







Hard drive Teardown

**flying heads, voice coil
motors, amazingly smooth
surfaces & signal processing**

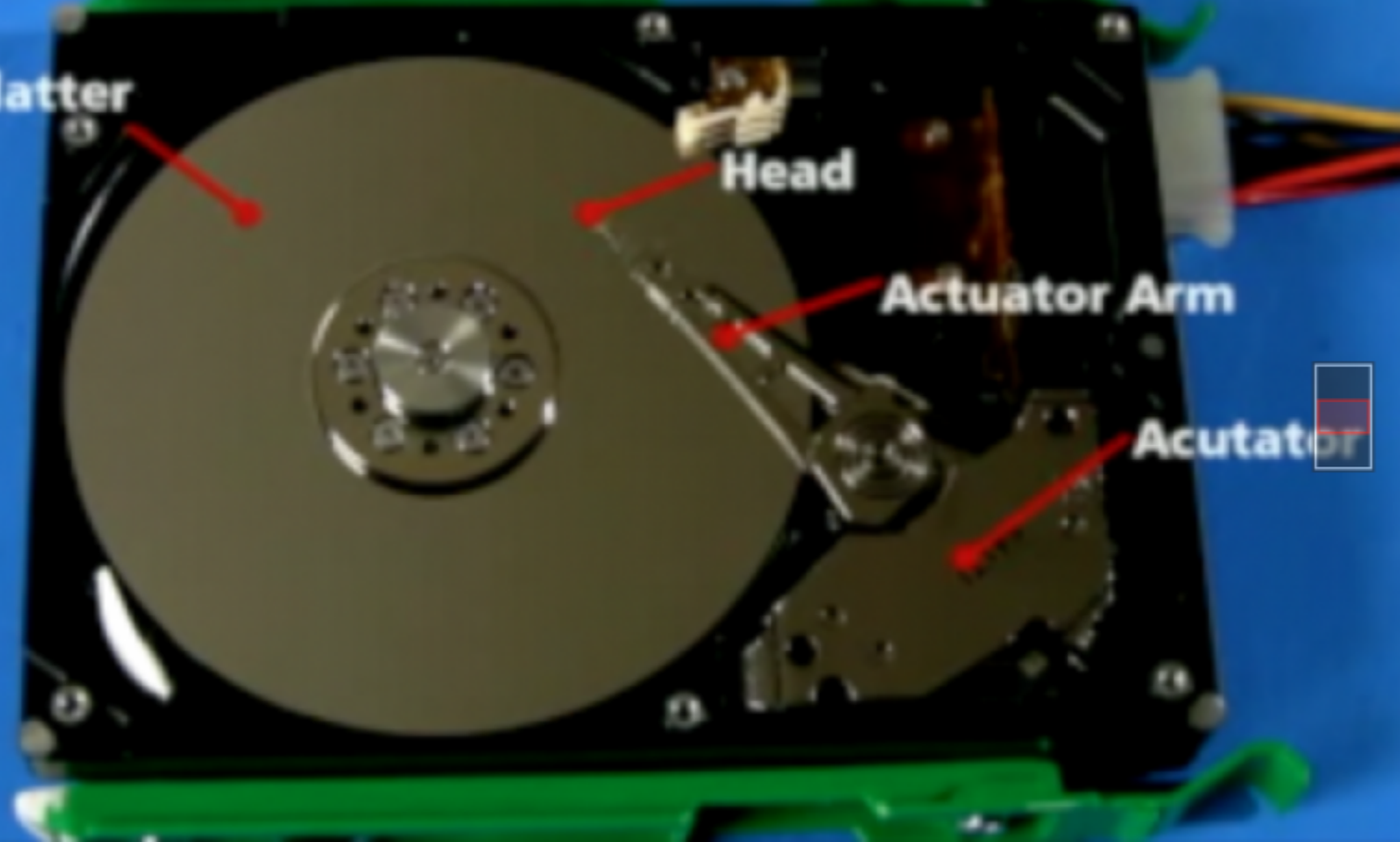
series 3 | [engineerguy videos](#)

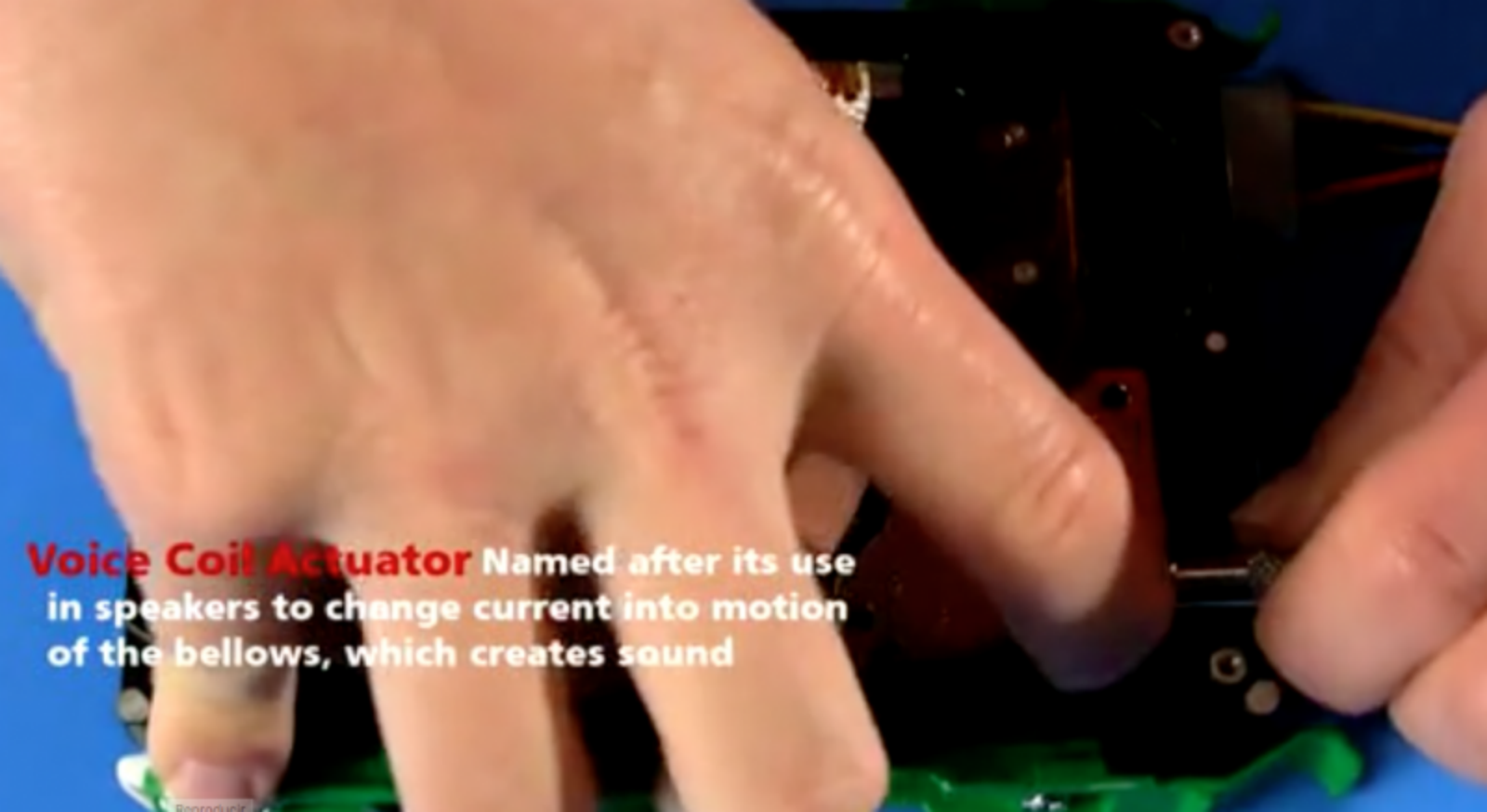
Platter

Head

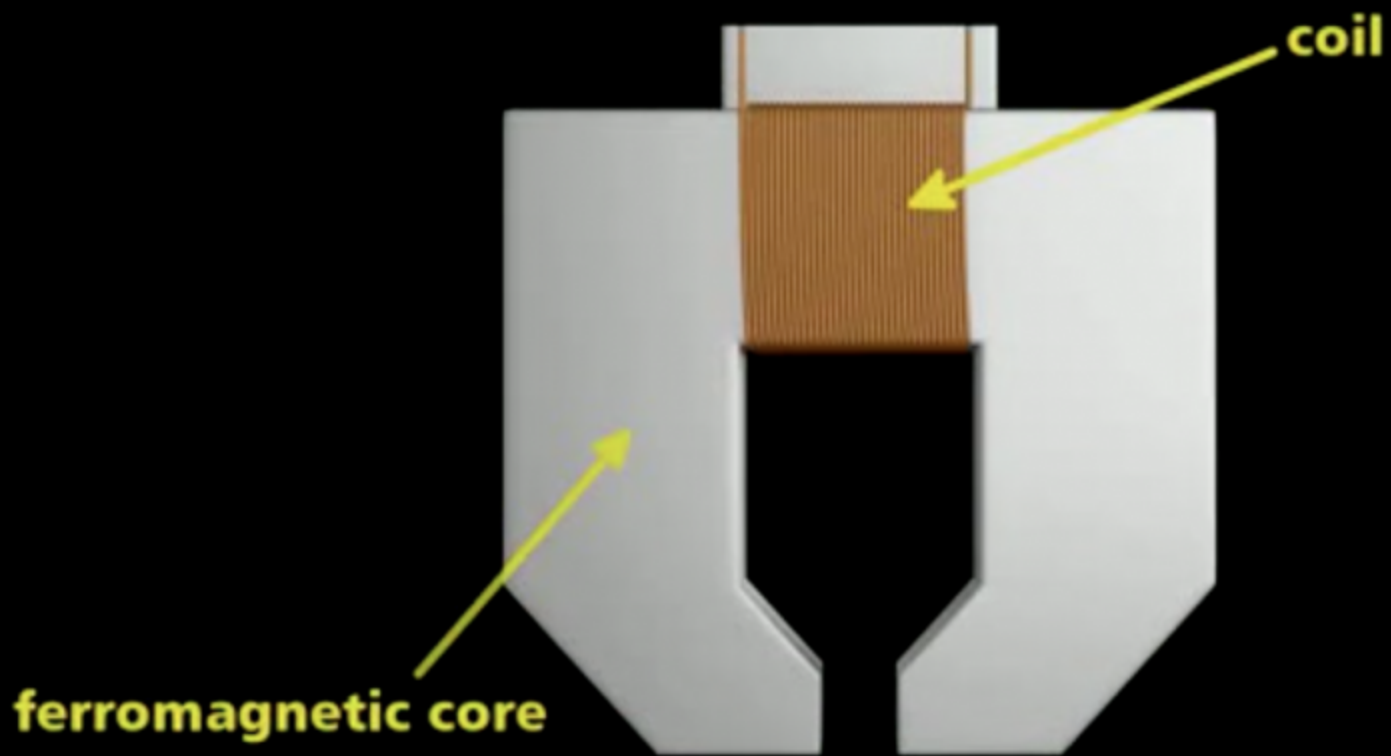
Actuator Arm

Actuator





Voice Coil Actuator Named after its use
in speakers to change current into motion
of the bellows, which creates sound





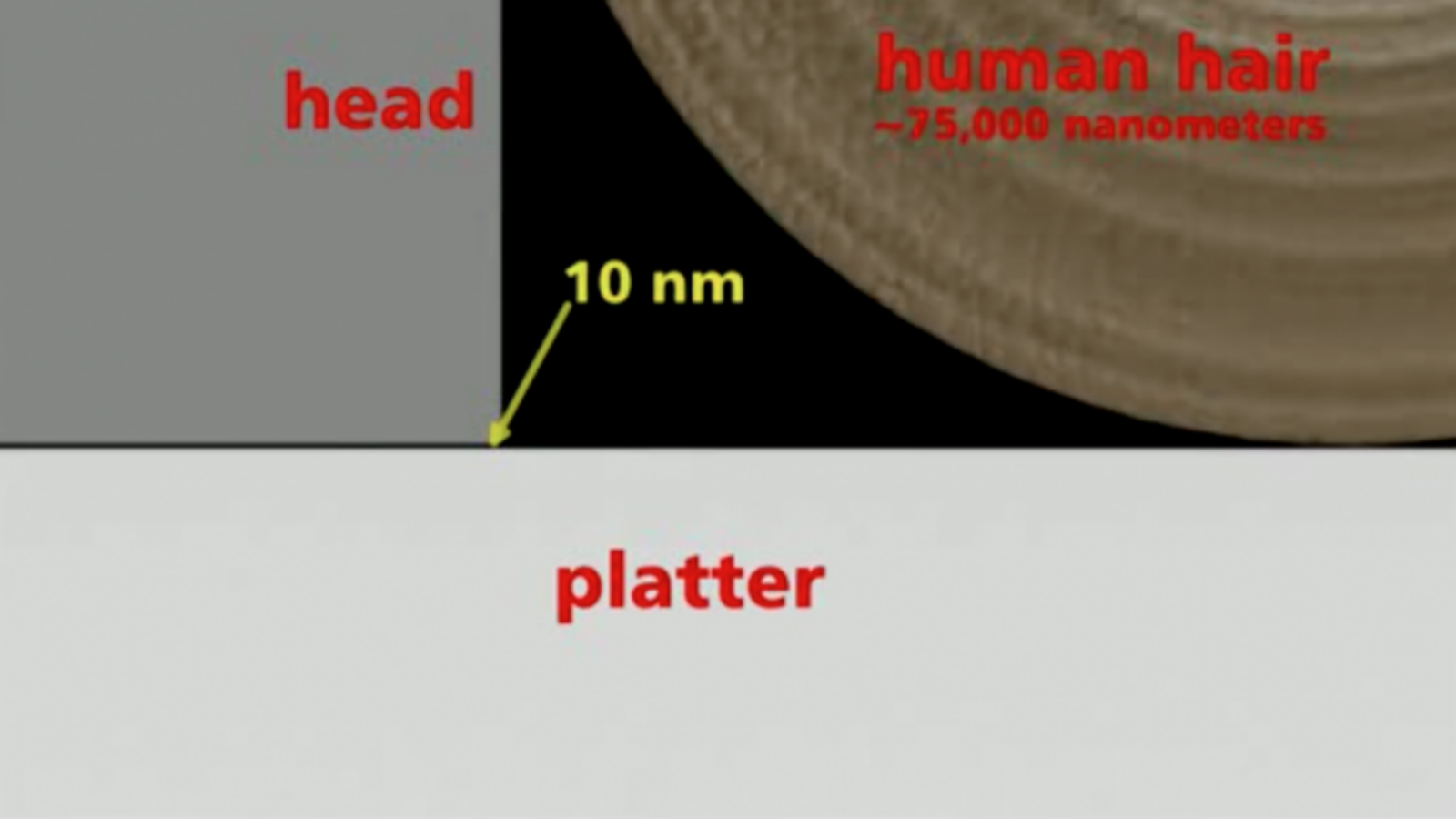
Faraday's Law The EMF (electromotive force) generated is proportional to the rate of change of the magnetic flux

head

human hair
~75,000 nanometers

10 nm

platter



Suspension

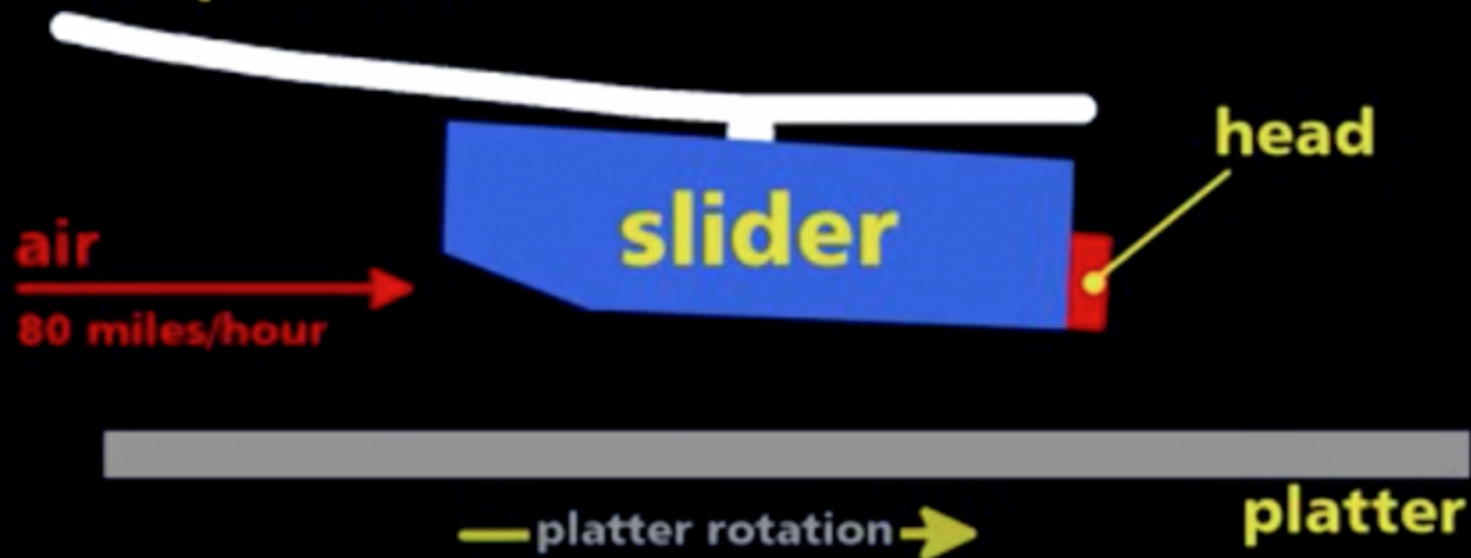
air
→
80 miles/hour

slider

head

— platter rotation →

platter



Carbon Overcoat

tough layer with lubricant
to reduce wear

Magnetic Layer

Chromium

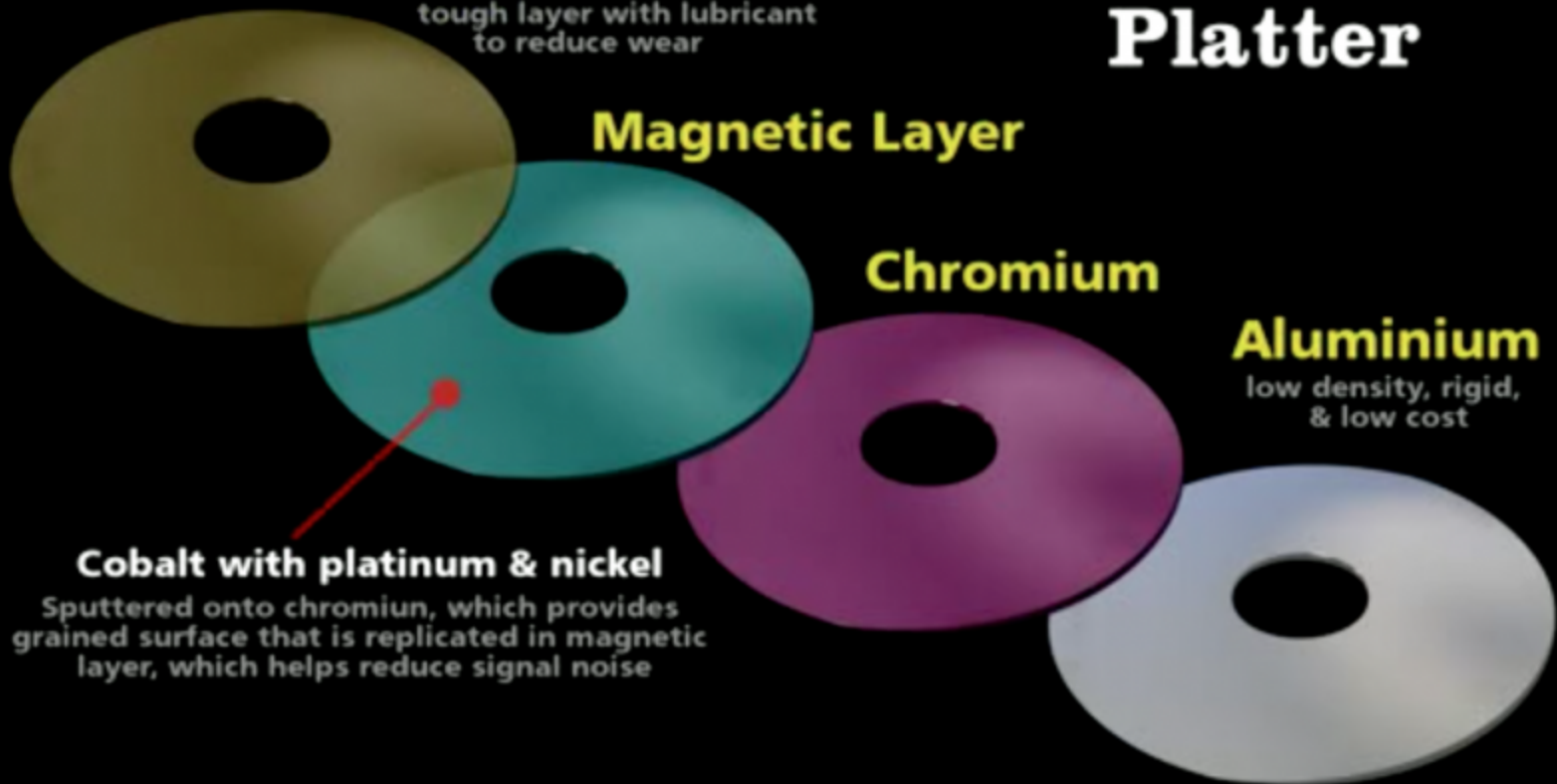
Aluminium

low density, rigid,
& low cost

Cobalt with platinum & nickel

Sputtered onto chromium, which provides
grained surface that is replicated in magnetic
layer, which helps reduce signal noise

Platter



Partial Response Maximum Likelihood

010111

001111

