

Building Relaxation Oscillators

Objective

In this lab, you will build and study the relaxation oscillator from the “Introduction to Nonlinear Circuit Analysis” chapter.

Prelab

1. Please read and understand the chapter titled “Introduction to Nonlinear Circuit Analysis” in your reader.
2. Derive the i - v graph for the circuit shown below. Assume $R_a = 1k$, $R_b = 1k$, $R_f = 10k$, $C = 1 \mu F$, $V_p = 12 V$ and $V_n = -12 V$.

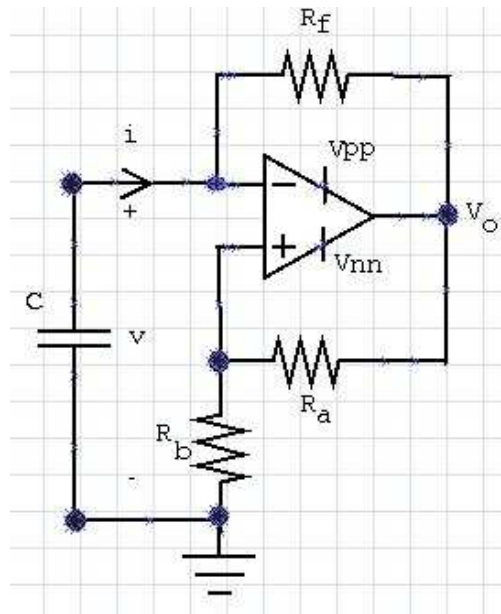


Figure 1. The nonlinear oscillator.

3. Sketch V_o and V_n assuming $v(0) = 0 V$.

Turn in the prelab to your TA as soon as lab starts. **Please note: If you do not complete the prelab beforehand, you will find it extremely difficult to understand and finish the lab.**

Group Member Name(s): _____

Lab Section/TA: _____

Lab

In the lab, build the relaxation oscillator in figure 1 using the LM741 op-amp. Once you get the circuit working, get checked off by your TA:

1. $V_o(t)$: _____ (TA checkoff)

2. $V_n(t)$: _____ (TA checkoff)