Introduction
Spectrum Analyser theory
Construction Techniques
Power Supply
Sweep Generator
Logarithmic Amplifier
145 MHz IF Filter
1st Mixer
2nd Mixer
8 MHz IF Filter
Low-pass Filter
Input Attenuator
10MHz Crystal Calibrator
Alignment and Operation

The simple man's Spectrum Analyser
8MHz IF Filter

{gallery}safilter2/1{/gallery}

The 8MHz 2nd IF Filter module requires no alignment. It contains four 8Mhz ceramic resonator filters, th

It's debateable how much of this circuit is really necessary. Since further gain and transistor amplifier is ok

2nd mixer section. All instrument 2 filters and the BC109 transistor filtering is ok

{gallery}safilter2/2{/gallery}

{gallery}safilter2/3{/gallery}

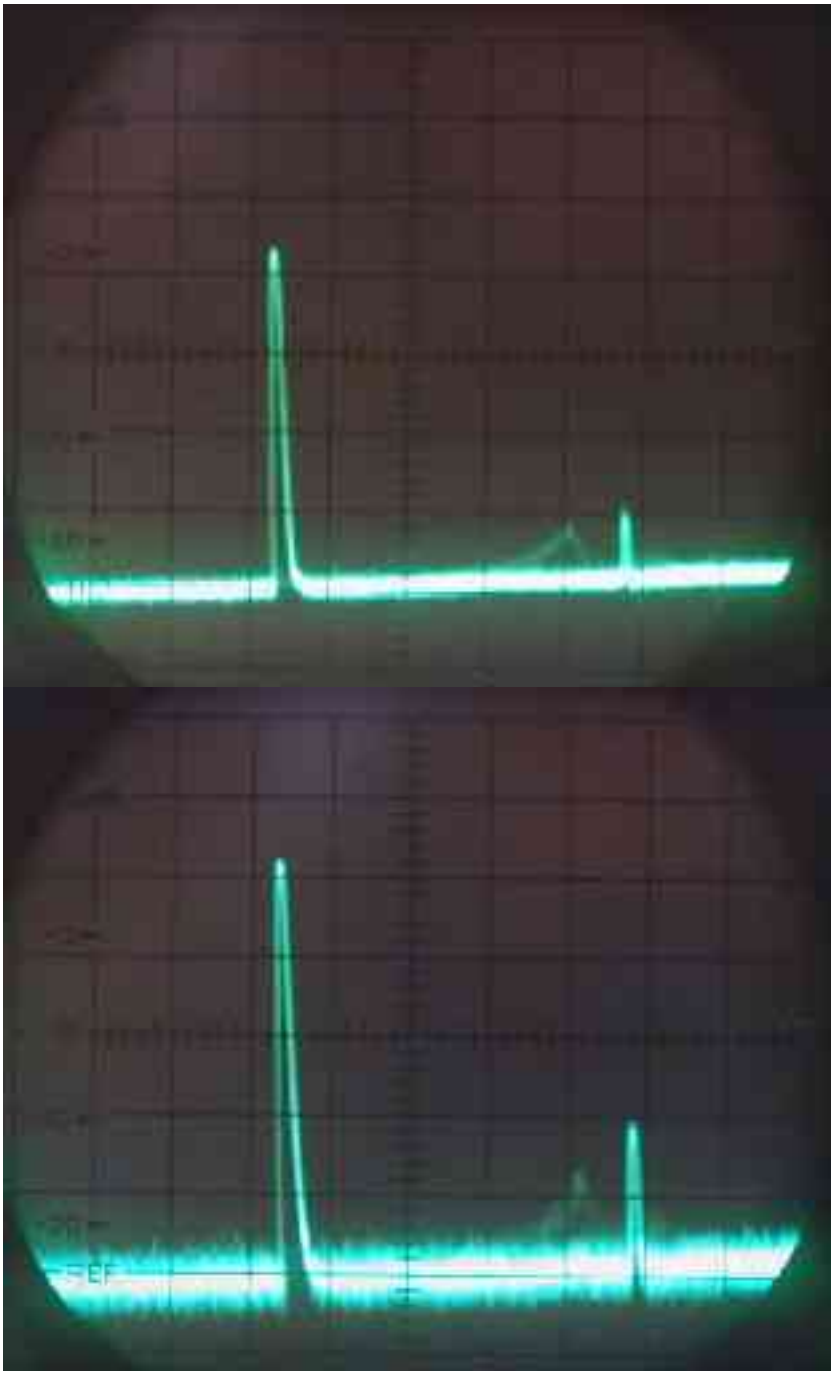
Since the addition of the 2 further ceramic filters did seem to improve t

I also tried cascading two of the BC109-transistor-plus-2-filters circuits but found the results unsatisfactory. The picture to the left shows the unused transistor module before removing the 2 filters for use in the AD603 circuit.

The circuit of the 2nd IF Filter at 8Mhz is shown below. Other IF frequencies would present no problem provided all the ceramic resonators are the same and the 2nd local oscillator frequency is adjusted accordingly. I believe ceramic resonators usually have input/output impedences of approximately 500 ohms so approximately correct termination is provided using 470 ohm resistors. If desired, the two rightermost ceramic filters and AD603 can be left out of the circuit. What we have here are the wild wanderings of the mind of a madman with too many identical ceramic filters to hand and most probably too little knowledge of how to use them

properly. But the result works.

{gallery}safilter2/circuit{/gallery}



Again, note the extensive use of inductor and capacitor filtering of all DC supply and control signals entering the shielded enclosure, vergeing perhaps on the paranoia. A firm believer in the theory that you can never have too much decoupling and shielding.

Shown here is an analyser trace from 0 - 70MHz of the signal generator set to 30MHz and using input attenuation of 26dB. On the left, the IF gain is set to minimum (10dB), and on the right it is maximum (50dB). The improvement in sensitivity is only about 7 or 8 dB. Though the noise floor appears as a continuous band in the photograph (right) it is in fact a continuously fluctuating strip of tiny peaks constantly appearing and dissappearing.

With the 2nd filter in line between the 2nd mixer and logarithmic amplifier modules, the spectrum analyser will now show good selectivity (sharp peaks) and greater sensitivity than the first module hook-up made on completion of the
2nd mixer
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