Automatic identification of sound features

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V. THESIS PROJECTS COMPLETED DURING THE PERIOD

A. AUTOMATIC IDENTIFICATION OF SOUND FEATURES

A thesis work with this title has been completed by J. Liljencrantz as a part of a continuing project. A brief summary of results is included in section I D. Further details will be given in coming progress reports.

J. Liljencrantz

B. RECORDING OF TIME-VARIABLE IMPEDANCES WITH THE AID OF A BRIDGE-STABILIZED LRC-Oscillator

The present design was intended for measurement of the fluctuating resistance values within a heart beat cycle of the complex electrical impedance between two electrodes placed so as to direct an AC-current through parts of the body where the wave shape of blood pulsations is to be studied (reography). The conventional reograph instrumentations employ an RC-bridge and an oscillator. One difficulty here is the maintenance of bridge balance during variations of the series capacitance of the electrode-body connections.

In order to overcome these difficulties and make possible measurements within an extended frequency range it was considered of interest to investigate the possibilities of a self-adjusting RLC-oscillator (see Fig. V-1).

The unknown impedance is inserted in an RLC-branch and the conditions of oscillations are such that a shift in the capacitance alone causes a shift merely in the oscillator frequency at constant amplitude whereas a variation of the resistance causes a change in the output amplitude of the oscillator. This is accomplished with an AVC-circuit that changes the gain A of the amplifier as a function of the output voltage \( V_u \). The differential change in A with respect to a small change in \( V_u \) is labeled k.

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A = A_0 - kV_{ut}
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