

TechNote 167 Eliminating 60 Hz noise and its multiples from ABR recordings

This noise can be manifested as noise at a multiple of 60 Hz. You may not see 60 Hz if you have a 60 Hz notch filter in place.

There are three things you can do to minimize this:

1. Record in an environment where there is not a lot of 60 Hz noise (like a Faraday cage).
2. Make sure that the electrode impedances are as close together as possible. If you have one at 2 kHz and one at 4 kHz, you will only get a reduction in the 60 Hz noise and its multiples by half (as opposed to virtually eliminating it in the amplifier). A differential amplifier will eliminate signals that are common to both the recording and reference electrodes. If the impedances to these electrodes are different, the common signals will have different voltages and not be subtracted out.
3. Set the stimulus presentation rate at something other than a multiple of 60 Hz. For example, if the presentation rate were 20 Hz, then it would line up perfectly on the 60 Hz noise, and the noise would not get averaged out. Instead, make it something like 21 Hz (or 11 Hz, if you wanted to use a 10 Hz presentation rate).