Re: Stepper Motor Basics

Source: http://sci.tech−archive.net/Archive/sci.electronics.basics/2008−04/msg00461.html

- *From*: Sjouke Burry <burrynulnulfour@xxxxxxxxxxxxxxxxx>
- *Date*: Mon, 14 Apr 2008 02:38:40 +0200

Bill Bowden wrote:

> On Apr 13, 4:39 am, Rich Webb <bbew...@xxxxxxxxxxxxxxxxx> wrote:
>
> > On Sat, 12 Apr 2008 19:02:05 −0700 (PDT), Bill Bowden
> >
> > <wrongaddr...@xxxxxxx> wrote:
> >
> > > I have a stepper motor from Airpax, modle C82710 that has 6 wires
> > > connected to 2 windings with a center tap. It's rated at 12 volts, 36
> > > ohms from center tap to the end of the winding, and 7.5 degrees per
> > > step.
> > > I'm not too familiar with stepper motors, but understand the shaft can
> > > be moved in either direction one step at a time. I read some articles
> > > on Google but couldn't find any that showed the necessary signals and
> > > timing to rotate the motor continously in one direction.
> > > I played around with it, and found I could move the motor shaft one
> > > step at a time by just alternating the connection to either side of
> > > one of the windings with the center tap common. But it only goes so
> > > far and stops, and the second winding was not being used.
> > > So, the question is, what is a proper polarity and timing sequence on
> > > the various connections to continuously move the motor in the same
> > > direction?
> >
> > Sounds like you have a uni−polar stepper there. The simplest way to
> > drive it is just to use four transistors. Apply your 12 V to the

> common and setup the transistors to turn on to provide a ground path
> for the desired winding. Sequence them in the order A, B, ~A, ~B.
>
> Once you have that part working, you can look into half−stepping (two
> phases on at once) and beefier drive circuits (choppers) that control
> the current through the windings for higher torque and speed.
>
> Wikipedia has a pretty good article with additional
> links.http://en.wikipedia.org/wiki/Stepper_motor
>
> −−
> Rich Webb Norfolk, VA

> Thanks, but I'm not sure of the sequence A,B,−A,−B. Suppose I have
> both center taps connected to +12 and the other 4 lines are connected
> to transistors. The problem is which side of which winding should I
> start with? And will the next transistor supply a ground to the other
> side of the same winding? An then there is a phase problem dealing
> with the second winding? How do I know which side of the second
> winding to ground next?
>
> −Bill

Playing with stepper motors I did the following:
attach both centre taps to 5 volts, and attach
a 10−15 cm piece of wood(I used a shaslik stick)
to the stepper motor axis.
Now ground one of the four wires,and mark the place
pointed at by the stick. Use your hand to damp the motion,
and in this way you get 4 marks close together.
Now just check which wire belongs to one of those
positions, and you know in which order you have to power them.
I connected a 4 channel buffer IC to them, and connected
the buffer to my computers printer port.
I also put 4 leds on those outputs, to be able to
see what my printerport did to those inputs.
For medium force, just energise them 1−2−3−4−1−2−3−4 etc.
For high force, use 12−23−34−41−12−23−34−41 etcetera.
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