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THE TERMINOLOGY OF ELECTRONIC MUSIC

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THE TERMINOLOGY OF ELECTRONIC MUSIC

Summary

In order to avoid possible confusion through the use of imprecise expressions in the field of electronic music, an attempt is made to define the meanings of certain terms already in use. A clear distinction is made between the instruments themselves and their mode of application.

With the increasing number of publications on the problems of electronic music there is a danger that a growing terminological confusion will add to the difficulty of understanding the subject matter. Misunderstandings frequently arise because of failure to distinguish between the instruments as such and their applications. We shall therefore attempt to give precise, clear names to the classes of instruments which have thus far become known and also to classify them according to their respective applications.

I. Nomenclature of Musical and Noise Instruments

A. Acoustic Instruments

Acoustic instruments produce sounds directly without any preliminary electric oscillation stage. Electrical transmission means (e.g. electric actions) in no way alter the acoustic character of the instruments. Class IA therefore includes all traditional musical instruments as well as out-of-the-ordinary music and noise-producing apparatus such as wind machines and steam organs. Human and animal voices also come under this classification.

B. Electric Instruments*

Electric instruments produce sound indirectly with the aid of an electro-acoustical converter (preferably a loud-speaker) as a sound-producing device**. The oscillation which is to be converted into sound is always present in electrical form. This is provided by an electric oscillator, which, depending on the number of electric components employed, will be classified as electro-acoustic, electronic-mechanical, or purely electronic.

1. Electro-acoustic instruments

Electro-acoustic instruments are constructed like traditional musical instruments but possess in addition microphones which pick up the sound after transmission through the air or a solid and pass it on to amplifiers and loud speakers. By this means either an inadequate volume may be amplified, or the tone may be enriched (e.g. Abbé Pujet's radio organ). This class also includes the conversion of the human voice picked up by an ordinary or a throat microphone, with the aid of a "Vocoder" or by means of electrically synchronized oscillators***.

2. Electronic-mechanical instruments

In these instruments the motion of mechanically oscillating systems (strings, reeds, diaphragms) or rotating parts (profiled discs, cogwheels) is converted by means of

*H.H. Draeger⁽¹⁾ suggests the use of the scientific term "electrophone" following the nomenclature of Hornbostel and Sachs.

**Thus electrically driven acoustic instruments cannot be considered electric instruments.

***H.V. Modak⁽²⁾ uses this principle for monophonic accompaniment of a singing voice on a stringed instrument provided with magnetic coils.

electrostatic, electromagnetic or photoelectric sound pickup devices into electrical oscillations. A large number of known electrical instruments belong in this class, e.g. the Wurlitzer and Hammond organs, but not record players and magnetic recorders, which must be included among the electrical "storage" devices.

3. Purely electronic instruments

In contrast to the previous two cases the purely electronic instruments do not possess any essential mechanical parts for producing the electrical oscillations. Rather, the oscillations are produced wholly by means of electronic components (vacuum tubes, ionic tubes, transistors, etc.).

C. Compound Instruments

Compound instruments combine acoustic and electric instruments in a single housing, or at least sufficiently close together in space so that they can be described as single instruments. An example is the Mannborg Organ (Siegfried Mager), the acoustic part of which comprises an ordinary harmonium while an electronic 16' pedal bass and a monophonic electronic melody instrument are combined in the electrical part.

II. Classification of Electrical Instruments

According to Application

A. Electrical Imitators

Electrical imitators are intended to "replace" conventional musical instruments. The following arguments are advanced in their favour: a lower cost, smaller size, easier playing, greater acoustic output, the combination of several instruments in one and resistance to tropical climatic conditions. In outward form they are frequently made to

resemble the instruments they imitate (the organ manual, the accordion) although there is no inherent necessity for them to do so. Most commercially produced electric musical instruments are applied in this manner.

B. Electric Musical Instruments

The purpose of electric musical instruments is not to imitate conventional instruments but rather to provide musical sounds of a distinctive kind. Included here is the use of such instruments for sound effects which cannot be attained by present-day orchestral instruments (Bach's soprano trumpets). Depending on the design of the electric oscillation generator the following sub-classifications may be distinguished:

1. Electro-acoustic musical instruments

These include the radio organ of Abbé Pujet already mentioned, a pipe organ which produces additional sound combinations with the aid of a microphone, filters and loud-speakers.

2. Electronic-mechanical musical instruments

The best known instrument of this class is the Hammond Organ*. For producing oscillations this instrument has rotating cogwheels with electromagnetic sound pickup.

3. Purely electronic musical instruments

In this class we may mention especially the Trautonium, the Mixtur-Trautonium, the Melochord and the Ondes Martenot.

*Strictly speaking this should not be called an "organ". It incorrectly suggests a mere imitator and does not do justice to many applications of this unique and original instrument.

C. Electric Composing Means

This classification includes all instruments, apparatuses and processes which are not used for concert or solo performance but for the production of a composition with the aid of a sound storage device (needle, photoelectric or magnetic recording apparatus, perforated bands, etc.)*. This application, of course, does not rule out the possibility of using such instruments in an orchestra when furnished with suitable playing mechanisms (manual, peddle, etc.). Basically, however, any electric oscillator can be used as a composing means regardless of whether it is easy or difficult to operate. By using a sound-storage device there is no necessity of getting through a given program of work within a prescribed period of time. A heterodyne oscillator can be used as an electrical composing means just as well as a noise generator or impulsing device. The purpose of these instruments is to permit composers and their assistants to make direct records of their composition on tape, film or the like. The reproduction is then made by means of a record-playing apparatus instead of a concert-rendering.

The distortion devices which are connected between the electrical instrument and the storage device (linear and non-linear distorters, sound converters, modulators, synchronizers, phase-delay means, faders, etc.) form parts of the

*The acoustic precursors of electric composing means were the "machinamenta" (musical clocks, music boxes, glockenspiels, etc.), which, judged by the technique of their day, had been brought to a high degree of perfection^(3,4). Related to these are mechanisms which use more modern storage methods (paper music rolls and perforated discs) but employ a conventional musical instrument (piano) or group of instruments as the sound producer. The signals from the storage device bear no direct relationship to the resulting sound process. Rather they serve to initiate the sound process according to some arbitrary code.

electric composing apparatus just as much as the storage device itself in its many forms (tape loops, multiple storers, time or frequency compressors, electronic converters, etc.).

III. The Consequences of Employing Electrical Instruments

As long as electrical instruments are used no differently from the traditional ones there is clearly no need to coin a new name for the resulting music. Even an "electrical orchestra"⁽⁵⁾ using nothing but electrical instruments will not necessarily produce music outside the scope of traditional sound patterns. Nevertheless, it is altogether possible to advance into new tonal fields with an electrical orchestra. We shall call the resulting music "electrogenic"⁽⁶⁾.

If storage devices are added to the electrical instruments conditions become more complex. Even the recording of a symphony concert on a magnetic tape represents a "processing of sound", if not an adulteration of the original composition. However, if this sound processing is carried out with the knowledge and consent of the composer we then have something akin to electrically arranged music. Most recordings of dance music (e.g. use of several microphones, violins placed singly throughout the recording hall) and also the multiplex recordings ("multiple recording"), where the same performer or singer is recorded several times in succession on the same sound tape so that a harmonizing effect is simulated which did not actually exist at the time of the recording, fall within this category.

The logical development of this electric sound shaping procedure leads to "musique concrète", whose manifold expressive possibilities have been discussed by Pierre Schaeffer and his associates⁽⁷⁾. Musique concrète uses microphonic records of actual ("concrete") sound events (instrumental sounds, noises, voices, etc.). The American group represented by John Cage,

Vladimir Ussachevsky and Louis and Bebe Barron also uses "concrete" objects but at the same time admits electric musical instruments. The compositions of this group are called "music for tape". It is also possible to interweave the shaping means described here with additional musical performances. Examples are the "Musica su due dimensioni" for flute, percussion instruments and electronic composing devices by Bruno Maderna⁽⁶⁾, Pierre Schaeffer's opera ballet concret, "Orphée"⁽⁷⁾ and H.W. Henze's "radiophonic" musical play, "The End of the World"⁽⁸⁾.

Dispensing with all purely acoustical intermediate stages by exclusive use of electronic sound-producing means leads to a third category whose musical life begins only at the moment of reproduction. The term electric music has been chosen for this⁽⁹⁾. If no confusion is to be feared, we might use the term "authentic" music (i.e., put down by the composer in final form ready for reproduction). If only electronic-mechanical or purely electronic sound-producing means are involved, then electronic music is produced. Another special case of electric music is "hand drawn" music. In this case the composer uses no instrument for the production of oscillations. From the entire composition inventory he retains only the sound-storage device on whose carrier material (film, magnetic tape, paper band) he records his composition directly⁽⁸⁾ or fixes it in some other way (e.g. by imprinting⁽⁹⁾).

Mechanized constructive music arises out of a composition process in which not only the individual elements of the composition are realized by electric means but also the formal structures underlying the composition. This means that an electric calculating or combining apparatus is added to the electrical recording means. The inventor of this kind of music is Joseph Schillinger⁽¹⁰⁾. L. Theremin has dealt with the special problem of the automatic formation of rhythmic structures.

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