beats

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1 Exploring Beat Frequencies

This simple notebook will let you play with close frequencies and hear the beatings created by intermodulation. It's also a cute example of the interactivity you can achieve with notebooks.

```
In [1]: # standard bookkeeping
        %matplotlib inline
        import matplotlib.pyplot as plt
        import numpy as np
        from IPython.display import Audio, display
        # interactivity here:
        from ipywidgets import interactive, fixed

        plt.rcParams["figure.figsize"] = (14,4)
```

Let's define a simple fuction that generates, plots and plays two sinusoids at the given frequencies:

```
In [2]: def beat_freq(f1=220.0, f2=224.0):
            # the clock of the system
            LEN = 3 # seconds
            Fs = 8000.0
            n = np.arange(0, int(LEN * Fs))
            s = np.sin(2*np.pi * f1/Fs * n) + np.sin(2*np.pi * f2/Fs * n)
            # play the sound
            display(Audio(data=s, rate=Fs))
            # display one second of audio
            plt.plot(s[:int(Fs)])

In [3]: v = interactive(beat_freq, f1=(200.0,300.0), f2=(200.0,300.0))
        display(v)
```

```
A Jupyter Widget
```

```
In [ ]:
```