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CLAIMS:



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1. A directional microphone, comprising:

a shotgun microphone having an elongated tube which is designed to control the directivity of said directional microphone at frequencies above a predetermined frequency, said elongated tube causing the portion of an output signal from said shotgun microphone and the directional microphone at frequencies above said predetermined frequency to be generally representative of the portion of the signals at frequencies above said predetermined frequency which originate from a location in front of said directional microphone in a direction along the longitudinal axis of said elongated tube;

at least two reference microphones spatially arranged about said shotgun microphone;

a low-pass filter electrically connected to said reference microphones, said low-pass filter generating an output signal having a frequency generally below said predetermined frequency; and

a signal process electrically connected to said shotgun and reference microphones and said low-pass filter, said signal processor generating interference canceling signals from the portions of the signals from said reference microphones which have frequencies generally below said predetermined frequency, output signal of said low-pass filter, and signal processor combining said canceling signals with the output signal from said shotgun microphone to generate an output signal in which signals originating from the location in front of the directional microphone in a direction along the longitudinal axis of said tube are enhanced and signals originating from locations other than in front of the directional microphone in a directional microphone in a direction along the longitudinal axis of said elongated tube are suppressed.

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2. The directional microphone of claim 1 wherein the directional microphone includes at least four reference microphones.

3. The directional microphone of claim 2 wherein said signal processor combines the output signals of said at least four reference microphones to form at least two reference microphone difference signals, said signal processor generating said cancelling signals from the portions of said difference signals which have frequencies generally below said predetermined frequency.

4. The directional microphone of claim 1 wherein said signal processor includes a preamplifier and limiter circuit electrically connected to each one of said shotgun and reference microphones and an analog to digital conversion circuit electrically connected to each one of said preamplifier and limiter circuits, each one of said preamplifier and limiter circuits having gain and limiter parameters which are balanced to allow a noise floor and dynamic range of said shotgun and reference microphones to be matched to a noise floor and dynamic range of said analog to digital conversion circuits.

5. The directional microphone of claim 1 wherein said signal processor includes a filter circuit and an analog to digital conversion circuit electrically connected to each one of said shotgun and reference microphones, said filter circuits allowing aliasing type noise to be reduced to a level below a noise threshold of said analog to digital conversion circuit corresponding thereto.

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CLAIMS:

- 1 A directional microphone, comprising:
a shotgun microphone having an elongated tube which is designed to control the directivity of said directional microphone at frequencies above a predetermined frequency;
at least two reference microphones spatially arranged about said shotgun microphone;
and
a signal processor electrically connected to said shotgun and reference microphones, said signal processor generating interference cancelling signals from the portions of the signals from said reference microphones which have frequencies generally below said predetermined frequency, said signal processor combining said cancelling signals with the signal from said shotgun microphone to generate an output signal in which signals originating from in front of the directional microphone in a direction along the longitudinal axis of said tube are enhanced and signals originating from locations other than in front of the directional microphone in a direction along the longitudinal axis of said elongated tube are suppressed.
2. The directional microphone of claim 1 wherein the directional microphone includes at least four reference microphones.
3. The directional microphone of claim 2 wherein said signal processor combines the output signals of said at least four reference microphones to form at least two reference microphone difference signals, said signal processor generating said cancelling signals from the portions of said difference signals which have frequencies generally below said predetermined frequency.
4. The directional microphone of claim 1 wherein said signal processor includes a preamplifier and limiter circuit electrically connected to each one of said shotgun and reference microphones and an analog to digital conversion circuit electrically connected to each one of said preamplifier and limiter circuits, each one of said preamplifier and limiter circuits having gain and limiter parameters which are balanced to allow a noise floor and dynamic range of said shotgun and reference microphones to be matched to a noise floor and dynamic range of said analog to digital conversion circuits.
5. The directional microphone of claim 1 wherein said signal processor includes a filter circuit and an analog to digital conversion circuit electrically connected to each one of said shotgun and reference microphones, said filter circuits allowing aliasing type noise to be reduced to a level below a noise threshold of said analog to digital conversion circuit corresponding thereto.