
MAGNETOMET

1
00:00:00,010 --> 00:00:04,080
[beeping, computer sounds]

2
00:00:04,100 --> 00:00:08,170
[humming, computer sounds]

3
00:00:08,190 --> 00:00:12,220
[music] Narrator: A fluxgate magnetometer works essentially like a compass.

4
00:00:12,240 --> 00:00:16,270
But, instead of a spinning needle, electromagnets are used to measure magnetic

5
00:00:16,290 --> 00:00:20,310
fields. To build one, we start with a bar of ferromagnetic metal.

6
00:00:20,330 --> 00:00:24,340
If you wrap a coil of wire around the bar and run an electric current

7
00:00:24,360 --> 00:00:28,380
through it, the bar becomes magnetized and generates its own magnetic field.

8
00:00:28,400 --> 00:00:32,410
Reverse the current, and the field reverses direction. If you do this

9
00:00:32,430 --> 00:00:36,430
over and over again, you can see that the two directions cancel each other out.

10
00:00:36,450 --> 00:00:40,550
However, when an external magnetic field is present, the two directions

11
00:00:40,570 --> 00:00:44,680
are thrown out of balance, allowing you to measure the external field.

12
00:00:44,700 --> 00:00:48,770
Finally, by combining multiple fluxgate sensors, you can measure a magnetic field in three

13
00:00:48,790 --> 00:00:52,850

dimensions.

14
00:00:52,870 --> 00:00:56,950
[music]

15
00:00:56,970 --> 00:01:01,040
[beeping]