6.002 Demo# 05A   (Load set up Demo#05A-RP.set)
# AND Gate output, noise   Fall 00
Fall 00 Lecture 4

Purpose: The "chain-saw demo" is a fun illustration of the digital abstraction. Two square waves are inputs to an AND gate, and the inputs and corresponding outputs are shown on the scope. A chain saw is used as a noise source on one of the inputs. (Agarwal waltzes around in a men-in-black gig with the chain saw, the right costume, and the right music, chopping a laptop with the chainsaw along the way). By adjusting the intensity of the noise (using a potentiometer), the noise-immunity of digital circuits is exhibited, along with the breakdown when the digital abstraction is violated (when the noise is large).

1. With switch in "Coil" position, adjust frequency of FG2 from 2.5 KHZ to 1.2 KHZ to illustrate "AND", and than return to 2.5 KHZ.
2. With switch in "Aux" position and duty cycle of FG2 at 50%, input sine wave from FG3 into pin #16 (Aux port)
3. With switch in "Coil" position, DISPLAY HAIRDRYER noise on scope (Pot should be set so that noise is not large enough to trip "AND" Gate
4. With switch in "Coil" position DISPLAY CHAINSAW noise on scope (Noise should now be large enough to trip " AND" Gate.
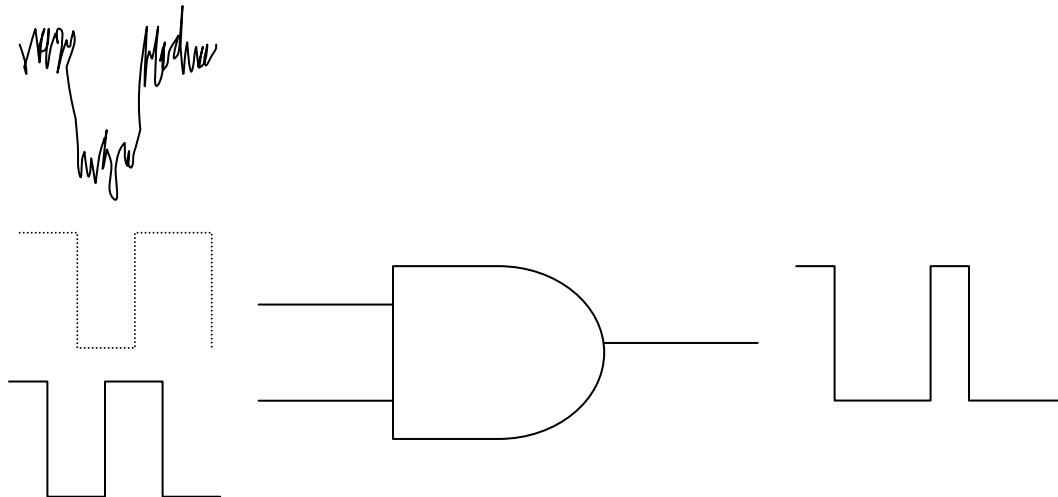
Description: AND Gate output with Chain Saw noise

Sync Cable: From FG1 sync (Front) to FG2 Ext Trig (Back)
To trigger FG2 from FG1:
Press [SHIFT] (Burst) then press [Single] to activate external trigger (FG2)

Note: see schematic next page for more detail

Oscilloscope Setup

CH	V/DIV	OFFSET	MODE	FUNC	MATH	VERTICAL	HORIZONTAL
1 on	2	2.03	DC	off			
2 on	5	-10 .44	DC	off			
3 on	2	6.72	DC	off			

Note! Music is played by A-V people so no need to take CD player

CH	V/DIV	OFFSET	MODE	FUNC	MATH	VERTICAL	HORIZONTAL
4 off				off			

Horizontal:	200 uS/div		Acquisition: AUTO	AUTO	4		Trigger: CH2

Waveform Generator Setup   **Power Supply Setup**

UNIT	WAVE	AMP	OFFSET	FREQ	+6	+25	-25	OUTPUT
FG1	Square	5	2.5	1 Khz *	5	15	-15	on
FG2	Square	5	2.5	2 Khz *	Trigger:		INT (see above)!	

FG3 Sinewave large enough to be visible offset 0 5 KHZ, Amplitude not large enough to trip " AND" Gate. Adjust offset of FG3 such that sine wave riding on FG1 (middle trace) looks good, however, it is not possible to sync sine wave to pulse waveform.

- **FG1 & FG2 should be on HIGH Z**

CHAIN SAW DEMO   **Fall 01 Prof.Sussman/Parker**