



**BRITISH ACADEMY
OF AUDIOLOGY**

Masking and 2 Channel Recordings

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- Masking is a truth expression
- To keep it simple: If Stimulus – Inter-aural attenuation \geq The bone conduction value of the non test ear, masking is required
- Stimulus level in dBHL – IA \geq BCnT
- i.e. Headphone inter-aural attenuation is 38dB, hence the need to mask if 40dB difference
- This is complicated further for EP equipment and short duration stimuli due to temporal integration of the stimuli



The full thing in all its glory:

- Masking is needed where:

Stimulus in dBnHL + stim correction (nHL – eHL) – (IAa) – (IAs) \geq BCnT

- IA(a) is the interaural attenuation due to age
- IA(s) is the interaural attenuation of the stimulus and transducer



- So lets assume a clear response at 80dBnHL on one ear, 20dBnhL on the other on a 3 week old at 4kHz using headphones

Do we need to mask?

- So what do we know?
- We know that the additional intraural attenuation at this age is 20dB and the interaural attenuation of the stimulus with headphones is 42dB
- We also know the bone conduction threshold of the non-test ear is likely to be 0



- The stimulus in dBnHL **80** + stim correction (nHL – eHL)
-10 – (IAa) **20** – (IAs) **42** \geq BCnT **likely 0**
- $80 - 10 - 20 - 42 \geq 0$
- $80 - 72 = 8$
- $8 > 0$
- **Masking is needed**



But how much noise?

- There's an equation for that too!
- $MdB = \text{Stim in dBnHL} - \text{correction to eHL} - \text{Total transmission loss (TTL)} + 10 + ABG$
- $MdB = 80 - 10 - 62 + 10 + ABG$
- $MdB = 22$
- So we now know we need 22dB SPL of noise
- EQUIPMENT SPECIFIC!
- Some kit considers 0dB SPL to be 0dB dial
- Others consider 0dB SPL to be 20dB dial
- Use the calculator!



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Masking Calculator



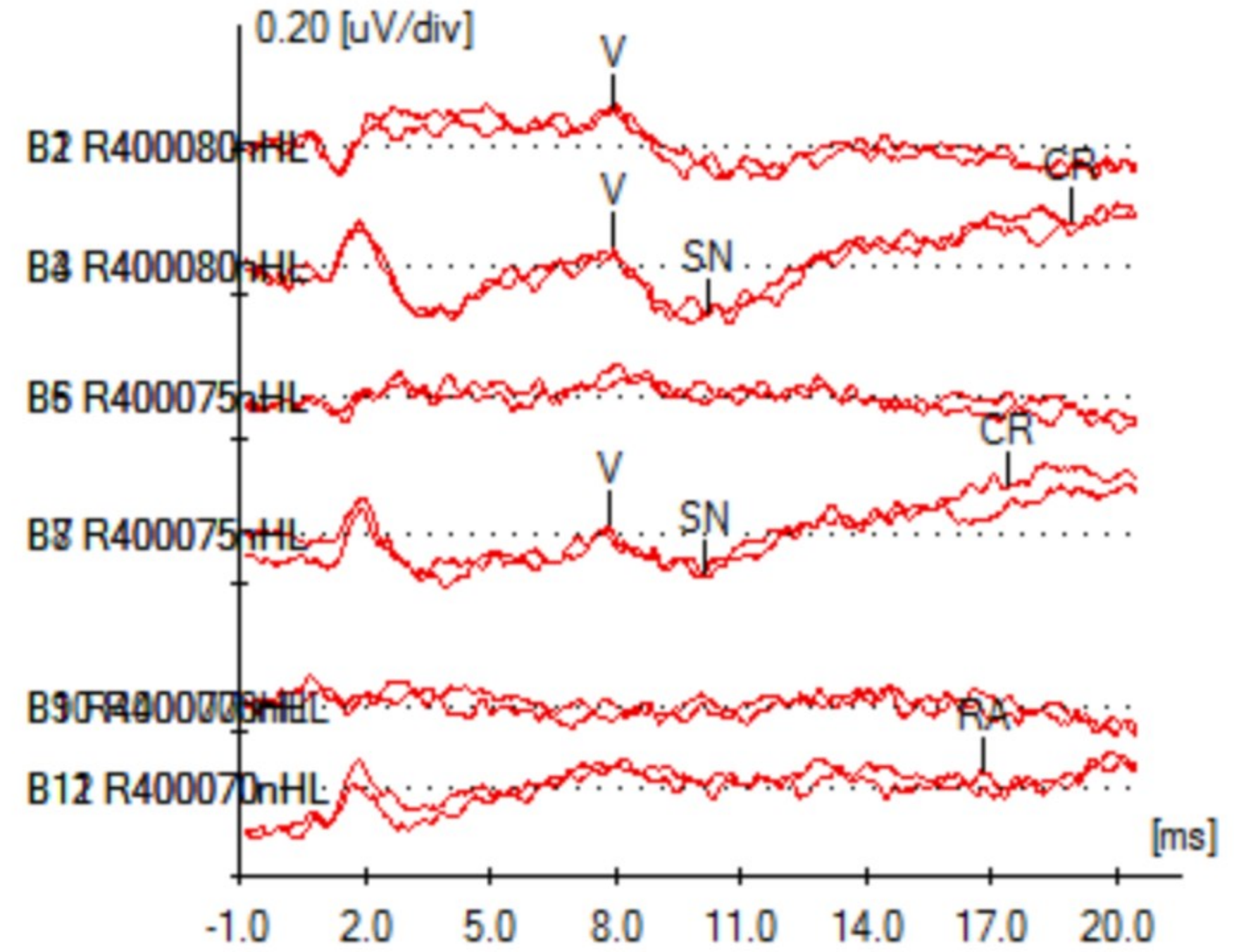
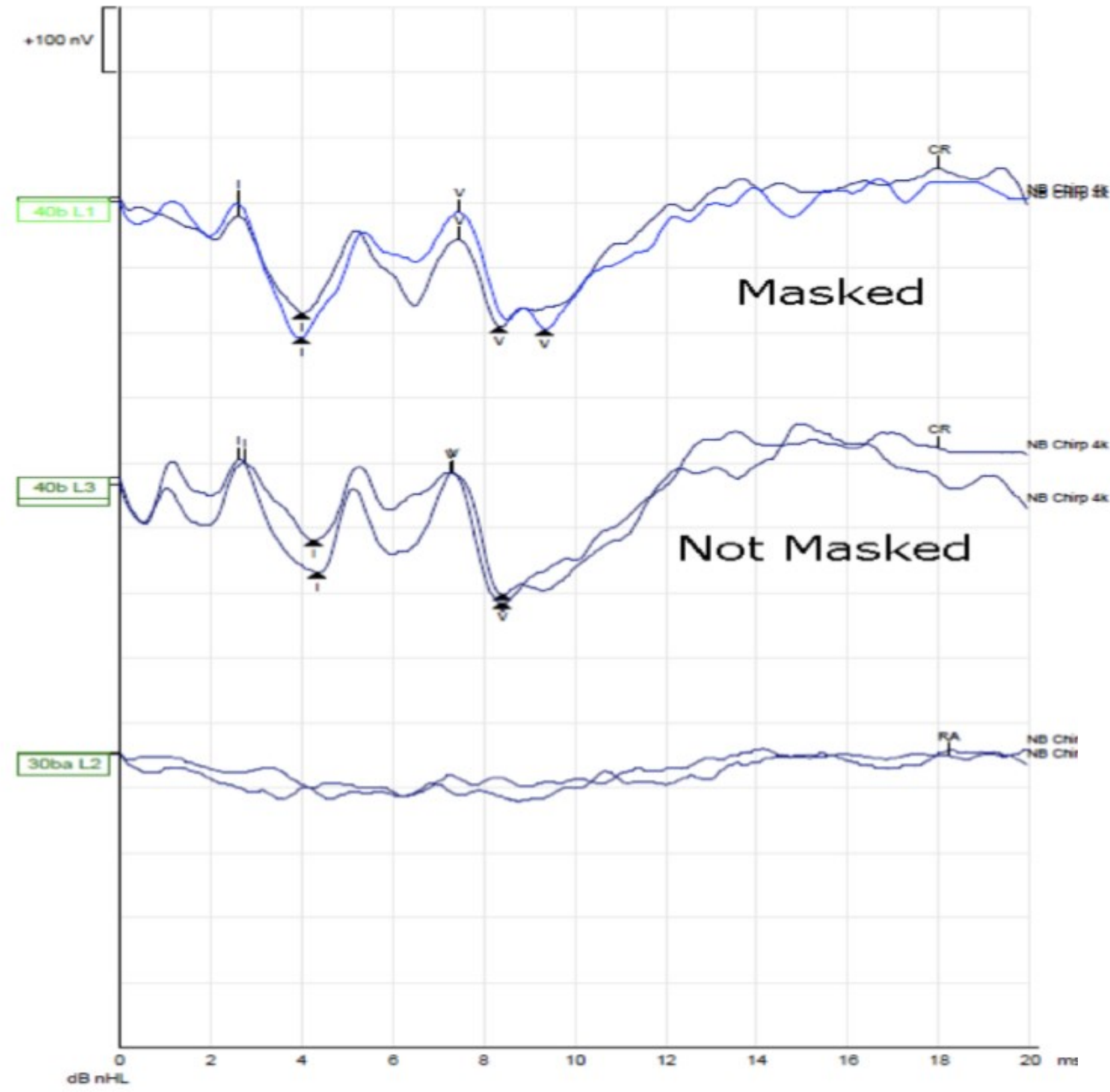
What if you can't mask?

- Use presence of wave I
- 2 channel recording
- Tips and Tricks



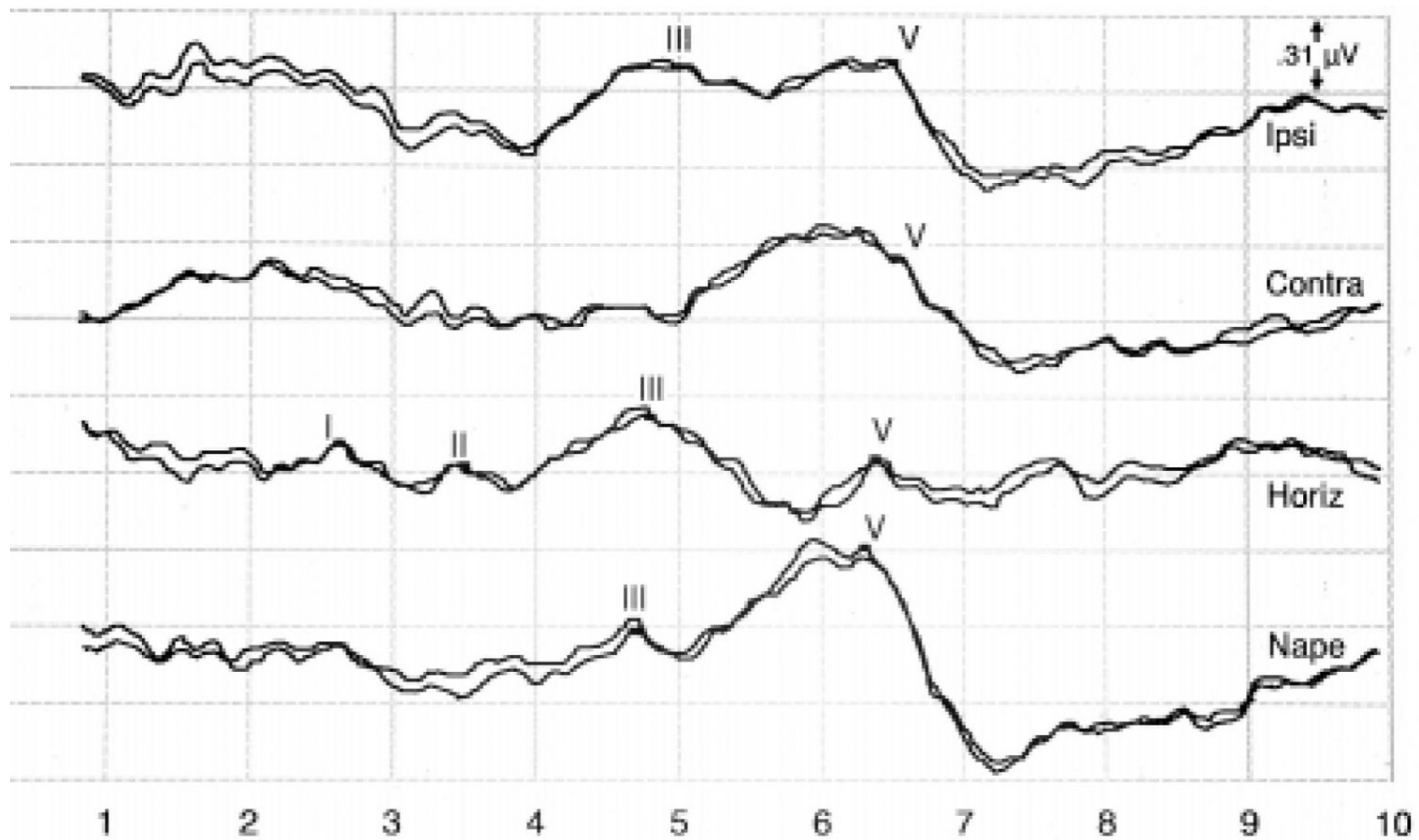
Using Wave I

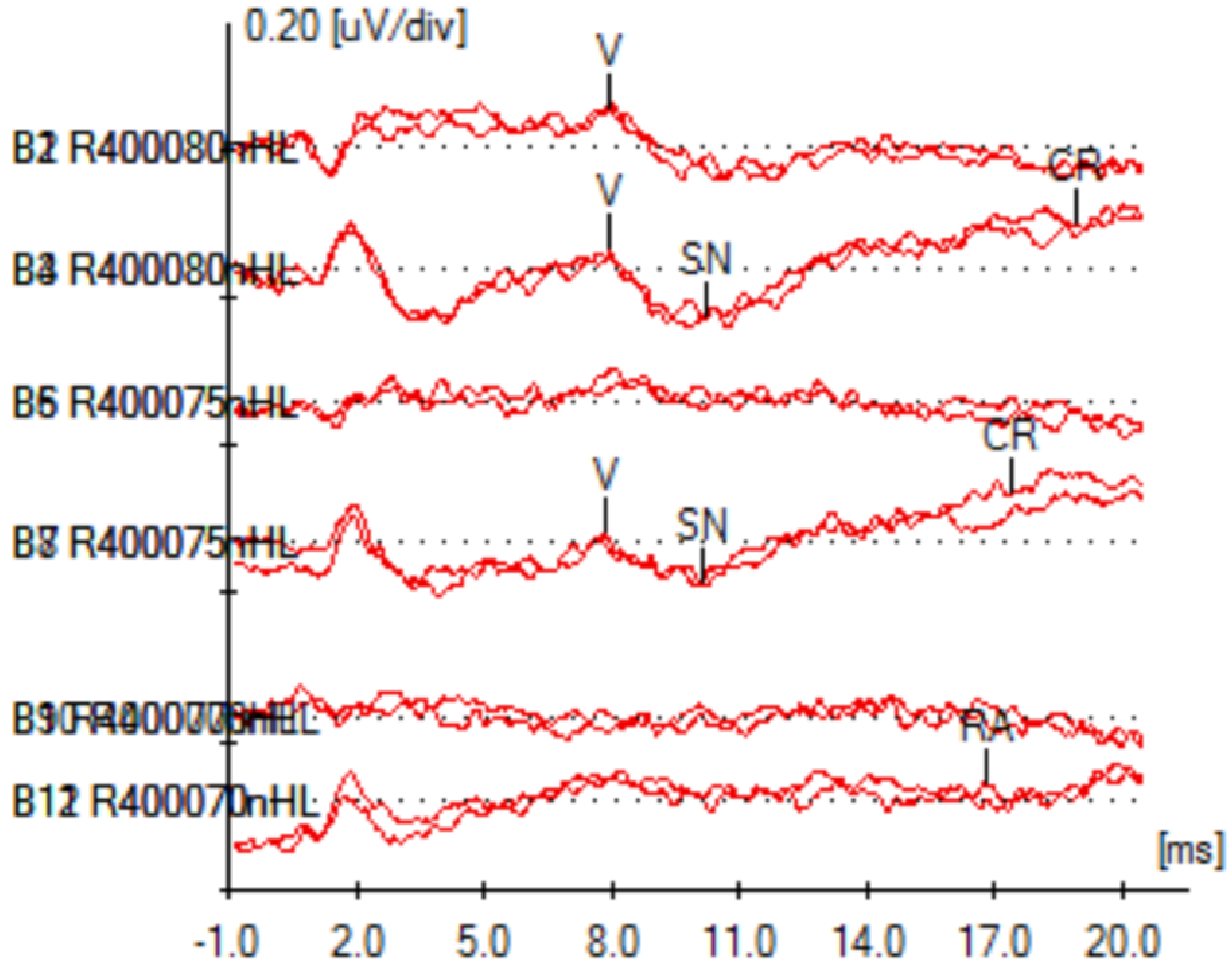
- Because Wave I is generated from the proximal end of the auditory nerve, where it leaves the cochlear, its much much closer to the ipsilateral electrode than the contralateral (unlike the forehead which is about the same) - its therefore only recordable from the ipsilateral ear
- Its presence, therefore means you're looking at a response from that ear and you do not need to mask - BUT make sure what you're looking at is definitely Wave I and until your sure, its a good idea to mask.



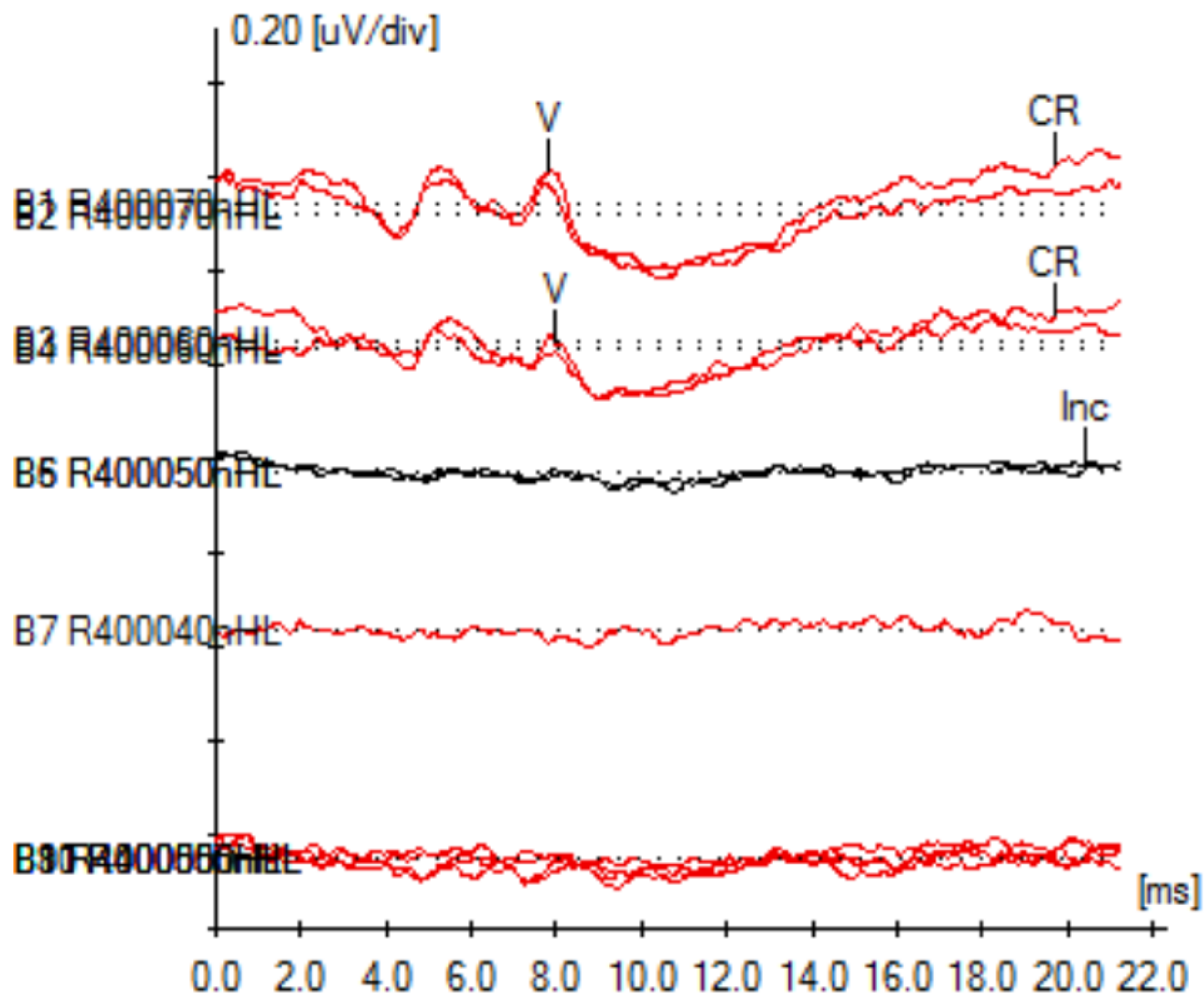
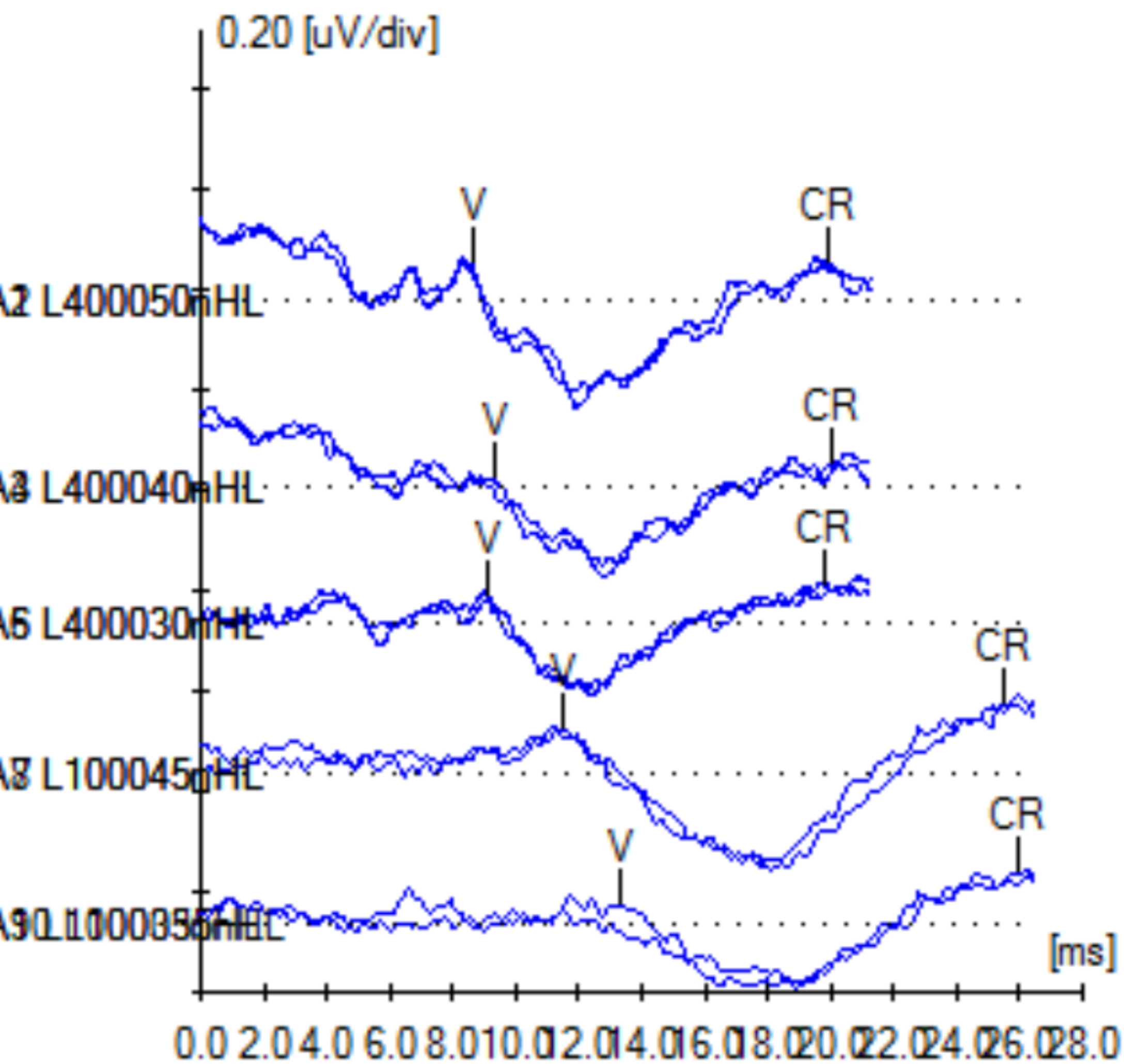
2 Channel Recording

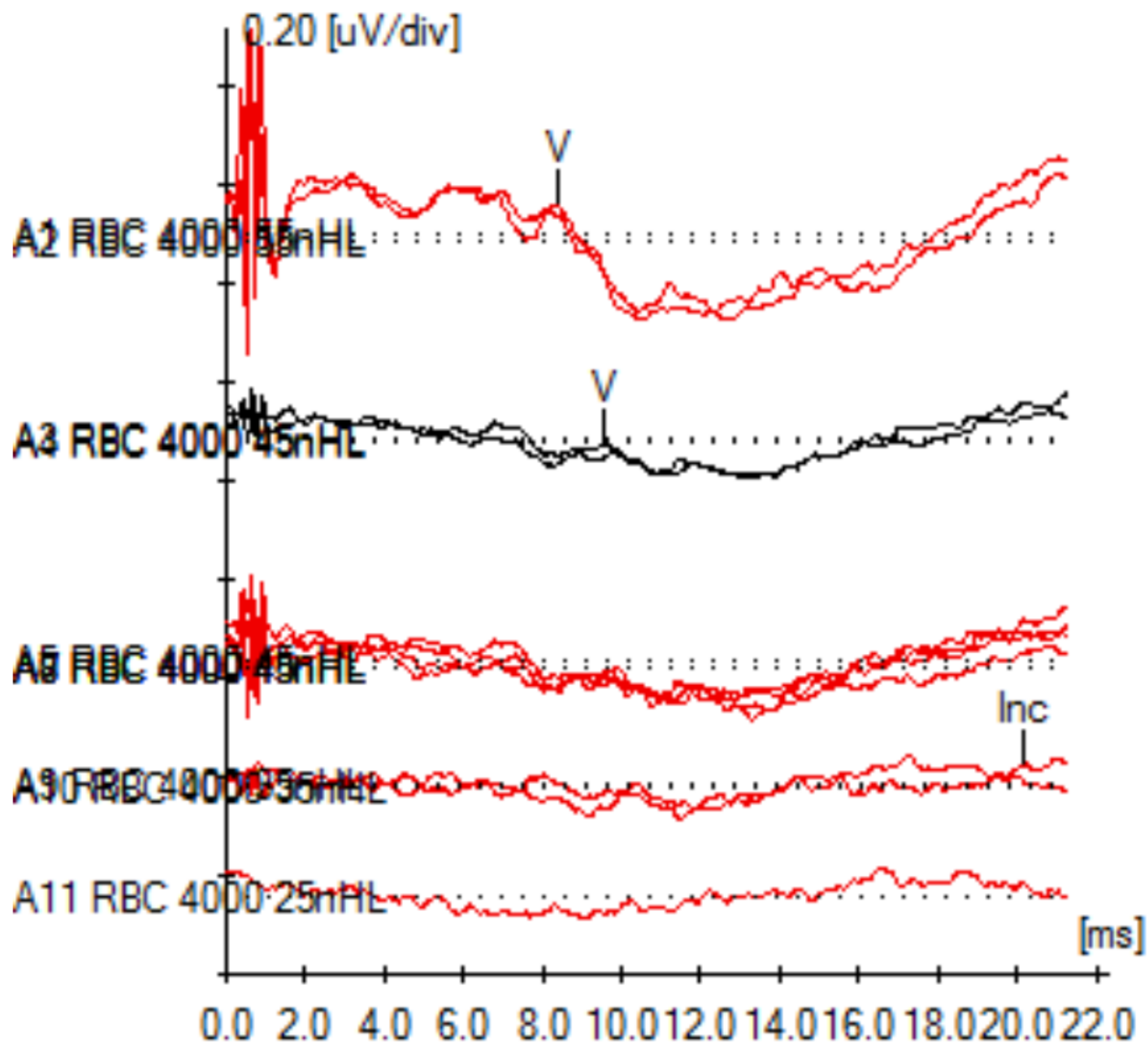
- By using electrode jumper leads, or just a 2 channel system you can record 2 channel ABR on most equipment, this allows you to see both the Ipsilateral and the contralateral response to the stimulus
- The ear generating the response will have the larger and earlier Wave V (in theory!!!)
- As discussed before, the contralateral channel will not have Wave I on it, but it may have the dip following Wave I

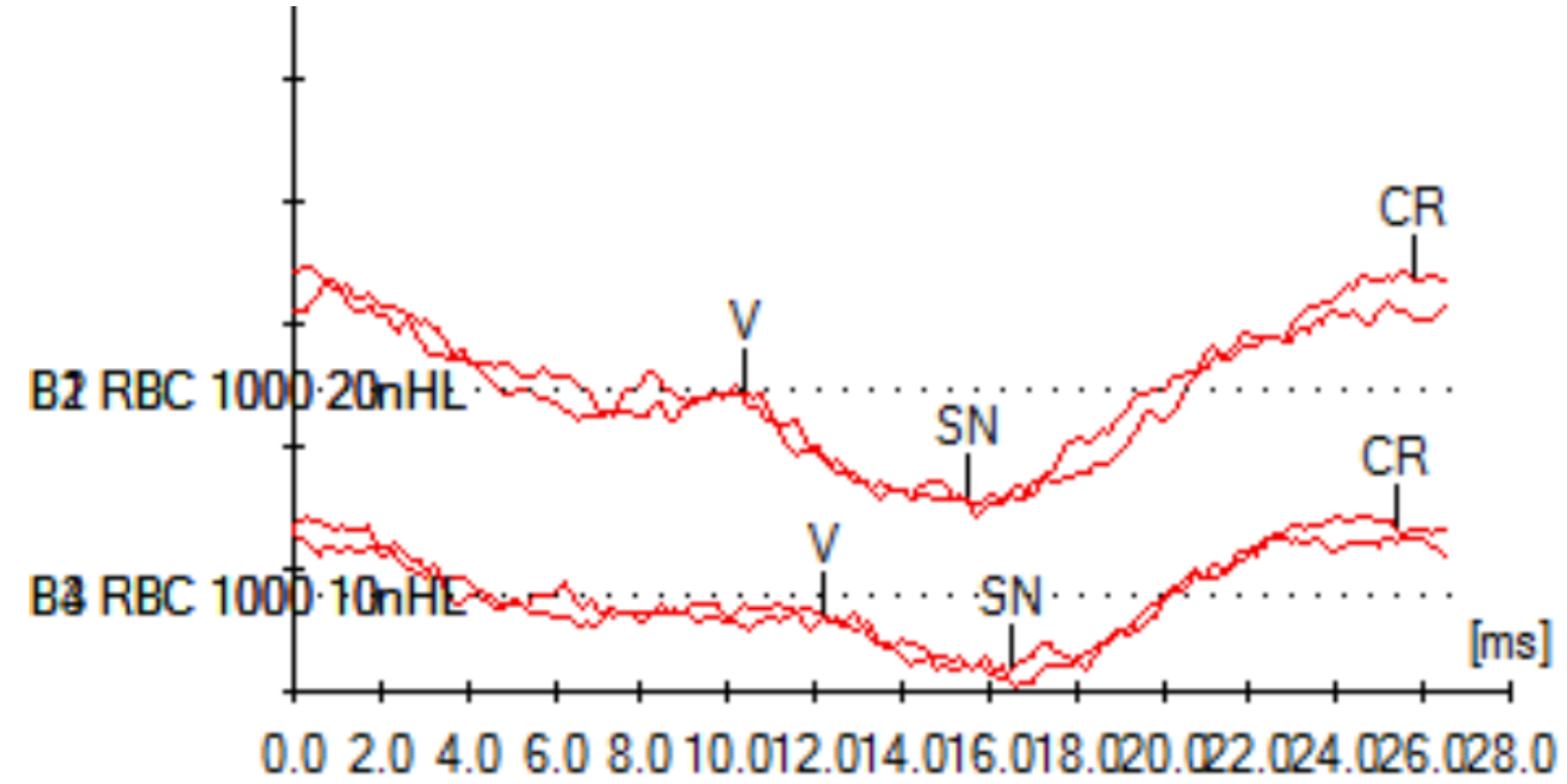
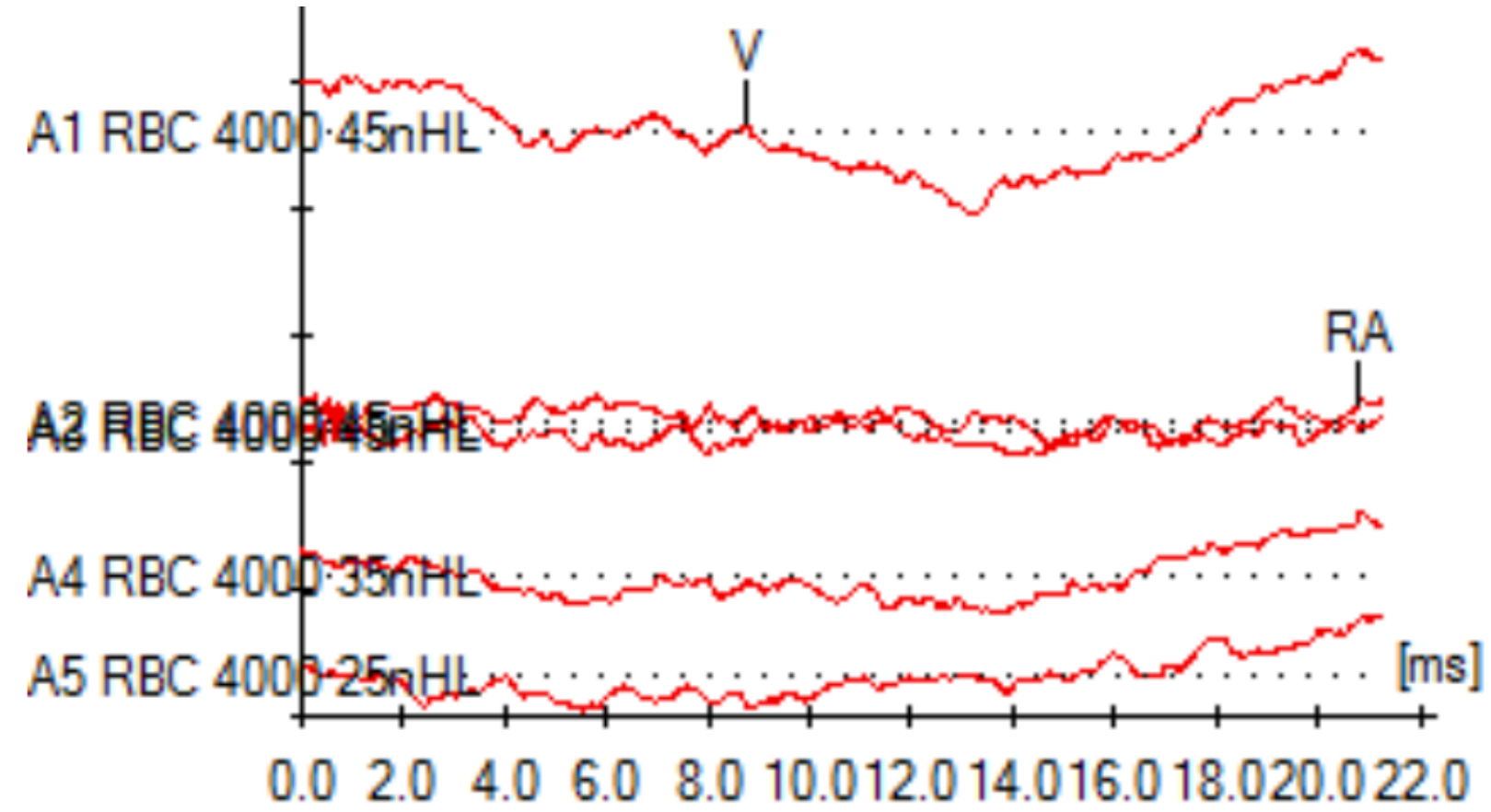




Questions and then some exercises....







Stimulus Parameters

<i>Label Index</i>	<i>Intensity</i>	<i>Ear</i>	<i>Transducer</i>	<i>Polarity</i>	<i>Type</i>	<i>Frequency</i>	<i>Ramp</i>	<i>Rise/Fall</i>	<i>Plateau</i>	<i>Masking level</i>
A1	45dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	4000	Blackman	0.50	0.25	N/A
A2	45dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	4000	Blackman	0.50	0.25	60dB HL
A3	45dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	4000	Blackman	0.50	0.25	60dB HL
A4	35dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	4000	Blackman	0.50	0.25	N/A
A5	25dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	4000	Blackman	0.50	0.25	N/A
B1	20dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	1000	Blackman	2.00	1.00	N/A
B2	20dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	1000	Blackman	2.00	1.00	N/A
B3	10dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	1000	Blackman	2.00	1.00	N/A
B4	10dB nHL	Right	Bone Oscillator	Alternating	Tone Burst	1000	Blackman	2.00	1.00	N/A