

6.002 Demo# 19A

Lead Inductance

Agarwal Fall 00

Purpose: This demo shows the inductive effect of long wires by showing voltage spikes on a power supply with a long lead when steps in current occur (due to switching wires of an inverter state). This effect disappears when a short lead is used.

Steps:

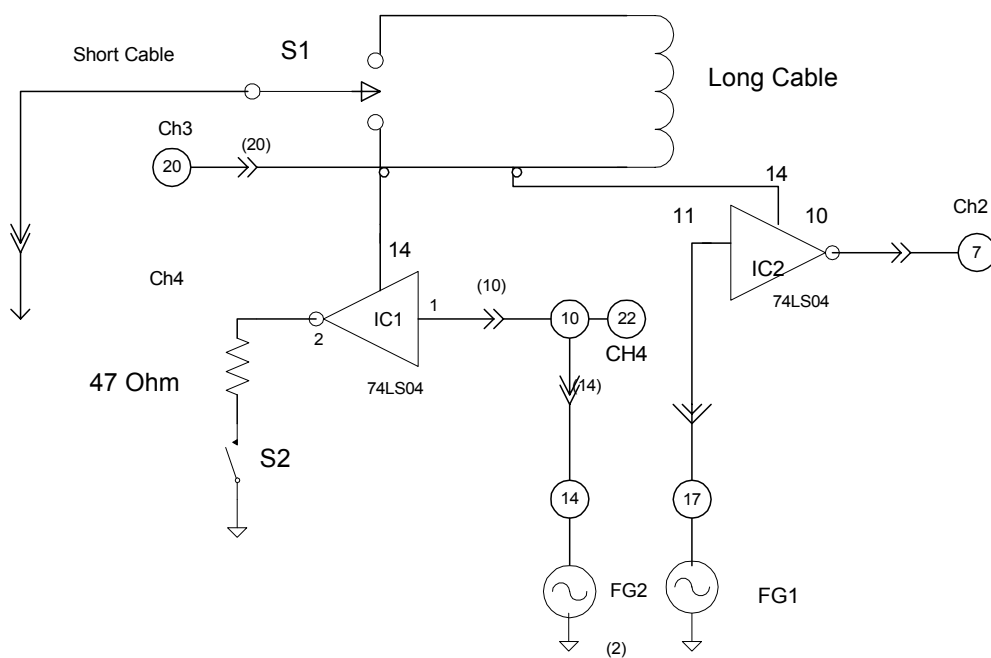
1. With the long lead in place, show the inverter output (in response to a square wave input) and the power supply voltage (at a point after the lead) on the scope. Note the spikes on the supply voltage, and their correlation to the inverter output switching.
2. Show the noisy output of an inverter with the input tied high, as an example of the effects on other circuits when noise is on the supply.
3. Switch to a short lead, and show that the effects disappear.

Long / short leads

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Description: Lead Inductor Demo

See schematic diagram next page for more detail

Oscilloscope Setup

CH	V/DIV	OFFSET	MODE	FUNC	MATH	VERTICAL	HORIZONTAL
1	off			off			
2	on	200mv	1.5	DC	off		
3	on	1	0	DC	off		
4	on	5	9	DC	off		
Horizontal: 200 us		Acquisition:		AUTO	AUTO	4	Trigger: CH4

Waveform Generator Setup**Power Supply Setup**

UNIT	WAVE	AMP	OFFSET	FREQ	+6 +5	+25 off	-25 off	OUTPUT
FG2	Square	2.5	1.25	4 Khz				Trigger: INT
FG1	Square	2.5	1.25	100 HZ				Trigger: INT