The ESD Habbit or an unexpected shock

Screaming Circuits

Excitement is building here. In a little over two weeks from today, The Hobbit movie will be released to theaters. I'm sure everyone reading here knows the story, but in case you don't I'll spoil it for you.

It's a story about Biblio who is, according to Spock, the bravest little hobbit of them all (google that if you don't get the reference. You'll be glad you did). Biblio is minding his own open source robotics business when the Wizard of Menlo Park (in CA, not NJ) invites 12 MCU designers over for a meal and discussion about the merits of hardware peripherals vs. bit-banged peripherals. The MCU guys convince Biblio to go with them to The Lonely Mountain Chip Fab and help them kill a terrible ESD Spike problem. Actually, it's the Wizard that convinces the MCU guys that Biblio could help. The next day the MCU folks left early and Biblio ran out to catch up with them without even an ESD smock.

The ESD problem came from the North because it's more humid up North and that tends to dissipate ESD. Our Terrible Spike didn't like the idea of being dissipated without having first destroyed a few gold interconnect wires. The MCU guys need those gold interconnects to remain intact, so they brought a secret encryption key and enlisted help from the technician Biblio.

First though, they had to get past the TO-92 packaged parts that wanted to squash them into jelly or tacky flux. Fortunately, despite the bumbling of technician Biblio, the Wizard bought solder with no-clean flux which made the TO-92 parts stop moving once applied. After the TO-92 parts stopped working in daylight, they made a brief stop to inspect the last Homely Chip Fab in the Silicon Valley and see where the light sensitivity came from.

Passing over the Siskiyou Mountains on the way to Oregon and The Lonely Mountain Chip Fab, it started raining so they went into a cave and ate porc for dinner. Biblio ate so much that he fell asleep in the corner behind a chair where no one could see him and his buttons popped off. The missing buttons didn't bother him too much because those ones had a de-bounce problem anyway. Luckily, the weren't Grayhill switches or they would have hates Biblio forever, even if he used an achient gold Tolkien-ring network to bypass more porcs.

Biblio wasn't the most skilled technician and he caught his pine cones on fire while trying to solder new switches into place, but the wizard was able to re-layout the board using Eagle CAD and an FPGA that could take many forms and would satisfactorily control the machinery and bears at the local honey production facility. But the FPGA brought them all into the murky world of Verilog and VHDL. That would have been fine except that the search engine spiders hadn't crawled the eleven Wikipedia pages they needed to properly map out the clock routing.

The MCU guys got hungry and wouldn't wait for Biblio to come back with pi so they rushed in causing so much in rush current that the lights went out with a snap. After eleven clock cycles in his new hall-effect switch, Biblio knew that the de-bounce problem would be gone except when he plugged the barrel jack into his Apple computer. But with no static guards to wine too, he had no choice but to use the Apple barrel jacks to get power to MCUs and switch open the flip flop made from a streaming-transistor logic gate.

Annoyingly, they split the story in two and the movie will end at this point. We'll have to wait another year to see if Silicon Oakensubstrate is robust enough to kill the terrible ESD spike and pass final QC.

Duane Benson
One oven to reflow them all

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