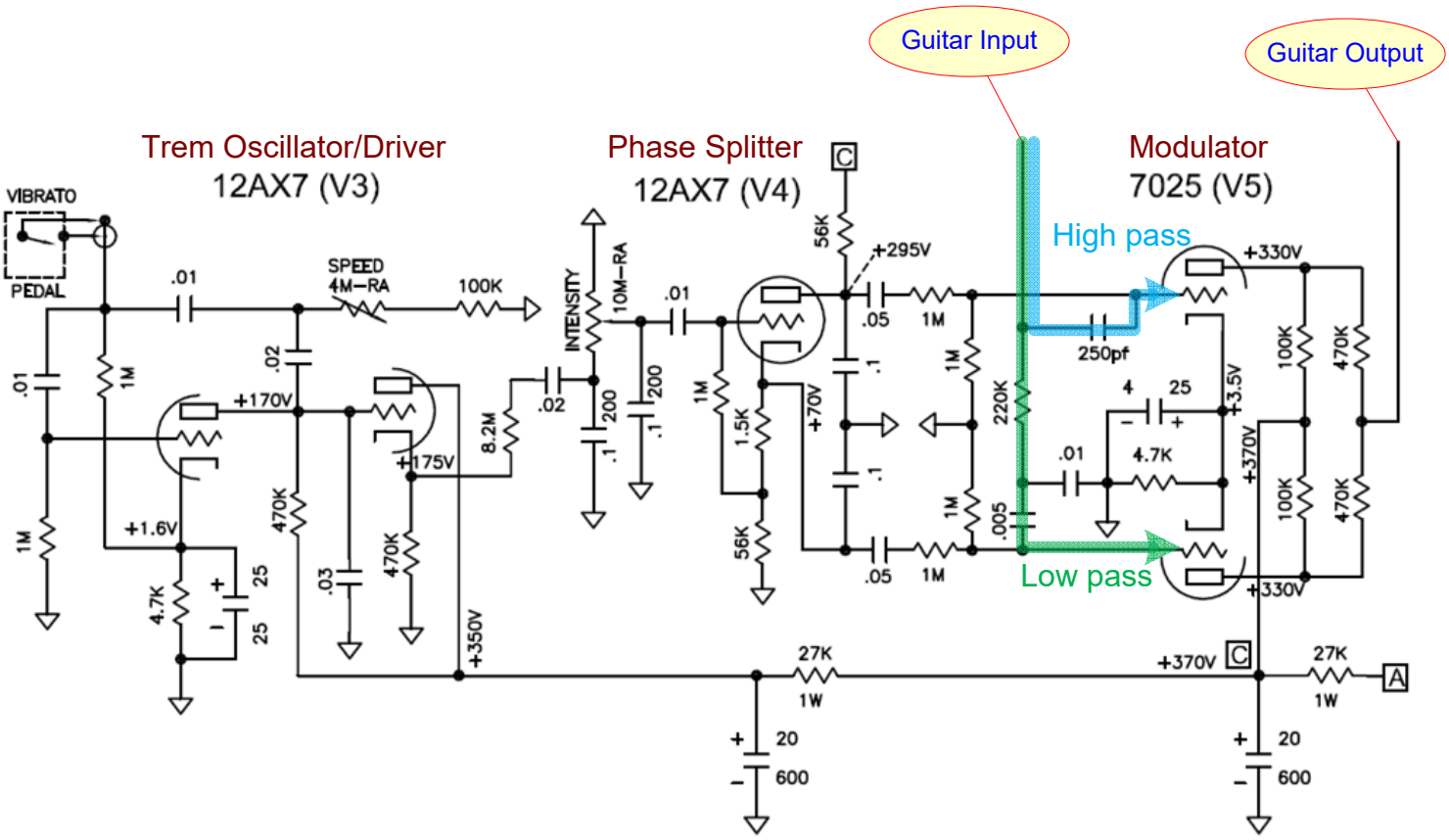
Fender 6G8 Harmonic Vibrato

This circuit is also found in several other 6Gxx amplifiers



The Oscillator is a standard Phase Shift Oscillator that operates at a low frequency range of approximately 3-10 Hz. The oscillator output is coupled through a cathode follower driver and then applied to the input of a phase splitter through the Intensity control. The phase splitter produces two identical outputs that are 180° out of phase with respect to each other. Each output is coupled to the grid of a modulator tube and will control the gain of that tube by modulating the bias at the slow oscillator frequency.

The input guitar signal is split and also applied to the grids of the modulator tubes. However, the guitar signal passes through a high pass filter to get to the top tube and passes through a low pass filter to get to the bottom tube. So, the top tube amplifies only the high frequency components of the guitar signal and the gain is varied/modulated by the Tremolo oscillator signal. Likewise, the bottom tube amplifies only the low frequency components of the guitar signal and the gain is varied/ modulated by the Tremolo oscillator signal that is 180° out of phase with the top Tremolo signal.

The modulated high frequency guitar signal is recombined with the low frequency guitar signal in the two 470KΩ mixing resistors. The out of phase Tremolo signals are also recombined in these mixing resistors, but since they are equal amplitude and 180° out of phase, the Tremolo signals cancel each other, leaving only the guitar signal. Since the Tremolo signals cancel each other, you will not hear the Tremolo signal ‘breathing’ when no guitar signal ia applied.