August 30, 2006
Supplement to HAC Test Report for Motorola portable cellular phone (IHDT56GJ1)

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There was a request for additional information regarding Motorola's HAC Test Reports for Motorola portable cellular phone (FCC ID IHDT56GJ1). The requested information is addressed below in the same numbering sequence received.

8.

Appendix 3-6 (Page 26) states a CMU200 manual reference value was used for the calculation of the 0dBm0 reference whereas Exhibit 6B-2 (Page 7) states that an internal calibration procedure should be implemented. Please show that the vocoder calibration was performed and was correctly implemented for the testing.

RESPONSE:
To calculate "0dBm0 Input reference", we use both "CMU200 manual reference value" and "Input Correction Factor". "Input Correction Factor" is measured using internal procedure described in 3-5.

9.

Demonstration that ABM2 noise is not affected by RF frequency shows a discrepancy between Table 4 and Table 5 regarding Channel 25 ABM2 data.

RESPONSE:

Table 4
We perform initial scan on the highest signal point over the transducer at low / mid / high channels. This measures the affect of different RF frequencies coupling into Hearing Aid. However, it might not be the best SNR point.

Table 5
The best SNR point is picked. This point might be slightly different from the highest signal point.

10.

Please indicate whether backlight was on or off during test conditions in Table 4. If off, then HAC compliance operation should be explained in the Users Manual.

RESPONSE:
Backlight was off during testing. HAC compliance will be explained in the manual.

11.

ABM2 figure reference in Appendix 3-1 (Page 21) was not found. Please supply. Please show that significant audio band noise components beyond 10kHz were addressed.

RESPONSE:

Speag's software does not allow the user to display results beyond 5kHz. Please note that the calculations use time domain operation, not frequency domain operation. Therefore, although it is not obvious in the plots provided in Appendix 1 of "HAC Test Report for T-coil IHDT56FT1" from July 18, 2006, the results are based on the entire frequency range of the signal (with sampling frequency of 48 kHz). The attached report from SPEAG, "T-Coil probe linearity and Frequency Response", addresses this topic in depth.

12.

Please provide details of the measurement from device reference plane to probe for the Clause 6 tests.

RESPONSE:

The distance is established by positioning the device beneath the test arch phantom so that it is touching the frame. The location and thickness of the arch, and the location/orientation of the coil within the probe housing, are precisely known values in the DASY software. The height of the measurement plane is further fine-tuned by performing a Surface Detection job at the beginning of each test. The end result is that the probe sensor is very precisely located 10mm above the device reference plane.

13.

Please show that the vocoder can pass the 1kHz 1/3 octave banded signal.

RESPONSE:

The 1kHz narrowband signal was measured with a Bruel & Kjaar 2144 to be -18.8dB V. The same signal was then passed through the Encode / Decode processes of the CMU200, and re-measurement with the Bruel & Kjaar resulted in -18.9dB V.

14.

Please fully address the FCC 3G policy recently issued in June 2006. Please provide details of device capability, RF modes and vocoder modes/options used. Please also provide SO2 and SO55 conducted powers as required in the 3G guidance in RF emissions report.

RESPONSE:

Conducted power (dBm) for SO55			
	Channel	RC1	RC3
CDMA 800	Ch 1013	25.15	25.12
	Ch 384	25.15	25.12
	Ch 777	24.91	24.90
CDMA 1900	Ch 25	25.18	25.05
	Ch 600	25.06	24.98
	Ch 1175	25.00	25.05

Conducted power (dBm) for SO2			
	Channel	RC1	RC2
800 CDMA	1013	24.99	24.91
	384	25.10	25.08
	777	24.81	24.76
1900 CDMA	25	24.93	24.90
	600	24.96	24.84
	1175	25.05	24.97

15.

Please discuss uncertainty table items. Which are lab specific? Please be sure to include Noise Contribution, RF interference and DUT positioning in your response.

RESPONSE:

Noise Contribution: The specific noise levels measured in our lab at the time of these tests are significantly lower than the "typical worst case noise levels" that were used by SPEAG to establish the 0.7% uncertainty component. Our reported 1kHz noise levels are below -67 dB A/m, compared to SPEAG's stated -55 dB A/m. And our reported 300-3000Hz noise levels are below -57 dB A/m, compared to SPEAG's stated -48 dB A/m. Therefore, the uncertainty component of 0.7% adequately covers our current and foreseeable noise contributions.

RF Interference: The SPEAG HAC T-Coil Extension uses a fully RF shielded probe. Contribution to the uncertainty budget is negligible.

DUT Positioning: The attached table has been updated to account for lab repeat measurements of a reference unit.

HAC T-Coil Uncertainty Budget

Error Description	Uncertainty value (%)	Prob. Dist.	Div.	c ABM1	c ABM2	St.Unc ABM1 (%)	St.Unc ABM2 (%)
PROBE SENSITIVITY							
Reference level	3.0	N	1	1	1	3.0	3.0
AMCC geometry	0.4	R	1.7	1	1	0.2	0.2
AMCC current	0.6	R	1.7	1	1	0.4	0.4
Probe positioning during calibration	0.1	R	1.7	1	1	0.1	0.1
Noise contribution	0.7	R	1.7	0.0143	1	0.0	0.4
Frequency slope	5.9	R	1.7	0.1	1	0.3	3.5
PROBE SYSTEM							
Repeatability / Drift	1.0	R	1.7	1	1	0.6	0.6
Linearity / Dynamic range	0.6	R	1.7	1	1	0.4	0.4
Acoustic noise	1.0	R	1.7	0.1	1	0.1	0.6
Probe angle	2.3	R	1.7	1	1	1.4	1.4
Spectral processing	0.9	R	1.7	1	1	0.5	0.5
Integration time	0.6	N	1	1	5	0.6	3.0
Field disturbation	0.2	R	1.7	1	1	0.1	0.1
TEST SIGNAL							
Reference signal spectral response	0.6	R	1.7	0	1	0.0	0.4
POSITIONING							
Probe positioning	1.9	R	1.7	1	1	1.1	1.1
Phantom thickness	0.9	R	1.7	1	1	0.5	0.5
DUT positioning **	4.0	R	1.7	1	1	2.4	2.4
EXTERNAL CONTRIBUTIONS							
RF interference	0.0	R	1.7	1	1	0.0	0.0
Test signal variation	2.0	R	1.7	1	1	1.2	1.2
COMBINED UNCERTAINTY							
Combined Std.Uncert. (ABM field)						4.6	6.5
Expanded Std. Uncertainty, k=2 (%)						9.1	12.9

** based on repeat measurements of reference unit

16.
Please provide validation for use of 30 kHz VBW.

RESPONSE:
The power measurements were compared and verified using spectrum analyzer (VBW = 30 Hz) and average power meter.

FYI
In the future, please submit ABM noise spectrum plots to 10kHz

RESPONSE:
System users do not have the ability to display the plot you have requested. Please refer to question 4 above for explanation and technical justification."