

SHAO Qing

**A Primary Research to Sound Organization and Structure of Dialog/ No
Dialog by Pierre Jodlowski**

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Abstract

This thesis analyzes Dialog/No Dialog with a view of sound organization and structure and explores the compositional techniques and structures of electronic music and the works combining electronic elements and traditional instruments.

Introduction

Music is a part of sentiments and expressions about the World by humankind. In certain sense, the history of music could be regard as an uninterrupted exploration to the art of sound in which, a rapid development platform has been established in the area of electronic music with the progress of science and techniques.

Electronic music represents the new conception about sound of humankind and has produced a series of new forms of sound materiel, organizations and structures. These procedures which have been created for realize the electronic conceptions are not only very useful to electronic music itself, but also significant to non-electronic music. We can find this grand influence in the masterpieces of many great composers of 20th century such as György Ligeti and Hans Lachmann.

Therefore, with analyzing the composing techniques and structural form of a work which combines the electronic music and traditional instrument, we can comprehend the special sound conception and structure of electronic music and also can provide references in many aspects for composers' practice.

Pierre Jodlowski¹ was born in 1971 in Toulouse and is a vivant contemporary French composer. He had studied music since the childhood in his native land and was elected by jury of IRCAM in 1997, and then he began a special research of "new techniques in music" at IRCAM center in Paris. By then he focused in the combination of instruments and electronic media, at the same time he concerns also the problem of new performance ways for the live playing combing with other arts' media.

¹ See for instanse <http://brahms.ircam.fr/composers/composer/1762/>
<http://www.integralive.org/composition/?id=216>
http://www.smcq.qc.ca/smcq/en/artistes/j/jodlowski_pi/
http://inoui.ircam.fr/resumes_n2.html?bio=31&L=1

As an outstanding composer, Pierre Jodlowski has always pursued a music practice of activity and live performance: he believes this performance have both physical elements (such as physical behavior, energy, space etc) and mental elements (image, memory, movie etc).

Dialog/No Dialog was composed in 1997 for solo flute and pre-electronic media. The duration of composition is 14'41". The work was created when he studied the course of "new techniques in music" at IRCAM center.

The focus of the work is the relations between solo instrument and electronic media, including: the mixing of solo flute, electronic sound and human voice which is the main material of original sample, and also the fusion and exchange of non-traditional sound of traditional instrument and electronic sound and their narrating ways. Meanwhile, the solo part still develops its structure being based on special harmonic progress designed by the composer¹.

There is no intuitive and precise documentary material for analyzing of the electronic media part, the notations of elements such as rhythm, timber, density and dynamics are just some simplified signs which aim to provide an easy and precise relationship of electronic media and instrument in performance. Since the composer applies a special notation system which combines the precise time point notation and vague music text notation, it is too difficult to analyze the form of electronic sound concretely and correctly just by auditory sense, therefore, the author of this thesis would to analyze the part of electronic media according to the score notations and seek its mutual relationship with flute by combing with the auditory experience, then, reflect and look for the material "lacked" in the score of electronic part after the sound, and interpret it with words. In analyzing the structure, the author replaces the measure numbers by Patch number in the score.

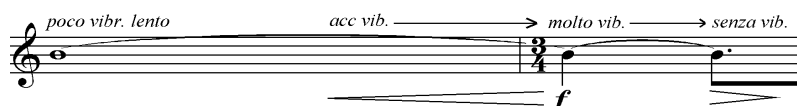
I will discuss the composition from five aspects: sound organization of flute part, sound organization of electronic part, combination of electronic media and flute, macro and micro forms of structure and conclusion.

1. Sound Organization of Solo Flute Part

I. Materials of Sound

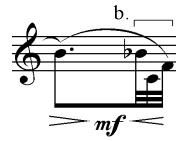
From the precise notation of flute part, I begin observing the forms of sound of the work and I find that there are several central materials of sound just as motives. In the process of structure of music, these sound materials and their transformations successfully and independently collage and promote the development of music, instead of traditional long and large linear development which depends on the materials themselves. These materials are below:

i. Element a: long tone (with subtle changes of long tone: slight trill-quickly trill-no trill) :



¹ See for instance the letters between author and composer

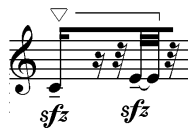
ii. Element b: short disjunct pattern :



iii. Element c: staccato solo tone :



iv. Element d: short continuous tone with rests :



These four independent sound materials above derive several variants in following music process, one of which is augmentation and redaction of quantity (as element b), others are timber's change because of different playing ways (as element a and c), and there are also the combinations of two or more elements (See below).

i. Element a, variants of long tone

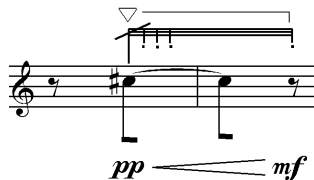
1) Trill (m. 13) :



2) Tongue (m.37) :



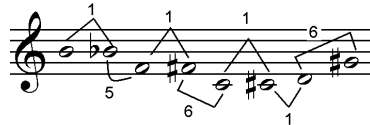
3) Fast free single tongue :



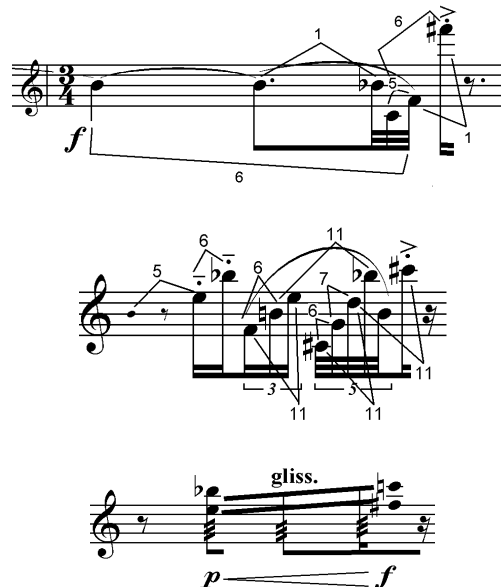
development of music like scattered mosaic with a form of single cell-like morphology, than became a part of existing subject as in traditional works. In certain sense, these sound elements themselves are subjects and very concise aphoristic ideas.

II. Pitch organization

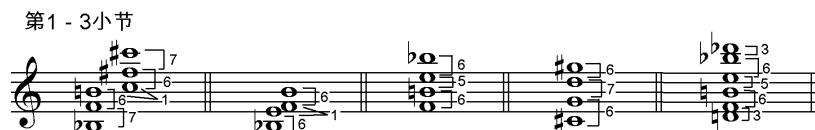
With a further observation of the independent sound materials from the view of pitch organization, I find that it exist a relationship similar to central interval and symmetrical chord. The central intervals everywhere in all the sound materials are minor second and pure (sharp) fourth.

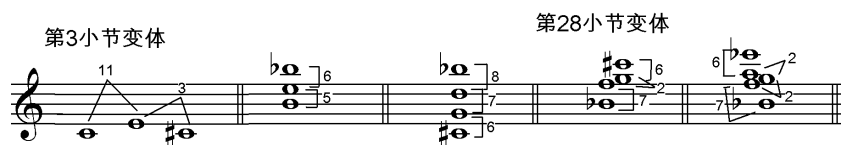


The sound of minor second (and its variants such as major seventh, minor ninth etc.) suggests sometimes a high degree of dissonance and the sharp fourth ensures the atonal style of the work. The examples below are their applications in the work:



The central intervals above have also a symmetrical character in different organizations and therefore form symmetrical chords which not only have a natural beauty of series and a logical structural force, but also drawn a line with the structures and forms of traditional chords. The examples below are their applications:





III. Timber design

The unconventional sound design and application of traditional instruments have a very important function in mixing electronic media music. In one side, the unconventional sound will make a timber comparison with conventional one; and the other side, it will fuse the electronic sound perfectly and constitute a non-tone system of sound together with electronic media.

In this work, the unconventional playing ways of flute which have been designed by the composer include coloratura tongue, breath sound and special fingerings that produce slight fast changes of melody etc. These quasi-noise sounds produced by the special playing ways enrich the content of music voice, and also play an important role of structural force. To this issue, I will discuss later.

IV. Rhythm organization

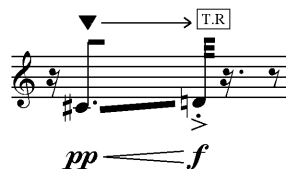
Rhythm is a characterization of meter and tempo of music breath, and further bears the spirit and character of music. The conceptions (uncertainty and variety of elements) and composing features of electronic music make rhythm more vivand and prominent in the works combing electronic media and instruments, and the place of rhythm in electronic music is undoubtedly more important.

The main feature of rhythm in this work is throughout long-short alternating who has two central rhythmic elements: Long tone (a) and group with successive short tones and a staccato (b).

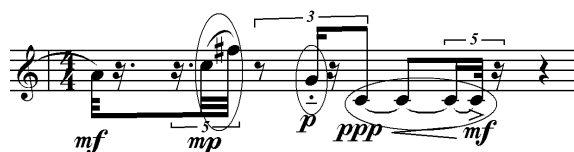


i. Reduction (reduce element of a and omit successive short tone in element of b).

M.93:



M.31, successive reductions with rests:



ii. Expansion

1). Successively expand by short tones of central rhythm elements

M.29:



M.3:



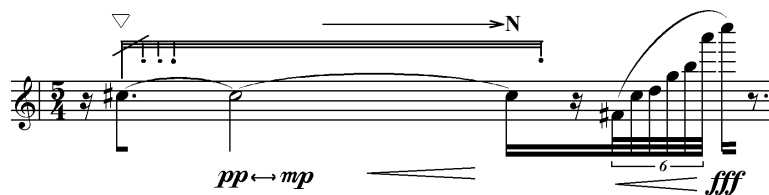
2). Insert rests into the basic forms of central rhythm elements

M.89, Expand by rests inserted in central rhythm elements :



It should be noted that a variant of basic form of central rhythm elements appears in m.159 (the end of recapitulation) and it recalls the first appearance of central rhythm elements in the beginning of music.

M.159:



With an analysis in details of the work, we can conclude that there is a very logical and overall rhythm design under the nimble surface of improvising. The clever and perfect combination of reason and sensibility could strengthen the idea of composer and produce a sense of unity by ears.

2. Sound organization of electronic part

I. Sound forms

In short, the work has an unite central design of sound material, but whose surface manifestations respectively in electronic part and flute part are different. Corresponding to the four basic sound elements of flute, the electronic media part has own forms and their variants.

II. Sound materials

The electronic media part of the work uses multiple pre-sound materials which could basically be classified in several kinds: human voice, flute sound, wind and metal percussion sound and others pre-recorded sounds. The most distinctive and prominent sound material in electronic media part is pre-recorded human voice with fixed pitch which becomes confluent element connecting the flute part.

III. Sounds Distribution

From the hearing of author, the original sounds pre-recorded for electronic media are human voice (woman), sounds of flute and percussion, in which, the percussion sound includes wind percussion (just as Bongo and other drums) and medal percussion (as cymbal etc.), whose individual relations of time don't be repeated here.

IV. Rhythm distribution

The variants and applications of central rhythmic elements in electronic media part are same as in flute part.

3. Combination of electronic media and flute

I. Sound organization of electronic media part

When the different single sounds are recorded and transformed, generally, their characters and their sound manners will determine their place in the whole sound organization.

The sound organization of electronic media gives every single sound phrase a more independent situation, that is, every single sound phrase must be relatively complete and independent.

The specialty of sound organization for electronic media part makes the overall breath and rhythm of music sections in electronic music or the works combing electronic media and traditional instruments shorter than traditional works and these works are no longer a mono-horizontal sound development, but a vertical complex overlapped form.

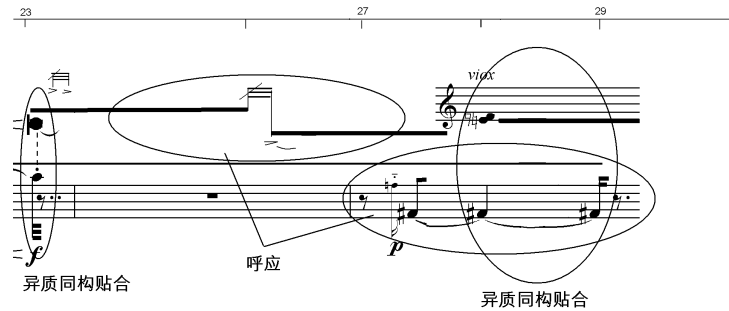
II. Movements of sound and rhythm when the two elements combined

The Movements of sound and rhythm when solo flute and electronic media are combined are: responding, comparison, assistance, subsidy etc. For example:

i. Sound movement forms of the two elements combined

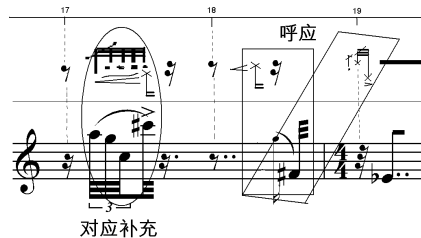
1)In exposition:

Respond and heterogeneous isomorphism subsidy (m.m.22-23, Parch 3, 23''-29'')

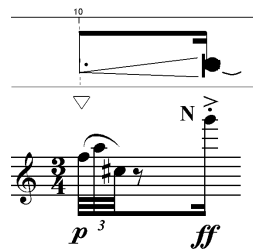


2) In development:

Respond and corresponding complementary (m.32, Patch 4, 17''-19'')



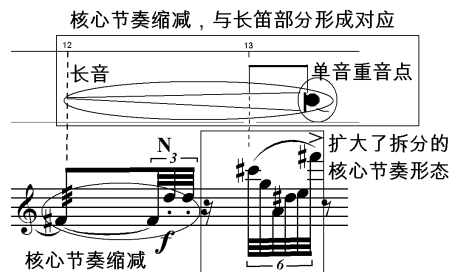
Assistance complementary (m.36, Patch 5, 10'')



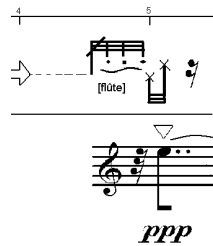
ii. Rhythm movement forms of the two elements combined

From the examples above, the Rhythm movement forms have appeared, and there are further examples:

Organizations of different rhythms: (m.37, Patch 5, 12''-13'')



Assistance promoting as an introduction: m.115, Patch 17, 4''-5''



iii. Applications of all the sound elements and orchestration characters when the two elements combined (omit.)

The relations of “orchestration” between flute and electronic media part embody in the heterogeneous isomorphism responds, dialogue, comparison, assistance etc. of pitch and rhythm which become each other’s background or promote and set off each other.

4. Macro and micro forms of structure

I. The Macro structure of the work

The work has duration of 14’41’’ and begins from the electronic part; totally, there are 177 measures in flute part.

Introduction	Exposition(A)	Development(B/ C)	Recapitulation(A1)	Coda
Patch 1 (0''--1'31'')	m.m.1—27	m.m.28—118	m.m.119—164	m.m. 164—177
	From the flute part, the expo. can divided in two sections: ○, 1m.m.1—5 ○, 2m.m.6—27	The devel. can divided in two sections: ○, 1m.m.28—75 ○, 2m.m.75—118		
Elec. M ¹ Patch (see below)				
Patch 1 0''--1'31''	Patch1 1'32''-- Patch 3	○, 1: Patch 4—13 ○, 2: Patch 14— 17	17—19	19—

Duration				
0'00''—1'31''	1'32''—4'14''	4'15''—10'07''	10'08''—12'53''	12'54''—14'41''

As the table above shows, we can see clearly a tri-parts form with introduction and coda.

II. The micro structure of Introduction and Exposition

Here I analyze these two parts together, because as we have discussed above, if we observe these two parts from two different views (the precise score notation and the hearing actual sound), we will have two different conclusions about the structure. However, from both views of analysis, the four basic sound elements appearing in the beginning of the work should be regarded as an important structural force of the tri-parts form.

First of all, the Introduction and Exposition in first structural view are:

Introduction	Exposition
Patch 1, 0'00''--1'31''	Patch 1, 1'32''--Patch 3 (including flute part m.m.1—27)

The introduction is played by electronic part lonely. The Patch 2 to Patch 3, that is m.m.4-27 of flute part, could be thought as the expositional second part with a sense of Fortspinnung. We can find some trace of inserting and alternately collage and Fortspinnung from the score text of this part which combines electronic media and flute and there is also a structural character of rondo developing around a long tone.

Secondly, we will discuss the Introduction and Exposition in second structural view.

From analyzing the flute part above, the whole work is constructed with the four basic sound elements and their variants. However, there is not the direct score notation in text of electronic media part for these sound materials. From my carefully hearing and considering after analyzing the flute part, in the first 15 seconds from the beginning of music, these four elements and their variants have been exposed in the part of electronic media. Therefore, before the Patch 2 of electronic part, the basic materials have been manifested separately by electronic media and solo flute. From my opinion, this separate manifestation to the basic materials seems to have a relation with the double expositions in baroque and classic concertos, we can say, from this point, the Introduction and Exposition of the work will together produce another form of structure.

First, the Introduction of the work will be not only the 0'00-1'31'' of electronic media part, it will also comprise the exposition of solo flute. While the Introduction of electronic media part arrives at 2'20'', the flute quietly seep in the mixing sound of medal long tone of electronic sound and long tone variant of actual pitch, then, after a two-measure's bridge, the solo flute joins into the introduction. From the beginning of Patch2, the electronic media and the flute enter the exposition with Fortspinnung color, at this time, the solo flute part overlapping with Patch 2 (m.m.4-5), has a double function of structure: it is the ending of last section and also the beginning of next one. This is an overlapping design. On the

other hand, if we consider it with the hearing, the ending long tone in m.3 of flute could be seen as an introduction to the next section, also the conclusion of the last section. See below.

Introduction	Exposition
Patch 1+Fl.m.m.1--5	Patch 2--3 (Fl.m.m.4--27)
<div style="border: 1px solid black; width: 50px; margin: 0 auto; height: 15px;"></div> <p style="text-align: center;">Fl.m.m.4--5/Patch 2' 0''--7''</p> <p style="text-align: center;">(Double structural design with an overlapping form)</p>	

In this structural form, the electronic media part and the flute part both display a tri-parts form when they manifest the four basic sound elements and their variants. To the electronic part, the Introduction clearly has three phrases (indicating in the score with 1.a. séquence 1、 1.b. séquence 2、 1.c. séquence 3).

With analyzing these three sequences and simplifying the different sounds forms, we can see a direction of music: long tone begins-petty pulsing sound-long tone ends which is also the presenting way of following m.m. 1-5 of flute part.

Therefore, if we think the m.m.1-5 of flute part as a section of Introduction, in this sense, the introduction is not only a simple pull in, but also has expositional function. Meanwhile, from the score text, yet the Exposition begins from 1'32'' of Patch1. So, from beginning of the work to m.27 of flute part (Patch 3), the entire first section seems to have a character of double-expositions, i.e. Patch 1 is actually the first manifestation (with electronic media) of the sounds materials of all the work, although we can not identify with score text because there isn't a precise notation about it: so we regarded it as only a introduction. The flute part precisely reflects the four basic materials and their variants in the score, but all these materials have been actually exposed before at least by the electronic media, we may make the flute part as the introduction, or regard the electronic sound as the exposition after this situation of manifesting the "subjects" in turn by solo instrument and "orchestra" (electronic media).

Here, we concern another question. For the composer of electronic music, the electronic sound discussed above is quantitative and definite because of their specialty and knowledge to the techniques and language of electronic music, but for the audience without this special background, the electronic sound is not clear because of lacking of precise notation. The conception of "Subject" is accepted and remembered just when the flute sound precisely noted appears. Therefore, the Exposition of the work is thought to begin from 1'32'' of Patch 1.

I has mentioned that there has not been a international popular notation system for the sound of electronic media, however, almost every composer respects one common rule when he/she is noting the electronic sound, that is, the most important aim of notation of electronic sound is to make the corporation of electronic media and instruments more convenient and make the players' entering more easy. Because of this, whatever elements needed to analyze quantitatively (the rhythm, timber, density or dynamics etc.) are noted with waveform file, simplified signs or descriptive words.

I think there is a key part which must not be ignored when we are analyzing the music combining the electronic media and instrument: it is the sound materials which haven't been noted with precise score. It is hardly to correctly analyze these materials without the original document from hands of composer, but for the works of an outstanding electronic composer, it is very possible to understand the basic sound material and its development by repeating hearing and careful analysis.

Pierre Jodlowski has used a system of notations simplifying the main characters of sounds for the electronic media part in this work and he also has used some descriptive words which mostly appeared in important places corresponding to the solo flute in order to help the player to find exact place of the sounds of electronic media.

In summary, after a careful analysis to the Introduction and the Exposition in details, we can find many overlaps of these two sections produced by the composing conception and sound characters of electronic music, because of which, every physical feature of single sound is particularly prominent and obvious, so the entering or releasing of the sound of electronic media would cause a special attention by composers who will try their best to avoid the unnatural and abrupt connections between the sounds. The most popular and simple manner is making the new sound entered and released quietly, as a result of it, we can frequently see the overlaps of sounds in electronic media, although it is also important for the traditional orchestration, it would be undoubtedly more sensitive in electronic music.

III. The structural function of unconventional playing methods

As mentioned earlier, the flute part of the work uses several unconventional playing methods, the noise produced by which contrasts not only with the traditional sound of the flute itself, but also perfectly echoes the sound of electronic media. Furthermore, there are also some sound materials that play a structural function such as the T.R (tongue striking) in score. The first appearance of this sound means the end of first sequence of expositional section for flute, and the second appearance means the end of the whole Exposition; meanwhile, it is used as a new sound material to prepare the short noise which appears abundantly in first section of Development from the electronic media. Perhaps this T.R sound has been pre-recorded as a basic sound material of the electronic part, therefore, we can not hear it from the flute in first section of Development and instead of the similar bisb., flat., trem. etc. The T.R sound don't appears abundantly in the flute part still to the second section of Development. If regarding this sound as an element of timber structure, we can get a sub-structure of tri-form with reprise that constitutes a multi-structure of counterpoint with the overall structure based on the different sound elements. See below:

Overall Struc.	Intro.	Expos.	Devel.	Recap.	
		A	B (A)	C	A'
T.R.Struc.		a	b	a	

Conclusion: The form features in the works combining the electronic media and traditional instruments

I. The structure

Since the unpredictability, randomness and changes in composing of electronic media are much more than in that of traditional orchestra and chamber music, although the composer conceives the overall design and details of electronic music the same as composing a traditional work, the ultimate composition will not be restricted by harmony, tonality, pitch-class, even rhythm and dynamics and will not belong to any tonal systems or noisy systems because there is not the quantitative and qualitative structural elements as basis just like in traditional compositions. The works of electronic music therefore are constructed on the sounds themselves.

The changes, development and mutual relations of these sounds depend on not only the sound imagination of the composer, but to a large extent on the variants to the sounds taken by computer systems. That is, although the composer has had a conception to the sound, there will be always many variations when he realizes the imaging sound: the final one could be even better than expected or could not archive the desired effect because of the limitations; it could also be a complete new sound that created by the software technician and the composer together.

Therefore, the crucial feather in composing pure electronic media part is the energy and variants of sound itself becoming the most important structural elements, and when the electronic media combines with instruments, the key element of structure is the music direction and breathy methods of instruments part. In practice of composing the electronic-instruments music, the two parts interact with each other and adjust themselves after the direction of music or the breath of other. This phenomenon is just like two people playing Tai Chi, the structural force comes from the two ones who exclude each other, attract each other and restrict each other, finally lead each other to a common space.

Hence, the creator of electronic-instruments works has an overall design and many detail manners, but the above changes and unpredictability of the electronic part will make him/her adjust the details of instruments playing or electronic media in the process of composing, although these adjustments would not completely change the entire structure of the music.

So we can conclude that there will be great randomness and improvisations for the structure of electronic –instruments music.

II. The structure and its “orchestration”

In the area of electronic music, the materials of sound have been limitlessly enlarged; all the sounds can be recorded and treated as the primary material for electronic music, the timber has been developed to an all-powerful element. Every work of electronic music will left the new timber even the special sound reserved for certain subject by the exploration of the composer. The sense or the applications of these timber materials are narrower or clearer than before because of their characteristic features, and this situation makes the reusability of every single sound much smaller, but at the same time it makes the possibilities of organizations of the sounds tend to infinite. Therefore, it is almost impossible to form some certain fixing and classic organizations or systems in the area of electronic music just as in the traditional orchestration.

On the other side, although we can hardly find the typical orchestration methods for the electronic works, the questions about this domain in composing are still numerous.

From view of the pitch, the electronic works also have the problem of registers. When the traditional works have the high, middle and low registers, however the electronic media don't have the limitation of any register or temperament by individual instrument, the arrangement of registers of electronic music can only be embodied after the sound frequency .

From the view of timber, there are also compound, fusion, contrast, connection and organization of all the sounds in electronic works. Because of the varieties of the sounds, the composer can choose and design the sound or timber for the certain passage or overall structure of certain composition after the feature of the sound itself from the basic sound materials or rhythm patterns.

Moreover, when composing the electronic media part, it is necessary to consider the place of single sound's volume in the total volume by produced by all the sounds together just as the traditional orchestration. Although for the electronic music, the overall volume is adjusted in post-production, the volume of single sound and the total volume in which it could appear must be remembered in heart when it is produced, just as we must grasp the features of every timber, the difference of the sounds of instruments and their volume in traditional orchestration.

Finally, from the view of the space, the electronic music has its special questions. For the traditional orchestration, the spatial place of sounds is generally fixed except to the characteristic designs for the players or the orchestra by some avant-garde composers; for the electronic music, since the presenter's great possibility for space and the superiority for play technology (such as the everywhere amplifiers in Messiaen Hall of Radio France and the large frequencies from 5.1, 7.1 to 9.1), the requirement for space design of electronic music is higher and higher, it needs to pay more attention to the spatial phase of sounds in composing the electronic music.

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