hereinafter explained in further detail particularly with respect to **FIG. 3, a** monofrequency tinnitus patient is asked to adjust knobs **18** and **20** of sound generator **10** until the output of the sound generator applied to headphones **12** matches the tinnitus monofrequency tone heard by the patient. This subjective "sound-typing" is preferably repeated a plurality of times on a blind basis, i.e. the patient cannot see the readout display, not shown, on the sound generator and the subjective sound typing data for each of the self-typing steps is recorded by an attending audiologist or physician.

[**0037**] The principles of sound wave cancellation by superimposing, e.g. summing, a second sine wave having the same frequency and amplitude, as the first sine wave with a phase shift of 180 degrees is well understood in the electrical and measurement arts and is utilized in many technical fields including audiology, mechanics and electronics generally. To prove the phase shift cancellation effect of summing two waves of the same frequency and amplitude but without any knowledge of the phase relationship of the first wave to the second wave relative to a common point, can be illustrated as follows. Sound generator **10** is set to a first tone having a frequency of f and an amplitude of A (for example in milli volts as displayed on sound generator **10**) and connected to the first input of multi-beam oscilloscope **14**. A second generator **16** is also set to the same tone of f with a like amplitude and the output is connected as a second input to oscilloscope **14**.

[**0038**] With reference to **FIG. 2** it may be seen that by adjusting the phase of sinewave f_1 through a series of steps, illustrated as $f_2 \ldots f_n$, the sum of f_1 plus f_n neutralizes or cancels and as illustrated f_1 plus f_n cancel when f_n is 180 degrees out of phase with f_1 Unfortunately for tinnitus patients, the structure and operation of the human auditory system is much more complex than the simple addition of two tonal sound waves as illustrated above on a multi-trace oscilloscope **14**.

[**0039**] It is well understood in the field of audiology that humans and animals can determine, to a considerable degree of precision, the direction of a sound wave remote from them and to some extent can estimate the distance of a sound source from an observer. Numerous experiments in the field of audiology have attempted to analyze the mechanics by which so-called binaural localization is accomplished in humans and animals. There are two primary factors which assist one in determining the direction of an arriving sound: (1) relative intensity in the hearer's two ears and (2) the difference in phase between the ears or for a sinusoidal tone, the difference in phase between the sound waves arriving at the right and left ear of the hearer respectively. Thus it is clear that a human or animal auditory system can distinguish phase shifts of complex sound signals and for pure or monofrequency tones specifically. This type of auditory analysis is frequency dependent and for frequencies above 1 K hertz most observers tend to determine the direction of a sound source from the side of the ear receiving the louder sound. Thus in general it appears that auditory localization by phase difference is most definite for a band of frequencies in the order of 1 to 5 1 K hertz. As discussed hereinafter with reference to **FIG. 3**, in implementing tinnitus treatments it is important to determine not only the tonal quality of the tinnitus signal but whether the tinnitus patient hears his/her tinnitus in both ears, in only one ear or as many patients indicate when asked where they hear the tinnitus they respond in their head without reference to either their right or left ear.

[**0040**] Referring again to **FIG. 1**, the structure and operation of Applicant's preferred embodiment of apparatus for treating monofrequency tinnitus patients will be further described. A phase shift network **30** may be of any type known to those skilled in the auditory and electrical arts. Applicant's preferred embodiment of sound generator **10** is of the type commercially available from Agilent as model 3312A function generator, which incorporates an output waveform phase shift feature. To select the waveform phase shift feature, an operator may dial in the desired phase shift (scaled in degrees) by turning knob **22** to the appropriate phase shift factor, e.g. 10 degrees, 20 degrees etc. which affects the desired shifts, e.g. of delta **1**, delta **2**, etc. as shown in **FIG. 2**.

[**0041**] As shown in **FIG. 1, a** gang switch **32** in its position illustrated connects the output of sound generator **10** to the patient's headphones **12**, which preferably is a high quality headset commercially available e.g. from Bose, Inc. of Massachusetts, USA under the trademark QuietComfort. If the sound generator **10** does not have a phase shift feature, a separate phase shift network **30** of any known type may be utilized. Switch **32**, as illustrated, applies the shifted output of sound generator **10** via phase shift network **30** to headphones **12**. Then the successively phase shifted increments of sinewave tone from generator **10**, as herein-above explained, successively shifts the generated sine wave relative to f , as illustrated in **FIG. 2**, to accomplish the reciprocal 180 degree phase canceling relationship through the steps illustrated as f_1 $f_2 \ldots f_n$

[**0042**] Referring again to **FIG. 1, a** further direct or essentially one step phase-shift reciprocal cancellation embodiment of Applicant's improved apparatus and method for treating monofrequency tinnitus patients will be described. The patient sound-typing is accomplished, as hereinabove described, by adjusting the frequency and amplitude knobs **18-2** and **20-2** of sound generator **16** until the desired match with the patient's tinnitus tone and amplitude are achieved. Then, as in the previously described embodiments disclosed above, the like frequency and amplitude knobs **18** and **20** of sound generator **10** are set to like settings of generator **16** and the phase shift knob **22** of sound generator **10** is adjusted in a direct or essentially one step motion to bring the output wave form of sound generator **10**, which is also applied to oscilloscope **14**, into a phase shift, reciprocal, canceling relationship of 180 degrees relative to the output wave form of sound generator **16** which is also displayed on oscilloscope **14**. As hereinabove described with reference to **FIG. 2**, this phase canceling reciprocal wave form relationship with regard to the respective outputs of sound generators **10** and **16** is depicted as the sum of f_1+f_n which verifies the identical match between the generated treatment tone of sound generator **10** and the patient selected tinnitus tone. As hereinabove explained with relation to the previous described embodiments, the phase shifted output of signal generator **16** is directly applied to the tinnitus patient via headphones **12** preferably for a time period in the order of ten minutes for each patient treatment. In this alternative embodiment, switch **32** remains in the position indicated in **FIG. 1** as the phase shift network is not utilized. However phase shift network **30** and switch **32** may be utilized to