WORKS CITED


McNamara, Peter (2004) – Auftauchen der Nacht original score. Wirripang Pty Ltd.

McNamara, Peter (2004) – Die Nacht kommt original score. Wirripang Pty Ltd.


The German Hills

Appendix II: The German Hills, bb.13-20

* Play closer to the bridge than normal and allow harmonic partials to appear.
Appendix III: The German Hills bb.45-52
Appendix IV: The German Hills bb 81-6

The German Hills—Peter McNamara 2008

* Play any strong multiphonic with the given fundamental.
Appendix V: The Styx Section K
Appendix VI: Zodiac Turbulence Section III
Appendix VII: Zodiac Turbulence Section VII
Appendix IX: *Microtonal Accidentals and definitions of Harmonic, Inharmonic and Sub-harmonic Spectra.*

**Quartertonal Accidentals:**

\[\flat\] A quartertone flat \[\flat\flat\] Three-quartertone flat

\[\sharp\] A quartertone sharp \[\#\] Three-quartertone sharp

**Microtonal Accidentals:**

\[\flat\] or \[\natural\] or \[\#\] Slightly sharp (c.a. 1/8\textsuperscript{th} tone) from \[\flat\] or \[\natural\] or \[\#\].

\[\sharp\] or \[\natural\] or \[\#\] Slightly flat (c.a. 1/8\textsuperscript{th} tone) from \[\flat\] or \[\natural\] or \[\#\].

**Harmonic Spectrum:** a harmonic spectrum follows the natural and normal logarithmic curve of the harmonic series, beginning with large intervals and progressively becoming smaller.

**Sub-harmonic Spectrum:** a sub-harmonic spectrum is an inversion of a harmonic spectrum, beginning with large intervals and progressively becoming smaller, but in a downward direction.

**Inharmonic Spectrum:** an inharmonic spectrum is un-natural and occurs when the logarithmic curve of the harmonic series (or sub-harmonic series) is in some way disrupted. This results in the interval series becoming uneven (i.e. each not necessarily becoming progressively smaller).
Appendix X: Definition of the Harmonic Series.

The Harmonic Series.

The harmonic series is a group of frequencies that are present above every pitch. The harmonic series is not perceived as individual pitches, but rather as a whole. The presence or lack of presence of the harmonic series determines the tone colour of a sound, as some of the frequencies of the harmonic series are more prevalent than others depending on the sound or instrument. Microtones exist naturally in the harmonic series and as a result, whenever we hear a pitch, we are also hearing microtones at the same time. Diagram 1 is a diagram of the harmonic series of C. This diagram shows pitches up to the sixty-fourth partial, but the pitches continue into infinity.

Diagram 1: The Harmonic Series of C to the 64th Partial.

As can be seen by the notation, many pitches cannot be notated by the equal tempered system such as partial number seven and so on. The exact tuning of these pitches is reliant on interpretation. Many measure them by way of quarter, sixth and eighth-tones, which are known as tempered microtones and fit best with the equal tempered tuning system. These tempered microtones are not completely accurate though, and are more of a compromise of the actual mathematical frequency. Some composers
measure them by an even smaller interval called a cent; there are one hundred cents in a semi-tone, which shows its minute status. The harmonic series also accounts for why many pitches in acoustic instruments are out of tune, particularly brass instruments. The harmonic series has large intervals at the bottom and progressively smaller intervals at the top, following a mathematical logarithmic curve. Spectral composers often used an artificial construction called the Sub-Harmonic Series, which is the inversion of the harmonic series having large intervals at the top and progressively smaller intervals at the bottom. **Diagram 2** is a diagram of the Sub-Harmonic Series of C.

![Diagram 2: The Sub-Harmonic Series of C to the 64th Partial.](image)