**CIRCUIT:** A peak detector circuit has a capacitor that charges quickly and drains slowly, like a reservoir that fills quickly during a spring downpour and drains slowly over the summer growing season. Fig. 1 shows a peak-detector that charges quickly when $v_s$ is higher (by one diode $v$-drop) than the $C$. The diode only lets current into the $C$ but prevents it from flowing back out to the left. Resistor $R_1$ is relatively small and is just large enough to prevent too much current from flowing in the diode. In contrast, $R_2$ is relatively large and provides a path to slowly discharge the capacitor.

As Fig. 2 shows, the capacitor voltage $v_o$ follows $v_s$ upwards when $v_s$ gets high enough (green region). If the diode drop were zero, $v_o$ would exactly follow $v_s$ up to its peak value and then decay slowly.

The decay rate between peaks is $\tau = R_2C$. We choose the decay rate that will hold the peak value for a time but eventually drop to zero so a new peak may be detected.

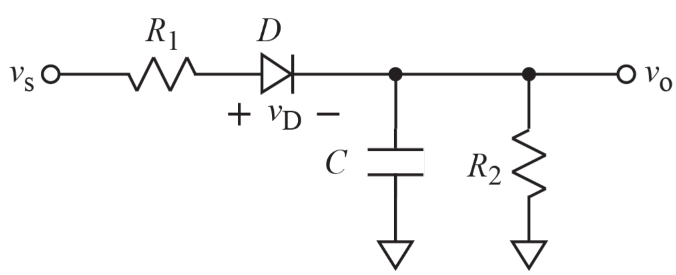


Fig. 1. Peak-detector circuit.

Fig. 2 shows the waveforms for the oscillator.

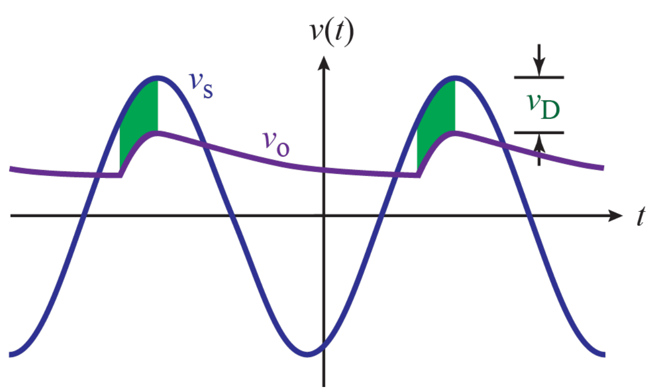


Fig. 2. Peak-detector waveforms. Green region indicates where $C$ is charging ($v_s$ is one diode-drop above $v_o$.