sup> Similarly, the FCC should leave it to the marketplace to regulate the maximum number of channels that can be provided by each licensee.

terrestrial" repeaters<sup>220</sup> and are therefore readily available.<sup>221</sup> Receivers designed to tune a different terrestrial frequency would be costly and might thwart the widespread deployment of satellite DARS receivers, as well as being spectrally inefficient.

In addition, the Commission should permit satellite DARS licensees to construct gap fillers without prior approval or even notification -- an approach similar to that used for the construction of interior cell sites in Part 22 of the Commission's rules.<sup>222</sup> Cellular licensees governed by Part 22 need not notify the FCC of the construction of cell sites that do not affect the "outer cloud" of the licensee's cellular geographic service area.<sup>223</sup> Likewise, gap fillers within a satellite DARS provider's coverage area should be permitted without prior FCC notification.<sup>224</sup>

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<sup>220</sup> See *Allocation Order*, 10 F.C.C. Rcd at 2318.

<sup>221</sup> The *NPRM's* proposed Section 25.144(a)(2) includes, without elaboration in the text, "radio astronomy service" within the allocated bandwidth for satellite DARS. CD Radio questions the necessity of this language. See Appendix E hereto (red-lined version of *NPRM's* proposed rules).

<sup>222</sup> See 47 C.F.R. § 22.165 ("additional transmitters for existing systems") (providing that a cellular licensee may operate additional transmitters at additional locations on the same channel block as its existing system without obtaining prior Commission approval).

<sup>223</sup> See *id.* § 163(e) (notification required for modifications affecting cellular geographic service area boundary).

<sup>224</sup> As with cellular, see *id.* at § 22.163, exceptions to this rule may have to be made for gap-filler repeaters located near adjacent country co-frequency systems. Cf. *id.* at § 1.955 (1994) (coordination with Canada for land mobile stations above 30 MHz); 47 C.F.R. § 73.207(b)(2-3) (1994) (coordination with Canada and Mexico for FM broadcast stations). CD Radio thus proposes that terrestrial gap fillers located within 68 kilometers of the Canadian or Mexican border require prior coordination with adjacent country co-frequency systems. Appendix E hereto includes the proposed text of the relevant rules (see proposed 47 C.F.R. § 25.221).

Finally, CD Radio firmly supports the FCC's proposal to limit terrestrial operation of gap fillers only to repeat signals received from an operating satellite DARS service.<sup>225</sup> This ensures that licensees build a satellite rather than an S-band terrestrial DARS System.

F. CD Radio Supports the *NPRM's* Flexible Approach to Cross-Polarized Emissions

CD Radio endorses the Commission's proposal to permit satellite DARS licensees, pursuant to mutual agreement, to transmit on cross-polarized frequencies in the frequency assignments of other licensees. Such a rule will further the important FCC goal in this proceeding of maximizing spectrum efficiency.<sup>226</sup> In any event, a licensee should be free to transmit cross-polarized signals within its own frequency assignment.

G. The FCC's Proposals on Inter-Service Sharing Are Logical and Supported

1. Domestic

Given the allocation of the 2310-2360 MHz band to satellite DARS on a primary basis,<sup>227</sup> CD Radio agrees with the Commission that there is no need to develop specific rules or coordination provisions for inter-service sharing between satellite DARS and existing

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<sup>225</sup> See *NPRM*, ¶ 56.

<sup>226</sup> See *NPRM*, ¶ 57.

<sup>227</sup> See 47 C.F.R. § 2.106, footnote US328.

users of the 2310-2360 MHz band. Continued use of the band by aeronautical telemetry and radiolocation users will be on a secondary basis only.

## 2. International

CD Radio agrees with the Commission that each satellite DARS licensee should coordinate with other Administrations over the portion of the 2310-2360 MHz band on which the licensee is licensed to operate. While CD Radio has previously made known its view that coordination would be facilitated if all systems met a power flux density ("pfd") level at the earth's surface of  $-139 \text{ dBW/m}^2/4 \text{ kHz}$ ,<sup>228</sup> CD Radio believes that it is not necessary for the FCC to re-open the issue of required pfd limits since it will be part of the coordination process. CD Radio also does not oppose the FCC's tentative plan to require licensees transmitting on other applicants' cross-polarized frequencies to apply to the Commission for approval before coordination is initiated with other Administrations.

## 3. Adjacent Band Services

CD Radio is on record as stating that it can employ techniques such as shaping, coding, offset quadrature modulation, and filtering to achieve the out-of-band emission requirements specified by Section 25.202(f) of the Commission's rules. CD Radio cannot at this time specify precisely the out-of-band emission levels required to protect adjacent band services. But it is confident that it can work with telemetry operations operating in the 2360-

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<sup>228</sup> See note 19, *supra*.

2390 MHz band and other radiocommunication services operating below the 2310-2360 MHz band to reduce interference to insignificant levels.

#### H. The Commission Should Not Delay in Authorizing Feeder Links

In the *NPRM*, the Commission declines to propose a separate allocation of spectrum specifically for satellite DARS feeder links at this time. In part, this is because of the Commission's confidence that sufficient spectrum can be found, as it has for other new satellite systems such as MSS and LEOs.

CD Radio shares that confidence. At the same time, however, CD Radio suggests that the agency begin narrowing possible choices. One possibility would be to authorize feeder links on non-congested frequency bands in the 6 - 7 GHz band.<sup>229</sup> While portions of this band are used by mobile Electronic News Gathering ("ENG") equipment, CD Radio concurs with the Commission that interference to satellite receivers can be avoided through careful coordination: there are only four satellite DARS applicants.

At the time of its application, CD Radio suggested that the 7 GHz band was suitable for its feeder link operations. Later, after completing a frequency coordination study, CD Radio proposed to operate two feeder links at 6715 MHz and 6725 MHz.<sup>230</sup> That these bands could be cleared in the metropolitan Washington, D.C. area is testimony to the fact that frequency can be found that permits operation of satellite DARS feederlink on a non-

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<sup>229</sup> See *NPRM*, ¶ 73.

<sup>230</sup> Attached as Appendix F is the two-year old coordination study.

interference basis. CD Radio specifically recommends that these bands, or other similar frequencies be designated as soon as feasible.

### **VIII. THE COMMISSION SHOULD CAREFULLY TAILOR FINANCIAL QUALIFICATIONS AND MILESTONE REQUIREMENTS TO THE CHARACTERISTICS OF THE NEW SATELLITE RADIO SERVICE**

The Commission has proposed to allow a DARS permittee to demonstrate its financial qualifications in stages. In order to receive a license, applicants would need to provide evidence of financial capability through a balance sheet showing the funding, a commitment from a corporate parent if the applicant is relying on the parent for the funds, or estimated income or revenues anticipated from proposed operations.<sup>231</sup> Within one year of grant, however, the licensee must show that it has firmly committed resources sufficient to cover the cost of construction, launch, and one year's operation of the proposed system. This second demonstration is to be made in the same manner as that required of domestic fixed-satellite systems, but should not require funding commitments solely from internal sources.<sup>232</sup>

The Commission also proposes to require a permittee to begin construction of the first satellite within one year of license grant. Launch and operation of the first satellite must

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<sup>231</sup> *NPRM*, ¶ 90.

<sup>232</sup> *Id.*, ¶ 91. The FCC should provide fair opportunities for DARS licensees to meet funding milestones other than through commitments from internal sources and should scrutinize both sorts of commitments with equal vigor.

occur within four years of license grant, while full operation of an entire satellite system comprised of more than one satellite must occur within six years of grant.<sup>233</sup>

CD Radio completely supports the Commission's proposed financial qualifications and construction milestone requirements for DARS authorizations. The Commission's proposal reflects the need for flexibility when granting authorizations for a new service, yet is stringent enough to weed out those parties that do not expeditiously construct their DARS system. The proposal gives entrants the opportunity to attract the necessary financial support, while ensuring that the public will be offered service in a timely fashion and that limited frequencies will not be warehoused/aggregated. Furthermore, since all pending applications can be granted, a licensee's pursuit of financial resources will not preclude another applicant from implementing its own system. Accordingly, there is no need to require applicants to demonstrate full financing prior to the award of its license. If the permittee fails to satisfy its financial qualifications in a manner acceptable to the Commission, moreover, the authorization will become null and void, and the frequency allocation will become available for assignment -- including by competitive bidding if deemed appropriate -- to a new applicant.

CD Radio further agrees with the Commission that DARS should not be held to the other stricter standard imposed on applicants in the domestic fixed-satellite service ("FSS")<sup>234</sup> and that licensees should be allowed to demonstrate their financing in

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<sup>233</sup> *Id.*, ¶ 92.

<sup>234</sup> 47 C.F.R. § 25.140.

stages.<sup>235</sup> A demonstration of *current* financial ability to meet the costs associated with construction, launch, and operation of the proposed satellite facility for one year is more appropriate in an established service, where numbers of other qualified applicants are ready and able to provide service. All pending DARS applications, however, can be granted within the current allocation, *i.e.*, there is no mutual exclusivity. Thus, allowing permittees additional time to complete financing does not impede other qualified applicants from providing service.<sup>236</sup>

The implementation of regulations for DBS service similarly balanced the desire to prevent warehousing of limited spectrum with the need for flexibility in the development of an innovative service. The regulatory approach used for DBS is a strong model that promoted the development of new service, utilizing state-of-the-art technology, without unduly prolonging its availability to the public.

The Commission requires DBS permittees to (a) begin construction or complete contracting for construction within one year of the grant of the construction permit and (b)

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<sup>235</sup> The Commission's rejection of the conditional permit approach in the FSS service does not raise the same concerns with respect to DARS. *See* Advanced Business Communications, Inc., 100 F.C.C.2d 525 (1985); *see also* Rainbow Satellite, Inc., Mimeo No. 2584 (Com. Car. Bur. Feb. 14, 1985); *see also* United States Satellite Systems, Inc., Mimeo No. 2584 (Com. Car. Bur. Feb. 14, 1985). Unlike DARS, FSS, now and at that time, was a well established industry with 23 satellites in orbit providing service. *Rainbow Satellite* at 12.

<sup>236</sup> *See* Norris Satellite Communications, Inc., 7 F.C.C. Rcd 4289, 4290 (1992) (financial qualifications streamlined for proposed FSS service in Ka-band; "key consideration" was that the waiver "would not preclude additional entities from implementing their own systems in this band."); *see also* Radiodetermination Satellite Service, 104 F.C.C.2d 650 (1986).

have their satellite station in operation within six years of the construction permit grant, unless otherwise determined by the Commission upon proper showing in any particular case. Strict enforcement of the first prong of due diligence (completion of contracting) resulted in the withdrawal or cancellation of permits by entities who were unable to proceed diligently with the development of their system in a timely manner.<sup>237</sup> Similarly, under the proposed milestones, the Commission would be able to reclaim permits granted to DARS applicants who are unable expeditiously to arrange financing.<sup>238</sup>

The Commission's approach to DBS successfully gave DBS permittees an opportunity to overcome regulatory and technical obstacles, yet eliminated those entities without immediate plans and intentions to develop their system. As a result, DBS has become a competitive reality in the video marketplace. Any less flexibility granted to satellite radio could undermine the ability of the new service to take its place in the market along side established audio providers.

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<sup>237</sup> CBS, Inc., 99 F.C.C.2d 565 (1984) (CBS, Inc. and Western Union Telegraph Company notified Commission that they would no longer pursue DBS; Graphic Scanning Corporation's and RCA American Communications, Inc.'s construction permits were canceled for failure to complete contracting); TEMPO Enterprises, Inc., 1 F.C.C. Rcd 20 (1986) (Satellite Development Trust and National Christian Network advised the Commission that they would no longer pursue DBS; National Exchange Satellite, Inc.'s permit was canceled for failure to complete contracting); RCA American Communications, Inc., 2 F.C.C. Rcd 1204 (1987) (RCA American Communication's and Antares Satellite Corporation's construction permits were revoked for failure to complete contracting).

<sup>238</sup> "The first due diligence requirement is ... intended to eliminate as quickly as possible those parties not willing or able to take immediate steps to begin implementation of their DBS plans, and this first provision accordingly has been strictly interpreted." United States Satellite Broadcasting Company, Inc., 3 F.C.C. Rcd 6858, 6859 (1988).

In conclusion, CD Radio submits that the Commission's proposal, in light of the success of the DBS regulatory model, will clearly serve the public interest by providing: (1) DARS to the public in the most expeditious manner; (2) without imposing artificial barriers to the entry of new companies; (3) the further development of new technology; and (4) the proliferation of competition. The Commission's proposed financial requirements, just like the DBS standards, will effectively prevent any party without the imminent ability to commence its DARS program from warehousing spectrum, while allowing applicants sufficient time to attract the necessary financial support for this new, innovative, and risky service. Accordingly, CD Radio fully supports the Commission's proposed financial qualifications and construction milestone requirements for DARS service.

#### **IX. MISCELLANEOUS ISSUES**

In the *NPRM*, the FCC asks a few general questions not already answered above. For example, the Commission correctly concludes<sup>239</sup> that application of the alien ownership provisions in the Communications Act<sup>240</sup> to satellite radio licensees depends on the type of service provided. Under the Act, licensees that choose to be broadcasters or common carriers must comply with Section 310; licensees that offer subscription services need not.

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<sup>239</sup> *NPRM*, ¶ 115.

<sup>240</sup> *See* 47 U.S.C. § 310(b) (1994).

Not only is this required by the statute, it is consistent with long-standing Commission precedent in other services.<sup>241</sup> No reason exists to alter this approach.

Regarding license term, CD Radio notes only that geostationary satellite lifetimes are ten years or more. A license term tailored to the proposed lifetime of the satellite would be the most logical and the easiest to administer.

It is unnecessary at this point in the evolution of satellite DARS to establish an industry advisory committee ("IAC") to address DARS regulatory issues. Most technical issues will be resolved when the Commission issues its *Report and Order* and service rules in this proceeding. Issues arising thereafter can be addressed among the implementing licensees. CD Radio, for its part, has consulted and continues to consult with satellite DARS applicants, and other interested parties, regarding technical and operational choices for satellite radio.

Finally, CD Radio concurs with the Commission's consequential change to Part 87, modifying the scope of the existing S-Band aeronautical telemetry allocation. As the

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<sup>241</sup> Land Mobile Radio Service, 51 F.C.C.2d 945 (1975) (licensee can choose not to make general offering to public and thus be regulated as non-common carriers), *aff'd sub nom.*, National Association of Regulatory Utility Commissioners, 525 F.2d 630 (D.C. Cir. 1976), *cert. denied*, 425 U.S. 999 (1976); Separate Satellite Systems, 101 F.C.C.2d 1046, 1164 (1985) ("Since separate system operators will be non-common carriers, Section 310(b) of the Communications Act will not apply."); Orion Satellite Corp., 5 F.C.C. Rcd 4937, 4940 (1990) ("the Commission has explicitly held that the foreign ownership provisions embodied in Section 310(b) of the Communications Act do not apply to non-common carrier satellite systems.").

Commission will recall, this issue was settled in the *Allocation Order*, and the current proposal has the support of the existing aviation users.<sup>242</sup>

## X. CONCLUSION

Nearly five-and-one-half years have elapsed since CD Radio filed this nation's first proposal to increase diversity in radio programming, and provide choice to underserved areas and interests, with a satellite DARS system. Nearly three years have passed since the cut-off. During that time, the radio broadcast industry -- with nearly \$11 billion in annual revenues last year -- has successfully blocked implementation of digital radio and licensing of satellite DARS applicants. In the process, satellite radio is achieving prominence as an example of the regulatory process being abused by special interest groups, to the detriment of new services, small entrepreneurial businesses, and consumers.

Now is the time to reverse this perception. The FCC has already found that satellite DARS would serve the public interest. Promptly finalizing the service rules as proposed by CD Radio, and issuing licenses, will allow this process to begin. Continuing down the current path will only necessitate use of a new unit of regulatory delay in this proceeding: *red-tape-decades*. This proceeding is over 1.3 red-tape-decades in length and increasing. But the delay already has cost CD Radio \$15 million in sunk costs and an additional \$20 million in increased satellite construction costs. As FCC Chairman Hundt acknowledged just last week at the NAB Radio Show, satellite DARS "was long delayed by the FCC primarily

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<sup>242</sup> See *Allocation Order*, 10 F.C.C. Rcd at 2312.

in order to let in-band digital radio develop in a similar time frame. But now its time has come."<sup>243</sup>

Continued adherence to the broadcasters' line serves no one. In particular, the public interest would not be furthered by either re-opening the cut-off or imposing spectrum auctions in this proceeding: both squarely violate the Communications Act and longstanding precedent, and both are unfair and poor policy. Indeed, broadcasters' transparent reason for suggesting new applications or competitive bidding is to increase the already protracted delays in this proceeding in order to forestall the emergence of a new competitor through abuse of the regulatory process.

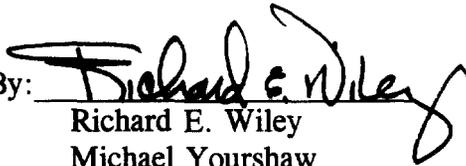
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<sup>243</sup> NAB Speech at 7.

And so it will, if the Commission is not careful. CD Radio suggests that the Commission act to adopt the attached rules and license CD Radio and other qualified applicants immediately.

Respectfully submitted,

**CD Radio Inc.**

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Of Counsel

September 15, 1995

**APPENDIX A**

*Satellite Radio*

(the "Lilley Study" on the economic impact of satellite DARS on the radio industry)

# Satellite Radio

Good for the U.S. Consumer

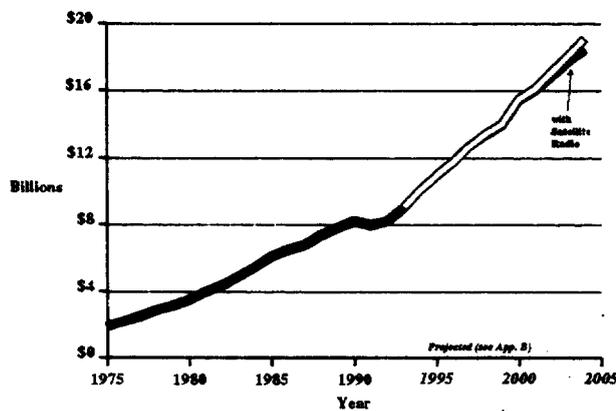
Good for U.S. Radio

Good for U.S. Industry

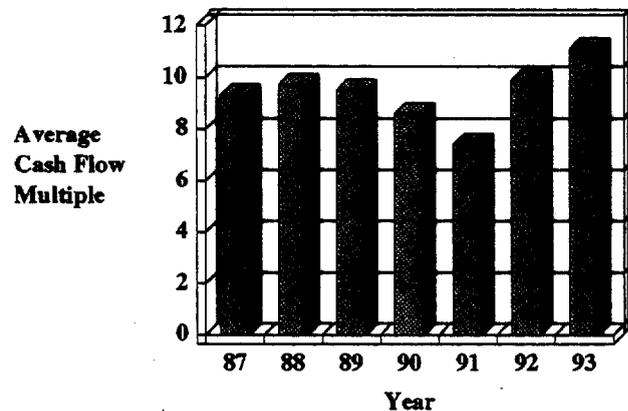
■ **Satellite Radio Won't Hurt Traditional Radio.**

■ **Traditional Radio—an Economic Powerhouse—Does Not Need Government Protection.**

**Radio Station Advertising Revenue**



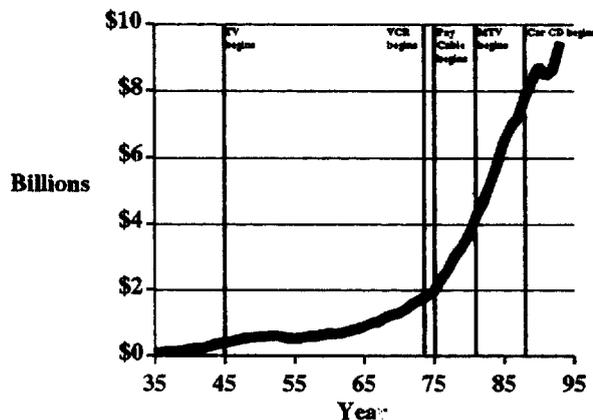
**Radio Station Cash Flow Multiples**



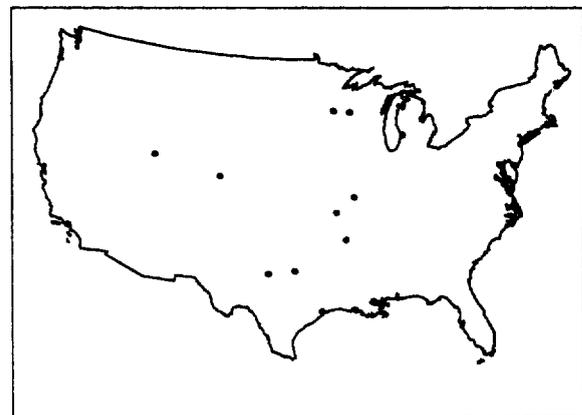
■ **Traditional Radio Has Thrived in the Face of New Technology.**

■ **Satellite Radio Increases Radio Audience — Delivers Scarce Programming Such as Children's Format.**

**Growth of Radio Advertising Revenue vs. Introduction of Competitive New Technologies**



**Children's Radio Stations—only 12.**



August 1994

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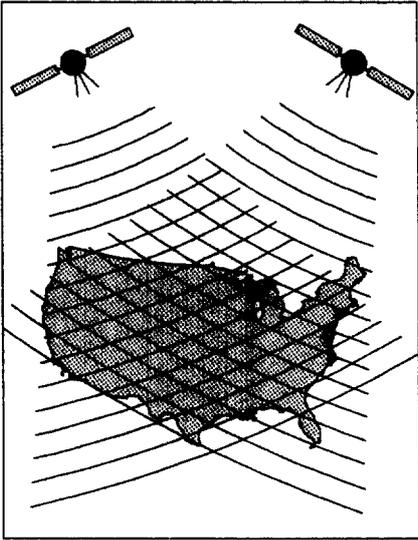
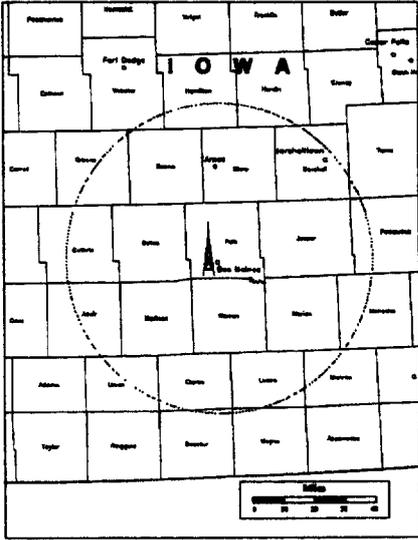
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## I. Satellite Radio Will Not Hurt Traditional Radio

### A. Traditional Radio Is Local; Satellite Radio Is National

- Satellite Radio—a national service—offers no competitive threat *at all* to **local** strengths of traditional radio—local news, weather, traffic, school closings, personalities, sports, talk, etc.
- Satellite Radio—a national service—is a different business entirely from traditional radio which depends primarily on attracting **local** advertising.

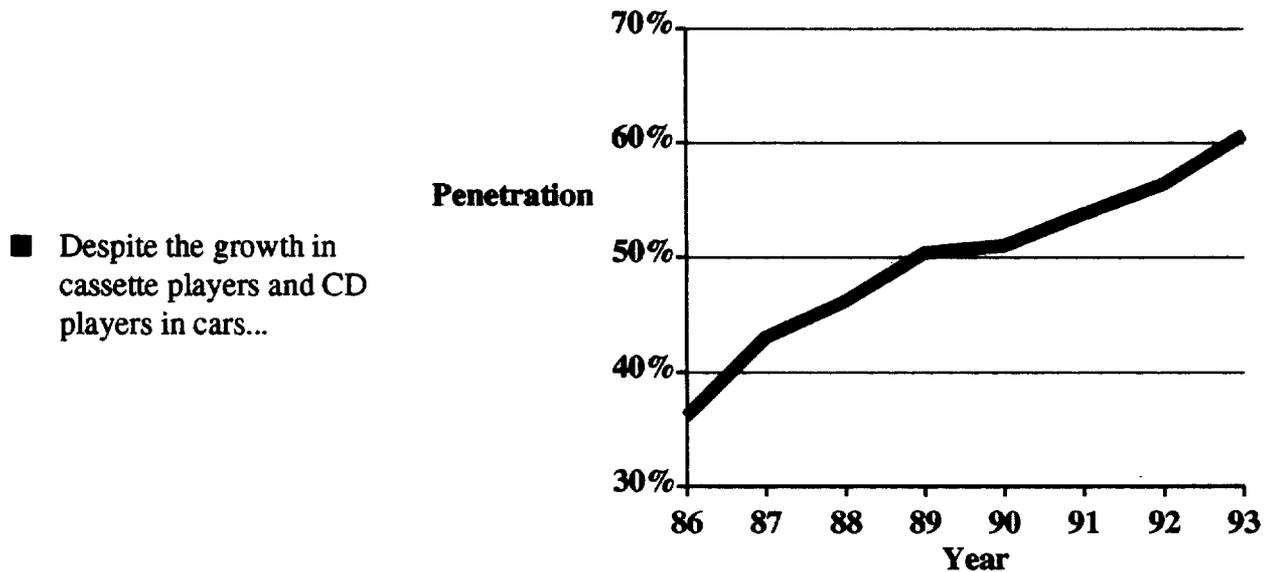
<b>Satellite Radio</b>	vs.	<b>Traditional Radio</b>
<p><b>Programming</b></p> <ul style="list-style-type: none"> <li>• Nationwide Programming</li> </ul>		<p><b>Programming</b></p> <ul style="list-style-type: none"> <li>• Music tailored to local market preference</li> <li>• Local News</li> <li>• Local Weather</li> <li>• Local Traffic</li> <li>• Local School Closings</li> <li>• Local Personalities</li> <li>• Local Sports</li> <li>• Local Talk</li> </ul>
<p><b>Primary Revenue Source</b></p> <ul style="list-style-type: none"> <li>• Subscription-based or National advertising</li> </ul>		<p><b>Primary Revenue Source</b></p> <ul style="list-style-type: none"> <li>• Local Advertising</li> </ul>
<p><b>Primary Audience</b></p> <ul style="list-style-type: none"> <li>• Automobile</li> </ul>		<p><b>Primary Audience</b></p> <ul style="list-style-type: none"> <li>• Home/Office/Automobile</li> </ul>
		

## I. Satellite Radio Will Not Hurt Traditional Radio

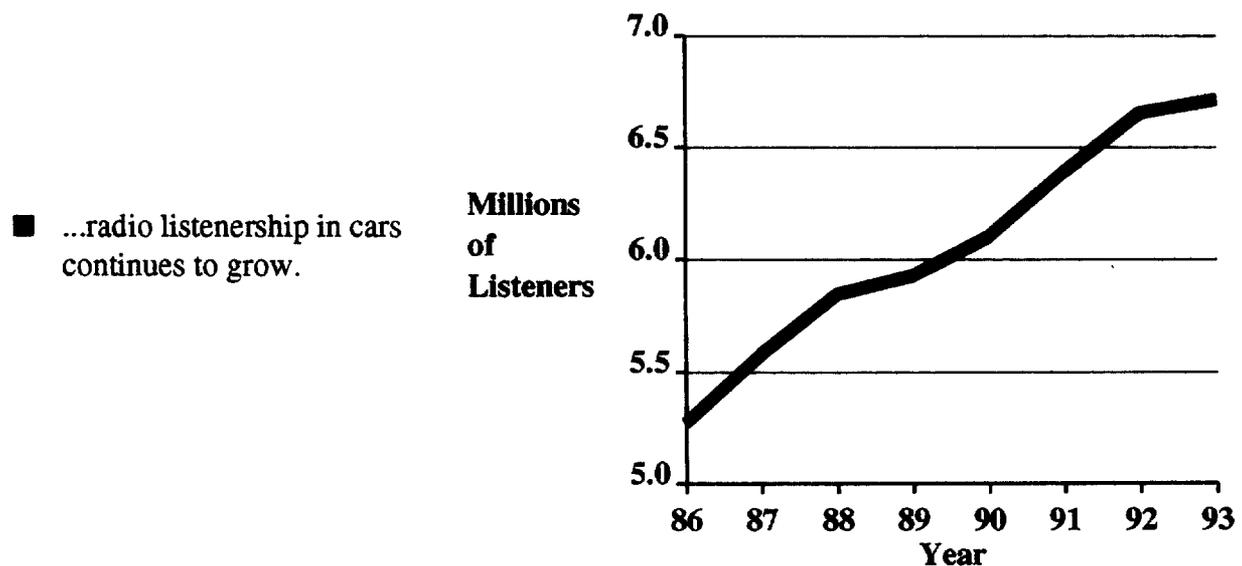
## B. Subscriber-Supported Satellite Radio Will Have Little or No Effect on Traditional Radio

Look at how traditional radio has accommodated new technologies which are different from a local radio station. Cassette players and CD players in cars have not hurt traditional radio:

### Car Owners with Cassette or CD Players



### Car Radio Listenership



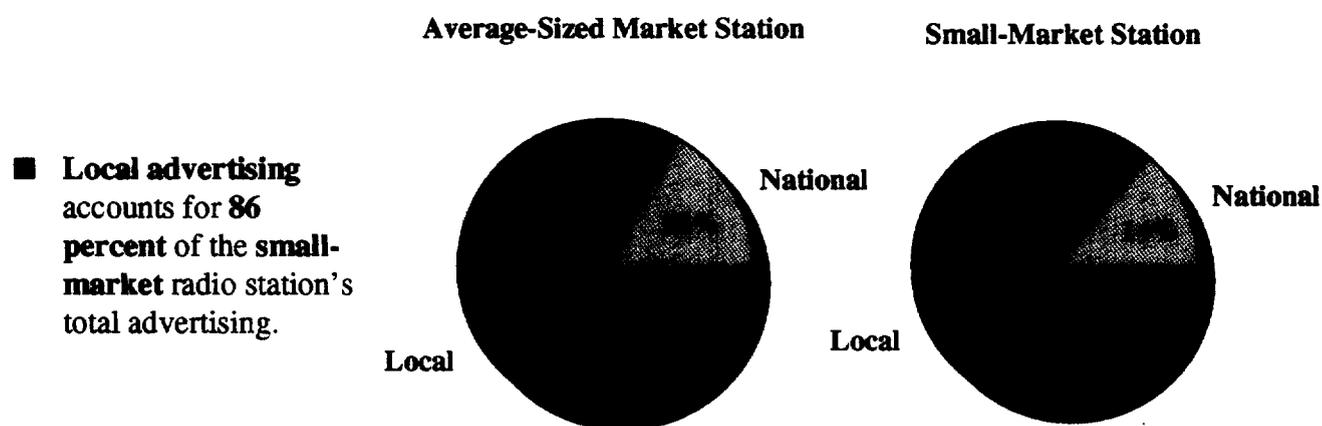


## I. Satellite Radio Will Not Hurt Traditional Radio

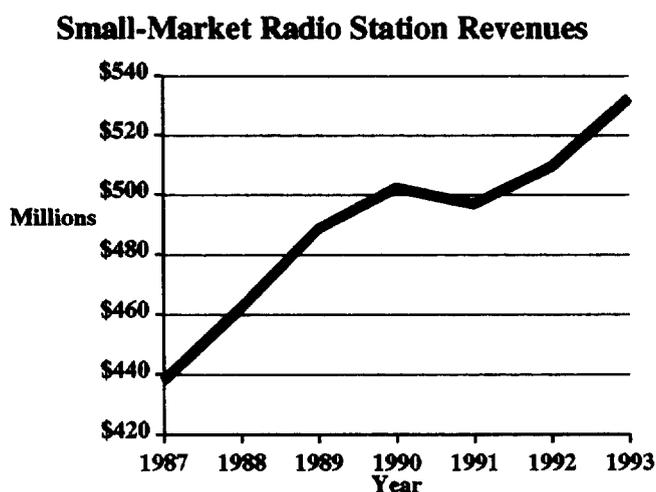
### D. Even if Advertiser-Supported, Satellite Radio Will Have Minimal Effect on Small-Market Traditional Radio

Small-market radio stations rely more heavily on local advertising than the average-sized market radio stations and, therefore, they will be less impacted by a national advertising service.

#### Radio Station Advertising Revenues Local vs. National—1993



- **Revenue for small-market** radio stations has **risen 22 percent** since 1987.



The [Radio Advertising] Bureau conducts a monthly survey of radio advertising in 115 areas around the country, and has found that [the 1994] percentage increases in smaller markets are similar to those [large increases] in bigger markets, a spokeswoman said.

*New York Times*, July 25, 1994

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### E. Satellite Radio Is Not Projected To Penetrate the Automobile Market by More Than 3%-10% by 2004

- Satellite Radio penetration projections are based on growth of analogous technologies.
- Like Satellite Radio:
  - CD players in automobiles require new equipment and provide commercial-free music;
  - Pay cable television provides nationwide programming for a monthly subscription fee.
- Penetration of CD players in automobiles grew from 0% to 3.2% of car owners between 1988 and 1994.
- Pay cable grew from 0% to 10% between 1975-1981.

