# Pulse to Tone Converter

Robert Ruark 2022: http://www.robruark.com/projects/pulsetone/pulsetone.html
Based on work by Matt Millman: https://www.mattmillman.com/projects/building-your-own-pulse-to-tone-converter/
Which was based on work by Arnie Webber: https://bitbucket.org/310weber/rotary_dial/src
Which was based on work by Boris Cherkasskiy : http://boris0.blogspot.com/2013/09/rotary-dial-for-digital-age.html

Input protection. The load of the phone will drop the line voltage to ~9V. The Zener diode protects against transient events. It is not necessary to use a 60V rated linear regulator -- I just happened to have these on hand. Decoupling capacitance should be minimized to prevent loading the phone line and reducing audio volume.

This circuit is designed for use with Matt Millman's rotary dial ATTINY85 code:
https://github.com/inaxeon/rotarydial

The ATTINY85 can be programmed using an Arduino Uno and AVRdude.

Make sure to set the fuse bytes of the ATTINY85. It will by default use its internal RC oscillator and will output the wrong frequency of tones.

The ATTINY85 outputs DTMF tones on PB0 as a PWM waveform. This tone is coupled to the phone line indirectly by modulating the current draw of circuit. Because this circuit is powered by the phone line, AC current drawn through the linear regulator is coupled into the phone line. The amplitude of the tones can be adjusted by adjusting the value of R1.

Interface to phone.
Phone wiring varries.