

The invention relates to an electro-acoustic device with an arrangement for the reproduction of speech and/or music and with an arrangement for setting the volume of the reproduced signals.

Devices of this type are known for example from E. Zwicker & M. Zollner: "Elektrotechnik" published by Springer, Berlin 1984, page 116. Here public address systems for relatively large areas are described, in the case of which limiters are used for the observance of overloads. For the setting of the coming into effect of the limitation, these limiters comprise a controller with which the maximum volume attainable therewith can be changed. They also comprise the actual volume control means with which the volume can be adjusted by the user up until the limiter comes into effect.

The document DE-A-37 22 752 has disclosed a device for the setting, storage and call-up of setting variables in electro-acoustic devices which utilises a microprocessor for the actuation of these functions.

The devices which have been referred to in the introduction and which serve to reproduce acoustic signals often have such large dimensions that in the event of maloperation they can either destroy the electro-acoustic transducers or, due to too high a playback level, can exert a disturbing effect on the environment or can even detrimentally affect the health of human beings.

Therefore the object of the invention is to provide an electro-acoustic device which avoids such situations. This object is fulfilled by the measure described in Claim 1. Claim 2 describes an advantageous embodiment of the invention.

It is known to carry out a digital setting for example of the volume, where the analogue setting takes place via corresponding digital-analogue converters. The invention provides that a memory is provided in which it is possible to store a value corresponding to a desired reproduction level which cannot be exceeded by the user of the device as a result of its setting. This maximum value can be individually preset and can be adapted to the prevailing external circumstances in that either the connected electro-acoustic transducers or physiological stresses are taken into consideration. An ⁽¹⁾overshooting of this maximum value is facilitated by means of a special key provided for this purpose.

The invention is particularly suitable for microprocessor-controlled devices as it incurs no additional costs since it can be incorporated into the software of the device.

In the following the invention will be described in the form of an exemplary embodiment with reference to the drawing.

In the drawing:

Fig. 1 shows a plan of a program running in the device and Fig. 2 shows a block circuit diagram in explanation of the mode of operation.

Fig. 1 illustrates the flow plan of a program in accordance with which the electro-acoustic device operates and which is executed by a microprocessor.

In the event of the adjustment of the volume by a pulse generator, the volume is changed incrementally. In the case of an incremental increase in this volume it is constantly checked whether the instantaneously set value is greater than or equal to a previously stored limit value. Only when the limit value is reached is a further increase in volume prevented and despite the actuation of the control means the

attained volume is maintained. In an additional scan process it is further decided whether the limit value can be overshoot or not. If "yes", the increase in volume takes place despite the fact that the limit value has been reached. For example, it could be the case that one may in fact wish to exceed the stored value. However, this is possible only by effecting this increase by the actuation of a special key. Thus for example it can be obtained that unauthorised individuals, such as children, can change the volume only up to the set limit value, but that an adult, having actuated a key known only to himself, can effect a further adjustment of the volume.

In Figure 2 the processes described above are explained in the example of a block circuit diagram.

It will firstly be assumed that the set volume is at the minimum. As a result of the actuation of an incremental generator INC in the form of a knob, pulses I are emitted which are analysed in an encoder ENC in that the encoder emits the pulses and at the same time via a line U/D (UP/DOWN) causes a binary counter COUNT to count upwards or downwards. The pulses I are fed via an AND gate G1 and an OR gate G2 to the counting input of the counter COUNT. The AND gate G1 is initially enabled by the H-level from the gate G3. On the attainment of a specified volume, i.e. on the attainment of a count of the counter corresponding to the desired limit value, this count can be stored in a memory MEM by the actuation of a key T1. The value emitted by the counter is fed via a bus line B to a digital-analogue converter D/A, the analogue output voltage of which serves as control voltage for an amplifier AMP to which a loudspeaker LSP is connected.

In the event of a later adjustment of the volume, the digital value generated by the counter is continuously

compared with the stored value in a comparator CMP. In the event of identity, a H-level is emitted which is negated by the gate G3 with the result that the AND gate G1 is disabled so that no further pulses I are allowed through from the encoder, i.e. also that the count is maintained and cannot be further increased even if the incremental generator is actuated.

If, nevertheless, this value is to be able to be overshoot at some point, which is to be possible only on the part of an authorised person, then as a result of the actuation of a special, not readily accessible code key T2 a gate G4 can be opened which switches through pulses I to the counting input of the counter.

Claims

1. An electro-acoustic device with an arrangement (AMP, LSP) for the reproduction of speech and/or music and with an arrangement for setting the volume of the reproduced signals, characterised in that the setting takes place via a microprocessor in such manner that the maximum value of the adjustable volume can be changed and stored (T1), and that overshooting of the maximum value is facilitated by a special key (T2) provided for this purpose.
2. A device as claimed in Claim 1, characterised in that the maximum value is adjusted taking into consideration the connected electro-acoustic transducers (LSP) or physiological stresses caused by sound intensity.