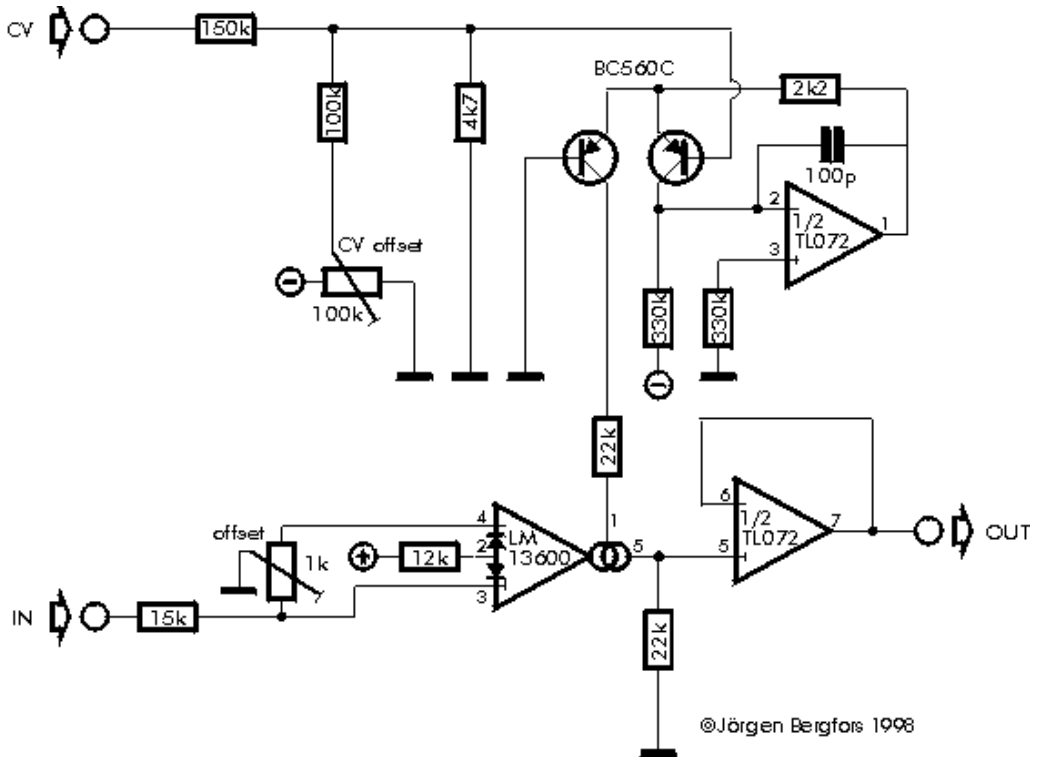
BERGFOTRON

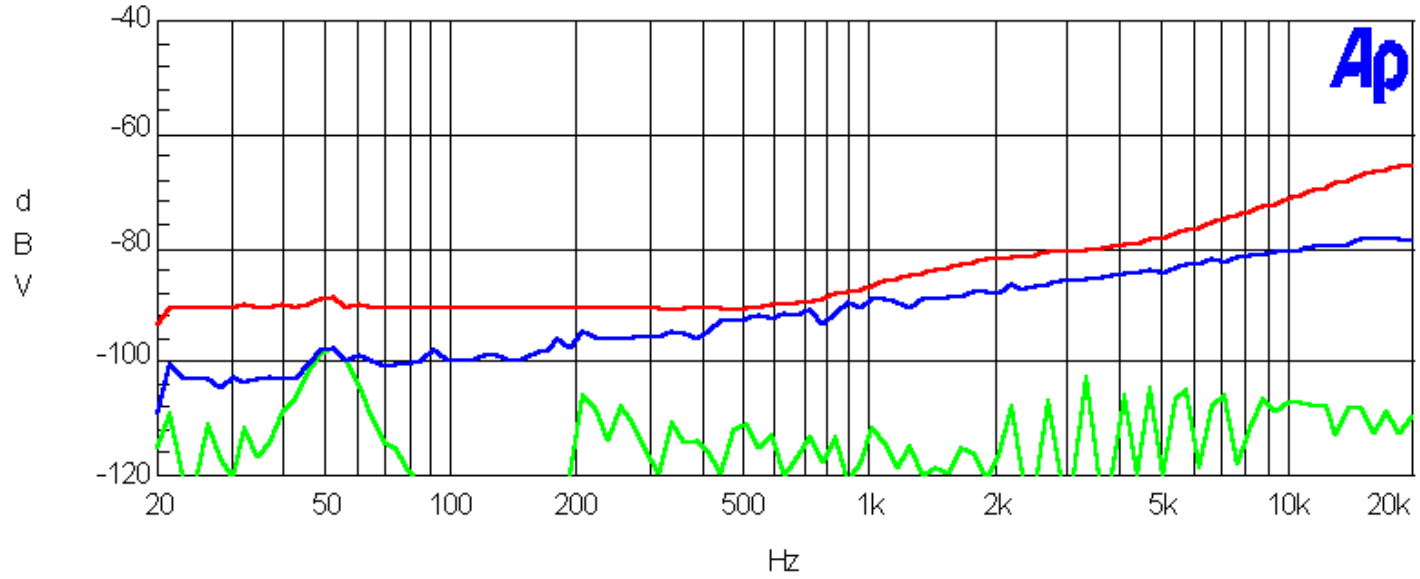
LM13600 VCA 1



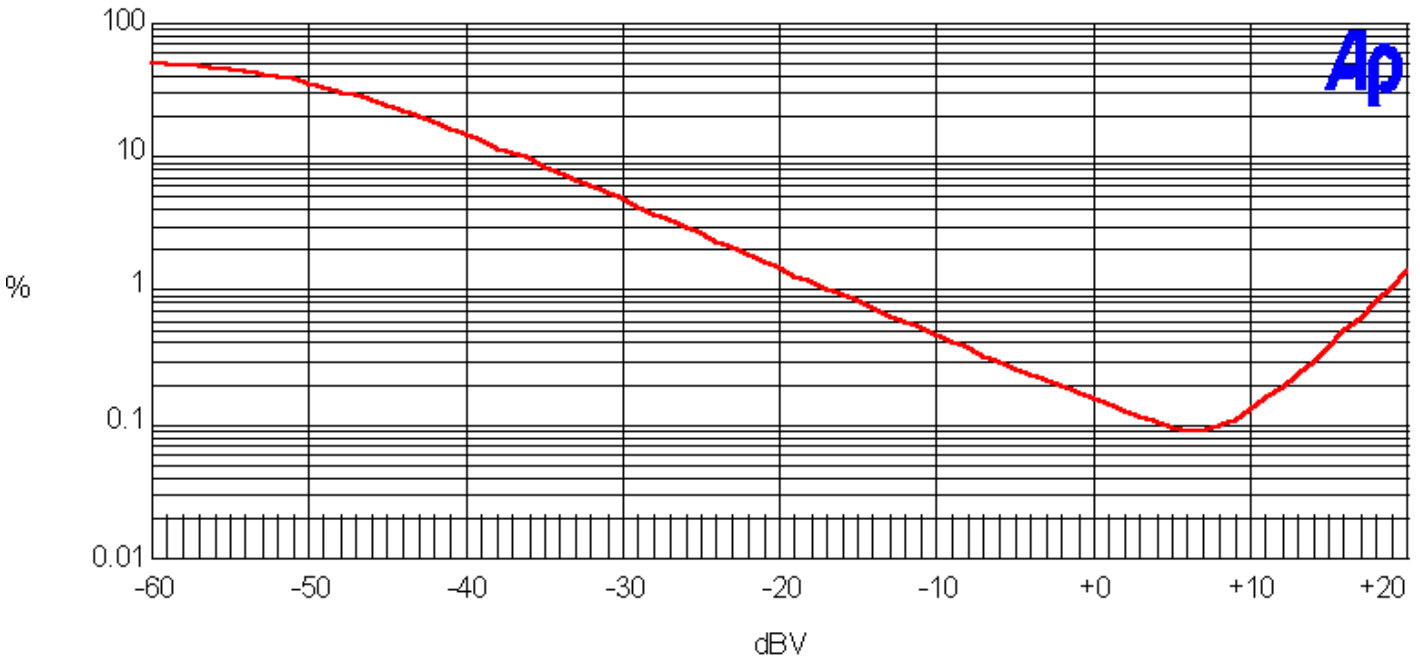
A logarithmic VCA based on the National Semiconductor LM13600. This circuit is based on the recommendations in the National Semiconductor application notes. The logarithmic converter is largely copied from the Elektor Formant. Because the built in Darlington buffer gives a DC-offset of around 1,2 volts, it is replaced by an op-amp buffer. It is a simple voltage follower. The load resistor is connected to ground, as in the application notes.
This is a really good VCA, built from cheap, easily obtainable parts. To get even better overall performance than this, you need to use expensive special-purpose ICs, that might not be obtainable in the future.

Noise & signal attenuation

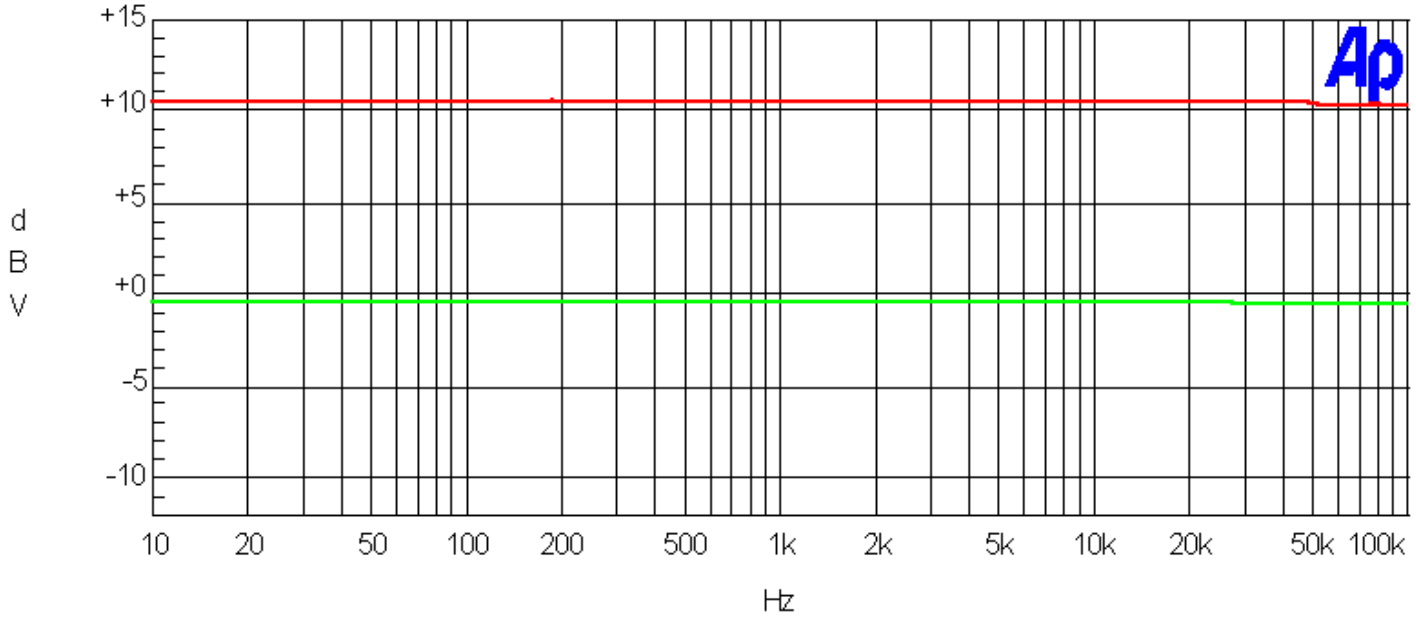
Red = signal bleedthtrough at 0V CV. Blue = 10V CV, no signal. Green = 0V CV, no signal.



Distortion (THD+N) vs. input level



Frequency response



Test results

Dynamic range	**10 V CV, no signal**	**81 dBr A**
	0 V CV, no signal	**117 dBr A**
	0 V CV, 1kHz 10 V p-p in	**97 dBr A**
	0 V CV, 2 kHz 10 V p-pin	**91 dBr A**
	0 V CV, 10 kHz 10 V p-pin	**83 dBr A**
	Headroom (over 10V p-p)	**8 dB**
CV bleedthrough	**after careful trimming**	**20 mV**

Summary

A good, low cost VCA

- Low signal bleedthrough
- Low distortion
- High headroom

- Rather low input inpedance