Purpose: This demo shows the capacitive coupling between signals on two separate wires in proximity. It is used as a case where 6.002 abstractions are violated. The coupling can be modeled as a capacitor, but the effect is due to physical implementation, not the design.

Steps:
1. With a sine wave applied to one circuit, and a square wave to the other, note on the scope the “spikes” riding on the sine wave circuit output, corresponding to the transitions in the square wave.
2. Remove the spikes from the sine wave output by switching the square wave to a triangle wave.

Description: Crosstalk demonstration

See schematic diagram next page for more detail

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Oscilloscope Setup

<table>
<thead>
<tr>
<th>CH</th>
<th>V/DIV</th>
<th>OFFSET</th>
<th>MODE</th>
<th>FUNC</th>
<th>MATH</th>
<th>VERTICAL</th>
<th>HORIZONTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>on</td>
<td>5</td>
<td>-13.31 DC</td>
<td>off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>on</td>
<td>2</td>
<td>-80 mV DC</td>
<td>off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>off</td>
<td>0</td>
<td>DC</td>
<td>off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>on</td>
<td>1</td>
<td>2.3 DC</td>
<td>off</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Horizontal: 200 us  Acquisition:  AUTO AUTO 4  Trigger: CH2
## Waveform Generator Setup

<table>
<thead>
<tr>
<th>UNIT</th>
<th>WAVE</th>
<th>AMP</th>
<th>OFFSET</th>
<th>FREQ</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG1</td>
<td>Sq</td>
<td>5</td>
<td>0</td>
<td>10 KHz</td>
<td>off</td>
</tr>
<tr>
<td>FG2</td>
<td>Sine</td>
<td>1</td>
<td>0</td>
<td>2.5 KHz</td>
<td>Trigger: INT</td>
</tr>
</tbody>
</table>

## Power Supply Setup

- +6 off
- +25 off
- -25 off

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### 6.002 Demo #19

**Crosstalk**

```
Ch1 1K
(17)
7
(14)
Fg1
```

```
1K
(17)
Ch2
```

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Prof. Agarwal Spring '98