DYNAMICS PROCESSING

WHITE PAPER

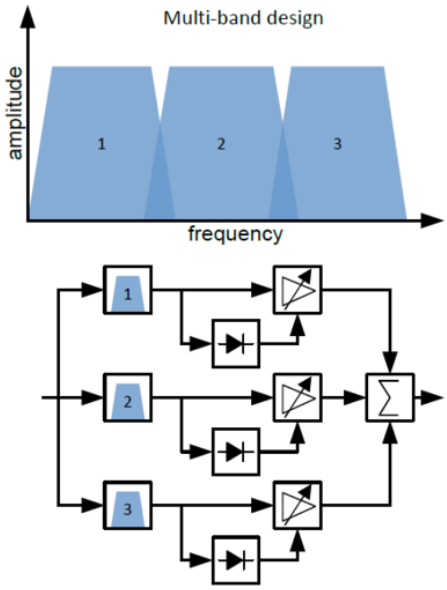
1 White Paper

CONTENT

JÜNGER AUDIO'S DYNAMICS PROCESSING

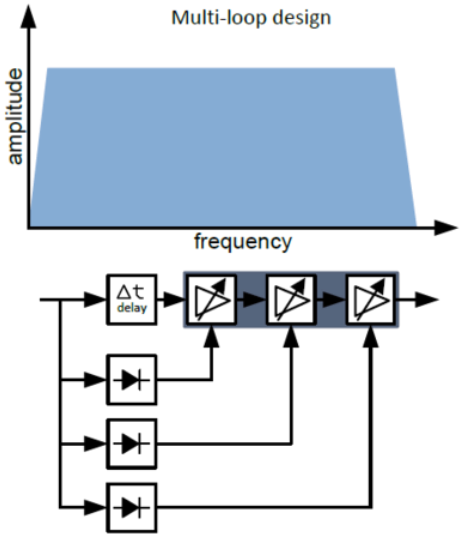
MULTI-BAND DESIGN

Multi-band systems split the audio frequency spectrum into several overlapping frequency bands. Gain and ratio, usually even attack and release times can be set separately for all of these frequency bands, resulting in independent processing for each band. Recombining the outputs of the multi-band stages can lead to severe problems. The spectral balance of the summed output signal is almost always deviating from its input. Thus the resulting relation of high, mid, and low frequencies may lead to a completely new impression of spectrum and sound quality. This is especially a problem when listening to music.



MULTI-LOOP DESIGN

Many Jünger Audio dynamics processors utilize a multi-loop principle. Instead of splitting the spectrum, all loops affect the entire audio frequency range. The loops run in parallel, each with an independent set of attack and release timing parameters. Every loop generates a control signal according to its parameters. The computed combination of these control signals (a proprietary Jünger algorithm) is then applied to one gain changing element.



ADAPTIVE DYNAMIC RANGE CONTROL

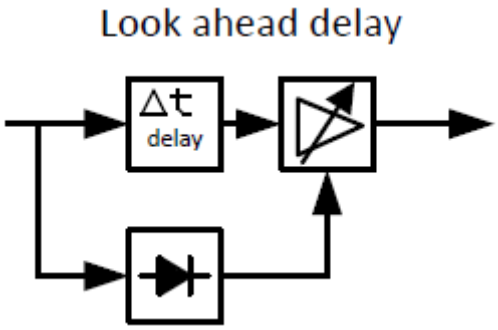
Based on a multi-loop design, Jüngers proprietary algorithms allow the automatic adjustment of attack and release timings according to the dynamic content of the input signal over time. We call this 'Adaptive Dynamic Range Control'. The system is automatically adjusting all timing parameters for optimal signal treatment without manual readjustment.

THE JÜNGER AUDIO DYNAMICS PROCESSOR PARADIGM

Changing the dynamic range of an audio signal is inherently a non-linear process. Unlike an ordinary line amp, the gain of a dynamic range processor is not static. It varies over time depending on the specific control algorithm of the dynamics processor and the amplitude of the input signal. These gain changes represent the control process. It is an art and a science to design a processing algorithm or even an analog circuit that is not introducing negative side effects, like pumping, distortion or noise modulation, to the audio quality. The Jünger dynamic processes are optimized on being 'inaudible' and 'clean' in terms of these side effects. With its adaptive multi-loop design, it can be a set and forget system of highest quality.

LOOK AHEAD

It may sound a bit exaggerated, but even audio has to follow causality. In consequence every reacting system is too late to fully reduce a signal to a certain value without introducing a high amount of signal distortion.
To design a true brickwall limiter or even a fast compressor, it is necessary to introduce delay into the signal path.



The detector circuit receives the input signal in real time, reacts and generates a dynamic gain change. The input path feeding the gain element (the controller) is delayed by 2 milliseconds. Thereby the gain reaction is already taking place, when the original sound appears at the controller. High peaks are reduced entirely with minimal distortion and signal degradation. The only downside is the essential signal latency of 2 milliseconds which is noncritical in most applications.

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About Jünger Audio

Established in Berlin in 1990, Jünger Audio specializes in the design and manufacture of highest quality digital audio dynamics processors. Jünger Audio has developed a unique range of digital processors that are designed to meet the precise needs of the professional audio market. All Jünger Audio products are easy to operate and are developed and manufactured in-house, ensuring that the highest standards are maintained throughout. Jünger Audio's customers includes the world's top radio and TV broadcasters, IPTV providers, music recording studios and audio post production facilities.

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