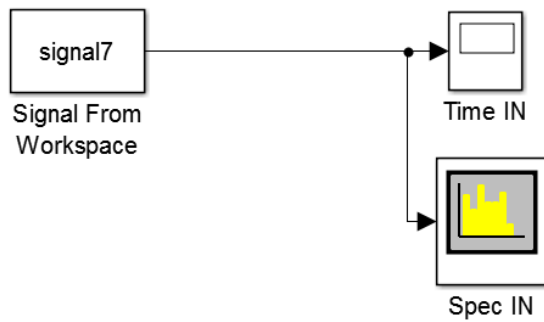


# Signal 7

## 1. Signal Zeit / Frequenz

Schaltung:



Signal from Workspace Einstellungen:

Parameters

Signal:  
signal7

Sample time:  
1/8000

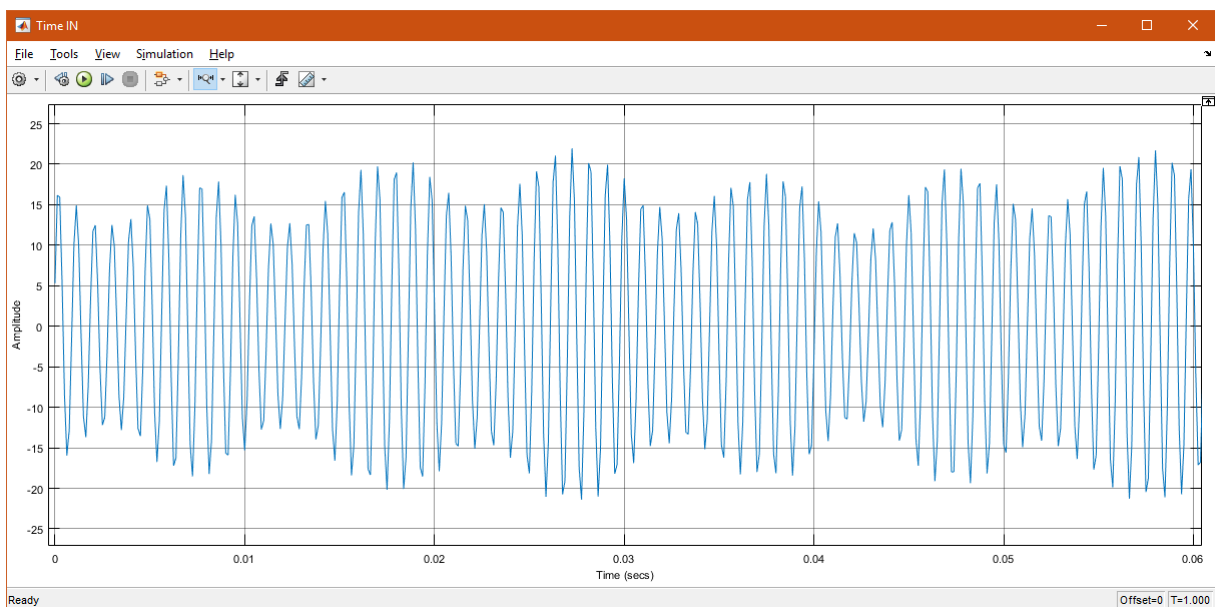
Samples per frame:  
1

Form output after final data value by: Cyclic repetition

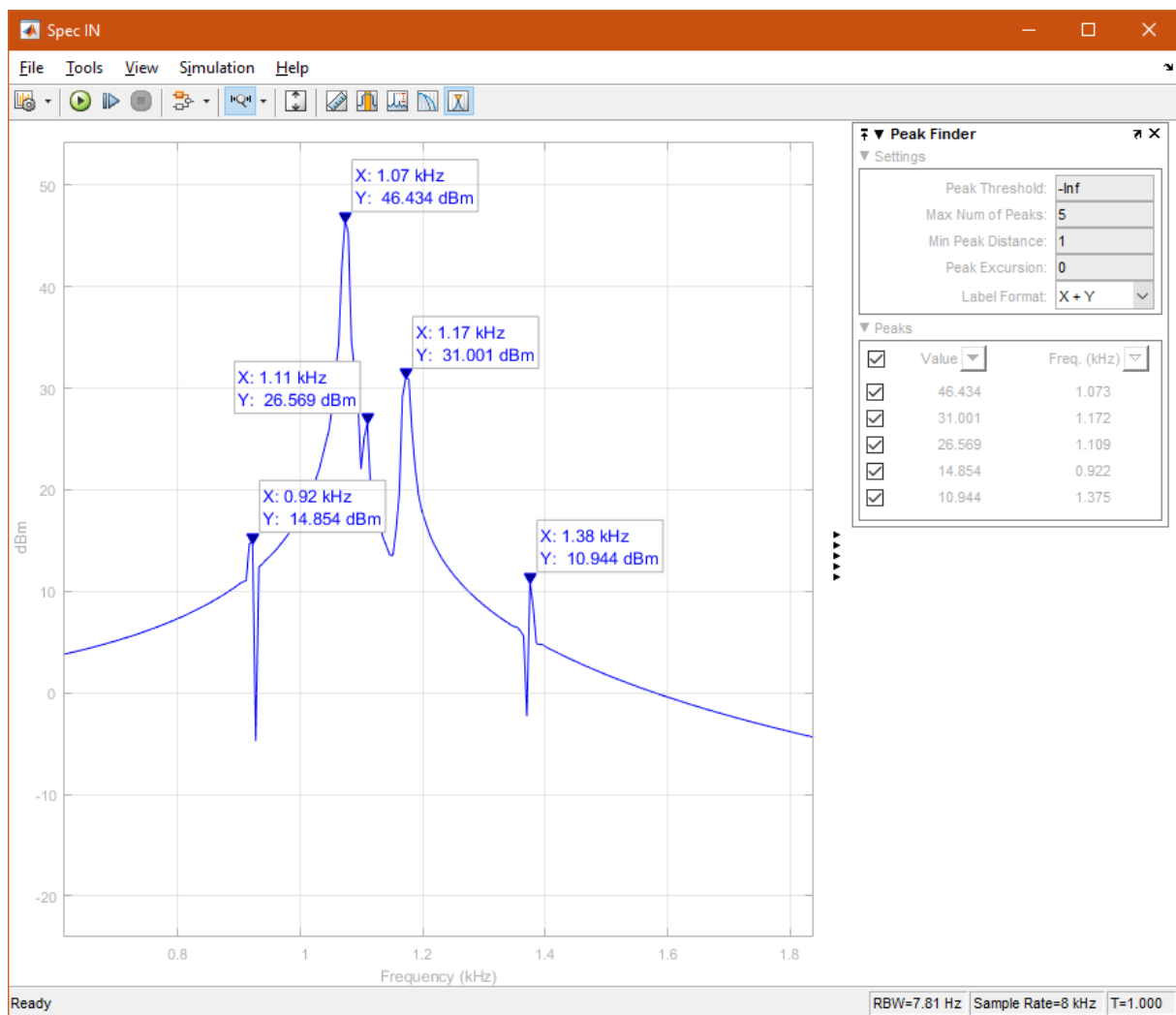
☒ Warn when frame size does not evenly divide input length

Buttons: ? OK Cancel Help Apply

Zeitbereich



Frequenzbereich:

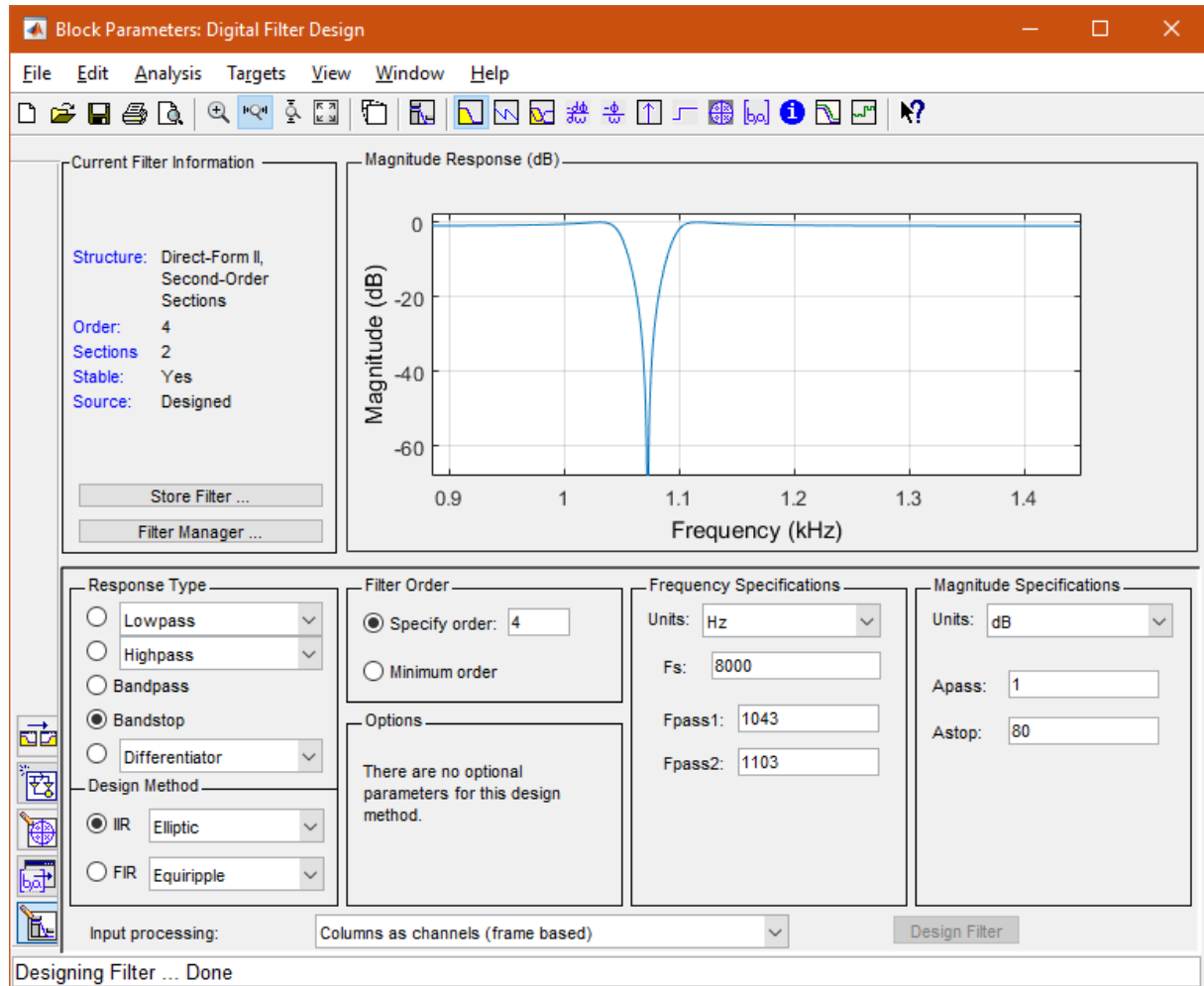


Die zweite Spektrallinie von der Frequenz her ist bei 1,07kHz.

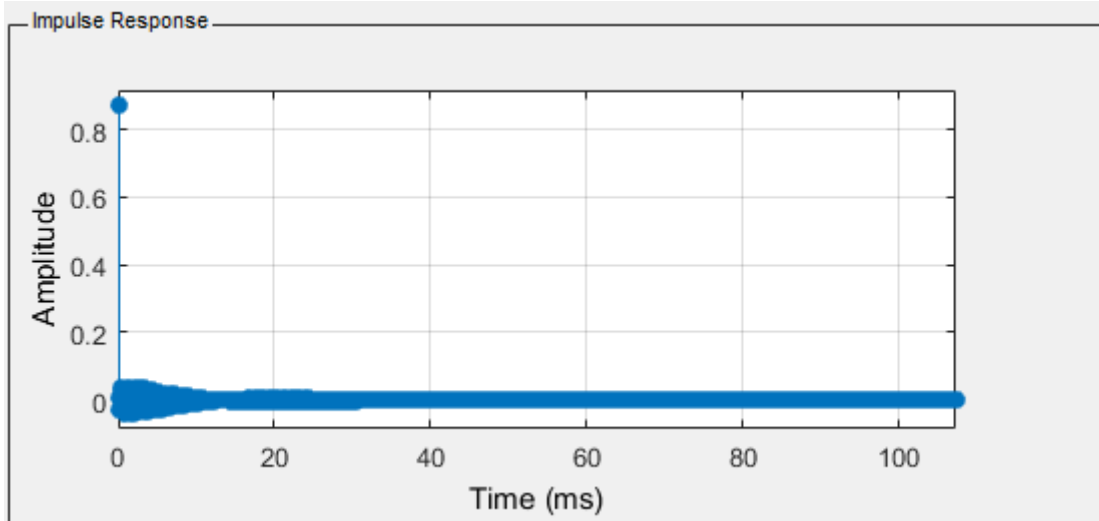
## 2. Filter

Der Filter ist ein Elliptic-IIR Filter 4. Ordnung.

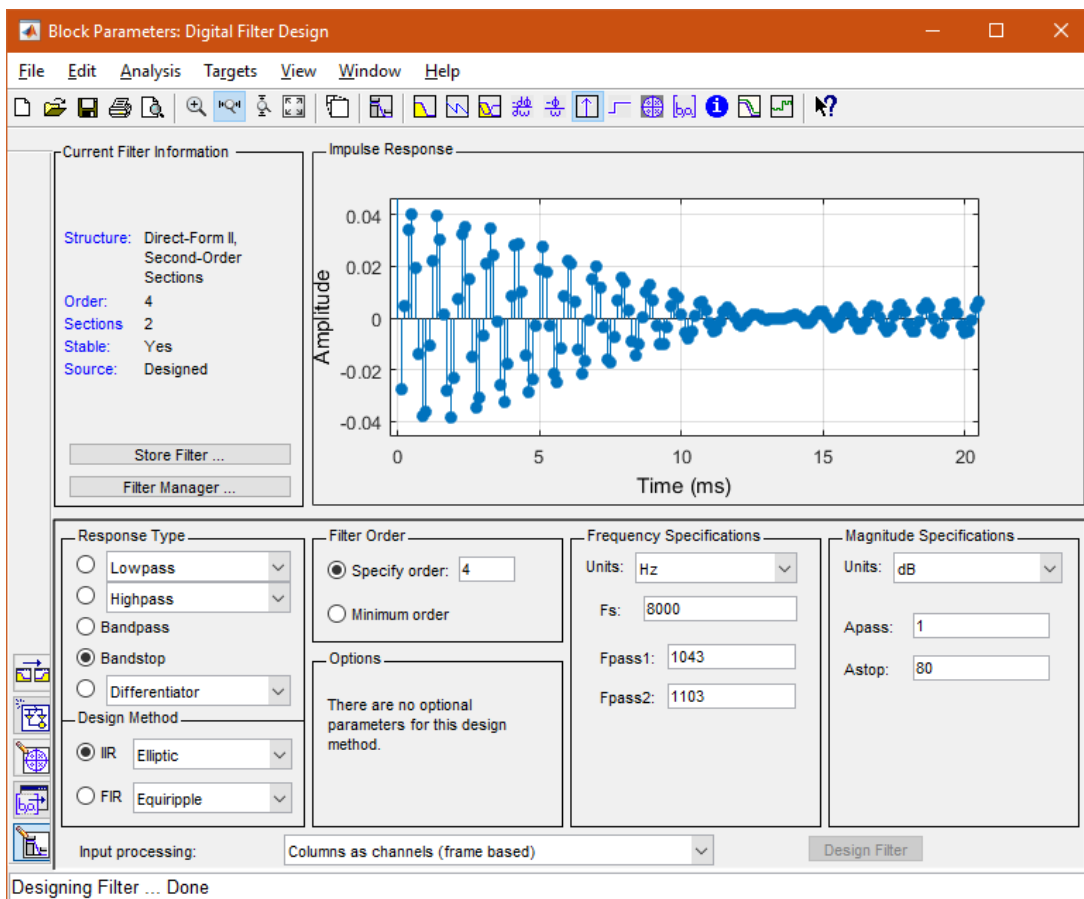
### Amplitudengang:

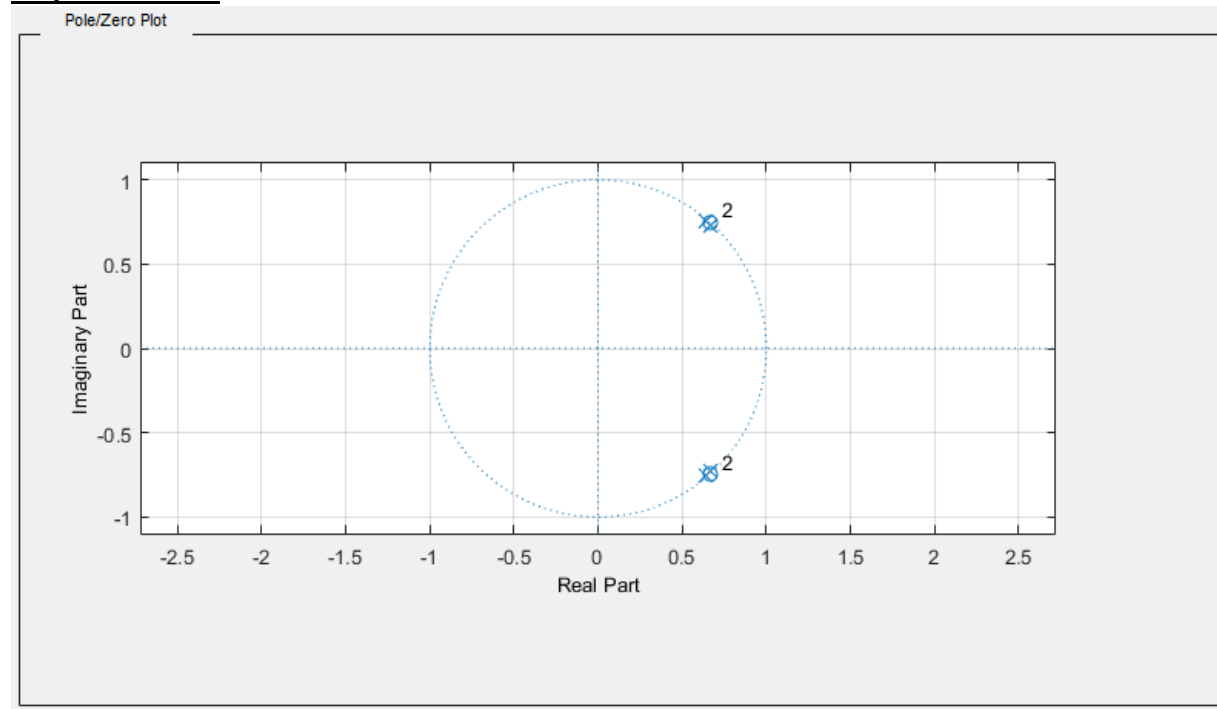
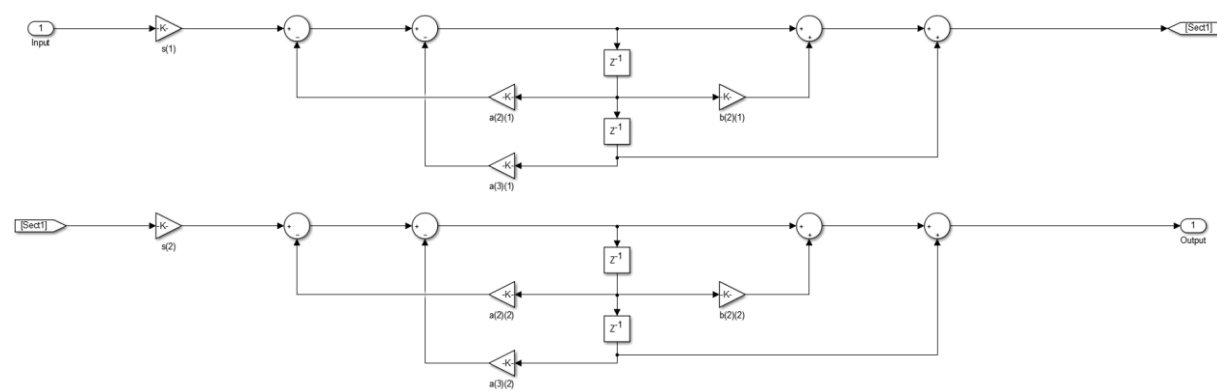


Die Durchlassfrequenzen wurden symmetrisch um 1073Hz platziert. (30Hz entfernt)

**Impulsantwort:**

Zur genaueren Darstellung wurde der vordere Bereich unter Ausschluss des Wertes 1 beim Zeitpunkt 0 erneut dargestellt:



**Pol/Nullstellen:****Struktur:**

**Filterkoeffizienten:**

$$s(1) = 0.93294784952258414$$

$$a(2)(1) = -1.2868250974445234$$

$$a(3)(1) = 0.97642787295864619$$

$$b(2)(1) = -1.3308661944188238$$

$$s(2) = 0.93294784952258414$$

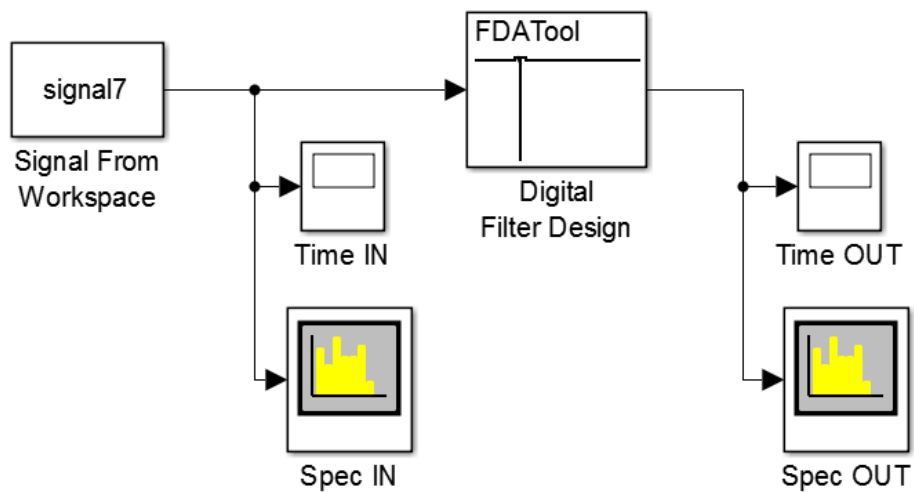
$$a(2)(2) = -1.3438056825526017$$

$$a(3)(2) = 0.97720971489810515$$

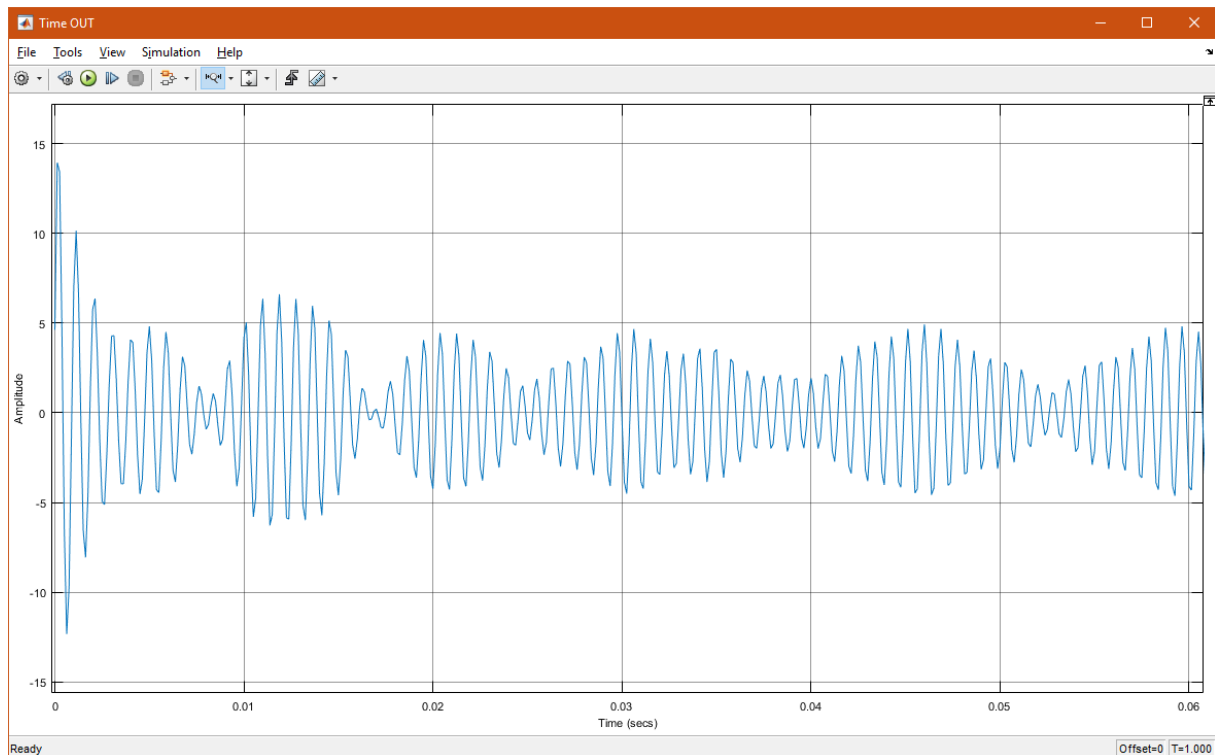
$$b(2)(2) = -1.3315758737107264$$

### 3. Filter anwenden

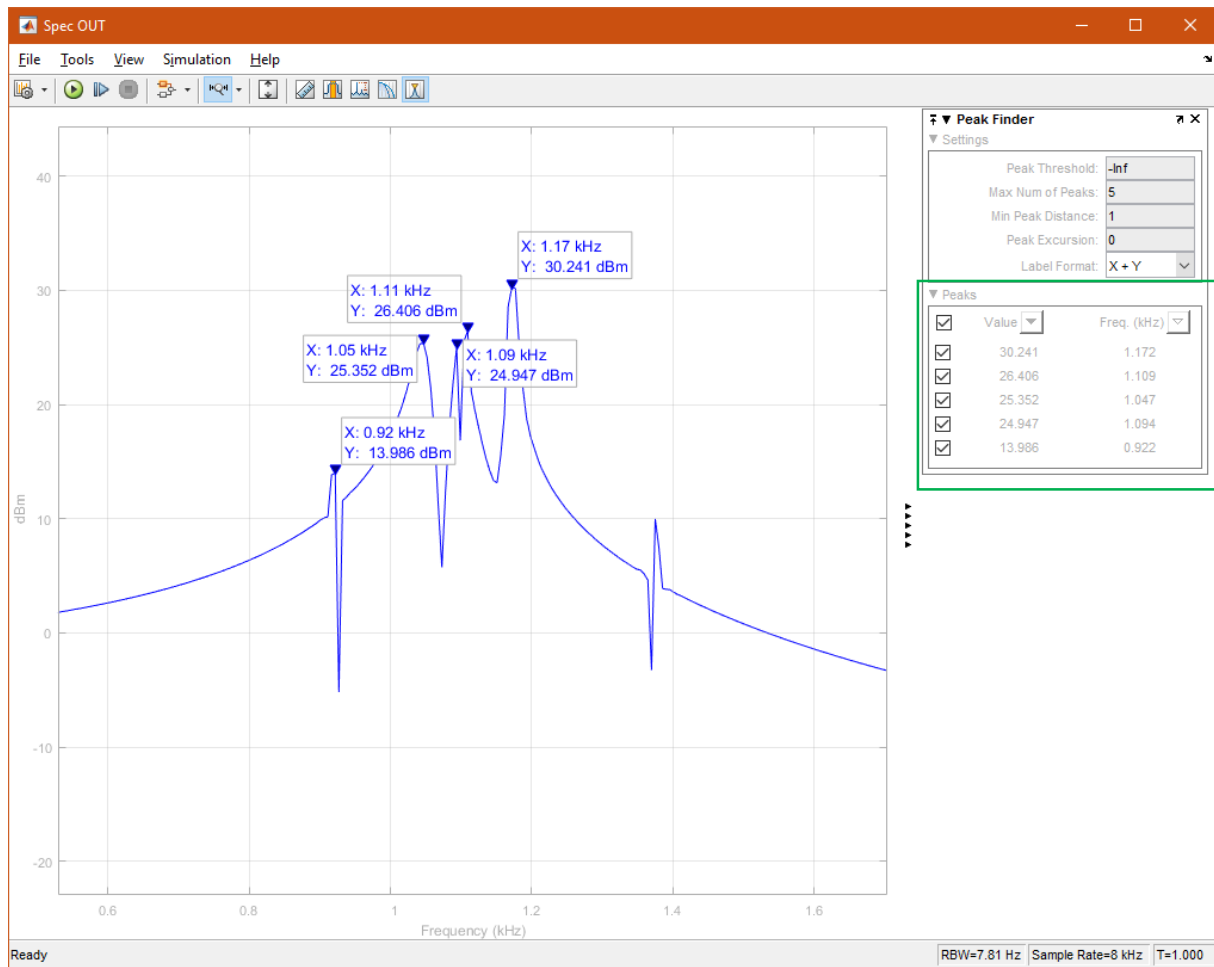
Schaltung:



Output Zeitbereich:



## Output Frequenzbereich



Spitzen sichtbar in Screenshot. (grün eingerahmt)

## 4. C-Code

```
float x=0,y=0;
float w11=0,w21=0,w31=0; float w2=0;
float w12=0,w22=0,w32=0;
float s1=0.93294784952258414;
float a21=-1.2868250974445234;
float a31=0.97642787295864619;
float b21=-1.3308661944188238;
float b31=1;
float s2=0.93294784952258414;
float a22=-1.3438056825526017;
float a32=0.97720971489810515;
float b22=-1.3315758737107264;
float b32=1;
```

ISR:

```
    x=Eingang;
    w11=X*s1-w21*a21-w31*a31;
    w2=w11+b21*w21+b31*w31;
    w12=w2*s2-w22*a22-w32*a32;
    y=w12+b22*w22+b32*w32;
    w31=w21;
    w21=w11;
    w32=w22;
    w22=w12;
    Ausgang=y;
    return;
```