

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In re)
)
Digital Audio Broadcasting Systems and) MM Docket No. 99-325
Their Impact on the Terrestrial)
Radio Broadcast Service)

To: The Office of the Secretary,
for the Attention of the Chief, Media Bureau

**COMMENTS ON JOINT PARTIES' REQUEST
FOR FM DIGITAL POWER INCREASE**

Klein Broadcast Engineering, L.L.C. (*KBE*), by its communications counsel, hereby files its Comments in response to the Commission's Public Notice, DA 09-1127 (rel. May 22, 2009).

I. BACKGROUND

1. A group of broadcasters and manufacturers of broadcast transmitting equipment calling themselves the "Joint Parties" has asked the FCC to revise the current technical specifications for FM digital audio broadcasting (*DAB*). Specifically, the Joint Parties have asked the Commission to increase the maximum permissible digital operating power of FM stations from the current level of 1% of a station's authorized analog power (-20 dBc) to a maximum of 10% of a station's authorized analog power (-10 dBc).

2. By means of prior Public Notices, DA 08-2340 (rel. October 23, 2008), and DA 08-2553 (rel. November 24, 2008), the Commission sought comment on the Joint Parties' request. The Commission received a variety of comments and reply comments, some supporting, and others opposing, the Joint Parties' Request.

3. The Commission now seeks comment on four issues.

- Whether the Bureau should defer consideration of the Joint Parties' requested power increase until the completion of and comment on further field tests by National Public Radio, Inc. (*NPR*)?
- Whether the record in this proceeding, the real-world experience gained from more than 1,400 FM stations operating for several years in the hybrid mode, and the record of experimental authorizations at higher digital power levels, warrant an increase in maximum digital operating power as proposed by the Joint Parties, or support a provisional power increase of some lesser extent than that requested by the Joint Parties?
- If the Commission does adopt a power increase, whether it should also establish standards to ensure the lack of interference to the analog signals of stations operating on first adjacent channels? Should such standards apply to, i.e., require the protection of, LPFM stations operating on first adjacent channels?
- Finally, if the Commission does adopt a power increase, whether it should also establish more explicit procedures to resolve digital-into-analog interference complaints?

KBE will address each of these issues in turn.

II. COMMENTS

A. Should the Bureau defer consideration of the Joint Parties' requested power increase until the completion of, and comment on, NPR's further field tests?

4. Yes... unquestionably yes. One of the fundamental principles of reasoned decision-making is that a decision-maker should have a fully developed record in front of it before making a decision especially if there are significant risks of adverse consequences that may flow from making the wrong choice. Here, the risk is that IBOC operations will cause harmful interference to analog FM operations. There have already been a significant number of instances of such interference, many from second-adjacent-channel IBOC operations. This has been clear for some time. Allowing wholesale increases in IBOC radiation by as much as +10 dB simply poses an

unacceptable risk of interference, especially — but not limited to — areas near the 60-dB μ contour. Until the further field tests are complete, the Commission should take no action that may tend to aggravate existing problems.

B. Does the record in this proceeding and the real-world experience gained to date warrant an increase in maximum digital operating power as proposed by the Joint Parties, or support a provisional power increase of some lesser extent?

5. No. The integrity of the analog FM Broadcasting Service is on the line here. FM Broadcasting has always been known for its technical quality. The Commission carefully established interference-protection rules, and has rigorously enforced them for several decades. For example, the Commission has required commercial FM applicants who have sought short-spacing waivers (§ 73.207) to demonstrate that there were *no* fully-spaced sites available. Kenter Broadcasting Co., 62 Rad. Reg.2d (P & F) 1573, 1577 (1986), aff'd, 816 F.2d 8 (D.C.Cir.1987).

6. Similarly, requests by Noncommercial Educational FM applicants for waivers of § 73.509 due to caused overlap have been routinely denied... even when the interference area amounted to, e.g., 0.1% of a station's protected service area, and the affected population was only 602 persons. Spirit Radio of North Florida, Inc., 24 FCC Rcd 2958 (2009). Even where an applicant asserted that its proposal would affect, in actuality, no people at all (or, on paper, only 62 persons, assuming uniform population distribution), the Commission has disallowed caused overlap. Rural California Broadcasting Corporation, BPED-951031MD, Ref. 1800B3 (Audio Div., June 26, 19970, recons. den., Ref. 1800B3 (Audio Div., March 13, 2000).

7. In disallowing such overlap, the Commission has noted, e.g., in Spirit Radio, that, "...the type of interference caused by the proposed facility might not be recognized by listeners

as interference,” and that, “it is the Commission’s charge, not applicants or licensees, to establish definitions of protected service and to ensure that existing protected service remains so.” Those seeking such waivers have invariably argued that grants of their proposals would serve the public interest, because new services would be provided, or existing services extended. Even where the amounts of interference would be small, and:

requests for waivers [...] may have individual appeal, routine waivers [...] would undermine the Commission’s well-settled NCE-FM licensing scheme. It would result in vast increases in interference levels in the congested reserved band while causing disruption to existing listening patterns. This interference interrupts the continuity of existing service[s], and thus diminishes the quality of FM service[....] Over time, the grant of numerous similar waivers would degrade the quality of existing FM reception within stations’ theoretically protected 60 dB μ service contours throughout the entire NCE-FM band. [Footnote: Division Letter at 2, n.2. This has been called the "Swiss cheese" effect, where a station's protected service contour is punctured by "holes" of interference from multiple second-and-third-adjacent channel FM stations. Revision of FM Rules, Notice of Proposed Rulemaking, 21 RR 1655, 1674 (1961).]

8. As discussed in greater detail below, HD sources have already been found to cause significant interference to analog FM reception. Allowing even more interference potential would be extremely disruptive to existing listening patterns. It would interrupt the continuity of existing services, and it would thus diminish the quality of FM service. The Commission must be consistent, and must continue to be strict with regard to interference, both actual and potential, regardless of whether the source is another analog signal, or a digital source.

9. It appears that sales of HD receivers have numbered in the hundreds of thousands. See, e.g., <http://is.gd/1oVHT>, <http://is.gd/1oWf7>). That is a tiny fraction of the **huge** installed base of many millions of analog FM receivers in homes, workplaces, and motor vehicles. According to the 2003 World Press Encyclopedia, as of the date of publication, there were **575,000,000** radio receivers in the United States. <http://is.gd/1oWKN>. Virtually every home in

the country has at least one radio receiver: many homes have several: clock radios in each bedroom and kitchen, portable receivers for on-the-go or patio listening, etc. Virtually every motor vehicle in the country has an in-dash radio receiver. The overwhelming majority of receivers in service are analog, and so it will remain for the foreseeable future.

10. This is especially true with respect to mobile receivers. A major reason why is very simple: the median and mean ages of automobiles have steadily increased since 1969. According to the Bureau of Transportation Statistics (a part of the Research and Innovative Technology Administration), in 2005, the overall median age for automobiles was 9.0 years — up from 6.5 years in 1990. By 2007, the median age had increased to 9.2 years. See <http://is.gd/1oSWf>. The dramatic decrease in new-car sales in the past year, triggered by the severe recession in the United States economy, and the resulting credit squeeze, will no doubt cause even further increases in the median and mean ages of vehicles. The weak economy and the lack of disposable income will also hinder the after-market sales of HD-capable automobile receivers, and of portable and tabletop receivers.

11. Recently, there was news that the Microsoft Corporation was adding HD Radio capability to the Zune mp3 player. However, that is faint praise indeed. Sales of the Zune player have been anemic, to put it charitably, and have been far outstripped by the Apple iPod and the Apple iPhone. Apple has chosen not to follow Microsoft down the HD Radio primrose path. Apple clearly sees far more promise in streaming technologies. Indeed, the Pandora player was the most popular iPhone application last year. <http://is.gd/1oUhm>.

12. Analog service, a proven technology that dominates aural broadcasting, simply must be protected from any increases in interference. The Commission, as the guardian of the listening

public's interest, must act responsibly in this matter. Allowing HD Radio power increases will surely result in increased numbers of interference complaints. This will cause inconvenience to the public, to put it mildly. Dealing with increased numbers of interference complaints will impose severe administrative burdens on the Commission's staff, and on broadcasters themselves. The far wiser course of action is to keep the toothpaste in the tube, and not trying to get it back into the tube once it has escaped.

13. KBE has first-hand experience dealing with interference to analog FM Broadcasting from HD Radio sources. One example is interference to Station KATY-FM, Channel 267A, Idyllwild, California, FCC Facility ID No. 33611, from Grandfathered, Super-Power Station KRTH, Channel 266B, Los Angeles, California, FCC Facility ID No. 28631. KRTH is conducting IBOC operations at 510 Watts ERP at the Mount Wilson antenna farm. This is nearly 70% of the analog ERP that would be run by a full class B station at the same site (740 Watts). As a result of KRTH's IBOC operations, station KATY-FM has suffered, and is suffering, significant levels of interference within its protected $60\text{-dB}\mu_{f(50,50)}$ contour.

14. KBE has also dealt with an IBOC interference problem in the Denver market. Shortly after Station KALC, Channel 290C, Denver, Colorado, FCC Facility ID No. 59601, began IBOC tests, second-adjacent-channel Station KJAC, Channel 288C, Timnath, Colorado, FCC Facility ID No. 38345, began receiving complaints from listeners inside Station KJAC's $60\text{-dB}\mu$ contour. The complaints reported difficulties receiving KJAC due to static, and in some cases bleeding from KALC. Since Station KALC commenced IBOC operations, Station KJAC has dropped from the Number 10 station in the prime 25-to-54 demographic to Number 16. This has occurred within one Arbitron rating period ("book").

15. KBE had substantial communications with engineering personnel for KALC. The experience convinced KBE that the Ibiqity emissions-mask standard is not stringent enough to protect analog FM stations from interference. The Commission should require all IBOC energy to be at least -50 dBc, referenced to the analog FM carrier. With respect to grandfathered, superpower stations, the Commission must employ a reference of the analog carrier corresponding to the maximum parameters for the station Class, not the analog carrier of the grandfathered, superpowered facilities. This is consistent with the way that the Commission treats facilities modifications, e.g., site changes, by grandfathered, superpowered stations.

16. KBE is also convinced that the FCC must address the problem of “spectral regrowth” — the generation of interference-causing spurious products, due to a loss of sync between, and a result of intermodulation products derived from, the upper and lower IBOC carriers. Sometimes, spectral regrowth also involves the analog carrier. Non-linearities within the overall transmission system also play a role. Such products can appear some time after IBOC operations commence, and can vary substantially with changes in environmental operating conditions.

17. In KBE’s experience, rebooting the IBOC exciter can *sometimes* suppress such harmful products. KBE therefore urges the Commission to require all IBOC transmission chains to include real-time Fast Fourier Transform analysis of transmitted energy, and forced reboots of exciter circuits if spectral-regrowth products appear. Such functionality should be a requirement for grant of equipment authorization or, in the case of existing equipment, a retrofitting requirement within a reasonable period of time, as a condition of continued operations. The

Commission should require the filing of a certification of compliance with this requirement by a date certain.

C. If the Commission does adopt a power increase, whether it should also establish standards to ensure the lack of interference to the analog signals of stations operating on first adjacent channels? Should such standards apply to, i.e., require the protection of, LPFM stations operating on first adjacent channels?

18. Regardless of whether the Commission adopts a power increase, the Agency must adopt explicit procedures to protect all analog signals to the full extent of their normally protected contours (60 dB μ for Class A and all sub-classes of Class C; 57 dB μ for Class B1, and 54 dB μ for Class B). This includes first-adjacent-channel signals.

D. Finally, if the Commission does adopt a power increase, whether it should also establish more explicit procedures to resolve digital-into-analog interference complaints?

19. Regardless of whether the Commission adopts a power increase, the Agency must adopt explicit procedures not only to resolve digital-to-analog interference complaints, but also to provide advance warning to the public that IBOC operations are to commence or are to be expanded or otherwise modified. The Commission's Rules already contain mechanisms for protecting broadcast and other communications services from the adverse effects of new or improved services. For example, if a broadcast applicant proposes to construct a tower within a certain distance of an AM antenna system, the applicant is required to conduct before-and-after signal measurements to ensure that the tower construction does not disrupt AM operations. See 47 C.F.R. § 73.1692. See also, 47 C.F.R. § 22.371. Similarly, DTV Construction Permits have issued with Special Operating Conditions requiring permittees to engage in advance notification

and in cooperation with health-care facilities concerning potential interference to medical electronic devices stemming from DTV operations.

20. The Commission can readily adapt such concepts to IBOC operations. The Commission should require advance notification to potentially affected broadcasters and to the public concerning the planned initiation or modification of IBOC operations. The burden must be on the IBOC operator to ensure that it will not cause, and is not causing, interference to analog operations. There should be a minimum one-year responsibility period, as is the case with respect to blanketing interference. See 47 C.F.R. § 73.318(b).

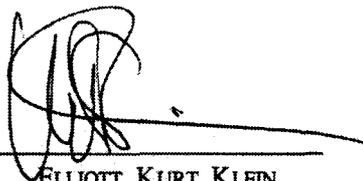
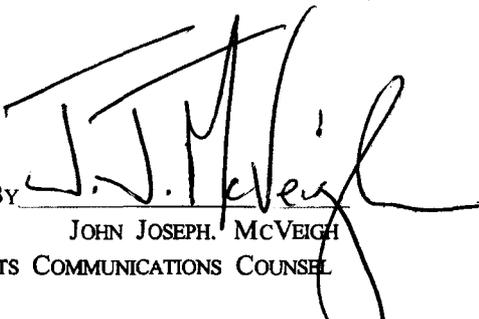
E. Other Matters

21. When the Commission has authorized new or enhanced services, e.g., Color Television, FM Stereo, and AM Stereo, the proponents of the new technologies received their profits from licensing and transmitter receiver manufacturers to build equipment that incorporates the new technologies. The licensees of Broadcast Stations have not been required to license the technology. The same should be the case here. The Commission should require the proponents of IBOC technology to confer a blanket license on station operators. Given the severe economic constraints that Broadcasters face, the last thing that they need is an IBOC tax. The proponents of IBOC technology will be more than amply compensated through licensing arrangements with transmitter and receiver manufacturers. Finally, considering the vested interest that IBOC proponents have in the adoption of the Joint Parties' proposals, the FCC should give far more weight to the technical studies of parties like NPR, who have no vested interest in the outcome of this proceeding.

III. CONCLUSION

22. To protect the public interest, the Commission should deny the Joint Parties request, and take such other actions as urged herein.

Respectfully submitted.

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