**Hardware Planning and Choice**

**Of OpenGameConsoleMK1**

**Hardware Planning**

* **Output devices**

**A main screen**: image display of game elements (large, enough refresh rate)

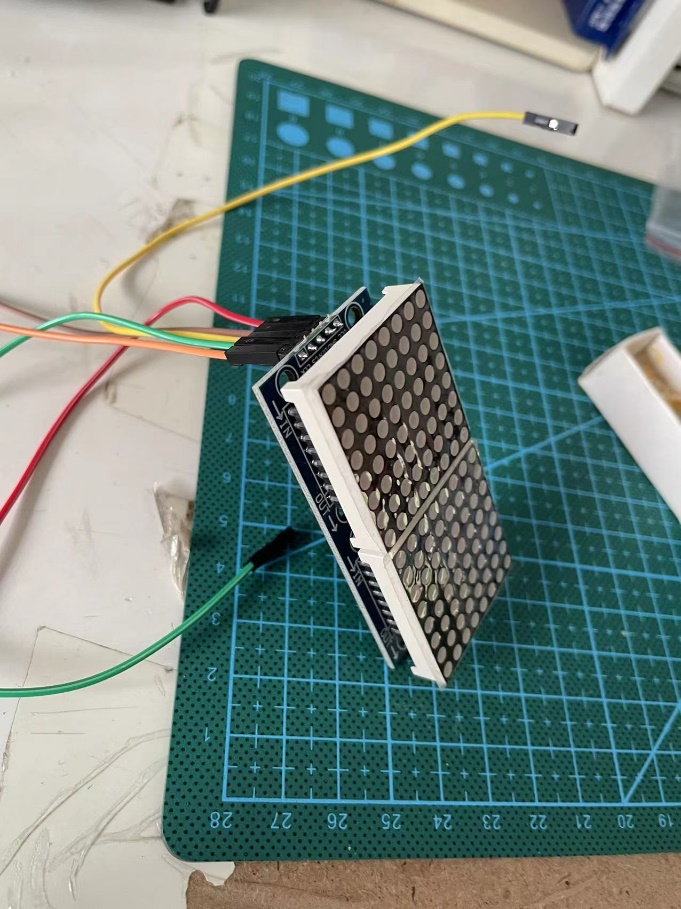
**A secondary screen**: display of text information (relatively small, high resolution)

**8-segment numeric LEDs:** display of numeric information such as remaining time and score.

**Sound generator:** output of sound feedback of game events. (adjustable frequency and volume)

**Hardware Choices**

* **Main screen: 8\*16 LED matrix with MAX7219 (SPI mode)**



Although only 128 LEDs are responsible for image display of each game, it is enough for every game object and element.

Low resolution also means relatively less requirement of computing power of development board (computing power is quite valuable when Micropython is used).

Also, designing images of game spirits will be easy and quickly (just different arrangement of pixels) so that development period could be shortened.

In terms of reflash rate, every 64 LEDs are controlled by 1 chip named MAX7219, which gets display content from serial data of GPIOs. The maximum rate of serial clock is 10MHz hence it is quick enough for only 128 LEDs.

The dimension of the LED matrix is 13cm \* 6.4cm \* 1.3cm, an ideal size for a portable handle device.

* **Secondary screen: Integrated 12864 LCD screen**

