6.002 Demo# 05 (Load set up Demo#05.set)
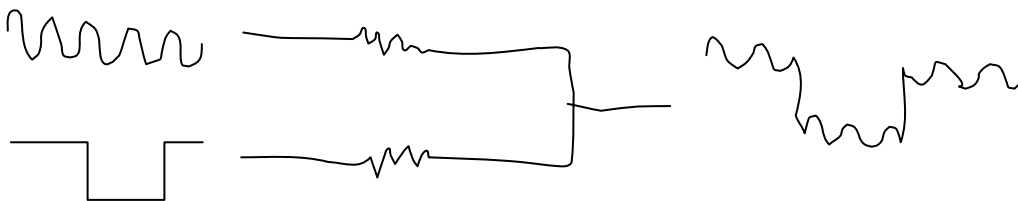
Superposition Using Resistors   Agarwal   Fall 00
# Lecture 4

Purpose: This demo is shown as a precursor to the intro to digital class, to motivate the use of digital logic. This demo illustrates superposition using a simple 2-source, 2-resistor network. We can show the two inputs (a square wave and a sine wave) on the scope, along with the output. The output is obviously a linear combination of the inputs, but this point can be made clearer by switching off the inputs individually and examining the corresponding output. This demo was used in the context of analog signal processing, and to motivate the digital abstraction.

Steps:
1.   Show on the scope the two input signals (square wave and sinusoid) and the resulting "adder" output.
2.   Turn off each source independently to demonstrate superposition.

3. This part is not demo'd, rather just drawn on the board. If the output is corrupted by noise, then it is hard to read.

Noise
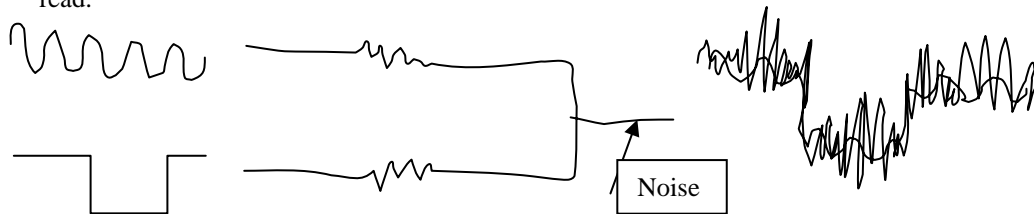
Description: Superposition using resistors

   Note: See schematic diagram next page for more detail

Oscilloscope Setup

CH	V/DIV	OFFSET	MODE	FUNC	MATH	VERTICAL	HORIZONTAL
1 on	2	6	DC	off			
2 on	2	6	DC	off			
3 on	2	0	DC	off			
4 off	2	6	DC	off			
Horizontal: 200 μ			Acquisition: AUTO AUTO 4			Trigger:	CH1

UNIT	WAVE	AMP	OFFSET	FREQ	+6	+25	-25	OUTPUT
On FG1	Sine	2	0	20 KHZ @ 50 Ohm				
On FG2	Square	2	0	1 KHZ @ 50 Ohm				Trigger: INT, INT

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