

# Codec Testing Status

IETF 79

9 Nov 2010

# Testing Goals

- Provide audio quality feedback to the development process
- Provide audio quality information to the consensus process
- Develop industry awareness and confidence

# Current Status

- Preparation for widescale online MUSHRA testing continues:
  - will run web based MUSHRA test from [www.open-codec.com](http://www.open-codec.com)
  - Also evaluating SoundExpert online tool
- Six companies have signed up for ‘semi-formal’ controlled testing (GIPS/Google, University of Tübingen, Dolby, Juniper, Vidyo, and Telurix)
  - 2 planning meetings held to date

# Ongoing Discussion Items

1. Testing strategy and requirements  
=>> develop and execute a test plan
2. Test cases and orthogonality
3. Source material – reuse of material where possible, identification of problem scenarios
4. Representative packet loss scenarios and impairment generation
5. Subjective pool size
6. Extending MUSHRA to narrowband testing
7. Other logistics (number of test periods, calibration, correlation of test house data, etc)

# Semi-formal Testing

- Define a core source corpus and test condition set common to each tester
- Allow additional varying source material and test conditions at the discretion of the tester
- Set a required minimum level of headphone-based playback signal path, noise environment, and calibration

# Source Material

- Reuse existing where possible
  - <http://www-mmsp.ece.mcgill.ca/Documents/Data/index.html>
  - <http://www.itu.int/net/itu-t/sigdb/menu.htm>
- Language and music genre coverage
- Identify likely problem scenarios
  - Particular instruments or environmental conditions
  - Test as many different scenarios as possible (orthogonality)
- Environmental simulation (e.g. speakerphone operation, packet loss)

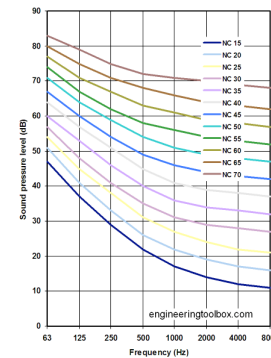
# New music files

10-15 second tailored segments, 16/44.1

- Beck – Cellphone’s Dead (‘click-hop’)
- Black Eyed Peas – Boom Boom Pow (?)
- Boz Scaggs – Lowdown (Mobile Fidelity audiophile master)
- Dave Brubeck – Tangerine (classic late 50’s jazz)
- Dirty Heads – Neighborhood (recent SoCal hip hop variant)
- Foo Fighters – Wheels (modern rock)
- Guns N Roses – Locomotive (Mobile Fidelity audiophile master)
- Haitink – Beethoven’s 5<sup>th</sup> (orchestral)
- Hal 9000 (narrowband speech)
- Harry James – Corner Pocket (Sheffield Labs audiophile master, big band)
- Evgny Kissin – Moonlight Sonata (classical piano)
- Kraftwerk – Spacelab (electronica)
- Lady Gaga – Paparazzi (21<sup>st</sup> century Abba)
- Steely Dan – Peg (peak of 1970’s recording)
- Yes – Long Distance Runaround (Mobile Fidelity audiophile master)

# Semi-formal chain

- Quiet listening environment at NC25 (approx 35 dBA) – e.g. ISOBOOTH
- Standardized sample preparation
  - 8, 16, 24, 32 etc to 48 kHz / 16 bit
  - SecretRabbitCode
- MUSHRA assessment tool
  - Ratelt
  - MUSHRAM (Matlab based)
- High quality D/A
  - e.g. Benchmark DAC, Metric Halo ULN-2, Apogee MiniDAC
- High quality headphone amp and playback level calibration
  - Decent headphone amp frequently included with good D/A
  - Playback levels measured via Etymotic in-ear mic
- High quality headphone (e.g. AKG 240DF, Senn HD600)



Metric Halo  
ULN-2



Sennheiser HD600



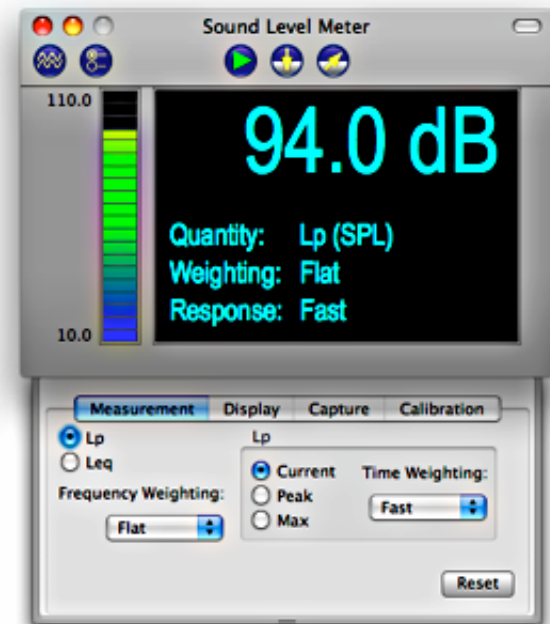
# Additional MUSHRA requirements

- Experienced listener pool
- Listener level calibration (83 dB SPL +/- 4 dB)

Etymotic ear canal microphone



SignalScope Pro



# Test Setup Cost

Item	Cost
ISOBOOTH Silver	\$2995.00
Metric Halo ULN-2 DAC and headphone amp	\$1695.00
Sennheiser HD-600 headphone	\$349.00
Etymotic ER-7C	\$1500.00
SignalScope Pro	\$249.00

Approx cost (not including PC's): \$6800

# Next steps

- Complete the first test plan draft (Dec 2010)
- Widescale testing up and running (Dec 2010)
- Dry run of semi-formal testing (Jan 2011)