Video Multimeter Test Case: Lip sync performance of iPad Pro with/without JBL Charge 2 Bluetooth speaker

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Background

One could easily think that the combination of **iPad Pro** and high-quality Bluetooth speaker like **JBL Charge 2** would be unbeatable for movie watching experience.

But the truth is different.

Our test group watched a movie from Netflix for a while, but then was forced to switch to use the internal speakers, due to really bad lip sync performance.

We wanted to **measure** how the iPad Pro & JBL Charge 2 –combination succeeds in our Video Multimeter tests. This report wraps up those results.

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Test setup

OptoFidelity's Video Multimeter was used as measurement instrument. It was equipped with microphone, so that both iPad Pro's internal speakers and external Bluetooth speaker could be used in testing.

Test video, a full HD 30 fps content, was played from Youtube.

Test devices:

- iPad Pro 16GB WiFi-model
- JBL Charge 2 Bluetooth speaker

High speed internet over WiFi was utilized in testing.

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Lip sync test results

iPad Pro with internal speakers

MOS = 2.1 (-35.9 ms)

Audio was 35.9 ms ahead of the video

iPad Pro with JBL Charge 2

MOS = 1.1 (+144.8 ms)

Audio was 144.8 ms behind of the video

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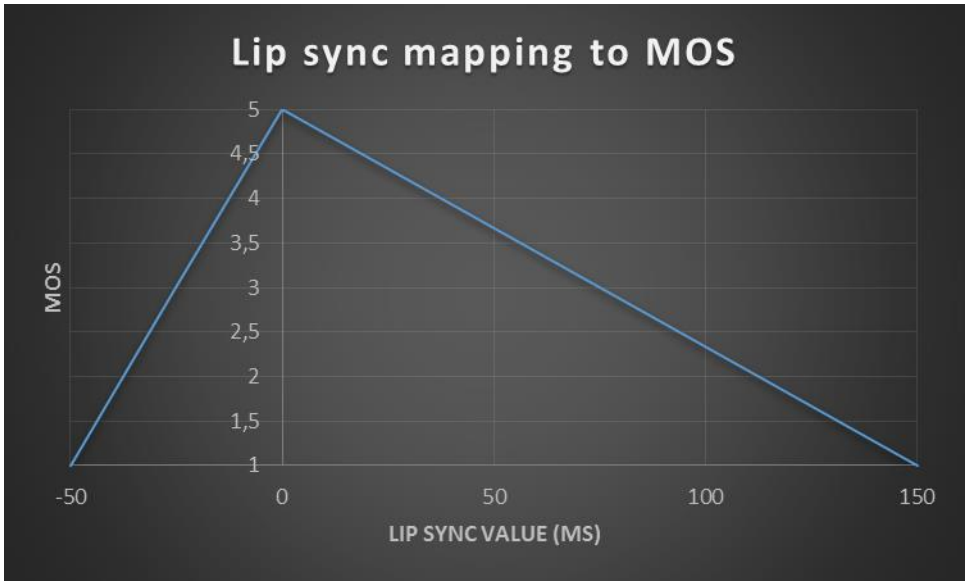
Lip sync and MOS



Score	Quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible, but not annoying
3	Fair	Slightly annoying
2	Poor	Annoying
1	Bad	Very annoying, unwatchable

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Conclusions

- The test result with **JBL Charge 2** –speaker was consistent with the subjective experience: the movie was unwatchable due to the lip sync error
- The lip sync performance of **iPad Pro** with internal speakers was better, but far from perfect
- Better interoperability testing would be obviously needed

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OptoFidelity Video Multimeter

Technical specifications	
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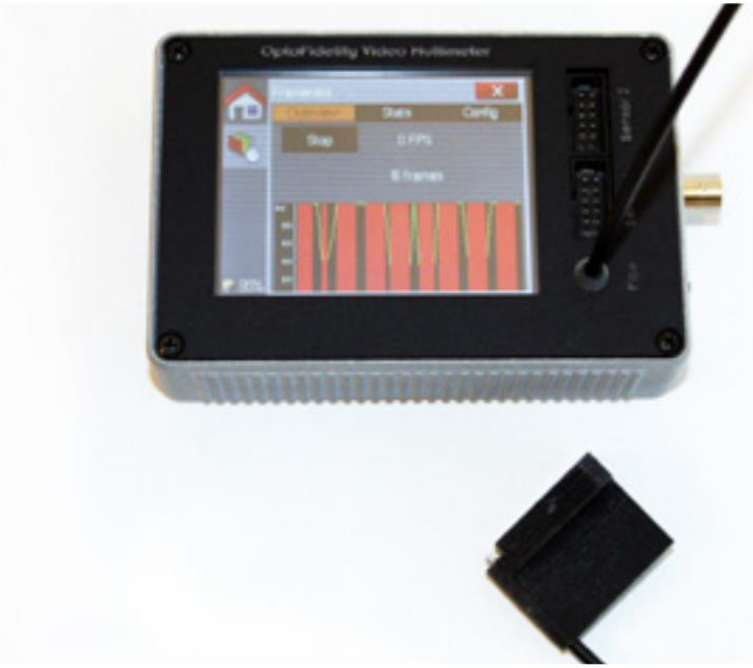
Dimensions	12x8x3 cm
Operating temperature range	-20 C to +50 C
Storage temperature range	-30 C to +80 C
Internal memory	200 measurement hours
Operating time on battery	6 hours
Supported operating systems for data transfer:	Windows 7 or newer, Ubuntu Linux 12.04 or newer, Mac OS X Snow Leopard or newer
Framerate measurement characteristics	
Timing accuracy	1 ms
Maximum framerate	150 FPS



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