Introduction
Spectrum Analyser theory
Construction Techniques
Power Supply
Sweep Generator
Logarithmic Amplifier
145 MHz IF Filter
1st Mixer
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10MHz Crystal Calibrator
Alignment and Operation

The simple man's Spectrum Analyser
Logarithmic Amplifier

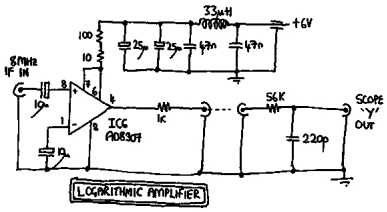
{gallery}salogamp/1{/gallery}

The logarithmic amplifier is a crucial part of the spectrum analyser. It forms both the final detecto

Whilst the logarithmic amplifier is the last stage in the spectrum analyser circuit and feeds the oscillosco

{gallery}salogamp/2{/gallery}

Note the "video filter" shown at the right of the diagram, whose sole purpose is to remove a little of the fuzz of the noise floor. The component values of this simple low-pass filter need to be selected carefully dependent on the oscilloscope used. In my case a compromise was once again needed due to the low bandwidth of the oscilloscope. The 56K resistor cannot be made too small, or the significant input capacitance of the oscilloscope effectively forms a low pass filter with too low a cutoff frequency without the addition of any capacitance my side (the 220pF capacitor). The height of the frequency peaks gets reduced substantially.



The 56K resistor was chosen to give some external control over the amount of filtering, whilst not being so high that the oscilloscope's input resistance also becomes of importance. The capacitor was chosen by trial and error to provide some reduction of the noise floor without undue reduction of the peaks, which was in any case worse at the low end of the frequency spectrum at the left of the oscilloscope display: another suspected limitation of the oscilloscope.

At this stage the logarithmic amplifier module can be tested by applying a signal generator to its input, and measuring the voltage at the output (either with a voltmeter or the oscilloscope in DC-input mode). By varying the signal generator's output amplitude, the output voltage of the AD8307 should also vary. If the signal generator is well calibrated it will probably even be possible to verify the logarithmic nature of the output.