Harmony’s Spectral Resolution...delivers 5 times more sound than any other cochlear implant system.

**Harmony**
- up to 100 bands

**OTHER SYSTEMS**
- up to 22 bands

### References
Harmony's Spectral Resolution delivers the pitch and timing of sound with the greatest accuracy.

Harmony's Spectral Resolution...what it means and why it matters

Like normal hearing ears, cochlear implants take advantage of both of those values deliver best. Cochlear implants substitute different points on the place of hearing that are located on the ear to the inner ear. Pitch is the highness or lowness of a tone. In normal-hearing ears, perception of pitch is encoded in two ways. The first way is called the "place" code because different frequencies correspond to different places in the inner ear. The second way to encode information, to the inner ear. Spectral resolution refers to how well the cochlear implant delivers frequency, or "pitch" information, to the brain. Fresh nerves and the ear can hear different pitches when different frequencies are delivered. This makes it important to have good spectral resolution in the cochlear implant.

Harmony's Spectral Resolution is a breakthrough in sound-processing technology that uses current steering to increase the number of pitches delivered to the brain.

How are spectral resolution and the number of electrodes related?

Historically, spectral resolution has been limited by the number of electrodes that can be delivered to the inner ear. However, the number of electrodes that can be delivered to the inner ear was limited by the number of electrical signals that could be delivered to the cochlear implant. With current steering, additional pitches can be delivered to the brain. This means that the cochlear implant can now deliver pitches that would have been impossible with traditional methods. For example, the Nucleus 5 System cannot stimulate two different electrodes at the same time, which limits the number of pitches to the number of electrodes (at most 22).

How does the internal technology differ among cochlear implant systems?

The cochlear implant technology is critical to the function of the cochlear implant. It includes the ability to stimulate two or more electrodes at the same time. This is called "current steering." The faster the stimulation rate, the more sounds you hear. The wider the range, the more accurate the timing of sound.

A comparison of spectral bands provides 22 spectral bands, delivering far fewer pitches than AB's Harmony System. If you have only one current source, the Nucleus 5 System claims they offer 161 pitches, but they currently have no sound-processing strategy to deliver that many pitches to recipients. With only one current source, the Nucleus 5 System does not have the capability to steer current or to deliver high spectral resolution. Cochlear's Nucleus Freedom System delivers the pitch and timing of sound with the greatest accuracy so that you can hear and enjoy music or hear well in noise like people with normal hearing do. Only HiRes® 120 from AB:

• Has been proven in studies to show better speech perception in noise, as well as improve listening in noisy situations and for hearing and appreciating music.
• Allows you to hear many more pitches than the number of electrodes implanted in the ear.
• Provides the ability to stimulate two or more electrodes at the same time. This simultaneous stimulation allows current to be "steered" between electrodes giving Harmony recipients the opportunity they have to differentiate sounds. The more accurate the timing of sound, the more sounds you hear. The faster the stimulation rate, the more sounds you hear. The wider the range, the more accurate the timing of sound.
• Offers unique sound processing strategies.

Choosing a cochlear implant is a big decision. As a cochlear implant candidate, you must weigh the long-term benefits for your child or yourself versus the short-term convenience of having the best experience today. When choosing the best cochlear implant system, you need to consider the size and appearance of the cochlear implant and the sound processor, as well as the type of internal technology your cochlear implant system uses. Only Harmony's HiRes® 120 spectral bands deliver the pitch and timing of sound with the greatest accuracy.