

#### DAC – ADC path (loop)

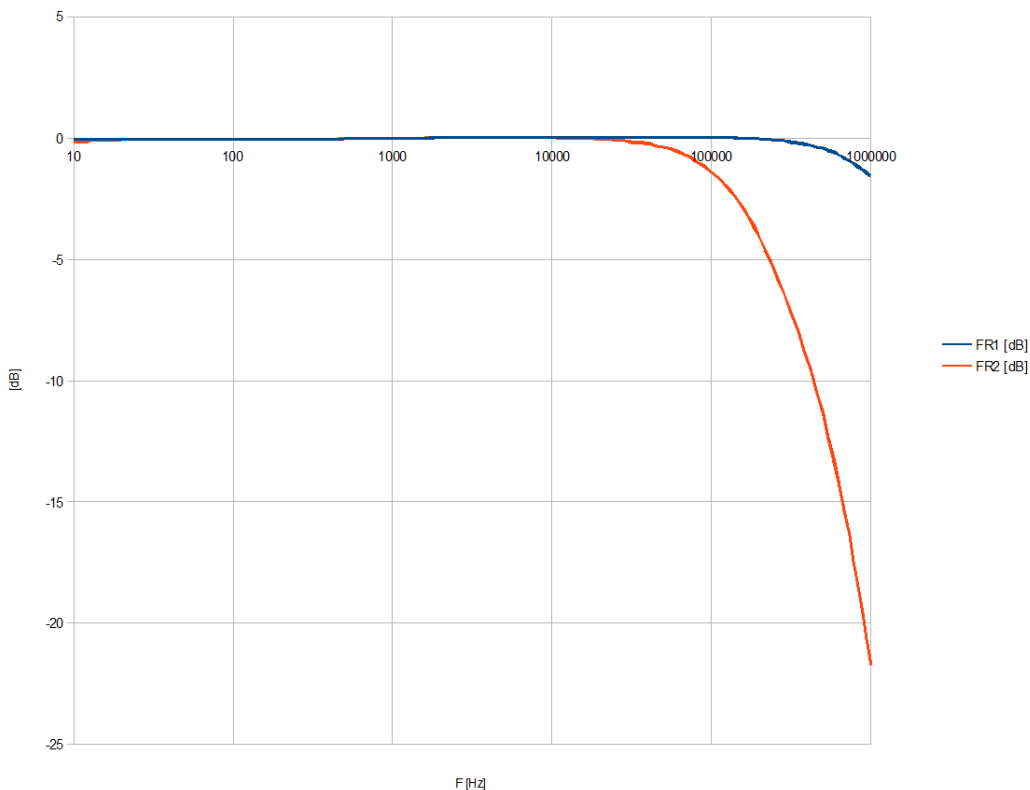
The samples were recorded at 96kHz/24bit format. The DAC-ADC loop has maximum ADC input level of 1Vrms (1dBV). Minimum of THD(1kHz) is 0.00034% at 0.24V – below this point distortion is buried in noise. At 1V, THD(1kHz) is 0.0026%. THD is quite flat with frequency, as will be seen from the posted plot. Both input and output are only single-ended, provided with RCA connectors.

#### Worldstring1 preamplifier path – test report

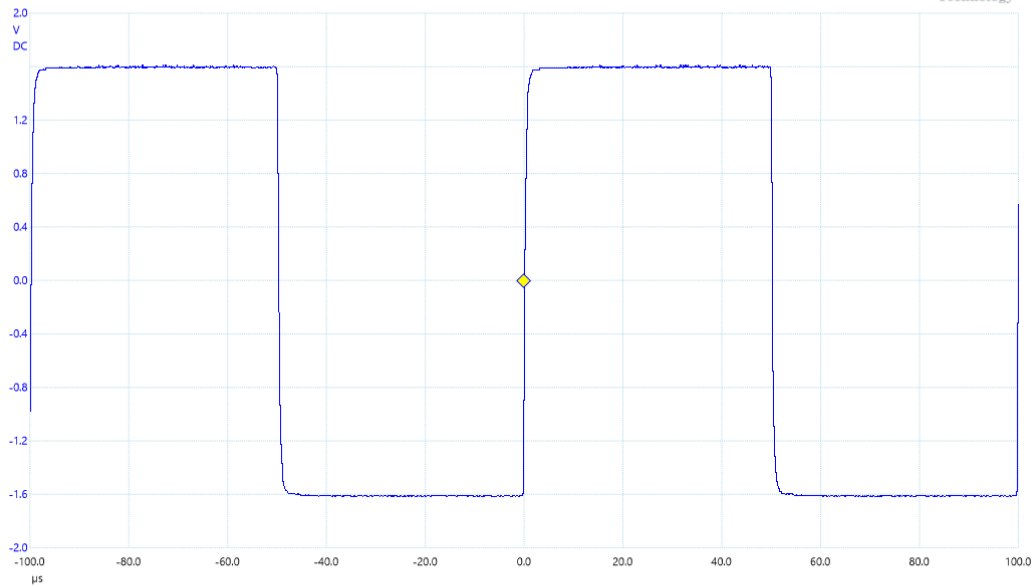
it is a preamplifier that I call “MSYS” and is intended as an analog interface for a soundcard, for measuring purposes. It is not normally used as an audio preamplifier. It has a balanced input, consisting of two 2SK170BL JFETs, followed by AD797 opamp. Then it has a gain control, stepped attenuator, DACT Danish product. This is followed by ADA4898 opamp to make a single ended output. It also has a balanced output, which was not used in this test. Because the DAC output is only single-ended, the parameters of the balanced input were not fully utilized and the distortion parameters were thus degraded a bit. However, some parameters remained quite remarkable, IMO.

|                       |   |
|-----------------------|---|
| Frequency response    | 20Hz – 40kHz / better than +/-0.02dB          |
| Frequency response    | 10Hz – 1MHz / better than 0/-1.6dB            |
| Rise time Tr(10%-90%) | 0.342 us                                      |
| Output noise          | -111dBV(A), complete DAC-preamp-ADC loop      |
| THD(1kHz)             | 0.0005% at 0.1V, complete DAC-preamp-ADC loop |
| THD(1kHz)             | 0.005% at 0.7V, complete DAC-preamp-ADC loop  |
| THD(10kHz)            | 0.006% at 0.7V, complete DAC-preamp-ADC loop  |
| Input impedance       | 100 kohm                                      |
| Output impedance      | 100 ohm                                       |

2 preamps frequency response



FR1...worldstring1 frequency response, FR2 ...worldstring2 frequency response



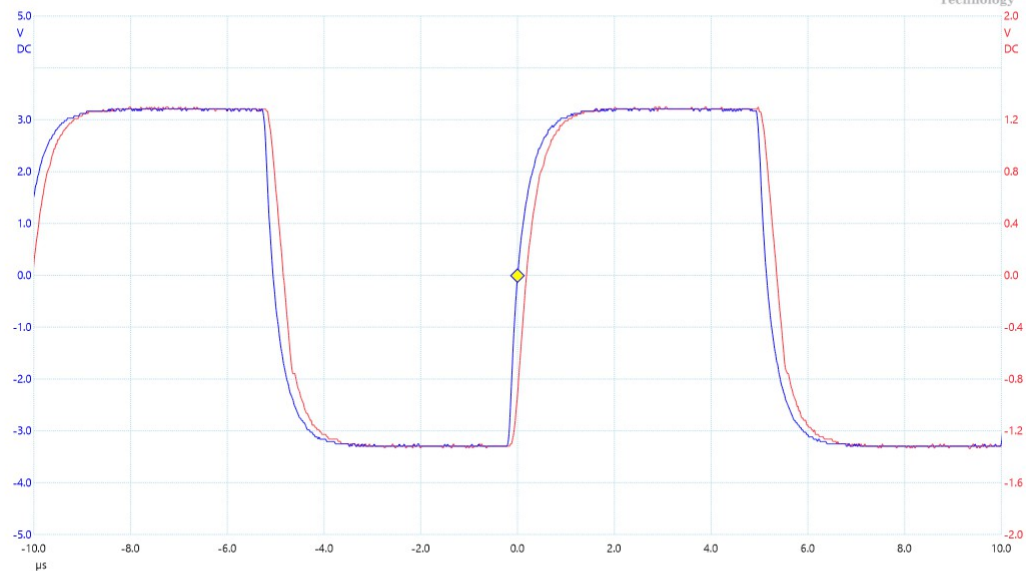
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| Channel | Name               | Span        | Value     | Min       | Max       | Average   | $\sigma$ |
|---------|--------------------|-------------|-----------|-----------|-----------|-----------|----------|
| A       | Frequency          | Whole trace | 10.01 kHz | 10.01 kHz | 10.01 kHz | 10.01 kHz | 0 Hz     |
| A       | Rise Time [90/10%] | Whole trace | 800 ns    | 800 ns    | 820 ns    | 811 ns    | 10.22 ns |

worldstring1

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*10kHz square response, rise time not corrected for input  $T_r$*



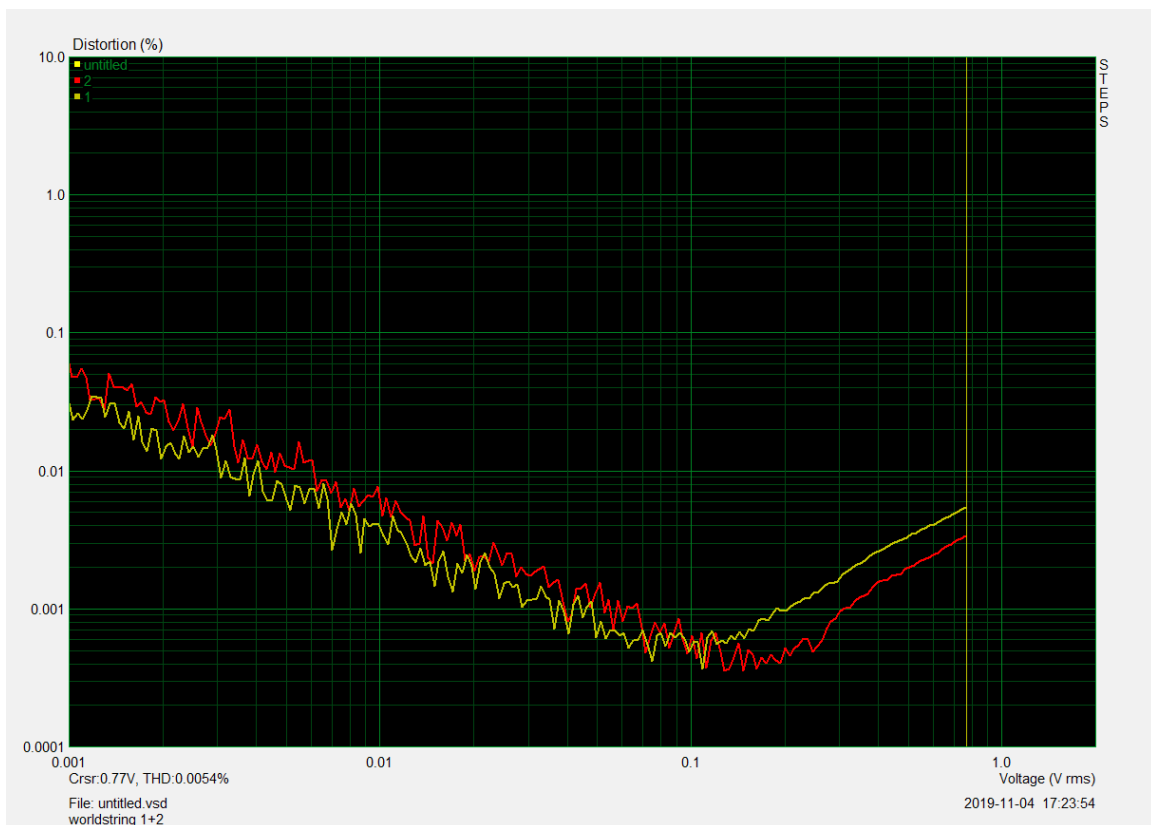
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| Channel | Name               | Span        | Value     | Min       | Max       | Average   | $\sigma$ |
|---------|--------------------|-------------|-----------|-----------|-----------|-----------|----------|
| A       | Frequency          | Whole trace | 98.04 kHz | 98.04 kHz | 98.04 kHz | 98.04 kHz | 0 Hz     |
| A       | Rise Time [90/10%] | Whole trace | 690 ns    | 690 ns    | 690 ns    | 690 ns    | 0 s      |
| B       | Rise Time [90/10%] | Whole trace | 770 ns    | 770 ns    | 770 ns    | 770 ns    | 0 s      |

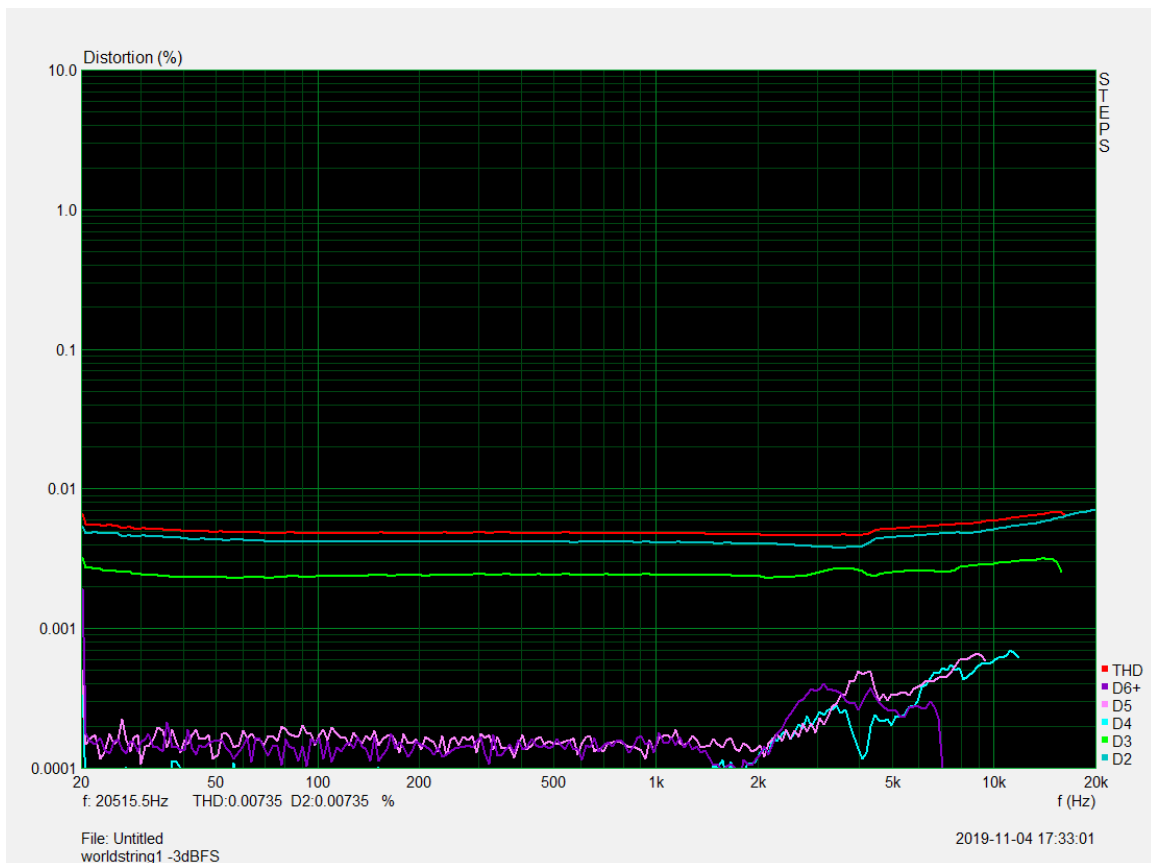
MSYS

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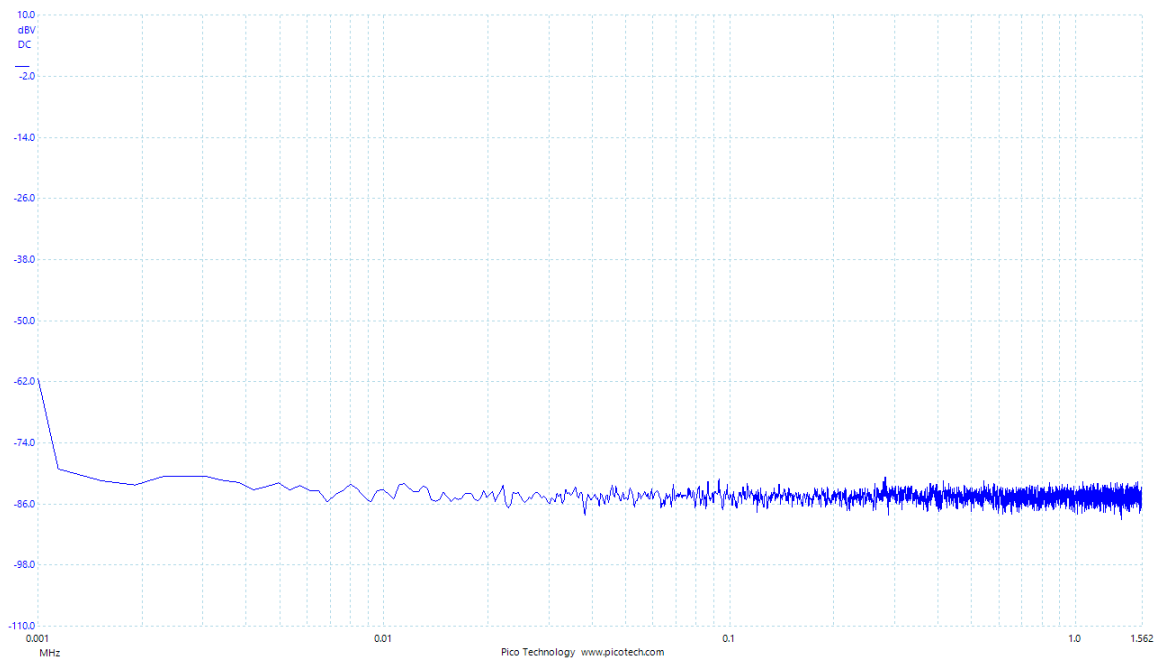
100kHz square response (red), input (blue). Corrected response  $T_r = 342\text{ns}$



Complete path, THD vs. amplitude at 1kHz. Yellow – worldstring1, Red -worldstring2



Complete path DAC-preamp-ADC, THD vs. frequency at 0.708V



*Preamp1 high frequency noise*

@PMA November 2019