

In the Matter of)
)
Modifying Rules for FM Terrestrial Digital Audio) MB Docket No. 22-405
Broadcasting Systems)

Released: September 25, 2024

2. In a 2022 Public Notice, the Media Bureau (Bureau) consolidated into one rulemaking proceeding two separate Petitions for Rulemaking, both proposing changes to the rules that the petitioners urged would improve digital FM signal quality and minimize the effect of the digital FM station signal on adjacent channel FM transmissions.³ In the first petition, filed December 9, 2019, petitioners National Association of Broadcasters (NAB), Xperi Corporation (Xperi), and National Public Radio (NPR) (collectively Asymmetric Petitioners), requested blanket authorization to set digital power at different levels on each digital sideband, thus allowing a digital FM station to protect, for example, an analog FM station on a lower first-adjacent channel, while enabling an increase in digital power on the upper sideband where there is no adjacent analog FM station or a more distant adjacent station.⁴ In the second petition, filed October 26, 2022, NAB and Xperi requested that the FCC update the methodology stations use to determine maximum FM digital power levels.⁵ In the *NPRM*, the Commission granted these

⁵ Petition for Rulemaking of Nat’l Ass’n of Broad. and Xperi Inc., MB Docket No. 22-405 (filed Oct. 26, 2022), <https://www.fcc.gov/ecfs/document/10261669202264/1> (Power Methodology Petition). On Feb. 21, 2024, the Media Bureau released a Public Notice announcing the Feb. 2, 2024, filing of a “Petition for Rulemaking

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petitions and sought comment on whether the rule changes proposed by the petitioners would serve the public interest, by providing FM digital stations with the ability to increase power and, concomitantly, increase coverage area, building penetration, and provide a more robust digital signal. The Commission additionally sought comment on: whether such rule changes would cause or increase interference to analog FM stations adjacent to a digital FM station; whether the proposed rule changes would have other adverse effects on incumbent FM stations; whether and to whom notice of increased digital FM power should be provided; and whether additional interference remediation procedures should be introduced.⁶

3. Broadcasters, engineers, and listeners filed comments and reply comments in response to the *NPRM*. Additionally, commenters such as the Aerospace Industries Association; Air Line Pilots Association, International; Garmin International, Inc.; and the General Aviation Manufacturers Association filed comments expressing concern about higher digital power levels at the upper end of the FM broadcast band causing interference to users in the adjacent Aeronautical Radio Navigation Spectrum (ARNS), from 108.0 – 117.95 MHz.⁷ The commenters state that preliminary industry studies suggest that further testing is needed; to that end, aviation industry commenters are working with NAB and Xperi, but state that comprehensive testing will take additional time.⁸ Accordingly, in the interest of a complete record, we defer action on the proposal relating to maximum FM digital power levels, and act only on the proposals relating to the Asymmetric Sideband Petition at this time, with appropriate safeguards for stations on Channels 296 - 300.

II. BACKGROUND

4. The FM digital radio system inserts redundant digital sidebands above and below a station's existing analog signal. The Commission's existing rules assume that digital power is the same on both digital sidebands, i.e., symmetric sideband operation.⁹ Currently, an FM station that wishes to employ asymmetric sideband operation, using different power on each digital sideband, must apply for an experimental authorization and renew that authorization annually.¹⁰ NAB, Xperi, and NPR, in the

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_____ Addendum–Request for Clarification” by NAB and Xperi. See *Media Bureau Announces Filing of Petition for Clarification Concerning FM Digital Power NPRM and Opportunity for Supplemental Comments*, Public Notice, DA 24-154 (MB rel. Feb. 21, 2024) (*Clarification PN*). NAB and Xperi sought to clarify what they termed an ambiguity regarding the maximum proposed FM digital power levels, taking into account all digital transmission modes. The time period for filing comments and reply comments on the *Clarification PN* closed on April 15, 2024. See *Comment and Reply Comment Dates Set for Supplemental Comments*, Public Notice, DA 24-187 (MB rel. Feb. 29, 2024). Because the *Clarification PN* is concerned with digital power levels rather than asymmetric sideband operation, we do not address the issues raised in the *Clarification PN* in this order.

⁶ See, e.g., *NPRM*, 38 FCC Rcd at 7159, para. 2.

⁷ See, e.g., Comments of Gen'l Aviation Mfrs. Ass'n (GAMA September Comments) at 2 and Attachment A; Comments of Aerospace Indus. Ass'n (AIA September Comments) at 2. See also Letter from First Officer Chris Sidor, Air Line Pilots Ass'n, Int'l, et al., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 22-405, at 3 (filed Sept. 19, 2024).

⁸ Supplemental Comments of Air Line Pilots Ass'n, Int'l; Airlines for America; Aviation Spectrum Res., Inc.; The Boeing Co.; Garmin; and GAMA, filed Apr. 1, 2024, at 2-4. See also Letter from First Officer Chris Sidor, Air Line Pilots Ass'n, Int'l, et al., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 22-405, at 3 (filed Sept. 19, 2024) (providing testing updates); Letter from Ashruf El-Dinary, Xperi Inc., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 22-405 (filed Sept. 23, 2024).

⁹ See *Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service*, Order, 25 FCC Rcd 1182, 1190, para. 20 (MB 2010) (*2010 MB DAB Order*) (setting forth methodology for calculating maximum permissible FM Digital ERP that assumes operation with symmetric sidebands, pursuant to delegated authority).

¹⁰ The request for experimental authorization must include a showing that the digital sideband signal contours will not overlap adjacent stations' protected contours.

Asymmetric Sideband Petition, assert that with asymmetric sidebands a digital FM station can limit the power of one digital sideband to protect the adjacent analog FM station on that side while concurrently increasing the power of the other sideband in order to expand its overall digital coverage and improve its building penetration.¹¹ The Asymmetric Petitioners conducted a study that they state demonstrates that many more digital FM stations could increase power on at least one sideband above the current limit of -14 dBc.¹² Out of 10,875 digital FM stations studied, petitioners contend that 6,120 could increase power on both sidebands to -10 dBc under the current rules,¹³ whereas if asymmetric sidebands were allowed, an additional 3,496 stations could increase one sideband to -10 dBc, with another 532 being able to increase one sideband's power to between -14 and -10 dBc.¹⁴ Asymmetric Petitioners also argue that the need to request experimental authorization, and the temporary nature of such authorizations, discourages use of asymmetric sidebands,¹⁵ which in turn limits digital FM stations to the power level needed to protect the adjacent-channel analog FM station that is most susceptible to digital interference.¹⁶ The Asymmetric Petitioners thus request that we amend our rules to allow FM stations to operate with asymmetric digital sidebands, without having to request experimental authorization to do so, in order to remove unnecessary regulatory barriers and promote broader adoption of terrestrial digital FM broadcasting.¹⁷

III. DISCUSSION

5. We conclude that the record contains considerable support for asymmetric sideband operation, and thus we adopt the relevant proposals set forth in the *NPRM*, with some modifications to the rules that were proposed.¹⁸ We therefore authorize digital FM stations, except stations operating on Channels 296 - 300,¹⁹ to originate digital transmissions at different power levels on the upper and lower digital sidebands without having to request experimental authorization, consistent with the requirements set forth herein. As further discussed below, a digital FM station need only notify us of asymmetric sideband operation by filing notification on Form 2100, Schedule 335-FM – FM Digital Notification (Schedule 335-FM) in the Bureau's Licensing and Management System (LMS) database.

6. *Asymmetric Sideband Operation Authorization.* We agree with the commenters and find that asymmetric sidebands will promote the adoption of digital radio without increasing the risk of interference to existing analog broadcasts. Those commenters that addressed this proposal generally support it. Some express approval of the proposal as being an affirmative step toward broader adoption of

¹¹ Asymmetric Sideband Petition at 8-9. Similarly, a station could reduce power on the sideband causing interference to another station and maintain the desired power level on the other digital sideband. See *NPRM*, 38 FCC Rcd at 7169, para. 26.

¹² Pursuant to the *2010 MB DAB Order*, most FM stations are allowed to operate with digital power up to -14 dBc without the need for additional authorization. See *2010 MB DAB Order*, 25 FCC Rcd at 1189, para. 16.

¹³ Pursuant to the *2010 MB DAB Order*, certain FM stations also are allowed to increase digital power above -14 dBc, to up to -10 dBc, upon a showing that such power increase would comply with the formula in the *Order*, and therefore would not cause harmful interference to adjacent-channel analog FM stations. See *2010 MB DAB Order*, 25 FCC Rcd at 1189-90, paras. 16-20.

¹⁴ Asymmetric Sideband Petition at 9-11. Petitioners' study was conducted in 2017.

¹⁵ *Id.* at 11.

¹⁶ *Id.* at 8-10.

¹⁷ *Id.* at 8-11.

¹⁸ In addition, as proposed in the *NPRM*, 38 FCC Rcd 7158, n.65, to conform to the publishing conventions of the National Archives and Records Administration's Office of the Federal Register, we add paragraph numbers to the list of definitions in 47 CFR §§ 73.310(a) and (b). See Appendix B. The definitions restated in Appendix B are identical to the current definitions.

¹⁹ See *infra* note 26.

digital radio,²⁰ with some specifically stating that eliminating the need for prior experimental authorization will encourage more stations to adopt FM digital operation.²¹ Many commenters opine that asymmetric operation will reduce interference to adjacent-channel analog FM stations, with some offering anecdotal or experimental evidence to support these claims.²² For example, three of the joint NCE commenters report that they have operated for several years under experimental asymmetric sideband operation authority, “without any interference issues at all,” and further that the University of Central Florida’s WUCF-FM, after five years of such operation, commissioned a study as part of its license renewal showing “significant HD reception benefits to the public from its asymmetrical sideband operations.”²³ Our current policy requiring the same power on both the upper and lower digital sidebands limits an FM station’s digital power to that needed to protect the adjacent-channel analog FM station most susceptible to interference, regardless of whether there is a need to limit power on the other sideband.²⁴ Asymmetric Petitioners contend, and commenters agree, that allowing calculation of the maximum allowable digital FM power on a per-sideband basis allows such stations to optimize their digital signal coverage while still protecting analog FM stations on adjacent channels.²⁵ We agree and, based on the record presented, we find that it is in the public interest to allow asymmetric sideband operation, except on Channels 296 - 300, without the need for an experimental authorization.²⁶

²⁰ See, e.g., Comments of CMG Media Corp. (CMG September Comments) at 2-3; Comments of Nat’l Pub. Radio (NPR September Comments) at 2-3; Comments of Press Commc’ns, LLC (Press September Comments) at 2 (favoring asymmetric operation if it is used to protect Class A FM stations from new or additional digital interference); Comments of N.Y. Public Radio (NYPR September Comments) at 4 (only filing Form 2100 Schedule 335-FM should be required to implement asymmetric sideband operation).

²¹ Comments of Xperi, Inc. and Nat’l Ass’n of Broad. (Xperi/NAB September Comments) at 7-8; Comments of Audacy, Inc., Beasley Media Group, LLC, Connecticut Public Broad., Inc., Davis Broad. of Atlanta, L.L.C., Davis Broad., Inc., of Columbus, Galaxy Syracuse Licensee LLC, Galaxy Utica Licensee LLC, and Spanish Broad. System, Inc. (Commercial Broadcasters Joint September Comments) at 7-8. See also Comments of Educational Media Found. (EMF September Comments) at 7 (not requiring prior authorization for asymmetric sideband operation removes a barrier to entry keeping stations from implementing FM digital operations).

²² See, e.g., Com. Broad. Joint September Comments at 4-6; Comments of Ariz. Bd. of Regents for Benefit of Univ. of Ariz., Bd. of Regents of the Univ. of Wis. Sys., Elkhart Cmty. Schools, Fla. Gulf Coast University, Ga. Public Telecommunications Comm’n, The Ohio State Univ., State of Wis. Educ. Commc’ns Bd., Univ. of Central Fla., and Univ. of North Tex. (NCE Broadcasters Joint September Comments) at 3; Reply of National Ass’n of Broad. (NAB October Reply) at 17-18; Comments of REC Networks (REC September Comments) at 12. See also Reply of Goldman Engineering Mgmt. (GEM Reply) at 3 (agreeing that all stations should be allowed to use asymmetric sideband operation on a notification basis if they are otherwise unable to reduce interference to other stations). We note that we have not received any interference complaints during the many years of granting experimental authorizations to stations employing asymmetric sideband operation.

²³ NCE Broadcasters Joint September Comments at 3.

²⁴ Asymmetric Sideband Petition at 9. See *supra* note 11.

²⁵ *Id.* at 8-9.

²⁶ See Letter from First Officer Chris Sidor, Air Line Pilots Ass’n, Int’l, *et al.*, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 22-405, at 3 (filed Sept. 19, 2024). In this *ex parte* letter, aviation industry commenters not only request that we expand to four channels the FM broadcast station frequencies required to request experimental authorization for asymmetric sideband operation, but also continue to express concerns regarding the effect the new digital power increase methodology could have on ARNS users. *Id.* at 3-5. Xperi filed a Response to this *ex parte* letter on September 23, 2024. Letter from Ashruf El-Dinary, Xperi Inc., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 22-405 (Xperi Response). In the Xperi Response, Xperi supports the aviation industry commenters’ suggestion to temporarily expand the channels for which the use of asymmetric sideband power is not authorized by default to include channels 296 through 300, “because it is important to provide a streamlined path for as many stations as possible to utilize asymmetric sideband power...” Xperi Response at 1-2. Because the aviation industry commenters are working with Xperi and NAB to determine what, if any, effect the *NPRM* proposals concerning the
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7. *Notice.* We further find that allowing a digital FM station to report its asymmetric sideband operation through a simple notification removes a regulatory barrier, compared to the current procedure of applying for an experimental license to operate asymmetrically, and having to file for annual renewals of that authorization. At the same time, we believe it is important for the Commission to track asymmetric operation in order to address any potential interference problems that may arise and to allow stations to identify if their adjacent-channel stations are using asymmetric sidebands. We find that a simple notification should provide the correct balance between our desire to streamline the regulatory burden on stations adopting asymmetric operations and our need to be able to identify stations employing this functionality.²⁷ We also note this is consistent with the approach we take for initial authorization of digital broadcasting. FM broadcast licensees have never needed to file a separate application for authorization to initiate hybrid digital operation; all that has been required is notification to the Commission.²⁸ We find the public interest would be similarly served by declining to require a separate application to initiate asymmetric sideband operation and allow stations to commence asymmetric sideband operation based on a simple notification.

8. To provide notification to the Commission, stations choosing asymmetric sideband operation will be required to file a revised Schedule 335-FM. The filing of Schedule 335-FM with the Commission does not trigger the release of a separate Public Notice in LMS, but like all LMS forms is searchable and thus available to members of the public using the LMS “Search” function.²⁹ We conclude this approach will provide the public with real time information on which stations have adopted asymmetric operations.³⁰

9. Some commenters seek further modification to the proposal regarding notice of asymmetric band operation. Cumulus advocates for the Commission to “maintain a readily accessible record of information” on every station increasing power, suggesting that this would include stations employing asymmetric sideband operation.³¹ It argues that listeners may find it difficult to identify digital-to-analog FM interference, and that such a public record of stations altering their digital power

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formula for determining maximum digital power could have on users in the ARNS, and given Xperi’s lack of objection, we will continue to require experimental authorization for any digital FM radio station seeking asymmetric sideband operation on Channels 296 - 300 (107.1 - 107.9 MHz). This will impact relatively few digital FM stations, and will ensure there is no change to the current relationship between digital operations on the upper four channels of the FM broadcast band and aeronautical users at 108 MHz and above. Based on any additional information we receive from the aviation industry, Xperi, and NAB concerning their investigations into the impact of digital radio operation on users in the ARNS, we may reconsider this requirement at a future date.

²⁷ Our need to track stations employing asymmetric sideband operation includes identifying those stations that discontinue such operation. We therefore similarly require that stations permanently terminating asymmetric sideband operation notify the Commission of such termination on Schedule 335-FM. *See infra* para. 13; Appendix B.

²⁸ 47 CFR § 73.406. *See also Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service*, First Report and Order, 17 FCC Rcd 19990, 20005-06, paras. 42-43 (2002) (*DAB R&O*).

²⁹ <https://enterpriseefiling.fcc.gov/dataentry/public/tv/publicSearchLanding.html>.

³⁰ The majority of comments on this “notice” issue was linked to the Power Methodology Petition, thus we defer consideration of those comments until the time we address the issue of digital power levels. *See supra* note 5. Given that asymmetric sideband operation will primarily be used to reduce power in the direction of the susceptible adjacent-channel analog FM station, increasing power only in the direction of the other analog station(s), we do not find any need for enhanced notice procedures at this time. *NPRM*, 38 FCC Rcd at 7171, para. 29 (“We observe that asymmetric sideband operation *per se* should not cause an increase in interference or complaints thereof, as stations employing such operation are already protecting the closer of the adjacent stations to their sideband frequencies, and the only power increases should be toward adjacent channel stations that are more distant, either physically or by frequency”).

³¹ Comments of Cumulus Media, Inc. (Cumulus September Comments) at 5-6.

profile would assist in identifying interfering stations.³² Similarly, iHeartCommunications, Inc. (IHC) believes that Schedule 335-FM should be modified to allow the notifying station to provide the effective radiated power (ERP) of the digital signal on both the upper and lower digital sidebands, as well as the total digital ERP.³³ However, IHC disagrees with the *NPRM*'s proposal to modify section 73.406(d)(7)-(8) of our rules to require licensees to file Schedule 335-FM with a short statement of the reason(s) for discontinuing digital operation, including a return to symmetric sideband operation from asymmetric operation.³⁴ It believes that specifying a reason is unnecessary because such operations "are not mandatory, are a voluntary business choice of the individual station, and the decision may be competitively sensitive."³⁵

10. We concur with commenter IHC that Schedule 335-FM should be modified to require a party giving notification of asymmetric sideband operation to indicate the digital ERP on both upper and lower digital sidebands, as well as the total digital ERP. We believe that requiring these data to be included in Schedule 335-FM should suffice to advise broadcasters and the public, through LMS, about digital operations. Thus, we find it unnecessary to adopt Cumulus's suggestion that we implement a separate database of FM stations broadcasting in hybrid digital mode and the per-sideband digital power of such stations.³⁶ We concur with IHC's objection to the proposed requirement of providing a reason for discontinuation, and agree it is unnecessary given the voluntary nature of asymmetric sideband operation. We thus adopt the tentative conclusion that Schedule 335-FM notification should be required for any digital FM station that reverts to symmetric sideband operation from asymmetric sideband operation, but will not adopt the proposal to require any such notification of return to symmetric sideband operation to be accompanied by a short statement of the reason(s) for this action.

11. *Reporting on Schedule 335-FM.* After the effective date of the rules adopted in this *First R&O*, licensees will be required to use Schedule 335-FM to provide notice to the Commission. This will serve as a replacement for many of the current requests for experimental authorization and informal requests. As noted above, licensees will be required to use Schedule 335-FM to notify the Commission of the commencement or discontinuance of asymmetric sideband operation as a replacement for requests for experimental authorization. A station adopting asymmetric sideband operation must notify the Commission upon commencement of such operation by filing Schedule 335-FM. We direct the Bureau to inform the digital FM station within 30 days of filing Schedule 335-FM if its asymmetric sideband operation is non-rule compliant. The station may commence asymmetric sideband operation upon submitting Schedule 335-FM and may continue such operation unless it receives notice of noncompliance during that 30-day period. Similarly, a digital FM station must notify the Bureau on Schedule 335-FM within 30 days of discontinuing asymmetric sideband operation.

³² *Id.* at 4-5.

³³ Comments of iHeartCommc'ns, Inc. (IHC September Comments) at 12.

³⁴ *Id.* It is not entirely clear whether IHC seeks to eliminate this language with regard to both a reduction in digital power and a return to symmetric from asymmetric sideband operation, or merely the former scenario. Because IHC characterizes its suggestion as a modification to Form 2100 Schedule 335-FM, which is used for both types of notification scenarios, we interpret this as a request to remove the explanatory language with regard to both types of operational change, i.e., from both proposed paragraphs (d)(7) and (d)(8).

³⁵ IHC September Comments at 12.

³⁶ REC identifies what it characterizes as "substantial shortcomings" in the LMS data, including the lack of a data field identifying stations operating in hybrid digital mode. REC September Comments at 13. Further, CTI, in its Reply, expresses concern regarding the accessibility of Schedule 335-FM data in LMS, and suggests that we require each station to upload any Schedule 335-FM filings to its Online Public Inspection File (OPIF). CTI Reply at 2. See also IHC Reply at 11-13 (encouraging "the development of, and to fortify the accessibility to, user-friendly tools for [the Bureau's] databases," and specifically requesting that we "implement a readily accessible, centralized record containing information on stations that have increased digital power under the revised rules."). We recognize the concerns raised by these comments, but find them to be beyond the scope of the current proceeding.

12. We also make an administrative change to the procedures used by licensees seeking to increase digital power above -14 dBc. Those requests, previously submitted by informal request, will be submitted using Schedule 335-FM.³⁷ This minor administrative change will help streamline processing of these requests and will further the Commission's efforts to transition all broadcast filings to the Bureau's Licensing and Management System (LMS).

13. The *2010 MB DAB Order* increased the allowable total power level of an FM station's digital sidebands from the previous maximum of -20 dBc to -14 dBc.³⁸ The same order allowed FM stations, except for grandfathered superpowered stations, to seek additional authorization to increase total digital power above -14 dBc, up to -10 dBc, through an informal request including a showing that such power increase would comply with the formula set forth in the *2010 MB DAB Order*, and therefore would not cause harmful interference to adjacent analog FM stations.³⁹ As noted, in this *First R&O* we are not revising the formula that determines the maximum permissible digital power a station may use. However, for purposes of administrative efficiency, we modify the current informal process used to request an increase in total digital power above -14 dBc. After the effective date of the rules adopted in this *First R&O*, digital FM stations must use Schedule 335-FM to request an increase in total digital ERP above -14 dBc, using Table 1 to § 73.404(f) adopted herein,⁴⁰ and will also report certain digital power decreases on Schedule 335-FM.⁴¹ After the effective date of this order, a digital FM station will report the following actions (or request authority in the case of an increase of total digital ERP above -14 dBc) by submitting

³⁷ The *2010 MB DAB Order* states that "we will require a licensee to submit an application to the Bureau, in the form of an informal request, for any increase in FM Digital ERP" beyond -14 dBc. *2010 MB DAB Order*, 25 FCC Rcd at 1189, para. 19. This informal request typically comes in the form of a letter to the Commission.

³⁸ *2010 MB DAB Order*, 25 FCC Rcd at 1189, para. 16. The -14 dBc power level is for both FM digital sidebands combined; when both sidebands are operating at the same power level, each sideband would operate at -17 dBc, or 3 dB lower than the combined symmetrical digital sideband power, representing one-half of the total allowed digital ERP for each sideband.

³⁹ *Id.* at 1182, 1189-90, paras 16-20. See also 47 CFR §73.404(a). The showing required to obtain FM digital power of between -14 dBc and -10 dBc included the calculation results using the following formula: Allowable FM digital power = $[2.27 * (60 - (\text{FM digital station } F(50,10) \text{ dB}\mu)) - 33.6]$. Thus, a licensee desiring FM digital ERP in excess of -14 dBc total power is required to calculate the digital station's analog $F(50,10)$ field strength at all points on the protected 60 dB μ $F(50,50)$ contour of a potentially affected first-adjacent-channel analog FM station. This calculation must be performed using each station's licensed analog facilities and the standard FCC contour prediction methodology. *2010 MB DAB Order*, 25 FCC Rcd at 1187, 1190, paras. 12, 20.

⁴⁰ See *infra* para. 15. Table 1 is based on the table set forth in the *2010 MB DAB Order*, 25 FCC Rcd at 1190, para. 20, adapted for use on a per-sideband basis. Certifications of compliance with Table 1 to new 47 CFR § 73.404(f) must be based on the most restrictive analog field strength of the proponent at any nearby first-adjacent-channel station's 60 dB μ contour. See *2010 MB DAB Order*, 25 FCC Rcd at 1190, para. 20. Although the Table has been modified, the information submitted by the station is the same as it is currently.

⁴¹ As discussed in paragraphs 12-13 herein, licensees will use Schedule 335-FM to provide the Commission with all notifications relating to digital operations. As part of that notification, an FM station initiating operation with total digital power in excess of -14 dBc will also be required to certify that the proposed FM digital power is permitted for each digital sideband. Licensees must use the table set forth in revised section 73.404(f) of our rules, 47 CFR § 73.404(f), which we also adopt herein. See *infra* paragraph 15; Appendix B. Licensees will provide this new per-sideband certification on Schedule 335-FM in addition to the certification that it intends to operate with total digital ERP between -14 dBc and -10 dBc. See paragraph 13. The licensee shall also attach to Schedule 335-FM an exhibit, which must include a plot of the relevant most restrictive interfering contour(s) of the digital station and the protected contour(s) of the most restrictive upper/lower first-adjacent-channel station(s).

Schedule 335-FM:⁴² the initiation of hybrid digital operation; the initiation of asymmetric sideband operation at any power level, as well as the discontinuance of asymmetric sideband operation; an increase of total digital ERP above -14 dBc; or a decrease in total digital ERP from a level above -14 dBc to a level at or below -14 dBc.⁴³ A station choosing to operate with total digital ERP between -14 dBc and -10 dBc must still attach to its Schedule 335-FM submission an exhibit demonstrating that the proposed FM digital ERP is permitted for each digital sideband,⁴⁴ using Table 1 to § 73.404(f), adopted herein.⁴⁵ As is the case with the current informal request process, a digital FM station choosing to operate with total digital ERP above -14 dBc may initiate such operation upon approval from the Commission.

14. *Changes to “per-sideband” table.* Although proponents/commenters Xperi and NAB support the Asymmetric Sideband Petition they co-authored with NPR, they have identified shortcomings in the tables presented in the *NPRM* to determine the maximum allowable ERP of each digital sideband. Xperi and NAB point out that total sideband power is necessarily calculated on a per-sideband basis, computing lower and upper digital sideband power by calculating the field strength of the digital FM station’s F(50, 10) contour at its overlap with the 60 dBμ F(50, 50) contour of, respectively, the lower and upper first-adjacent analog stations. The proponents contend that the tables in paragraphs 9 and 26 of the *NPRM* are mis-labeled and thus are incorrect, as are their counterparts in Appendix A to the *NPRM*, the then-proposed new tables to section 73.404, paragraphs (e) and (f).⁴⁶ In their comments, they submitted corrected tables as well as corrections to the proposed rule change to section 73.404.⁴⁷

15. We agree with Xperi and NAB to the extent that the column headings of the Tables in the *NPRM* were mis-labeled, and further agree that the maximum permissible FM digital ERP is better displayed on a per-sideband basis, as the combination of the sideband ERPs adds up to the full digital ERP. The Asymmetric Petitioners proposed a per-sideband table, but their proposed table was calculated based upon adoption of the proposals in the *NPRM* to update the methodology used to determine maximum FM digital power. As no commenters objected to the use of a per-sideband table, and as we are not adopting at this time the proposals to update the methodology for determining FM digital power levels, we have modified and adopted Xperi and NAB’s corrected “Maximum permissible FM digital ERP per-sideband” table to comport with the current limits on FM digital ERP, as follows:⁴⁸

⁴² While recognizing that this is not specifically within the scope of this proceeding, REC expresses a belief in the need to “implement a readily accessible, centralized record containing information on stations that have increased digital power under the revised rules.” REC September Comments at 14 n.27. *See also supra* note 36. While acknowledging REC’s and other commenters’ desire for accurate station data, we agree with REC that such an undertaking is beyond the scope of the current proceeding.

⁴³ In other words, an FM digital station not currently operating with total digital ERP above -14 dBc need not report further digital power reductions.

⁴⁴ 2010 MB DAB Order, 25 FCC Rcd at 1190, para. 20.

⁴⁵ *See infra*, Appendix B.

⁴⁶ Xperi/NAB September Comments at Appendix 1, 1-5.

⁴⁷ *Id.* at Appendix 1, 2-5.

⁴⁸ *See also infra* Appendix B. The proposed modification to section 73.404(f) in the *NPRM* also noted the need for an adjustment to account for the difference between asymmetric and symmetric operation. *NPRM*, 38 FCC Rcd at 7169, para. 26. Because our final rules only reflect power for each sideband, no adjustment is needed.

IBOC Station's F(50,10) Field Strength at the Upper or Lower First-Adjacent Station's Analog 60 dBμ F(50,50) Contour	Maximum Permissible FM Digital ERP for the Respective (Upper or Lower) Sideband
51.2 dBμ and above	-17 dBc
50.7 dBμ to 51.1 dBμ	-16 dBc
50.3 dBμ to 50.6 dBμ	-15 dBc
49.6 dBμ to 50.2 dBμ	-14 dBc
49.5 dBμ or less	-13 dBc

If, in a subsequent Order, we modify the formula used to determine the maximum permissible digital power level, we will adjust this table at that time.

16. *Interference Mitigation and Remediation.* We find that the interference mitigation and remediation procedures set forth in the *2010 MB DAB Order* are sufficient to remedy any reports of inter-station interference as a result of asymmetric sideband operation, given that reduction of power on one sideband necessarily reduces the potential for interference and therefore makes such interference less likely. As before, we reserve further consideration of modified interference mitigation and remediation procedures in the FM digital power increase context.⁴⁹

17. *Pending Proceedings.* We adopt the proposal that any licensees with asymmetric sideband operation under experimental authorizations that are compliant with the rules adopted in this *First R&O* may file Schedule 335-FM notification at any time after the effective date of the rules adopted in this *First R&O* and before the existing experimental authority expires.⁵⁰ EMF agrees, asserting that permitting such stations to transition to asymmetric sideband operation by filing Schedule 335-FM notification represents an efficient use of both broadcasters' and the Commission's resources, and is in the public interest as it would incentivize the rapid deployment of HD Radio.⁵¹ No commenter opposes this proposal. However, there appears to be no reason to limit FM digital stations under experimental authorization to a 30-day window in which to transition to asymmetric sideband operation. Therefore, after the rules adopted in this *First R&O* take effect and the changes to Schedule 335-FM are approved by the Office of Management and Budget and there is an announcement of such approval published in the *Federal Register*, any station currently employing asymmetric sideband operation under experimental authorization that is compliant with the rules adopted in this *First R&O* may transition to non-experimental asymmetric sideband operation by notifying the Commission through Schedule 335-FM at any time prior to expiration of the experimental authorization. Although we do not require that stations currently operating with power greater than -14 dBc under existing special temporary authorization file Schedule 335-FM, we encourage such stations to update their records in LMS using Schedule 335-FM in order that their sideband power levels are properly reflected in LMS. Any station seeking a power increase above -14 dBc in the future must request authority to do so using Schedule 335-FM.

18. *Digital Equity and Inclusion.* As part of the Commission's continuing effort to advance digital equity for all,⁵² including people of color, persons with disabilities, persons who live in rural or

⁴⁹ We acknowledge that several commenters raise interference concerns in the power increase context. *See, e.g.,* Santiam Comm. Radio Corp. Comments at 1; GEM Reply at 3-4; Cumulus September Comments at 4-5. We anticipate addressing such concerns in a future *Report and Order* in this proceeding.

⁵⁰ *NPRM*, 38 FCC Red at 7171, para. 30.

⁵¹ EMF September Comments at 8.

⁵² Section 1 of the Communications Act of 1934 as amended provides that the FCC "regulat[es] interstate and foreign commerce in communication by wire and radio so as to make [such service] available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex." 47 U.S.C. § 151.

Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality, the *NPRM* invited comment on any equity-related considerations⁵³ and benefits (if any) that may be associated with the proposals and issues discussed herein. Specifically, the Commission sought comment on how the proposals may promote or inhibit advances in diversity, equity, inclusion, and accessibility, as well the scope of the Commission's relevant legal authority.⁵⁴

19. Commenter IHC provides a listing of programming aimed at underserved and minority audiences that is broadcast over digital channels, including programming for audiences in Spanish and Hmong.⁵⁵ It states that its experience “has proven that FM Digital has expanded the opportunities for free, over-the-air programming for diverse and inclusive communities,” and that the more streamlined and robust FM digital programming becomes, “the more broadcasters will invest in FM Digital, and the greater will be the opportunities for service to, and by, diverse and inclusive communities.”⁵⁶ Likewise, commenter NYPR lists programming designed to serve underserved communities, some of which is digital-only, and states that adoption of the *NPRM* proposals will help to bring such programs to larger audiences.⁵⁷

IV. PROCEDURAL MATTERS

20. *Regulatory Flexibility Act.* The Regulatory Flexibility Act of 1980, as amended (RFA),⁵⁸ requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”⁵⁹ Accordingly, we have prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in this *First R&O*. The FRFA is set forth in Appendix C.

21. *Final Paperwork Reduction Act of 1995 Analysis.* This *First R&O* may contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA).⁶⁰ All such new or modified information collections will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA.⁶¹ OMB, the general public, and other Federal agencies are invited to comment on any new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief

⁵³ The term “equity” is used here consistent with Executive Order 13985 as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. See Exec. Order No. 13985, 86 Fed. Reg. 7009, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (January 20, 2021).

⁵⁴ *NPRM*, 38 FCC Rcd at 7171-72, para. 31.

⁵⁵ IHC September Comments at 12-14 and Attachment A.

⁵⁶ *Id.* at 14.

⁵⁷ NYPR September Comments at 4-5 and Attachments 1-2.

⁵⁸ 5 U.S.C. §§ 601–612. The RFA has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

⁵⁹ 5 U.S.C. § 605(b).

⁶⁰ Pub. L. No. 104-13, 109 Stat 163 (1995) (codified at 44 U.S.C. §§ 3501-3520).

⁶¹ 44 U.S.C. § 3507(d).

Act of 2002,⁶² the Commission previously sought specific comment on how it might further reduce the information collection burden for small business concerns with fewer than 25 employees. In Appendix C, we have assessed the effects of the required collection of information on these small entities.

22. *Congressional Review Act.* The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs, that this rule is non-major under the Congressional Review Act, 5 U.S.C. § 804(2). The Commission will send a copy of this *First R&O* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A).

23. *People with Disabilities.* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

24. *Additional Information.* For additional information on this proceeding, contact Thomas Nessinger, Media Bureau, Audio Division, at (202) 418-2709 or Thomas.Nessinger@fcc.gov; or James Bradshaw, Media Bureau, Audio Division, at (202) 418-2739 or James.Bradshaw@fcc.gov.

V. ORDERING CLAUSES

25. Accordingly, **IT IS ORDERED** that, pursuant to the authority contained in sections 1, 4(i), 4(j), 301, 302a, 303, 307, 308, 309, 316, 319, and 324 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 301, 302a, 303, 307, 308, 309, 316, 319, and 324 the foregoing *First Report and Order* **IS ADOPTED**, and the Commission's rules are hereby **AMENDED** as set forth in Appendix B.

26. **IT IS FURTHER ORDERED** that the *First Report and Order* and the amendments to the Commission's rules **SHALL BE EFFECTIVE** 30 days after publication of a summary in the Federal Register, except that the amendments to sections 73.404 and 73.406, which may contain new or modified information collection requirements, will not become effective until OMB completes review of any information collection requirements that the Media Bureau determines is required under the Paperwork Reduction Act. The Commission directs the Media Bureau to announce the effective date of the rule changes to sections 73.404 and 73.406 by subsequent Public Notice.

27. **IT IS FURTHER ORDERED** that the Office of the Managing Director, Performance and Program Management, **SHALL SEND** a copy of the *First Report and Order* in a report to Congress and the Government Accountability Office pursuant to the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A).

28. **IT IS FURTHER ORDERED** that the Commission's Office of the Secretary **SHALL SEND** a copy of this *First Report and Order*, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

⁶² Pub. L. No. 107-198, 116 Stat 729 (2002) (codified at 44 U.S.C. § 3506(c)(4)).

APPENDIX A
List of Commenters

Comments

Aerospace Industries Association

Air Line Pilots Association, International

Audacy, Inc.; Beasley Media Group, LLC; Connecticut Public Broadcasting, Inc.; Davis Broadcasting of Atlanta, L.L.C.; Davis Broadcasting, Inc., of Columbus; Galaxy Syracuse Licensee LLC; Galaxy Utica Licensee LLC; Spanish Broadcasting System, Inc.

CMG Media Corporation

Cohen, Dippell and Everist, P.C.

Communications Technologies

Cumulus Media, Inc.

Douglas Sedon

Dwight Price

E. Glynn Walden

Educational Media Foundation

Garmin International, Inc.

General Aviation Manufacturers Association

iHeartCommunications, Inc.

Ira Petry II

John Heubel

John Joseph Nangle

Maciej Kawalkowski

Michael Ravnitzky

Mt. Wilson FM Broadcasters, Inc.

National Public Radio

New York Public Radio

Paul Cullings

Press Communications, LLC

REC Networks

Rick Price, Pamela Price

Santiam Community Radio Corp.

Scott Atkinson

Tom Potter

Arizona Board of Regents for Benefit of University of Arizona; Board of Regents of the University of Wisconsin System; Elkhart Community Schools; Florida Gulf Coast University; Georgia Public

Telecommunications Commission; The Ohio State University; State of Wisconsin Educational Communications Board; University of Central Florida; University of North Texas

University of Southern California

Xperi, Inc. and National Association of Broadcasters

Reply Comments

Aerospace Industries Association; General Aviation Manufacturers Association; National Association of Broadcasters

Communications Technologies

Robert Fitzgerald

Garmin International, Inc.

Goldman Engineering Management

iHeartCommunications, Inc.

National Association of Broadcasters

Press Communications, LLC

REC Networks

Xperi, Inc.

APPENDIX B

Final Rule Changes

For the reasons discussed in this preamble, the Federal Communications Commission amends 47 CFR part 73 to read as follows:

PART 73 – RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 155, 301, 303, 307, 309, 310, 334, 336, 339.

2. In § 73.310 revise paragraphs (a) and (b) to read as follows:

§ 73.310 FM technical definitions.

(a) Frequency modulation. The following definitions pertain to frequency modulation, as defined in § 73.310(a)(17).

(1) Antenna height above average terrain (HAAT). HAAT is calculated by: determining the average of the antenna heights above the terrain from 3 to 16 kilometers (2 to 10 miles) from the antenna for the eight directions evenly spaced for each 45° of azimuth starting with True North (a different antenna height will be determined in each direction from the antenna); and computing the average of these separate heights. In some cases less than eight directions may be used. (*See* § 73.313(d).) Where circular or elliptical polarization is used, the antenna height above average terrain must be based upon the height of the radiation of the antenna that transmits the horizontal component of radiation.

(2) Antenna power gain. The square of the ratio of the root-mean-square (RMS) free space field strength produced at 1 kilometer in the horizontal plane in millivolts per meter for 1 kW antenna input power to 221.4 mV/m. This ratio is expressed in decibels (dB). If specified for a particular direction, antenna power gain is based on that field strength in the direction only.

(3) Auxiliary facility. An auxiliary facility is an antenna separate from the main facility's antenna, permanently installed on the same tower or at a different location, from which a station may broadcast for short periods without prior Commission authorization or notice to the Commission while the main facility is not in operation (e.g., where tower work necessitates turning off the main antenna or where lightning has caused damage to the main antenna or transmission system) (*See* § 73.1675).

(4) Center frequency. The term “center frequency” means:

- (i) The average frequency of the emitted wave when modulated by a sinusoidal signal.
- (ii) The frequency of the emitted wave without modulation.

(5) Composite antenna pattern. The composite antenna pattern is a relative field horizontal plane pattern for 360 degrees of azimuth, for which the value at a particular azimuth is the greater of the horizontally polarized or vertically polarized component relative field values. The composite antenna pattern is normalized to a maximum of unity (1.000) relative field.

(6) Composite baseband signal. A signal which is composed of all program and other communications signals that frequency modulates the FM carrier.

(7) *Effective radiated power*. The term “effective radiated power” means the product of the antenna power (transmitter output power less transmission line loss) times:

(i) The antenna power gain, or

(ii) the antenna field gain squared. Where circular or elliptical polarization is employed, the term effective radiated power is applied separately to the horizontal and vertical components of radiation. For allocation purposes, the effective radiated power authorized is the horizontally polarized component of radiation only.

(8) *Equivalent isotropically radiated power (EIRP)*. The term “equivalent isotropically radiated power (also known as “effective radiated power above isotropic) means the product of the antenna input power and the antenna gain in a given direction relative to an isotropic antenna.

(9) *FM Blanketing*. Blanketing is that form of interference to the reception of other broadcast stations which is caused by the presence of an FM broadcast signal of 115 dB μ (562 mV/m) or greater signal strength in the area adjacent to the antenna of the transmitting station. The 115 dB μ contour is referred to as the blanketing contour and the area within this contour is referred to as the blanketing area.

(10) *FM broadcast band*. The band of frequencies extending from 88 to 108 MHz, which includes those assigned to noncommercial educational broadcasting.

(11) *FM broadcast channel*. A band of frequencies 200 kHz wide and designated by its center frequency. Channels for FM broadcast stations begin at 88.1 MHz and continue in successive steps of 200 kHz to and including 107.9 MHz.

(12) *FM broadcast station*. A station employing frequency modulation in the FM broadcast band and licensed primarily for the transmission of radiotelephone emissions intended to be received by the general public.

(13) *Field strength*. The electric field strength in the horizontal plane.

(14) *Free space field strength*. The field strength that would exist at a point in the absence of waves reflected from the earth or other reflecting objects.

(15) *Frequency departure*. The amount of variation of a carrier frequency or center frequency from its assigned value.

(16) *Frequency deviation*. The peak difference between modulated wave and the carrier frequency.

(17) *Frequency modulation*. A system of modulation where the instantaneous radio frequency varies in proportion to the instantaneous amplitude of the modulating signal (amplitude of modulating signal to be measured after pre-emphasis, if used) and the instantaneous radio frequency is independent of the frequency of the modulating signal.

(18) *Frequency swing*. The peak difference between the maximum and the minimum values of the instantaneous frequency of the carrier wave during modulation.

(19) *Multiplex transmission.* The term “multiplex transmission” means the simultaneous transmission of two or more signals within a single channel. Multiplex transmission as applied to FM broadcast stations means the transmission of facsimile or other signals in addition to the regular broadcast signals.

(20) *Percentage modulation.* The ratio of the actual frequency deviation to the frequency deviation defined as 100% modulation, expressed in percentage. For FM broadcast stations, a frequency deviation of $\pm 75\text{kHz}$ is defined as 100% modulation.

(b) *Stereophonic sound broadcasting.* The following definitions pertain to *stereophonic sound broadcasting*, as defined in § 73.310(b)(8).

(1) *Cross-talk.* An undesired signal occurring in one channel caused by an electrical signal in another channel.

(2) *FM stereophonic broadcast.* The transmission of a stereophonic program by a single FM broadcast station utilizing the main channel and a stereophonic subchannel.

(3) *Left (or right) signal.* The electrical output of a microphone or combination of microphones placed so as to convey the intensity, time, and location of sounds originating predominately to the listener’s left (or right) of the center of the performing area.

(4) *Left (or right) stereophonic channel.* The left (or right) signal as electrically reproduced in reception of FM stereophonic broadcasts.

(5) *Main channel.* The band of frequencies from 50 to 15,000 Hz which frequency-modulate the main carrier.

(6) *Pilot subcarrier.* A subcarrier that serves as a control signal for use in the reception of FM stereophonic sound broadcasts.

(7) *Stereophonic separation.* The ratio of the electrical signal caused in sound channel A to the signal caused in sound channel B by the transmission of only a channel B signal. Channels A and B may be any two channels of a stereophonic sound broadcast transmission system.

(8) *Stereophonic sound.* The audio information carried by plurality of channels arranged to afford the listener a sense of the spatial distribution of sound sources. Stereophonic sound broadcasting includes, but is not limited to, biphonic (two channel), triphonic (three channel) and quadrophonic (four channel) program services.

(9) *Stereophonic sound subcarrier.* A subcarrier within the FM broadcast baseband used for transmitting signals for stereophonic sound reception of the main broadcast program service.

(10) *Stereophonic sound subchannel.* The band of frequencies from 23 kHz to 99 kHz containing sound subcarriers and their associated sidebands.

* * * * *

3. In § 73.402 add paragraph (i) to read as follows:

§ 73.402 Definitions.

* * * * *

(i) *Asymmetric sideband operation.* For digital FM stations, the use of different power levels on the upper and lower digital sidebands in a hybrid or extended hybrid DAB system.

4. In § 73.404 add paragraphs (e) and (f) to read as follows:

§73.404 IBOC DAB operation.

* * * * *

(e) Except stations operating on Channels 296 - 300 (107.1 - 107.9 MHz), FM stations may transmit hybrid IBOC signals with asymmetric power on the digital sidebands, as defined in § 73.402(i). Stations operating on Channels 296 - 300 (107.1 - 107.9 MHz) may seek an experimental authorization to transmit hybrid IBOC signals with asymmetric power on the digital sidebands.

(f) All FM stations transmitting hybrid IBOC signals may operate with total digital effective radiated power of up to -14 dBc. No station may operate its digital carriers with a total effective radiated power in excess of -10 dBc. A station planning to operate with a total digital effective radiated power in excess of -14 dBc must certify compliance with the Table below by calculating the F(50,10) signal strength of its analog signal at the first adjacent station's F(50,50) 60 dBμ contour. Compliance with this Table must be established for the upper and lower IBOC digital sidebands separately. All calculations must be made using the standard FCC contour prediction methodology.

Table 1 to Paragraph (f)—Maximum Permissible FM Digital ERP per Sideband

IBOC Station's F(50,10) Field Strength at the Upper or Lower First-Adjacent Station's Analog 60 dBμ F(50,50) Contour	Maximum Permissible FM Digital ERP for the Respective (Upper or Lower) Sideband
51.2 dBμ and above	-17 dBc
50.7 dBμ to 51.1 dBμ	-16 dBc
50.3 dBμ to 50.6 dBμ	-15 dBc
49.6 dBμ to 50.2 dBμ	-14 dBc
49.5 dBμ or less	-13 dBc

5. In § 73.406 add paragraphs (d)(5) and (d)(6), to read as follows:

§73.406 Notification.

* * * * *

(d) * * *

(5) Any digital FM station taking any of the following actions must notify the Commission of such action on Form 2100, Schedule 335-FM:

(i) Upon initiation of hybrid digital operation;

- (ii) Upon initiation of asymmetric sideband operation at any power level. For FM stations employing asymmetric sideband operation as defined in § 73.402(i), the notification must include a certification that the proposed digital sideband power on each sideband conforms to the Maximum Permissible FM Digital ERP set forth in Table 1 to § 73.404(f), and that the total digital sideband power will not exceed the total power if the digital sideband operation were symmetric. The notifying station may commence asymmetric sideband operation upon filing Form 2100, Schedule 335-FM, and may continue such operation unless notified by the Commission that such operation is not rule-compliant;
 - (iii) Discontinuing asymmetric sideband operation and reverting to symmetric sideband operation. The digital FM station must file Form 2100, Schedule 335-FM within 30 days of discontinuing asymmetric sideband operation; or
 - (iv) Decreasing total digital Effective Radiated Power from a level above -14 dBc to a level at or below -14 dBc. The digital FM station must file Form 2100, Schedule 335-FM within 30 days of decreasing power.
- (6) Any digital FM station seeking authority to increase total digital Effective Radiated Power above -14 dBc must submit Form 2100, Schedule 335-FM. The submission must include a certification that the proposed FM digital Effective Radiated Power is permitted, using the table set forth in Table 1 to § 73.404(f). Certifications must be based on the most restrictive analog field strength of the proponent at any nearby first-adjacent channel station's 60 dBμ contour. The station choosing to operate with total digital ERP above -14 dBc may initiate such operation upon approval from the Commission.

APPENDIX C

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA)¹ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Modifying Rules for FM Terrestrial Digital Audio Broadcasting Systems, Notice of Proposed Rulemaking (NPRM)*, released on August 1, 2023.² The Federal Communications Commission (Commission) sought written public comment on the proposals in the *NPRM*, including comment on the IRFA. No comments were filed addressing the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.³

A. Need For, and Objectives of, the *First Report and Order*

2. In the *First Report and Order*, the Commission finds that it is in the public interest to allow FM broadcast stations transmitting a hybrid analog-digital signal to operate with different digital effective radiated power (ERP) on the upper and lower digital sidebands, upon notification to the Commission on FCC Form 2100, Schedule 335-FM. This replaces the current procedure whereby a digital FM station must apply for an experimental authorization to operate with different digital ERP on the upper and lower digital sidebands (asymmetric sideband operation); this experimental authority must be renewed annually.

3. The FM digital radio system inserts redundant digital sidebands above and below a station's existing analog signal. The Commission's existing rules assume that digital power is the same on both digital sidebands, i.e., symmetric sideband operation. The advantage to asymmetric sideband operation is that it allows a digital FM station to operate with lower power on the digital sideband closer to a first-adjacent-channel analog FM station, thus reducing the potential for interference to that station, while enabling the digital FM station to increase power to the digital sideband where there is no or only a very distant analog FM station to protect from interference. For example, a Class A digital FM station on Channel 251 might have a Class A analog FM station on Channel 250 within 75 kilometers of the digital station, while being several hundred kilometers from the nearest analog FM station on Channel 252. In such a situation, the digital FM station would reduce digital ERP on the lower digital sideband, protecting the analog station on Channel 250, while increasing power and, therefore, signal coverage on the upper digital sideband where there is no adjacent channel station to protect. The total digital ERP transmitted over the two digital sidebands would be the same as it would be if both sidebands were transmitting at the same digital ERP (symmetric sideband operation), thus there would be no increase in the total digital energy emitted by the digital FM station.

4. The Commission in the *First Report and Order* adopts its proposal to allow digital FM stations wishing to use asymmetric sideband operation to do so by notifying the Commission using FCC Form 2100, Schedule 335-FM, and modifies that schedule by including fields to report the digital ERP being transmitted on each digital sideband, as well as the total digital ERP. It makes an exception, however, for digital FM stations operating on Channels 296 - 300 (107.1 - 107.9 MHz), at the top of the FM broadcast band, which must continue to seek experimental authorization for asymmetric sideband operation. This is deemed necessary to protect users in the lower frequencies of the Aeronautical Radio Navigation Spectrum (ARNS) from possible interference resulting from higher power on an upper digital sideband. The Commission further concludes that a station permanently discontinuing asymmetric operation need not disclose its reasons for doing so. It also implements the proposal that any FM licensees operating facilities under experimental or special temporary authorizations that are compliant

¹ 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 847 (1996).

² *Modifying Rules for FM Terrestrial Digital Audio Broadcasting Systems*, Notice of Proposed Rulemaking, 38 FCC Rcd 7158 (2023).

³ 5 U.S.C. § 604.

with the rules adopted in this proceeding may transition to asymmetric sideband operation by filing Schedule 335-FM notifications after the effective date of the rules adopted in the *First Report and Order*. Commenters generally supported the Commission's proposal to allow asymmetric sideband operation upon simple notice to the Commission, though some raised concerns regarding notifications, interference remediation, and the transition to asymmetric sideband operation. The Commission observes that adopting rules simplifying the process of initiating asymmetric sideband operation is likely to reduce inter-station interference rather than exacerbate it, and thus concludes that existing interference mitigation and remediation procedures are sufficient at the present time, but also concludes that Form 2100, Schedule 335-FM should be amended to provide fields for the notifying station to indicate the digital ERP transmitted on each digital sideband, as well as the total digital ERP.

5. This minor administrative change will help streamline processing of these requests and will further the Commission's efforts to transition all broadcast filings to the Bureau's Licensing and Management System (LMS).

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

6. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

7. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments.⁴ The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

8. The RFA directs the agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.⁵ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small government jurisdiction."⁶ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁷ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.⁸

9. *Radio Stations.* This industry is comprised of "establishments primarily engaged in broadcasting aural programs by radio to the public."⁹ Programming may originate in their own studio,

⁴ 5 U.S.C. § 604(a)(3).

⁵ *Id.* § 604(a)(4).

⁶ *Id.* § 601(6).

⁷ *Id.* § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

⁸ 15 U.S.C. § 632.

⁹ See U.S. Census Bureau, 2017 NAICS Definition, "515112 Radio Stations," <https://www.census.gov/naics/?input=515112&year=2017&details=515112>.

from an affiliated network, or from external sources.¹⁰ The SBA small business size standard for this industry classifies firms having \$47 million or less in annual receipts as small.¹¹ U.S. Census Bureau data for 2017 show that 2,963 firms operated in this industry during that year.¹² Of this number, 1,879 firms operated with revenue of less than \$25 million per year.¹³ Based on this data and the SBA's small business size standard, we estimate a majority of such entities are small entities.

10. The Commission estimates that as of June 30, 2024, there were 4,413 licensed commercial AM radio stations and 6,620 licensed commercial FM radio stations, for a combined total of 11,033 commercial radio stations.¹⁴ Of this total, 11,032 stations (or 99.99 %) had revenues of \$47 million or less in 2023, according to Commission staff review of the BIA Kelsey Inc. Media Access Pro Database (BIA) on July 3, 2024, and therefore these licensees qualify as small entities under the SBA definition. In addition, the Commission estimates that as of June 30, 2024, there were 4,356 licensed noncommercial (NCE) FM radio stations, 1,965 low power FM (LPFM) stations, and 8,906 FM translators and boosters.¹⁵ The Commission however does not compile, and otherwise does not have access to financial information for these radio stations that would permit it to determine how many of these stations qualify as small entities under the SBA small business size standard. Nevertheless, given the SBA's large annual receipts threshold for this industry and the nature of radio station licensees, we presume that all of these entities qualify as small entities under the above SBA small business size standard.

11. We note, however, that in assessing whether a business concern qualifies as "small" under the above definition, business (control) affiliations¹⁶ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. In addition, another element of the definition of "small business" requires that an entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific radio or television broadcast station is dominant in its field of operation. Accordingly, the estimate of small businesses to which the rules may apply does not exclude any radio or television station from the definition of a small business on this basis and is therefore possibly over-inclusive. An additional element of the definition of "small business" is that the entity must be independently owned and operated. Because it is difficult to assess these criteria in the context of media entities, the estimate of

¹⁰ *Id.*

¹¹ See 13 CFR § 121.201, NAICS Code 515112 (as of 10/1/22 NAICS Code 516110).

¹² See U.S. Census Bureau, *2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017*, Table ID: EC1700SIZEREVFIRM, NAICS Code 515112, <https://data.census.gov/cedsci/table?y=2017&n=515112&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false>. We note that the US Census Bureau withheld publication of the number of firms that operated for the entire year. At this time, the 2022 Economic Census data is not available.

¹³ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We note that the U.S. Census Bureau withheld publication of the number of firms that operated with sales/value of shipments/revenue in the individual categories for less than \$100,000, and \$100,000 to \$249,999 to avoid disclosing data for individual companies (see Cell Notes for the sales/value of shipments/revenue in these categories). Therefore, the number of firms with revenue that meet the SBA size standard would be higher than noted herein. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, see https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

¹⁴ *Broadcast Station Totals as of June 30, 2024*, Public Notice, DA 24-644 (rel. July 3, 2024) (*July 2024 Broadcast Station Totals PN*), <https://docs.fcc.gov/public/attachments/DA-24-644A1.pdf>.

¹⁵ *Id.*

¹⁶ "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 CFR § 21.103(a)(1).

small businesses to which the rules may apply does not exclude any radio or television station from the definition of a small business on this basis and similarly may be over-inclusive.

E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

12. The *First Report and Order* adopts procedures that will create new reporting, recordkeeping, and compliance obligations for small digital FM stations that operate with asymmetric power on the digital sidebands. Specifically, it replaces the current requirement that digital FM stations request experimental or special temporary authorization for asymmetric sideband operation with a new, simplified notification procedure on existing FCC Form 2100, Schedule 335-FM. This form will be modified to collect the total digital ERP and the digital ERP on each of the upper and lower digital sidebands used by a digital FM station. Form 2100, Schedule 335-FM, will now be the means by which a small, digital FM station will report (or request authority in the case of an increase of total digital ERP above -14 dBc) the following actions: the initiation of hybrid digital operation; the initiation of asymmetric sideband operation at any power level, as well as the permanent discontinuance of asymmetric sideband operation; an increase of total digital ERP above -14 dBc; or a decrease in total digital ERP from a level above -14 dBc to a level below -14 dBc. Form 2100, Schedule 335-FM will also be amended to provide a digital FM station proposing to increase total digital ERP above -14 dBc to certify that it complies with the power levels set forth in Table 1 to amended section 73.404(f) (regulating In Band On Channel Digital Audio Broadcast Operations), which is based on the current formula used to calculate acceptable power levels, but adapted to calculate those levels on a per-sideband basis. As is currently required, a station choosing to increase total digital ERP to a level between -14 dBc and -10 dBc must still attach to its Schedule 335-FM submission an exhibit demonstrating that the proposed FM digital ERP is permitted for each digital sideband, using newly adopted Table 1 to § 73.404(f). However, the Commission will continue to require that small and other entities request experimental authorization for a digital FM station on Channels 296 - 300 seeking to engage in asymmetric sideband operation to avoid any potential issues regarding interference with the ARNS.

13. Requiring small and other entities to use FCC Form 2100, Schedule 335-FM for the provision of the digital ERP is minimally burdensome, as this form will collect the same or similar information the notifying FM station would use to request asymmetric sideband operation, and is less burdensome than preparing an application for experimental authorization and renewing such authorization annually. Small entities will likely use the same processes and professional staff to comply with the FCC Form 2100, Schedule 335-FM requirements. Accordingly, although there is not sufficient evidence quantifying the compliance cost of the adopted rule changes, the Commission anticipates the approaches it has taken to implement the requirements will have minimal cost implications and should significantly reduce compliance requirements for small entities that may have smaller staff and fewer resources.

F. Steps Taken to Minimize Significant Economic Impact on Small Entities and Significant Alternatives Considered

14. The RFA requires an agency to provide, “a description of the steps the agency has taken to minimize the significant economic impact on small entities...including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.”¹⁷

15. In the *First Report and Order*, the Commission considered a number of alternatives that will minimize the impact of the revised rules. Specifically, the Commission adopted measures to simplify the implementation of asymmetric sideband operation for digital FM stations, by notification through Form 2100, Schedule 335-FM rather than application for experimental authorization and annual renewal.

¹⁷ 5 U.S.C. § 604(a)(6).

The Commission sought to weigh the impact of these measures on small and other entities against the public interest benefits gained from them and has determined that the benefits outweigh the costs. As some commenters have observed, the burden of filing an experimental application and annual renewals has likely discouraged many digital FM stations from implementing asymmetric sideband operation, and has therefore impeded the implementation of such operation and its corresponding benefits, including expanded signal coverage and interference protection. The Commission concludes that these benefits outweigh the burdens imposed by the current procedures, and justify the simplified process adopted in the *First Report and Order*.

16. The Commission also observes that adopting rules simplifying the process of initiating asymmetric sideband operation is likely to reduce inter-station interference rather than exacerbate it, and thus concludes that existing interference notification and remediation procedures are sufficient at the present time, but also concludes that Form 2100, Schedule 335-FM should be amended to provide space for the notifying station to indicate the digital ERP transmitted on each digital sideband, as well as the total digital ERP. While the provision of these items of information are a minimal additional burden, they consist of information that is readily available to the broadcaster, and will assist other FM stations in evaluating interference complaints.

17. The use of Form 2100, Schedule 335-FM will simplify required station submissions, and harmonizes such submissions with the recent transition of the Media Bureau's application filing system to LMS. The Commission also considered whether a station permanently discontinuing asymmetric sideband operation should be required to include a short statement disclosing its reasons for doing so when notifying the Commission, and determined such information was not necessary based on commenter input. This decision will eliminate an added burden to certain stations, as well as allow them to preserve the confidentiality of their business decision making. The Commission further concludes that digital FM stations currently using asymmetric sideband operation under experimental or special temporary authorizations shall be able to continue operation upon notification using Form 2100, Schedule 335-FM, provided such notification is submitted before the experimental authorization or STA expires. This option has been determined to be the least burdensome alternative, as compared to other options such as filing a one-time application with annual renewal. Finally, to avoid any potential issues regarding interference with the ARNS, the Commission will continue to require experimental authorization for a digital FM station on Channels 296 - 300 seeking to engage in asymmetric sideband operation. This will impact relatively few digital FM stations, and has been deemed necessary to protect ARNS users pending the results of testing by aviation industry stakeholders and the broadcast industry proponents of the new procedures.

G. Report to Congress

18. The Commission will send a copy of the *First Report and Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.¹⁸ In addition, the Commission will send a copy of the *First Report and Order*, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *First Report and Order* and FRFA (or summaries thereof) will also be published in the *Federal Register*.¹⁹

¹⁸ *Id.* § 801(a)(1)(A).

¹⁹ *Id.* § 604(b).