

6.002 Demo# 17 (Load Set up demo#17.set)

Integrator and Differentiator Op-Amp

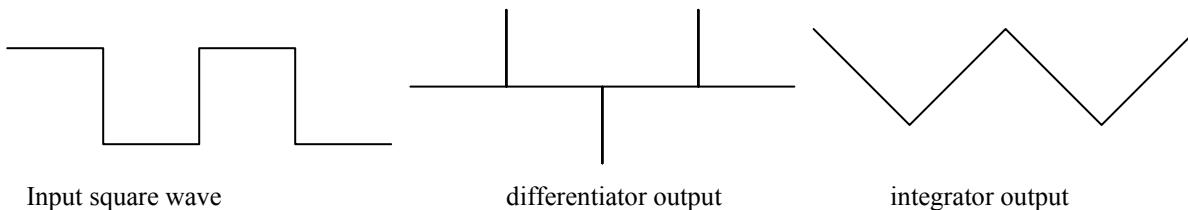
Lecture 20

Agarwal Fall 2000

Purpose: This demo shows the behavior of an (inverting) op-amp integrator and differentiator. The demo is used as an example of applications of op-amps, as well as op-amp circuit analysis.

Steps:

1. Show the op-amp differentiator input and output on the scope. Note that the differentiator works over a large frequency range.
2. Show the op-amp integrator input and output on the scope. Note that without a resistor placed in parallel with the capacitor, the integrator will tend to one of the rails, integrating even a small DC offset.
3. Add the shunt resistor, and show the integrator is more stable.



Description: To show Integrator and Differentiator, using Op-Amp.

For Integrator set the switches on the card as follows: Down, Down and Up (Shunt switch should be off and Bias switch be on)

For Differentiator set the switches on the card as follows: UP, Up and Down (starting from left to right).

For triangle wave on differentiator you have to change the Ch4 gain in order to see square wave.

For triangle wave on integrator you get parabolic wave similar to sine wave and Ch4 gain has to be Changed and adjust the position on order to see the signal.

See schematic diagram next page for more detail

Note: If you want to differentiator signal to be stable (not drifting) you should put Ch4 on AC instead DC!

Oscilloscope Setup

CH	V/DIV	OFFSET	MODE	FUNC	MATH	VERTICAL	HORIZONTAL
1 on	2	-3.5	DC	off			
2 off				off			
3 off				off			
4 on	2	12.5	DC	off			
Horizontal: 1 ms		Acquisition:		AUTO AUTO	4	Trigger:	CH4

Power Supply Setup

UNIT	WAVE	AMP	OFFSET	FREQ	+6 off	+25 +15	-25 -15	OUTPUT
FG1	Square	1	0	400 HZ		Trigger:		INT

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