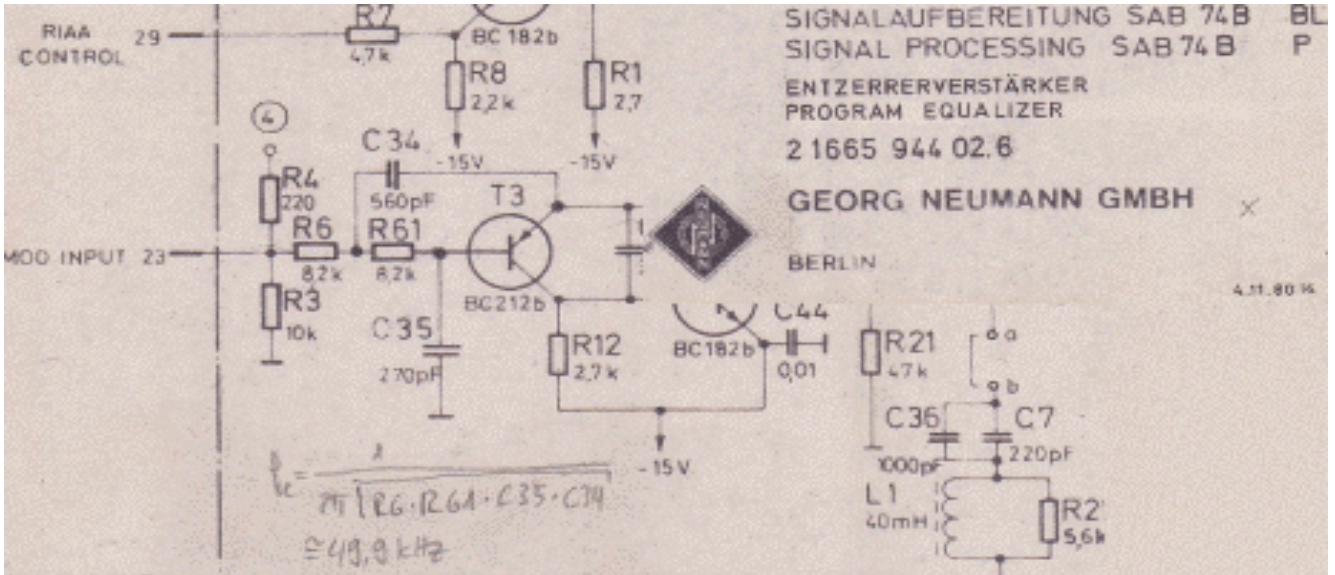


**Attention – Phonostage Phono2Ci with Neumann 3.18us or 50kHz RIAA addition?**

What is the mysterious Neumann compensation in the RIAA?  
 First we need to know more about the facts.

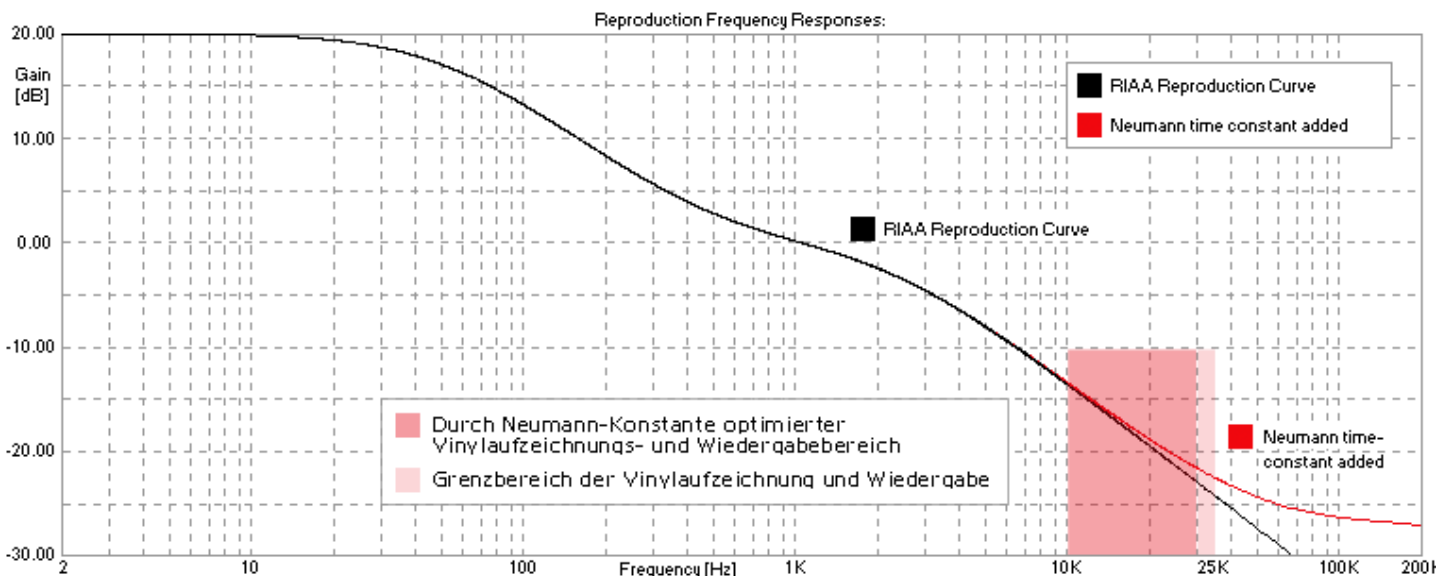


Above is an excerpt of an Neumann Cuttingamp schematic-diagram, the SAB 74B version 04-Nov-1980  
 At the MOD-input it shows a second-order Sallen-Key filter at 49,9kHz. Parts: R6 + R61 + C35 + C34

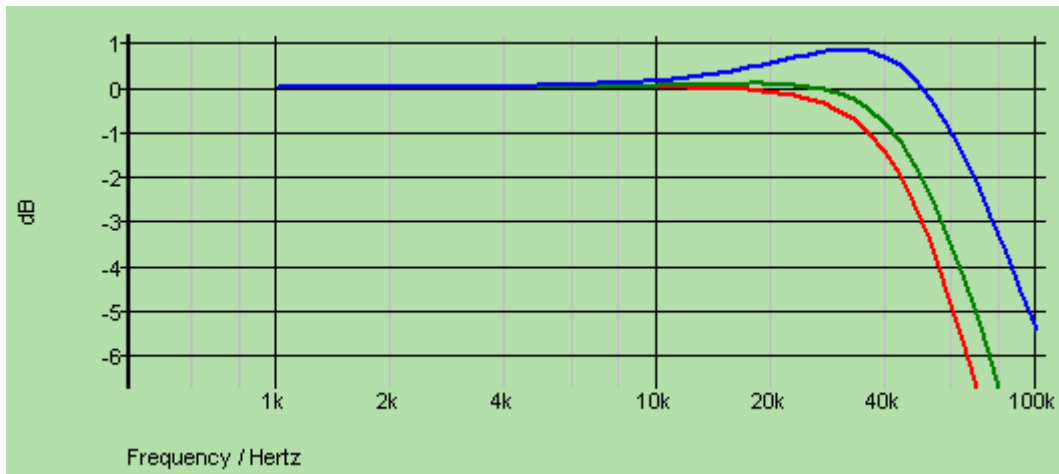
Sometimes the Neumann implementation is misinterpreted as if this RIAA-equalisation extends the frequency to 50kHz, but this is not the case. Albeit up to 50kHz are sometimes in the vinyl-signal. But Neumann and other manufacturers of cutting amplifiers/cutting lathes implemented a filter mostly at the input of the cutting-amp. This filter has in case of Ortofon 60kHz, early Neumann's had 30kHz and 50kHz, where up from the 60's the Neumann's had only 50kHz. Scully or Westrex have low roll-off values of 20-30kHz. The filter was intended to prevent cutterhead-coils from burn-off, because the RIAA would otherwise be infinite amplified in the highs.

**This filter, like all filters, affects the phase and the level**, in the top bandwidth. The chart shows the level is affected beginning with 10kHz rising over the end of controlled cutting freq. 18-25kHz resulting in +0db to +2db

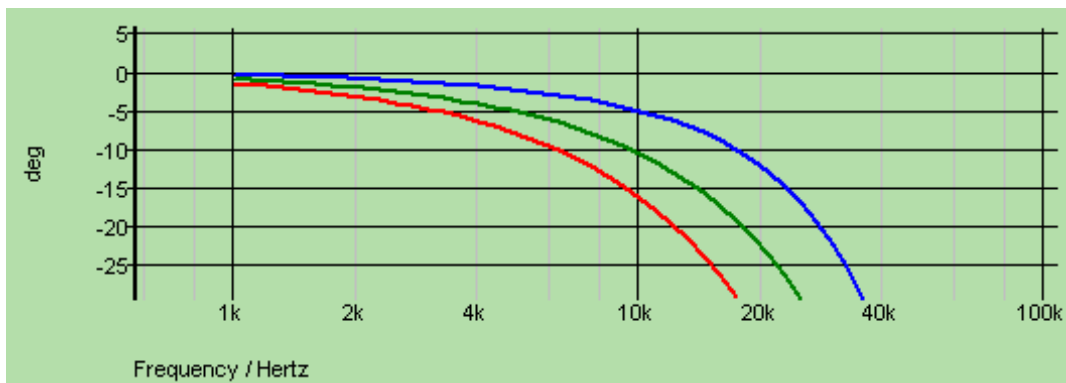
The graph below shows the affected frequency bandwidth



This graph shows the frequency



This graph shows the phase



Above figures are simulations of a Neumann SAL-74B cutter amplifier followed with:

1. **standard RIAA de-emphasis (red)**
2. **single-zero-50kHz-compensated de-emphasis (green)**. Used in **AQVOX** Phonostages.
3. **single-zero 100kHz compensation, not used in any cutting-amp.**  
 Only used in this simulation for better visualisation of the phase/level ratio

The standard equalisation (**red**) has a near-flat amplitude response out to 20kHz, but suffers over 25 degrees of phase shift at this frequency. The 50kHz compensated replay equalisation (**green**) shows a slowly rising treble, but has less phase shift. The unused **blue** curves are for a single-zero 100kHz compensation, clear to much treble.

Additional to the more correct phase and level, it must be remarked, that the small treble peaking in the compensated version might offset some of the treble losses inherent to vinyl's crude manufacturing process or wear and tear from playing abrasion.

**Benefits :**

- 1- more correct phase
- 2- more correct level
- 3- extended highs
- 4- more natural sound reproduction
- 5- 50kHz is the most widely used roll-off frequency and a good compromise for all the rest.

In case of any question to this matter, please contact **AQVOX**.