

We have completed a kit (Fig. 1) containing software using python and hardware using ADC chip, stepping motors and various electronic parts. This kit is implemented by using a small computer, raspberry pi. Functions of this kit had been tested in part in the maintenance workshop in 2016. This kit is complementary to QuarkNet's e-Lab, it will join our student's learning in the future.

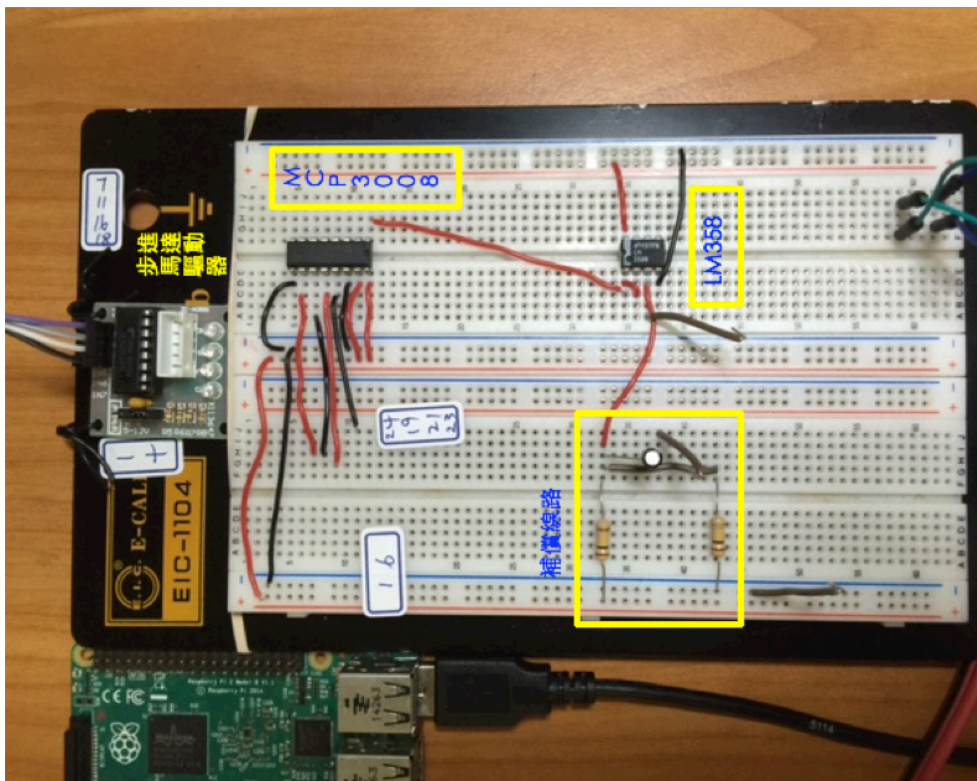


Fig.1, PCB board with various electronic parts; ADC(mcp3008), op AMP(LM358), stepping motor controller and raspberry pi.

We are helping Macao Science Center (MSC) to set up a cosmic ray program using QuarkNet equipment. They are currently contacting Fermilab to purchase DAQ and GPS, etc. Other parts , e.g. scintillators and PMTs, need to get from commercial companies. However the assembly of four counters is a difficult task for MSC. We have designed a frame (Fig. a and b) for them which will hold the counter so that it will sustain many more outreach activities. We will also redesign it such that we can reassemble our already existed QuarkNet counters in this way.



Fig. a, Showing the part of the frame to hold PMT.



Fig. b, Showing the part of the frame to hold the scintillator.