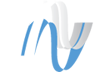
Measurement Protocol

**Test Report**

“Listen and Sound Better. Anywhere!”

**Confidential**



|  |  |
| --- | --- |
| Measurement Object | 20230324\_Kraken\_15\_930\_2\_raw |

|  |  |
| --- | --- |
| Project | MS Teams Speakerphones |
| Report Generation Date | 3/28/2023 11:16 AM |
| Responsible Person | User |

Status Overview

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SMD | Status | Single Value Description | Single Value | Object |
| Stabilize AGC - signal level with normal speech v4 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) SND - female run 1 | Done | MOS-LQO | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) SND - male run 1 | Done | MOS-LQO | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) SND - female run 2 | Done | MOS-LQO | 4.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) SND - male run 2 | Done | MOS-LQO | 4.2 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.1 Send path - total quality loss - Personal | Ok | Calculated Value [MOS] | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.2 Send path - end to end latency - Offload proc. | Not Ok | Calculated Value [ms] | 311.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.4 - 4.1.5 Send path - send levels - default levels | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Stabilize AGC - signal level with quiet speech v4 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.5 Send path - signal level quiet speech - Offload | Ok | Calculated Value | -15.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Stabilize AGC - signal level with normal speech v4 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.4 Send path - signal level normal speech - Offload | Ok | Calculated Value | -15.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.6 - 4.1.8 Send noise and interf. - default levels | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph - noise spectrum idle ch. 4.1.6 - active ch.4.1.7 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.6 Send path - idle channel SNR - Offload | Ok | Calculated Value | 65 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.7 Send path - active channel SpNR - Offload | Ok | Calculated Value | 72 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.7 Send path - active channel SpNR - RAW | Ok | Calculated Value | 72 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.8 Single Frequency Interference SND | Ok | Min. dist. to tolerance scheme [dB], 808.6 Hz | 1.35 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.8 Single Frequency Interference PEAK -80 dBV SND | Ok | Calculated Value [dBV] | -92.23 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.1.9 - distortion and noise | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.9 Send path - distortion and noise | Not Ok |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Noise and Speech plots (0,-6,-12,-15,-21dB) | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Speech and Noise level at various gains | Done | Calculated Value | -84.6 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.11 Send path - noise level change at max mic gain | Ok | Calculated Value [dB] | -1.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Send path - activations sensitivity - filtered | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.3 Send path - activation sensitivity -20dBPa marker | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Calc. for 4.1.3 - SND activation- lvl vs time - first 8 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.3 Send path - activation sensitivity -20dBPa | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.3 Send path - activation sensitivity -23dBPa marker | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Calc. for 4.1.3 - SND activation- lvl vs time - first 8 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.3 Send path - activation sensitivity -23dBPa | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Stabilize AGC - signal level with normal speech | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.12 Send path - signal lvl - normal speech - no dAGC | Ok | Level [dBm0], 0 | -14.50 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.1 Receive path - output lvl - Spec V4 - Personal | Ok | Level [dB20μPa], 0 | 65.23 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.1 Receive output level - Personal - Kickstand, Tent | Ok | Calculated Value | 65.23 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) RCV - female run 1 | Done | MOS-LQO | 3.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) RCV - male run 1 | Done | MOS-LQO | 3.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) RCV - female run 2 | Done | MOS-LQO | 3.7 | 20230324\_Kraken\_15\_930\_2\_raw |
| Super Wideband MOS (P.863) RCV - male run 2 | Done | MOS-LQO | 3.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.2 Receive path - Total Quality Loss - Personal | Ok | Calculated Value [MOS] | 3.78 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.3 Receive path - end to end latency - Offload proc. | Ok | Calculated Value [ms] | 148.37 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.4 Receive - idle channel noise - Personal | Ok | Level [dB20μPa(A)] | 23.74 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.4 Receive - idle channel noise - Personal with Fan | Ok | Level [dB20μPa(A)] | 23.57 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.5 Single Frequency Interference RCV | Not Ok | Min. dist. to tolerance scheme [dB], 19151.4 Hz | -11.65 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.5 Single Frequency Interference PEAK 24dB20uPa RCV | Ok | Calculated Value [dB20uPa] | 8.23 | 20230324\_Kraken\_15\_930\_2\_raw |
| Receive path - freq. resp. 1/12oct for SDNR reference | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.6 Receive path - distortion and noise - Personal | Ok |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.6 Receive path - distortion and noise - Conferencing | Not Ok |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Rec. for Receive path - low signal DRC gain - dB | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.8 Rcv path - dynamic vol.compression - quiet signal | Ok | Calculated Value | -0.12 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.3.1 terminal coupling loss (TCL) - SWB | Done | Echo Loss [dB] | 74.58 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.3.1 terminal coupling loss - lvl vs. time | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.1 Echo path - terminal coupling loss (TCL) | Ok | Calculated Value [dB] | 78 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.3.2 - EQUEST analysis waveform | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.3.2 EQUEST Level vs time vs freq | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (male) 1/6 | Ok | MOS | 4.6 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (female) 2/6 | Ok | MOS | 4.9 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (male) 3/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (male) 4/6 | Ok | MOS | 4.4 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (female) 5/6 | Ok | MOS | 4.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.2 EQUEST nomvol (female) 6/6 | Ok | MOS | 5.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.2 Echo path - EQUEST nomvol - worst of 6 | Ok | Calculated Value [MOS] | 4.4 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.3-4.3.4 Echo path - ECC and SND attn - default lvl | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.3.4 ECC Seg 1and 2 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.3.4 ECC 1o2 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.3.3. Echo Control Charac SND 1o2 HHWB | Done | DT Class A1 [%] | 85.22 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.3.4 ECC 2o2 | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.3.3. Echo Control Charac. SND 2o2 HHWB | Done | DT Class A1 [%] | 47.16 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.3 Auto Check of Echo and DoubleTalk Requirements HHWB V3 | Ok | , 4.3.3 Echo path - Echo Control Characteristics (ECC) | 28.00 | 20230324\_Kraken\_15\_930\_2\_raw |
| Calc for 4.3.4 SND attn. during DT - 1o2 HHWB | Done | Attenuation during double talk [dB] | 2.60 | 20230324\_Kraken\_15\_930\_2\_raw |
| Calc for 4.3.4 SND attn. during DT - 2o2 HHWB | Done | Attenuation during double talk [dB] | 6.26 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.4 Echo path - SND attn. during DT - Both - Default | Ok | Calculated Value [dB] | 6.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Info for 4.3.8 Receive path - maximum output level | Done | Level [dB20μPa], 0 | 69.73 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph fo 4.3.8 EQUEST analysis - max vol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.3.8 EQUEST Lvl vs time vs freq - MaxVol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (male) 1/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (female) 2/6 | Ok | MOS | 5.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (male) 3/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (male) 4/6 | Ok | MOS | 4.6 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (female) 5/6 | Ok | MOS | 4.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.3.8 EQUEST maxvol (female) 6/6 | Ok | MOS | 5.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.8 Echo path - EQUEST MAXvol - worst of 6 | Ok | Calculated Value [MOS] | 4.50 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph LevelvsTime for 4.3.9-4.3.10 ECC Seg 1and2 maxvol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.3.9-4.3.10 ECC 1o2 maxvol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.3.9-4.3.10 ECC 2o2 maxvol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.3.9 Echo Control C. SND 1o2 HHWB maxvol | Done | DT Class A1 [%] | 89.37 | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.3.9 Echo Control C. SND 2o2 HHWB maxvol | Done | DT Class A1 [%] | 57.41 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.9 Auto Check of Echo and DoubleTalk Requirements HHWB Maxvol | Ok | , Speech Based Double Talk (and Echo) | 28.00 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 SNDattn.during DT - 1o2 HHWB MaxVol Conferencing | Ok | Attenuation during double talk [dB] | 2.65 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 SNDattn.during DT - 2o2 HHWB MaxVol Conferencing | Ok | Attenuation during double talk [dB] | 5.22 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 SNDattn.during DT - 1o2 HHWB MaxVol Personal | Ok | Attenuation during double talk [dB] | 2.65 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 SNDattn.during DT - 2o2 HHWB MaxVol Personal | Ok | Attenuation during double talk [dB] | 5.22 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 Echo path - SND attn. during DT - Conferencing | Ok | Calculated Value [dB] | 5.2 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.3.10 Echo path - SND attn. during DT - Personal | Ok | Calculated Value [dB] | 5.2 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.1.10 - 3 test positions | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.1.10 Send path - freq. resp personal device | Ok | Min. dist. to tolerance scheme [V/Pa], 2000.0 Hz | 3.28 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.2.7 - 3 positions | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.2.7 Receive path - freq.resp personal device | Ok | Min. dist. to tolerance scheme [Pa/V], 1250.0 Hz | 1.36 | 20230324\_Kraken\_15\_930\_2\_raw |
| O. Record 3QUEST TS103 - noBGN | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| D. Record 3QUEST TS103 - Train | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| F. Record 3QUEST TS103 - CafeCounter | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| G. Record 3QUEST TS103 - Mensa | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| H. Record 3QUEST TS103 - CallCenter | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| I. Record 3QUEST TS103 - VoiceDistr | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| O. Analy. 3QUEST TS103 - noBGN | Done | G-MOS (Average) | 4.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| D. Analy. 3QUEST TS103 - Train | Done | G-MOS (Average) | 3.7 | 20230324\_Kraken\_15\_930\_2\_raw |
| F. Analy. 3QUEST TS103 - CafeCounter | Done | G-MOS (Average) | 3.9 | 20230324\_Kraken\_15\_930\_2\_raw |
| G. Analy. 3QUEST TS103 - Mensa | Done | G-MOS (Average) | 3.9 | 20230324\_Kraken\_15\_930\_2\_raw |
| H. Analy. 3QUEST TS103 - CallCenter | Done | G-MOS (Average) | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| I. Analy. 3QUEST TS103 - VoiceDistr | Done | G-MOS (Average) | 3.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.1 Send quality with ambient noise - avg S-MOS | Ok | Calculated Value [MOS (Avg)] | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.1 Send quality with ambient noise - avg N-MOS | Ok | Calculated Value [MOS (Avg)] | 4.1 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.1 Send quality with ambient noise - min S-MOS | Ok | Calculated Value [MOS] | 3.8 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.4 RCV path - output lvl - SpecV4 - Personal (HATS) | Ok | Level [dB20μPa(C)], 0 | 65.55 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.4 RCV output lvl - Personal - Kickstand,Tent (HATS) | Ok | Calculated Value | 65.55 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.4.5 - EQUEST analysis waveform | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.4.5 EQUEST Level vs time vs freq | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (male) 1/6 | Ok | MOS | 4.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (female) 2/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (male) 3/6 | Ok | MOS | 4.7 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (male) 4/6 | Ok | MOS | 4.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (female) 5/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.5 EQUEST RR nomvol (female) 6/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.5 Echo path - EQUEST nomvol - worst of 6 | Ok | Calculated Value [MOS] | 4.30 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.4.6 ECC Seg 1&2 reverb room | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.4.6 - ECC SND 1o2 HHWB RR nomvol | Done | DT Class A1 [%] | 92.87 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.4.6 ECC 1o2 reverb room | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.4.6 - ECC SND 2o2 HHWB RR nomvol | Done | DT Class A1 [%] | 53.13 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Level vs Time for 4.4.6 ECC 2o2 reverb room | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.6 Echo path - ECC cat F- reverb room - nominal Vol | Ok | Calculated Value [%] | 0.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.6 Echo path - ECC cat G- reverb room - nominal Vol | Ok | Calculated Value [%] | 0.0 | 20230324\_Kraken\_15\_930\_2\_raw |
| V3test Echo path - Send signal attn. during DT - RRSeq1 | Ok | Attenuation during double talk [dB] | 2.41 | 20230324\_Kraken\_15\_930\_2\_raw |
| Rec for 4.4.7 Echo path - AEC conv. time at call start | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.7 Echo path - AEC convergence time at call start | Ok | Min. dist. to tolerance scheme [dB], 5.029 s | 27.61 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.7 Echo path - AEC convergence time at call start | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph 4.4.8 Echo stability loss- no variable echo path | Done | Echo Loss [dB] | 75.12 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph 4.4.8 Echo stability loss with variable echo path | Done | Echo Loss [dB] | 74.75 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.8 Echo stability loss variable echo path - Personal | Ok | Calculated Value [dB] | 0.4 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.9 RCV path - max out lvl - SpecV4 - Personal | Ok | Level [dB20μPa(C)], 0 | 70.33 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph for 4.4.10 EQUEST Lvl vs Time - reverbroom maxvol | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path 4.4.10 - EQUEST RR maxvol (male) 1/6 | Ok | MOS | 4.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path 4.4.10 - EQUEST RR maxvol (female) 2/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.10 EQUEST RR maxvol (male) 3/6 | Ok | MOS | 4.7 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.10 EQUEST RR maxvol (male) 4/6 | Ok | MOS | 4.4 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.10 EQUEST RR maxvol (female) 5/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| Echo path - 4.4.10 EQUEST RR maxvol (female) 6/6 | Ok | MOS | 4.5 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.10 Echo path - EQUEST maxvol - worst of 6 | Ok | Calculated Value [MOS] | 4.3 | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.4.11 - ECC SND 1o2 HHWB maxvol - reverbr | Done | DT Class A1 [%] | 90.68 | 20230324\_Kraken\_15\_930\_2\_raw |
| Graph Lvl vs Time for 4.4.11 ECC Seg 1&2 maxvol reverbr | Done |  |  | 20230324\_Kraken\_15\_930\_2\_raw |
| Analysis for 4.4.11 - ECC SND 2o2 HHWB maxvol reverbr | Done | DT Class A1 [%] | 41.49 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.11 Echo path - ECC cat F- reverb room - Max Vol | Ok | Calculated Value [%] | 0.9 | 20230324\_Kraken\_15\_930\_2\_raw |
| 4.4.11 Echo path - ECC cat G- reverb room - Max Vol | Ok | Calculated Value [%] | 2.7 | 20230324\_Kraken\_15\_930\_2\_raw |
| V3test Echo path - Send signal attn. during DT - RRSeq1 | Ok | Attenuation during double talk [dB] | 3.16 | 20230324\_Kraken\_15\_930\_2\_raw |
| V3test Echo path - Send signal attn. during DT - RRSeq2 | Ok | Attenuation during double talk [dB] | 5.40 | 20230324\_Kraken\_15\_930\_2\_raw |

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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: send\_path\_signal\_level\_stabilization\_42sec\_v4.dat

Level adj. Ch1 13.0 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 42778.38 ms

Time weighting Sliding window Manual time weight. 0.2000 s

Special Features

Compensate delay 310.0000 ms (D\_SND, Delay (Cross))

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) SND - female run 1, Index: 4

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 4.1 |  |  |
| Attenuation | -0.75 dB |  |  |
| Reference |  |  |  |
| Level | -28.07 dBov | Active Speech Level | -27.06 dBov |
| Pause Level | -66.76 dBov | Activity | 58.23 % |
| SNR | 38.67 dB |  |  |
| Degraded |  |  |  |
| Level | -28.14 dBov | Active Speech Level | -26.31 dBov |
| Pause Level | -68.69 dBov | Activity | 57.74 % |
| SNR | 39.01 dB |  |  |
| Delay |  |  |  |
| Minimum | 306.9 ms | Maximum | 320.0 ms |
| Average | 311.1 ms |  |  |

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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_female\_x2\_2ch\_fullband.dat

Level adj. Ch1 15.9 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 14000.00 ms

Direction Out 1 -> In 1

Reference channel Source ch.1

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.1 Compensate loss 15.0 dB

Store to variable SND\_SWB\_F1 Run Script after snd delay start polqa f1

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) SND - male run 1, Index: 4

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 4.1 |  |  |
| Attenuation | -0.74 dB |  |  |
| Reference |  |  |  |
| Level | -28.26 dBov | Active Speech Level | -27.70 dBov |
| Pause Level | -87.52 dBov | Activity | 58.82 % |
| SNR | 38.46 dB |  |  |
| Degraded |  |  |  |
| Level | -28.36 dBov | Active Speech Level | -26.95 dBov |
| Pause Level | -89.95 dBov | Activity | 58.16 % |
| SNR | 37.90 dB |  |  |
| Delay |  |  |  |
| Minimum | 303.3 ms | Maximum | 319.2 ms |
| Average | 311.6 ms |  |  |

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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_x4\_2ch\_fullband.dat

Level adj. Ch1 16.2 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 17000.02 ms

Direction Out 1 -> In 1

Reference channel Source ch.1

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.1 Compensate loss 15.0 dB

Store to variable SND\_SWB\_M1 Run Script after snd delay next polqa m1

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) SND - female run 2, Index: 3

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 4.0 |  |  |
| Attenuation | -0.72 dB |  |  |
| Reference |  |  |  |
| Level | -28.07 dBov | Active Speech Level | -27.06 dBov |
| Pause Level | -66.76 dBov | Activity | 58.23 % |
| SNR | 38.67 dB |  |  |
| Degraded |  |  |  |
| Level | -28.10 dBov | Active Speech Level | -26.34 dBov |
| Pause Level | -69.47 dBov | Activity | 57.74 % |
| SNR | 38.86 dB |  |  |
| Delay |  |  |  |
| Minimum | 307.1 ms | Maximum | 317.3 ms |
| Average | 312.3 ms |  |  |

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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_female\_x2\_2ch\_fullband.dat

Level adj. Ch1 15.9 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 14000.00 ms

Direction Out 1 -> In 1

Reference channel Source ch.1

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.1 Compensate loss 15.0 dB

Store to file snd\_swb\_f2 Store to variable SND\_SWB\_F2

Run Script after snd delay next polqa f2

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) SND - male run 2, Index: 3

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 4.2 |  |  |
| Attenuation | -0.79 dB |  |  |
| Reference |  |  |  |
| Level | -28.26 dBov | Active Speech Level | -27.70 dBov |
| Pause Level | -87.52 dBov | Activity | 58.82 % |
| SNR | 38.46 dB |  |  |
| Degraded |  |  |  |
| Level | -28.31 dBov | Active Speech Level | -26.90 dBov |
| Pause Level | -90.13 dBov | Activity | 58.29 % |
| SNR | 37.45 dB |  |  |
| Delay |  |  |  |
| Minimum | 305.6 ms | Maximum | 316.7 ms |
| Average | 312.2 ms |  |  |

3/27/2023 4:22 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_x4\_2ch\_fullband.dat

Level adj. Ch1 16.2 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 17000.02 ms

Direction Out 1 -> In 1

Reference channel Source ch.1

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.1 Compensate loss 15.0 dB

Store to file snd\_swb\_m2 Store to variable SND\_SWB\_M2

Run Script after snd delay next polqa m2

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.1.1 Send path - total quality loss - Personal, Index: 3

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SND\_SWB\_F1 | 4.100 | 3/27/2023 | Measured | Super Wideband MOS (P.863) SND - female run 1 |
| SND\_SWB\_F2 | 4.000 | 3/27/2023 | Measured | Super Wideband MOS (P.863) SND - female run 2 |
| SND\_SWB\_M1 | 4.100 | 3/27/2023 | Measured | Super Wideband MOS (P.863) SND - male run 1 |
| SND\_SWB\_M2 | 4.200 | 3/27/2023 | Measured | Super Wideband MOS (P.863) SND - male run 2 |

(SND\_SWB\_F1+SND\_SWB\_F2+SND\_SWB\_M1+SND\_SWB\_M2)/4

Calculated Value: 4.1 MOS Ok

Ok

3/27/2023 4:22 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.2 Send path - end to end latency - Offload proc., Index: 3

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.1 - 4.1.2 Send path - total quality loss and E2E latency

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SND\_DELAY\_F1 | 311.066 ms | 3/27/2023 | Measured |  |
| SND\_DELAY\_M1 | 311.559 ms | 3/27/2023 | Measured |  |
| SND\_DELAY\_F2 | 312.290 ms | 3/27/2023 | Measured |  |
| SND\_DELAY\_M2 | 312.182 ms | 3/27/2023 | Measured |  |

(SND\_DELAY\_F1+SND\_DELAY\_M1+SND\_DELAY\_F2+SND\_DELAY\_M2) / 4

Calculated Value: 311.8 ms Not Ok

Not Ok

3/27/2023 4:23 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.4 - 4.1.5 Send path - send levels - default levels, Index: 3

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.4 - 4.1.5 Send path - send levels - default levels

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Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Stabilize AGC - signal level with quiet speech v4, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.4 - 4.1.5 Send path - send levels - default levels



3/27/2023 4:24 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: send\_path\_signal\_level\_stabilization\_42sec\_v4.dat

Level adj. Ch1 3.0 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 42778.38 ms

Time weighting Sliding window Manual time weight. 0.2000 s

Special Features

Compensate delay 313.5000 ms (D\_SND, Delay (Cross))

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.1.5 Send path - signal level quiet speech - Offload, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.4 - 4.1.5 Send path - send levels - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_lvl\_Q\_def | -15.250 dBm0 | 3/27/2023 | Measured | Meas. Send path - signal level with quiet speech v4 |

snd\_lvl\_Q\_def

Calculated Value: -15.3 Ok

Ok

3/27/2023 4:24 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Stabilize AGC - signal level with normal speech v4, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.4 - 4.1.5 Send path - send levels - default levels



3/27/2023 4:25 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: send\_path\_signal\_level\_stabilization\_42sec\_v4.dat

Level adj. Ch1 13.0 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 42778.38 ms

Time weighting Sliding window Manual time weight. 0.2000 s

Special Features

Compensate delay 313.5000 ms (D\_SND, Delay (Cross))

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.1.4 Send path - signal level normal speech - Offload, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.4 - 4.1.5 Send path - send levels - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_lvl\_N\_def | -15.120 dBm0 | 3/27/2023 | Measured | Meas.4.1.4 Send path - signal lvl with normal speech v4 |

snd\_lvl\_N\_def

Calculated Value: -15.1 Ok

Ok

3/27/2023 4:25 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.6 - 4.1.8 Send noise and interf. - default levels, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels

3/27/2023 4:25 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph - noise spectrum idle ch. 4.1.6 - active ch.4.1.7, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels



3/27/2023 4:27 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.6 Send path - idle channel SNR - Offload, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_speech\_spnr | -14.580 dBm0 | 3/27/2023 | Measured | Graph for 4.1.6 - 4.1.7 - speech level |
| snd\_noise\_idle | -79.130 dBm0 | 3/27/2023 | Measured | Graph for 4.1.6 - idle channel noise A-weight |

snd\_speech\_spnr - snd\_noise\_idle

Calculated Value: 65 Ok

Ok

3/27/2023 4:27 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.7 Send path - active channel SpNR - Offload, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_speech\_spnr | -14.580 dBm0 | 3/27/2023 | Measured | Graph for 4.1.6 - 4.1.7 - speech level |
| snd\_noise\_active | -86.090 dBm0 | 3/27/2023 | Measured | Graph for 4.1.7 - active channel noise |

snd\_speech\_spnr - snd\_noise\_active

Calculated Value: 72 Ok

Ok

3/27/2023 4:27 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.7 Send path - active channel SpNR - RAW, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_speech\_spnr | -14.580 dBm0 | 3/27/2023 | Measured | Graph for 4.1.6 - 4.1.7 - speech level |
| snd\_noise\_active | -86.090 dBm0 | 3/27/2023 | Measured | Graph for 4.1.7 - active channel noise |

snd\_speech\_spnr - snd\_noise\_active

Calculated Value: 72 Ok

Ok

3/27/2023 4:27 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.8 Single Frequency Interference SND, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels



Absolute minimal distance

1.35 dB at 808.6 Hz Ok

Ok

3/27/2023 4:27 PM ACQUA 4.0.220

If this tescase shows a failing result then please check next SMD for the peak noise level value.

If the peak interference noise level measured is below -80dBV then the result of send interference noise test can be marked as Pass over ruling the calculated result.

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysed: snd\_noise\_idle.dat

Graph for 4.1.6 - idle channel noise A-weight

Analysis

Direction Out 1 -> In 1

Range start 12000.00 ms Range length 1000.00 ms

Use FIR Filter Ch1 FIR filter a-filter

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Tol. scheme file snd\_sfi\_1.tol Min. freq. for tol. 100.0 Hz

Auto adjust No Max. freq. for tol. 12000.0 Hz

4.1.8 Single Frequency Interference PEAK -80 dBV SND, Index: 2

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.6 - 4.1.8 Send path - send noise and interference - default levels

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| snd\_interference | -92.230 dB[V] | 3/27/2023 | Measured | Graph for 4.1.8 - single frequency interference |

snd\_interference

Calculated Value: -92.23 dBV Ok

Ok

3/27/2023 4:27 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.1.9 - distortion and noise, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.9 Send path – send distortion and noise



3/27/2023 4:30 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.9 Send path - distortion and noise, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.9 Send path – send distortion and noise

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 'ID' | 'Variable Name' | 'Distortion Value' | 'LowerLimit' | 'Frequency Range' | 'Pass/Fail' |
| 1 | 'iso24\_89\_HS' | 38.65 | 30 | '224...282 Hz' | 'Pass' |
| 2 | 'iso25\_89\_HS' | -14.38 | 30 | '282...355 Hz' | 'Failed' |
| 3 | 'iso26\_89\_HS' | -18.98 | 30 | '355...447 Hz' | 'Failed' |
| 4 | 'iso27\_89\_HS' | -16.87 | 30 | '447...562 Hz' | 'Failed' |
| 5 | 'iso28\_89\_HS' | -18.41 | 30 | '562...708 Hz' | 'Failed' |
| 6 | 'iso29\_89\_HS' | -17.52 | 30 | '708...891 Hz' | 'Failed' |
| 7 | 'iso30\_89\_HS' | -16.78 | 30 | '891...1122 Hz' | 'Failed' |
| 8 | 'iso31\_89\_HS' | -13.21 | 30 | '1122...1413 Hz' | 'Failed' |
| 9 | 'iso32\_89\_HS' | -12.37 | 30 | '1413...1778 Hz' | 'Failed' |
| 10 | 'iso33\_89\_HS' | -11.31 | 30 | '1778...2239 Hz' | 'Failed' |
| 11 | 'iso34\_89\_HS' | -12.85 | 30 | '2239...2818 Hz' | 'Failed' |
| 12 | 'iso35\_89\_HS' | -14.38 | 30 | '2818...3548 Hz' | 'Failed' |
| 13 | 'iso36\_89\_HS' | -7.61 | 30 | '3548...4467 Hz' | 'Failed' |
| 14 | 'iso37\_89\_HS' | -0.28 | 28 | '4467...5623 Hz' | 'Failed' |

Noise and Speech plots (0,-6,-12,-15,-21dB), Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.11 Send path - noise level with max mic gain



3/27/2023 4:35 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Speech and Noise level at various gains, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.11 Send path - noise level with max mic gain

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| noise\_m3 | -84.580 dBm0(A) | 3/27/2023 | Measured | Normal speech -3dB - noise level |
| noise\_m6 | -85.030 dBm0(A) | 3/27/2023 | Measured | Normal speech -6dB - noise level |
| noise\_m9 | -84.580 dBm0(A) | 3/27/2023 | Measured | Normal speech -9dB - noise level |
| noise\_m12 | -84.610 dBm0(A) | 3/27/2023 | Measured | Normal speech -12dB - noise level |
| noise\_m15 | -86.610 dBm0(A) | 3/27/2023 | Measured | Normal speech -15dB - noise level |
| noise\_m18 | -86.350 dBm0(A) | 3/27/2023 | Measured | Normal speech -18dB - noise level |
| noise\_m21 | -86.170 dBm0(A) | 3/27/2023 | Measured | Normal speech -21dB - noise level |
| speech\_0 | -14.680 dBm0 | 3/27/2023 | Measured | Normal speech 0dB - speech level |
| speech\_m6 | -15.270 dBm0 | 3/27/2023 | Measured | Normal speech -6dB - speech level |
| speech\_m12 | -15.740 dBm0 | 3/27/2023 | Measured | Normal speech -12dB - speech level |
| speech\_m18 | -16.410 dBm0 | 3/27/2023 | Measured | Normal speech -18dB - speech level |

max ( max ( max ( max ( max ( max (noise\_m3, noise\_m6), noise\_m9), noise\_m12) , noise\_m15), noise\_m18) , noise\_m12)

Calculated Value: -84.6

3/27/2023 4:35 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.11 Send path - noise level change at max mic gain, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ 4.1.11 Send path - noise level with max mic gain

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| noise\_m15 | -86.610 dBm0(A) | 3/27/2023 | Measured | Normal speech -15dB - noise level |
| noise\_m18 | -86.350 dBm0(A) | 3/27/2023 | Measured | Normal speech -18dB - noise level |
| noise\_m21 | -86.170 dBm0(A) | 3/27/2023 | Measured | Normal speech -21dB - noise level |
| noise\_0 | -84.880 dBm0(A) | 3/27/2023 | Measured | Normal speech 0dB - noise level |

((noise\_m15+noise\_m18+noise\_m21)/3) - noise\_0

Calculated Value: -1.5 dB Ok

Ok

3/27/2023 4:35 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Send path - activations sensitivity - filtered, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysed: snd\_activation\_fives\_unfiltered.dat

Imported by Wave2HDF

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 21500.00 ms

Use FIR Filter Ch1 FIR filter snd\_act\_freqresp

Special Features

Store to file snd\_act\_fives\_filtered\_source Run Script after snd\_act\_combine

4.1.3 Send path - activation sensitivity -20dBPa marker, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 21500.00 ms

Time weighting Manual Manual time weight. 0.0050 s

Tol. scheme file snd\_act.tol Min. time for tol. 0.000 s

Auto adjust No Max. time for tol. 10.000 s

Special Features

Channel combination Ch 1 minus ch 2

Calc. for 4.1.3 - SND activation- lvl vs time - first 8, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 8500.00 ms

Time weighting Sliding window Manual time weight. 0.0125 s

Tol. scheme file snd\_act.tol Min. time for tol. 315.000 s

Auto adjust No Max. time for tol. 3150.000 s

4.1.3 Send path - activation sensitivity -20dBPa, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 4500.00 ms Range length 600.00 ms

Time weighting Manual Manual time weight. 0.0050 s

Tol. scheme file snd\_act.tol Min. time for tol. 0.000 s

Auto adjust No Max. time for tol. 10.000 s

Special Features

Channel combination Ch 1 minus ch 2

4.1.3 Send path - activation sensitivity -23dBPa marker, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 21500.00 ms

Time weighting Manual Manual time weight. 0.0050 s

Tol. scheme file snd\_act\_-27.tol Min. time for tol. 0.000 s

Auto adjust No Max. time for tol. 10.000 s

Special Features

Channel combination Ch 1 minus ch 2

Calc. for 4.1.3 - SND activation- lvl vs time - first 8, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 8500.00 ms

Time weighting Sliding window Manual time weight. 0.0125 s

Tol. scheme file snd\_act\_-27.tol Min. time for tol. 315.000 s

Auto adjust No Max. time for tol. 3150.000 s

4.1.3 Send path - activation sensitivity -23dBPa, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.3 Send path - activation level (no dAGC)



3/27/2023 4:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 1500.00 ms Range length 600.00 ms

Time weighting Manual Manual time weight. 0.0050 s

Special Features

Channel combination Ch 1 minus ch 2

Stabilize AGC - signal level with normal speech, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.12 Send path – signal level with normal speech from device (no dAGC)



3/27/2023 4:39 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: send\_path\_signal\_level\_stabilization\_22sec\_v4.dat

Level adj. Ch1 13.0 dB Level adj. Ch2 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 22000.00 ms

Time weighting Fast

Special Features

Compensate delay 321.3000 ms (D\_SND, Delay (Cross))

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.1.12 Send path - signal lvl - normal speech - no dAGC, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 Send path testing - anechoic \ Send path testing - no Teams dAGC \ 4.1.12 Send path – signal level with normal speech from device (no dAGC)



Level SND(1): -14.50 dBm0 Ok

Ok

3/27/2023 4:40 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 2way\_slevel\_rcv\_snd\_lvl\_4sent\_v4.dat

Level adj. Ch1 13.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 15700.00 ms Range length 8900.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Freq. range 1 min. 100.0 Hz

Special Features

Compensate delay 321.3000 ms (D\_SND, Delay (Cross))

Store to variable snd\_normal\_no\_dagc

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.1 Receive path - output lvl - Spec V4 - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.1 Receive path - output level - Handheld/Personal

Level RCV(2): 65.23 dB20μPa Ok

Ok

3/27/2023 4:40 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 4.2.1\_rcv\_level\_v4.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 250.00 ms Range length 10200.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Freq. range 1 min. 100.0 Hz

Special Features

Compensate delay 150.2000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_nom\_level

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.1 Receive output level - Personal - Kickstand, Tent, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.1 Receive path - output level - Handheld/Personal

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rcv\_nom\_level | 65.230 dB20μPa | 3/27/2023 | Measured | 4.2.1 Receive path - output lvl - Spec V4 - Personal |

rcv\_nom\_level

Calculated Value: 65.23 Ok

Ok

3/27/2023 4:40 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Super Wideband MOS (P.863) RCV - female run 1, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 3.8 |  |  |
| Attenuation | -1.81 dB |  |  |
| Reference |  |  |  |
| Level | -28.06 dBov | Active Speech Level | -27.05 dBov |
| Pause Level | -66.75 dBov | Activity | 58.23 % |
| SNR | 38.57 dB |  |  |
| Degraded |  |  |  |
| Level | -27.53 dBov | Active Speech Level | -25.24 dBov |
| Pause Level | -50.72 dBov | Activity | 58.06 % |
| SNR | 37.56 dB |  |  |
| Delay |  |  |  |
| Minimum | 143.2 ms | Maximum | 152.2 ms |
| Average | 148.5 ms |  |  |

3/27/2023 4:41 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_female\_x2\_2ch\_superwideband.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 14000.00 ms

Direction Out 2 -> In 2

Reference channel Source ch.2

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.2 Store to file rcv\_swb\_f1

Store to variable RCV\_SWB\_F1 Run Script after rcv delay start polqa f1

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) RCV - male run 1, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 3.8 |  |  |
| Attenuation | -1.58 dB |  |  |
| Reference |  |  |  |
| Level | -28.27 dBov | Active Speech Level | -27.70 dBov |
| Pause Level | -88.08 dBov | Activity | 58.82 % |
| SNR | 38.45 dB |  |  |
| Degraded |  |  |  |
| Level | -28.27 dBov | Active Speech Level | -26.12 dBov |
| Pause Level | -54.82 dBov | Activity | 58.95 % |
| SNR | 36.56 dB |  |  |
| Delay |  |  |  |
| Minimum | 144.4 ms | Maximum | 151.8 ms |
| Average | 148.6 ms |  |  |

3/27/2023 4:41 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_x4\_2ch\_superwideband.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 17000.00 ms

Direction Out 2 -> In 2

Reference channel Source ch.2

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.2 Store to file rcv\_swb\_m1

Store to variable RCV\_SWB\_M1 Run Script after rcv delay next polqa m1

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) RCV - female run 2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 3.7 |  |  |
| Attenuation | -1.61 dB |  |  |
| Reference |  |  |  |
| Level | -28.06 dBov | Active Speech Level | -27.05 dBov |
| Pause Level | -66.75 dBov | Activity | 58.23 % |
| SNR | 38.57 dB |  |  |
| Degraded |  |  |  |
| Level | -27.72 dBov | Active Speech Level | -25.44 dBov |
| Pause Level | -51.12 dBov | Activity | 58.06 % |
| SNR | 36.87 dB |  |  |
| Delay |  |  |  |
| Minimum | 143.7 ms | Maximum | 153.1 ms |
| Average | 148.5 ms |  |  |

3/27/2023 4:41 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_female\_x2\_2ch\_superwideband.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 14000.00 ms

Direction Out 2 -> In 2

Reference channel Source ch.2

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.2 Store to file rcv\_swb\_f2

Store to variable RCV\_SWB\_F2 Run Script after rcv delay next polqa f2

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Super Wideband MOS (P.863) RCV - male run 2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency





|  |  |  |  |
| --- | --- | --- | --- |
| MOS-LQO | 3.8 |  |  |
| Attenuation | -1.59 dB |  |  |
| Reference |  |  |  |
| Level | -28.27 dBov | Active Speech Level | -27.70 dBov |
| Pause Level | -88.08 dBov | Activity | 58.82 % |
| SNR | 38.45 dB |  |  |
| Degraded |  |  |  |
| Level | -28.26 dBov | Active Speech Level | -26.11 dBov |
| Pause Level | -55.03 dBov | Activity | 59.21 % |
| SNR | 36.29 dB |  |  |
| Delay |  |  |  |
| Minimum | 139.8 ms | Maximum | 151.2 ms |
| Average | 147.9 ms |  |  |

3/27/2023 4:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_x4\_2ch\_superwideband.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 0.00 ms Range length 17000.00 ms

Direction Out 2 -> In 2

Reference channel Source ch.2

Calculate POLQA

Version 2.4 Mode Super-wideband

Fixed Speech Level Yes Accuracy Normal

Special Features

Show source signal Source ch.2 Store to file rcv\_swb\_m2

Store to variable RCV\_SWB\_M2 Run Script after rcv delay next polqa m2

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.2 Receive path - Total Quality Loss - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RCV\_SWB\_F1 | 3.800 | 3/27/2023 | Measured | Super Wideband MOS (P.863) RCV - female run 1 |
| RCV\_SWB\_F2 | 3.700 | 3/27/2023 | Measured | Super Wideband MOS (P.863) RCV - female run 2 |
| RCV\_SWB\_M1 | 3.800 | 3/27/2023 | Measured | Super Wideband MOS (P.863) RCV - male run 1 |
| RCV\_SWB\_M2 | 3.800 | 3/27/2023 | Measured | Super Wideband MOS (P.863) RCV - male run 2 |

(RCV\_SWB\_F1+RCV\_SWB\_F2+RCV\_SWB\_M1+RCV\_SWB\_M2)/4

Calculated Value: 3.78 MOS Ok

Ok

3/27/2023 4:42 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.2.3 Receive path - end to end latency - Offload proc., Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.2- 4.2.3 Receive path - total quality loss and E2E latency

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RCV\_DELAY\_F1 | 148.476 ms | 3/27/2023 | Measured |  |
| RCV\_DELAY\_M1 | 148.570 ms | 3/27/2023 | Measured |  |
| RCV\_DELAY\_F2 | 148.490 ms | 3/27/2023 | Measured |  |
| RCV\_DELAY\_M2 | 147.932 ms | 3/27/2023 | Measured |  |

(RCV\_DELAY\_F1+RCV\_DELAY\_M1+RCV\_DELAY\_F2+RCV\_DELAY\_M2)/4

Calculated Value: 148.37 ms Ok

Ok

3/27/2023 4:42 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.2.4 Receive - idle channel noise - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.4 - 4.2.5 Receive path idle ch. noise and SFI - Personal devices



Level: 23.74 dB20μPa(A) Ok

Ok

3/27/2023 4:43 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_dual\_spnr.dat

Level adj. Ch1 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 12000.00 ms Range length 1000.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Analysis bandwidth octave

Filter

Filter 1 Ch2

Kind Highpass Min./edge freq. 100.0 Hz

Order 4th order

Type Butterworth

Special Features

Compensate delay 147.2000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_noise\_spl

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.4 Receive - idle channel noise - Personal with Fan, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.4 - 4.2.5 Receive path idle ch. noise and SFI - Personal devices



Level: 23.57 dB20μPa(A) Ok

Ok

3/27/2023 4:43 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_dual\_spnr.dat

Level adj. Ch1 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Range start 12000.00 ms Range length 1000.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Analysis bandwidth octave

Filter

Filter 1 Ch2

Kind Highpass Min./edge freq. 100.0 Hz

Order 4th order

Type Butterworth

Special Features

Compensate delay 147.2000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_noise\_fan\_spl

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.5 Single Frequency Interference RCV , Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.4 - 4.2.5 Receive path idle ch. noise and SFI - Personal devices



Absolute minimal distance

-11.65 dB at 19151.4 Hz Not Ok

Not Ok

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If this tescase shows a failing result then please check next SMD for the peak noise level value.

If the peak interference noise level measured is below 24dBSPL then the result of receive interference noise test can be marked as Pass over ruling the calculated result.

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysed: rcv\_self\_noise.dat

Graph for 4.2.5 - idle channel noise - dBPa(A)

Analysis

Direction Out 2 -> In 2

Range start 12000.00 ms Range length 1000.00 ms

Use FIR Filter Ch2 FIR filter a-filter

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Tol. scheme file rcv\_sfi\_1.tol Min. freq. for tol. 100.0 Hz

Auto adjust No Max. freq. for tol. 20000.0 Hz

4.2.5 Single Frequency Interference PEAK 24dB20uPa RCV, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.4 - 4.2.5 Receive path idle ch. noise and SFI - Personal devices

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rcv\_interference | -85.770 dB[Pa] | 3/27/2023 | Measured | Graph for 4.2.5 - single frequency interference dBPa(A) |

rcv\_interference+94

Calculated Value: 8.23 dB20uPa Ok

Ok

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Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Receive path - freq. resp. 1/12oct for SDNR reference, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.6 Receive path – distortion and noise



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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: p50\_male\_swb.dat

Level adj. Ch1 -90.0 dB

Imported by Wave2HDF

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 400.00 ms Range length 10300.00 ms

Frequency base 12th octave DIN Row Row B

Method FFT

FFT size 16384 Overlap 75 %

Window function. Hanning

Reference file rcv\_swb\_ref\_1\_14\_.fft

Special Features

Compensate delay 145.0000 ms (D\_RCV, Delay (Cross))

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.6 Receive path - distortion and noise - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.6 Receive path – distortion and noise

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 'ID' | 'Variable Name' | 'Distortion Value' | 'LowerLimit' | 'Frequency Range' | 'Pass/Fail' |
| 1 | 'iso24\_16\_HS' | 18.92 | 0 | '224...282 Hz' | 'Pass' |
| 2 | 'iso25\_16\_HS' | 20.98 | 0 | '282...355 Hz' | 'Pass' |
| 3 | 'iso26\_16\_HS' | 23.84 | 0 | '355...447 Hz' | 'Pass' |
| 4 | 'iso27\_16\_HS' | 28.58 | 0 | '447...562 Hz' | 'Pass' |
| 5 | 'iso28\_16\_HS' | 34.7 | 20 | '562...708 Hz' | 'Pass' |
| 6 | 'iso29\_16\_HS' | 36.3 | 22 | '708...891 Hz' | 'Pass' |
| 7 | 'iso30\_16\_HS' | 43.37 | 24 | '891...1122 Hz' | 'Pass' |
| 8 | 'iso31\_16\_HS' | 47.2 | 24 | '1122...1413 Hz' | 'Pass' |
| 9 | 'iso32\_16\_HS' | 42.56 | 24 | '1413...1778 Hz' | 'Pass' |
| 10 | 'iso33\_16\_HS' | 46.37 | 24 | '1778...2239 Hz' | 'Pass' |
| 11 | 'iso34\_16\_HS' | 44.68 | 24 | '2239...2818 Hz' | 'Pass' |
| 12 | 'iso35\_16\_HS' | 42.57 | 24 | '2818...3548 Hz' | 'Pass' |
| 13 | 'iso36\_16\_HS' | 42.66 | 24 | '3548...4467 Hz' | 'Pass' |
| 14 | 'iso37\_16\_HS' | 43.49 | 24 | '4467...5623 Hz' | 'Pass' |

4.2.6 Receive path - distortion and noise - Conferencing, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.6 Receive path – distortion and noise

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 'ID' | 'Variable Name' | 'Distortion Value' | 'LowerLimit' | 'Frequency Range' | 'Pass/Fail' |
| 1 | 'iso24\_16\_HS' | 18.92 | 20 | '224...282 Hz' | 'Failed' |
| 2 | 'iso25\_16\_HS' | 20.98 | 20 | '282...355 Hz' | 'Pass' |
| 3 | 'iso26\_16\_HS' | 23.84 | 22 | '355...447 Hz' | 'Pass' |
| 4 | 'iso27\_16\_HS' | 28.58 | 24 | '447...562 Hz' | 'Pass' |
| 5 | 'iso28\_16\_HS' | 34.7 | 24 | '562...708 Hz' | 'Pass' |
| 6 | 'iso29\_16\_HS' | 36.3 | 24 | '708...891 Hz' | 'Pass' |
| 7 | 'iso30\_16\_HS' | 43.37 | 24 | '891...1122 Hz' | 'Pass' |
| 8 | 'iso31\_16\_HS' | 47.2 | 24 | '1122...1413 Hz' | 'Pass' |
| 9 | 'iso32\_16\_HS' | 42.56 | 24 | '1413...1778 Hz' | 'Pass' |
| 10 | 'iso33\_16\_HS' | 46.37 | 24 | '1778...2239 Hz' | 'Pass' |
| 11 | 'iso34\_16\_HS' | 44.68 | 24 | '2239...2818 Hz' | 'Pass' |
| 12 | 'iso35\_16\_HS' | 42.57 | 24 | '2818...3548 Hz' | 'Pass' |
| 13 | 'iso36\_16\_HS' | 42.66 | 24 | '3548...4467 Hz' | 'Pass' |
| 14 | 'iso37\_16\_HS' | 43.49 | 24 | '4467...5623 Hz' | 'Pass' |

Rec. for Receive path - low signal DRC gain - dB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.8 Receive path- low signal DRC gain V4



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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: ieee\_male\_dual\_spnr\_during\_speech\_rcv\_v4(-20db).dat

Level adj. Ch1 -90.0 dB Level adj. Ch2 -3.0 dB

Imported by Wave2HDF

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 0.00 ms Range length 13267.10 ms

Time weighting Manual Manual time weight. 0.1250 s

Filter

Filter 1 Ch2

Kind Highpass Min./edge freq. 200.0 Hz

Order 4th order

Type Butterworth

Special Features

Compensate delay 161.4000 ms (D\_RCV, Delay (Cross))

Store to file rcv\_spnr\_speech

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

4.2.8 Rcv path - dynamic vol.compression - quiet signal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.2 Receive path testing - anechoic \ 4.2.8 Receive path- low signal DRC gain V4

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DRC\_gain\_1 | -60.830 dBm0 | 3/27/2023 | Measured | Analysis dynamic vol.compression - quiet signal beg. |
| DRC\_gain\_2 | -60.950 dBm0 | 3/27/2023 | Measured | Analysis dynamic vol.compression - quiet signal end. |

DRC\_gain\_2 - DRC\_gain\_1

Calculated Value: -0.12 Ok

Ok

3/27/2023 4:48 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.3.1 terminal coupling loss (TCL) - SWB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.1 Echo Path - Terminal Coupling Loss (TCL) - nominal volume





Echo Loss: 74.58 dB

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Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: fb\_male\_female\_single-talk\_seq\_compressedx2+ne.dat

Level adj. Ch1 13.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 1 Calculate Echo loss (100..11000 Hz)

Range start 46600.00 ms Range length 35000.00 ms

Frequency base 12th octave DIN Row Row A

Method FFT

FFT size 8192 Overlap 75 %

Window function. Rect

Reference file tclw\_1\_12\_1.fft

Special Features

Show source signal Source ch.2

Compensate delay 417.7000 ms (D\_ECHO, Calculated Value)

Store to file echo\_tcl Store to variable tcl

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Graph for 4.3.1 terminal coupling loss - lvl vs. time, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.1 Echo Path - Terminal Coupling Loss (TCL) - nominal volume



3/27/2023 4:51 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 46600.00 ms Range length 35000.00 ms

Frequency base Transformation

FFT size 4096 Overlap 0 %

Window function. Hanning Smooth Off

4.3.1 Echo path - terminal coupling loss (TCL) , Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.1 Echo Path - Terminal Coupling Loss (TCL) - nominal volume

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| tcl | 74.580 dB | 3/27/2023 | Measured | Graph for 4.3.1 terminal coupling loss (TCL) - SWB |
| snd\_normal\_tcl | -14.830 dBm0 | 3/27/2023 | Measured | Send path - signal level with normal speech for TCL |

tcl + (snd\_normal\_tcl-(-18))

Calculated Value: 78 dB Ok

Ok

3/27/2023 4:51 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.3.2 - EQUEST analysis waveform, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



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Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 30000.00 ms

Time weighting Manual Manual time weight. 0.0500 s

Special Features

Compensate delay 424.7000 ms (D\_ECHO, Calculated Value)

Graph for 4.3.2 EQUEST Level vs time vs freq, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



3/27/2023 4:52 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 30000.00 ms

Frequency base Transformation

FFT size 4096 Overlap 0 %

Window function. Hanning Smooth Off

Echo path - 4.3.2 EQUEST nomvol (male) 1/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.6 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -87.97 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.37 % |  |

Ok

3/27/2023 4:52 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 400.00 ms Range length 3300.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_1

Echo path - 4.3.2 EQUEST nomvol (female) 2/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.9 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -87.97 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.46 % |  |

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 4000.00 ms Range length 4100.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_2

Echo path - 4.3.2 EQUEST nomvol (male) 3/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -87.59 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.14 % |  |

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 11000.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_3

Echo path - 4.3.2 EQUEST nomvol (male) 4/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.4 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.22 % |  |

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 15000.00 ms Range length 3500.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_4

Echo path - 4.3.2 EQUEST nomvol (female) 5/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.8 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -48.86 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.46 % |  |

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 21500.00 ms Range length 4000.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_5

Echo path - 4.3.2 EQUEST nomvol (female) 6/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume



|  |  |  |
| --- | --- | --- |
| MOS | 5.0 | Ok |
| Delay | 424.7 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.43 % |  |

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 25600.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_6

4.3.2 Echo path - EQUEST nomvol - worst of 6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.2 Echo Path - EQUEST WB MOS at nominal volume

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| equest\_nom\_1 | 4.600 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (male) 1/6 |
| equest\_nom\_2 | 4.900 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (female) 2/6 |
| equest\_nom\_3 | 4.500 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (male) 3/6 |
| equest\_nom\_4 | 4.400 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (male) 4/6 |
| equest\_nom\_5 | 4.800 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (female) 5/6 |
| equest\_nom\_6 | 5.000 | 3/27/2023 | Measured | Echo path - 4.3.2 EQUEST nomvol (female) 6/6 |

min ( min ( min( min ( min (equest\_nom\_1, equest\_nom\_2), equest\_nom\_3) ,equest\_nom\_4) ,equest\_nom\_5) ,equest\_nom\_6)

Calculated Value: 4.4 MOS Ok

Ok

3/27/2023 4:53 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.3.3-4.3.4 Echo path - ECC and SND attn - default lvl, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def

3/27/2023 4:55 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph Level vs Time for 4.3.4 ECC Seg 1and 2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



3/27/2023 4:57 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 35000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Graph Level vs Time for 4.3.4 ECC 1o2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



3/27/2023 4:57 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 20000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.3.3. Echo Control Charac SND 1o2 HHWB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT 0.001 s | Delay SND vs Source 0.002 s |
| DT Class A1 85.22 % | ST Class A1 95.67 % |
| DT Class A2 10.10 % | ST Class A2 1.62 % |
| DT Class A1+A2 95.32 % | ST Class A1+A2 97.29 % |
| DT Class B 1.23 % | ST Class B 0.23 % |
| DT Class C 0.00 % | ST Class C 1.85 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 1.72 % | ST Class E 0.34 % |
| DT Class F 1.72 % | ST Class F 0.30 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 0.13 dB | ST Avg. Level A1 -0.19 dB |
| DT Avg. Level A2 -6.92 dB | ST Avg. Level A2 -8.45 dB |
| DT Avg. Level B -18.35 dB | ST Avg. Level B -24.70 dB |
| DT Avg. Level C 0.00 dB | ST Avg. Level C -20.03 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 4.00 dB | ST Avg. Level E 9.16 dB |
| DT Avg. Level F 4.00 dB | ST Avg. Level F 6.80 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/27/2023 4:58 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after fr\_spdt\_uc3

Graph Level vs Time for 4.3.4 ECC 2o2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



3/27/2023 4:58 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 43500.00 ms Range length 15000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.3.3. Echo Control Charac. SND 2o2 HHWB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT 0.001 s | Delay SND vs Source 0.002 s |
| DT Class A1 47.16 % | ST Class A1 97.10 % |
| DT Class A2 43.09 % | ST Class A2 0.75 % |
| DT Class A1+A2 90.25 % | ST Class A1+A2 97.85 % |
| DT Class B 1.06 % | ST Class B 0.28 % |
| DT Class C 5.23 % | ST Class C 0.00 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 2.93 % | ST Class E 0.09 % |
| DT Class F 0.53 % | ST Class F 1.78 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 -0.97 dB | ST Avg. Level A1 -0.29 dB |
| DT Avg. Level A2 -7.54 dB | ST Avg. Level A2 -7.45 dB |
| DT Avg. Level B -24.99 dB | ST Avg. Level B -22.20 dB |
| DT Avg. Level C -19.52 dB | ST Avg. Level C 0.00 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 6.48 dB | ST Avg. Level E 27.65 dB |
| DT Avg. Level F 4.50 dB | ST Avg. Level F 13.13 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/27/2023 4:58 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after fr\_spdt\_uc3

4.3.3 Echo path - Echo Control Characteristics (ECC), Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. | TalkType | Segm. | Category | UseCase&BW | Percentage | Req. Perc. | Pass/Fail |
| 0 | DoubleTalk | 1 | A1+A2 | HHWB | 95.32 % | > 0 % | Pass(2) |
| 4 | DoubleTalk | 1 | E | HHWB | 1.72 % | < 100 % | Pass(2) |
| 5 | DoubleTalk | 1 | F | HHWB | 1.72 % | < 5 % | Pass(2) |
| 6 | DoubleTalk | 1 | G | HHWB | 0.00 % | < 5 % | Pass(2) |
| 7 | SingleTalk | 1 | A1+A2 | HHWB | 97.29 % | > 0 % | Pass(2) |
| 11 | SingleTalk | 1 | E | HHWB | 0.34 % | < 100 % | Pass(2) |
| 12 | SingleTalk | 1 | F | HHWB | 0.30 % | < 5 % | Pass(2) |
| 13 | SingleTalk | 1 | G | HHWB | 0.00 % | < 5 % | Pass(2) |
| 14 | DoubleTalk | 2 | A1+A2 | HHWB | 90.25 % | > 0 % | Pass(2) |
| 18 | DoubleTalk | 2 | E | HHWB | 2.93 % | < 100 % | Pass(2) |
| 19 | DoubleTalk | 2 | F | HHWB | 0.53 % | < 5 % | Pass(2) |
| 20 | DoubleTalk | 2 | G | HHWB | 0.00 % | < 5 % | Pass(2) |
| 21 | SingleTalk | 2 | A1+A2 | HHWB | 97.85 % | > 0 % | Pass(2) |
| 25 | SingleTalk | 2 | E | HHWB | 0.09 % | < 100 % | Pass(2) |
| 26 | SingleTalk | 2 | F | HHWB | 1.78 % | < 5 % | Pass(2) |
| 27 | SingleTalk | 2 | G | HHWB | 0.00 % | < 5 % | Pass(2) |

All req. passed!

Calc for 4.3.4 SND attn. during DT - 1o2 HHWB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 1

Attenuation during double talk: 2.60 dB

Compensated delay: 0.001 s

3/27/2023 4:58 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after save\_dtattn\_result

Calc for 4.3.4 SND attn. during DT - 2o2 HHWB, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 2b

Attenuation during double talk: 6.26 dB

Compensated delay: 0.001 s

3/27/2023 4:58 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after save\_dtattn\_result

4.3.4 Echo path - SND attn. during DT - Both - Default, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic - nominal playback volume \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume (no dAGC) \ 4.3.3 - 4.3.4 Echo path - ECC & Send signal attenuation - nominal volume - Send level: def

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTatt\_nor\_seg1 | 2.604 | 3/27/2023 | Measured |  |
| DTatt\_nor\_seg2 | 6.255 | 3/27/2023 | Measured |  |

max (DTatt\_nor\_seg1, DTatt\_nor\_seg2)

Calculated Value: 6.3 dB Ok

Ok

3/27/2023 4:58 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Info for 4.3.8 Receive path - maximum output level, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume

Level RCV(2): 69.73 dB20μPa

3/27/2023 4:59 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 4.2.1\_rcv\_level\_v4.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement GRAS\_46AG (User def. ac. 2, -0.90 dB 1/16/2023, Measured)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 250.00 ms Range length 10200.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Freq. range 1 min. 100.0 Hz

Special Features

Compensate delay 153.1000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_maxvol

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Graph fo 4.3.8 EQUEST analysis - max vol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 30000.00 ms

Time weighting Manual Manual time weight. 0.0500 s

Special Features

Compensate delay 412.8000 ms (D\_ECHO, Calculated Value)

Graph for 4.3.8 EQUEST Lvl vs time vs freq - MaxVol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 30000.00 ms

Frequency base Transformation

FFT size 4096 Overlap 0 %

Window function. Hanning Smooth Off

Echo path - 4.3.8 EQUEST maxvol (male) 1/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.31 % |  |

Ok

3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 400.00 ms Range length 3300.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_1

Echo path - 4.3.8 EQUEST maxvol (female) 2/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 5.0 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.45 % |  |

Ok

3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 4000.00 ms Range length 4100.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_2

Echo path - 4.3.8 EQUEST maxvol (male) 3/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -87.97 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.97 % |  |

Ok

3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 11000.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_3

Echo path - 4.3.8 EQUEST maxvol (male) 4/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.6 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -87.97 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.33 % |  |

Ok

3/27/2023 5:01 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 15000.00 ms Range length 3500.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_4

Echo path - 4.3.8 EQUEST maxvol (female) 5/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 4.8 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -46.55 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.42 % |  |

Ok

3/27/2023 5:02 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 21500.00 ms Range length 4000.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_5

Echo path - 4.3.8 EQUEST maxvol (female) 6/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume



|  |  |  |
| --- | --- | --- |
| MOS | 5.0 | Ok |
| Delay | 412.8 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.43 % |  |

Ok

3/27/2023 5:02 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 25600.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_6

4.3.8 Echo path - EQUEST MAXvol - worst of 6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.8 Echo path - EQUEST MOS - Max volume

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| equest\_max\_1 | 4.500 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (male) 1/6 |
| equest\_max\_2 | 5.000 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (female) 2/6 |
| equest\_max\_3 | 4.500 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (male) 3/6 |
| equest\_max\_4 | 4.600 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (male) 4/6 |
| equest\_max\_5 | 4.800 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (female) 5/6 |
| equest\_max\_6 | 5.000 | 3/27/2023 | Measured | Echo path - 4.3.8 EQUEST maxvol (female) 6/6 |

min ( min ( min( min ( min (equest\_max\_1, equest\_max\_2), equest\_max\_3) ,equest\_max\_4) ,equest\_max\_5) ,equest\_max\_6)

Calculated Value: 4.50 MOS Ok

Ok

3/27/2023 5:02 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph LevelvsTime for 4.3.9-4.3.10 ECC Seg 1and2 maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



3/27/2023 5:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 35000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Graph Level vs Time for 4.3.9-4.3.10 ECC 1o2 maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



3/27/2023 5:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 20000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Graph Level vs Time for 4.3.9-4.3.10 ECC 2o2 maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



3/27/2023 5:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 43500.00 ms Range length 15000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.3.9 Echo Control C. SND 1o2 HHWB maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT 0.001 s | Delay SND vs Source 0.002 s |
| DT Class A1 89.37 % | ST Class A1 94.78 % |
| DT Class A2 8.21 % | ST Class A2 2.15 % |
| DT Class A1+A2 97.58 % | ST Class A1+A2 96.94 % |
| DT Class B 0.24 % | ST Class B 0.11 % |
| DT Class C 2.17 % | ST Class C 2.12 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 0.00 % | ST Class E 0.11 % |
| DT Class F 0.00 % | ST Class F 0.72 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 -0.51 dB | ST Avg. Level A1 -0.20 dB |
| DT Avg. Level A2 -7.65 dB | ST Avg. Level A2 -8.32 dB |
| DT Avg. Level B -24.25 dB | ST Avg. Level B -23.30 dB |
| DT Avg. Level C -19.16 dB | ST Avg. Level C -21.65 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 0.00 dB | ST Avg. Level E 12.71 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 7.95 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/27/2023 5:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after fr\_spdt\_uc3

Analysis for 4.3.9 Echo Control C. SND 2o2 HHWB maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT -0.024 s | Delay SND vs Source 0.002 s |
| DT Class A1 57.41 % | ST Class A1 97.46 % |
| DT Class A2 35.98 % | ST Class A2 0.75 % |
| DT Class A1+A2 93.39 % | ST Class A1+A2 98.21 % |
| DT Class B 2.12 % | ST Class B 1.32 % |
| DT Class C 3.09 % | ST Class C 0.00 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 1.41 % | ST Class E 0.47 % |
| DT Class F 0.00 % | ST Class F 0.00 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 -1.02 dB | ST Avg. Level A1 -0.34 dB |
| DT Avg. Level A2 -7.15 dB | ST Avg. Level A2 -8.63 dB |
| DT Avg. Level B -20.10 dB | ST Avg. Level B -23.37 dB |
| DT Avg. Level C -18.41 dB | ST Avg. Level C 0.00 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 4.00 dB | ST Avg. Level E 5.00 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 0.00 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/27/2023 5:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after fr\_spdt\_uc3

Speech Based Double Talk (and Echo), Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. | TalkType | Segm. | Category | UseCase&BW | Percentage | Req. Perc. | Pass/Fail |
| 0 | DoubleTalk | 1 | A1+A2 | HHWB | 97.58 % | > 0 % | Pass(2) |
| 4 | DoubleTalk | 1 | E | HHWB | 0.00 % | < 100 % | Pass(2) |
| 5 | DoubleTalk | 1 | F | HHWB | 0.00 % | < 8 % | Pass(2) |
| 6 | DoubleTalk | 1 | G | HHWB | 0.00 % | < 8 % | Pass(2) |
| 7 | SingleTalk | 1 | A1+A2 | HHWB | 96.94 % | > 0 % | Pass(2) |
| 11 | SingleTalk | 1 | E | HHWB | 0.11 % | < 100 % | Pass(2) |
| 12 | SingleTalk | 1 | F | HHWB | 0.72 % | < 8 % | Pass(2) |
| 13 | SingleTalk | 1 | G | HHWB | 0.00 % | < 8 % | Pass(2) |
| 14 | DoubleTalk | 2 | A1+A2 | HHWB | 93.39 % | > 0 % | Pass(2) |
| 18 | DoubleTalk | 2 | E | HHWB | 1.41 % | < 100 % | Pass(2) |
| 19 | DoubleTalk | 2 | F | HHWB | 0.00 % | < 8 % | Pass(2) |
| 20 | DoubleTalk | 2 | G | HHWB | 0.00 % | < 8 % | Pass(2) |
| 21 | SingleTalk | 2 | A1+A2 | HHWB | 98.21 % | > 0 % | Pass(2) |
| 25 | SingleTalk | 2 | E | HHWB | 0.47 % | < 100 % | Pass(2) |
| 26 | SingleTalk | 2 | F | HHWB | 0.00 % | < 8 % | Pass(2) |
| 27 | SingleTalk | 2 | G | HHWB | 0.00 % | < 8 % | Pass(2) |

All req. passed!

4.3.10 SNDattn.during DT - 1o2 HHWB MaxVol Conferencing, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 1

Attenuation during double talk: 2.65 dB Ok

Compensated delay: 0.001 s

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after save\_dtattn\_result

4.3.10 SNDattn.during DT - 2o2 HHWB MaxVol Conferencing, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 2a

Attenuation during double talk: 5.22 dB Ok

Compensated delay: -0.024 s

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after save\_dtattn\_result

4.3.10 SNDattn.during DT - 1o2 HHWB MaxVol Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 1

Attenuation during double talk: 2.65 dB Ok

Compensated delay: 0.001 s

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after save\_dtattn\_result

4.3.10 SNDattn.during DT - 2o2 HHWB MaxVol Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 2a

Attenuation during double talk: 5.22 dB Ok

Compensated delay: -0.024 s

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after save\_dtattn\_result

4.3.10 Echo path - SND attn. during DT - Conferencing, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTatt\_max\_seg1 | 2.650 | 3/27/2023 | Measured |  |
| DTatt\_max\_seg2 | 5.216 | 3/27/2023 | Measured |  |

max (DTatt\_max\_seg1, DTatt\_max\_seg2)

Calculated Value: 5.2 dB Ok

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.3.10 Echo path - SND attn. during DT - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.3 Echo path testing - anechoic -Max volume \ 4.3.9-4.3.10 Echo path - ECC and Send Signal Attenuation - Max volume (no dAGC)

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTatt\_max\_seg1 | 2.650 | 3/27/2023 | Measured |  |
| DTatt\_max\_seg2 | 5.216 | 3/27/2023 | Measured |  |

max (DTatt\_max\_seg1, DTatt\_max\_seg2)

Calculated Value: 5.2 dB Ok

Ok

3/27/2023 5:07 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.1.10 - 3 test positions, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 - 4.2 Frequency response tests - anechoic - speakerphone



3/27/2023 5:14 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.1.10 Send path - freq. resp personal device, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 - 4.2 Frequency response tests - anechoic - speakerphone



Absolute minimal distance

3.28 dB at 2000.0 Hz Ok

Ok

3/27/2023 5:14 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.2.7 - 3 positions, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 - 4.2 Frequency response tests - anechoic - speakerphone



3/27/2023 5:14 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.2.7 Receive path - freq.resp personal device, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Anechoic room testing \ 4.1 - 4.2 Frequency response tests - anechoic - speakerphone



Absolute minimal distance

1.36 dB at 1250.0 Hz Ok

Ok

3/27/2023 5:14 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

O. Record 3QUEST TS103 - noBGN, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:06 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_nobgn\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file no\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

D. Record 3QUEST TS103 - Train, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:07 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_train\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file train\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

F. Record 3QUEST TS103 - CafeCounter, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:09 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_cc\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file cafecounter\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

G. Record 3QUEST TS103 - Mensa, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:11 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_mensa\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file mensa\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

H. Record 3QUEST TS103 - CallCenter, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:12 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_callc\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file callcenter\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

I. Record 3QUEST TS103 - VoiceDistr, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Record

3/24/2023 3:14 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

MFE VI Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 3quest\_ng.dat

Level adj. Ch1 10.0 dB Level adj. Ch2 -90.0 dB

FULLBAND Real Speech (20 sentences) at Channel 1

FULLBAND Real Speech (according to ETSI TS 103 106 Annex C, length 83s, 25 Hz high-pass filtered) +

Pause till end of file

Signal level (ch1): -14.7 dBV active speech level

Calibration

Measurement Ch.1: Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Ch.2: GRAS\_46AG (Meas. Microphone, -0.90 dB 1/16/2023, Measured)

Output Equalization/Filter

Equalization Set GRAS\_44AB(100-14K)

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Both channels

Range start 0.00 ms Range length 83000.00 ms

Special Features

Store to file 3qu\_3rch4\_ts103\_distr\_hhwb Run Script after 3quest\_add\_clean\_ref\_5noise

Use command file voicedistr\_rcbgn

MFE VI Settings (Setting: Skype test\_Anechoic Room\_DanielWu)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

O. Analy. 3QUEST TS103 - noBGN, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.6 |
| SNR Unprocessed | 26.66 dB |
| SNR Processed | 42.36 dB |
| Delta SNR | 15.70 dB |
| Delay Processed vs. Unprocessed | 293.3 ms |
| Delay Processed vs. Clean | 290.2 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.5 |
| SNR Unprocessed | 24.79 dB |
| SNR Processed | 39.31 dB |
| Delta SNR | 14.52 dB |
| Delay Processed vs. Unprocessed | 286.2 ms |
| Delay Processed vs. Clean | 290.3 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.3 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 26.01 dB |
| SNR Processed | 42.03 dB |
| Delta SNR | 16.03 dB |
| Delay Processed vs. Unprocessed | 286.2 ms |
| Delay Processed vs. Clean | 290.3 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.6 |
| S-MOS (TS 103 106) | 4.7 |
| SNR Unprocessed | 24.25 dB |
| SNR Processed | 47.50 dB |
| Delta SNR | 23.25 dB |
| Delay Processed vs. Unprocessed | 286.5 ms |
| Delay Processed vs. Clean | 291.2 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.6 |
| SNR Unprocessed | 26.47 dB |
| SNR Processed | 38.84 dB |
| Delta SNR | 12.38 dB |
| Delay Processed vs. Unprocessed | 293.8 ms |
| Delay Processed vs. Clean | 289.2 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.5 |
| SNR Unprocessed | 23.34 dB |
| SNR Processed | 33.87 dB |
| Delta SNR | 10.53 dB |
| Delay Processed vs. Unprocessed | 286.7 ms |
| Delay Processed vs. Clean | 291.2 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.6 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 28.14 dB |
| SNR Processed | 49.50 dB |
| Delta SNR | 21.36 dB |
| Delay Processed vs. Unprocessed | 286.5 ms |
| Delay Processed vs. Clean | 291.3 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.6 |
| SNR Unprocessed | 23.90 dB |
| SNR Processed | 42.73 dB |
| Delta SNR | 18.82 dB |
| Delay Processed vs. Unprocessed | 286.8 ms |
| Delay Processed vs. Clean | 290.7 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.3 |
| S-MOS (TS 103 106) | 4.5 |
| SNR Unprocessed | 27.59 dB |
| SNR Processed | 38.62 dB |
| Delta SNR | 11.03 dB |
| Delay Processed vs. Unprocessed | 286.7 ms |
| Delay Processed vs. Clean | 290.8 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 4.7 |
| SNR Unprocessed | 25.01 dB |
| SNR Processed | 45.64 dB |
| Delta SNR | 20.62 dB |
| Delay Processed vs. Unprocessed | 287.0 ms |
| Delay Processed vs. Clean | 290.8 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.7 |
| SNR Unprocessed | 24.35 dB |
| SNR Processed | 26.14 dB |
| Delta SNR | 1.79 dB |
| Delay Processed vs. Unprocessed | 286.8 ms |
| Delay Processed vs. Clean | 291.0 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.6 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 27.03 dB |
| SNR Processed | 41.27 dB |
| Delta SNR | 14.24 dB |
| Delay Processed vs. Unprocessed | 287.2 ms |
| Delay Processed vs. Clean | 291.0 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.7 |
| SNR Unprocessed | 25.06 dB |
| SNR Processed | 34.02 dB |
| Delta SNR | 8.96 dB |
| Delay Processed vs. Unprocessed | 287.0 ms |
| Delay Processed vs. Clean | 291.2 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.6 |
| SNR Unprocessed | 25.14 dB |
| SNR Processed | 47.08 dB |
| Delta SNR | 21.94 dB |
| Delay Processed vs. Unprocessed | 287.3 ms |
| Delay Processed vs. Clean | 291.2 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 24.22 dB |
| SNR Processed | 36.20 dB |
| Delta SNR | 11.97 dB |
| Delay Processed vs. Unprocessed | 291.0 ms |
| Delay Processed vs. Clean | 290.8 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.8 |
| SNR Unprocessed | 22.81 dB |
| SNR Processed | 28.11 dB |
| Delta SNR | 5.30 dB |
| Delay Processed vs. Unprocessed | 287.2 ms |
| Delay Processed vs. Clean | 291.3 ms |

G-MOS (Average, TS 103 106): 4.3

N-MOS (Average, TS 103 106): 4.3

S-MOS (Average, TS 103 106): 4.6

G-MOS (Deviation): 0.1

N-MOS (Deviation): 0.2

S-MOS (Deviation): 0.2

3/24/2023 3:15 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

D. Analy. 3QUEST TS103 - Train, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | 0.49 dB |
| SNR Processed | 51.88 dB |
| Delta SNR | 51.39 dB |
| Delay Processed vs. Unprocessed | 289.5 ms |
| Delay Processed vs. Clean | 292.0 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | -4.01 dB |
| SNR Processed | 52.14 dB |
| Delta SNR | 56.15 dB |
| Delay Processed vs. Unprocessed | 288.3 ms |
| Delay Processed vs. Clean | 292.2 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 3.6 |
| SNR Unprocessed | -5.40 dB |
| SNR Processed | 46.00 dB |
| Delta SNR | 51.41 dB |
| Delay Processed vs. Unprocessed | 288.3 ms |
| Delay Processed vs. Clean | 292.2 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 3.6 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 54.01 dB |
| Delta SNR | 66.01 dB |
| Delay Processed vs. Unprocessed | 288.8 ms |
| Delay Processed vs. Clean | 292.3 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | -5.64 dB |
| SNR Processed | 42.23 dB |
| Delta SNR | 47.86 dB |
| Delay Processed vs. Unprocessed | 287.8 ms |
| Delay Processed vs. Clean | 291.0 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 3.9 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 0.06 dB |
| SNR Processed | 33.53 dB |
| Delta SNR | 33.46 dB |
| Delay Processed vs. Unprocessed | 288.7 ms |
| Delay Processed vs. Clean | 293.0 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 3.4 |
| N-MOS (TS 103 106) | 3.7 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 28.39 dB |
| Delta SNR | 40.39 dB |
| Delay Processed vs. Unprocessed | 288.3 ms |
| Delay Processed vs. Clean | 292.5 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 3.0 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 3.1 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 32.64 dB |
| Delta SNR | 44.64 dB |
| Delay Processed vs. Unprocessed | 288.7 ms |
| Delay Processed vs. Clean | 292.5 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | -2.54 dB |
| SNR Processed | 52.79 dB |
| Delta SNR | 55.32 dB |
| Delay Processed vs. Unprocessed | 290.2 ms |
| Delay Processed vs. Clean | 292.7 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | -10.01 dB |
| SNR Processed | 53.56 dB |
| Delta SNR | 63.58 dB |
| Delay Processed vs. Unprocessed | 288.8 ms |
| Delay Processed vs. Clean | 292.7 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.3 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 1.45 dB |
| SNR Processed | 36.47 dB |
| Delta SNR | 35.03 dB |
| Delay Processed vs. Unprocessed | 288.7 ms |
| Delay Processed vs. Clean | 293.5 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | -0.40 dB |
| SNR Processed | 45.40 dB |
| Delta SNR | 45.81 dB |
| Delay Processed vs. Unprocessed | 289.0 ms |
| Delay Processed vs. Clean | 292.8 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.7 |
| S-MOS (TS 103 106) | 3.7 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 49.22 dB |
| Delta SNR | 61.22 dB |
| Delay Processed vs. Unprocessed | 289.2 ms |
| Delay Processed vs. Clean | 293.0 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 3.4 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 50.25 dB |
| Delta SNR | 62.25 dB |
| Delay Processed vs. Unprocessed | 289.2 ms |
| Delay Processed vs. Clean | 293.0 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 3.9 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 0.80 dB |
| SNR Processed | 35.72 dB |
| Delta SNR | 34.92 dB |
| Delay Processed vs. Unprocessed | 290.7 ms |
| Delay Processed vs. Clean | 293.2 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.7 |
| S-MOS (TS 103 106) | 3.7 |
| SNR Unprocessed | -0.29 dB |
| SNR Processed | 50.67 dB |
| Delta SNR | 50.96 dB |
| Delay Processed vs. Unprocessed | 289.3 ms |
| Delay Processed vs. Clean | 293.2 ms |

G-MOS (Average, TS 103 106): 3.7

N-MOS (Average, TS 103 106): 4.5

S-MOS (Average, TS 103 106): 3.8

G-MOS (Deviation): 0.3

N-MOS (Deviation): 0.4

S-MOS (Deviation): 0.3

3/24/2023 3:16 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

F. Analy. 3QUEST TS103 - CafeCounter, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.7 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | -2.35 dB |
| SNR Processed | 48.61 dB |
| Delta SNR | 50.96 dB |
| Delay Processed vs. Unprocessed | 293.7 ms |
| Delay Processed vs. Clean | 294.0 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | -0.74 dB |
| SNR Processed | 49.47 dB |
| Delta SNR | 50.21 dB |
| Delay Processed vs. Unprocessed | 290.2 ms |
| Delay Processed vs. Clean | 294.0 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.3 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 0.67 dB |
| SNR Processed | 41.00 dB |
| Delta SNR | 40.32 dB |
| Delay Processed vs. Unprocessed | 291.2 ms |
| Delay Processed vs. Clean | 294.2 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 1.63 dB |
| SNR Processed | 44.99 dB |
| Delta SNR | 43.37 dB |
| Delay Processed vs. Unprocessed | 290.3 ms |
| Delay Processed vs. Clean | 294.2 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.7 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 5.19 dB |
| SNR Processed | 52.43 dB |
| Delta SNR | 47.24 dB |
| Delay Processed vs. Unprocessed | 294.3 ms |
| Delay Processed vs. Clean | 292.8 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | -6.45 dB |
| SNR Processed | 30.43 dB |
| Delta SNR | 36.87 dB |
| Delay Processed vs. Unprocessed | 290.5 ms |
| Delay Processed vs. Clean | 294.8 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 7.78 dB |
| SNR Processed | 32.31 dB |
| Delta SNR | 24.52 dB |
| Delay Processed vs. Unprocessed | 290.5 ms |
| Delay Processed vs. Clean | 295.0 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 3.4 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 3.5 |
| SNR Unprocessed | -2.07 dB |
| SNR Processed | 38.06 dB |
| Delta SNR | 40.13 dB |
| Delay Processed vs. Unprocessed | 291.0 ms |
| Delay Processed vs. Clean | 294.5 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 5.07 dB |
| SNR Processed | 51.89 dB |
| Delta SNR | 46.81 dB |
| Delay Processed vs. Unprocessed | 290.7 ms |
| Delay Processed vs. Clean | 294.0 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 0.00 dB |
| SNR Processed | 52.72 dB |
| Delta SNR | 52.72 dB |
| Delay Processed vs. Unprocessed | 290.7 ms |
| Delay Processed vs. Clean | 294.7 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 3.5 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 9.17 dB |
| SNR Processed | 26.66 dB |
| Delta SNR | 17.49 dB |
| Delay Processed vs. Unprocessed | 291.8 ms |
| Delay Processed vs. Clean | 295.3 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 3.00 dB |
| SNR Processed | 52.79 dB |
| Delta SNR | 49.79 dB |
| Delay Processed vs. Unprocessed | 290.8 ms |
| Delay Processed vs. Clean | 294.8 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 4.42 dB |
| SNR Processed | 37.53 dB |
| Delta SNR | 33.11 dB |
| Delay Processed vs. Unprocessed | 292.0 ms |
| Delay Processed vs. Clean | 294.8 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | -1.51 dB |
| SNR Processed | 52.68 dB |
| Delta SNR | 54.19 dB |
| Delay Processed vs. Unprocessed | 291.0 ms |
| Delay Processed vs. Clean | 294.8 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 3.9 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 4.29 dB |
| SNR Processed | 32.68 dB |
| Delta SNR | 28.40 dB |
| Delay Processed vs. Unprocessed | 292.5 ms |
| Delay Processed vs. Clean | 295.0 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 28.40 dB |
| Delta SNR | 40.40 dB |
| Delay Processed vs. Unprocessed | 291.2 ms |
| Delay Processed vs. Clean | 295.0 ms |

G-MOS (Average, TS 103 106): 3.9

N-MOS (Average, TS 103 106): 4.4

S-MOS (Average, TS 103 106): 4.0

G-MOS (Deviation): 0.2

N-MOS (Deviation): 0.5

S-MOS (Deviation): 0.1

3/24/2023 3:17 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

G. Analy. 3QUEST TS103 - Mensa, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 11.52 dB |
| SNR Processed | 44.27 dB |
| Delta SNR | 32.75 dB |
| Delay Processed vs. Unprocessed | 299.0 ms |
| Delay Processed vs. Clean | 295.8 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 7.82 dB |
| SNR Processed | 40.89 dB |
| Delta SNR | 33.07 dB |
| Delay Processed vs. Unprocessed | 292.0 ms |
| Delay Processed vs. Clean | 296.5 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 5.74 dB |
| SNR Processed | 42.75 dB |
| Delta SNR | 37.02 dB |
| Delay Processed vs. Unprocessed | 293.0 ms |
| Delay Processed vs. Clean | 296.0 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.6 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 7.71 dB |
| SNR Processed | 47.60 dB |
| Delta SNR | 39.89 dB |
| Delay Processed vs. Unprocessed | 292.2 ms |
| Delay Processed vs. Clean | 296.0 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 10.35 dB |
| SNR Processed | 45.68 dB |
| Delta SNR | 35.33 dB |
| Delay Processed vs. Unprocessed | 299.3 ms |
| Delay Processed vs. Clean | 294.7 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 4.74 dB |
| SNR Processed | 37.11 dB |
| Delta SNR | 32.37 dB |
| Delay Processed vs. Unprocessed | 292.3 ms |
| Delay Processed vs. Clean | 296.7 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 10.93 dB |
| SNR Processed | 37.94 dB |
| Delta SNR | 27.00 dB |
| Delay Processed vs. Unprocessed | 292.3 ms |
| Delay Processed vs. Clean | 296.8 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 6.40 dB |
| SNR Processed | 42.43 dB |
| Delta SNR | 36.02 dB |
| Delay Processed vs. Unprocessed | 292.8 ms |
| Delay Processed vs. Clean | 296.3 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 5.70 dB |
| SNR Processed | 37.21 dB |
| Delta SNR | 31.51 dB |
| Delay Processed vs. Unprocessed | 300.0 ms |
| Delay Processed vs. Clean | 296.5 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 5.91 dB |
| SNR Processed | 37.82 dB |
| Delta SNR | 31.91 dB |
| Delay Processed vs. Unprocessed | 292.3 ms |
| Delay Processed vs. Clean | 296.5 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 3.7 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 8.50 dB |
| SNR Processed | 27.99 dB |
| Delta SNR | 19.49 dB |
| Delay Processed vs. Unprocessed | 293.7 ms |
| Delay Processed vs. Clean | 297.2 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 9.27 dB |
| SNR Processed | 33.81 dB |
| Delta SNR | 24.54 dB |
| Delay Processed vs. Unprocessed | 292.7 ms |
| Delay Processed vs. Clean | 296.7 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.2 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 10.68 dB |
| SNR Processed | 37.59 dB |
| Delta SNR | 26.92 dB |
| Delay Processed vs. Unprocessed | 293.8 ms |
| Delay Processed vs. Clean | 296.7 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 5.23 dB |
| SNR Processed | 50.00 dB |
| Delta SNR | 44.77 dB |
| Delay Processed vs. Unprocessed | 292.8 ms |
| Delay Processed vs. Clean | 297.5 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 3.7 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 6.78 dB |
| SNR Processed | 28.02 dB |
| Delta SNR | 21.24 dB |
| Delay Processed vs. Unprocessed | 294.3 ms |
| Delay Processed vs. Clean | 296.8 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.1 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 6.98 dB |
| SNR Processed | 32.37 dB |
| Delta SNR | 25.39 dB |
| Delay Processed vs. Unprocessed | 293.0 ms |
| Delay Processed vs. Clean | 297.5 ms |

G-MOS (Average, TS 103 106): 3.9

N-MOS (Average, TS 103 106): 4.2

S-MOS (Average, TS 103 106): 4.1

G-MOS (Deviation): 0.1

N-MOS (Deviation): 0.3

S-MOS (Deviation): 0.1

3/24/2023 3:18 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

H. Analy. 3QUEST TS103 - CallCenter, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.5 |
| SNR Unprocessed | 10.51 dB |
| SNR Processed | 45.22 dB |
| Delta SNR | 34.71 dB |
| Delay Processed vs. Unprocessed | 300.8 ms |
| Delay Processed vs. Clean | 297.7 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 6.36 dB |
| SNR Processed | 45.45 dB |
| Delta SNR | 39.09 dB |
| Delay Processed vs. Unprocessed | 293.8 ms |
| Delay Processed vs. Clean | 298.3 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 12.31 dB |
| SNR Processed | 38.55 dB |
| Delta SNR | 26.24 dB |
| Delay Processed vs. Unprocessed | 294.8 ms |
| Delay Processed vs. Clean | 297.8 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.5 |
| S-MOS (TS 103 106) | 3.9 |
| SNR Unprocessed | 8.34 dB |
| SNR Processed | 45.42 dB |
| Delta SNR | 37.09 dB |
| Delay Processed vs. Unprocessed | 294.0 ms |
| Delay Processed vs. Clean | 297.8 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 17.06 dB |
| SNR Processed | 37.94 dB |
| Delta SNR | 20.88 dB |
| Delay Processed vs. Unprocessed | 301.2 ms |
| Delay Processed vs. Clean | 296.7 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 12.06 dB |
| SNR Processed | 32.29 dB |
| Delta SNR | 20.23 dB |
| Delay Processed vs. Unprocessed | 294.2 ms |
| Delay Processed vs. Clean | 298.7 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 14.24 dB |
| SNR Processed | 33.26 dB |
| Delta SNR | 19.02 dB |
| Delay Processed vs. Unprocessed | 294.2 ms |
| Delay Processed vs. Clean | 298.8 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 13.29 dB |
| SNR Processed | 45.62 dB |
| Delta SNR | 32.33 dB |
| Delay Processed vs. Unprocessed | 294.7 ms |
| Delay Processed vs. Clean | 298.2 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 11.16 dB |
| SNR Processed | 45.66 dB |
| Delta SNR | 34.50 dB |
| Delay Processed vs. Unprocessed | 301.5 ms |
| Delay Processed vs. Clean | 298.3 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 4.3 |
| N-MOS (TS 103 106) | 4.8 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 8.09 dB |
| SNR Processed | 51.87 dB |
| Delta SNR | 43.77 dB |
| Delay Processed vs. Unprocessed | 294.8 ms |
| Delay Processed vs. Clean | 298.3 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 12.90 dB |
| SNR Processed | 27.83 dB |
| Delta SNR | 14.93 dB |
| Delay Processed vs. Unprocessed | 295.5 ms |
| Delay Processed vs. Clean | 299.0 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 4.0 |
| N-MOS (TS 103 106) | 4.4 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 15.40 dB |
| SNR Processed | 41.02 dB |
| Delta SNR | 25.63 dB |
| Delay Processed vs. Unprocessed | 295.0 ms |
| Delay Processed vs. Clean | 298.5 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 15.96 dB |
| SNR Processed | 36.11 dB |
| Delta SNR | 20.15 dB |
| Delay Processed vs. Unprocessed | 298.7 ms |
| Delay Processed vs. Clean | 298.5 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 4.4 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 13.92 dB |
| SNR Processed | 50.67 dB |
| Delta SNR | 36.75 dB |
| Delay Processed vs. Unprocessed | 295.2 ms |
| Delay Processed vs. Clean | 299.3 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 3.9 |
| N-MOS (TS 103 106) | 3.8 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 16.00 dB |
| SNR Processed | 30.01 dB |
| Delta SNR | 14.00 dB |
| Delay Processed vs. Unprocessed | 296.2 ms |
| Delay Processed vs. Clean | 298.7 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 4.2 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.5 |
| SNR Unprocessed | 6.21 dB |
| SNR Processed | 32.19 dB |
| Delta SNR | 25.99 dB |
| Delay Processed vs. Unprocessed | 294.8 ms |
| Delay Processed vs. Clean | 298.8 ms |

G-MOS (Average, TS 103 106): 4.1

N-MOS (Average, TS 103 106): 4.2

S-MOS (Average, TS 103 106): 4.3

G-MOS (Deviation): 0.2

N-MOS (Deviation): 0.3

S-MOS (Deviation): 0.2

3/24/2023 3:19 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

I. Analy. 3QUEST TS103 - VoiceDistr, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN \ Analyze



|  |  |
| --- | --- |
| Time range: 16.0 .. 20.0 s |  |
| G-MOS (TS 103 106) | 3.1 |
| N-MOS (TS 103 106) | 2.8 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | 2.92 dB |
| SNR Processed | 11.78 dB |
| Delta SNR | 8.86 dB |
| Delay Processed vs. Unprocessed | 302.7 ms |
| Delay Processed vs. Clean | 299.5 ms |
| Time range: 20.0 .. 24.0 s |  |
| G-MOS (TS 103 106) | 4.1 |
| N-MOS (TS 103 106) | 4.9 |
| S-MOS (TS 103 106) | 4.0 |
| SNR Unprocessed | 2.18 dB |
| SNR Processed | 51.96 dB |
| Delta SNR | 49.79 dB |
| Delay Processed vs. Unprocessed | 295.7 ms |
| Delay Processed vs. Clean | 299.7 ms |
| Time range: 24.0 .. 28.0 s |  |
| G-MOS (TS 103 106) | 3.8 |
| N-MOS (TS 103 106) | 4.0 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 2.57 dB |
| SNR Processed | 37.73 dB |
| Delta SNR | 35.16 dB |
| Delay Processed vs. Unprocessed | 295.5 ms |
| Delay Processed vs. Clean | 299.7 ms |
| Time range: 28.0 .. 32.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 4.6 |
| S-MOS (TS 103 106) | 3.7 |
| SNR Unprocessed | 0.21 dB |
| SNR Processed | 42.25 dB |
| Delta SNR | 42.04 dB |
| Delay Processed vs. Unprocessed | 295.8 ms |
| Delay Processed vs. Clean | 299.7 ms |
| Time range: 32.0 .. 36.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 3.1 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | -1.94 dB |
| SNR Processed | 15.01 dB |
| Delta SNR | 16.95 dB |
| Delay Processed vs. Unprocessed | 303.0 ms |
| Delay Processed vs. Clean | 298.5 ms |
| Time range: 36.0 .. 40.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 3.7 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 8.94 dB |
| SNR Processed | 30.00 dB |
| Delta SNR | 21.06 dB |
| Delay Processed vs. Unprocessed | 296.0 ms |
| Delay Processed vs. Clean | 300.5 ms |
| Time range: 40.0 .. 44.0 s |  |
| G-MOS (TS 103 106) | 3.2 |
| N-MOS (TS 103 106) | 3.1 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | 14.93 dB |
| SNR Processed | 15.38 dB |
| Delta SNR | 0.46 dB |
| Delay Processed vs. Unprocessed | 295.8 ms |
| Delay Processed vs. Clean | 300.7 ms |
| Time range: 44.0 .. 48.0 s |  |
| G-MOS (TS 103 106) | 3.6 |
| N-MOS (TS 103 106) | 2.9 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 1.22 dB |
| SNR Processed | 15.39 dB |
| Delta SNR | 14.17 dB |
| Delay Processed vs. Unprocessed | 296.2 ms |
| Delay Processed vs. Clean | 300.0 ms |
| Time range: 48.0 .. 52.0 s |  |
| G-MOS (TS 103 106) | 3.1 |
| N-MOS (TS 103 106) | 1.7 |
| S-MOS (TS 103 106) | 4.4 |
| SNR Unprocessed | 2.36 dB |
| SNR Processed | -12.00 dB |
| Delta SNR | -14.36 dB |
| Delay Processed vs. Unprocessed | 296.0 ms |
| Delay Processed vs. Clean | 300.2 ms |
| Time range: 52.0 .. 56.0 s |  |
| G-MOS (TS 103 106) | 3.5 |
| N-MOS (TS 103 106) | 2.7 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | -0.60 dB |
| SNR Processed | 10.80 dB |
| Delta SNR | 11.40 dB |
| Delay Processed vs. Unprocessed | 296.3 ms |
| Delay Processed vs. Clean | 300.2 ms |
| Time range: 56.0 .. 60.0 s |  |
| G-MOS (TS 103 106) | 3.4 |
| N-MOS (TS 103 106) | 2.9 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | 4.39 dB |
| SNR Processed | 13.15 dB |
| Delta SNR | 8.77 dB |
| Delay Processed vs. Unprocessed | 297.3 ms |
| Delay Processed vs. Clean | 300.8 ms |
| Time range: 60.0 .. 64.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 4.3 |
| S-MOS (TS 103 106) | 3.8 |
| SNR Unprocessed | 1.25 dB |
| SNR Processed | 37.07 dB |
| Delta SNR | 35.82 dB |
| Delay Processed vs. Unprocessed | 296.8 ms |
| Delay Processed vs. Clean | 300.3 ms |
| Time range: 64.0 .. 68.0 s |  |
| G-MOS (TS 103 106) | 3.5 |
| N-MOS (TS 103 106) | 2.8 |
| S-MOS (TS 103 106) | 4.3 |
| SNR Unprocessed | 3.36 dB |
| SNR Processed | 10.00 dB |
| Delta SNR | 6.65 dB |
| Delay Processed vs. Unprocessed | 297.5 ms |
| Delay Processed vs. Clean | 300.5 ms |
| Time range: 68.0 .. 72.0 s |  |
| G-MOS (TS 103 106) | 3.7 |
| N-MOS (TS 103 106) | 3.5 |
| S-MOS (TS 103 106) | 4.2 |
| SNR Unprocessed | -12.00 dB |
| SNR Processed | 18.87 dB |
| Delta SNR | 30.87 dB |
| Delay Processed vs. Unprocessed | 297.0 ms |
| Delay Processed vs. Clean | 300.5 ms |
| Time range: 72.0 .. 76.0 s |  |
| G-MOS (TS 103 106) | 3.5 |
| N-MOS (TS 103 106) | 3.3 |
| S-MOS (TS 103 106) | 4.1 |
| SNR Unprocessed | 9.85 dB |
| SNR Processed | 22.86 dB |
| Delta SNR | 13.01 dB |
| Delay Processed vs. Unprocessed | 296.7 ms |
| Delay Processed vs. Clean | 302.0 ms |
| Time range: 76.0 .. 80.0 s |  |
| G-MOS (TS 103 106) | 3.1 |
| N-MOS (TS 103 106) | 3.0 |
| S-MOS (TS 103 106) | 3.7 |
| SNR Unprocessed | 13.76 dB |
| SNR Processed | 15.65 dB |
| Delta SNR | 1.90 dB |
| Delay Processed vs. Unprocessed | 296.5 ms |
| Delay Processed vs. Clean | 300.7 ms |

G-MOS (Average, TS 103 106): 3.5

N-MOS (Average, TS 103 106): 3.3

S-MOS (Average, TS 103 106): 4.1

G-MOS (Deviation): 0.3

N-MOS (Deviation): 0.8

S-MOS (Deviation): 0.2

3/24/2023 3:20 PM ACQUA 4.0.220

Meas. Setting Skype test\_Anechoic Room\_DanielWu

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 16000.00 ms Range length 4000.00 ms

Number of seq. 16 Sequence length 4000.00 ms

3QUEST Version TS 103 106 Bandwidth Wideband

Clean speech from Source File (Ch.1)

Unprocessed from Recording (Ch.2)

Special Features

Run Script after 3quest\_store\_mos\_variables

4.4.1 Send quality with ambient noise - avg S-MOS, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S\_MOS\_TS\_CALLC\_ | 4.277 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_CC\_ | 4.028 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_DISTR\_ | 4.079 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_MENSA\_ | 4.109 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_TRAIN\_ | 3.786 | 3/24/2023 | Measured |  |

1/5\*(S\_MOS\_TS\_CALLC\_ + S\_MOS\_TS\_CC\_ + S\_MOS\_TS\_DISTR\_ + S\_MOS\_TS\_MENSA\_ + S\_MOS\_TS\_TRAIN\_)

Calculated Value: 4.1 MOS (Avg) Ok

Ok

3/24/2023 3:20 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.1 Send quality with ambient noise - avg N-MOS , Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N\_MOS\_TS\_CALLC\_ | 4.228 | 3/24/2023 | Measured |  |
| N\_MOS\_TS\_CC\_ | 4.363 | 3/24/2023 | Measured |  |
| N\_MOS\_TS\_DISTR\_ | 3.331 | 3/24/2023 | Measured |  |
| N\_MOS\_TS\_MENSA\_ | 4.228 | 3/24/2023 | Measured |  |
| N\_MOS\_TS\_TRAIN\_ | 4.485 | 3/24/2023 | Measured |  |

1/5\*(N\_MOS\_TS\_CALLC\_ + N\_MOS\_TS\_CC\_ + N\_MOS\_TS\_DISTR\_ + N\_MOS\_TS\_MENSA\_ + N\_MOS\_TS\_TRAIN\_)

Calculated Value: 4.1 MOS (Avg) Ok

Ok

3/24/2023 3:20 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.1 Send quality with ambient noise - min S-MOS, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.1 - 4.4.3 Reverberant Room - Send path tests \ 4.4.1 send quality with ambient noise - Personal & Handheld speakerphone - HAE-BGN

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S\_MOS\_TS\_CALLC\_ | 4.277 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_CC\_ | 4.028 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_DISTR\_ | 4.079 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_MENSA\_ | 4.109 | 3/24/2023 | Measured |  |
| S\_MOS\_TS\_TRAIN\_ | 3.786 | 3/24/2023 | Measured |  |

( min ( min ( min ( min (S\_MOS\_TS\_CALLC\_, S\_MOS\_TS\_CC\_), S\_MOS\_TS\_DISTR\_), S\_MOS\_TS\_MENSA\_) , S\_MOS\_TS\_TRAIN\_))

Calculated Value: 3.8 MOS Ok

Ok

3/24/2023 3:20 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.4 RCV path - output lvl - SpecV4 - Personal (HATS), Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.4 Receive path - output level - Handheld/Personal (HATS)

Level RCV(2): 65.55 dB20μPa(C) Ok

Ok

3/24/2023 3:29 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

MFE VI Setting Teams\_PersonalDevice\_4.4.4~4.4.11

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 4.2.1\_rcv\_level\_v4.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement HEAD\_EAR L (Art. Head right, 0.87 dB 1/6/2016, User defined)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 250.00 ms Range length 10200.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Freq. range 1 min. 100.0 Hz

Special Features

Compensate delay 149.8000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_nom\_level\_rr\_ha

MFE VI Settings (Setting: Teams\_PersonalDevice\_4.4.4~4.4.11)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Input Equ. Ch. 2 FF

4.4.4 RCV output lvl - Personal - Kickstand,Tent (HATS), Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.4 Receive path - output level - Handheld/Personal (HATS)

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rcv\_nom\_level\_rr\_ha | 65.550 dB20μPa(C) | 3/24/2023 | Measured | 4.4.4 RCV path - output lvl - SpecV4 - Personal (HATS) |

rcv\_nom\_level\_rr\_ha

Calculated Value: 65.55 Ok

Ok

3/24/2023 3:29 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph for 4.4.5 - EQUEST analysis waveform, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



3/24/2023 3:32 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 30000.00 ms

Time weighting Manual Manual time weight. 0.0500 s

Special Features

Compensate delay 1067.5000 ms (D\_ECHO, Calculated Value)

Graph for 4.4.5 EQUEST Level vs time vs freq, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



3/24/2023 3:32 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 30000.00 ms

Frequency base Transformation

FFT size 4096 Overlap 0 %

Window function. Hanning Smooth Off

Echo path - 4.4.5 EQUEST RR nomvol (male) 1/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.3 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -89.56 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.39 % |  |

Ok

3/24/2023 3:32 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 400.00 ms Range length 3300.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_1\_rr

Echo path - 4.4.5 EQUEST RR nomvol (female) 2/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -89.56 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.64 % |  |

Ok

3/24/2023 3:32 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 4000.00 ms Range length 4100.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_2\_rr

Echo path - 4.4.5 EQUEST RR nomvol (male) 3/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.7 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -64.92 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 5.27 % |  |

Ok

3/24/2023 3:32 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 11000.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_3\_rr

Echo path - 4.4.5 EQUEST RR nomvol (male) 4/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.3 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.22 % |  |

Ok

3/24/2023 3:33 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 15000.00 ms Range length 3500.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_nom\_4\_rr

Echo path - 4.4.5 EQUEST RR nomvol (female) 5/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -41.38 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.51 % |  |

Ok

3/24/2023 3:33 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 21500.00 ms Range length 4000.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_5\_rr

Echo path - 4.4.5 EQUEST RR nomvol (female) 6/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1067.5 ms |  |
| Echo Level | -87.97 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 1.65 % |  |

Ok

3/24/2023 3:33 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 25600.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_nom\_6\_rr

4.4.5 Echo path - EQUEST nomvol - worst of 6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.5 EQUEST WB MOS at nom.playback volume output lvl in - Reveberant Room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| equest\_nom\_1\_rr | 4.300 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (male) 1/6 |
| equest\_nom\_2\_rr | 4.500 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (female) 2/6 |
| equest\_nom\_3\_rr | 4.700 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (male) 3/6 |
| equest\_nom\_4\_rr | 4.300 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (male) 4/6 |
| equest\_nom\_5\_rr | 4.500 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (female) 5/6 |
| equest\_nom\_6\_rr | 4.500 | 3/24/2023 | Measured | Echo path - 4.4.5 EQUEST RR nomvol (female) 6/6 |

min ( min ( min( min ( min (equest\_nom\_1\_rr, equest\_nom\_2\_rr), equest\_nom\_3\_rr) ,equest\_nom\_4\_rr) ,equest\_nom\_5\_rr) ,equest\_nom\_6\_rr)

Calculated Value: 4.30 MOS Ok

Ok

3/24/2023 3:33 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Graph Level vs Time for 4.4.6 ECC Seg 1&2 reverb room, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 35000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.4.6 - ECC SND 1o2 HHWB RR nomvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT -0.246 s | Delay SND vs Source -0.198 s |
| DT Class A1 92.87 % | ST Class A1 93.21 % |
| DT Class A2 5.98 % | ST Class A2 5.26 % |
| DT Class A1+A2 98.85 % | ST Class A1+A2 98.46 % |
| DT Class B 1.15 % | ST Class B 0.61 % |
| DT Class C 0.00 % | ST Class C 0.50 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 0.00 % | ST Class E 0.42 % |
| DT Class F 0.00 % | ST Class F 0.00 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 0.01 dB | ST Avg. Level A1 -0.37 dB |
| DT Avg. Level A2 -7.24 dB | ST Avg. Level A2 -7.25 dB |
| DT Avg. Level B -17.00 dB | ST Avg. Level B -19.06 dB |
| DT Avg. Level C 0.00 dB | ST Avg. Level C -16.61 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 0.00 dB | ST Avg. Level E 5.10 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 0.00 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after fr\_spdt\_uc3\_nom

Graph Level vs Time for 4.4.6 ECC 1o2 reverb room, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 20000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.4.6 - ECC SND 2o2 HHWB RR nomvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT -0.289 s | Delay SND vs Source -0.198 s |
| DT Class A1 53.13 % | ST Class A1 52.33 % |
| DT Class A2 38.52 % | ST Class A2 43.01 % |
| DT Class A1+A2 91.65 % | ST Class A1+A2 95.34 % |
| DT Class B 4.43 % | ST Class B 2.38 % |
| DT Class C 3.65 % | ST Class C 2.28 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 0.26 % | ST Class E 0.00 % |
| DT Class F 0.00 % | ST Class F 0.00 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 -1.10 dB | ST Avg. Level A1 -1.24 dB |
| DT Avg. Level A2 -7.39 dB | ST Avg. Level A2 -7.29 dB |
| DT Avg. Level B -22.74 dB | ST Avg. Level B -24.71 dB |
| DT Avg. Level C -17.39 dB | ST Avg. Level C -16.24 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 4.00 dB | ST Avg. Level E 0.00 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 0.00 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after fr\_spdt\_uc3\_nom

Graph Level vs Time for 4.4.6 ECC 2o2 reverb room, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 43500.00 ms Range length 15000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

4.4.6 Echo path - ECC cat F- reverb room - nominal Vol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTClassF\_RR\_nom\_1 | 0.000 % | 3/24/2023 | Measured | DT Class F |
| DTClassF\_RR\_nom\_2 | 0.000 % | 3/24/2023 | Measured | DT Class F |
| STClassF\_RR\_nom\_1 | 0.000 % | 3/24/2023 | Measured | ST Class F |
| STClassF\_RR\_nom\_2 | 0.000 % | 3/24/2023 | Measured | ST Class F |

max( max ( max (DTClassF\_RR\_nom\_1, DTClassF\_RR\_nom\_2), STClassF\_RR\_nom\_1) ,STClassF\_RR\_nom\_2)

Calculated Value: 0.0 % Ok

Ok

3/24/2023 3:36 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.6 Echo path - ECC cat G- reverb room - nominal Vol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTClassG\_RR\_nom\_1 | 0.000 % | 3/24/2023 | Measured | DT Class G |
| DTClassG\_RR\_nom\_2 | 0.000 % | 3/24/2023 | Measured | DT Class G |
| STClassG\_RR\_nom\_1 | 0.000 % | 3/24/2023 | Measured | ST Class G |
| STClassG\_RR\_nom\_2 | 0.000 % | 3/24/2023 | Measured | ST Class G |

max( max ( max (DTClassG\_RR\_nom\_1, DTClassG\_RR\_nom\_2), STClassG\_RR\_nom\_1) ,STClassG\_RR\_nom\_2)

Calculated Value: 0.0 % Ok

Ok

3/24/2023 3:36 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

V3test Echo path - Send signal attn. during DT - RRSeq1, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.5 - 4.4.6 Echo path - nominal volume - reverberant Room \ 4.4.6 Echo path - Echo Control Characteristics - Reverberant Room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 1

Attenuation during double talk: 2.41 dB Ok

Compensated delay: -0.246 s

Ok

3/24/2023 3:36 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after save\_dtattn\_result

Rec for 4.4.7 Echo path - AEC conv. time at call start, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.7 Echo path - AEC convergence at call start



3/24/2023 3:37 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

MFE VI Setting Teams\_PersonalDevice\_4.4.4~4.4.11

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: fb\_male\_female\_single-talk\_seq\_compressed+ne\_shorter.dat

Level adj. Ch1 13.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

Output Equalization/Filter

Equalization Set HEADMouth(100-14k)\_GRAS-46AG\_DanielWu

Channel 1 Mouth Equalization Channel 2 Off

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 41627.98 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Special Features

Show source signal Source ch.2 Store to file aec\_callstart

MFE VI Settings (Setting: Teams\_PersonalDevice\_4.4.4~4.4.11)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Input Equ. Ch. 2 FF

4.4.7 Echo path - AEC convergence time at call start, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.7 Echo path - AEC convergence at call start



Absolute minimal distance

27.61 dB at 5.029 s Ok

Ok

3/24/2023 3:37 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 20000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Tol. scheme file aec\_convergence.tol Min. time for tol. 5.000 s

Auto adjust No Max. time for tol. 15.000 s

Special Features

Store to file aec\_callstart

4.4.7 Echo path - AEC convergence time at call start, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.7 Echo path - AEC convergence at call start



3/24/2023 3:38 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 0.00 ms Range length 41627.98 ms

Frequency base Transformation

FFT size 2048 Overlap 0 %

Window function. Hanning Smooth Off

Special Features

Store to file aec\_callstart

Graph 4.4.8 Echo stability loss- no variable echo path, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.8 Echo path – stability loss with variable echo path





Echo Loss: 75.12 dB

3/24/2023 3:39 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

MFE VI Setting Teams\_PersonalDevice\_4.4.4~4.4.11

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: fb\_male\_female\_single-talk\_seq\_compressed+ne\_shorter.dat

Level adj. Ch1 13.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 1 Calculate Echo loss (100..11000 Hz)

Range start 30700.00 ms Range length 15600.00 ms

Frequency base 12th octave DIN Row Row A

Method FFT

FFT size 8192 Overlap 75 %

Window function. Rect

Reference file tclw\_1\_12\_1.fft

Special Features

Show source signal Source ch.2

Compensate delay 999.5000 ms (D\_ECHO, Calculated Value)

Store to file tcl\_not\_var Store to variable tcl\_not\_var

MFE VI Settings (Setting: Teams\_PersonalDevice\_4.4.4~4.4.11)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Input Equ. Ch. 2 FF

Graph 4.4.8 Echo stability loss with variable echo path, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.8 Echo path – stability loss with variable echo path





Echo Loss: 74.75 dB

3/24/2023 3:40 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

MFE VI Setting Teams\_PersonalDevice\_4.4.4~4.4.11

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: fb\_male\_female\_single-talk\_seq\_compressed+ne\_shorter.dat

Level adj. Ch1 13.0 dB

Imported by Wave2HDF

Calibration

Measurement Skype\_IN\_SND\_DanielWu (User def. el., -5.00 dB 1/15/2016, User defined)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 1 Calculate Echo loss (100..11000 Hz)

Range start 30700.00 ms Range length 15600.00 ms

Frequency base 12th octave DIN Row Row A

Method FFT

FFT size 8192 Overlap 75 %

Window function. Rect

Reference file tclw\_1\_12\_1.fft

Special Features

Show source signal Source ch.2

Compensate delay 999.5000 ms (D\_ECHO, Calculated Value)

Store to file tcl\_variable Store to variable tcl\_variable

MFE VI Settings (Setting: Teams\_PersonalDevice\_4.4.4~4.4.11)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Input Equ. Ch. 2 FF

4.4.8 Echo stability loss variable echo path - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.7 - 4.4.8 Echo path - convergence and stability - reverberant room \ 4.4.8 Echo path – stability loss with variable echo path

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| tcl\_not\_var | 75.120 dB | 3/24/2023 | Measured | Graph 4.4.8 Echo stability loss- no variable echo path |
| tcl\_variable | 74.750 dB | 3/24/2023 | Measured | Graph 4.4.8 Echo stability loss with variable echo path |

tcl\_not\_var - tcl\_variable

Calculated Value: 0.4 dB Ok

Ok

3/24/2023 3:40 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.9 RCV path - max out lvl - SpecV4 - Personal, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.9 - Receive path - max output level - reverberant room - HATS \ 4.4.9 - Receive path - max output level - Handheld/Personal (HATS)

Level RCV(2): 70.33 dB20μPa(C) Ok

Ok

3/24/2023 3:41 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

MFE VI Setting Teams\_PersonalDevice\_4.4.4~4.4.11

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Source: 4.2.1\_rcv\_level\_v4.dat

Level adj. Ch1 -90.0 dB

Calibration

Measurement HEAD\_EAR L (Art. Head right, 0.87 dB 1/6/2016, User defined)

External Output Gains

Channel 1 20.00 dB (Power Amp.) Channel 2 -5.00 dB

Analysis

Direction Out 2 -> In 2

Range start 250.00 ms Range length 10200.00 ms

Frequency base Transformation

FFT size 16384 Overlap 75 %

Window function. Hanning Smooth Off

Freq. range 1 min. 100.0 Hz

Special Features

Compensate delay 198.4000 ms (D\_RCV, Delay (Cross))

Store to variable rcv\_maxvol

MFE VI Settings (Setting: Teams\_PersonalDevice\_4.4.4~4.4.11)

Output Ch.1 Mouth Amp., HP Output Ch.2 AES/EBU

Input Ch.1 AES/EBU Input Ch.2 Microphone

Input Equ. Ch. 2 FF

Graph for 4.4.10 EQUEST Lvl vs Time - reverbroom maxvol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



3/24/2023 3:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 0.00 ms Range length 30000.00 ms

Time weighting Manual Manual time weight. 0.0500 s

Special Features

Compensate delay 1008.4000 ms (D\_ECHO, Calculated Value)

Echo path 4.4.10 - EQUEST RR maxvol (male) 1/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.3 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.31 % |  |

Ok

3/24/2023 3:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 400.00 ms Range length 3300.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_1\_rr

Echo path 4.4.10 - EQUEST RR maxvol (female) 2/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -85.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 5.79 % |  |

Ok

3/24/2023 3:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 4000.00 ms Range length 4100.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_2\_rr

Echo path - 4.4.10 EQUEST RR maxvol (male) 3/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.7 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -63.94 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 7.63 % |  |

Ok

3/24/2023 3:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 11000.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_3\_rr

Echo path - 4.4.10 EQUEST RR maxvol (male) 4/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.4 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -87.94 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 2.33 % |  |

Ok

3/24/2023 3:42 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 15000.00 ms Range length 3500.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Male

Special Features

Store to variable equest\_max\_4\_rr

Echo path - 4.4.10 EQUEST RR maxvol (female) 5/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -41.71 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 4.98 % |  |

Ok

3/24/2023 3:43 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 21500.00 ms Range length 4000.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_5\_rr

Echo path - 4.4.10 EQUEST RR maxvol (female) 6/6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room



|  |  |  |
| --- | --- | --- |
| MOS | 4.5 | Ok |
| Delay | 1008.4 ms |  |
| Echo Level | -87.78 dB |  |
| Avg. Delta Rel.App. | 0.00 cPa |  |
| Max. Correlation | 3.43 % |  |

Ok

3/24/2023 3:43 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Range start 25600.00 ms Range length 3800.00 ms

Direction Out 2 -> In 1

Reference channel Other channel

Bandwidth Wideband Assessment Mode Female

Special Features

Store to variable equest\_max\_6\_rr

4.4.10 Echo path - EQUEST maxvol - worst of 6, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.10 Echo path - EQUEST WB MOS with max output level - reverberant room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| equest\_max\_1\_rr | 4.300 | 3/24/2023 | Measured | Echo path 4.4.10 - EQUEST RR maxvol (male) 1/6 |
| equest\_max\_2\_rr | 4.500 | 3/24/2023 | Measured | Echo path 4.4.10 - EQUEST RR maxvol (female) 2/6 |
| equest\_max\_3\_rr | 4.700 | 3/24/2023 | Measured | Echo path - 4.4.10 EQUEST RR maxvol (male) 3/6 |
| equest\_max\_4\_rr | 4.400 | 3/24/2023 | Measured | Echo path - 4.4.10 EQUEST RR maxvol (male) 4/6 |
| equest\_max\_5\_rr | 4.500 | 3/24/2023 | Measured | Echo path - 4.4.10 EQUEST RR maxvol (female) 5/6 |
| equest\_max\_6\_rr | 4.500 | 3/24/2023 | Measured | Echo path - 4.4.10 EQUEST RR maxvol (female) 6/6 |

min ( min ( min( min ( min (equest\_max\_1\_rr, equest\_max\_2\_rr), equest\_max\_3\_rr) ,equest\_max\_4\_rr) ,equest\_max\_5\_rr) ,equest\_max\_6\_rr)

Calculated Value: 4.3 MOS Ok

Ok

3/24/2023 3:43 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis for 4.4.11 - ECC SND 1o2 HHWB maxvol - reverbr, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT 0.001 s | Delay SND vs Source -0.517 s |
| DT Class A1 90.68 % | ST Class A1 85.22 % |
| DT Class A2 8.86 % | ST Class A2 12.98 % |
| DT Class A1+A2 99.53 % | ST Class A1+A2 98.21 % |
| DT Class B 0.47 % | ST Class B 0.50 % |
| DT Class C 0.00 % | ST Class C 0.42 % |
| DT Class D 0.00 % | ST Class D 0.00 % |
| DT Class E 0.00 % | ST Class E 0.00 % |
| DT Class F 0.00 % | ST Class F 0.88 % |
| DT Class G 0.00 % | ST Class G 0.00 % |
| DT Avg. Level A1 -0.54 dB | ST Avg. Level A1 -0.64 dB |
| DT Avg. Level A2 -6.65 dB | ST Avg. Level A2 -6.89 dB |
| DT Avg. Level B -16.29 dB | ST Avg. Level B -22.11 dB |
| DT Avg. Level C 0.00 dB | ST Avg. Level C -21.64 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D 0.00 dB |
| DT Avg. Level E 0.00 dB | ST Avg. Level E 0.00 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 7.76 dB |
| DT Avg. Level G 0.00 dB | ST Avg. Level G 0.00 dB |

3/24/2023 3:45 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after fr\_spdt\_uc3\_max\_rr

Graph Lvl vs Time for 4.4.11 ECC Seg 1&2 maxvol reverbr, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room



3/24/2023 3:45 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Both channels

Range start 23500.00 ms Range length 35000.00 ms

Time weighting Sliding window Manual time weight. 0.1250 s

Analysis for 4.4.11 - ECC SND 2o2 HHWB maxvol reverbr, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

|  |  |
| --- | --- |
| Delay ST vs DT 0.001 s | Delay SND vs Source -0.516 s |
| DT Class A1 41.49 % | ST Class A1 27.32 % |
| DT Class A2 50.53 % | ST Class A2 45.06 % |
| DT Class A1+A2 92.02 % | ST Class A1+A2 72.38 % |
| DT Class B 1.51 % | ST Class B 3.98 % |
| DT Class C 3.55 % | ST Class C 9.48 % |
| DT Class D 0.00 % | ST Class D 14.17 % |
| DT Class E 0.18 % | ST Class E 0.00 % |
| DT Class F 0.00 % | ST Class F 0.00 % |
| DT Class G 2.75 % | ST Class G 0.00 % |
| DT Avg. Level A1 -1.09 dB | ST Avg. Level A1 -1.38 dB |
| DT Avg. Level A2 -6.90 dB | ST Avg. Level A2 -8.32 dB |
| DT Avg. Level B -19.85 dB | ST Avg. Level B -21.62 dB |
| DT Avg. Level C -15.81 dB | ST Avg. Level C -19.08 dB |
| DT Avg. Level D 0.00 dB | ST Avg. Level D -17.52 dB |
| DT Avg. Level E 4.00 dB | ST Avg. Level E 0.00 dB |
| DT Avg. Level F 0.00 dB | ST Avg. Level F 0.00 dB |
| DT Avg. Level G 4.00 dB | ST Avg. Level G 0.00 dB |

3/24/2023 3:46 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after fr\_spdt\_uc3\_max\_rr

4.4.11 Echo path - ECC cat F- reverb room - Max Vol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTClassF\_RR\_max\_1 | 0.000 % | 3/24/2023 | Measured | DT Class F |
| DTClassF\_RR\_max\_2 | 0.000 % | 3/24/2023 | Measured | DT Class F |
| STClassF\_RR\_max\_1 | 0.878 % | 3/24/2023 | Measured | ST Class F |
| STClassF\_RR\_max\_2 | 0.000 % | 3/24/2023 | Measured | ST Class F |

max( max ( max (DTClassF\_RR\_max\_1, DTClassF\_RR\_max\_2), STClassF\_RR\_max\_1) ,STClassF\_RR\_max\_2)

Calculated Value: 0.9 % Ok

Ok

3/24/2023 3:46 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

4.4.11 Echo path - ECC cat G- reverb room - Max Vol, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room

Correction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DTClassG\_RR\_max\_1 | 0.000 % | 3/24/2023 | Measured | DT Class G |
| DTClassG\_RR\_max\_2 | 2.748 % | 3/24/2023 | Measured | DT Class G |
| STClassG\_RR\_max\_1 | 0.000 % | 3/24/2023 | Measured | ST Class G |
| STClassG\_RR\_max\_2 | 0.000 % | 3/24/2023 | Measured | ST Class G |

max( max ( max (DTClassG\_RR\_max\_1, DTClassG\_RR\_max\_2), STClassG\_RR\_max\_1) ,STClassG\_RR\_max\_2)

Calculated Value: 2.7 % Ok

Ok

3/24/2023 3:46 PM ACQUA 4.0.220

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

V3test Echo path - Send signal attn. during DT - RRSeq1, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 2a

Attenuation during double talk: 3.16 dB Ok

Compensated delay: 0.001 s

Ok

3/24/2023 3:46 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 23500.00 ms Range length 20000.00 ms

Special Features

Run Script after save\_dtattn\_result

V3test Echo path - Send signal attn. during DT - RRSeq2, Index: 1

Speakerphones and Conference devices V4 \ Speakerphone UI - Reverberant room testing \ 4.4.4 - Receive path - output level - reverberant room - HATS \ 4.4.9 - 4.4.11 Echo path - max output level - reverberant room \ 4.4.11 Echo path - ECC with max output level - reverberant room



Single Talk & Double Talk



Level vs. Time (Double Talk) - Level vs. Time (Single Talk)

Double Talk Type: Type 2a

Attenuation during double talk: 5.40 dB Ok

Compensated delay: 0.001 s

Ok

3/24/2023 3:46 PM ACQUA 4.0.220

Meas. Setting Skype test\_Listening Room\_July\_1

Underlying Standard: Microsoft Teams Audio Specification V4.0 (April 2019)

Database Version: 40\_MS\_Teams\_Rev04SP1

Analysis

Direction Out 1 -> In 1

Range start 43500.00 ms Range length 15000.00 ms

Special Features

Run Script after save\_dtattn\_result