Subject: Re: Question about magnetic flux modulation
Posted by Wayne Parham on Tue, 27 May 2008 22:03:40 GMT
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I've studied this mechanism a lot over the years. From the first time I heard JBL's woofers with shorting rings, I was impressed with their clear sound. So I studied their approach and learned that they used an induction ring to counter the flux, basically reducing the difference between weak and strong half cycles and making the driver motion more symmetrical.What I didn't realize until relatively recently is how much the effectiveness of the ring weakens as frequency is reduced. I mean, I could see from measurements that distortion rose as frequency dropped, but I didn't realize how completely ineffective the shorting ring was at low frequencies. It's still a great idea, and I always prefer a driver with a shorting ring when used as a midwoofer or midrange. But below 100Hz or so, a shorting ring just can't do very much.The reason is pretty simple. Since the ring requires magnetic induction to work it needs to be made physically large to work well at low frequencies. Opposing requirements make it virtually impossible to make a woofer motor with a shorting ring that's effective below 50Hz. You want both the magnet and the ring in close proximity to the voice coil, near the pole piece. Make one bigger and the other has to get smaller. So the designer has to strike a balance.When I realized this, it became very clear to me that the best way to improve symmetry at subwoofer frequencies is with push-pull drive. Shorting rings are nice for midrange frequencies up.
Push-pull verses shorting rings