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Physics 141—A1 March 15, 2004

\*\*\*Remember that in everything we do, we have to preserve life. Take great caution in handling materials that deal with electricity most especially if it concerns high voltages. Not because one is a big fan of Lego™ means he/she is safe from any accidents that might occur. Enjoying what you are doing is good; being careful is another thing.

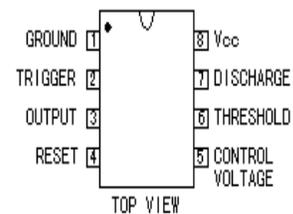


Ever wondered how your digital clock works? A digital clock is a watch where instead of second, minute and hour hands circling around your wristwatch, it has a black screen where certain parts of the screen just light up to show the time.

To be able to create a digital clock, one needs a power supply. A power supply is a much smaller version of Meralco that provides electricity for little “appliances” in our breadboard. Now, “what is a breadboard?” one may ask. It resembles a map wherein we could place our little “appliances” to connect it to one another. It is somehow similar to power outlets in homes.



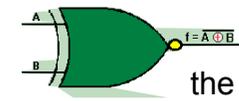
Let us proceed to our little “appliances” then. One of these “appliances” is the 555 IC. No, this is not a new variant of the canned sardines rather this is a counter. Counter in the sense that it sends signals in a very rhythmic way. The way the 555 counts is very similar to how one counts in his brain. No one knows you are counting but yourself.



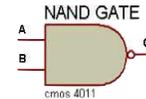
So to be able to show everyone that you are counting, you have to use your fingers to show what one, two, three and so on are. Like a part of the brain responsible for counting, similar to the 555 IC, it needs special fingers called LEDs or light emitting diodes to display what number it is already in. But then the 555 IC and the LEDs are two very different appliances.



So to be able to make the two “understand” each other’s action, one needs a decoder and a multiplexer. Both serve as translators of signals into actions to make the LEDs light in a very unique way—sort of like a translator in a Miss Universe pageant when the contestant is a Puerto Rican or a Venezuelan. But the decoder and multiplexer have a very big difference—Mr. Decoder simplifies his translations while Mr. Multiplexer uses rich vocabulary of words to make simple things more complex.



To help the two translators moderate their frequent clashes, gates such as NAND and NOR serve as pacifiers of the fight. NAND and NOR are not just gates but logic gates meaning they are the one who decide whether to allow or disallow the throw of words between Mr. Decoder and Mr. Multiplexer.



Sometimes, the disagreement between the two worsens because of another “appliance” called an operational amplifier (op-amps). It is an appliance that amplifies input. Thus, whenever a fight arises, it is usually the operation amplifier that even worsens it because of “*panggagatong*.” Examples of op-amps are transistors. Transistors look like water reservoirs. Still their use is to amplify input.

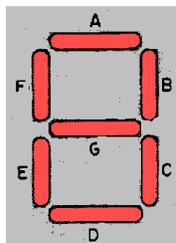


But if there are things used to amplify input, there should be other appliances to limit these things such as the resistor. It looks like a colorfully stripped hotdog on a stick. It limits the electricity flowing through a circuit.



Resistors are usually found with capacitors.

Capacitors, on the other hand, act as temporary batteries or power supplies.



Now, after that we have discussed most of the items for our digital clock, we need the 7-segment display to show a single digit number. How? Connect all the above-mentioned devices. But I know everything seems too vague to do it now. One of these days, let’s have an electronics session and see these things perform in action.

