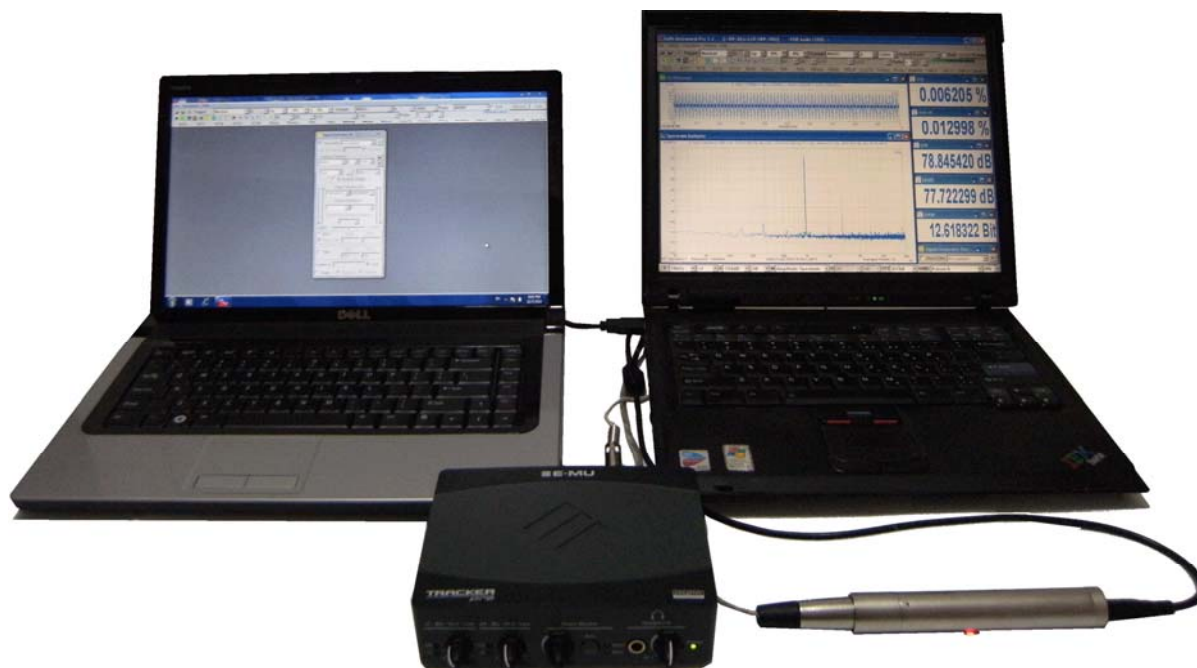


VT XLR-to-USB Pre Test Report using Multi-Instrument



Rev: 01
May 22, 2010

This report is valid only for the particular VT XLR-to-USB Pre unit we tested. The purpose of these tests was to evaluate the performance of VT XLR-to-USB Pre.

Note: VIRTINS TECHNOLOGY reserves the right to make modifications to this document at any time without notice. This document may contain typographical errors.

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1. Test Setup

- (1) VT XLR-to-USB Pre (www.virtins.com).
- (2) E-MU Tracker Pre USB2.0 Audio Interface (www.emu.com), Firmware Version: 8.04.
- (3) IBM ThinkPad R51 Laptop PC with Intel Pentium M processor 1.60 GHz, 248M RAM, 32-bit Windows XP Professional SP2.
- (4) Dell Studio 15 laptop, with 64-bit Windows 7 Professional, Intel Core 2 Duo Processor P8700 (2.53GHz/1066FSB/3MB Cache), 4GB memory.
- (5) Multi-Instrument 3.2 (Full version, Build 3.2.0.3). (21-day fully functional FREE trial available at: www.virtins.com/MIsetup.exe, or www.multi-instrument.com/MIsetup.exe)

Tips:

- *For THD measurement, use a test frequency with no spectral leakage. If you do not know what the “no spectral leakage” frequency is, just enter the test frequency you want in the Signal Generator and then tick the “no spectral leakage” option. The Signal Generator will then calculate the “no spectral leakage” frequency for you based on the current sampling frequency and FFT size. In most of cases, the “no spectral leakage” frequency is not an integer value. With a “no spectral leakage” test frequency, Rectangle window function should be used in the Spectrum Analyzer. Otherwise, Kaiser 6 window function is recommended. For both cases, the record length of the Oscilloscope should be set to a value equal or greater value than the FFT size to avoid zero padding. If the Signal Generator and the Oscilloscope do not share the same sampling clock, e.g. two sound cards are used for signal input & output respectively, then “Kaiser 6” window should always be used.*
- *The screenshots of this document are of high resolution. You can zoom in to see all the details.*

2. E-MU Tracker Pre Line Output -> VT XLR-to-USB Pre XLR

Input

As VT XLR-to-USB Pre does not have any audio output channel, we will use an E-MU Tracker Pre's output channel to generate the test signals. As indicated in the loop back test report of E-MU Tracker Pre at: http://www.virtins.com/doc/D1004/EMU_Tracker_Pre_Report_D1004.pdf, E-MU Tracker Pre has extremely excellent performance in terms of noise level, distortion, frequency response, etc.. When only its output channel is used, its performance would be even better than what was measured in that test report, because the test results in that report were contributed by both the E-MU Tracker Pre's input and output channels. The following measurements will show that the noise and distortion contributed by the E-MU Tracker Pre's output channel is negligible compared with the contribution from the VT XLR-to-USB Pre.

The following tests were carried out by connecting the Line Output of the E-MU Tracker Pre to the XLR input of the VT XLR-to-USB Pre using an in-house made 1/4" male TRS to male XLR cable. This is a balanced connection. Note that, to prevent the +48 phantom power of the VT XLR-to-USB Pre from being imposed on the Line Output of the E-MU Tracker Pre, the ground of the TRS plug and the Pin 1 of the XLR connector was not connected. This was also the reason why we used two computers here. If one computer had been used instead, the grounds of the two sound cards would have been connected through the ground of the computer itself.

2.1 Noise Level

Test Conditions

On VT XLR-to-USB Pre:

- The hardware gain switch was at LO.
- Pin 2 and Pin 3 of the XLR connector were shorted.

On E-MU Tracker Pre:
(Not used)

On Laptop:
The laptop was powered by battery.

On Windows Control Panel for VT XLR-to-USB Pre:

- [Sounds and Audio Devices]>[Sound Recording]>[USB Audio CODEC]: Not activated.
- [Sounds and Audio Devices]>[Sound Playback]>[USB Audio CODEC]: Not used.

In Multi-Instrument for VT XLR-to-USB Pre:

- MME Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 16 Bit
- Sampling Channels: A (Mono)

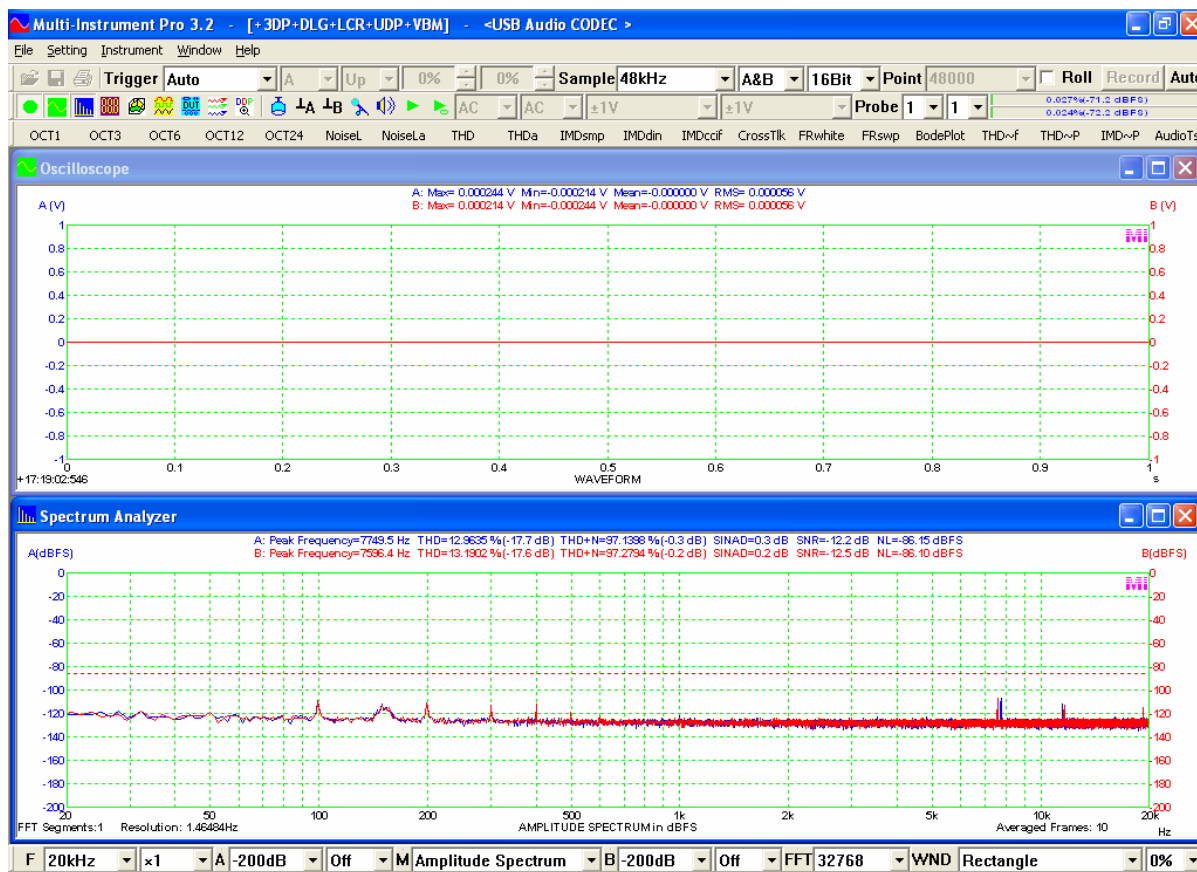
- Record Length: 48000
- FFT Size: 32768
- Window Function: Rectangle
- Noise Measurement Range: 20~20 kHz
- Linear average: 10 frames

In Multi-Instrument for E-MU Tracker Pre:
(Not used)

Test Results

Please refer to the Multi-Instrument manual for a clear definition of the following parameters.

Noise Level (no signal): -86.2 dBFS (represented by the dotted line in the following screen shot). As a comparison, the noise level of E-MU Tracker Pre is -113.8 dBFS in the loop back test. This implies the noise contributed by the output channel of E-MU Tracker Pre is negligible.



2.2 THD, THD+N, SNR, SINAD, ENOB, Noise Level

Test Conditions

On VT XLR-to-USB Pre:

- The hardware gain switch was at LO.
- The Line Output of the E-MU Tracker Pre was connected to the XLR input of the VT XLR-to-USB Pre using an in-house made ¼" male TRS to male XLR cable.

On E-MU Tracker Pre:

- All the knobs on the panel were set to minimum.
- Phantom Power: Off
- Direct Monitor: Off

On Laptop:

The two laptops were powered by battery.

On Windows Control Panel for VT XLR-to-USB Pre:

- [Sounds and Audio Devices]>[Sound Recording]>[USB Audio CODEC]: Not activated.
- [Sounds and Audio Devices]>[Sound Playback]>[USB Audio CODEC]: Not used.

On Windows Control Panel for E-MU Tracker Pre:

- [Sound]>[Recording]>[E-MU Tracker Pre Microphone]>[Levels]>[Main Volume]: Not used.
- [Sound]>[Playback]>[E-MU Tracker Pre Speakers]>[Levels]>[Main Volume]: 21%

In Multi-Instrument for VT XLR-to-USB Pre:

- MME Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 16 Bit
- Sampling Channels: A (Mono)
- Record Length: 48000
- FFT Size: 32768
- Window Function: Kaiser 6
- Noise Measurement Range: 20~20 kHz
- Linear average: 10 frames

In Multi-Instrument for E-MU Tracker Pre:

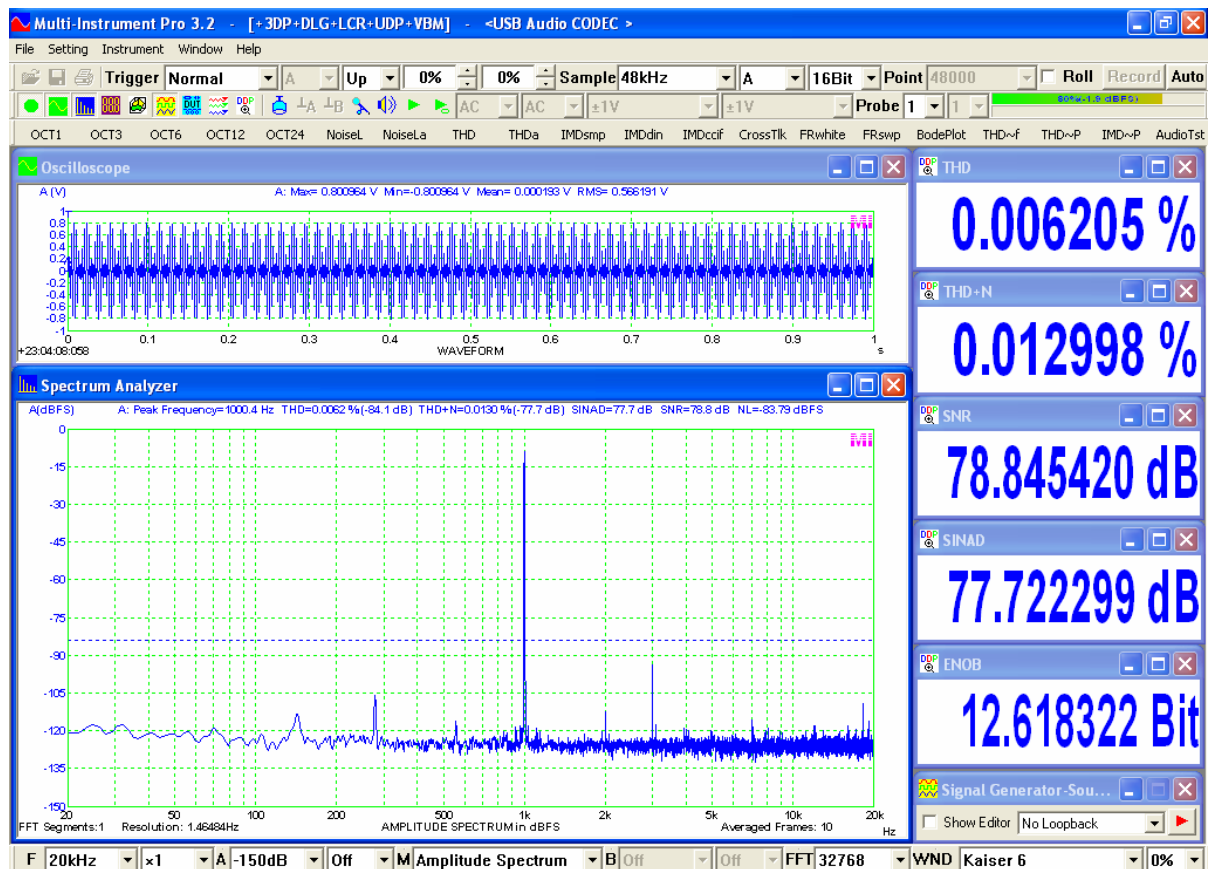
- ASIO Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 24 Bit
- Sampling Channels: A&B (Stereo)
- Test Tone: Sine, 1000.4882812 Hz

Test Results

Please refer to the Multi-Instrument manual for a clear definition of the following parameters. They were measured at peak level: -1.9 dBFS.

THD (1kHz, -1.9dBFS): 0.006205% (-84.1 dB)
 THD+N (1kHz, -1.9dBFS): 0.012998% (-77.7 dB)
 SINAD (1kHz, -1.9dBFS): 77.7 dB
 SNR (1kHz, -1.9dBFS): 78.8 dB
 ENOB (1kHz, -1.9dBFS): 12.62 Bit
 Noise Level (1kHz, -1.9dBFS): -83.8 dBFS (represented by the dotted line in the following screen shot)

As a comparison, the THD, THD+N, SINAD, SNR, ENOB, Noise Level of E-MU Tracker Pre at 1 kHz are 0.000351% (-109.1dB), 0.001424% (-96.9dB), 96.9dB, 97.2dB, 15.81Bit, -109.7dBFS respectively in the loop back test. This implies the distortion and noise contributed by the output channel of E-MU Tracker Pre are negligible.



2.3 IMD

Test Conditions

On VT XLR-to-USB Pre:

- The hardware gain switch was at LO.
- The Line Output of the E-MU Tracker Pre was connected to the XLR input of the VT XLR-to-USB Pre using an in-house made ¼" male TRS to male XLR cable.

On E-MU Tracker Pre:

- All the knobs on the panel were set to minimum.
- Phantom Power: Off
- Direct Monitor: Off

On Laptop:

The two laptops were powered by battery.

On Windows Control Panel for VT XLR-to-USB Pre:

- [Sounds and Audio Devices]>[Sound Recording]>[USB Audio CODEC]: Not activated.
- [Sounds and Audio Devices]>[Sound Playback]>[USB Audio CODEC]: Not used.

On Windows Control Panel for E-MU Tracker Pre:

- [Sound]>[Recording]>[E-MU Tracker Pre Microphone]>[Levels]>[Main Volume]: Not used.
- [Sound]>[Playback]>[E-MU Tracker Pre Speakers]>[Levels]>[Main Volume]: 21%

In Multi-Instrument for VT XLR-to-USB Pre:

- MME Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 16 Bit
- Sampling Channels: A (Mono)
- Record Length: 48000
- FFT Size: 32768
- Window Function: Kaiser 6
- Linear average: 10 frames

In Multi-Instrument for E-MU Tracker Pre:

- ASIO Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 24 Bit
- Sampling Channels: A&B (Stereo)

Test Results

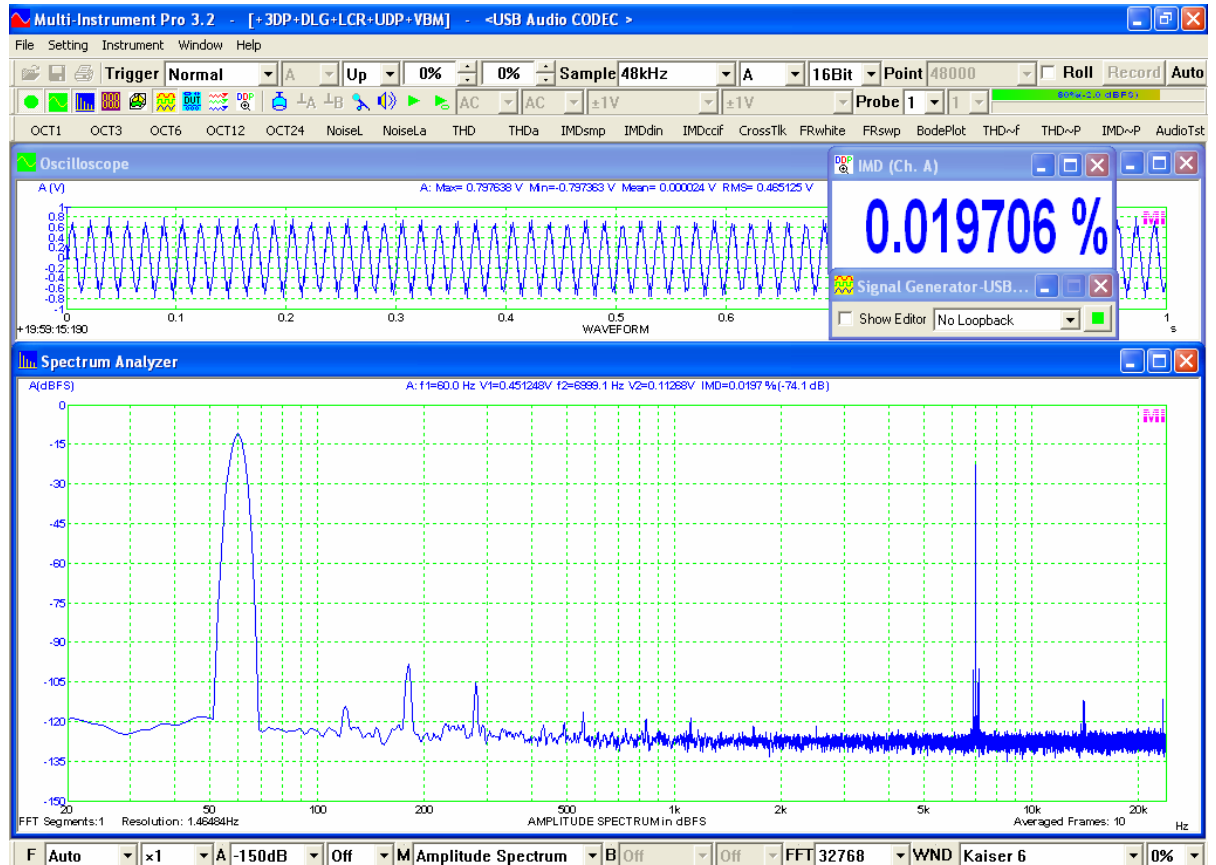
Please refer to the Multi-Instrument manual for a clear definition of the following parameters. They were measured at peak level: -1.9 dBFS.

SMPTE IMD (-1.9dBFS) : 0.019706% (-74.1 dB)

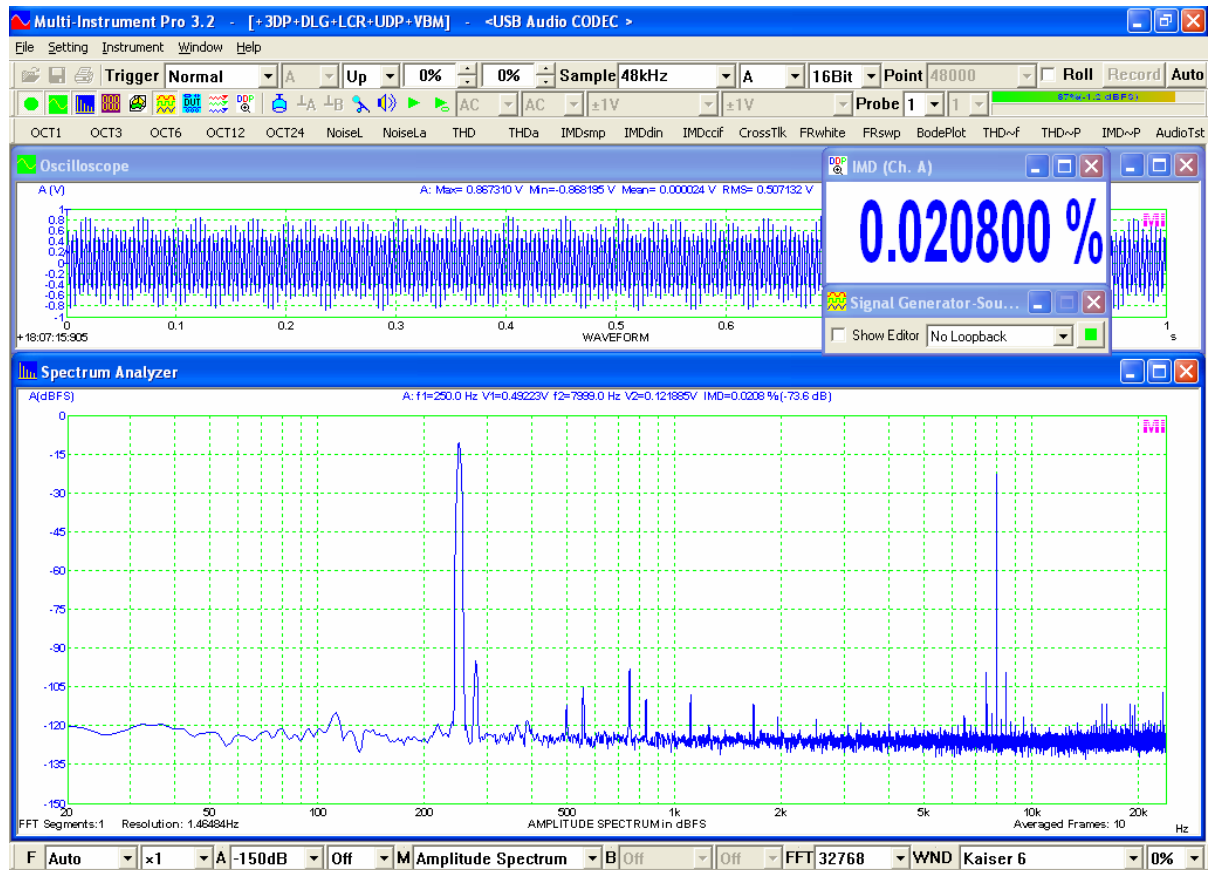
DIN IMD (-1.9dBFS): 0.0208% (-73.6 dB)

CCIF2 IMD (-1.9dBFS): 0.002288% (-92.8 dB)

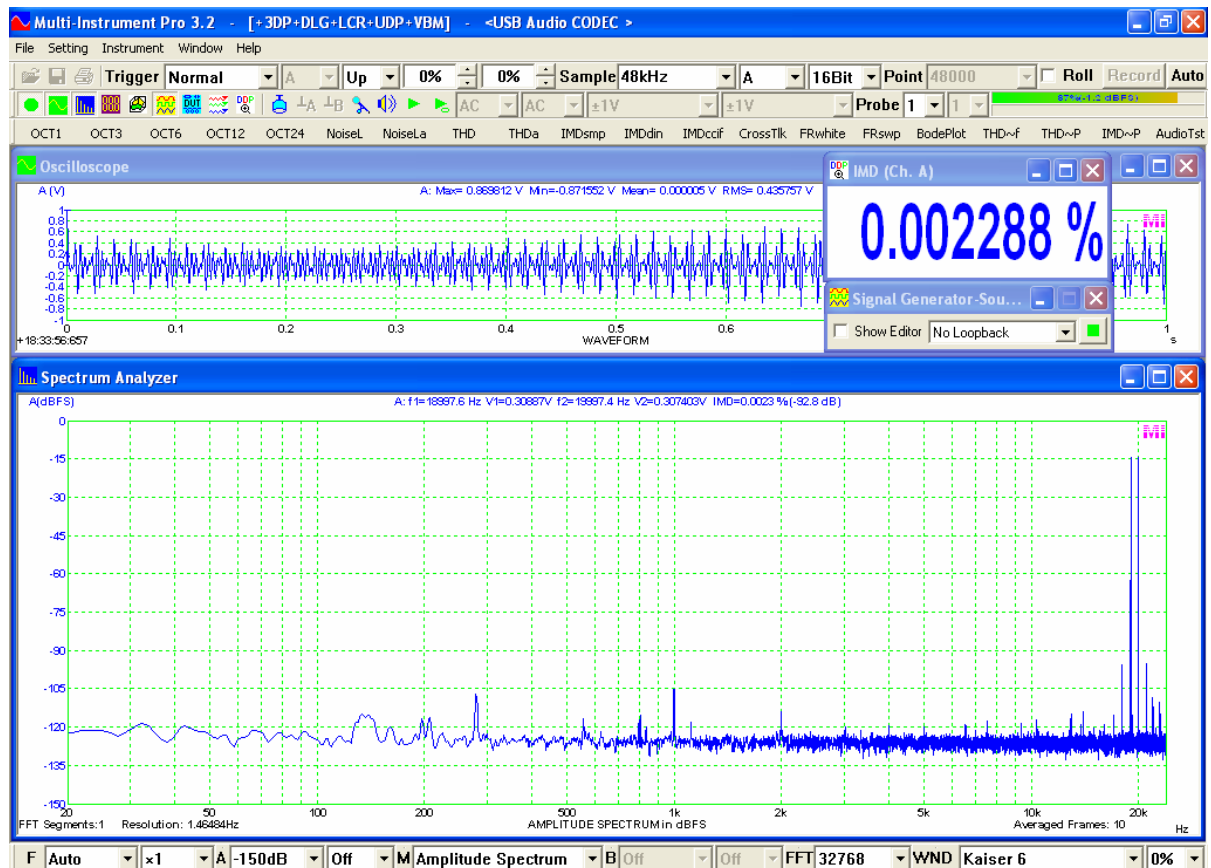
As a comparison, the SMPTE IMD, DIN IMD, CCIF2 IMD of E-MU Tracker Pre at 1 kHz are 0.002035% (-93.8dB), 0.002340% (-92.6dB), 0.000099% (-120.1dB) respectively in the loop back test. This implies the distortion contributed by the output channel of E-MU Tracker Pre is negligible.



SMPTE IMD (Test Tone: 60Hz and 7kHz mixed at an amplitude ratio of 4:1)



DIN IMD (Test Tone: 250Hz and 8kHz mixed at an amplitude ratio of 4:1)



CCIF2 IMD (Test Tone: 19kHz and 20kHz mixed at an amplitude ratio of 1:1)

2.4 Bandwidth

Test Conditions

On VT XLR-to-USB Pre:

- The hardware gain switch was at LO.
- The Line Output of the E-MU Tracker Pre was connected to the XLR input of the VT XLR-to-USB Pre using an in-house made ¼" male TRS to male XLR cable.

On E-MU Tracker Pre:

- All the knobs on the panel were set to minimum.
- Phantom Power: Off
- Direct Monitor: Off

On Laptop:

The two laptops were powered by battery.

On Windows Control Panel for VT XLR-to-USB Pre:

- [Sounds and Audio Devices]>[Sound Recording]>[USB Audio CODEC]: Not activated.
- [Sounds and Audio Devices]>[Sound Playback]>[USB Audio CODEC]: Not used.

On Windows Control Panel for E-MU Tracker Pre:

- [Sound]>[Recording]>[E-MU Tracker Pre Microphone]>[Levels]>[Main Volume]: Not used.
- [Sound]>[Playback]>[E-MU Tracker Pre Speakers]>[Levels]>[Main Volume]: 7%

In Multi-Instrument for VT XLR-to-USB Pre:

- MME Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 16 Bit
- Sampling Channels: A (Mono)
- Record Length: 48000
- FFT Size: 32768
- Window Function: Rectangle
- Linear average: 200 frames

In Multi-Instrument for E-MU Tracker Pre:

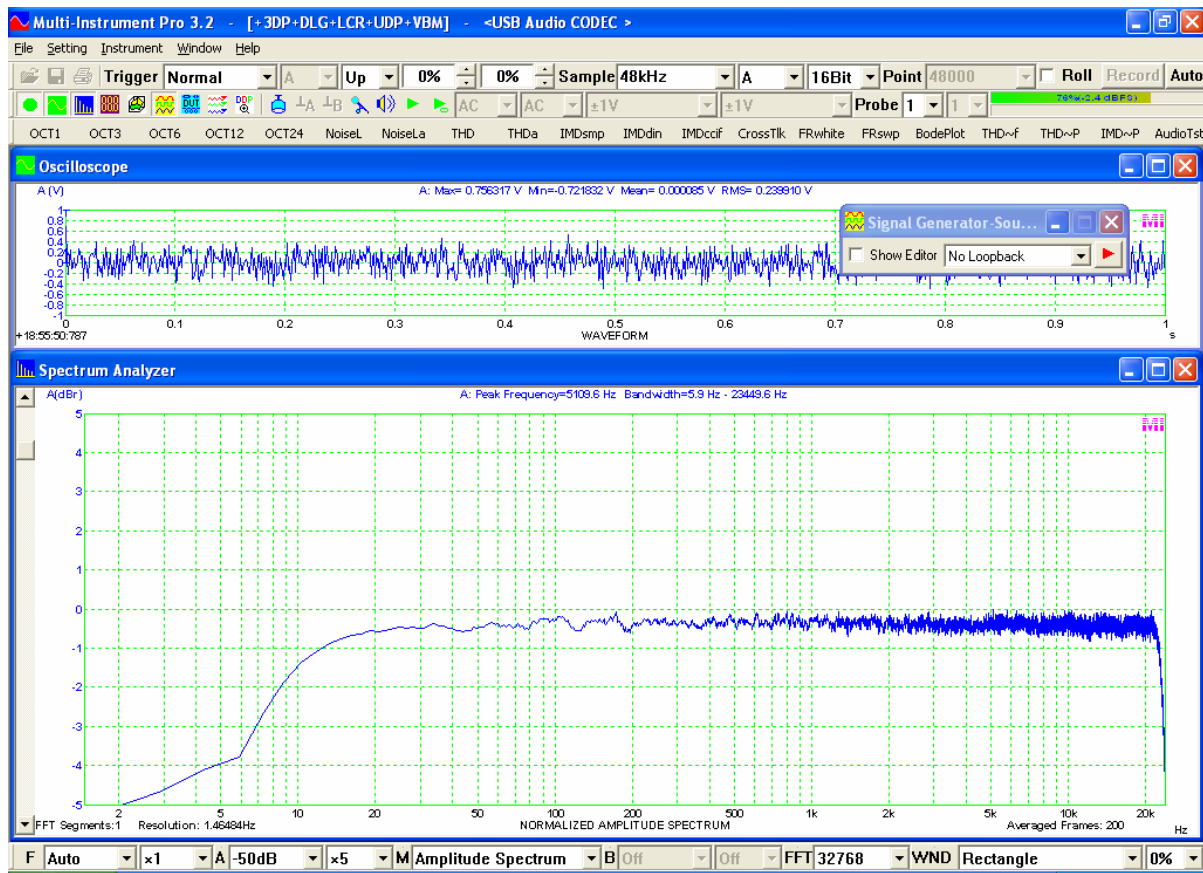
- ASIO Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 24 Bit
- Sampling Channels: A&B (Stereo)
- Test Tone: White Noise

Test Results

Please refer to the Multi-Instrument manual for a clear definition of the following parameters.

Bandwidth (-3dB) at the sampling rate of 48kHz: 5.9Hz ~23449.6Hz

As a comparison, the bandwidth (-3dB) of E-MU Tracker Pre at the sampling rate of 48kHz is 1.5Hz ~ 23562Hz in the loop back test. This implies the bandwidth of the input channel of VT XLR-to-USB Pre would be better than the measured values above.



2.5 Dynamic Range

Test Conditions

On VT XLR-to-USB Pre:

- The hardware gain switch was at LO.
- The Line Output of the E-MU Tracker Pre was connected to the XLR input of the VT XLR-to-USB Pre using an in-house made ¼” male TRS to male XLR cable.

On E-MU Tracker Pre:

- All the knobs on the panel were set to minimum.
- Phantom Power: Off
- Direct Monitor: Off

On Laptop:

The two laptops were powered by battery.

On Windows Control Panel for VT XLR-to-USB Pre:

- [Sounds and Audio Devices]>[Sound Recording]>[USB Audio CODEC]: Not activated.
- [Sounds and Audio Devices]>[Sound Playback]>[USB Audio CODEC]: Not used.

On Windows Control Panel for E-MU Tracker Pre:

- [Sound]>[Recording]>[E-MU Tracker Pre Microphone]>[Levels]>[Main Volume]: Not used.
- [Sound]>[Playback]>[E-MU Tracker Pre Speakers]>[Levels]>[Main Volume]: 1%

In Multi-Instrument for VT XLR-to-USB Pre:

- MME Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 16 Bit
- Sampling Channels: A (Mono)
- Record Length: 48000
- FFT Size: 32768
- Window Function: Kaiser 6
- Noise Measurement Range: 20~20 kHz
- Linear average: 10 frames

In Multi-Instrument for E-MU Tracker Pre:

- ASIO Driver
- Sampling Rate: 48 kHz
- Sampling Bit Resolution: 24 Bit
- Sampling Channels: A&B (Stereo)
- Test Tone: Sine, 1000.4882812 Hz
- Output Amplitude of the Signal Generator: 0.036% of the full scale

Test Results

Please refer to the Multi-Instrument manual for a clear definition of the following parameters. They were measured at peak level: -60 dBFS.

SNR (-60dBFS, 1kHz): 18.4 dB

Dynamic Range: $18.4+60=78.4$ dB

