

RTX6001 Overload detection problem

With signal above a certain level, high levels of distortion was created in the input amplifiers of the RTX6001. The reason for this is the overvoltage detection circuit, which, while not needed at settings from 20 dBV to 40 dBV, would still be active and generate noise, which coupled into the input attenuator.

A method has been found to deactivate the overvoltage detection when using input settings from 20 dBV to 40 dBV. The circuit has been implemented and added to the left channel of an RTX6001, serial no. 3 from the prototype series.

Generator: Stanford Research DS360

Connection: Balanced XLR cable

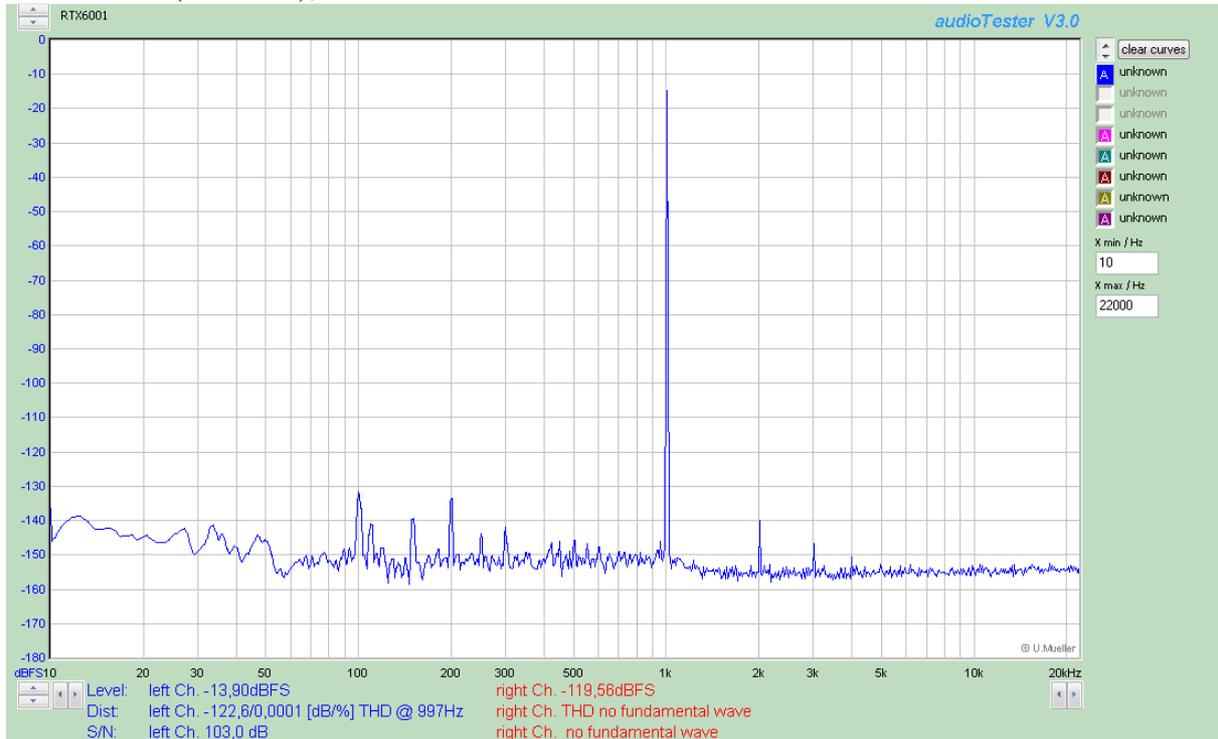
AudioTester

FFT = 64k

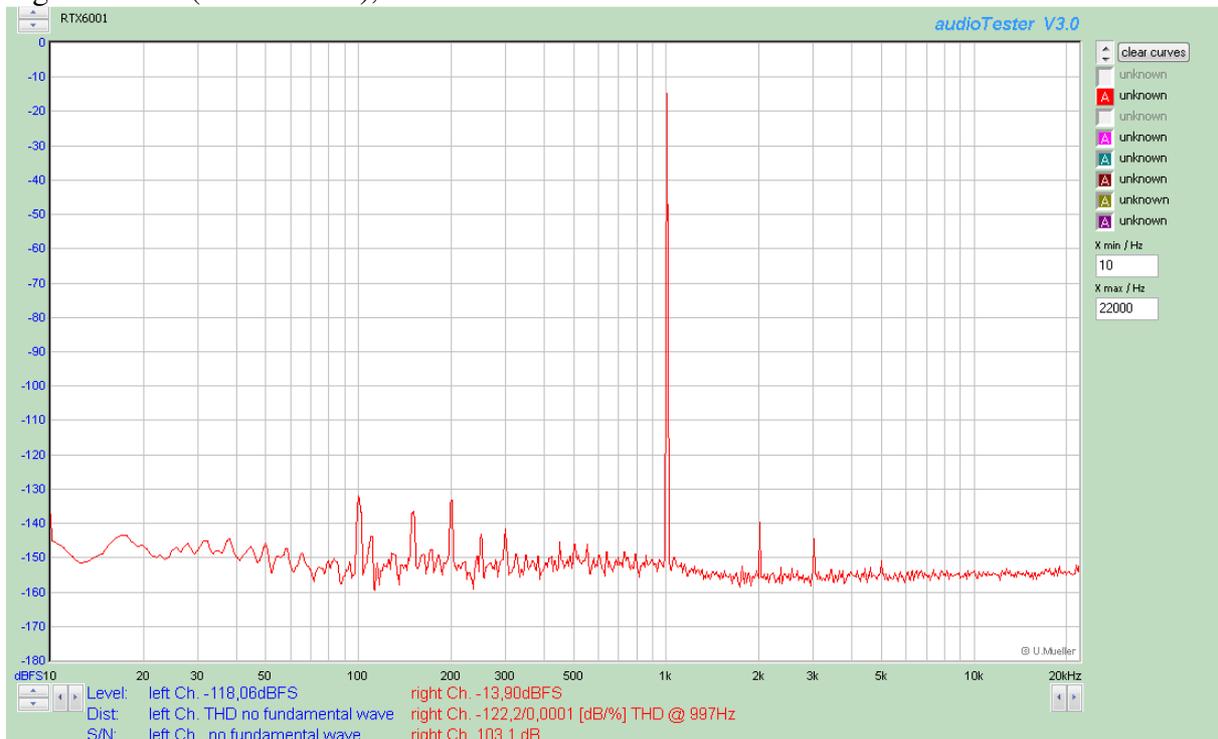
Average over 10

1 Level = 10 dBV single ended, 6.34 V rms balanced

Left channel (modified), set to 30 dBV



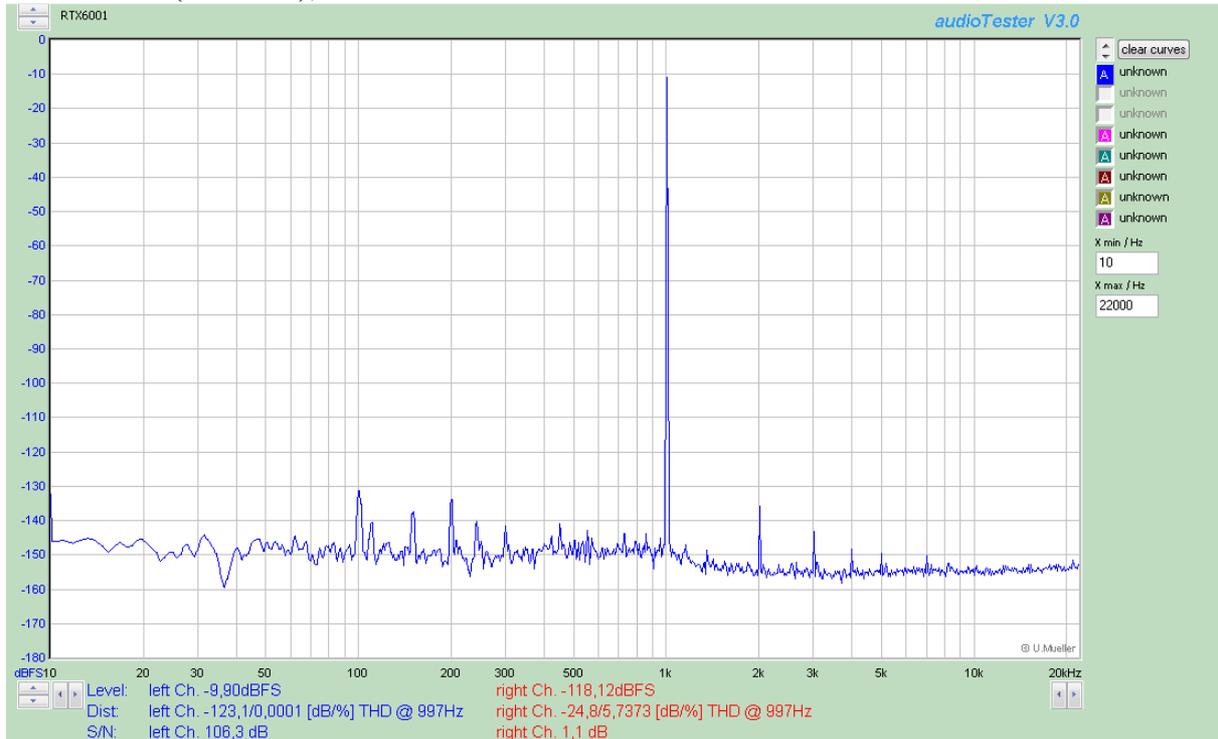
Right channel (un-modified), set to 30 dBV



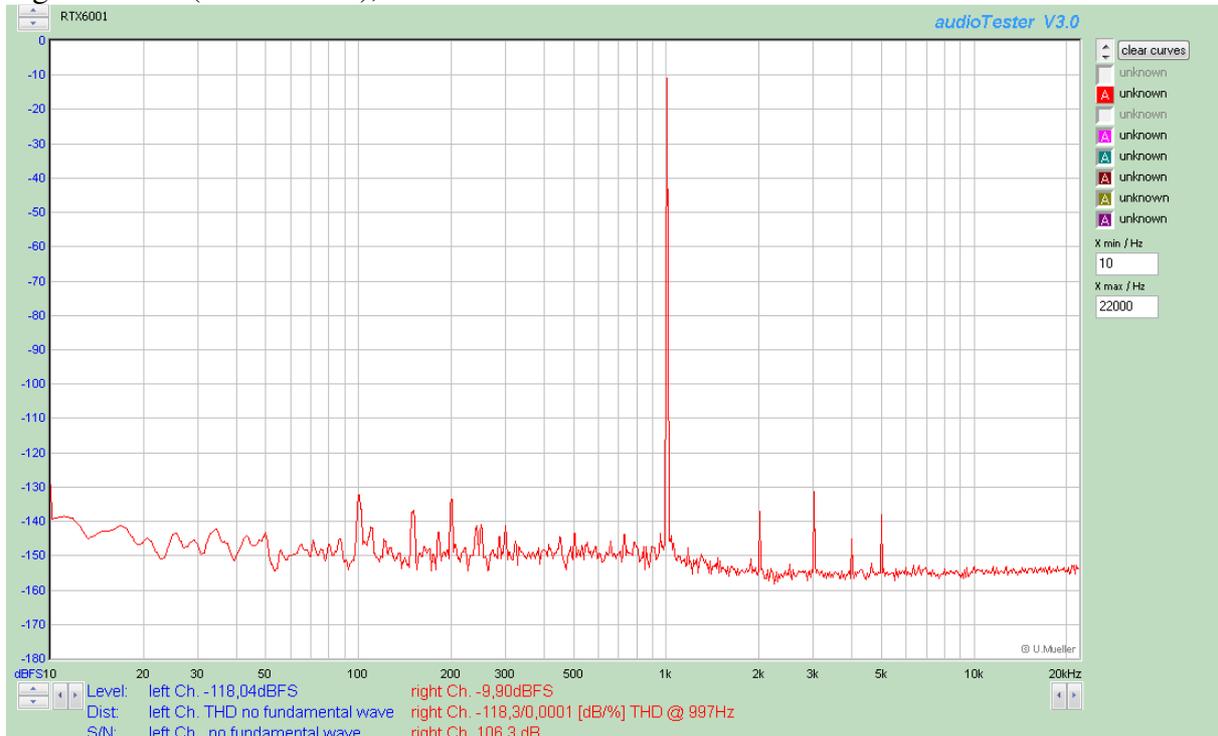
No significant difference between the two channels.

2 Level = 14 dBV single ended, 10.12 V rms balanced

Left channel (modified), set to 30 dBV



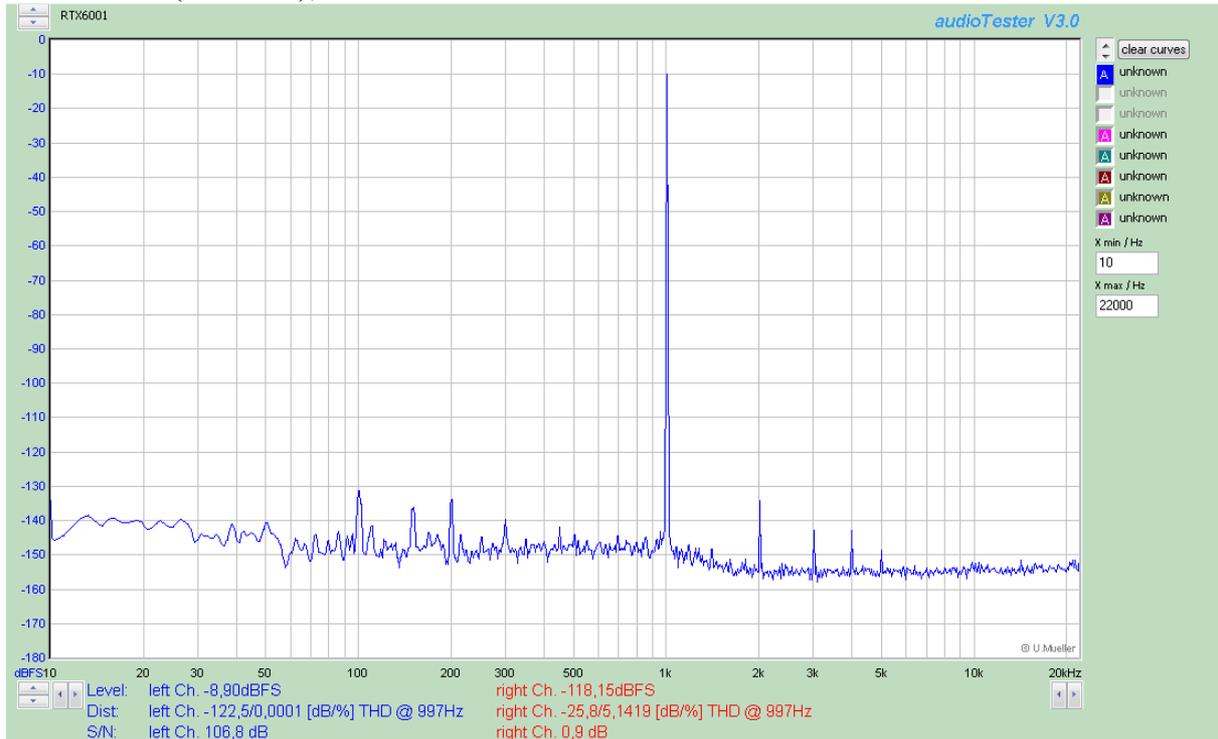
Right channel (un-modified), set to 30 dBV



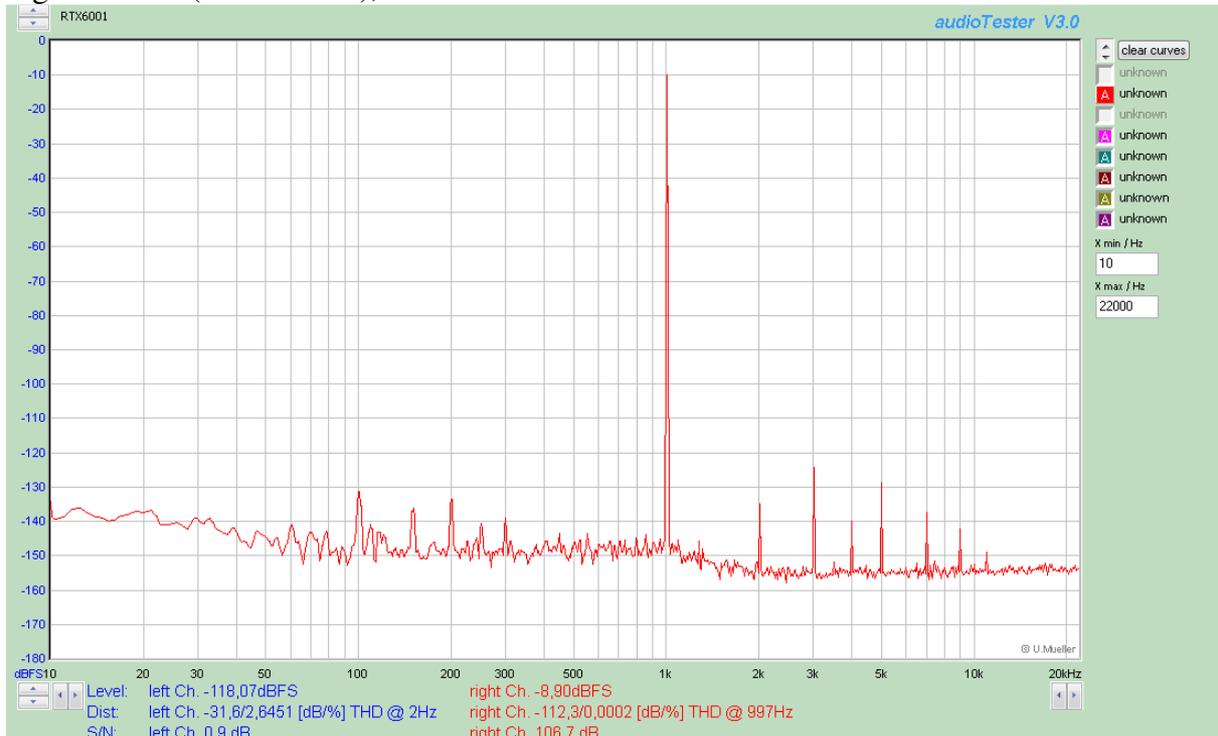
Somewhat higher distortion on the un-modified channel (around 5 dB difference).

3 Level = 15 dBV single ended, 11.36 V rms balanced

Left channel (modified), set to 30 dBV



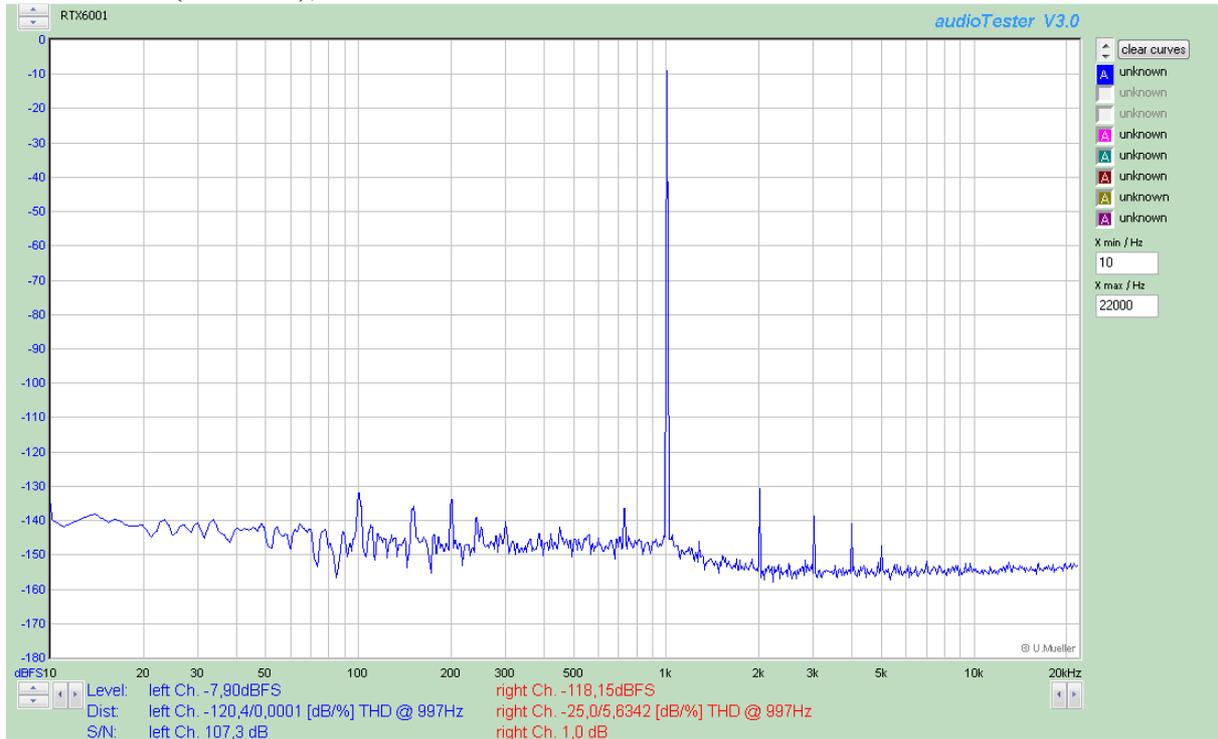
Right channel (un-modified), set to 30 dBV



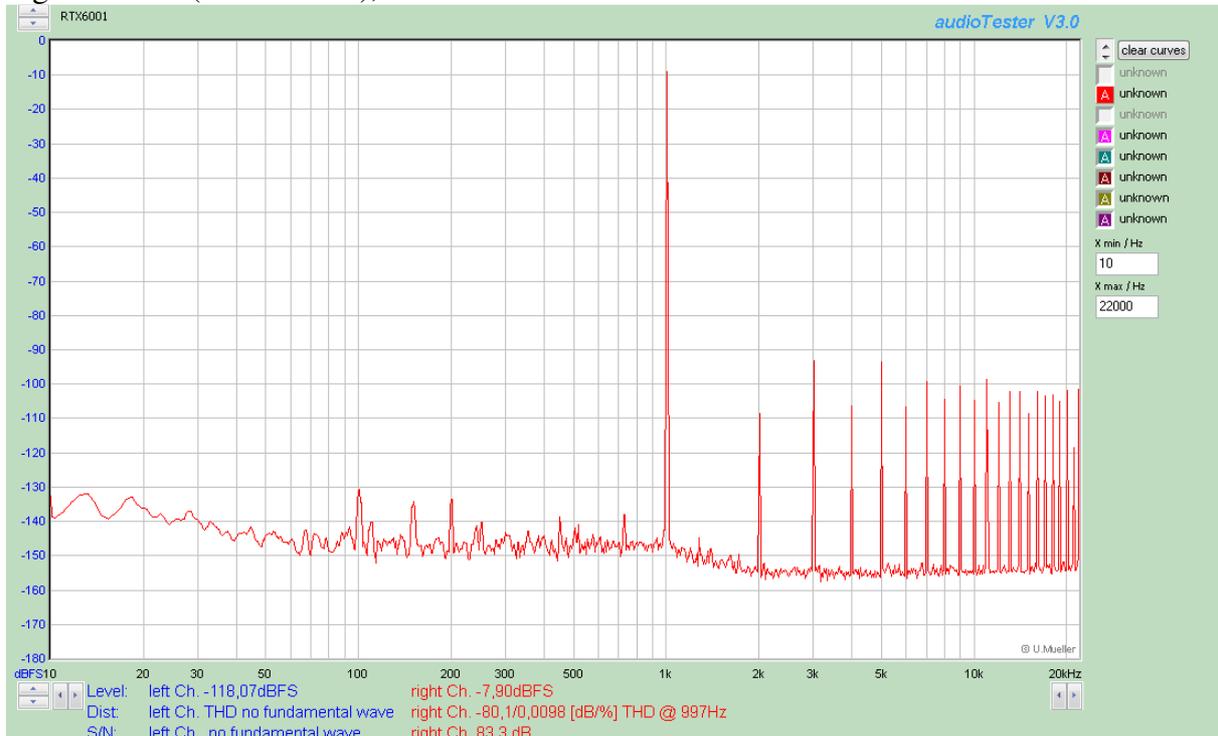
Somewhat higher distortion on the un-modified channel (around 10 dB difference).

4 Level = 16 dBV single ended, 12.74 V rms balanced

Left channel (modified), set to 30 dBV



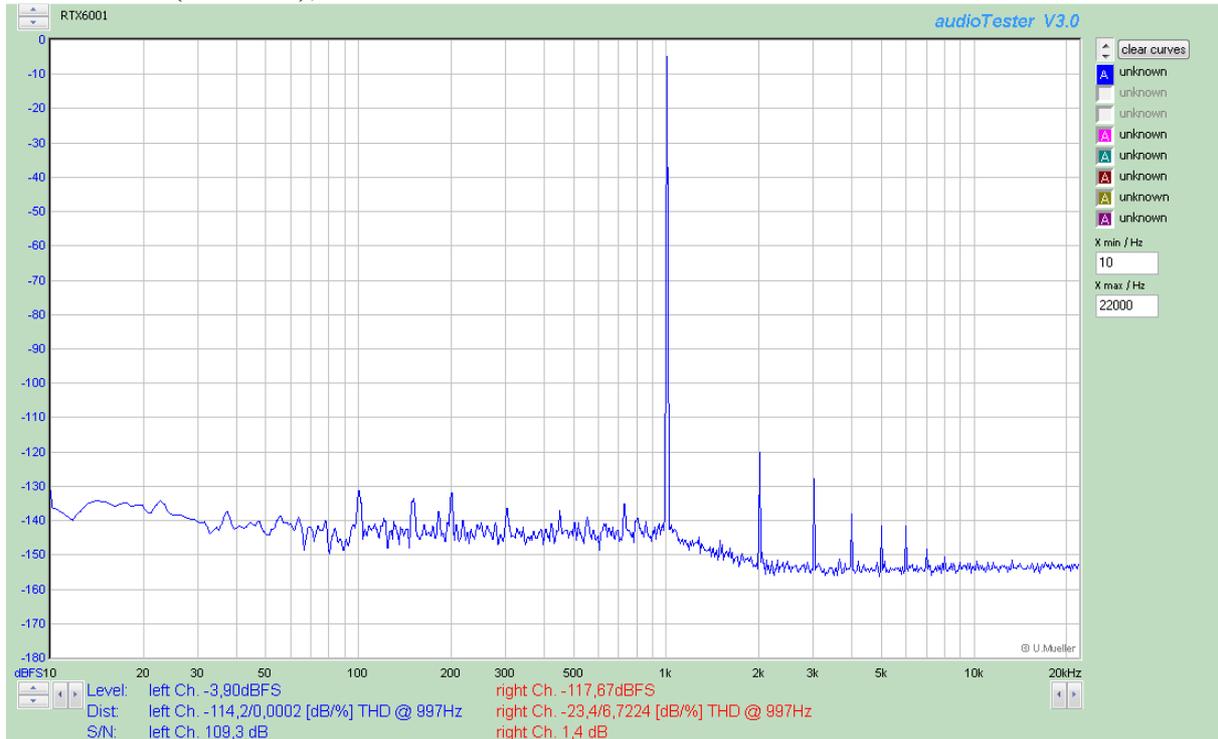
Right channel (un-modified), set to 30 dBV



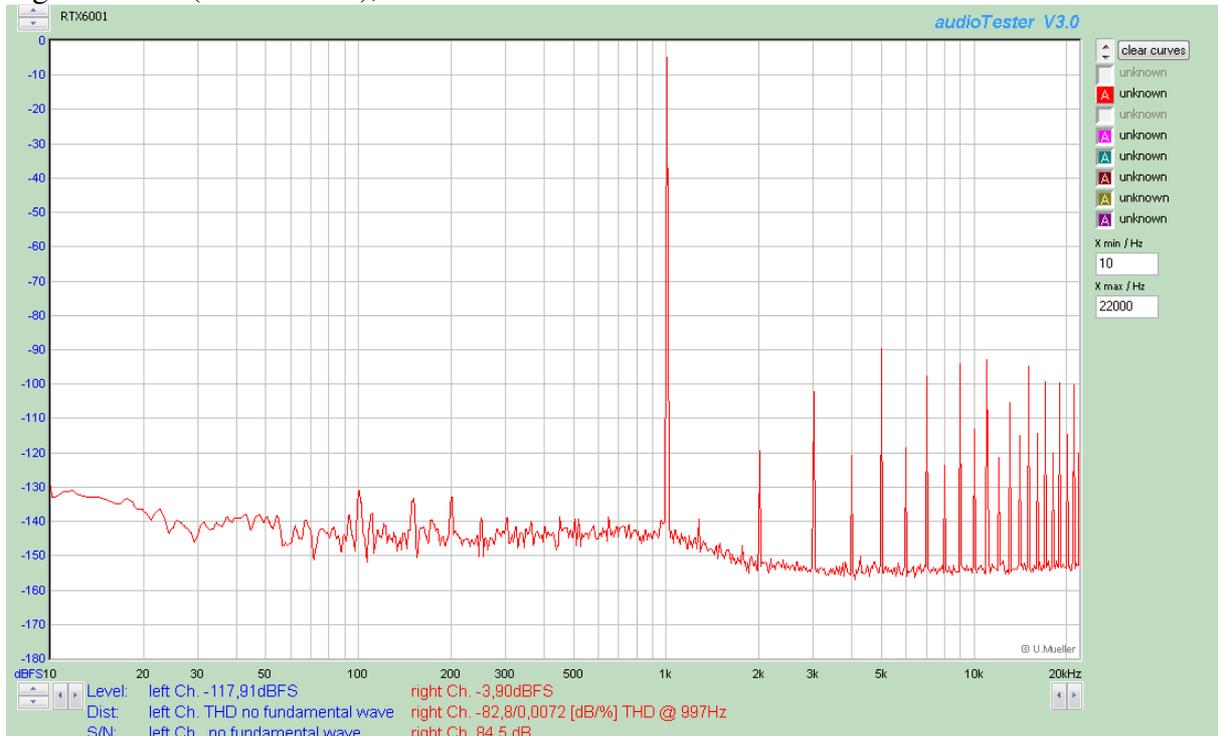
Much higher distortion on the un-modified channel (around 40 dB difference).

5 Level = 20 dBV single ended, 20.16 V rms balanced

Left channel (modified), set to 30 dBV



Right channel (un-modified), set to 30 dBV



Much higher distortion on the un-modified channel (around 31 dB difference).

6 Conclusion

The measurements show that the modification works. The distortion is reduced considerably. Even when operating below the point where severe distortion sets in, the modification seems to reduce the distortion.

The protection circuit still works as intended for input settings from -20 dBV to 10 dBV.