

Model C - Built on design for Klard wave - Button Actuation

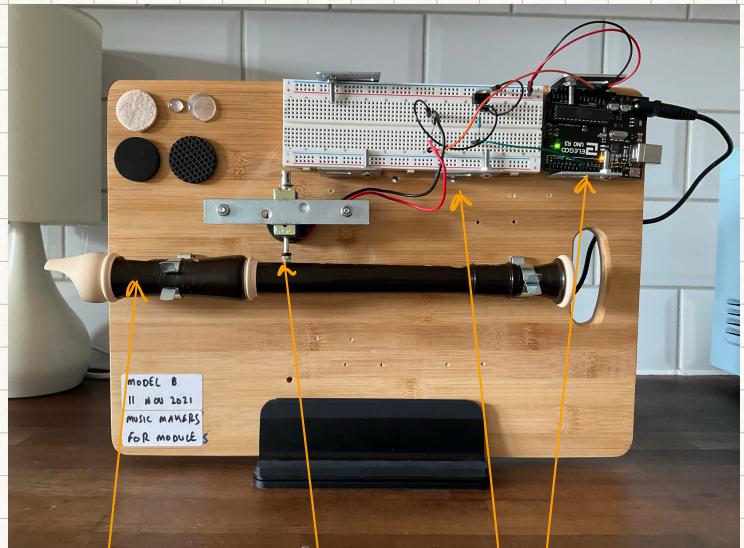
16 NOV 2021

Build of system onto a display unit

When displaying the recorder instrument the team decided we should allow for full visible access. We also decided that the electrical components as far as possible be at the rear of the display or out of view.

The team decided that the display should be vertical (previously we had it flat) and that the recorder positioned so that easy access to the mouthpiece by an adjoining air blower be easily facilitated. This means the orientation of the recorder finger/thumb hole face down (z axis).

Image of the system on a breadboard



1. Breadboard to display the system on - this allows us an easy way to modify the height of the mouthpiece.

2. Brackets and screws - used for R&D when supporting the solenoid and resisting movement forces when activating - forming, most of the force come from the spring rebound on the solenoid return.

3. Toolbox with arduino kit and extra parts for R&D

4. Soprano recorder - music room - £14.99

5. Solenoid valve - 6V 1Amp 10mm travel IN force - this is offset to circa 8mm so the end effector does not bottom out before reaching the hole. The end effector is also positioned directly above the fingering hole of the recorder.

6- Arduino Uno R3 and breadboard with TIP120, diode and resistor, with 5V coming from the Vout pin to drive the single solenoid

Results of mockup

The system worked really well. There was a high level of trapping but this was resolved when we stopped the solenoid bottoming out on its return. The connection to the hole was solid and the team put on a ear plug onto the end effector and it worked really well on covering the full hole.

The recorder bounced a little on the clips but this was mainly due to a mismatch on the O/D of the recorder and I/D of the clip.

The team noted we needed an extra power supply to drive the additional solenoids as well as amend the orientation when tackling the double hole and half hole positions.

Achieving a half hole position requires thought and perhaps an alternative servo activation separate from the linear solenoids. This needs to be thought through.