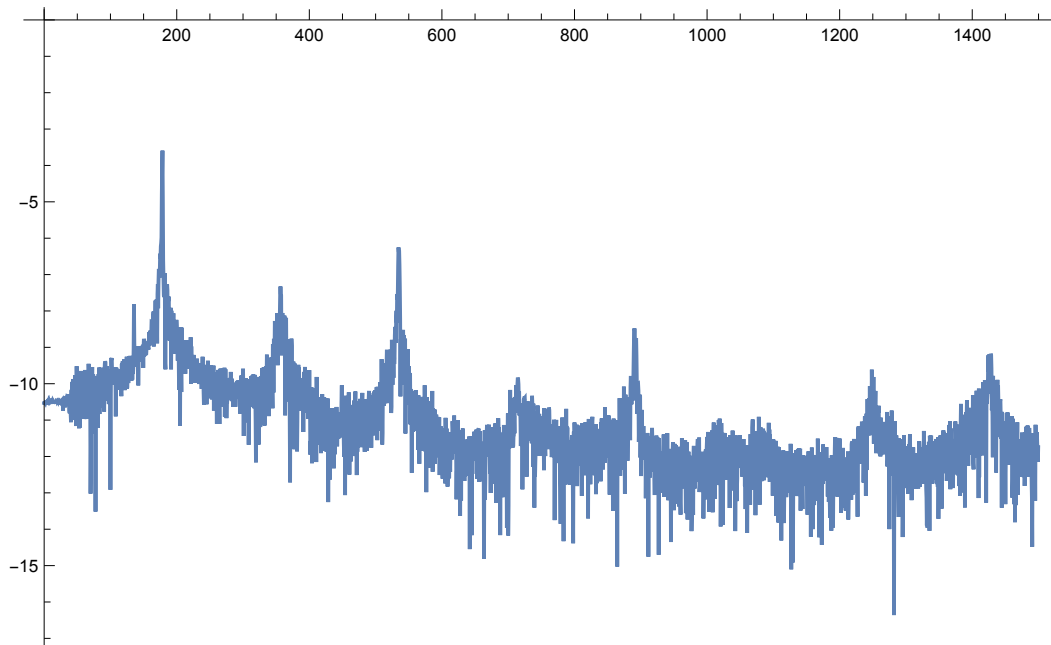


Measured spectrum of string in magnetic field

1861-magnetHalfPartOfStringEbow

```
In[ ]:= data = First@Import[FileNameJoin[
    {NotebookDirectory[], "1861-magnetHalfPartOfStringEbow.wav"}], "Data"];
sr = 44 100; nfft = 2 sr;
wav = data[[1 ;; nfft]];
spec = Log[Abs[Fourier[wav, FourierParameters → {-1, 1}]]];
ssf = N[Range[0, sr / 2, sr / nfft]];
maxFreq = 1500; numDisp = Length[Select[ssf, # < maxFreq &]];
ListLinePlot[Transpose[{ssf[[1 ;; numDisp]], spec[[1 ;; numDisp]]}], PlotRange → All]
```

Out[]:=



```
In[2]:= {178, 356, 535, 714, 893, 1248} / 178.
```

```
Out[2]= {1., 2., 3.00562, 4.01124, 5.01685, 7.01124}
```

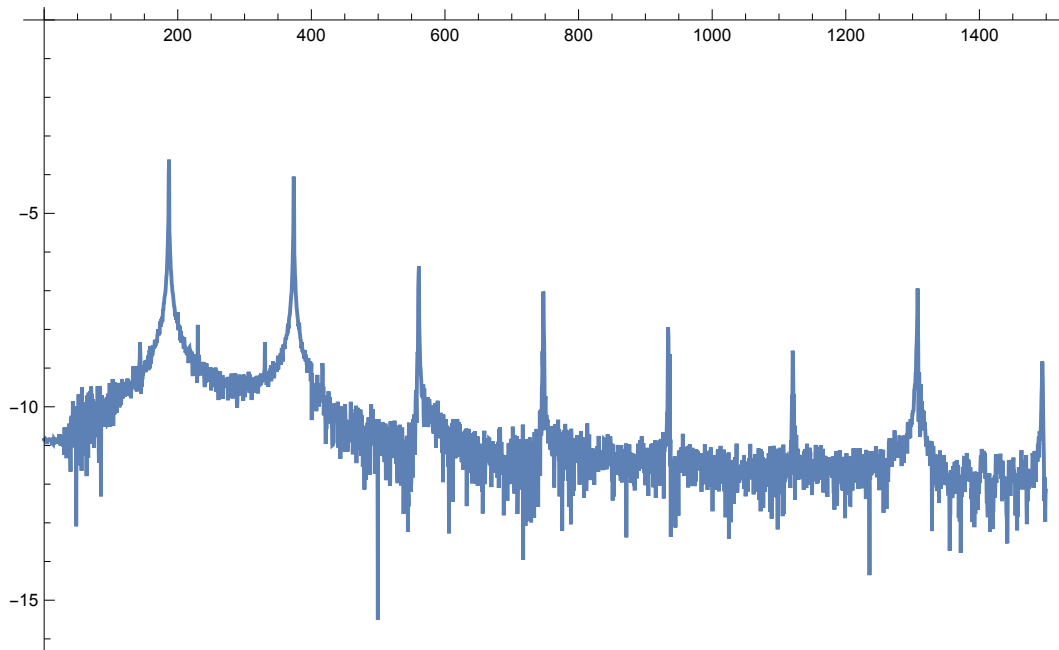
1861-noMagnetEbow

```

In[9]:= data = First@
  Import[FileNameJoin[{NotebookDirectory[], "1861-noMagnetEbow.wav"}], "Data"];
sr = 44 100; nfft = 2 sr;
wav = data[[1 ;; nfft]];
spec = Log[Abs[Fourier[wav, FourierParameters → {-1, 1}]]];
ssf = N[Range[0, sr / 2, sr / nfft]];
maxFreq = 1500; numDisp = Length[Select[ssf, # < maxFreq &]];
ListLinePlot[Transpose[{ssf[[1 ;; numDisp]], spec[[1 ;; numDisp]]}], PlotRange → All]

```

Out[15]=



```

In[16]:= {187, 374, 560, 747, 934, 1120, 1308} / 187.

```

Out[16]=

```

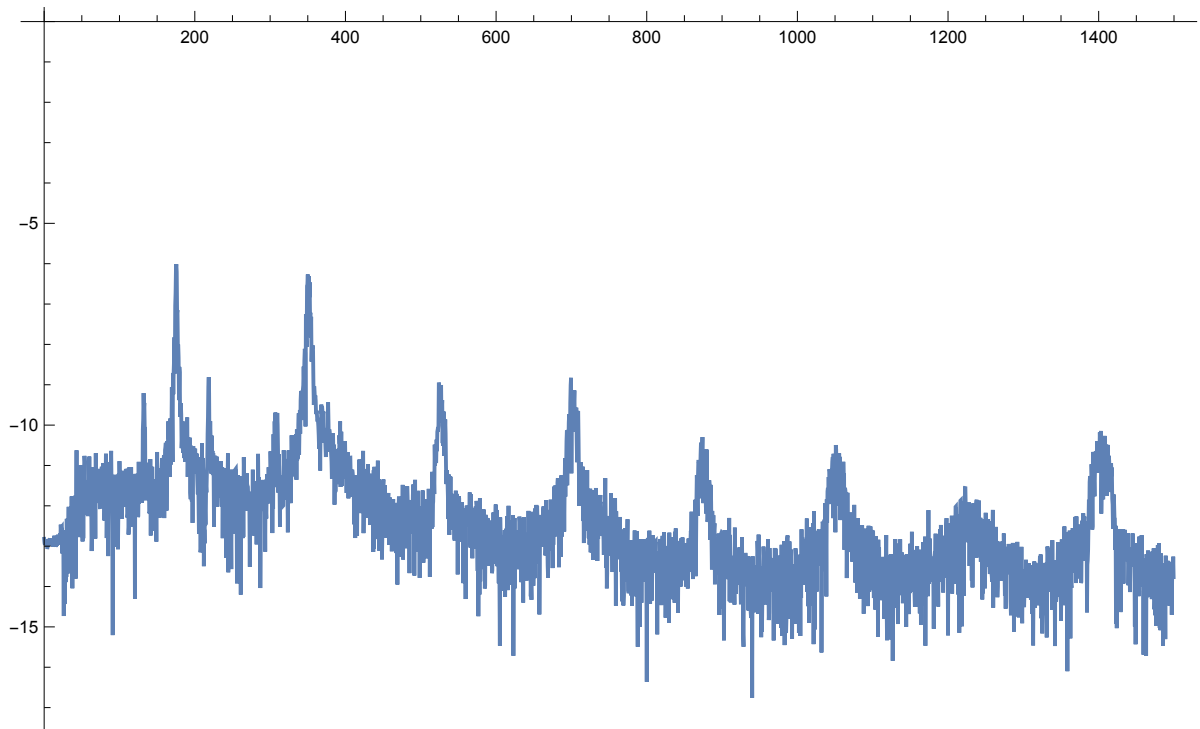
{1., 2., 2.99465, 3.99465, 4.99465, 5.9893, 6.99465}

```

1864-HandHeldNeodymMagnetAboutThirdPartOfString

```
In[17]:= data = First@Import[FileNameJoin[{NotebookDirectory[],
      "1864-HandHeldNeodymMagnetAboutThirdPartOfString.wav"}], "Data"];
sr = 44100; nfft = 2 sr;
wav = data[[1 ;; nfft]];
spec = Log[Abs[Fourier[wav, FourierParameters → {-1, 1}]]];
ssf = N[Range[0, sr / 2, sr / nfft]];
maxFreq = 1500; numDisp = Length[Select[ssf, # < maxFreq &]];
ListLinePlot[Transpose[{ssf[[1 ;; numDisp]], spec[[1 ;; numDisp]]}], PlotRange → All]
```

Out[23]=



```
In[24]:= {175, 350, 524, 700, 874, 1051} / 175.
```

Out[24]=

```
{1., 2., 2.99429, 4., 4.99429, 6.00571}
```

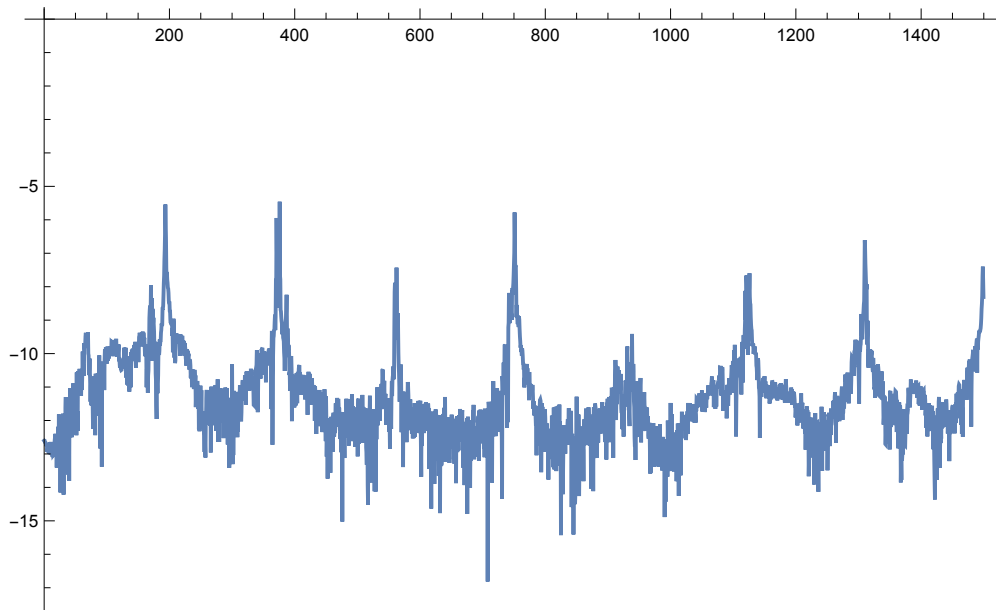
1864-HandHeldNeodymMagnetAboutThirdPartOfString+touchhizz

This one has no “steady state” portion and so taking the spectrum is not very meaningful. You might be able to break this into pieces and analyze the (steady) pieces one by one.

Pizz_NeodymMagnetThirdPartOfString

```
In[48]:= data = First@Import[FileNameJoin[
    {NotebookDirectory[], "Pizz_NeodymMagnetThirdPartOfString.mp3"}], "Data"];
sr = 44100; nfft = 2 sr;
wav = data[[1 ;; nfft]];
spec = Log[Abs[Fourier[wav, FourierParameters → {-1, 1}]]];
ssf = N[Range[0, sr / 2, sr / nfft]];
maxFreq = 1500; numDisp = Length[Select[ssf, # < maxFreq &]];
ListLinePlot[Transpose[{ssf[[1 ;; numDisp]], spec[[1 ;; numDisp]]}], PlotRange → All]
```

Out[54]=



```
In[56]:= {194, 376, 562, 751, 938, 1126, 1310} / 194.
```

Out[56]=

```
{1., 1.93814, 2.89691, 3.87113, 4.83505, 5.80412, 6.75258}
```