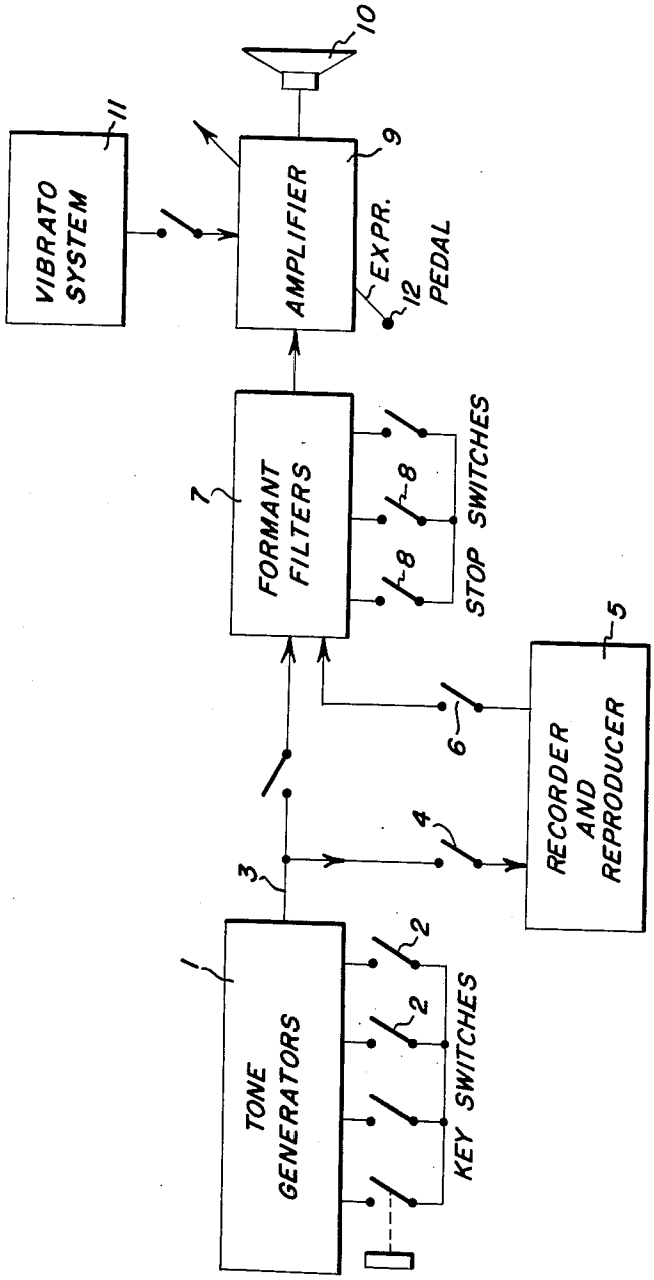
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AUTOMATIC ELECTRONIC ORGAN

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AUTOMATIC ELECTRONIC ORGAN

Hyman Hurvitz, 822 Warner Bldg., Washington 4, D.C.

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The present invention relates generally to electrical musical instruments of the automatic player type, and more particularly to systems for automatically playing musical selections by means of electronic organs of the type employing key-controlled tone generators for generating harmonic-rich tones and formant filters for translating the harmonic-rich tones to tones simulating conventional musical tones.

Many conventional and commercial electronic organs comprise a plurality of tone generators which are energized selectively by manually actuatable keys and in consequence provide a series of tonal combinations in the form of electrical signals, each consisting of a harmonic-rich ensemble of frequencies. As generated, the harmonics for each tone are of predetermined amplitudes. By suitable manipulation of the keys musical compositions may be played, and these may be acoustically translated by conventional devices. The tones as generated by the tone generators do not simulate true pipe organ tones, nor the tones of other conventional musical instruments, in their harmonic content. To attain the latter result the tones are passed through selected formant filters, which change the harmonic content of the tones generated by the generators in such fashion as to cause the tones delivered by the formant filters to simulate the frequency content of conventional instruments or of pipe organ tones. The tonal output of the formant filters is amplified at will, subjected to vibrato tones, and electro-acoustically transduced.

According to the present invention the raw tones provided by the tone generators are recorded, magnetically or on discs, or in any other conventional fashion, while a musical selection is being played on the organ. The recording then lacks the tone modifying effect of the formant filters, and of gain control in the amplifier, i.e., is composed of uniform amplitude tone signals of maximum harmonic content for the tone generators involved, regardless of the expression or stops which the musician may be employing as he plays the composition.

The recorded signals are then reproduced at some time following the original recording of the musical composition, and the reproduced tones inserted at the input of the formant filters. A player may then select his own stops and expression, at will, whereby he may re-render the originally recorded composition quite distinguishably from its form as originally rendered, and the variation may be modified further on each successive reproduced rendition, to suit the taste of the player, or to suit the occasion. It will be clear that the player who is rendering a reproduced rendition need not be an organist, but may be musically unskilled.

It is, accordingly, a broad object of the present invention to provide a system of automatic rendition of organ music by an unskilled person, the notes being previously recorded without stop selection or expression by a skilled musician, and the unskilled person contributing expression and stop selection to the rendition.

It is a further object of the invention to provide a simple, inexpensive automatic player system for electronic organs, applicable to conventional organs with virtually no reorganization thereof, and in which tonal character and expression of automatically reproduced music may be controlled by the stops and expression pedal of the organ.

The above and still further objects, features and advantages of the present invention will become apparent upon consideration of the following detailed description of one specific embodiment thereof, especially when taken in conjunction with the accompanying drawings, wherein:

The single figure is a functional block diagram of a system according to the invention.

Referring now to the drawings, the reference numeral 1 denotes the tone generators of an electronic organ. These may be selectively energized or connected in circuit by means of key-controlled switches 2. The tonal output of the generators 1 may be collected by a collector or bus 3 and applied via a switch 4 to the recorder of a magnetic tape recorder and reproducer 5.

The reproducer may then apply the recorded tones at any time following recording, via a switch 6, to the input of formant filters 7. The latter may be selected by stop switches 8. The output of the formant filters is applied to an audio amplifier 9, in cascade with which is a loudspeaker or other acoustic radiator 10. The amplifier 9 may have an associated vibrato circuit 11 and an expression pedal 12, which controls the gain of the amplifier.

Clearly, instead of a magnetic tape recorder, the raw tones of a musical composition may be recorded on discs, and these sold to the public for future reproduction.

In addition, the organ may be played in response to manipulation of the keys while reproduction is occurring, whereby ready comparison between performances of an experienced organist and of a student may be accomplished, and a device provided for teaching the student organ playing techniques.

While I have described and illustrated one specific embodiment of my invention, it will be clear that variations of the details of construction which are specifically illustrated and described may be resorted to without departing from the true spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. The method of producing a complex musical selection consisting of organ or the like tones comprising producing sawtooth type current oscillations representing the notes constituting the gamut of the scale of an organ, recording selected ones of said current oscillations, the selection being according to said musical selection in tempo and arrangement, reproducing said recorded current oscillations, formant filtering said reproduced oscillations and translating said filtered oscillations into sound.

2. The method according to claim 1, wherein said current oscillations as recorded are all of substantially the same amplitudes.

3. The method according to claim 1 wherein is provided the further step of controlling the amplitudes of the reproduced current oscillations at will, and imparting vibrato to the reproduced current oscillations at will.

4. The method of reproducing organ music representative of a complex musical selection comprising producing constant amplitude sawtooth current oscillations representing the notes of said musical selection, recording selected ones of said sawtooth current oscillations, selection being in tempo and content representative of said musical selection, at will reproducing said recorded sawtooth current oscillations, at will selectively filtering said reproduced oscillations to provide selectively formed tones from said reproduced current oscillations, and translating said filtered oscillations into sound.

5. The method according to claim 4 wherein are provided the further steps of at will varying the amplitudes and modulating the pitches of said reproduced oscillations.

6. The method of producing organ tones representative of a musical selection from pre-recorded sawtooth type current oscillations consisting of an arrangement of notes

constituting the gamut of the scale of an organ representing said musical selection, said notes being selected and having a tempo corresponding with said musical selection, comprising reproducing said pre-recorded sawtooth type current oscillations, formant filtering said reproduced oscillations selectively to provide formed oscillations representative of selected musically pleasing tones, and translating said filtered oscillations into sound.

7. The method of producing organ or the like tones from pre-recorded sawtooth type current oscillations representing the notes constituting the gamut of the scale of an organ, and arranged according to a musical selection in content and tempo, comprising reproducing said recorded current oscillations at will, formant filtering said reproduced oscillations, and translating said filtered oscillations into sound.

8. The method according to claim 7 wherein said pre-recorded sawtooth type current oscillations are selected to represent, in terms of their arrangement and tempo, a musical selection.

9. The method according to claim 8, wherein are provided the further steps of at will controlling the amplitude and modulating the pitch of said reproduced current oscillations.

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