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May 16, 2018

BY ECFS

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: **Elefante Group Written *Ex Parte* Presentation;**
Application of Audacy Corporation to Operate an Inter-Satellite Service
File No. SAT-LOA-20161115-00117

Dear Ms. Dortch:

On June 26, 2017 and July 14, 2017, Elefante Group, Inc. ("Elefante Group") filed comments and reply comments on the above-referenced application ("Application") of Audacy Corporation ("Audacy") to operate an inter-satellite service ("ISS") with unspecified third-party satellite systems.[1] Elefante Group's comments focused primarily on Audacy's unusual ISS system design in the 22.55-23.55 GHz band ("23 GHz Band"), including the incomplete nature of the Application in that none of the low-earth orbit ("LEO") satellites of its customers-to-be with which Audacy's proposed medium-earth orbit ("MEO") satellites would communicate are the subject of, or described in sufficient detail in, the Application or any other application currently before the Commission. Elefante Group also described the real potential for harmful interference from the Audacy MEO satellites ("Relay Satellites") into co-primary fixed systems operating in the 23 GHz band,[2] specifically the stratospheric-based services planned by Elefante Group.[3] Elefante Group did not seek to deny Audacy's Application but urged the Commission to

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[1] The Application was put on public notice by the Satellite Policy Branch on May 26, 2017. *See* DA 17-524.

[2] The 23 GHz Band is allocated on a co-primary basis to Federal and non-Federal Fixed, Mobile, Space Research (earth-to-space), and ISS.

[3] *See* Comments of Elefante Group, Inc., File No. SAT-LOA-20161115-00117 at 7-12 (filed June 26, 2017) ("Elefante Group Comments"). Elefante Group plans to deploy novel, high-capacity stratospheric-based communications services ("SBCS") as a fixed service. Elefante Group specifically focused its comments on the Audacy Application on the potential for

direct Audacy to explore means to enhance spectral compatibility of its proposed ISS service with other services in the bands.[4] Elefante Group explained how the Application did not contain sufficient information for Elefante Group to perform its own compatibility analysis and confidently explore this issue. Nonetheless, Elefante Group described several options that Audacy could consider to improve its compatibility with little or no compromise likely to its system's performance.[5] The Application file has never been updated by Audacy in regards to compatibility or these details, and Elefante Group renews its request.

Elefante Group submits this letter as well to address another important issue concerning the proposed Audacy ISS service, namely to eliminate any uncertainty that may exist regarding the amount of interference protection that the future Audacy customer LEO satellites ("User Satellites") establishing ISS links with the Relay Satellites are entitled, if any, from existing *and future* fixed services operating under the existing co-primary Fixed allocation in the 23 GHz band.[6] Under the Commission's Part 101 rules for fixed links in the 23 GHz band, there are no limits on either the heights of a radio on one end of a fixed link or the elevation angle of a fixed link transmission.[7] Further, Part 101 does not impose any obligations on fixed service licensees to protect satellite receivers in the ISS from interference.[8]

Tellingly, the Audacy Application materials are silent on this issue of protection. This reflects a clear lack of expectation on Audacy's part that any protection from fixed stations would be forthcoming, consistent with the lack of obligations imposed on fixed service licensees

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interference into Elefante Group downlinks from its planned, nominally fixed stratospheric platforms stations ("STRAPS") to fixed user terminals on the ground ("UTs"). *See* Elefante Group Comments at 7-12. Elefante Group also noted the potential for interference into aeronautical mobile systems that might be authorized in the band. *Id.* at 12. More recently, Elefante Group has studied the use of the 23 GHz band, and indeed the entire range between 21.5-24.0 GHz, for uplinks from UTs to STRAPS and, as the result of extensive compatibility analysis, believes that this range is the most suitable frequency range for such uplinks to realize the potential of SBCS (paired with the 25.25-27.5 GHz band for downlinks). *See* Comments of Elefante Group, Inc. on the Second Further Notice of Proposed Rulemaking, GN Docket No. 14-177 et al. (filed Jan. 23, 2018)

4 *See* Elefante Group Comments at 15-17.

5 *See id*. at 16-17.

6 Elefante Group focuses this letter on fixed services because no mobile services are currently authorized in the Commission's rules in the 23 GHz band, albeit there is a co-primary allocation for mobile services.

7 *See* 47 C.F.R. Part 101.

8 *See id.*

today.[9] Of further note, Audacy does not describe the receiver characteristics for future User Satellites – perhaps impossible in any event since no 23 GHz LEO applications have been filed for the purpose of taking the Audacy ISS service. Therefore, if the Commission does grant Audacy's application, it should expressly confirm that Audacy's third-party customer User Satellites must operate without protection from fixed services.

In the alternative, the Commission should create certainty for both fixed services and Audacy and its customers by establishing, as a condition on any of an ISS license grant to Audacy (and its customers), an appropriate protection criterion for User Satellites relative to fixed service links. Fortunately, an appropriate interference protection criterion has already been developed that would be appropriate and natural to apply to Audacy's ISS system. In particular, the Commission should specify in any grant of the Application that an interference protection criterion for Audacy User Satellites from fixed services could be sought through coordination at levels consistent with Recommendation ITU-R SA.1155 and User Satellite receiver characteristics consistent with ITU-R SA.1414-2. These ITU Recommendations, which apply to data relay satellite systems and permit compatibility analysis between ISS DRS and other services**,** describe an I/N -10 dB protection criterion, assuming certain LEO receiver characteristics, that can be exceeded no more than 0.1 percent of the time when in view of the corresponding DRS.[10] In other words, according to this Recommendation, subject ISS receivers would accept such interference from a fixed link consistent with those limits.[11] This DRS protection criterion is appropriate to apply in the case of Audacy because its system is, in effect, a DRS as its principal function is to allow Audacy customer User Satellites to exchange data on a relay basis with earth stations through the Audacy Relay Satellites.

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[9] Although not explicitly described in the Application Narrative, the Audacy Base service architecture excludes uplink beams aimed at the Earth's limb, suggesting an intention to reduce the potential for interference from fixed stations transmitting at low elevation angles – although it is unclear what Audacy's assumptions were about how close to horizontal (i.e., zero degrees elevation) fixed links operate. *See* Application Narrative at 16-17 (filed Nov. 15, 2016)**.**

[10] Recommendation ITU-R SA.1155 recommends "that protection criteria, specified in maximum aggregate interference power spectral density to system noise power density ratio, from all sources should not be exceeded for more than 0.1% of the time for the various links of data relay satellite systems as indicated in Table 1." *See* Recommendation ITU-R SA.1414-2 for the performance characteristics for compatibility analyses with DRS forward links from geostationary orbit to LEO satellites in the 22.55-23.55 GHz band, specifically Table 2 "Forward DRS-to-spacecraft link characteristics" which specifies Recommendations ITU-R SA.1155 for the protection criterion and ITU-R S.672 for antenna patterns.

[11] In addition, all existing fixed services licenses (as of the Audacy Application's grant date) should be grandfathered without potential for complaint by Audacy or its customer if a fixed service deployment exceeds the criterion.

The public interest advantages of adopting this criterion as a condition to an Audacy Application grant are clear. First and foremost, the resulting certainty will allow the fixed and ISS services to coexist with clear expectations. The Audacy customer User Satellites, for example, can choose in light of the criterion to design their receivers to meet or exceed the receiver characteristics underlying ITU-R SA.1155 so as to be entitled to the protection offered by the criterion. Similarly, fixed service licensees can configure their links to ensure that such criterion will be satisfied by their system configurations with respect to the Audacy customer User Satellites, assuming they adopt those receiver parameters.[12] As a result, an objective protection criterion will allow new fixed services, such as SBCS, to establish operations in the 23 GHz band knowing what is expected of them and without subjecting themselves to claims of causing harmful interference provided they meet the criterion. Moreover, the criterion will reduce the need for further prior coordination by the fixed services, which can result in delays. Thus, an objective criterion will promote investment in and timely deployment of not only more intensive use of the band by traditional fixed links but also innovative new fixed service applications.

Finally, it should be noted that Elefante Group is not recommending that the Audacy customer User Satellites must design their receivers to the parameters assumed in the ITU Recommendation. Audacy's customers will retain the flexibility, if they choose, to deploy receivers in the User Satellites that do not satisfy those characteristics that form the foundation for ITU-R SA.1155, knowing that if they do so, they will not be entitled to protection from interference from fixed services links. This may make sense for them to do given the height of the User Satellite orbits, the nature of the data being relayed, the operational needs, and the period of time that the User Satellites will likely be communicating not with a Relay Satellite toward the zenith but rather with a Relay Satellite across the limb of the earth, i.e., over a path where any potentially interfering signals from fixed deployments are likely to occur.[13]

For the foregoing reasons, the Commission, if it grants the Audacy application, should confirm in the grant that Audacy is not entitled to protection from fixed service links or, in the alternative, establish and apply to the grant an interference protection criterion equal to ITU-R

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[12] Subsequent to grant, Audacy or its customers could request coordination, during the fixed service licensee's post-grant reconsideration period if there are any cases in which it has a good faith reason to believe that the fixed service link would operate in a manner that would result in an exceedance of the -10 dB I/N for more than 0.1% of the time towards the User Satellite's compliant receiver.

[13] Audacy would also appear to have the flexibility to reconsider how it plans to utilize the many bands it envisions for ISS links in a way that reduces potential for interference from co-primary fixed operations

SA.1155 and User Satellite receiver characteristics consistent with ITU-R SA.1414-2 to remove uncertainty for both fixed services and Audacy and its customers alike.

Pursuant to Section 1.1206(b) of the Commission's rules, this letter is being filed electronically.

Respectfully submitted,

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