

Project 1

ECGR 6264 Report

John Q. Adams
J.J Heder
Federico Faggin

12/1/2121

Executive summary

In this project, ADS was used to simulate 2 circuits: a 3rd order Butterworth filter and a 1/8 wave line with 25 ohm load. The following experiments were performed:

1. S-parameters for a 3rd order Butterworth filter Multiply sin32.au by 4
2. S-parameters for 1/8 wave line with 25 ohm load FFT of rand5.au, sin32.au, and bark.au

The only unresolved problem was in a 0.023 volt DC error remained after filtering. We were not able to resolve the problem. No other issues remained unresolved.

Answers to Questions

Q1. Explain the result displayed on the interface (minimum and maximum vertical axis values) in terms of the source code attached to the F1 button.

The observed minimum value corresponds to $5 + 2(5 + 0.77)$ where 0.77 is the original maximum before pressing the button twice:

$$\text{Max} = 5 + 2(5+0.77) = 16.54$$

$$\text{Min} = 5 + 2(5 - 0.77) = 13.46$$

Q2. Hand in the java code for "divide(float x)."

```
public void plus(Myclass x)
{
    for (int xx = 0; xx < n; xx++)
        {
            (this.data)[xx] = (byte)((this.data)[xx] + (x.data)[xx]);
            (this.re)[xx] = (this.re)[xx] + (x.re)[xx];
            (this.im)[xx] = (this.im)[xx] + (x.im)[xx];
        }
}
```

Q3. What is the theoretical value of $H(\omega)$?

$$H(\omega) = \frac{\omega^2}{1 + \omega}$$

Q4. Explain the results, particularly what happened to the noise when comparing P10 with P11?

The noise floor in P11 is lower because of the highpass filtering operation.

Q5. And so forth

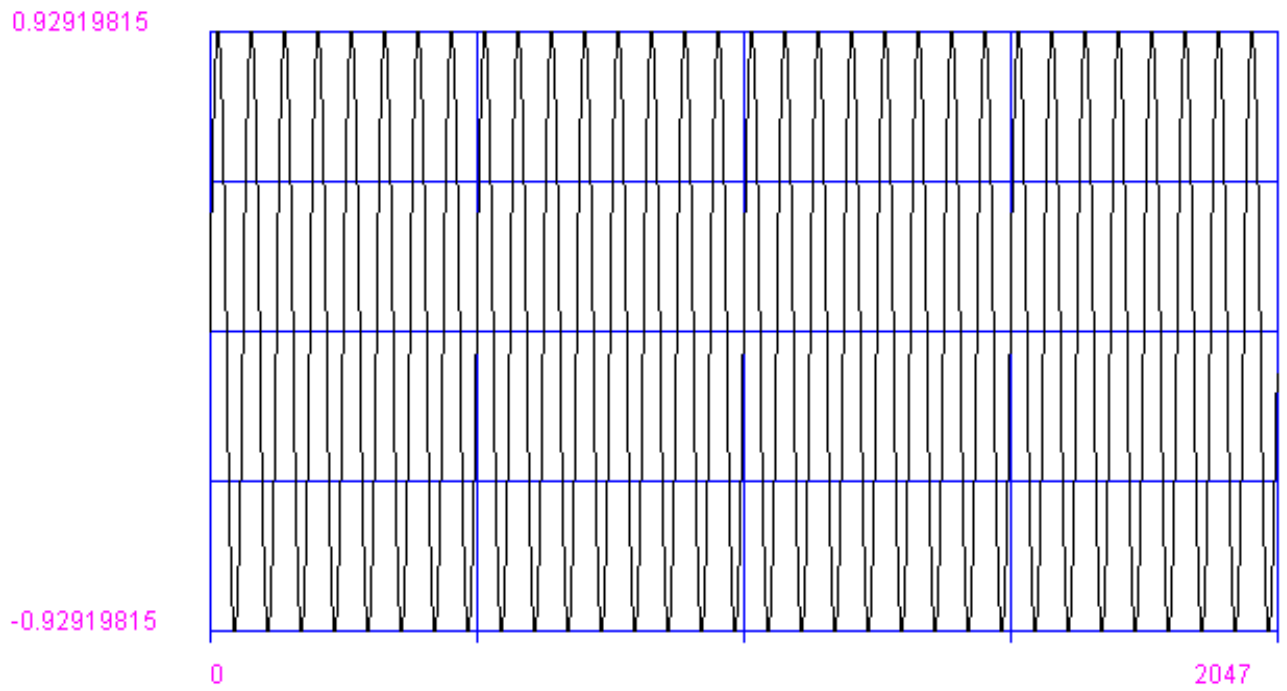


Fig. P1. Plot P1 showing sin32.au file.

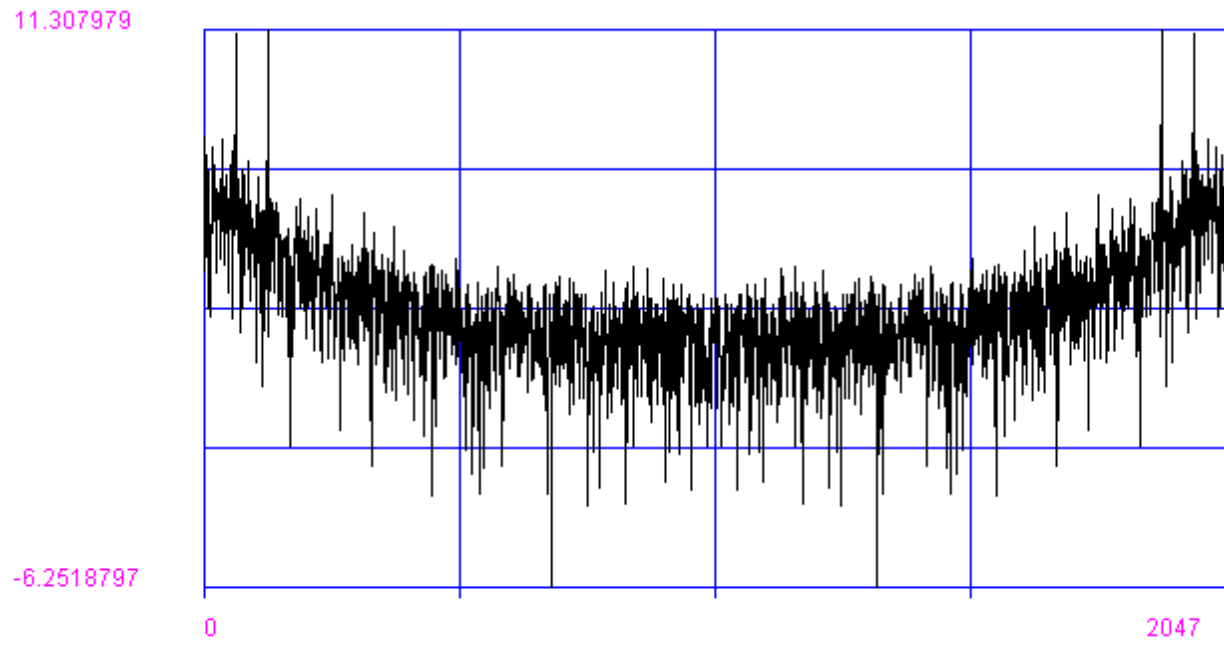


Fig. P2. Plot P2 showing $20 \log_{10} |FFT|$ of ran88.au file.

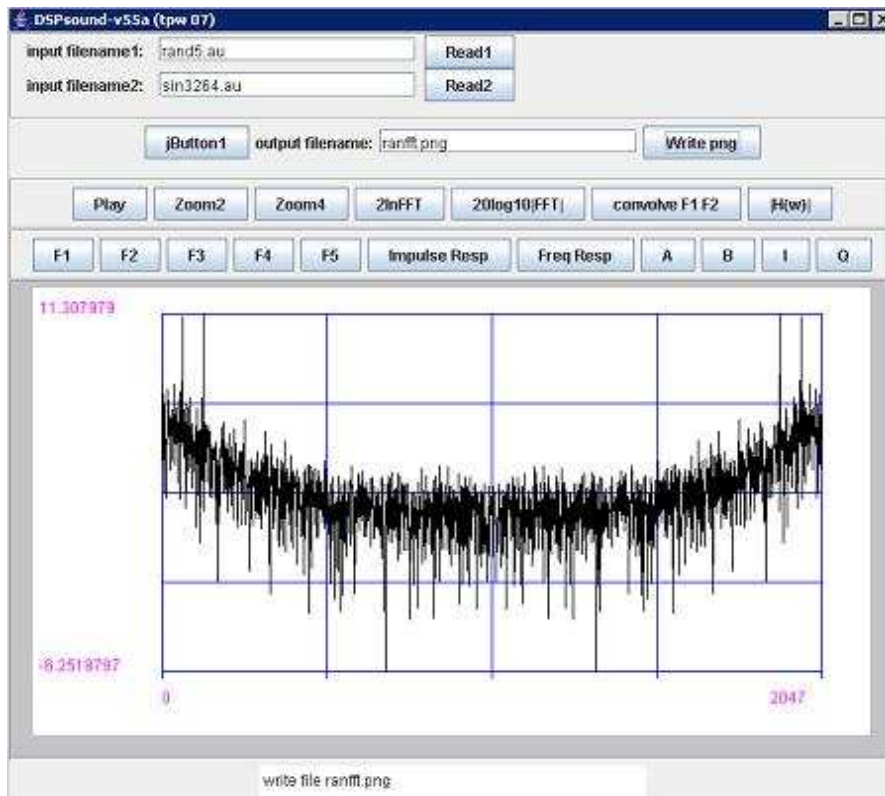


Fig. P3. Plot P3 showing UI.