



Weird & Wireless: Why do mobile phones cause noise on my office speaker phone?



I have a lot of conference calls in my office where a number of us are clustered around a speaker phone. It is one of those spider shaped [Polycom](#) devices and it used to be, that whenever we were on a call, someone's phone would cause a pulsing like noise on the phone.

It still happens today, but not as often and not as badly. You might think that we are getting fewer calls and fewer messages, but that's not it. So what gives?

First, to understand the noise, we must all understand that most cell phones emit reasonably strong electro-magnetic pulses when signaling for an incoming call or sending data or an SMS message. The wires to the speaker within the phone (or the speaker coil itself) pick this signal up and it comes out of the speaker.

It typically only happens when a phone is pretty close to the speaker. This is pretty basic stuff and it wouldn't make a very interesting blog if it ended here. The key is in the word most.

What's the difference? Why do some cell phones cause more interference than others? Why do some phones not cause any interference at all?

To understand this, we need to note that most interference comes from GSM phones as opposed to CDMA phones. This is because GSM phones use something called TDMA (Time Division Multiple Access) for their signaling, voice, SMS and 2G data. CDMA phones use CDMA (Code Division Multiple Access), a type of spread spectrum for their communication. What's the difference?

Well, I won't go into the details of CDMA vs. TDMA here - that will need to wait for another blog. What I will tell you is that TDMA separates the signal into little time slices, so that the phone will transmit for one piece of time and then be silent for others.

On things like the handshake for an incoming call, SMS messages or slow speed data, the transmissions appear to be pulses - a burst of energy at one frequency followed by quiet time and so on. These pulses are picked up by the speaker and come out as noise.

In the world of CDMA, the same power is spread over a broader range of frequencies, without the time slicing. Hence the power at any frequency looks more like low level background noise. If it is picked up by the speaker, it probably shows up as very low level static.

Now even this isn't the end of the story. It turns out that 3G data, the really fast data that AT&T is always boasting about in the ads, is spread spectrum as well. So, your 3G phone, at least when data traffic is concerned, shouldn't cause problems like its 2G predecessors. Unfortunately, this doesn't impact voice or SMS. Finally, I recently noticed one more thing that I can't explain. That is the iPhone seems to cause less noise than some of the counterpart Windows mobile devices. This I don't know why.



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