Project: Ventilator Monitor

Goal: To develop an improved version of the existing ventilator monitor designed for further development.

This version should include:

* All of the original monitor functionality of the original version.
* A manageable project foundation for further development.
* A modular ventilator communication protocol system.
* Communication protocols for all RS232 ports.

This project will be produced via the following phases:

Phase 1: Software Foundation

* A GitHub project management system will be established to manage and track additions and changes to monitor software. Updates will be submitted and tracked via this system throughout the project.
* The foundational software for the monitor will be developed for use with a Raspberry Pi computer.
* Modular low-level communication protocols for each of the RS232 ports will be developed. RS232 communication with the Servo-I ventilator used in the original version will be set as the default communication protocol.
* Additional functionality will be developed for other ventilators as well as other devices using RS232 protocol i.e. pulse oximeter.

Phase 2: Integration with Original Version

* Relevant software from the original version will be imported to the new project foundation.
* The imported software will be modified with minimal changes to integrate with the new software.
* Robust testing and error handling software will be added to the original software.

Phase 3: Monitor Testing

* The completed second software version will be ported to a Raspberry Pi computer and installed in an existing monitor. This will replace the functional but underperforming Nucleo F767ZI microcontroller.
* The software will be tested with the existing hardware and updated to produce a final release version.
* The manual for the monitor will be updated to reflect all relevant hardware and software changes.

Phase 4: Hardware Distribution

* The final tested version of the software will be ported to Raspberry Pi computers.
* The Raspberry Pi computers will be installed in all existing monitors.