

Wow and Flutter Compensation for IRENE



Wow and Flutter

- Periodic variation of pitch 🔊 🔊
- Cylinders, disc records and cassettes
- Three main sources:
 - Bad recording/manufacturing
 - Medium deterioration
 - Bad playback

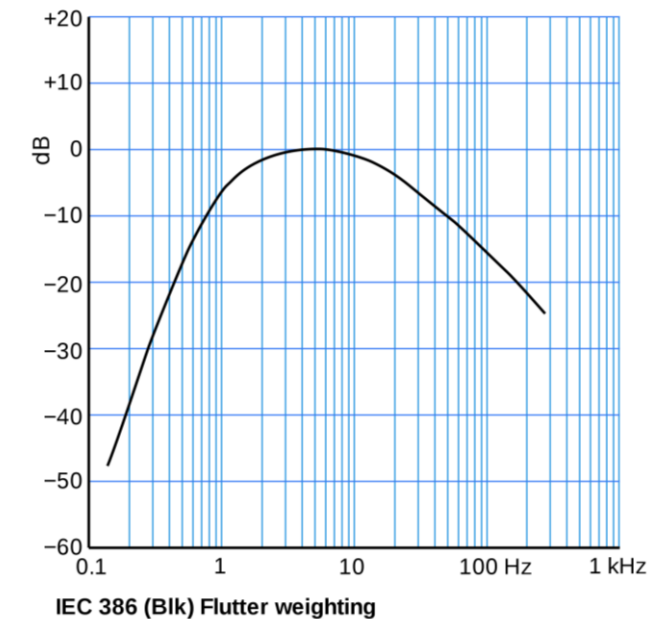
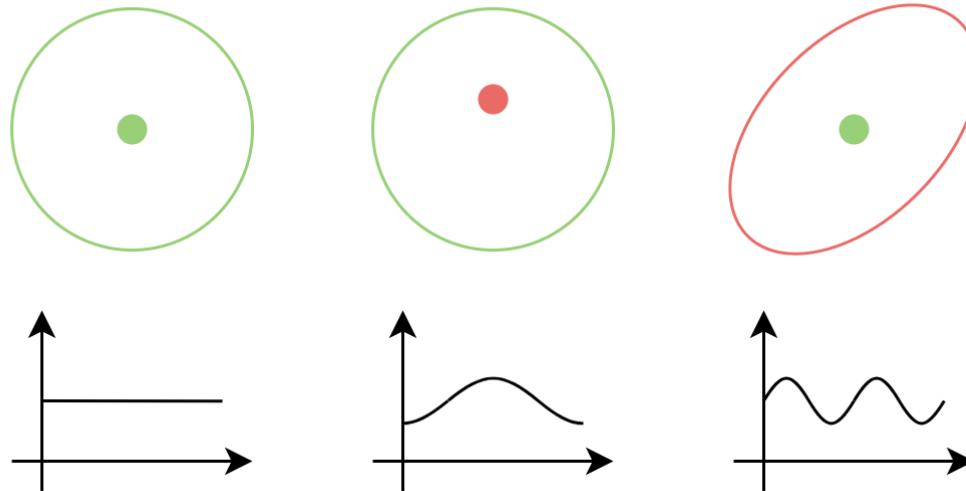


Wow and Flutter

- Wow and flutter is Frequency Modulation (FM)

- Original profile
- Deformed profile
- Original hole
- Off-center hole

Pitch Variation Curve
(or modulating signal)

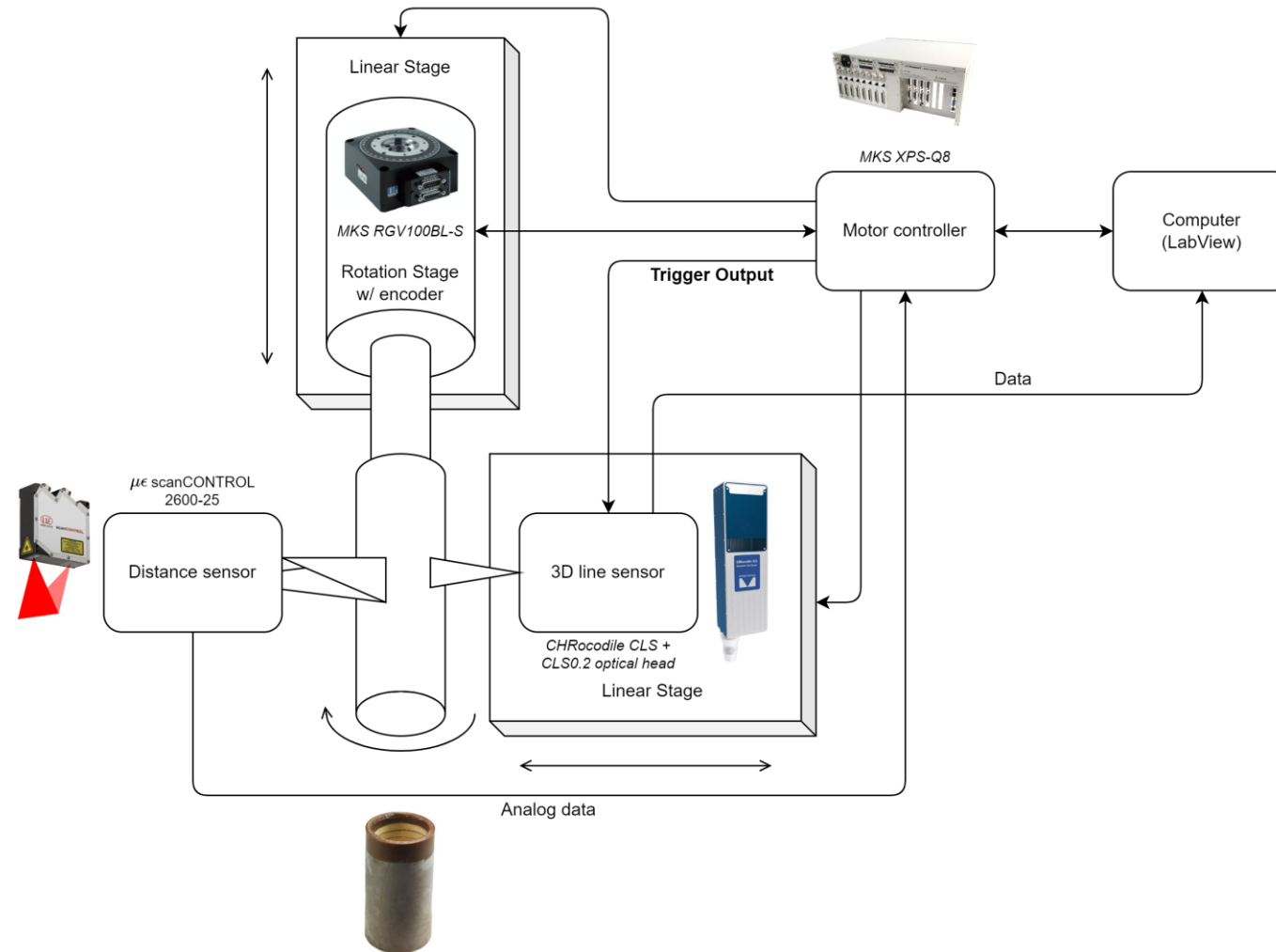


https://en.wikipedia.org/wiki/Wow_and_flutter_measurement

Goals

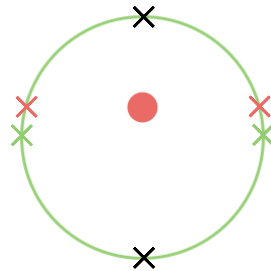
- Study the current system
- Compare different ways of improving wow and flutter performance
- Implement one or more solutions
- Evaluate the performance of the solution(s)

Current System



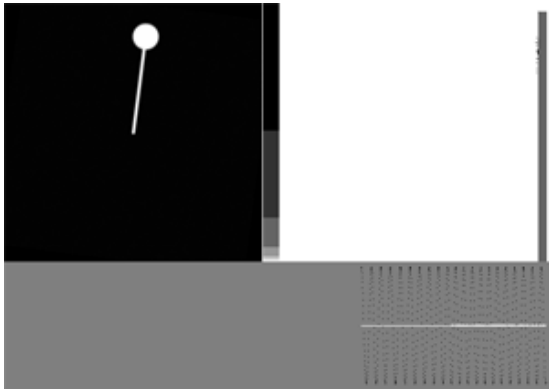
Solutions under consideration

- 1) Changing the velocity of the rotation stage in real-time
- 2) Adding artificial jitter to the acquisition clock
- 3) Sampling the analog encoder to trigger the acquisition at the correct position
- 4) Correcting for pitch after sampling

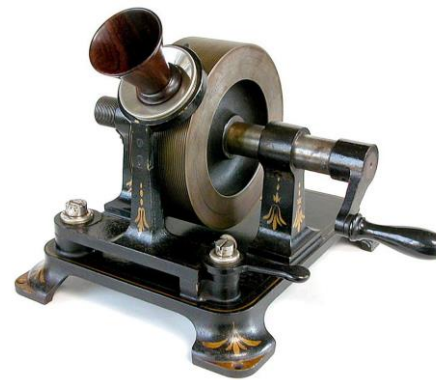


Challenges

- Mechanical artefacts
- Non-periodic variations of pitch
- Gaps in the medium
- Badly recorded material



<https://griffonagedotcom.wordpress.com/2017/01/29/see-the-phonograph-turn-motion-capture-with-sound-1860/>



<http://www.edisontinfoil.com/hardy.htm>

Discussion