

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Amendment of Section 74.1231(i) of the Commission's Rules on FM Broadcast Booster Stations	)	MB Docket No. 20-401
	)	
Modernization of Media Initiative	)	MB Docket No. 17-105
	)	
Amendment of Section 74.1231(i) of the Commission's Rules on FM Broadcast Booster Stations	)	RM-11854
	)	

**COMMENTS OF THE  
NATIONAL ASSOCIATION OF BROADCASTERS**

**I. INTRODUCTION AND SUMMARY**

The National Association of Broadcasters (NAB)<sup>1</sup> hereby submits comments on the above-captioned Further Notice of Proposed Rulemaking, in which the Commission proposes licensing and service rules to govern the use of FM booster stations to originate programming, pursuant to the Report and Order in this proceeding.<sup>2</sup> The Report and Order approves a proposal submitted by GeoBroadcast Solutions LLC (GBS), which claims to have developed a proprietary technology that can effectively target distinct programming to different “zones” within a radio market using FM boosters (ZoneCasting).<sup>3</sup> NAB continues to

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<sup>1</sup> NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission (Commission or FCC) and other federal agencies, and the courts.

<sup>2</sup> *Amendment of Section 74.1231(i) of the Commission's Rules on FM Broadcast Booster Stations, Modernization of Media Initiative, Amendment of Section 74.1231(i) of the Commission's Rules on FM Broadcast Booster Stations, Report and Order and Further Notice of Proposed Rulemaking, MB Docket Nos. 20-401 and 17-105, and RM-11854 (rel. Apr. 2, 2024) (Report and Order or Further Notice).*

<sup>3</sup> Petition for Rulemaking of GeoBroadcast Solutions LLC, RM-11854 (filed Mar. 13, 2020).

believe that allowing this new use of boosters will facilitate marketplace changes that could disadvantage smaller stations and pave the way for the redlining of advertising.<sup>4</sup> Basic engineering also makes clear that use of program originating boosters is likely harm listeners due to inevitable signal disruption in “transition areas” where a station’s primary signal meets a booster signal that is airing different content.<sup>5</sup> This interference will not only harm the station baited into employing the technology, but also is likely to erode public confidence in FM radio broadcasting generally. Therefore, certain conditions must be imposed on this approach to curb the potential harms the Report and Order may allow.

## **II. THE FCC SHOULD REQUIRE CERTAIN SAFEGUARDS ON THE USE OF PROGRAM ORIGINATING BOOSTERS TO PROTECT LISTENERS**

### **A. Program Origination Notification**

NAB believes that listeners should be able to access a clear FM radio signal regardless of their location within a station’s market, and regardless of a broadcaster’s decision to create zones of service using boosters, even if such a decision is voluntary. Under GBS’s scheme, any static or audio distortion that occurs in the transition areas between geotargeted zones may frustrate listeners, even if it lasts only a few seconds. Thus, NAB submits that stations seeking to originate programming on boosters should be required to design a system that prevents unwanted interference, including voluntary self-interference to the station’s primary signal.

For the same reason, NAB supports the FCC’s proposal to adopt a notification requirement for stations using program originating boosters.<sup>6</sup> In the Report and Order, the

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<sup>4</sup> Reply Comments of National Association of Broadcasters at 5-8, MB Docket Nos. 20-401 and 17-105, and RM-11854 (Mar. 12, 2021) (2021 NAB Reply Comments).

<sup>5</sup> *Id.* at 9-10.

<sup>6</sup> Further Notice at ¶¶ 73-74.

FCC finds that GBS's testing of ZoneCasting shows that "properly engineered program originating boosters can be implemented without causing harmful interference."<sup>7</sup> This is a baffling statement based on the record and GBS's almost laughable testing regime. For example, GBS only examined its system using back-to-back boosters placed at cherry-picked locations next to a highway, and measured interference only to cars traveling at high speeds on small stretches of a highway and only along the most ideal routes.<sup>8</sup> To the best of our knowledge, GBS never evaluated ZoneCasting under real-world conditions; and if it did, it certainly did not submit those results for public review. It is also notable that GBS's testing was not observed by any independent broadcasters, engineers, FCC staff, or representatives of the Federal Emergency Management Agency (FEMA). These are data points that should give an expert agency pause.

In addition, it appears that the FCC may have relied, at least in part, on information that GBS may not have accurately described. In the section of the Report and Order approving GBS's testing and claims concerning interference, the FCC states that, according to GBS, "geo-casting is being used in India," and notes that the record "does not contain any mention of interference experienced by listeners or stations there."<sup>9</sup> NAB submits that the reason the record does not mention any such interference is because, to the best of our knowledge, the use of geo-targeting boosters has not commenced in India. And even if it had, the Commission cannot rely on the fact it knows of no complaints of an allegedly

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<sup>7</sup> Report and Order at ¶ 37.

<sup>8</sup> Comments of the National Association of Broadcasters at 21-22, MB Docket Nos. 20-401 and 17-105, and RM-11854 (June 6, 2022) (2022 NAB Comments). See also Letter from John D. Kennedy, Audacy, et al., to Ms. Marlene H. Dortch, Secretary, FCC, MB Docket Nos. 20-401 and 17-105; RM-11854 (Aug. 31, 2022).

<sup>9</sup> Report and Order at ¶ 51.

related system being employed halfway around the world without doing any research whatsoever. The FCC should direct GBS to correct the record as needed regarding geo-targeting in India. In addition, as the joint comments of leading radio industry engineers explained in detail, GBS jettisoned dozens of data sets from its testing of ZoneCasting that likely indicated unwanted interference, failed to conduct any real-world listener studies, and may have mischaracterized the results of its testing.<sup>10</sup>

Thus, given all the uncertainties that still surround GBS's testing and technical claims, a public notification obligation is essential to allow listeners, stakeholders, and the Commission to track which stations are using ZoneCasting and monitor whether these stations are causing unwanted interference. Such a requirement will also help the Commission track and respond to any complaints that may arise.<sup>11</sup>

More importantly, in the Report and Order, the FCC requires program originating boosters to receive and broadcast all emergency alerts in the same manner as a station's main transmitter.<sup>12</sup> Again, the FCC relied on GBS's testing to find that program originating boosters can be designed to minimize disruptions to emergency alerts.<sup>13</sup> However, this testing was not observed by the Federal Emergency Management Agency (FEMA) or any other independent stakeholders. In addition, there is still no evidence that GBS's mechanism will ensure EAS compatibility under real-world conditions. NAB submits that it is critical that stations provide public notification of their intent to use program originating

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<sup>10</sup> Joint Comments of Audacy, Inc., et al. at 3-8, MB Docket Nos. 20-401 and 17-105; RM-11854 (June 6, 2022).

<sup>11</sup> Further Notice at ¶ 73.

<sup>12</sup> Report and Order at ¶ 53.

<sup>13</sup> *Id.* at ¶ 58.

boosters to allow FEMA, EAS alert originators, and others monitor the geotargeting station for EAS alerts, to watch for problems that could affect public safety.<sup>14</sup>

Finally, the FCC finds in the Report and Order that the use of program originating boosters will advance the public interest by enabling radio stations to seek new sources of revenue while providing audiences with hyper-local content, and could enhance the competitiveness of the overall FM radio industry by expanding the range of available advertising opportunities.<sup>15</sup> However, the supporting record on these questions is unsubstantiated, the vast majority of objective broadcast experts did not agree, and BIA's apparently influential submissions were flimsy even on their face.<sup>16</sup> For example, based on input from veteran radio sales executives, NAB explained that allowing ZoneCasting could enable large stations located in the center of radio markets to win critical local advertising business from smaller stations located in communities near the edge of radio markets.<sup>17</sup> NAB also showed that geotargeting may drive down advertising rates and facilitate the "redlining" of advertising away from less affluent parts of a station's market.<sup>18</sup> A public

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<sup>14</sup> Comments of the Federal Emergency Management Agency at 2, MB Docket Nos. 20-401 and 17-105; RM-11854 (Feb. 10, 2021).

<sup>15</sup> Report and Order at ¶ 21.

<sup>16</sup> The Report and Order states that GBS has supported its proposal with "submissions by sources that are well respected in the industry, such as a study of advertising by BIA Advisory Services." *Id.* at ¶ 16 note 51. The Report and Order repeatedly cites BIA's speculations about the impact ZoneCasting will have on advertising sales and rates, and even notes BIA's agreement with GBS's engineering consultant that ZoneCasting will work "from a technical perspective." *Id.* at ¶¶ 17, 35, and 46. Curiously, however, the Commission did not even bother to acknowledge in the 2018 Quadrennial Review Report and Order any of the "actual" empirical radio and television studies that were prepared by BIA and filed in that record. See, e.g., Comments of National Association of Broadcasters at Attachments A and B, MB Docket No. 18-349 (Apr. 29, 2019).

<sup>17</sup> 2021 NAB Reply Comments at 7.

<sup>18</sup> *Id.* at 8-9.

notification requirement will enable stakeholders to monitor the marketplace for such effects, albeit too late for the FCC to undo any such problems.

## **B. Synchronization**

The Further Notice asks if there should be a requirement that broadcasters synchronize their primary station and booster signals to reduce and eliminate self-interference.<sup>19</sup> As an overriding matter, NAB submits that any new requirements adopted in this context must only apply to boosters that originate programming, and not to traditional boosters that retransmit only the programming of the main channel. In the latter case, stations primarily use boosters to enhance reception of their programming in areas where reception is affected by terrain shielding or distance from the main transmitter.<sup>20</sup> Stations rarely need more than two or three boosters to serve this purpose.<sup>21</sup> These arrangements inherently limit the potential for self-interference.

On the other hand, GBS's approach uncouples the use of FM boosters from their original purpose, and the FCC proposes to allow stations to use up to 25 program originating boosters.<sup>22</sup> As a result, stations seeking to geotarget programming will likely locate multiple boosters to serve areas that lack terrain shielding in order to properly design a ZoneCasting system, dramatically increasing the risk of self-interference. Also, as mentioned above, GBS's testing failed to adequately consider potential transition areas where self-interference is likely to occur,<sup>23</sup> and such transition areas may be located away from the areas being

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<sup>19</sup> Further Notice at ¶ 77.

<sup>20</sup> Report and Order at ¶ 3.

<sup>21</sup> Further Notice at ¶ 66.

<sup>22</sup> *Id.* at ¶ 81.

<sup>23</sup> It is well established that boosters can diminish usable coverage in areas where their signals overlap coverage areas of the main facility. S. Salek, *Analysis of FM Booster System*

targeted by the booster. Increased perceptions of audio disruption due to improperly synchronized program originating boosters will annoy listeners and reduce public confidence in the fidelity of FM radio service.

NAB believes that additional synchronization requirements should apply to situations where program originating boosters are not serving areas shielded by terrain or when more than a certain number of program originating booster stations are proposed (e.g., four). Synchronization involves several methodologies, including carrier frequency, modulation parameters, and program time delay.<sup>24</sup> The carrier frequencies should be locked together using a common reference, such as GPS. Failure to maintain coherence between main and program originating booster carrier frequencies would cause incidental AM modulation or beating, which will manifest as “picket-fence” interference that would frustrate listeners.

Modulation levels, including peak deviation and stereo pilot frequency, should also be identical. Studies show that even a small mismatch in composite baseband modulation levels, such as 0.5 dB, can dramatically increase perceived audio distortion when the signal levels of the booster and main transmitter are similar.<sup>25</sup>

Time alignment of programming, which requires simulcast operation to achieve, will be particularly critical in the transition areas where the main and booster RF signal levels are approximately the same. For the case of simulcasting, rapid degradation in audio distortion occurs when the time misalignment exceeds 1 microsecond. The alignment should be adjusted so that the program material received from the booster and main

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*Configurations*, NAB Broadcast Engineering Conference Proceedings (1992) (Salek Analysis).

<sup>24</sup> Note that program time delay is meaningless in the context of ZoneCasting during periods when the main channel and zoned content are different.

<sup>25</sup> Salek Analysis at Figure 4b

transmitters has no time delay in areas where the booster and main signal levels are within 10 dB.

Another important aspect of synchronization involves system behavior after a “crash” or when the system reboots for some reason. Restarting a system may cause ambiguities. Therefore, NAB submits that stations should be required to ensure and verify proper synchronization after a reboot to make sure the boosters are behaving as designed, with provisions for disabling the booster if they do not.

### **C. Cap on Boosters**

The FCC proposes to limit stations to 25 program originating boosters.<sup>26</sup> GBS reports that it tested ZoneCasting at Station WRBJ-FM with six boosters transmitting the geotargeted content and two booster transmitting the main signal content.<sup>27</sup> On the other hand, LPFM advocates express concerns that allowing the use of a large number of program originating boosters will hinder the availability of frequencies for low power FM stations.<sup>28</sup>

NAB has no idea at this time whether 25 is an appropriate cap on the number of program originating boosters. To a certain extent, NAB believes that the number of boosters used for this purpose will almost certain be self-limiting because the incremental advertising revenues that GBS claims will be created by ZoneCasting are unlikely to justify the costs associated with such boosters (e.g., purchase and installation, tower and site leasing fees, maintenance, power, ZoneCasting licensing fees). In our view, it seems more likely that GBS

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<sup>26</sup> Further Notice at ¶ 81.

<sup>27</sup> Roberson and Associates, *WRBJ Demonstration system – Geo-targeted FM Broadcast Technical Report*, (Mar. 30, 2022), at 4. This raises the question of whether the two main signal boosters in this example will count towards whatever booster cap the FCC imposes. NAB requests that the FCC clarify this point.

<sup>28</sup> Comments of REC Networks, MB Docket Nos. 20-401 and 17-105; RM-11854 (June 6, 2022).



may have to bear some of the expenses to persuade stations to deploy ZoneCasting, and early indications are that GBS is already seeking to pay stations to use its system.

#### **D. Licensing Issues**

During periods when a station's main channel and geotargeting boosters are broadcasting the same content, it is unclear if the boosters are simulcasting that programming or are simply turned off. NAB queries if some ZoneCasting designs will require the former and others the latter. We submit that the FCC should require stations seeking to use geotargeting boosters to disclose their system plans in this context because the chosen approach will bear upon the potential interference expected at the boundaries during simulcasting, and in particular, during the broadcast of EAS messages.

NAB supports the Commission's proposal to make explicit the requirement that booster stations suspend operations any time their primary stations are not broadcasting and to file notices of suspended operations.<sup>29</sup> NAB asks the Commission to clarify that suspension of geotargeted programming should take place immediately upon cessation of the primary signal.

### **III. CONCLUSION**

For the reasons stated above, NAB respectfully requests that the Commission impose

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<sup>29</sup> Further Notice at ¶ 80.

certain safeguards to ensure that the use of program originating FM boosters does not cause unwanted interference or otherwise harm listeners or radio broadcasters.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rick Kaplan".

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