

Welcome to the Readme file for my MSI340 submission.

For your attention: Some of the practice mixes in "EVIDENCE/DRAFTS/DJ Practice Mixes" are not trimmed as that makes the time indexes in the CUE files inaccurate. So there is a long gap at the start of some of them.

EVIDENCE	
ARDUINO	
Arduino Code	
basicdemo_with_serial_plotter_WORKING_WITH_GAIN_x3	-----> This is where I got the tuning correct for the sensor by setting the gain correctly so that a smooth sine wave output is produced.
basicdemo_with_serial_plotter_WORKING_WITH_GAIN_x2.ino	
basicdemo_with_serial_plotter_WORKING_WITH_GAIN_x2.ino.pdf	
DVS_test	-----> Unsuccessfully calculating output due to using X and Y when it should be Z.
DVS_test.ino	
DVS_test.ino.pdf	
Magnetic_DJ	-----> Attempt at sending MIDI CC control to Mixxx but calculation still on X/Y.
Magnetic_DJ.ino	
Magnetic_DJ.ino.pdf	
Magnetic_DJ_1	-----> Attempt to control Mixxx via HID. However was only seen as a mouse.
Magnetic_DJ_1.ino	
Magnetic_DJ_1.ino.pdf	
Magnetic_DJ_3	-----> At one point I was simulating the magnetometer readings when I did not have the sensor connected.
Magnetic_DJ_3.ino	
Magnetic_DJ_3.ino.pdf	
Magnetic_DJ_4	-----> Sending the angle as raw serial output for reception by Python script.
Magnetic_DJ_4.ino	
Magnetic_DJ_4.ino.pdf	
Magnetic_DJ_5_Wifi	-----> Sending serial output over Wifi.
Magnetic_DJ_5_Wifi.ino	
Magnetic_DJ_5_Wifi.ino.pdf	
Magnetic_DJ_6	-----> Now I start sending the Z axis of sensor (rotation of magnet by turntable). However I start having problems interpreting the readings in a Python script.
Magnetic_DJ_6.ino	
Magnetic_DJ_6.ino.pdf	
Pitch_wheel_test	-----> Sending out just MIDI with no sensor interpretation in order to test with Mixxx.
Pitch_wheel_test.ino	
Pitch_wheel_test.ino.pdf	
Arduino Controlling Mixxx Via MIDI Pitch Bend.mov	-----> Sending only MIDI pitch wheel to Mixxx (no sensor interpretation).
Arduino IDE Showing Basic Test of Magnetometer Sensor.png	-----> This shows the micro tesla (magnetic field readings) from the sensor.
Arduino Showing as MIDI Controller in Mixxx.png	
Blender Visualisation	
graffiti_shelter_4k.exr	
Magnetic DJ Detail 3.jpeg	
Magnetic DJ Mockup Magnetometer Sensor 12.blend	
Magnetic DJ Mockup.jpeg	
Magnetic DJ Overview FIXED 1.jpeg	
Magnetic-DJ-Overview.mp4	-----> Video render of Blender animation.
Untitled.png	
DC motors with encoder research.png	-----> Encoder and Hall Effect (magnetic) sensors are commonly used in motors.
First test of Magnetic DJ.MOV	-----> First test showing Arduino reacting to DJ turntable movement (the music is unrelated).
Gyro DJ Mockup 1.png	
Gyro DJ Mockup 2.png	-----> Early mockup of the device when I was still using an encoder (not a magnet).
Incoming MIDI from Arduino to Mixxx.png	
Initial Conceptualisation of Magnetic DJ	-----> It took me a while to realise how to mount the magnet.
IMG_6543.HEIC	
IMG_6544.HEIC	
IMG_6545.HEIC	
Magnetic DJ Control of Mixxx With Deck on and Off But On Wrong X-Y Axis.mov	-----> When Mixxx transport stops moving the turntable is stopped. Shows X/Y problem.
Magnetic DJ Improved Sensor Settings With Perfect Sine Serial Plot.mov	-----> Once I'd tuned the Gain and found optimal sensor placement (distance) from magnet.
Magnetic DJ moving mouse.mov	-----> Arduino controlling mouse before I realised it could not be seen as a full HID device.
Magnetic DJ Python Successful Generation of DVS audio without Arduino input.mov	-----> This from when using Python to generate DVS audio (no Arduino involved).
Magnetic DJ Sound of Generated Vinyl Control Signal Audio From Python Script.mov	-----> Trouble interpreting sensor to DVS (see magneticDJ_Ext_Headphone_3.py).
Magnetic DJ Successful Test But Needs Tuning.mov	-----> Arduino to Python script to Mixxx (magneticDJ_Ext_Headphone_3.py).
Mixxx Controlled By MIDI Pitch Wheel Mapping From Arduino	-----> Works but erratic DVS control shows wrong conversion of sensor readings.
Arduino_MIDI_Controller.js	-----> Mixxx mappings for being able to send MIDI pitch wheel from Arduino to Mixxx.
Arduino_MIDI_Controller.js.pdf	
Numark NS6II.midi.xml	
Mixxx MIDI Mapping Test	-----> Testing mapping with Mixxx.
MIDIUSB_test.ino	
MIDIUSB_test.ino.ino	
MIDIUSB_test.ino.ino.pdf	
Numark NS6II.midi.xml	
Screenshot 2025-05-25 at 09.55.35.png	
Output of Magnetometer Sensor.png	-----> Shows the sinusoidal output of the sensor as turntable rotates. Z axis of sensor.
Python Code	
dvs-test AUDIO SOUND CORRECT.py	-----> Development of Python for DVS control signal (sine waves) output to Mixxx. Sort by date in folder to see versions. By the time I get to "dvs-test WITH SMOOTHER PITCH CHANGE AND BETTER SLOW DOWN.py" I have a fully functional command line DJ software controller that will work with any DVS control vinyl enabled software (Mixxx, Serato, Traktor, etc). With pitch up and down on the up and down arrows, and a reverse on "R" that retains the current pitch. This shows the DVS vinyl control signal is the most viable way of interpreting what the Arduino sensor picks up from the physical turntable.
dvs-test AUDIO SOUND CORRECT.py.pdf	
dvs-test CONTROL OF MIXXX VIA BLACKHOLE.py	
dvs-test CONTROL OF MIXXX VIA BLACKHOLE.py.pdf	
dvs-test PITCH WORKING WITH NO GAPS IN AUDIO.py	
dvs-test PITCH WORKING WITH NO GAPS IN AUDIO.py.pdf	
dvs-test WITH ARDUINO SENSOR INPUT (NOT WORKING).py	
dvs-test WITH ARDUINO SENSOR INPUT (NOT WORKING).py.pdf	
dvs-test WITH SMOOTHER PITCH CHANGE AND BETTER SLOW DOWN.py	
dvs-test WITH SMOOTHER PITCH CHANGE AND BETTER SLOW DOWN.py.pdf	
dvs-test WITH WORKING PITCH CONTROL BUT HAS GAPS IN AUDIO.py	
dvs-test WITH WORKING PITCH CONTROL BUT HAS GAPS IN AUDIO.py.pdf	
dvs-test WORKING WITH CONTROLS RIGHT WAY ROUND.py	
dvs-test WORKING WITH CONTROLS RIGHT WAY ROUND.py.pdf	
dvs-test WORKING WITH REVERSE AS WELL.py	
dvs-test WORKING WITH REVERSE AS WELL.py.pdf	
magneticDJ_Ext_Headphone_1.py	-----> Successfully controlling Mixxx via DVS control signal from Arduino. However I'm having trouble interpreting the sinusoidal output of the sensor into a linear reading that can be used to drive the DVS control signal pitch and direction (which in DVS is signalled by the phase of stereo sine waves inverting). Unless I solve the problem myself (and every A.I. I've used becomes confused by this problem!) then this would be a job for a future Software Engineer/Mathematician.
magneticDJ_Ext_Headphone_1.py.pdf	
magneticDJ_Ext_Headphone_2.py	
magneticDJ_Ext_Headphone_2.py.pdf	
magneticDJ_Ext_Headphone_3.py	
magneticDJ_Ext_Headphone_3.py.pdf	
magneticDJ_Ext_Headphone.py	
magneticDJ_Ext_Headphone.py.pdf	
magneticDJ_Wifi.py	
magneticDJ_Wifi.py.pdf	
magneticDJ.py	
magneticDJ.py.pdf	
Researching Hall Effect Sensors.jpeg	-----> Notice the 90 degree phase shift which is the same as DVS reverse detection.
Setting Up Hall Effect Sensor Circuit in Fritzing.png	
Successfully Mapping MIDI Input from Arduino to Mixxx.png	
Using Blender To Make Arduino Mockup.png	
Wokwi Magnetometer Simulation 1.png	-----> I initially used the simulation to understand how magnetometer sensors work.
Wokwi Magnetometer Simulation 2.png	
Wokwi Magnetometer Simulation 3.png	
Wokwi Magnetometer Simulation 4.png	
DJ Freeman - Showcase form diagram.png	
DJ Practice Specialised Table.HEIC	
DRAFTS	
AMATA Showcase Programme Image	
Screenshot 2025-03-06 at 13.30.42.png	
Screenshot 2025-03-06 at 13.32.18.png	
Screenshot 2025-03-06 at 13.33.44.png	
Screenshot 2025-03-06 at 13.35.05.png	
Screenshot 2025-03-06 at 13.38.51.png	
Screenshot 2025-03-06 at 13.39.07.png	
Screenshot 2025-03-06 at 13.39.40.png	
DJ Practice Mixes	
2025-05-10_14h48m56s.cue	
2025-05-10_14h48m56s.txt	
2025-05-10_14h48m56s.txt.pdf	
2025-05-10_14h48m56s.wav	
2025-05-11_13h09m40s.cue	
2025-05-11_13h09m40s.txt	
2025-05-11_13h09m40s.txt.pdf	
2025-05-11_13h09m40s.wav	
DJ Freeman DJ Practice 1st March 2025 Tracklist.pdf	
DJ Freeman DJ Practice 1st March 2025.wav	
DJ Michael Z Freeman Turntablism Mix - Gizmo's Chillin'.cue	
DJ Michael Z Freeman Turntablism Mix - Gizmo's Chillin'.wav	
Go Deeper - DJ Michael Freeman Mix - 14 minutes.wav	
Playlist Versions	
2025-04-22.m3u	
2025-04-22.pdf	
Printed Circuit Beats - Showcase 1.m3u	
Printed Circuit Beats - Showcase 1.pdf	
Printed Circuit Beats - Showcase v1.0.m3u	
Printed Circuit Beats - Showcase v1.0.pdf	
Printed Circuit Beats - Showcase v1.1.m3u	
Printed Circuit Beats - Showcase v1.1.m3u.pdf	
Printed Circuit Beats - Showcase v1.2.m3u	
Printed Circuit Beats - Showcase v1.2.m3u.pdf	
Printed Circuit Beats - Showcase v1.4.m3u	
Printed Circuit Beats - Showcase v1.4.m3u.pdf	

- └─ Printed Circuit Beats - Showcase v1.5.m3u
- └─ Printed Circuit Beats - Showcase v1.5.m3u.pdf
- Poster
  - └─ 1210 model for poster 4.blend
  - └─ 1210-1.jpeg
  - └─ Completed KiCad poster lettering.png
  - └─ Creating poster lettering in KiCad.png
  - └─ DJ Freeman PCB Lettering - White - Red Inset.png
  - └─ DJ Freeman PCB Lettering.png
  - └─ Leonardo\_With\_DJ\_Freeman 1.png
  - └─ Screenshot 2025-03-06 at 12.24.01.png
  - └─ Screenshot 2025-03-06 at 13.19.14.png
  - └─ Technics 1210 Wireframe 1.png
  - └─ Technics 1210 Wireframe.png
- Studio K Practice Photo's
  - └─ IMG\_6520.HEIC
  - └─ IMG\_6520.jpeg
  - └─ IMG\_6521.HEIC
  - └─ IMG\_6522.HEIC
  - └─ IMG\_6523.HEIC
  - └─ IMG\_6524.HEIC
  - └─ IMG\_6525.HEIC
  - └─ IMG\_6526.HEIC
  - └─ IMG\_6527.HEIC
- MESSAGES
  - └─ Message to DJ Nick Warren Requesting Unreleased Track.png
  - └─ Message to FSOL About Using Their Track and With Invitation.png
- Michael Freeman - Tech Spec - Printed Circuit Beats - MSI340 CRMT.pdf
- MIXXX
  - └─ Investigating Mixxx Simulation of 1210 Power Turn Off Slow Down 1.png -----> Mixxx can be made to simulate what you get when you turn the power off on a physical 1210. I thought this might be useful for producing some kind of interesting effect but I never used it.
  - └─ Investigating Mixxx Simulation of 1210 Power Turn Off Slow Down 2.png
  - └─ Investigating Mixxx Simulation of 1210 Power Turn Off Slow Down 3.png
  - └─ Mixxx Contributor Agreement.png
  - └─ Mixxx Github Code Showing Auto Record Alteration.png
  - └─ Mixxx Performance Showcase DJ Set Revisioning.mov
  - └─ Mixxx Pull Request.png
  - └─ Mixxx Use of Track Comments to Strategise Playlist.png
- OTHER ARTISTS MIXES -----> These are cited in the Framing Statement but are behind a paywall.
  - └─ Coldcut Solid Steel 3hr Spacetime mix 21101994 by DJ Food Strictly.mp3
  - └─ OMMixxx - Solid Steel 06051995 by DJ Food Strictly Kev Mixcloud.mp3
  - └─ Openmind - Thats My Boy Pt 2 side B - Live Mixxx 26051994 by DJ .mp3
  - └─ Openmind - Thats My Boy Pt 2 What Time Is It side A - Live Mixxx.mp3
  - └─ Openmind vs BB edit 10061995 by DJ Food Strictly Kev Mixcloud.mp3
  - └─ Solid Steel Strictly Session 02091995 by DJ Food Strictly Kev Mi.mp3
  - └─ Strictly Kev Solid Steel 27041997 by DJ Food Strictly Kev Mixclo-01.mp3
  - └─ Strictly Kev Solid Steel 27041997 by DJ Food Strictly Kev Mixclo.mp3
  - └─ Strictly Kev Solid Steel set 12111995 by DJ Food Strictly Kev Mi.mp3
  - └─ Strictly Session - Coldcut 300198 by DJ Food Strictly Kev Mixclo.mp3
  - └─ Strictly Session AB - BundyStanley 27041998 by DJ Food Strictly .mp3
  - └─ Strictly vs Vadim Kev sets 14071996 by DJ Food Strictly Kev Mixc.mp3
- Performance and Arduino Planning.pdf
  - └─ Zotero Script for Discogs Referencing PR for Inclusion in Main Release.png -----> When citing performance tracks I became frustrated that Zotero cannot get the info correct. So I wrote a "translator" for Zotero that does get it right that should be released officially by the Zotero dev team.
  - └─ Zotero Script for Discogs Referencing Result in Zotero With Correct Artist Name.png.
  - └─ Zotero Script for Discogs Referencing Result in Zotero With Cover.png
  - └─ Zotero Script for Discogs Referencing Showing in Browser.png
  - └─ Zotero Script for Discogs Referencing.js
  - └─ Zotero Script for Discogs Referencing.js.pdf
- OUTPUT
  - └─ Checking Engineer and Lighting Setup on Day
    - └─ IMG\_6653.HEIC
    - └─ IMG\_6653.mov
    - └─ IMG\_6654.HEIC
    - └─ IMG\_6654.mov
    - └─ IMG\_6655.HEIC
    - └─ IMG\_6655.mov
  - Publicity
    - └─ AMATA Showcase Ticketing Image.html
    - └─ DJ Freeman - AMATA Showcase Programme Image.png
    - └─ DJ Freeman - Printed Circuit Beats - Track List.pdf -----> Part of Link Stack site that was linked through QR code on poster.
    - └─ DJ Freeman - Printed Circuit Beats Poster PRINT MASTER.png
    - └─ linkstack.michaelzfreeman.org\_.png
    - └─ Poster Up in The Crown Pub Penzance.HEIC
    - └─ Poster Up in The Crown Pub Penzance.mov
    - └─ Printed Final Posters and Printed Tickets.HEIC
  - The Performance
    - └─ DJ Freeman - Printed Circuit Beats Mix Map - Full Scroll.mov -----> Published mix through linkstack.michaelzfreeman.org for any members of the public who might want to hear it again and/or see what tracks were played.
    - └─ Recording of Printed Circuit Beats DJ Freeman Performance.wav
    - └─ We are controlling transmission Sample Chain.flac -----> This sample was constructed by me from some short vocal samples and can be heard at 00:23:10 in the DJ set mix recording.
    - └─ We are controlling transmission Sample Chain.m3u
    - └─ We are controlling transmission Sample Chain.m3u.pdf

35 directories, 197 files