Team 17: Test Plan

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Objectives

Listed are a combination of acceptance, integration, and module/unit tests, with detailed test cases which can be used during a live demonstration to a client. Those outlined tests in this document which are not detailed are meant to be used to ensure functionality of individual modules and module interaction prior to a live demonstration.

Outline of Test Cases

1) Unit/Module Test
    a) Motor running smoothly (power applied from fixture)
    b) DC amplifier switching on and off correctly (fixture to provide square wave to transistor gate)
2) Integration Test
    a) Disc with no hole punches
    b) Disc with all holes punched
    c) Motor at default tempo
    d) Motor at minimum tempo
    e) Motor at max tempo
    f) Motor at default tempo and with volume sweep from minimum to maximum
    g) Torque delivered to motor with 6 1.5v batteries
    h) Torque delivered to motor with 1 9v battery
    i) Function of circuit with fresh battery (9.5v)
        i) Battery to be used decided after tests 2g-h
    j) Function of circuit with low battery (~8.0v)
        i) Battery to be used decided after tests 2g-h
3) Acceptance Test
    a) Default tempo with variation in volume
    b) Increased tempo

Test Cases Detailed

1) Default Tempo with Variation in Volume (Test 3a)

a) Black box test
b) Equipment needed: Completely built binary disk reader, with disk configuration chosen at random, freshly charged battery for disk player
c) Actions:

Step	Action	Expected Result	Pass	Fail	N/A	Comment

1	Load disk	---				
2	Turn on Device	Device on in paused state				
3	Press play	Disk rotates and sound generated				
4	Move volume to min	Sound decreases to zero				
5	Sweep volume linearly to max	Sound increases linearly to max volume				

2) Increased Tempo (Test 3b)

a) Black box test
b) Equipment needed: Completely built binary disk reader, with disk configuration chosen at random, freshly charged battery for disk player
c) Actions:

Step	Action	Expected Result	Pass	Fail	N/A	Comment
1	Load disk	---				
2	Turn on Device	Device on in paused state				
3	Press play	Disk rotates and sound generated				
4	Press speed up (2x)	Playback speed increases above default				

Resources

- A human with baseline average hearing and an understanding of circuit theory, code debugging, test equipment, and problem solving equivalent to a fairly gifted 4th year electrical engineering student.
- Complete binary disk reader, with disk set to random state.
- 6 fresh 1.5v batteries and 1 fresh 9v battery for binary disk reader.
- Oscilloscope (either USB or stand-alone device), function generator (square waves required from 200 to 1000Hz), power supply (for testing different voltage inputs, must supply at least 9.5v 1a).

References

Requirements Document (Rev. A, 10/25/2020):
https://github.com/Hector-S/ECE411-Practicum/blob/main/Documentation/Product%20Design%20Specification/Team17_PDS.pdf
Final Circuit Schematic (Rev. C, 12/5/2020):
https://github.com/Hector-S/ECE411-Practicum/blob/main/Schematics/Final%20Project%20Schematic/Final%20Project%20Schematic.pdf
Grading Rubric:
http://web.cecs.pdx.edu/~faustm/capstone/forms/TestPlanRubric.pdf