



# INTERACTIVE LED DINING TABLE

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We made a dining table with a frosted glass top lit by 448 LEDs that respond, in a complex and gentle fashion, to input generated by motion above the table while we eat.

The project was started in September 2005, and took less than a month.

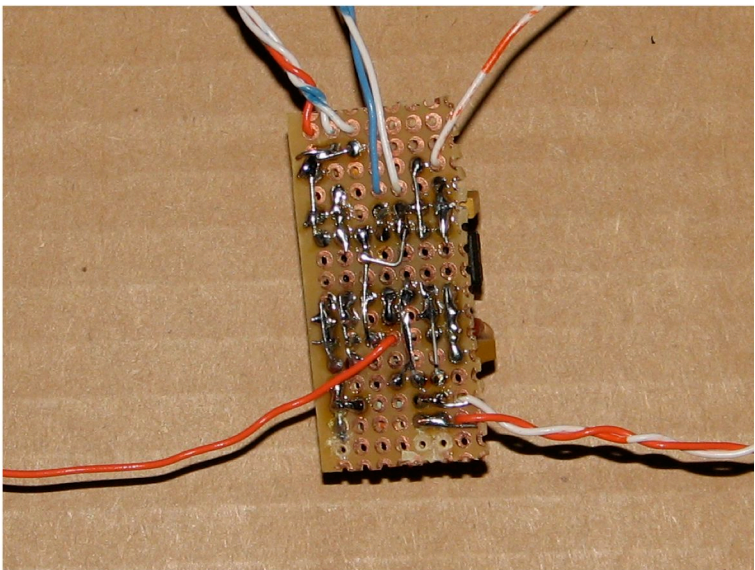
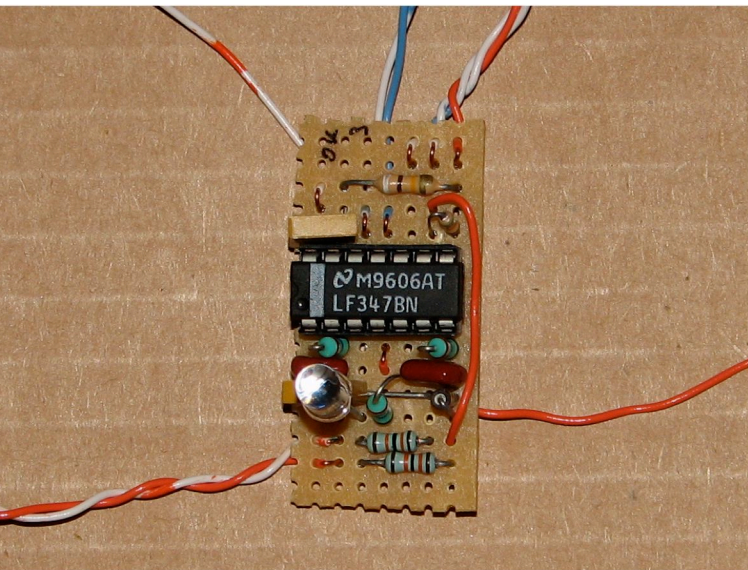
Yes, we actually eat at this table. No, it isn't annoying.

For more information: <http://www.evilmadscientist.com/>  
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## *TECHNICAL DESCRIPTION*

The LEDs are controlled by a 16-node 1-D analog computer network.

Each node has an amplified photodiode that senses changes in ambient light above its region of the table. A simple analog integrator (memory) averages that signal along with input from its two neighbors, and the resulting signal is used to drive one of two strands of 14 LEDs each (depending on polarity) with intensity that depends on the strength of the signal. Each node consists of one photodiode, one quad op-amp chip, eight resistors, and four capacitors that we hand-soldered onto plain perfboard. We mounted the nodes to sheets of masonite pegboard, such that the output LEDs fit through the holes. After (a dozen or so evenings of) soldering, the pegboard with its electronics and a power supply was set into a simple stained-wood table frame that we made out of birch and poplar, and topped with glass recycled from a desk top.



Single network node– there are 16 in the table, connected with a 1-D topology.

## *TABLE FRAME*

Frame of the LED table, with JellyBean the cat (Harley is hiding back there too). The frame is made of birch and poplar, stained red-orange and finished with several coats of tung oil. (Can't you just *feel* the sandpaper?)

The lower inside ledge and cross brace, which are unstained in the photo, support the masonite pegboard that holds the LEDs. The flat surface at the top of the four legs supports the glass top of the table.





## *TWIST. SOLDER. GLUE. REPEAT.*

Remarkably, standard size LEDs fit perfectly into pegboard holes.

Placing LEDs in the pegboard took a long, long time. Each LED was soldered, stuck in a hole, and held down with hot glue.

The cutout in the near end of the pegboard is to accomodate one of the power supplies. The cross-braces are 1x1 wooden strips, and prevent the pegboard from bending under its own weight. Because the photodiodes stick up above the table top (down, here), the table is supported a few inches above another table by some cans (cans of corn, mostly).

You can see the hot glue gun, multimeter, and wire strippers in the photo. The soldering iron is hidden below the level of the table.



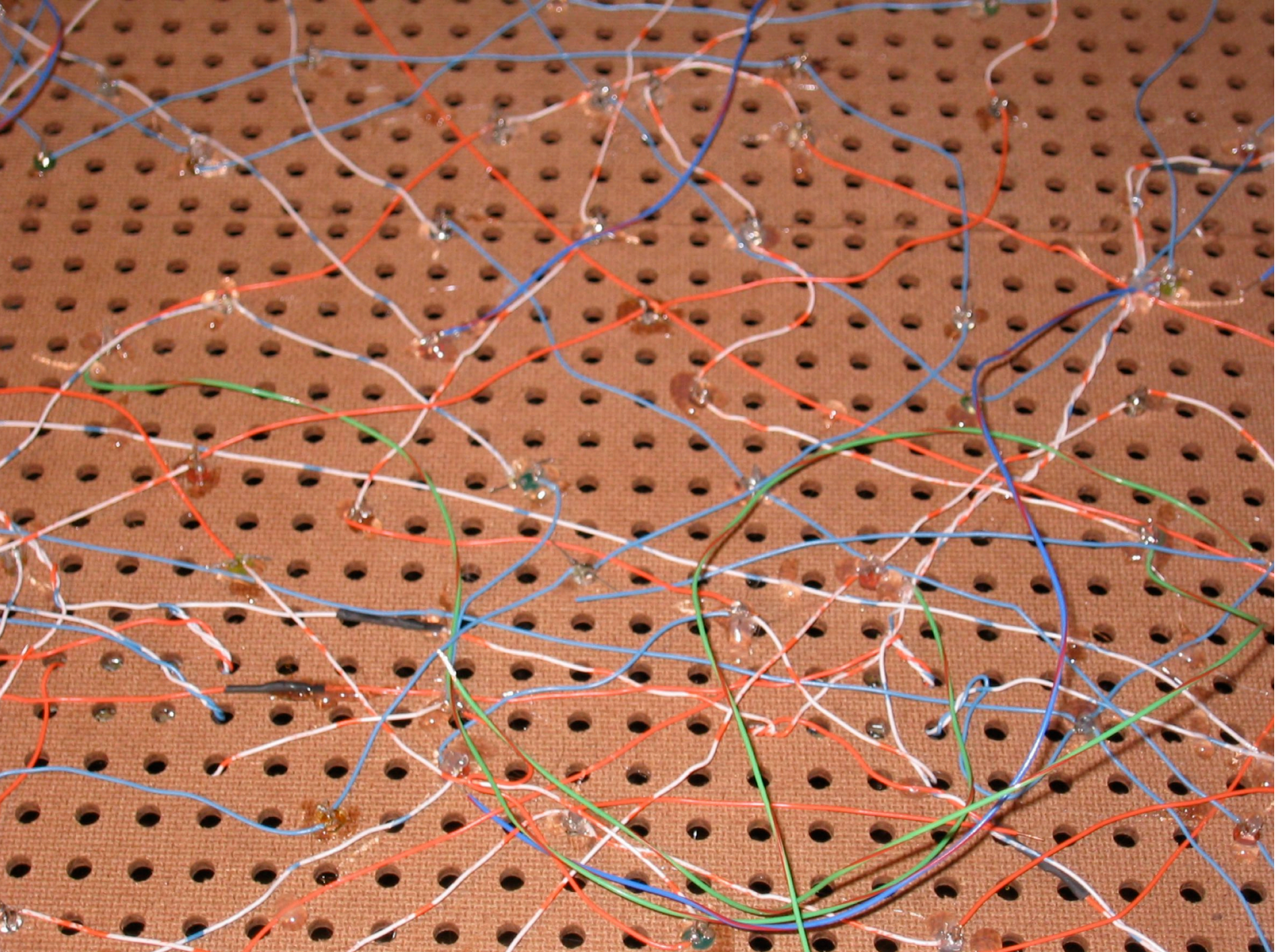




*MESSY, MESSY, MESSY...*

The underside of the pegboard. There's a reason that we hide this.

The wires were taken out of some network cable-- it's cheap! You can see the undersides of many of the LEDs, which are held in place by a dab of hot glue. This photo also shows the bottom side of two of the circuit nodes, with their wires sticking up through the holes.



## *ELECTRONICS MOUNTED ON THE TABLE*

Harley Cat tries out the table.

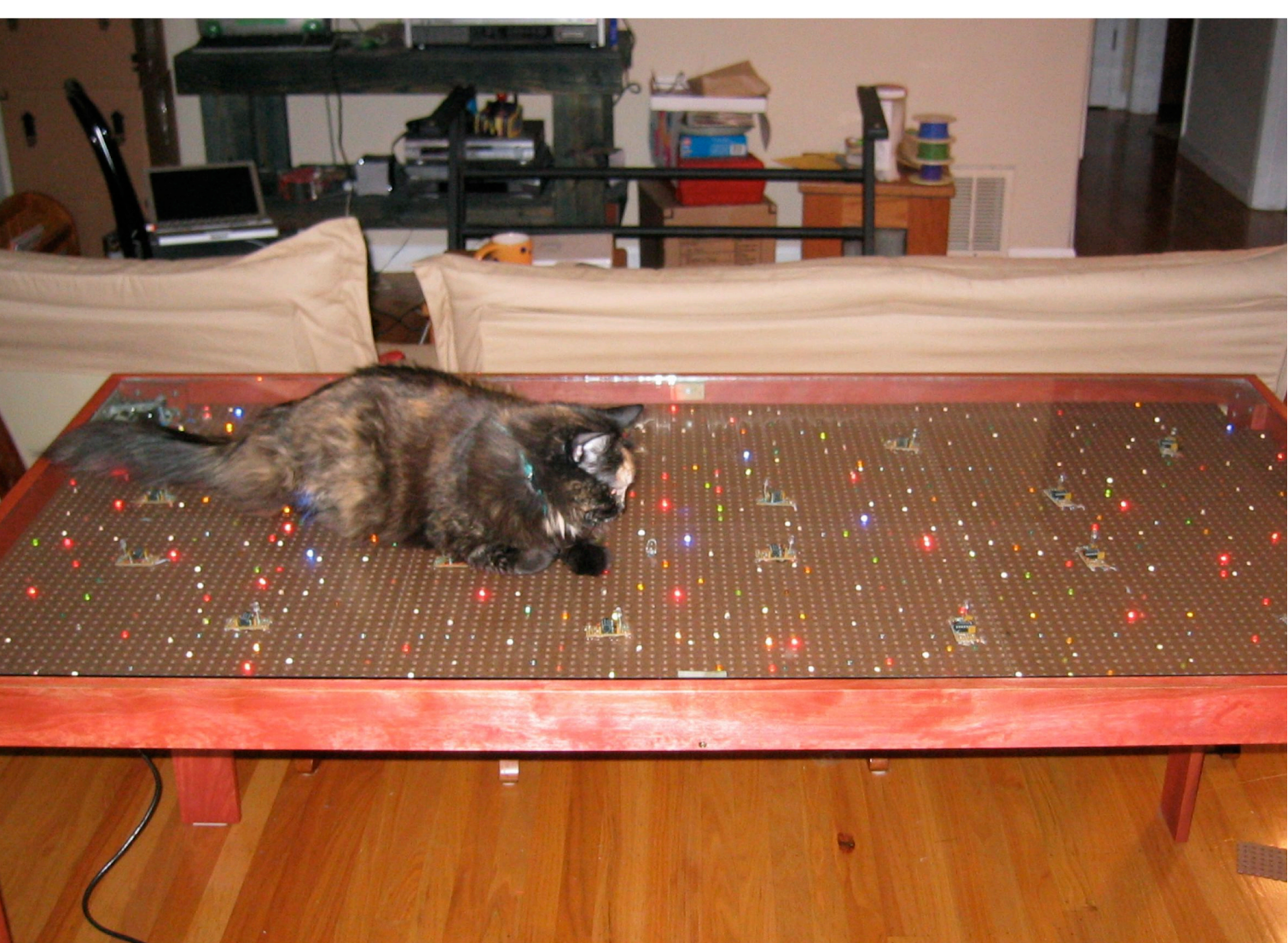
The glass top is present but the opaque coating has not yet been added. Below the glass top are the sixteen nodes of the circuit, each with the photodiode (in an LED-type T 1 3/4 package) sticking up close to the glass. The idea is that the table should be more sensitive to light from outside the table than to light from the LEDs.

The circuit nodes sit on top of the pegboard that holds the LEDs. In the far corner of the table is one of the two power supplies.













## *COMPLETED TABLE*

We added an translucent plastic diffusing film to the glass, and added a silicone seal around the edges to keep crumbs out.

In the photo, the newly completed table is checked out by Harley Cat and Christian. Meanwhile, JellyBean inspects the undercarriage.

The power switch is located by the power cord, under the corner of the table where Harley's tail is pointing.











JellyBean insisted on taking part in the photography.







About the authors: Lenore, Windell, and Christian are supporting members of the First Church of the Flying Spaghetti Monster, and are relatively new to the furniture business. [EvilMadScientist.com](http://EvilMadScientist.com)