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December 20, 2005

*Via Electronic Correspondence*
Julius P. Knapp
Deputy Chief
Office of Engineering and Technology
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Correspondence in WT Docket No. 01-309
Section 68.4(a) of the Commission's Rules Governing Hearing Aid Compatible Telephones

Dear Mr. Knapp:

The Alliance for Telecommunications Industry Solutions (ATIS), on behalf of the ATIS Incubator Solutions Program #4- Hearing Aid Compatibility (AISP.4-HAC or ATIS Incubator) hereby submits this update from AISP.4-HAC Working Group 4 (WG-4) and its efforts to investigate and find solutions to challenges faced by manufacturers and service providers in meeting the Commission's hearing aid compatibility requirements for wireless devices operating in the Telecoil (T-coil) mode. The following issues/proposals are being addressed in the WG-4:

**Radial T-coil Rating.** WG-4 member APREL Labs has designed and developed a Telephone Magnetic Field Simulator (TMFS) "test device" and well as a test procedure for use of the device. (A copy of the test procedure is attached to this letter). This device simulates the audio band magnetic field output, and was circulated to various manufacturers and independent labs to conduct an equipment and process assessment through these magnetic measurements. The participating labs' measurements were sent to ATIS, which compiled test data as it did in the earlier Round Robin (RR) radiofrequency (RF) tests.

The initial results of the TMFS tests are encouraging and are attached hereto. The data shows at least 7dB difference between the axial and two radial measurements, with radial measurements always being the lower. In addition, the WG-4 has measured the magnetic field strength of several mobile phones and found the same difference exists, ranging from 3 dB to 15 dB between the axial and two radial positions.

A Federal Communications Commission (FCC) general comment was submitted and incorporated in the C63.19 rd 3.1 that technically changed the way T-coil

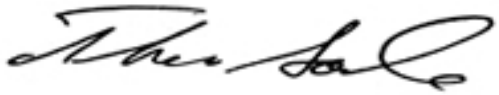
ratings are determined.[1] Prior to this change, the radial measurements were not used to determine the mobile phone signal quality. After the FCC's recommended change, the C63.19 Standard now uses the worst signal quality of the 3 T-coil signal measurements, to determine the mobile phone rating. This requirement remains in the latest release of C63.19 rd 3.10 and creates technical challenges for mobile manufacturers to ensure T-coil compliance. If the recommended change is approved, the resulting measurements will reduce the "T" ratings of devices by at least one "T" rating category.

**Peak Power.** The FCC has insisted that RF testing be performed using peak power. Requiring peak power in the RF test is unnecessarily burdensome. The T-coil rating is the ratio of signal quality to RF interference and WG-4 has previously presented data to the FCC that proves that hearing aids do not pass the peak power fluctuations onto the consumer.[2] The ATIS Incubator WG-4 has shown that testing with average power during the transmit interval equates to a more realistic user experience. The current measurements unfairly penalize wireless devices using an air interface with more fluctuation in signal power even though the users' experiences with these devices would be equivalent to those using an air interface with less power fluctuation.

WG4 would welcome the opportunity to meet with the FCC to resolve these matters in order to minimize any further delay to the successful revision and adoption of the C63.19 (2005) Standard. We would appreciate your immediate attention to this matter.

Please do not hesitate to contact the undersigned if you have any questions.

Sincerely,



Thomas Goode
Associate General Counsel
The Alliance for Telecommunications
Industry Solutions
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[1] This change, FCC 029, was challenged by Motorola to be a technical comment in MOTO 035.
[2] *See* ATIS Letter to Julius Knapp, Deputy Chief, FCC Office of Engineering and Technology, December 6, 2005 (WT Docket No. 01-309).

# Test Procedure for
# Telephone Magnetic Field Simulator (TMFS)

## Submitted to

## AISP.4-Hearing Aid Compatibility Test Plan & Technical Specification (HACTS)

**Revision record:**

| Created: | Revision | Prepared by | Comments |
|---|---|---|---|
| March 23, 2005 | 1.6 | APREL Laboratories | |

**Contents**




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# 1. Introduction

Telephone Magnetic Field Simulator (TMFS) is a device to validate the testing system for HAC audio band Magnetic Signal Test. It is placed in the position normally occupied by the WD. The TMFS serves as a known source for the audio band magnetic field output. TMFS is energized with an audio frequency signal. It is scanned with the T-coil probe to detect maximum axial and radial magnetic field values. The readings are compared with the target values specified in HACTS document.

# 2. Procedure

This section provides a validation procedure using TMFS.

Position the TMFS in a suitable place meeting the ambient conditions prescribed in section 6.2.1 of HACTS. The T-coil probe is positioned and scanned over the TMFS at 1cm distance from the calibration reference point of the T-coil probe to the Top Surface of TMFS as shown in Figure A.3.3 (Gauge Block with T-coil Probe). Probe measurements are recorded by the HAC testing system. Additional magnetic field characteristics of TMFS are presented in section 3.

Figure 2.1 illustrates the instrumentation setup. The input signal for TMFS should be maintained with 1kHz signal with 0.5V (-6dBV) rms input.

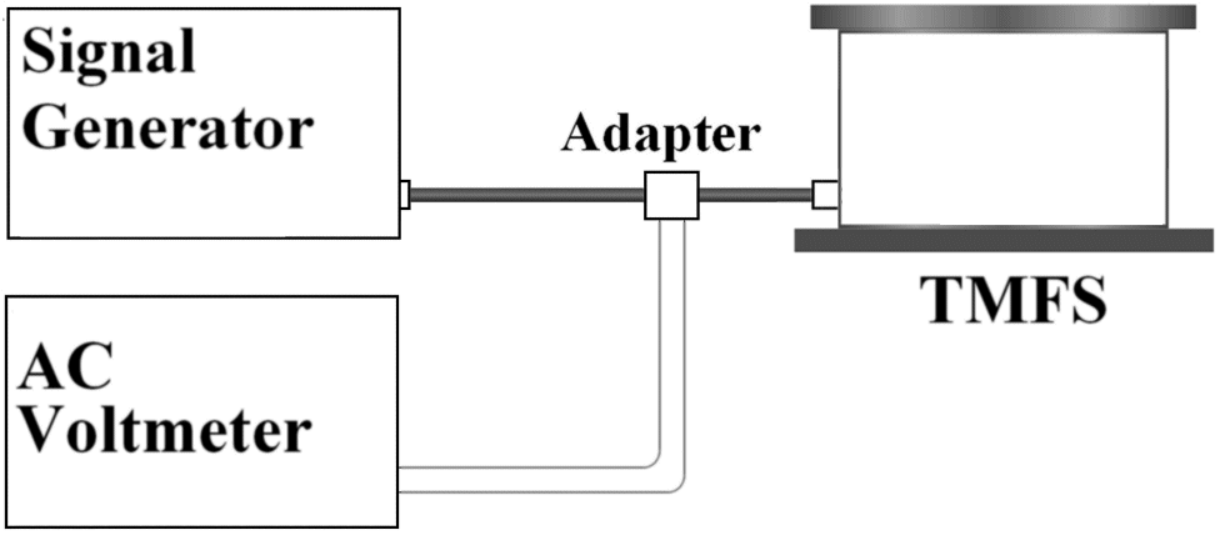



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**Figure 2.1 Instrumentation Setup**

The scan area is defined as 5cm by 5cm with grid resolution of 5mm. Scans should be repeated with axial and two radial orientations. The Maximum magnetic field value should be recorded for each of the three probe coil orientation. The measured values then will be compared with target values stated in Annex A.5 of HACTS - TMFS specification should be within ±1dB.

**Table 2.1 Required Results for TMFS Axial and Radial Magnetic Field**

| Orientation | Scan area | Grid resolution | Input Signal | Target Magnetic field |
|---|---|---|---|---|
| Axial | 5cm x 5cm | 5mm | 1kHz, 0.5V | -20.0 dBA/m |
| Radial 1 | 5cm x 5cm | 5mm | 1kHz, 0.5V | -27.5 dBA/m |
| Radial 2 | 5cm x 5cm | 5mm | 1kHz, 0.5V | -27.5 dBA/m |

# 3. TMFS Magnetic Field Characteristics


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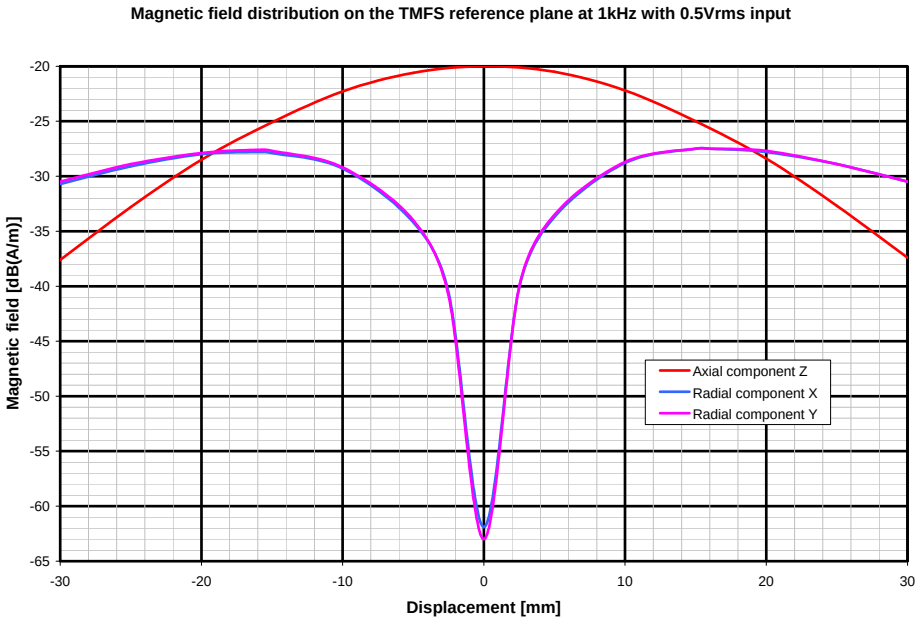


**Figure 3.1 – Target magnetic field distribution along axis**

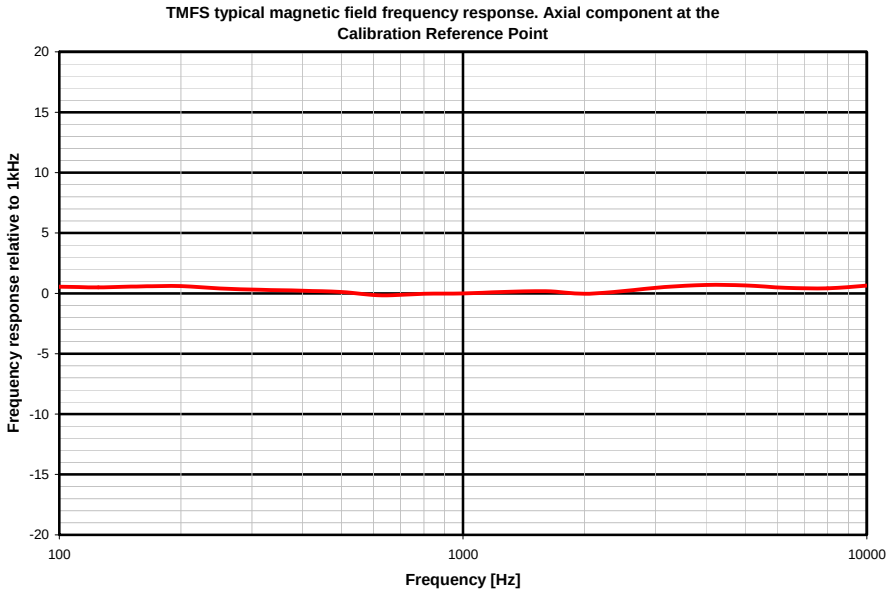


**Figure 3.2 – Target frequency response**
**(Should be within ±1dB in the range of 300Hz – 3kHz)**


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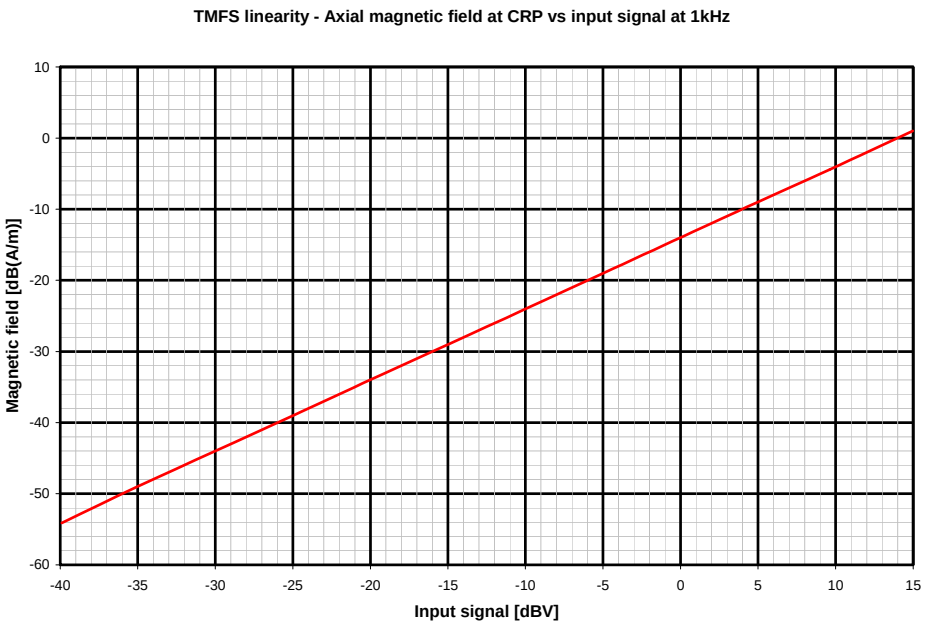


**Figure 3.3 – Typical linearity response**
**(Should be within ±1dB in the range of -40dBA/m – 0dBA/m)**


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# 4. TMFS Magnetic Field Distribution

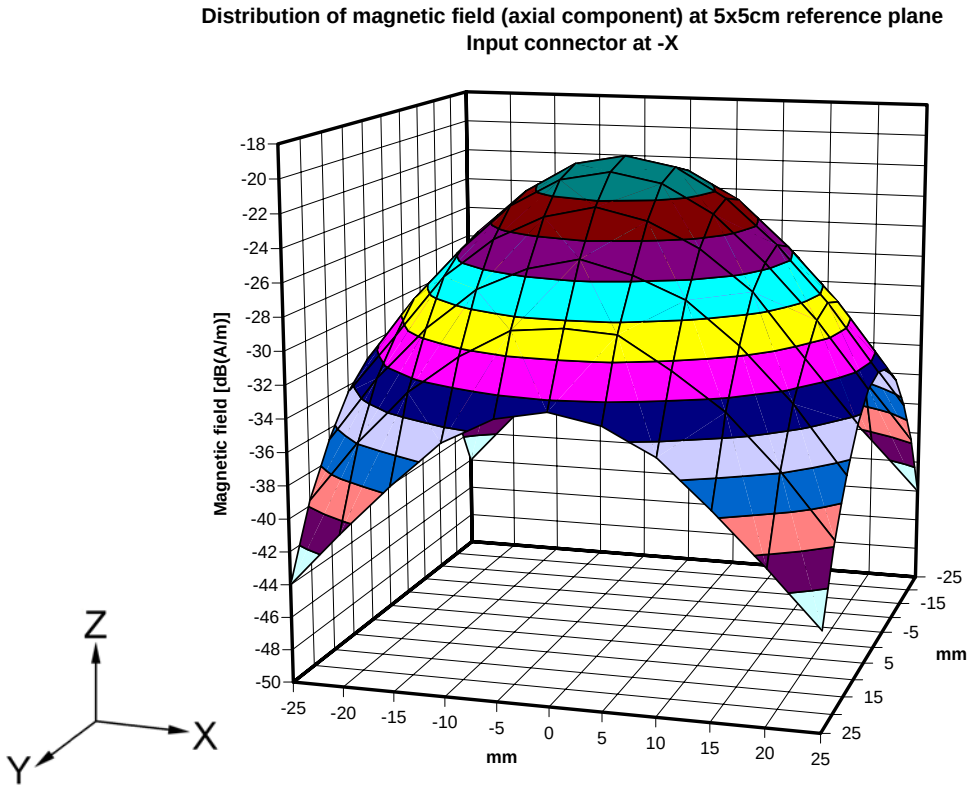


**Figure 4.1 – Axial component distribution**


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**Distribution of magnetic field (radial component) at 5x5cm reference plane**
**T-coil axis aligned with axis X, input connector at -X**

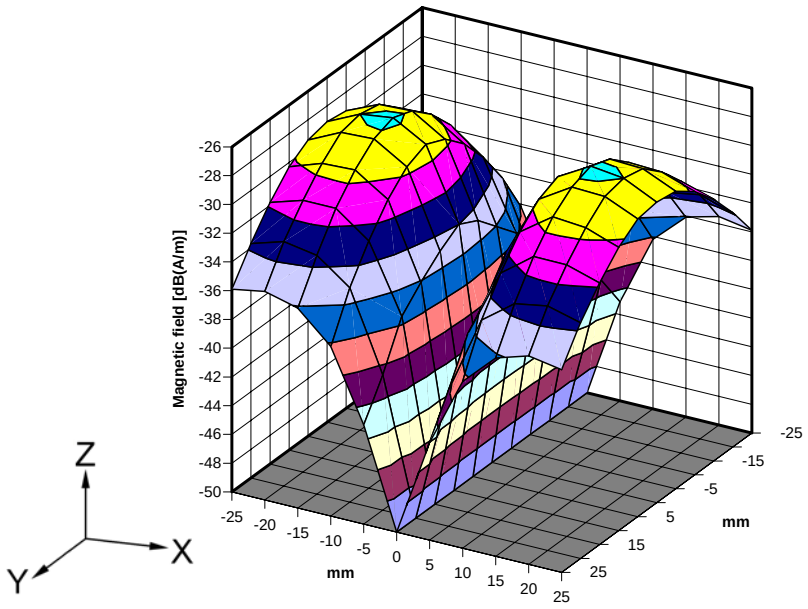


**Figure 4.2 – Radial component distribution (X axis)**

**Distribution of magnetic field (radial component) at 5x5cm reference plane**
**T-coil axis aligned with axis Y, input connector at -X**

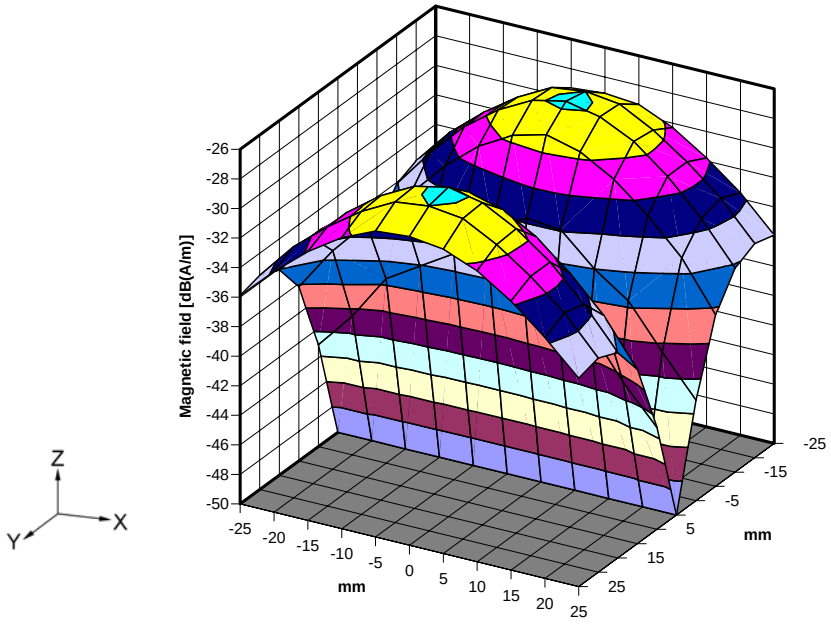


**Figure 4.3 – Radial component distribution (Y axis)**


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# 5. TMFS Setup Pictures

**Figure 5.1 TMFS Test Setup**

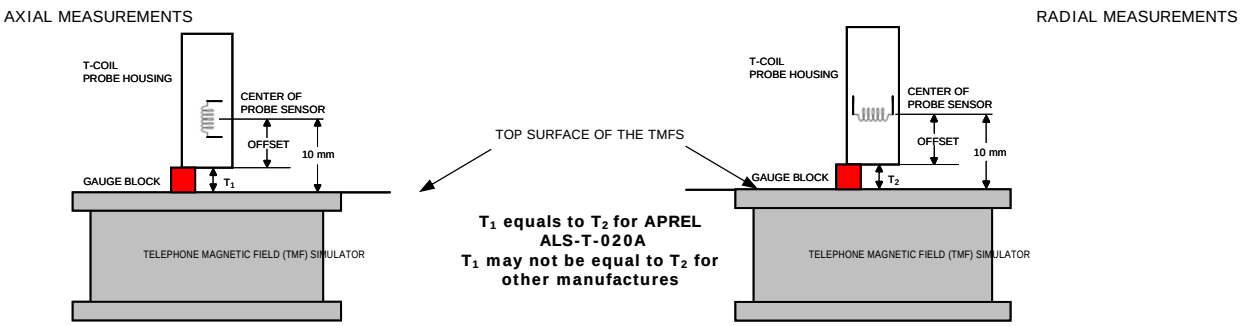



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**Figure 5.2 – T-coil positioning at the Calibration Reference Point**


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ATIS HAC Incubator T-Coil
Test Results
December 2005

| LAB | Axial | Radial 1 Parallel to X-Axis | Radial Parallel To Y-Axis | Average Values Axial | Average Values Radial 1 | Average Values Radial 2 | Delta Axial | Delta Radial 1 | Delta Radial 2 | % Standard Deviation Axial | % Standard Deviation Radial 1 | % Standard Deviation Radial 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -19.7 | -27.7 | -27.6 | -19.93 | -27.17 | -26.99 | 0.23 | -0.53 | -0.61 | 21.7% | 15.2% | 20.4% |
| 2 | -19.7 | -27.02 | -26.52 | | | | 0.21 | 0.15 | 0.47 | | | |
| 3 | -19.8 | -27.1 | -27.1 | | | | 0.13 | 0.07 | -0.11 | | | |
| 4 | -19.3 | -27.3 | -26.8 | | | | 0.63 | -0.13 | 0.19 | | | |
| 5 | -22.1 | -27.5 | -27.4 | | | | -2.17 | -0.33 | -0.41 | | | |
| 7 | -19.5 | -25.7 | -25.1 | | | | 0.43 | 1.47 | 1.89 | | | |
| 8 | -20 | -27.5 | -27.5 | | | | -0.07 | -0.33 | -0.51 | | | |
| 9 | -19.3 | -27 | -27.2 | | | | 0.63 | 0.17 | -0.21 | | | |
| 10 | -20.1 | -27.7 | -27.7 | | | | -0.17 | -0.53 | -0.71 | | | |
| | | | | | | | | | | | | |
| | | | | | | | Standard Deviation Axial 0.85 | Standard Deviation Radial 1 0.61 | Standard Deviation Radial 2 0.81 | | | |

Shaded are not consistent with other lab results.