6.002 Demo# 21RP   **(Load Set up demo#21RP.set)**
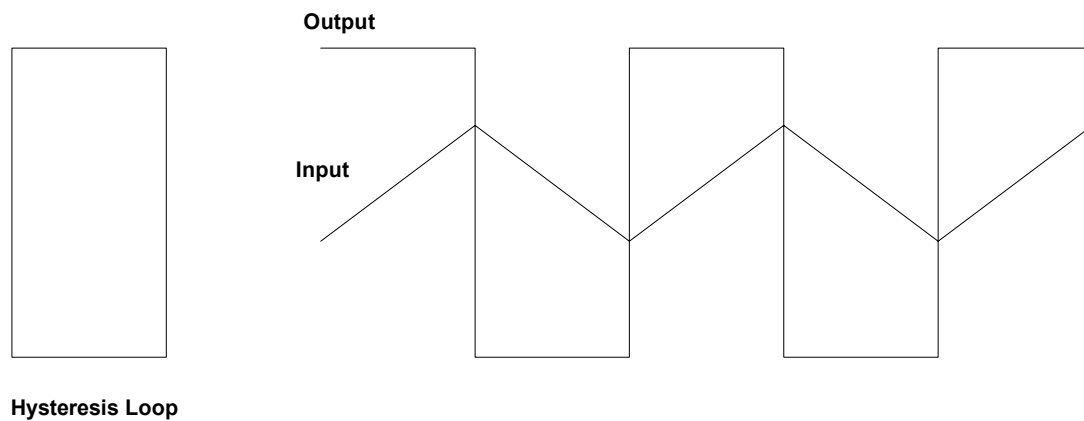**Relaxation Oscillator**
Lecture 21   **Prof. Parker Fall 01**

Purpose: This demo illustrates the use of positive feedback to create an oscillator. The oscillation frequency is shown to depend on the RC relaxation time of the feedback loop.

Steps:

1) Show input-output hysteresis loop
2) Show input and output waveforms
3) Adjust potentiometer in feedback loop to change the oscillation frequency. Output waveform can be played on speaker, if desired.

Description: Relaxation Oscillator

1) Set switch S1 " UP " and switch S2 " UP". Ensure that SYMM pot is turned all the way CW, HYS pot is turned all the way CCW, and FREQ pot is turned all the way CW.

2) To display input and output waveforms, press buttons "3" and "4" on scope

3) Turn FREQ pot CCW to increase the oscillator frequency. CH4 can be plugged into a speaker to play output waveform.

OSCILLOSCOPE SETUP

CH1	V/DIV	OFFSET	MODE	FUNC	MATH	VERT	HORIZ
1 Off				Off			
2 Off				ON	CH4vsCH3	5 v/Div	5v/Div
3 On	5	0	DC	Off			
4 On	5	0	DC	Off			

Horizontal 2ms/Div Acquisition: AUTO AUTO 1   Trigger   CH4

Waveform Generator Setup: Power Supply Setup

UNIT	WAVE	AMP	OFFSET	FREQ	+6	+25	-25	Output
					0	+15	-15	on

Relaxation Oscillator

CH1

17

5

1 K

FG1

Sine wave   1200 Hz

10 K

Gain

CH2

7

1 K

14

Sq.Wave 200 Hz

FG2

−

+

Summer

100 K

1 K

0.1 uF

20   CH3

21 RP

21 A

S2

1 K

−

+

CH4

22

Speaker
optional

33 K

S1

HYS

10 K

10 K

− 15 V

1 K

SYM

7633

7A26   7B53A

Op-Amp Ckts 2 Board

6.071/6.002 4-D-E Board

6.002/6.071 Op-Amp
Used old demo #5

50 Ohm

Left   Right

22   7

Trig Out

Gain

22

Home Made #1

Home Made #2

H.P. Dual Supply

(22) H. Made #2

(20) #1

(5) #1

Horiz. CH4

Square Wave

Vert CH2