

Re: detecting a magnet

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2005-02/0939.html>

From: Brian (brian_at_w3gate.com)

Date: 02/03/05

Date: Thu, 3 Feb 2005 17:35:56 -0600

Much smaller scale, much smaller target, proportionally much longer range.

"Mark" <makolber@yahoo.com> wrote in message
news:1107471453.151065.22920@f14g2000cwb.googlegroups.com...

>

> *Bob Eldred wrote:*

>> *"Brian" <brian@w3gate.com> wrote in message*

>> *news:VJadnZKl8qofnp_fRVn-tA@centurytel.net...*

>> > *If I had a flat, 2 foot by two foot coil lying flat, how far above*

> *it*

>> *could*

>> > *I reasonably expect the detect a rare earth magnet, perhaps the*

> *size of an*

>> > *M&M?*

>>

>> *An ordinary inductive coil requires the magnet to be in motion and*

> *the*

>> *voltage induced is a function of the number of turns and the rate of*

> *change*

>> *of the flux, $d\phi/dt$. Therefore the speed of a moving magnet is very*

>> *important. Practically you might be able to sense the magnet moving a*

> *foot*

>> *away or so depending on the number of turns in the coil and the speed*

> *of the*

>> *magnet. It is a signal to noise issue and power line interference*

> *(hum)*

>> *would limit what you can detect.*

>>

>> *However it is possible to detect small stationary magnetic fields*

> *(DC) by*

>> *arranging and energizing coils in a device called a flux gate. These*

> *things*

>> *can be designed to measure fields as low as 1/1000 of the earths*

> *magnetic*

>> *field or even lower, less than a milligauss and could easily measure*

> *your*

>> *magnet many feet from the fluxgate. Being DC, it's easy to get rid of*

> *the*

>> *power line interference. There is also hall effect devices which has
> been
>> mentioned but they are not particularly sensitive. Beyond that, there
> is a
>> quantum mechanical device called a "squid" that can measure
> extremely small
>> fields like the field from the iron in a single blood cell. These are
>> probably way beyond what you need or could pay for but it gives you
> an idea
>> of the technology available. What are you trying to do?
>> Bob
>
>
> I'm guessing, maybe wrongly that the OP is interested in those vehicle
> detection loops burried in the ground at red lights. These sometimes
> fail to respond to motorcycles and some people sell magnets that you
> can attach to your motorcycle that alegendly allow the coil to see your
> motorcycle.
>
> I believe the principal of these coils is a tuned resonant tank that is
> detuned by a large hunk of metal. I don't believe that the magnet
> helps in this case but there are people out there that will swear that
> they do work.
>
> Mark
>*