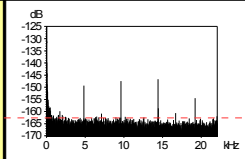
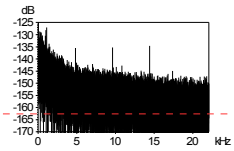
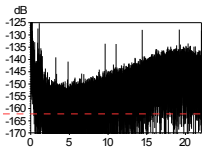
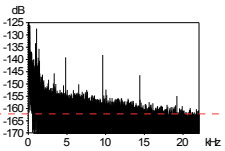
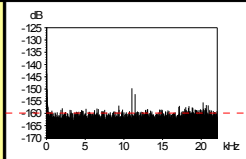
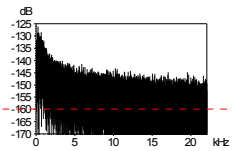
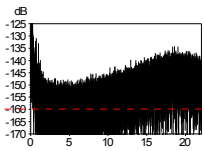
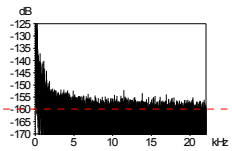
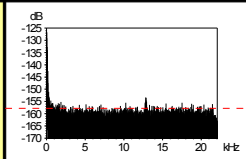
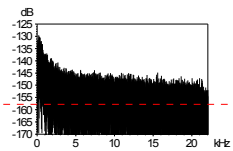
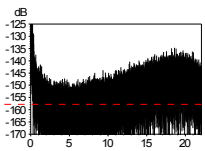
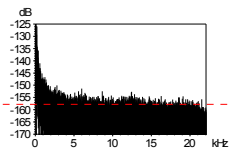
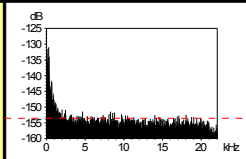
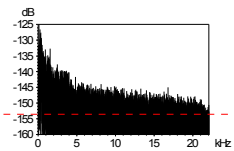
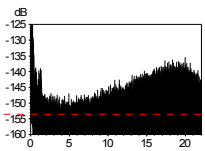
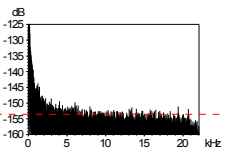
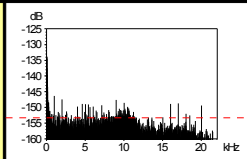
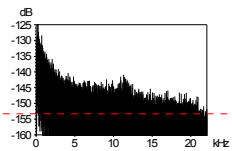
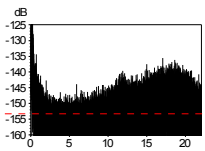
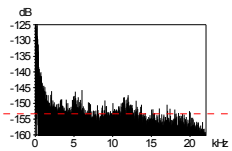
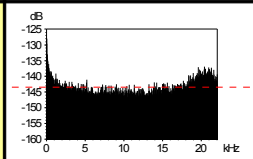
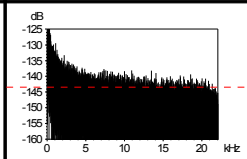
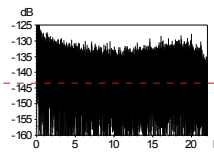
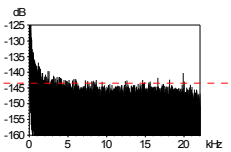
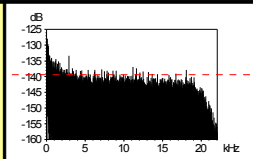
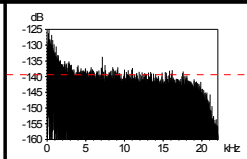
Noise Floor Comparison of various Microphone - Recorder Combinations

The inherent noise floor of a recording system is determined by the noise components contributed by both the microphone preamplifier inside the recorder and the microphone (the two noise components add geometrically). It is desired that the recorder's preamplifier does not significantly degrade the overall noise floor of the recording system. If it is acceptable that the preamp degrades the overall system noise performance by up to 1.0 dB, it will be sufficient that the recorder's noise floor is at all relevant frequencies about 7 dB below the overall (microphone + preamp) noise floor. The following table indicates the combinations of microphones and recorders that meet that criterion by green + signs. Note that this kind of evaluation is only relevant for recording under optimal conditions in very quiet environments. In most practical field recording conditions however, the inherent noise floor of the recording system will be masked by the more intensive environmental noise floor.

	preamplifier noise	preamplifier + microphone noise		
	150 ohm termination	**Sennheiser K6/ME66** 50 mV/Pa, 10 dBA	**Sennheiser MKH60** 40 mV/Pa, 8 dBA	**Rode NT1-A** 25 mV/Pa, 5 dBA
Sound Devices 722 [1] EIN: -128 dBu Sens.: -46 dBu		 +++	 +++	 ++
TASCAM HD-P2 EIN: -125 dBu Sens.: -40 dBu		 +++	 +++	
marantz PMD671 EIN: -123 dBu Sens.: -50 dBu		 +++	 ++	
marantz PMD670 EIN: -118 dBu Sens.: -52 dBu		 ++	 +	
marantz PMD660 EIN: -118 dBu Sens.: -52 dBu		 ++	 +	 -
M-AUDIO MT24/96 EIN: -113 dBu Sens.: -45 dBu		 +	 --- [2]	 -
EDIROL R-09 EIN: -104 dBu Sens.: -41 dBu		 -		

Conditions: Sample rate: 44.1 kHz, Bit-depth: 16 bit, Max gain, AGC: off, Noise reduction: off, Dither: off, FFT size: 65536 (RECT window)

[1] The harmonic noise artifacts on the SD722 recorder are caused by a failure of the individual test unit and should not appear on other series units.

[2] The very high noise level is caused by the non-standard phantom power voltage of 30V that is incompatible to the MKH60 microphone.