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Title: Equipment Authorization Guidance for Hearing Aid Compatibility

Short Title: HAC Guidance

Reason: Update Guidance for Rule Changes to Section 20.19

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Keyword/Subject: Section 20.19, Hearing Aid Compatibility, HAC

First Category: Administrative Requirements

Second Category: Hearing Aid Compatibility

Third Category:

Question: What are the equipment authorization requirements for hearing aid compatibility of mobile handsets?

Answer: The attached document below - 285076 D01 HAC Guidance v02- provides equipment authorization guidance for mobile handsets subject to the requirements of Section 20.19 for hearing aid compatibility.

Attachment List: [285076 D01 HAC Guidance v02](#)

Notice: This draft publication provides guidance for rules for Hearing Aid Compatibility that were effective on October 8, 2010, per a modification to Section 20.19, released August 5, 2010 in Policy Statement and Second Report and Order and Further Notice of Proposed Rulemaking, FCC 10-145. Applications subject to the revised hearing aid compatibility rules in FCC 10-145 that are submitted after October 8, 2010 shall use this draft publication as a guide and [Submit an Inquiry](#) to the FCC for application review during the draft review period - other applications do not need to submit an inquiry to the FCC. Submit the inquiry by going to <http://www.fcc.gov/labhelp> and selecting the [Submit an Inquiry](#) link on the left with the Subject: HAC Guidance During Draft Review Period. The applicant shall confirm in the Inquiry the intended air interfaces and bands being tested and not tested, disclosure statements, modes of operation as required in items 10-13 below and also include any other questions concerning the rules.

Attachment: 285076 D01 HAC Guidance v02

Equipment Authorization Guidance for Hearing Aid Compatibility

Introduction:

This publication provides guidance¹ to clarify the Hearing Aid Compatibility (HAC) equipment certification requirements for wireless handsets subject to Section 20.19² of the rules.

Wireless handsets that provide Commercial Mobile Radio Service (CMRS Section 20.9) using air interface and frequency bands for which technical standards are defined in ANSI C63.19-2007³ are subject to Section 20.19.

Manufacturers of wireless handsets subject to Section 20.19 that are hearing aid compatible⁴ (*i.e.* HAC rated) must submit, as part of the equipment certification process, test report exhibit(s) demonstrating the HAC rating, tested according to the ANSI C63.19-2007 standard.

Equipment Certification

1. HAC test report exhibit(s) are submitted with a Form 731 application, either as an original application, or as a Class II Permissive Change application to add or change the HAC rating of a handset subject to Section 20.19.
2. A Form 731 application associated with a hearing aid compatible test report exhibit(s) must contain one complete M test report for model(s) marketed and reported as an M#, or one complete M and one complete T report (see example appendix A) for a model(s) marketed and reported as M#T#

¹ Telecommunication Certification Bodies (TCB), test laboratories, and manufacturers can use this document for equipment certification guidance; however, some requirements may only be applicable to TCB(s) - for example: grant comments and grant note identification entered on the Grant of Equipment Authorization.

² FCC 10-145 released August 5, 2010 and effective October 8, 2010 revised the Hearing Aid Compatibility rules of Section 20.19 and revision FCC 08-68 released February 28, 2008 effective June 6, 2008.

³ ANSI C63.19 IEEE - Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids

⁴ Service providers and manufacturers are required to make available (providers to customers and manufacturers to providers) a number or percentage of Hearing Aid Compatible (HAC) handset models used in delivery of the digital Commercial Mobile Radio Service. The number is defined by a schedule in Section 20.19 (c) - *Phase-in of requirements relating to radio frequency interference*. Both (providers and manufacturers) must also submit to the Federal Communications Commission Wireless Telecommunications Bureau (WTB) regular reports demonstrating compliance to the schedule in Section 20.19, according to a reporting schedule set out in Section 20.19(i). The handset - model/FCCID/HAC Rating/standard-version reported to the WTB must match the FCCID/HAC Rating/standard-version granted, and the supporting test report exhibits in the Equipment Authorization System (EAS). There is no requirement that the Grant and HAC report exhibits include an up to date model designation in the EAS for each model reported to the WTB.

3. Test report exhibits demonstrating HAC compliance according to ANSI C63.19-2007 must be submitted for all of the handset's air interfaces and bands (air interface/bands) defined in the ANSI C63.19-2007 standard.
4. Any devices that can be held to the ear in any ordinary way, or found suitable to hold to the ear, are considered a handset set under Section 20.19. This includes any device, even if the manufacturer claims that usually, or most often, users will operate it in a speakerphone or other mode. If a device cannot be practically used held to the ear for voice communication, it is not subject to the HAC requirements of Section 20.19. This includes devices that provide voice communication through a speakerphone only arrangement, headphone or other instrument.
5. Concurrent connections or services are modes that permit active voice calls concurrently with other active connections for data or other voice calls.
 - a. Handsets that provide concurrent connections using simultaneous transmissions⁵ shall be independently tested for each voice mode and not tested together with any data modes. Simultaneous transmissions include air interfaces/bands, all modes either defined or not, in C63.19-2007 (see Items 10, 12 and 13 below for grant note, test reports and disclosure requirements).
 - b. Handsets that provide concurrent connections using time division multiplexing over the same air interface protocols covered in the C63.19-2007 standard shall be tested in either both modes to determine the applicable HAC rating, or the applicant shall justify the appropriate worst case mode tested. (See item 10 d. below).
6. For handsets capable of air interface/bands that provide Commercial Mobile Radio Service, only some of which are defined in ANSI C63.19-2007, a Form 731 application can be submitted for HAC compliance under the interim rules established in DA-10-145.⁶ This includes air interfaces/bands that have the capability for supporting voice over data applications.⁷ All air interfaces must be documented and listed, and noted in the test report, but only interface/bands defined by ANSI C63.19-2007 are to be included in the tested results to determine the HAC rating. Handsets in this category are granted with a grant note code of "HX" with specific grant comment text, and must provide disclosure statements to end users (see items 10, 12 and 13 below).⁸

⁵ Simultaneous transmissions are when two transmitters are radiating simultaneously operating over separate, or the same air interface/bands, such that each transmitter is contributing to the radiated field. Currently ANSI C63.19 is reviewing the issue of testing simultaneous transmissions to address the ability to measure simultaneous transmissions. Until such time when the C63.19 validates simultaneous transmissions results, devices offering this capability shall not be tested in the simultaneous transmission mode.

⁶ Prior to the release of DA-10-145 phones had to be tested in all air interfaces/bands offered, thus a phone that included air interfaces/bands not defined in C63.19 were not subject to Section 20.19 and could not be tested and rated for HAC compliance. The only exception was phones that supported WIFI capability.

⁷ Initial voice capability is not incorporated in off-the-shelf handsets for certain air interfaces available, but is available through commercial sources as user or provider installed software applications. For example, some handsets that transmit and receive data over a Wi-Fi air interface do not contain the software to use Wi-Fi for voice communications, but the software can be downloaded and installed on the handset through data internet services.

⁸ The Grant Note HX is not applicable if the handset's only non C63.19 defined air interfaces/band(s) has no capability to support voice, or third party voice, applications (i.e. API's right to use the ear piece and microphone).

7. Handsets that operate over the GSM air-interface in the 1900 MHz Band that can be HAC rated under the requirements of Section 20.19(c)(1)(ii)(C) that permit reducing the power by a user selectable option shall be identified in the test results and noted in the itemized list of air interfaces. See Items 10, 11, 12, and 13 below for disclosure and Grant comments required for handsets granted under this provision.
8. Handsets that only use air interfaces/bands not defined by ANSI C63.19-2007 are not subject to Section 20.19 (i.e. only provide Commercial Mobile Radio Service (CMRS Section 20.9) over air interfaces/bands not defined in ANSI C63.19-2007).
9. A Form 731 application for certification that shows test results in the M4, or M4T4 category cannot declare a lower rating (M3, M3T4). In all cases, the test report must have test results demonstrating the same rating declared by the manufacturer and reported to the Wireless Telecommunications Bureau.

Test Reports, Grant Notes and Comment Text

10. All test reports shall contain (in the introduction or a separate section) a list of all applicable air interfaces and bands (including air interfaces/bands that are not included in the C63.19-2007 standard):
 - a. List all air interfaces tested according to ANSI C63.19-2007 and those interfaces which were not tested;⁹
 - b. The list shall indicate the combinations of air interface/bands that operate in simultaneous transmission mode; however, as noted in Item 5 above, such air interfaces are not to be tested in simultaneous transmission mode;
 - c. The list shall indicate concurrent service modes tested from a single transmitter, and indicate the concurrent state that determined the HAC rating;
 - d. GSM air-interface in the 1900 MHz Band that meet the requirements of Section 20.19(c)(1)(ii)(C) by a user selectable option must be noted.
 - e. The list shall also indicate the capability for supporting voice over data applications.⁷
11. Grant Notes and grant comments for all HAC rated handsets that have been tested for air interfaces/bands that are defined in C63.19-2007:
 - a. Use a grant note of “HC” in the grant note field;
 - b. Add the text indicating the HAC rating in the comment field “HAC Rating M#T\$ or;
 - c. When multiple models are marketed with different HAC ratings under the same FCC ID HAC Ratings, list ratings for each model: M#T\$-200N, M#T\$-200N”; and

⁹ Air interfaces not tested include those not currently not defined in the ANSI C63.19-2007 standard and those interfaces that support data mode which may be used for voice over data type transmission in the current implementation, or in the future.

- d. If the HAC rating is for the GSM air-interface in the 1900 MHz Band using the user selectable mode of reducing the power under provision of 20.19 (c) (1) then the following grant comment text shall be added: *“HAC rating requires user activation of a special mode for GSM operation in the 1900 MHz band.”*.
12. Additional Grant Notes and comments for HAC rated handsets that operate on air interfaces/ bands not included in C63.19-2007, have simultaneous transmissions and/or support voice over data applications which are not tested (see item 6 above) shall:
- a. Use the grant note HX and;
 - b. Add the grant comment text *“This phone has been tested and rated for use with hearing aids for only some of the wireless technologies that it uses”*
13. The Form 731 application for certification or permissive change shall also include an example or exhibit for the applicable disclosure statements in the user’s manual, or other appropriate forms for the user disclosure statement as required in Section 20.19(f). This shall include, as appropriate,:
- a. The HAC rating per Section 20.19(f)(1);
 - b. An explanation of the ANSI C63.19 rating system per Section 20.19(f)(1);
 - c. Handsets HAC rated that operate with both defined and not defined air interfaces/ bands (grant note “HX”) disclosure statement(s) per Section 20.19(f)(2);
 - d. Handsets HAC rated for the GSM air-interface in the 1900 MHz Band using the user selectable mode of reducing the power under the provisions of Section 20.19(c)(1) shall provide a disclosure as defined in Section 20.19(f)(3).

Permissive Changes, Product Changes and Model Variations

14. Multiple compliance reports under one FCC ID that represent distinct models¹⁰ with different HAC ratings are permissible. A Form 731 application is required for each model variant that has a distinct HAC rating. After the initial Form 731 application for the first model, subsequent Form 731 applications for a Class II permissive change request shall be filed. As noted in Item 2 each 731 application must contain a complete compliance HAC report for all air interfaces/bands applicable.
15. For model variations¹¹ approved under one FCC ID with multiple HAC ratings, all the appropriate grant notes must be entered in the grant note field and “HAC Ratings: M#T\$-200N, M#T\$-200N” must be included in the grant comments for all the approved HAC ratings.¹²

¹⁰ If a manufacturer assigns different model designations solely to distinguish units (for either the same or different FCC ID), or to signify other distinctions that do not relate to either form, features, or capabilities, such designations shall not count as distinct models for purposes of compliance to the required schedule.

¹¹ The grant comment “HAC rating only evaluated for the specific configurations described in this filing” is no longer required.

¹² The grant comment must list all HAC ratings for handsets under one FCC ID offered to carriers and reported to the WTB as HAC compliant. The format is “HAC Ratings: M#T\$-200N, M#T\$-200N” after the (:) each distinctive rating/model is separated by a (,).

16. Any changes that affect the HAC rating must be reported as a Class II Permissive Change.¹³ The handset must be given a new model designation distinct from that of the prior version of the handset.
17. A Class II Permissive Change application that only includes an M rating report for a phone previously granted as a rating of M#T\$ is only acceptable if (1) the handset is no longer to be marketed or reported with a rating of M#T\$, or (2) there are HAC model variations. The grant comment associated with the Class II Permissive Change would then be “HAC Rating: M#” or “HAC Ratings: M#T\$, M#” for examples 1 and 2 respectively. For cases where the modified equipment continues to be marketed and reported with a rating of M#T\$, revised test data must be submitted in both the M and T reports. If the modification to the equipment results in a change in the HAC rating, a new model designation distinct from that of the handset is required (see Item 11 above).
18. When adding T-coil rating for a device according to Class II Permissive Change procedures for handsets, a complete M and complete T report must be submitted with the Form 731 application. Only if there has been no product change to add the T-coil rating, may the previously filed report be resubmitted.
19. If the manufacturer builds the product with alternative components, it must be tested to show compliance using the components representing the worst case situation, according to the guidance for the permissive change rules¹⁴.

Features to be Tested

20. The Form 731 application exhibits shall include a clear description justifying the features activated, or not activated, during testing.
21. No external special parts or ancillary devices are permitted in order to demonstrate HAC compliance.
22. Handset models with user instructions that disable any of its features, degrade performance, reduce RF output power, degrade battery performance, etc. for the purpose of meeting HAC compliance are not permitted. However, power reduction is permitted for the GSM air-interface in the 1900

¹³ ANSI C63.19 M rating measurements evaluate the near fields of the RF electrical and magnetic fields at a distance of 1 or 1.5 cm (ANSI C63.19-2006 used 1 cm (not currently applicable for new 731 applications) and ANSI C63.19-2007 uses 1.5 cm) from the surface of the handset earpiece. Any type of equipment modification (antenna position, design, metallic surface, adding system processes, changing battery capacity or type, etc.) has the potential to change the rating. The manufacturer must evaluate the equipment modification to determine if there is a change in the rating and if a Class II Permissive Change is required. Equipment changes that do not result in a change of the HAC rating being marketed and reported to the WTB do not require a Class II Permissive Change Form 731 application, and can be considered a Class I Permissive Change.

¹⁴ Permissive Change Policies – KDB 178919

MHz Band for handsets using a user selectable mode of reducing the power by no more than 2.5 dB under the provisions of Section 20.19 (c) (1). Phones using this provision must be noted in the test report and provide the appropriate text in the grant comment field (see Items 10, 11 12 and 13 above).

23. Settings may be acceptable for processing audio signals in accordance with ANSI C63.19-2007 requirements in order to improve the performance for the hearing impaired. A clear description of these controls must be provided in the test report submitted with the application.
24. The antenna must be tested in the optimum performance position. If an antenna extension is not obvious, a declaration from the manufacturer regarding the optimum antenna position must be described in the test report , in accordance with ANSI C63.19-2007 requirements.
25. The rating for a phone must be in accordance with the method defined by the ANSI C63.19-2007 and can decouple the M and T rating.
26. In addition to the documentation to define the air interfaces/bands (see Items 10,11,12 and 13 above) the application shall document all other key marketed features¹⁵ of the tested model(s), including:
 - a. Special HAC audio configurations permitted in accordance with ANSI C63.19-2007;
 - b. Statements regarding special antenna positions for HAC compliance, etc.
27. The applicant shall provide a general declaration stating that specific transmission modes do not operate in the held to ear mode for providing phone service (i.e. Wi-Fi, Bluetooth profile is not in held to ear modes for phone service).
28. Use of any feature discussed above that is disabled during testing must be clear to the user, or clearly documented in the user's manual.

Appendix A: Example of Test Report

1. Summary
2. Air Interfaces and Bands
3. Test Site Description
4. Description of Test System
5. Equipment List
6. Description of EUT¹⁴
 - a. Model Modes Features and Capabilities
 - b. Justification of Held to Ear Modes Tested
7. Test Procedure

¹⁵ An applicant has the option to submit the description of the EUT as a separate exhibit in the Operational Description, and request short term confidentiality.

8. Test System Validation, Calibration and Alignment Procedures
9. Detailed Measurements for M and T Ratings
10. Measurement Uncertainty
11. Calibration Certificates
12. References and Supporting Test Data
13. Detailed Test Measurement Plots

Change Notice:

285076 D01 HAC Guidance v01 has been changed to a new revision under the same version to 285076 D01 HAC Guidance v01r01

- a. Item 15 of 285076 D01 HAC Guidance v01 has been changed to (see item 15 above)
- b. From - 15. Only held to ear modes need to be tested. The Form 731 application exhibits shall include a clear description justifying the features activated, or not activated, during testing. – of 285076 D01 HAC Guidance v01
- c. Item 16 has been added (which was the second sentence of Item 15 of 285076 D01 HAC Guidance v01)
- d. Items 16 through 24 of 285076 D01 HAC Guidance v01 are now 17 through 25 of 285076 D01 HAC Guidance v01r01

10/08/2010: 285076 D01 HAC Guidance v01r01 has been changed to 285076 D01 HAC Guidance v02

Major revisions have been implemented due to FCC 10-145 released August 5, 2010 and effective October 8, 2010 which revised the Hearing Aid Compatibility rules in Section 20.19.