

IPDS 608
9608468-6**Device for generating applause for Karaoke vocals****Prior art:**

The invention relates to a device for generating applause for Karaoke vocals according to the introductory part of claim 1. Within Karaoke the user produces vocals by microphones accompanying a music derived from a recording device or any other source. Said vocals and said music signal are then combined for reproduction via a loudspeaker or for recording. An applause signal derived from a speech synthesizer with pre-recorded applause like clappings, an "encore" etc. may be added when music and vocals from the user are finished. Generally the user has to activate applause feature manually after the end of the reproduction of music and vocals. Existing method is realized with expensive integrated ICs with detector output which is vocal amplitude dependent. Activation of applause, if available, is manual and fixed with existing systems.

Object:

It is an object to facilitate automatic activation of speech synthesizer with pre-recorded applause like clappings, "bravo", "encore" etc. based on simple vocal scoring system.

Summary:

According to the invention scoring means are provided for measuring parameters like loudness, pitch and duration of the vocal from the user and for initiating applause being automatically dependent from the scoring measuring results.

Advantages:

The vocal detector is realized with low costs, transistor detector with variable duty cycle which is proportional to amplitude, pitch and duration of vocal. Automatic applause with variable intensity, length and type according to the vocal score

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at the end of a song can be realized. The new concept is a cost effective realization of new and attractive features for Karaoke application. The invention provides a new feature not yet available on the market which will be popular for Karaoke application.

Embodiments of the invention:

Applause generated may have an intensity, length and type dependent from the measuring results of scoring. The applause preferably is automatically initiated at the end of the song of the user. A music detection circuit may be provided having a threshold and providing an output voltage indicating a music start and a music end, said output voltage being used for initiating applause. Said circuit preferably has a low time constant of about 15 ms for detection of music start and a high time constant of about 5 s for detection of music end. Said music detection circuit may include at its output a darlington circuit to provide rapid transition of output from one state to another. A scoring circuit may be provided having a first input proportional to the magnitude and a second input proportional to the frequency of the vocal signal.

Description of an example of the invention:

In order to make it more comprehensible the invention will now be described in combination with the accompanying drawing. Within the drawing

figure 1 shows a circuit diagram partially in block form and partially in detailed form for a device according to the invention,

figure 2 is a diagram showing the dependence of the on-time from the frequency of the vocal,

figure 3 is a further diagram showing the on-time in dependence from the amplitude of the vocal and

figure 4 is a flow chart showing the operation of a device according to the invention.

In figure 1 two microphones 1, 2 taking up the vocals from the user are connected to a Karaoke processor 3 having its output connected to adding stage 4. A music signal coming from a recorder or any other source is also fed to adding stage 4 and further to input of music detection circuit 5. The output f of said circuit 5 is connected to input of microprocessor 6. Two outputs a, b of Karaoke processor 3 are connected to two inputs of score detector 7 having its output connected to a further input of microprocessor 6. First output c of microprocessor 6 is connected to input of a speech synthesizer 7 and a second output d is connected to an input of Karaoke processor 3. Synthesizer 7 produces applause signal which is fed to a further input of adding stage 4. At output e of adding stage 4 there appears the music signal accompanied by the vocals from processor 3 and after music and vocals are finished applause signal from synthesizer 7.

Music detector 5 is realized by transistors TU 116, TU 117 und TU 118. TU 116 serves to amplify the music audio signal by 6 dB. Output is then rectified by diode DU 001. When DC exceeds the threshold of the darlington comparator configured by transistors TU 117 and TU 118, the output goes low. Said darlington ensures rapid transition from one state to another with small base current. Transition from high to low at output f implies music start and transition from low to high music end. The short constant is small, about 15 ms to enable quick detection of music start but having a long recovery time of about 5 s to prevent false intermittent music trailings.

The score detection circuit configured by transistors TU 108, TU 110 and TU 111 is similar to music detection circuit 5. However, each microprocessor provides two inputs to the detector, with one input proportional to magnitude and the other proportional to frequency.

Figure 2 shows a graph illustrating the on-time, i. e. active low of the detector in dependence from the frequency of the

vocals produced by the user. Said on-time can then be interpreted to be proportional to the score by the software.

Figure 3 shows the on-time in dependence from the amplitude of the vocals represented by voltages V_{in} . The recovery time is shorter, about 200 ms, so that the score detector can respond faster to the change in vocal.

Figure 4 shows a flow chart showing the operation of the device and showing the preliminary auto applause algorithm.

The flow of the algorithm for the auto applause feature is illustrated by the flow chart and is self explanatory, however some of the indicators and memory designations will be briefly described below. The interrupt is riding on existing 1 ms interrupt, the auto applause routine will be processed every 1 s, this is to minimise software loading and overflow of the score counter. This is realized by the first counter A. Music status indicator is active low. The end of song is detected by low to high transition. However, the start of score count can be activated when the music status is active low. This is to facilitate the start of score count at any portion of the song, convenient when tape is fast forward or rewind to the beginnings of the song, instead of start of song.

Music count is to further minimise the likelihood of false trigger by the music status detector due to low music trailings. Score count is incremented each time the score detector is scanned and detected to be at active low. Reward flag is set when score count exceeds a certain threshold. With every increase of score count by 10, reward count will be incremented. This counter can thus be used to prolong the duration of applause or to activate other sections of the speech synthesizer which is "more rewarding".



Claims

1. Device for generating applause for Karaoke vocals produced by a user and added to a music signal for reproduction or recording, **characterized in that** scoring means (7) are provided for measuring parameters like loudness, pitch and duration of the vocal from the user and for initiating applause being automatically dependent from the scoring measuring results.
2. Device according to claim 1, **characterized in that** applause has an intensity, length and type dependent from the measuring results.
3. Device according to claim 1, **characterized in that** applause is automatically initiated at the end of the song of the user.
4. Device according to claim 1, **characterized in that** a music detection circuit (5) is provided having a threshold and providing an output voltage indicating music start and music end said output voltage being used for initiating applause.
5. Device according to claim 4, **characterized in that** said circuit has a low time constant of about 15 ms for detection of music start and a high time constant of about 5 s for detection of music end.
6. Device according to claim 4, **characterized in that** said music detection circuit includes at its output a darlington circuit to provide rapid transition of output from one state to another.
7. Device according to claim 1, **characterized in that** a scoring circuit is provided having a first input proportional to the magnitude and a second input proportional to the frequency of the vocal signal.