

04-29

Gen-0: (The first prototype) Yoshio Okamoto: A High-Gain Seismograph system for Educational Use: Toray Science Education Award 1990_Incentive Award https://www.toray-sf.or.jp/awards/education/pdf/h01_15.pdf

Sensor: car-stereo speaker magnet and coil: Body: iron L angles

Recording system: OP-amp + A/D ADC0809CCN 8bit + I/O 8255A + NEC PC-9801F2 Driving software: N88BASIC on MS-DOS

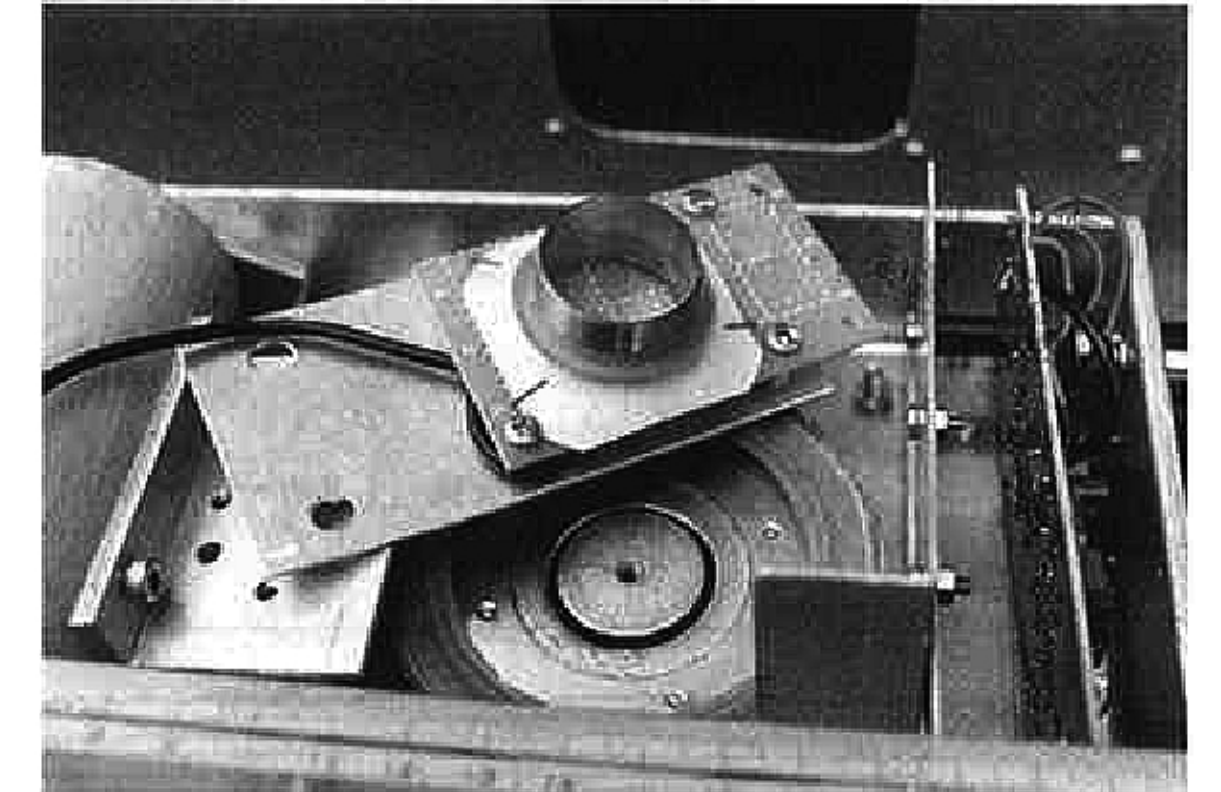
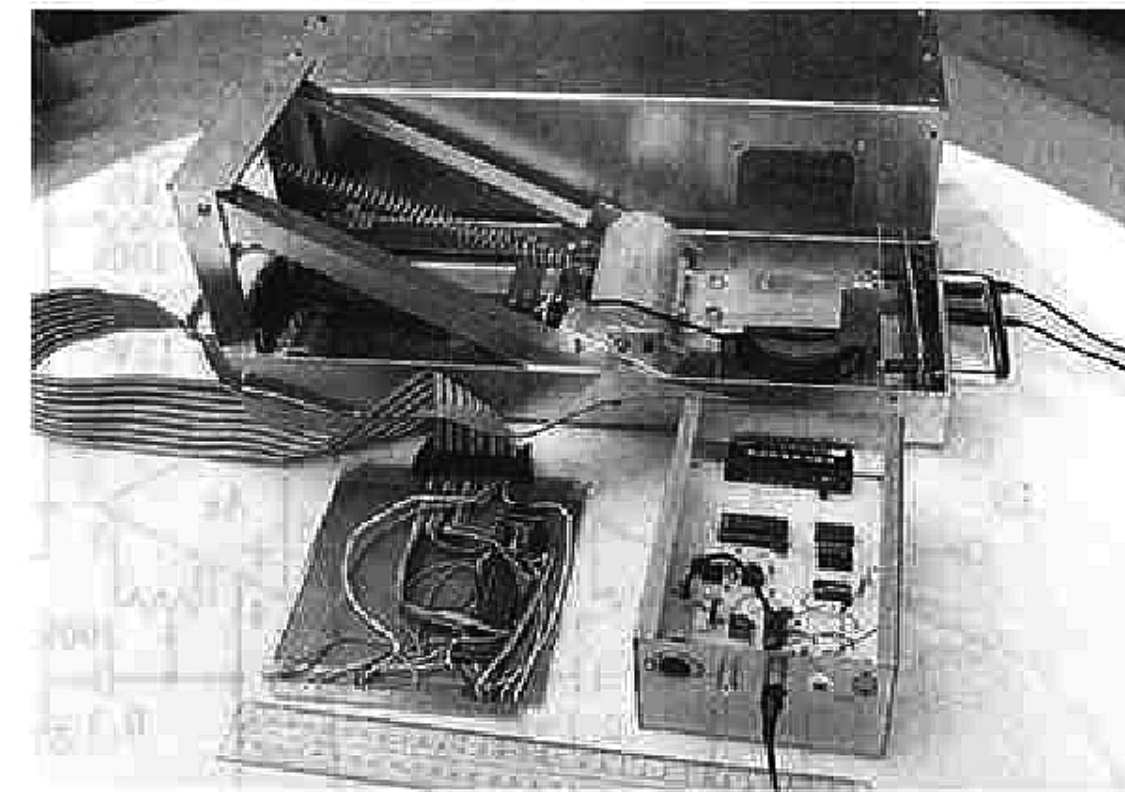
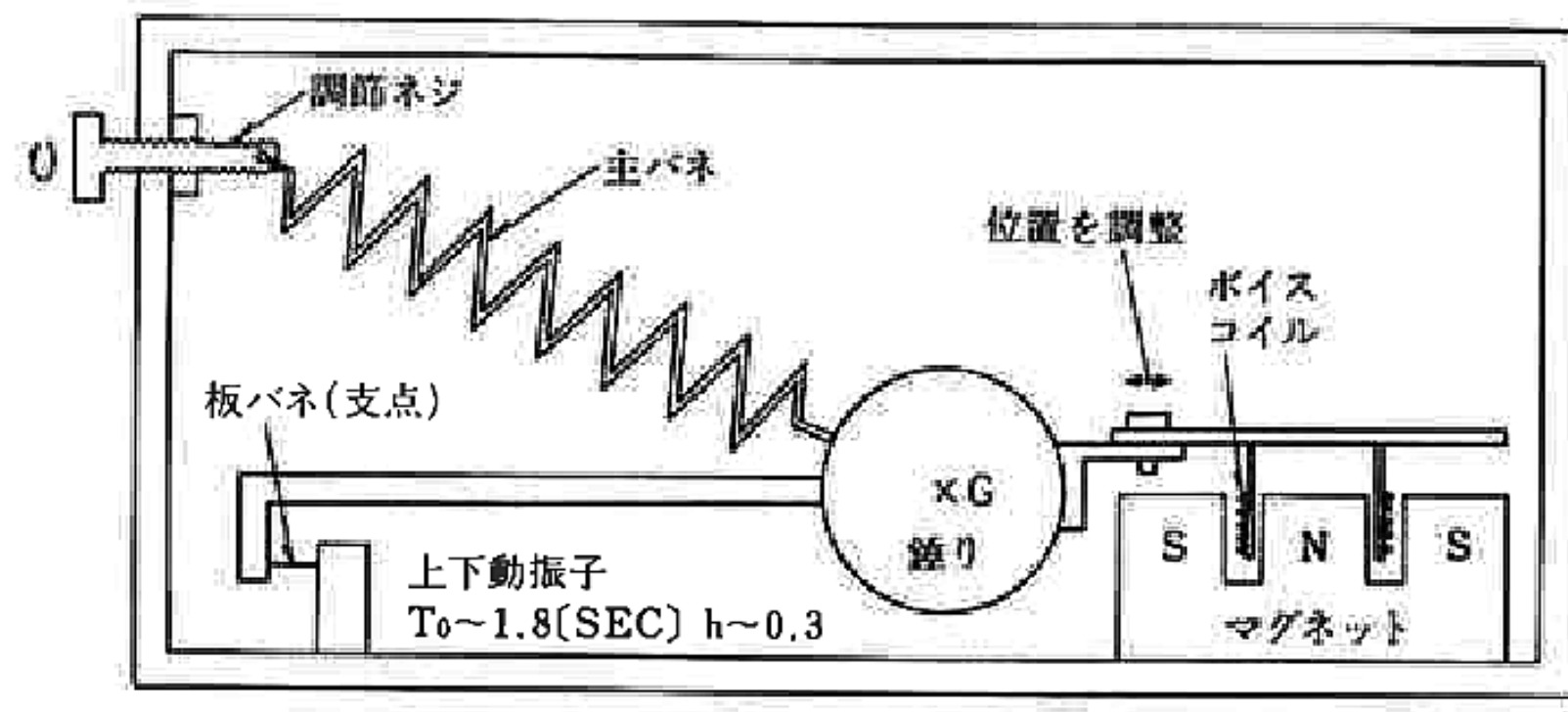
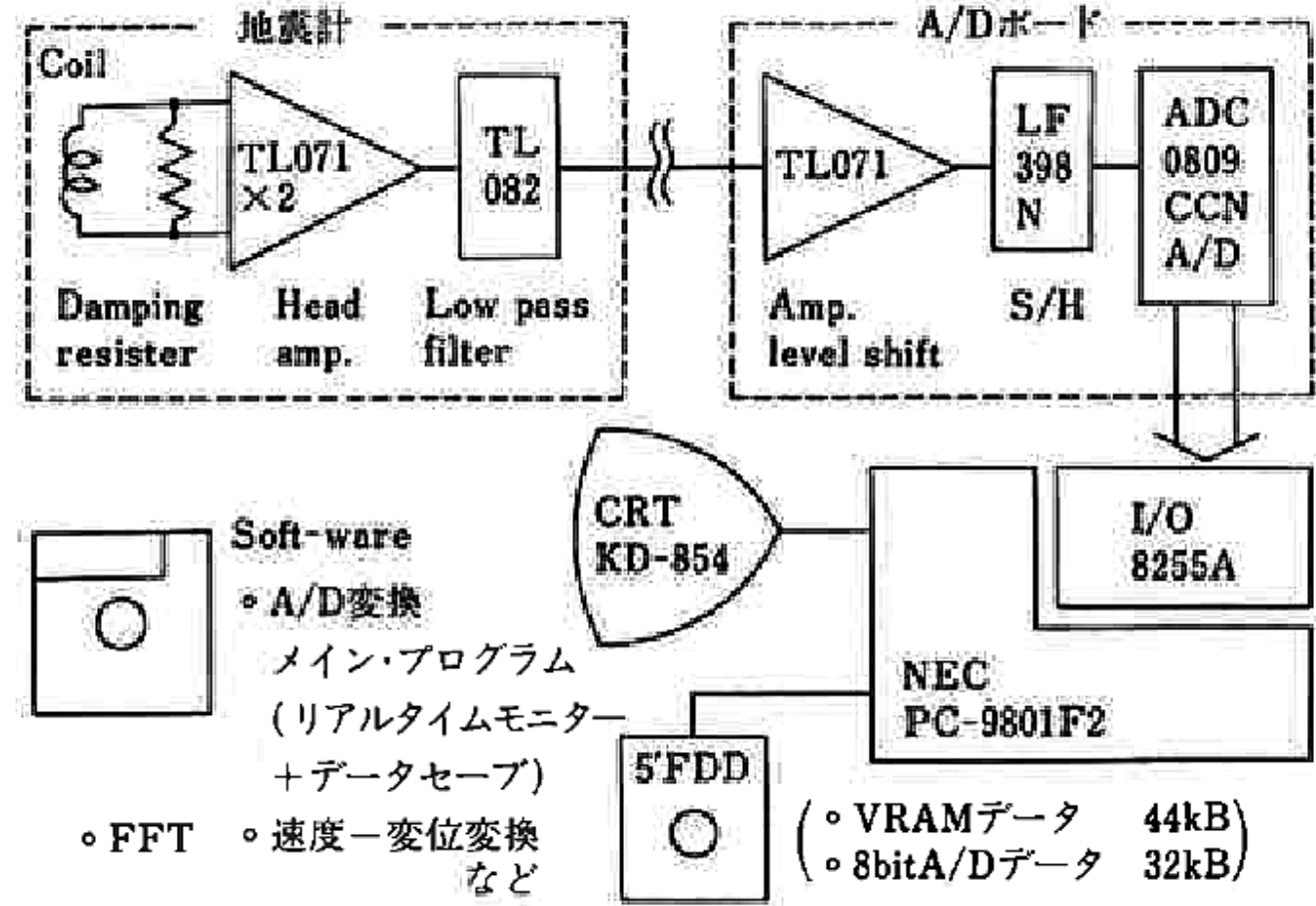


図1 システムブロック図

写真1 システム全景
手前左 I/O 基板 右 A/D 基板 中地震計 奥ケース

写真2 感震器 (センサー)

Gen-1: Yoshio Okamoto: A Seismograph system for Educational Use: Osaka and Science Education 5, 9-14, 1991 (in Japanese)

http://seagull.stars.ne.jp/resources/My_Seismograph_System.pdf

http://yossi-okamoto.net/Old_HP/Futen/2000_Sydney/Seismograph.pdf (in English, GeoSciEd3 Sydney, 2000)

Sensor: ferrite magnet of audio speaker, hand winding copper coil

Body: iron angle, brass mass, iron spring, phosphorous copper thin plate as a fulcrum of the pendulum

Logging system: hand-made A/D and I/O board + NEC PC with N88BASIC software on MSDOS

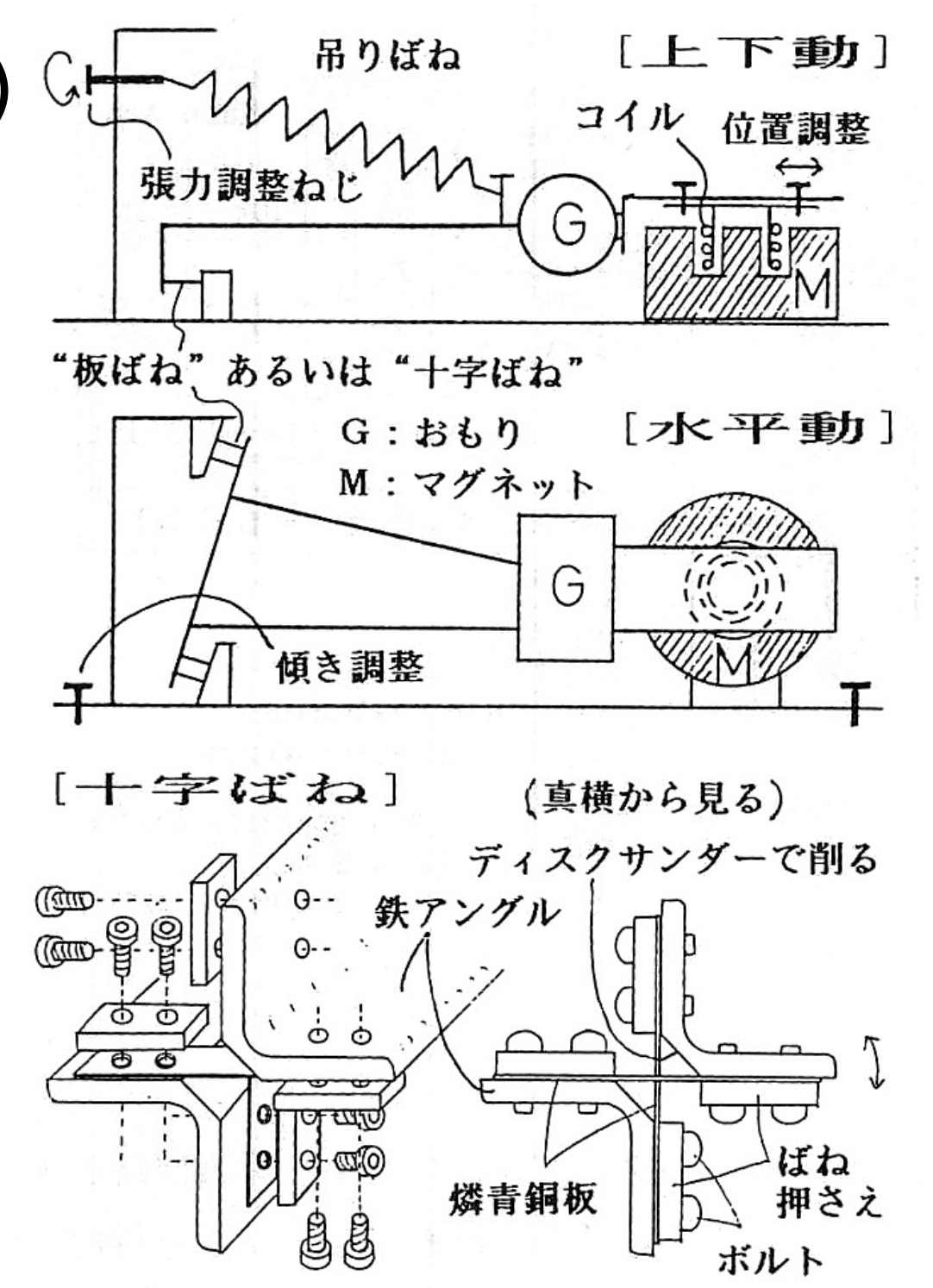
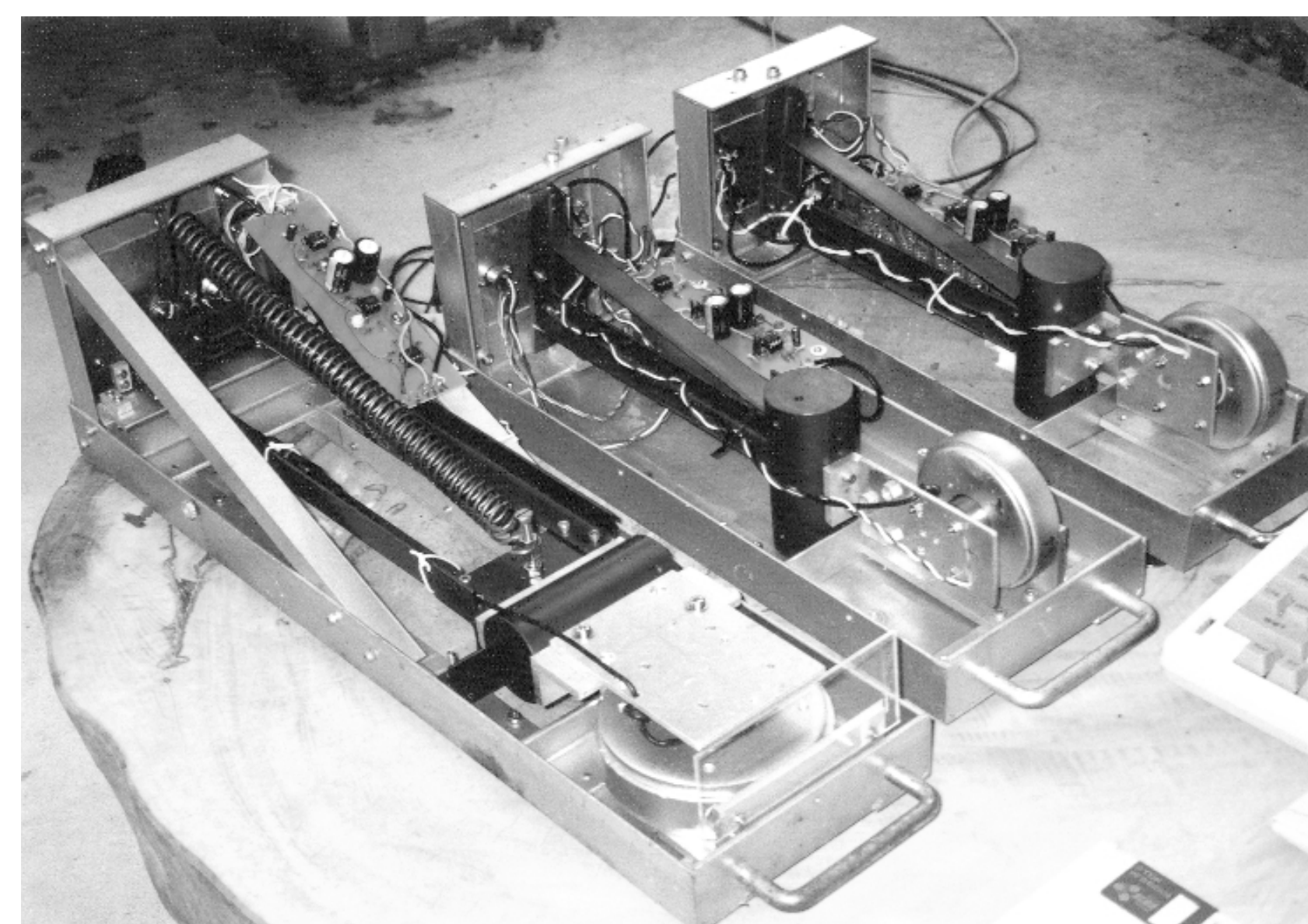
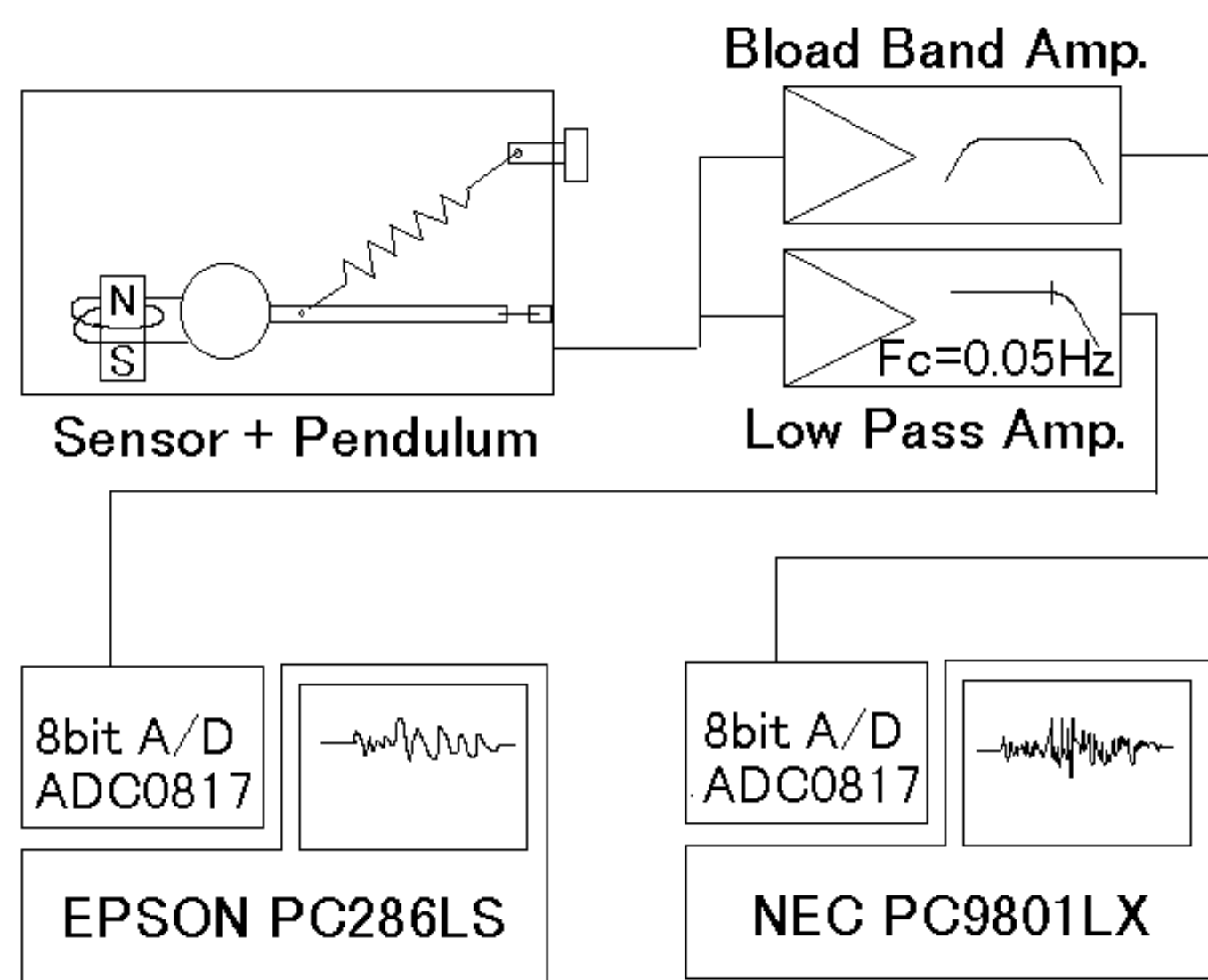


図3 振り子の構造と「十字ばね」の製作

Gen-2: Filmcase Seismometer (Page 2)

Gen-3: ANB Seismograph (Page 2)

Gen-4: Semi-professional Type Educational Seismograph:

http://seagull.stars.ne.jp/Articles/Japanese/Homemade_Seismogram_2015.pdf in Japanese

http://seagull.stars.ne.jp/Brazil_2018/Poster_GeoSciEd8.pdf in English

Sensor: neodymium magnet, lathe winding copper coil

Body: aluminum, brass mass, iron spring, phosphorous copper

Logging system: OP integral amp., A/D and I/O Arduino Uno

+ PC with Processing Language software on Linux

Now installed at my home (Osaka, Japan)

KVIS (Kamnoetvidya Science Academy, Ryong Thailand)

PCSHS Mukdahan (Thailand)

Gen-5: New version of Gen-4 using 3D-printed materials:

http://www.yossi-okamoto.net/2022_JpGU-GeoSciEdIX/JpGU_Poster_Seis_2022finalv2.pdf

Sensor: neodymium magnet, lathe winding copper coil

Body: 3D-printed PETG, brass mass, iron spring, phosphorous copper thin plate as a fulcrum of the pendulum

Logging system: OP integral amp., A/D and I/O Arduino Uno + PC with Processing Language software on Linux

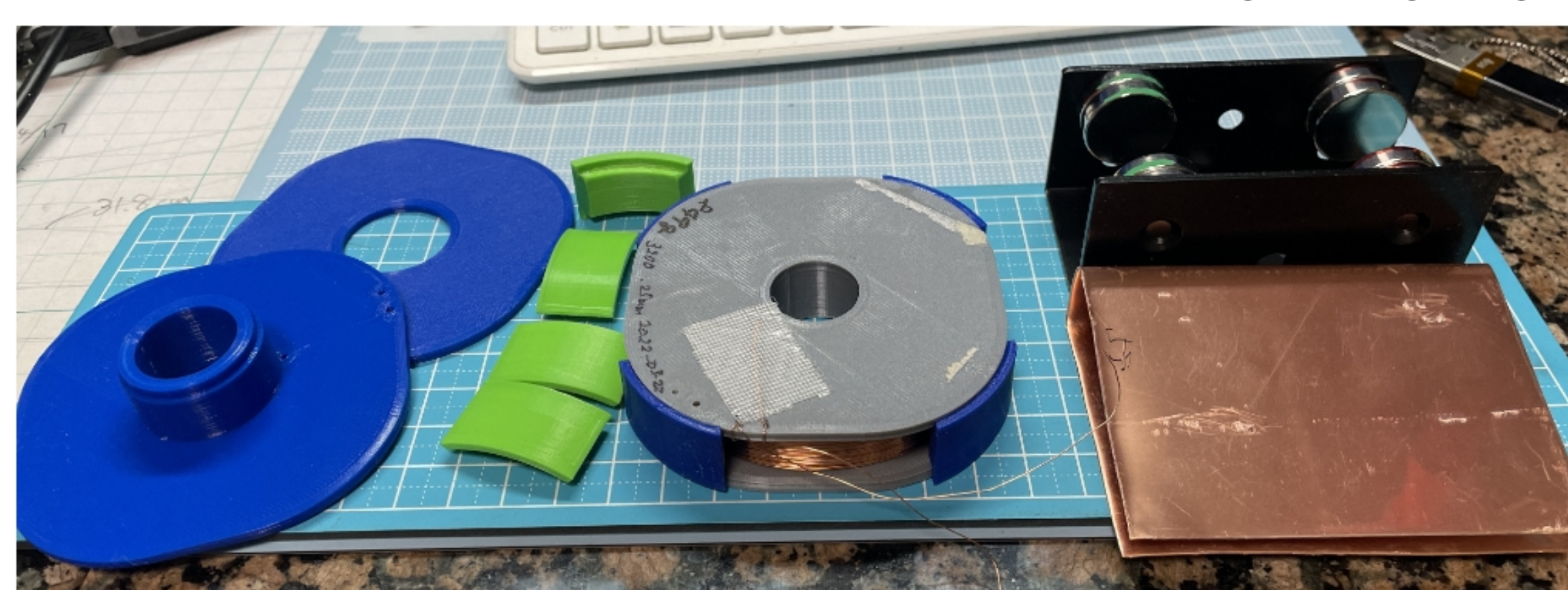


Fig.3 Bobbin, coil, copper damper and magnetic circuit

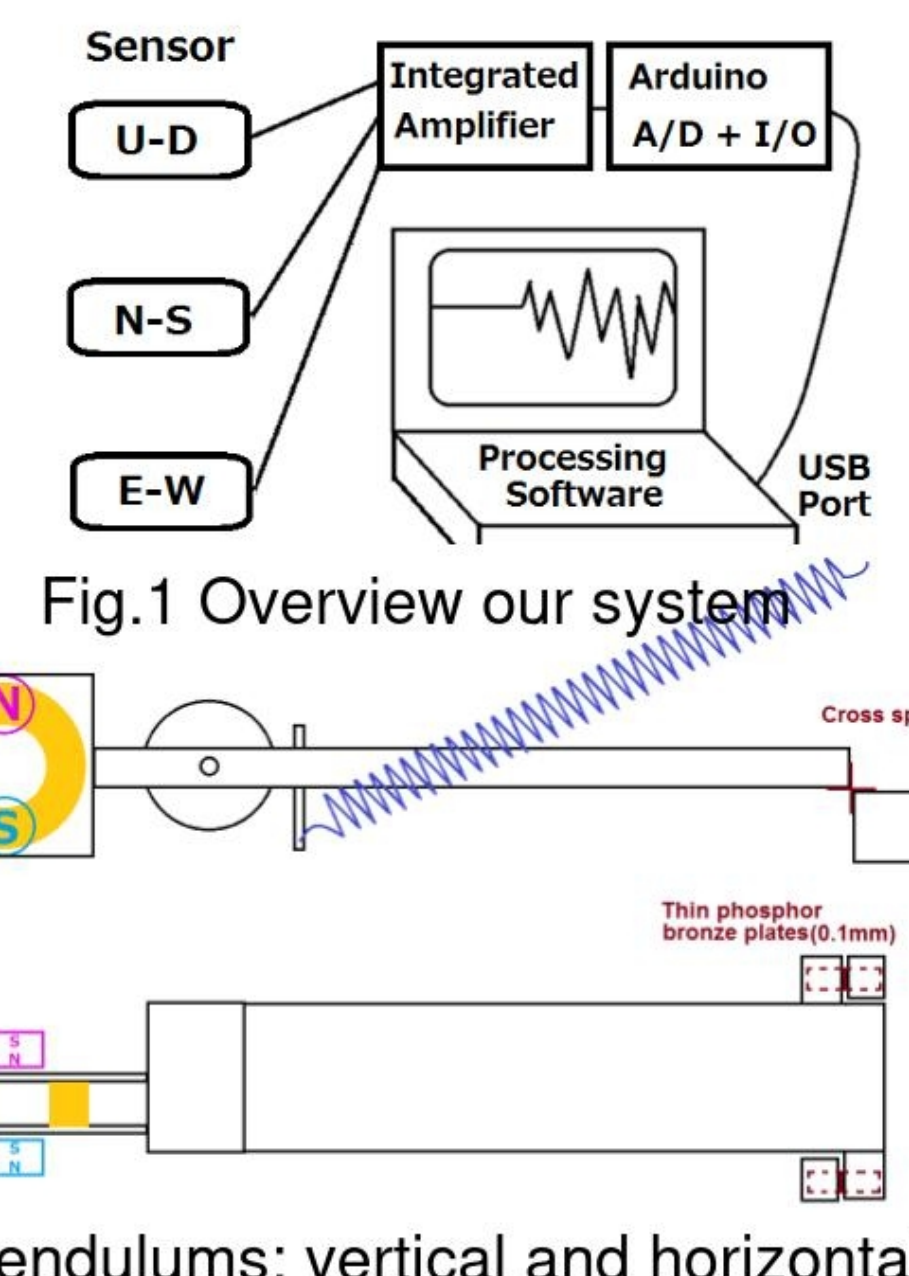
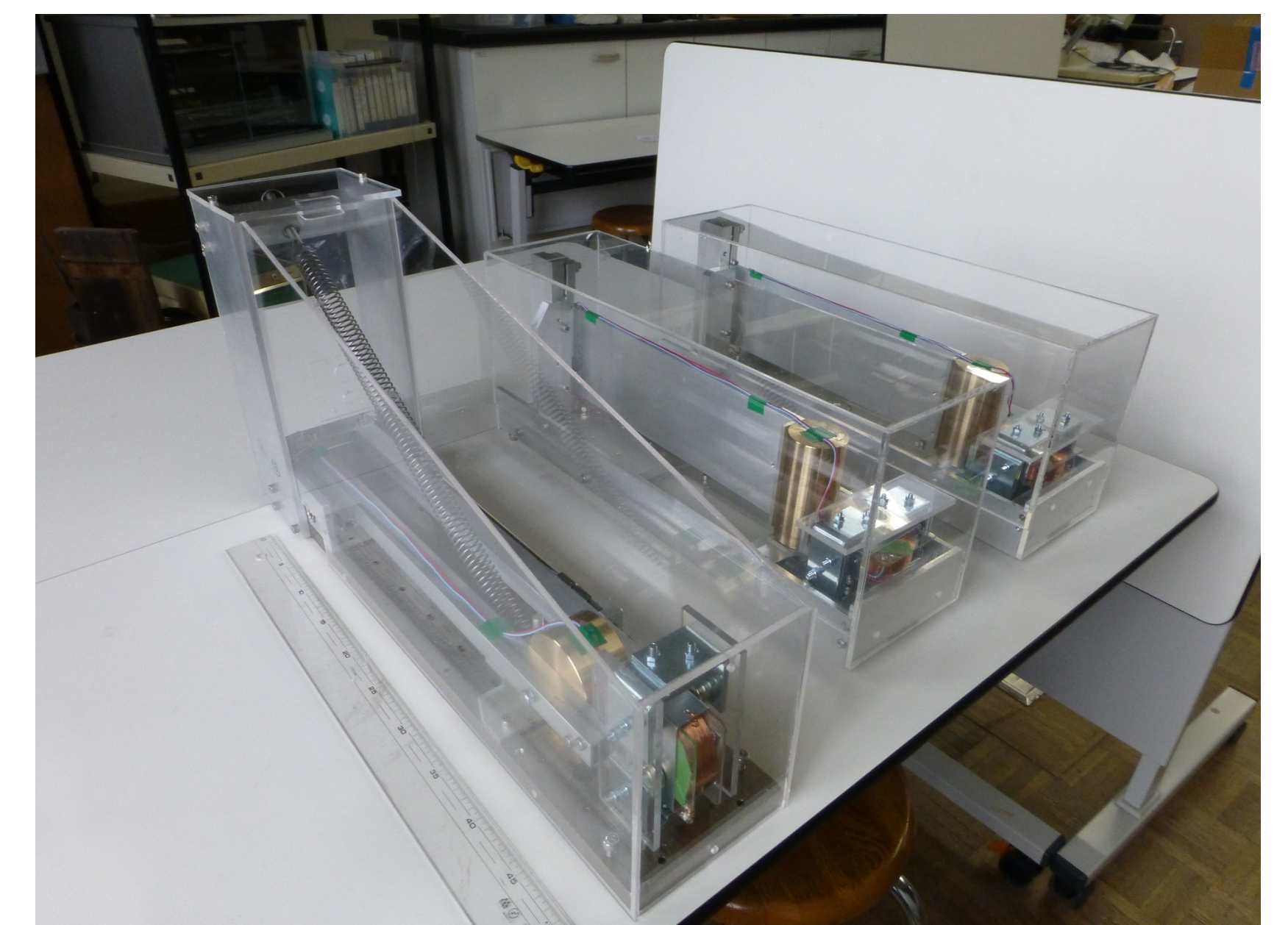


Fig.2 Pendulums: vertical and horizontal

Now installed at

PCSHS Loei (Thailand)

PCSHS Nakhon Si Thammarat (Thailand)

Gen-6: Completely new model (now under developing)

with super-cheap cost

Sensor: hand-winding copper coil using a winding tool

+ Neodymium magnet as play a pendulum mass

Body: Acrylic plates, phosphorous copper thin plate

Recording Unit: Single supplied OP amp + ESP32 with LCD as an A/D converter and micro-controller (PC alternative)

