

## Assignment 1 + Answers

6. Read about ESD protection and send me a plan of your actions for working with our development kit and other electronic devices (PCBAs, Sensors, Components). 2 points

To protect sensitive electronics from ESD one has to follow some rules:

6.1 Before taking/placing a chip (module, PCBA) from/on any surface discharge yourself by touching some well grounded metal part: metal case of a PS, metal frame of a test bench, or ground connector of the device plugged into power outlet.

6.2 When carrying a chip (...) somewhere use ESD protective bag.

6.3 To work with a chip (...) place it on a grounded ESD mat (a piece of a plywood from Home Depot or other store, wiped with a wet fabric can be used) and ground yourself with a wrist strap.

7. Find two or three embedded systems in the gramophone (not electrical) and describe what they do. 2 points

First observation must be: this is a pure mechanical system – no electricity used. A spring-based motor rotates the disk with a gramophone record.

7.1 One subsystem, providing sounds is a needle moving in the V-shaped groove with wavy surfaces on both slopes. The needle moves the attached diaphragm which produce sounds. The horn amplifies and direct sound waves.

7.2 The needle “moves in the groove” due to rotation of the disc (the disk moves relative to the almost static needle). To provide constant rotational speed there is another mechanical subsystem based on the centrifugal effect, - it stabilizes the rotational speed at 78rpm.

7.3 At the very end of the record the needle starts moving much faster towards the center of the disk, and the third subsystem detects this move, shifts its lever and stops the motor.