From Timbre Modulation Method to Research the Relation Between
Electronic Music and Chinese Musical tradition

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Abstract

The purpose of the treatise is to take the timbre of the electronic music as a research object, from the timbre-modulation point of view, through its subsistent way to observe the some connection between electronic music and orient culture, particularly the Chinese music tradition. Also to probe into the source of its characteristic and its representation form is my research object.

Introduction

With a particular sounding media and a special way of the sound synthesize, the electronic music has been determined on the beginning that it will progress in a quite different way from the traditional 'Acoustics Music'. (It mainly played by the instruments and by the object vibration, the sound wave synthesis accomplished in the air). Compare to the traditional 'acoustics music' that emphasizes on the pitch-relation, the electronic music that take the sounds synthesized as its vitality has to choose tone color relation as the main way of music expression. It just shows the conception of oriental music that emphasis is placed on the tone color.

I. The Characteristic of the Timbre

As we known, all kinds of the Chinese traditional musical instruments have their own individual vivid timbre features. For showing its feature, most of them are suitable for solo or ensemble playing. Pipa, for example, its sounding is quick and short, the head of sound is sharp. This kind of timbre feature is unsuitable to make up of the harmony with either same kind of instrument or the unlike one. Only for solo, all of Pipa’s charming are able to come out. The Erhu, for example, since without the limited of fingerplate, the degrees of changing its pitch is according to the finger’s pressure, and this is quite different from the other string instruments like violin. So that it is disadvantageous to composing the exact and euphonious harmony. That the Chinese traditional aesthetic taste is help to fully developing the folk instrument’s solo ability, but relatively weakening its ensemble capability. This is the natural selection by the Chinese traditional music history.

For electronic music, its own developing process is a procedure in looking for a new timbre. The vitality of the electronic music is first of all from its vivid timbre characteristic, even some one call it as "the sound from the heaven". To discuss its timbre feature, firstly, it should review the timbre bank of the electronic instrument, the sounding media of the electronic music. Though the timbre of electronic instruments various, but it may be divided into two main kinds: the emulation and the creation. The former one is to simulate the existent instrument,
to pursue the character with the commonness of the other acoustics musical instruments such as the brass, string and etc. With the particular unequivocal feature, the latter one intends to show its own individual character, like SE (Synthesize Effect), ME (Multi-Effect). Only this kind of one shows actually the electronic music own characteristic. In electronic instrument, the particular timbre feature is originally from the basic waveform, which build up the timbre. There are two sources of the waveforms: first one is to sample directly the sounding by acoustic musical instruments as the waveform. It is to simulate the real musical instrument while using the original waveform, or to create the new timbre by transmutation usage. The second one is from the waveform that synthesized by FM method. This kind of waveform sound contains a quite complicated harmonic series structure. Because of its particular method of making waveform, the timbre based on the modulation of the waveform has a special style that completed different from the sound we familiar with the timbre. It is propitious to obtain the timbre of the original creation.

From discussion above, we might have the clues that the relationship between the electronic music and the Chinese musical tradition embody above all in seeking the individual feature of the timbre. To get a basic waveform with the individual feature is the foundation of forming the timbre individuality in the timbre synthesis of the electronic music.

II. Modify During the Sounding Process

To decorate and ornament the individual tone is very important way while playing the Chinese traditional music. With various playing techniques to obtain the colorful sound changing during the sounding process is one of the main artistic expression methods. Some scholar called this decoration during the sounding process as “Tone-Expression”. The “Tone-Expression” is fully represented in performing the Chinese traditional instrument, singing the folk song and the local opera. In a sense, the charming of Chinese traditional music is its unique timbre individuality with various decorations in sounding process, rather than its beautiful melody.

The modifying of the sounding process is also playing an important role in the electronic music. It relates closely to the individuality of the timbre, and can fully exhibit the distinguishing feature of some timbre. Of course, it can help some timbre with weak individuality to getting some feature by modifying the sounding process. For Chinese traditional musical instrument it is by the performance way to get the “Tone-Expression”, while the electronic musical instrument to attain it by performance controlling and the parameter setting of the timbre modulation. Its range is wider, because it can make the transformation of the space sense besides modifying the pitch, dynamic and timbre like the general acoustic musical instruments.

1. Performance controlling: Performance controlling of the electronic musical instruments is fulfilled by various kinds of the Real Time Performance Controller. It includes the pitch band, modulation, breath control and etc. The pitch band mainly uses to modify the pitch element of the “Tone-Expression”, and it can lively imitate the traditional musical instrument’s various transformation of the pitch “Tone-Expression”. The modulation can control the periodical transformation of the pitch, timbre, volume and the space sense.

2. Pre-set Modulation Parameter: It includes low frequency oscillator, envelope generator and etc. EG is one of them that setting the non-periodicity diversification to the sounding process, and it has unlimited abilities to sculpting the timbre feature, to pursue the sound’s fine transformation. It probably is the most effective

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*Tone-Expression: A Chinese music term. It refers to the special mode of sounding processing that include the diversification component of the certain pitch, dynamic and timbre.
means to modify the sounds in the electronic musical instrument, and it can make the "Tone-Expression" process either the same with or complete different from what made by the common acoustic musical instrument. (playing)

Anyway, with the multi capabilities to modify the sounding process, the electronic musical instrument is capable to perfect the artistic expression of the single tone. So, to embody the style of the electronic music, the changeful single tone is usually more representatives than the small phrase of a few different tones.

III. Perfection Quality of the Acoustic Feature.

The more a single tone has an artistic expressive power on electronic musical instrument, the more it has a distinctive individuality. It helps the acoustic feature of the single timbre getting perfection, in the meanwhile, making the single timbre with a certain expressive sense. It represents in the four aspects:

1. **Timbre with the Particular Music Ambience.** This kind of timbre mainly plays up a certain musical ambience. It has a degree "theme taste" if they are just suitable to the demand for some special mood. For a timbre to achieve this goal, it usually requires to deal globally with the selection of the basic waveform, the synthesis method of the waveform, the modifying of the sounding process, therefore to make it take on the ability of applying colors to a special ambience alone. *The Lost My May*, for example, is this kind of electronic timbre to build up a certain music mood such as the loneliness or maze.

2. **Timbre with the Special Sounding Environment.** For common acoustic musical instruments, even the performance environment affects the instrument timbre more or less, but it cannot be one of certain factors of the instrument’s timbre character. For electronic musical instrument, the sense of the environment has been one of certain elements existed in timbre, and an inseparability part of it. It is fulfilled by setting parameter to the effect unit of the electronic musical instrument. The difference of the timbres nor is only the difference of the basic waveform, but also include the different space sense. *Aurora*, for instance, belongs to the acoustics timbre, and the effect playing an important even the definitive action in it. It would come into being another totally different acoustic effect if changed some setting parameter of the effect. The timbre might turn to the other one of "the setting sun" or "moonbeam" or anything else.

3. **Timbre with the Particular Music Style.** In timbre modulation, the timbre will be related closely to a certain national musical style if adding some performance feature with the national color, such as the strong breath of Japanese Shakuhachi, the glissandi tone-head of India Sitar. Here it means of adding what into a timbre that a characteristic performance feature as one of the timbre waveform factors, and let it accompany steady with each sounding of the timbre, so that, the timbre will be related to some special music style. The timbre ‘*Ethno Pipes*’ belongs to this sort.

4. **Timbre with the Certain Figure.** In timbre synthesize, the timbre will produce a periodical changes in multi-levels to the pitch, the degree of light and shade, the sense of the space through using EG, low frequency oscillator and some special techniques. Then, this timbre will take on the significance of the ostinato. With this kind of timbre, the composer can build up abundant music textures by a quite simple way. The timbre like *Flying Waltz, Raggitronic*, which possess some national feature, are this kind of sort.

Those four aspects related to the perfection quality of the acoustic feature in electronic music, in fact, are the comprehensive embodiment on the representation of the timbre character, the modifying of sounding process, and
others individuality factors in timbre synthesis. In a short, all of these are to emphases an issue of the timbre concept.

Through the discussing of these three topics above, it may be seen that with its own method of the timbre synthesize and the performance controlling, the electronic music that born on in the West happen to have the same view with some Chinese traditional musical idea. The common points mainly are:

1. Both pay attention on the Timbre character.

2. Both pay attention on the sounding process.

3. Both put the timbre character at least as the same important position as the other musical factors during the music developing processing.

Along with the artistic expression of the electronic musical instrument stronger continuously, and the technique of the music produce continuously colorful, the types of the electronic music shall represent even more various the individualities of the musical ideas, and make a widely fusion of the nationalities and worldwide.

English translated by Meng Qiu