

The aesthetics of notation in Japanese Electroacoustic Music

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Received 6th August 2018

Revision 21 March 2019

1. Introduction

Musical notation is a system which is to be visually represented and aurally perceived. It can be seen as the totality of the collection of signs and symbols commonly perceived among the members of a culture in which everybody shares common connotations of a musical language. A notational system has reciprocal relationship with the musical practice just as the relationship between *langue* and *parole*. We know some examples of this kind of reciprocal effects in the music history from Byzantine Empire to Early Europe where the musical practice changes the notation system and vice versa.

This paper deals with the Japanese contemporary notation whose strategies are in close relation with the aesthetic search for Japanese identity. The article will describe much more about the musical thought than the form or style of the notation.

Notation of Japanese electroacoustic music is to be discussed in relation with the Japanese aesthetic concepts. My discussion will mainly consider the Japanese electroacoustic music of the 1960s and 1970s. In this period Japanese composers are struggling for their musical identity which has to have different language and different notation systems from those of Europe. I focus rather onto live electronic style (chapters 3-4) than the fixed media style and that for two reasons. One reason is that notation has different functions in these two styles, and live electronic music needs more sophisticated rules of descriptive function, including ensemble timing and machine-human physical relation. Secondly “live electronic” has developed in a unique style in the 1960s in Japan in a different way from that of Western cultures even though some composers were affected by Fluxus or Cagean aesthetics. Moreover, Japanese first movements of live-electronic music occurred incidentally in the same era when Japanese traditional music started their new phase called *Shin-Hogaku*.

I start with an analysis of the prescriptive notation of sound making, which is much different from the hearing-based graphic visualization like the graphic representation of *musique concrète*. The notation of *ICON* by Joji Yuasa will be discussed in chapter 2. This score is composed of 4 stages, each of which is applied to each parameters of the

sounds¹. In chapter 3 Japanese live-electronic music as indeterminate performance is described in relation with notation. Chapter 4 discusses notation in the new trend of Japanese traditional music called *Shin-Hogaku*.

2. “Notated score” in the early Japanese electroacoustic pieces

2.1 Representation of the electronic sound in the early electroacoustic pieces

Although we know some technical documents concerning the electroacoustic music that were written for technical production, one of which is *Shichi-no-variation* (*Variations on Numerical Principle of Seven*, 1956) by Toshiro Mayuzumi and Makoto Moroi, there are not so many examples of “notated score” in Japanese electroacoustic repertoires before the 1970s. “Notated score” here means the integrated parameters of sound (pitch, intensity, duration, timbre, space etc.) or other symbolized sound images that are written on paper as visual information which does/does not follow the time.

In the case of *Shichi-no-variation*, the documents of each parameter were made separately: pitch, duration, intensity and timbre². So the changing process of pitch, for example, is not correlated with that of timbre in one integrated graph.

We have two examples of notation before 1970, the year of Osaka Expo, which have graphical representation of sounds. Both were fixed on tape before the performance. One is *Water Music* (1960) by Toru Takemitsu, whose score remains unpublished, and the other is *ICON* (1967) by Joji Yuasa.

2.2. *ICON* (1967)

Let’s start with *ICON* as the early notation of electronic sound. In *ICON*, the notation was created as the musical idea of the composer as well as the technical indications for sound realization.

In the score of *ICON*³, three parameters are graphically notated along with the time scale (Figure 1). Frequency bands are indicated in the shape of rectangle in relation with time and frequency. Intensity from *pppp* to *ffff* is notated in relation with time and decibel. Spatialisation is indicated as the position change regarding the five speakers signed as A, B, C, D, E. The position change is written in two different ways; the positioning in a pentagonal shape and the crossfade volume in each channel. The

¹ Joji Yuasa’s idea of white noise composition is now programmed on Max/MSP by Akihiko Matsumoto. His patch visualizes the process of FFR by cross synthesis of graph and noise and enables realtime composition through depicting the graph. <<http://akihikomatsumoto.com/maxmsp/joji.html>> (02/19).

² Moroi Makoto, “Denshi ongaku no tenmatsu”, in *Ongakugeijyutsu* (Japanese music magazine), 1957, n. 8.

³ The graphic notation of *ICON* was published in 1968 in the additional volume of a Japanese music magazine *Ongakugeijyutsu*.

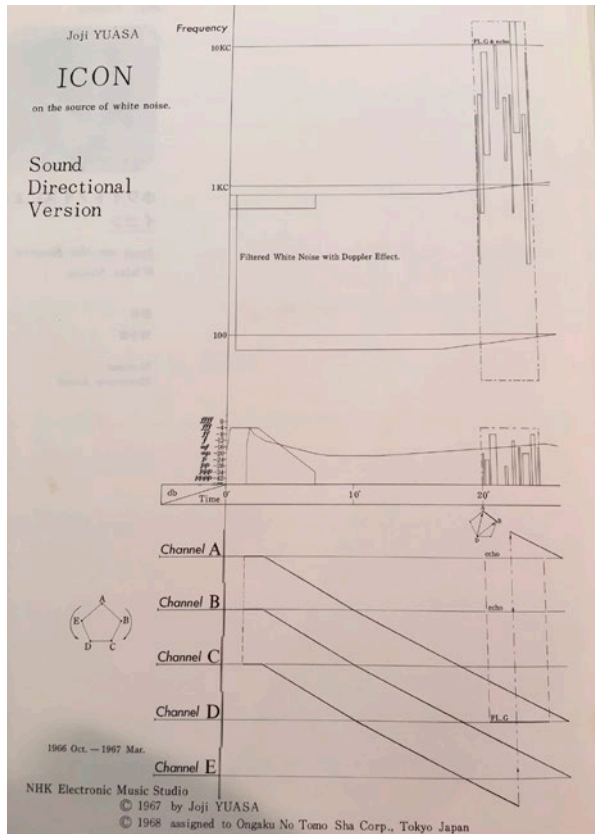


Figure 1. The first page of *ICON* by Joji Yuasa (excerpt)

pentagonal indication gives direct image of sound movements and the crossfade indication gives the technical procedure to realize the image.

ICON begins with a sound mass in the middle register, a narrow frequency band between 700 and 875 Hz. This sound comes from channel B. Six-tenths of a second later, a lower-middle register mass sound of wider bandwidth (80-875 Hz) starts from a sound surface created by channels A, B, and C.

From the 20th second several pulse sounds and echoes are diffused. Various bands of pulse sounds come from channel D and the echoes are diffused from channels A and B. -- From the 29th second another group of pulse sounds and the echoes are diffused. The pulse sounds come from channel A and the echoes are diffused from channels C and D⁴.

In the latter half of *ICON* the relationship between the basic sound and the echoes or the gradual movements from one plane to the other become more complex

⁴ Joji Yuasa, "Gekijo-kono higekijotekina mono. Envairnementaru-media toshite (The nontheatrical elements of theatre as environmental media)", *Transonic vol. 1*, 1972, pp. 47-51, pp. 48-9.

and multi-layered. Yuasa described the movements in the terms of «following, catching up, passing» or «crossing» and the graphic notation gives a clear visualization of each part.

In 1967 Yuasa had made several experiments with white noise⁵. Filtering the low frequencies or other bands of frequencies, he recorded the sounds onto the tapes in various speed in collaboration with NHK sound engineers. Before then, Yuasa was deeply influenced by Daisetsu Suzuki and he took Suzuki's philosophy of *One immediately Multi, Multi immediate One*. Yuasa made several sounds by cutting off several groups of frequencies depending on Suzuki's philosophy because the situation of «one equals to multi» presents itself in a white noise in the literally sense of words.

After Yuasa's process of composition with several cut off methods on white noises, he started to write graphic notation for the instrument part.

Putting the scale of frequency and pitch on the paper of logarithmic graph, I wrote down the graphic score along with the time and the frequency change. Depending on my graphic notation, the engineers worked to realize the sounds⁶.

In the process of notating *ICON*, Yuasa started to integrate the notation of electronic sounds into the instrumental music score. Since *ICON* Yuasa's instrumental music has been notated firstly on the grid paper then depending on the graphic notation the score was written on the musical staff⁷.

3. *Live electronic performance and environmental notation*

3.1. *Live electronic performance as improvisation using electronic tools*

“Live electronic music” means in general live performance with electronic machines. In 1960s the term “live electronic music” indicates the electronic music in which electronic sounds are produced or modulated by human actions in front of the audience. Minao Shibata and his colleague Koji Sano used sometimes the phrase «a sort of live electronic», and they did not give a decisive definition.

Sano used this term for Toshi Ichianagi's *APPEARANCE* (1967) for three instruments, two oscillators and ring modulation⁸. Sano explained the term “live electronic” simply as «performing the electronic machine». Shibata also defines Mayuzumi's

⁵ “Interview with Joji Yuasa in 2000”, in Koji Kawasaki (ed.), *Japanese Electronic Music second edition*, Aiiku-sya, 2009, p. 190.

⁶ *Ibidem*.

⁷ *Ibidem*.

⁸ The first performance of this noisy piece of graphic notation was realized in US with John Cage (electronic equipment), David Tudor (bandoneon) and others. The piece has been recently released in the CD *Obscure Tape Music of Japan*, Edition Omega Point, Catalog n. opa 005, 2019.

Campanology for multi-piano (1966)⁹ as «a sort of» live electronic music. It is clear that there is no decisive definition of live electronic music, but they admitted various type of performances.

In the 1960s the term was mostly used for the performance of “tape + instruments” or for the sound performance using electric gadgets. It should be remembered that the activity of live electronic performances was developed at the same time of indeterminacy. Also, it should be noted that these Japanese live electronic performances were developed with both indeterminate improvisation and with graphic score. Ichiyanagi himself talked about his understanding of live electronic performance as follows:

Live electronic music has non-studio-based style. The stage is the place both for composition and for representation. There are no corrections, editing or re-takes that had been the main operation in the electronic studio. Each operation should be the stage performance. Composition and performance are inseparable because listening leads to creating and responding causes finding¹⁰.

As a result, we have no notation for live electronic music in the 1960s other than “tape + instrument” style. However, there were produced several documents concerning the objects or the space design, in which the composers designed for performance. These documents give us information about the performance environment.

3.2. Group Ongaku in 1961

Group Ongaku is said to be the first experimental music performance group in the world. The group uninterruptedly realized live electronic music in the early 1960s. This was the first time when Japanese composers were integrated in the Euro-American avant-garde scene.

Though Mayuzumi had written a short article about Cage in 1950, most Japanese discovered Cage’s indeterminacy directly in January of 1961 during the concert of Ichiyanagi and Yoko Ono. In October of the same year, Yuji Takahashi, composer and pianist, gave a recital with Cage’s *Winter Music*, Ichiyanagi’s *Music for piano No.2* and other pieces. In November of the same year, several indeterminate pieces by Ichiyanagi were performed, including *IBM Event and musique concrète*. The first public concert of *Group Ongaku* was held before these two experimental concerts.

⁹ In a NHK radio program (1966), Mayuzumi explains about multi-piano in the following terms. «Multi-piano is invented by inserting some objects inside the piano in order to create sounds similar to electronic sounds. The microphone catches directly the waves of the piano strings and the waves are modulated through the electric circuit. The timbre is more varied by filtering. So the output sounds from the speakers are completely different from the piano sounds. This is the first piece for multi-piano, which was realized through several experiments in collaboration with the engineers of NHK. Thanks to this instrument system we can get easily electronic sounds, so human musicians can control the electronic sounds».

¹⁰ Toshi Ichiyanagi, “Possibilities of live-electronic music”, *Ongakugeijyutsu* (Japanese music magazine), 1970, n. 12.

Concert Title : Improvisation and *objets sonores*

Venue : Sogetsu Kaikan Hall

Date : September 15, 1961

composer/performer(s)	title of the piece
Group ONGAKU	Metaplasm 9-15
Takehisa Kosugi	O-S-3
Gennichi Tsuge	music for tape
Yasunao Tone	Piano Sound with Magnetic Tape #1 for a pianist with headphone
Yasunao Tone	Piano Sound with Magnetic Tape #2 for 5 pianists
Yasunao Tone	Piano Sound with Magnetic Tape #3, Days

Diagram 1. “Improvisation and *objets sonores*” in Sogetsu Kaikan.

Group Ongaku included several non-genre members; Yasunao Tone (visual artist), Takehisa Kosugi (performer), Mieko Shiomi (performer), Mikio Tojima (composer), Shuko Mizuno (composer), Gennichi Tsuge (musicologist, performer), and Yoshio Tsukio (architect, performer). They gave repeated improvisational performances at the Tokyo University of Arts and Tokyo University. That was before they knew Cage. The name *Group Ongaku* was adopted in September 1961, when they gave a concert titled “Improvisation and *objets sonores*” in Sogetsu Kaikan (Diagram 1). Kosugi played violin, sax and tape. Tone played sax and tape. Mizuno played cello, drums and tape. Shiomi, Tojima and Tsuge played the piano, the cello and the guitar respectively.

It should be noted that the term *objets sonores* in the concert title meant physical objects like electric cables, microphones, cans, boxes, instruments etc. With these physical objects they could produce sounds. This term was used differently from that of Pierre Schaeffer, because *objets sonores* were defined as the sound quality itself which is correlative to reductive listening in the theory by Schaeffer and Michel Chion. For the members of *Group Ongaku*, the body or the shape of the physical objects were more important than the sound itself.

Kuniharu Akiyama, music critic, reported about this concert that

I think these pieces should get more sharpen-eyed criticism and high tension to penetrate to the chaotic foundation before they fixed sounds on tape. These improvisational pieces were rather interesting because the performers directly presented actual questions without elaboration.¹¹

This concert is important from two points of view. The first one is that the main concept is the idea of improvisation, which appeared independently from the influence from Cage. The second point is that they accepted the notion of *objets sonore*

¹¹ Kuniharu Akiyama, concert review of “Improvisation and *objets sonores*”, *Ongakugeijyutsu* (Japanese music magazine), 1961, n. 12.

from Pierre Schaeffer, but their ways to performance was quite different from his, and the making-alive or the spatialization by Schafferian and similar works at GRM.

3.3. Kosugi's space design and environmental notation

Group Ongaku used electronic machines¹² in their performances; for Kosugi, electronic machines or electronic materials have been essential even after the «dissolution of *Group Ongaku* for the sake of reform» (his words). Though Shuko Mizuno thought he was changing following the trend after the “Cage-shock” in Japan, Kosugi has actually only gradually found his way to develop the aesthetic concepts from Cage.

Kosugi had founded a team called *Collective Music*, with Ichiyangi and Takemitsu during the activities of *Group Ongaku*, known also in the US. He collaborated with Cage, David Tudor and Merce Cunningham. He also performed as a member of Fluxus. It was in these experiences with the experimental arts, that Kosugi sought out his unique style of live-electronic performance.

Takehisa Kosugi's first performance with electronic instruments took place in 1963 at the Tokyo University. The instrument was again an *objet sonore*, and he used a tape machine. Kosugi also made an improvisational performance using a Theremin. A long cable was connected to the antenna of the Theremin and Kosugi walked around the stage with the cable.

Also in 1963, Kosugi created an “installation” entitled *Malika for objects*, which featured the Theremin with speakers, a turntable and a wooden door. On the turntable was a flower which turned round and attracted the audience to see by approaching. There was an electric cable connected, and it functioned as an extensional antenna to the Theremin. These two styles, that is, the improvisational performance and the sound installation, have been consistently Kosugi's main artistic presentation forms. These forms are not suitable for notation and Kosugi himself stated his anti-notation concept in the following words.

I don't like notation and fixed design of electronic music. I was in the opposite side of composition with pre-fixed design of sounds. Music is accepted not only through the audible elements. The traditional concept of European composition is to fix and keep the sound in figure. My concept was apart from that kind of composition.

Musique concrète is interesting but the sounds are fixed on tape. The element of being concrete is pretty important but the concretization can't be realized by playing the tape. So John Cage and David Tudor selected live electronic performance.¹³

¹² Even though Takehisa Kosugi and the members of *Group Ongaku* often performed with tape, tape is not only a fixed media of pre-recorded sound material but functions as a totally new instrument.

¹³ Interview with Takehisa Kosugi (2000) by Koji Kawasaki, in Koji Kawasaki (ed.), *Japanese Electronic Music second edition*, Aiiku-sya, 2009, pp. 255-256.

Kosugi denied notation both in the process of creating music and in the process of producing sounds during the performance. For Kosugi, using tape as fixed media was unacceptable because the process of sound producing was invisible even though the tape machine was used as a physical object producing sounds. It is music notation that Kosugi denied. In place of time-based music notation, Kosugi made texts descriptions and sometimes graphical illustrations about how to install the objects or equipment and in what type of space. The notes and graphs give information about the environment where the performer should make sound. These representations can be called “environmental notation”.

Kosugi prepared the objects and the space with great elaboration, but the process of producing sounds are free from fixed structure of composition. The notated performance settings are designed as environments or as an instrument for the performance with/without timeline.

4. Graphic score: the integration of Japanese traditional music and electroacoustic music

4.1 Discussions among the composers

Notation has been one of the controversial theme for Japanese composers. Japanese composers were on the “ground zero” just after WWII. The new movements started in the 1950s, when composers discussed the serious problem about the identity of Japanese music. We find several important arguments about “Japanese” features compared to Western music among Toshiro Mayuzumi, Makoto Moroi, Minao Sshibata and Joji Yuasa in the journal *Ongakugeijyutsu* during the 1960s. The controversial topics were timbre-pitch relation and notational strategies. Both topics concern deeply the cultural differences between the two worlds, and are taken as a common problem to Japanese traditional music and to live-electronic music.

In an article concerning ethnicity in modern music, Mayuzumi claimed that his mentality was similar to the post-serial music by Stockhausen and Boulez, in the sense that they were standing on the border line between the Western and the Eastern worlds, in view of their philosophical identities¹⁴.

Compared to the situation of the 1940s, the aesthetic concept of extremism and rationalism is becoming weaker today (in the latter half of the 1950s). The most important problem for us concerns the philosophically serious dilemma between the Western and the Eastern. But the dilemma is now becoming ambiguous. ----- If European culture be cut off from the modern rationalism, the difference between the Western and the Eastern has no meaning because both of them seek irrationalism and relativism¹⁵.

¹⁴ In *Ongakugeijyutsu* (Japanese music magazine), 1957, n. 12, pp. 44-53.

¹⁵ Ivi, pp. 52-53.

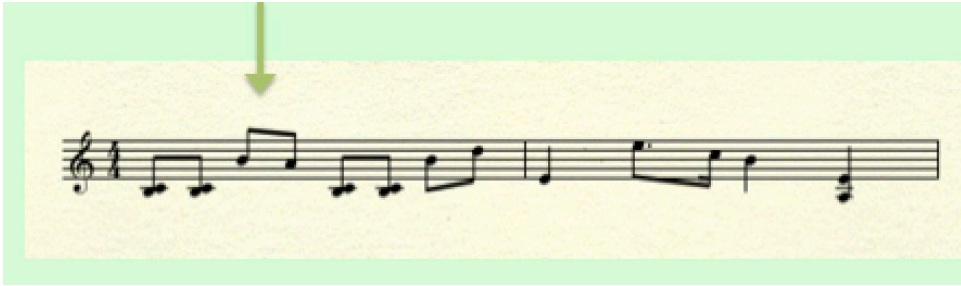


Figure 2. *Rokudan* and *OSAE* technique in Koto in the traditional repertoire *Rokudan* (written in musical notation) and the playing style.

The symbolic and serious problem for the composers concerning *irrationalism and relativism* is how to create notation for Japanese traditional music. Japanese traditional music called *Hogaku* does not have notation's systems like that in European style. It can't be signified as the correlation of parameters such pitch, duration, intensity and timbre. In the performing technique of Koto and Shakuhachi, for example, slight pitch changes are mostly perceived as timbre and are identified by their original traditional names. Here I take the example of *OSAE*, one playing technique of KOTO. The already mentioned Minao Shibata exemplified indivisibility between pitch and timbre realized by *OSAE*. *OSAE* cannot be signified as pitch change in the European style notation, because it identifies Japanese ethnicity of the timbre perception.

OSAE means originally the action of pushing something. Pushing the Koto string makes the pitch higher, but the upper pitch does not function as the pitch itself but should be heard as the nuances or change of timbre, like a modified resonance in live-electronics including both pitch and amplitude changes.

The notated B signed with the array in (Figure 2) does not only signify the pitch but it should be interpreted as a performing pattern for timbre of pushing the string to higher the next note. Shibata pointed out the basic problem of notation for Japanese traditional music.

European style of staff had been developed for the systematic scale of semi-tone and whole-tone. In Japanese music the basic interval is the fourth and mostly the fourth accompanies the complementary notes either upwards or downwards. The interval between the basic tone and the additional tone is less than a half tone and changes depending on the context of the phrase¹⁶.

That's why one note, which is regulated by pitch and intensity, should be realized with several microtonal or noisy nuances.

Timbre as a slight pitch change is also discussed by Joji Yuasa. Yuasa certified the Japanese cultural singularity concerning timbre and the representation of the timbre change that relates inseparably with microtonal pitch change. Yuasa also stressed the

¹⁶ In *Transonic Vol. 2*, 1973, p. 5.

style differences between European music and Japanese music. Pitch in European music has been stabilized, while that of Japanese traditional music is always vibrating and changing as well as timbre.

Toru Takemitsu wrote paradoxically about the Japanese sound and notation, as follows.

Especially in the case of Japanese sound, one sound is not one sound. I am interested in what was abandoned as redundancy in the process of development of European rational notation system¹⁷.

4.2. Shibata's theory of timbre and the "spirit of a dead person"

Shibata remembered the experience at the NHK electronic studio and said:

As I used to think music as some unstable fluid which is changing itself into various forms, I enjoy creating electroacoustic music which can reveal the images of the spirit of a dead person¹⁸.

"The spirit of a dead person" shows Shibata's preference in being unstable, as a "distance" in Japanese tonal system. The concept of distance presupposes the thought of a single dimension without the difference between time and space. Distance in time can be calculated by seconds and distance in space can be calculated by meters, centimetres, etc. Shibata thinks the Japanese sense of distance as one integrated dimension which he sometimes finds in timbre representation.

Shibata makes a list of sounds of *Bonsyo* (temple gongs), *Dokyo* (the voice of the monk who is reading Buddhism's codex), *Syomyo*, *O-hara-i* (by Shinto priests) as typical Japanese timbres. The following five statements by Shibata exemplify his concept of timbre. The list includes both European music and Japanese sounds:

- extremely high or extremely low register, which are used in contemporary music;
- *Syo* and *Hichiriki* in Gagaku are human voices which have been used as natural sounds;
- *Sprechstimme* in *Pierrot Lunaire* by Arnold Schoenberg and the other rapid pitch changes which are described «Soon after aiming at the specified pitch, the voice flees up or down»¹⁹;
- noise, as sound events, which have no relation with the harmonic structure, after short and momentary attacks of voice. The voice runs to the upper, or to the lower range.

¹⁷ Ivi, p. 4.

¹⁸ Minao Shibata, *Nippon no Oto wo kiku* (Listening the Japanese Sounds), Tokyo, Seidosha, 1983.

¹⁹ Shibata uses the rapid sound change in *Phaedrus, for baritone and recorder* (1978) and *The Story of Mimi-Nashi-Hoichi, for voice, Koto, guitar and piano* (1981).

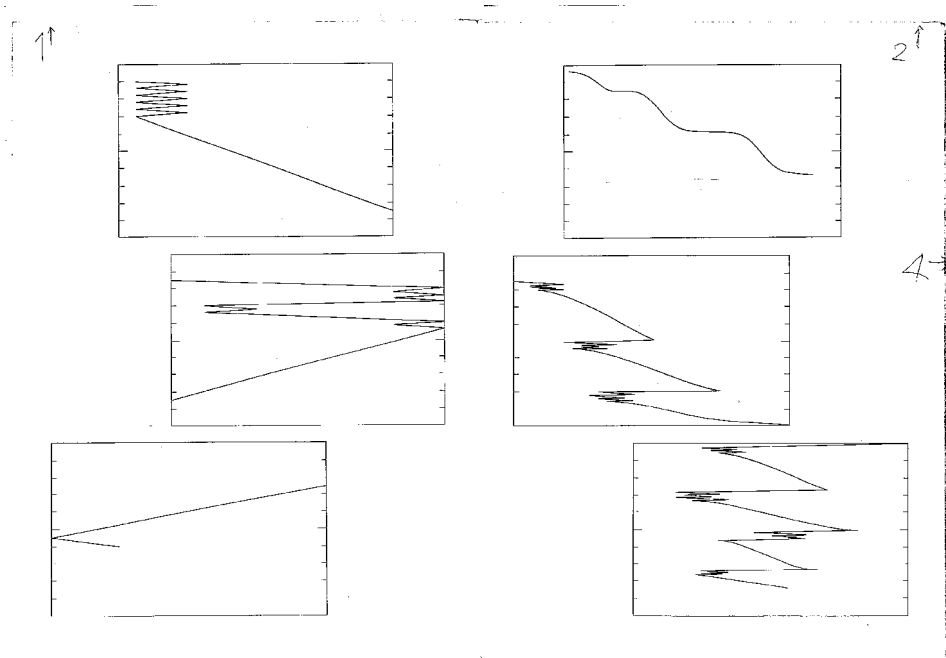


Figure 3. 18 diagrams showing the bow movements of Ko-kyu in the notation for Minao Shibata *Leap Day's Vigil* (1972).

- Japanese traditional instruments have both adjusted harmonic structure and noise. In those last instruments *Ne-iro*²⁰ is defined as non-regulated harmonic pitch, contrary to the regulated harmonic structure in the European instruments.

4.3. Notation in Shibata's live electronic piece *Leap Day's Vigil* (1972)

We can see Shibata's strategy of juxtaposition of the timbre of Japanese traditional music and the electronic sound in his piece *Leap Day's Vigil*. The sole live-electronic piece by SHIBATA is *Leap Day's Vigil (Jungetsu Touka) for Ko-Kyu, San-Gen and Electroacoustic Devices*. This piece was created in January and February in 1972, and was premiered on the third night of the 6th NICHU-DOKU (Japan-Germany) Music Festival in Tokyo.

The score of *Leap Day's Vigil* is composed of three types of graphical notations and one sheet for the ensemble time schedule. Two types of graphic notations are for the bow and the pitch of Ko-Kyu. The tape part was made from the sounds of Ko-Kyu and Futo-Zao. The modulated pitches in the tape part are layered on the sounds of the per-

²⁰ *Ne-iro* is another pronunciation of the same Japanese letters of the word which means timbre. A Japanese word which means timbre has two different pronunciations, *Ne-iro* and *Onshoku*. Shibata uses *Ne-iro* for Japanese traditional music.

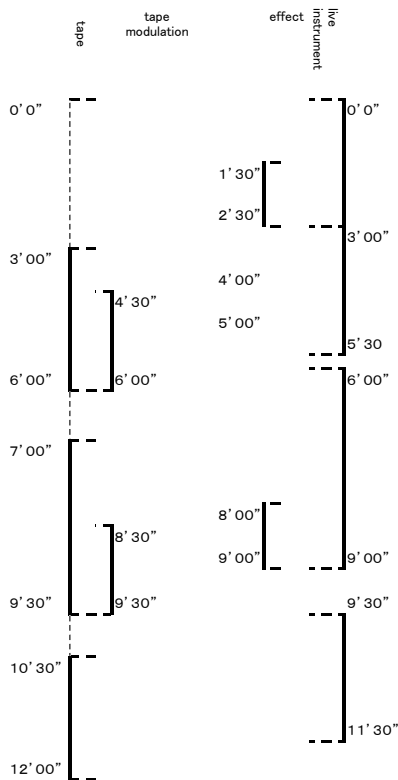


Figure 4. Time chart for a sample performance indicated in the notation of Minao Shibata's *Leap Day's Vigil* (1972).

formers, which make unique timbre as heterophony. Keiji Azech, a Ko-Kyu player who played *Leap Day's Vigil* several times, says that Ko-Kyu has a dazzling timbre, it appeals to the primitive humane emotion, and the feature of timbre seems could be produced by irrational systems with indeterminate relations between pitch and timbre.

This notation (shown in figures 3 and 4) for instrument does only indicate how to move the bow and to control the pitch change as timbre nuance but the precise pitch is not shown as it needs continuous pitch change, live-performing and modified tape echo etc. It is a kind of hybrid electroacoustic music of the 1970s.

This notation is rooted on the Japanese traditional sense, which has been conceived as *Ne-iro*, that can be translated as tone color and/or timbre, but that includes also register change, microtonal pitch change, and diversified resonance.

4.4. Integration of Japanese traditional instrument, live electronics and graphic notation: Masanori Fujita's *Dimension* (1973)

The achievements of *New Hogaku* in the 1960s resulted in several live-electronic pieces, and led to the integration of styles of Japanese traditional music with European

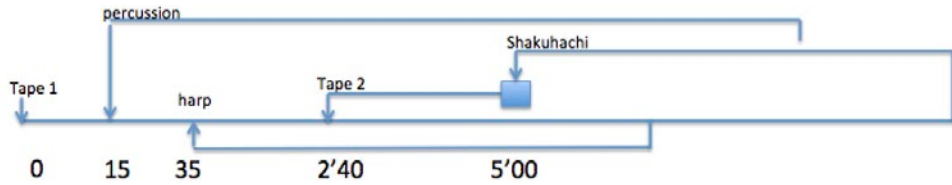


Figure 5. Outline of the structure of *Dimension* by Masanori Fujita (1973).

music. After the Osaka World Expo of 1970, which represented the great chance for Japanese composers to realize their avant-garde concepts and especially to create unique spaces, the conflict between Japanese traditional music and the European style contemporary music got into the next phase, called «Re-thinking and Re-creation of the Traditional Japanese Music»²¹. The age after Osaka Expo sees a growing of international activities, above all in three prominent festivals at the end of the 1960s: Nichi-Doku Gendai Ongakusai (1967-72, Festival of Japan-Germany Contemporary Music), Cross-Talk (1967-71) and Inter-Media Art Festival (1969).

Masanori Fujita, one of the pioneer of musical integration between Japanese and Western instruments, composed *Dimension* for shakuhachi, harp, percussions and tape in 1973. This piece was premiered in the world tour of TOKK-Solisten-Ensemble Tokyo²².

The score of *Dimension* has no notation of a unified timeline, which can show one integrated time process. The score includes the outline of the entire structure (Figure 5), the three parts for each instrumentalist (Figure 6, 7, 8) and textual comments for each player which explain how to read the signs on the score and how to make sounds from each instrument.

The timeline of each part is partially indeterminate. The pitch of Shakuhachi is sometimes indicated but mostly it is the player who decides the pitches. The timbre and the length of each sound is indicated by seconds and by the breath amount.

The harp part starts at 35th seconds from the beginning. The harpist should follow the arrowed direction and four axes (A, B, C, D) for several seconds (20secs, 25secs, 16secs, 27secs each). The pitches are not indicated by the composer. The length of each note is not fixed but each axis should be played in the indicated time.

The percussion score is shaped in a big round in which timbre signs can be read not only vertically and horizontally but also diagonally or helicoidally. There should be 7 different percussions, including 3 Tam-tams, 3 Beckens, 3 Triangles, 5 antique Cymbals, 5 Temple blocks, glockenspiel and others. These percussions have different timbres and the composer shows 9 timbres derived from 9 different ways of playing

²¹ *Nihon Sengo Ongakushi* (Japanese contemporary music after WWII), two volumes, Sengo Ongakushi Kenkyukai, edited by Hori Kyō, Tokyo, Heibonsha, 2007.

²² TOKK Ensemble was founded in 1971 by Yoshiro Irino and Maki Ishii as a performance group. They realized a lot of concerts in order to introduce Japanese avant-garde music with excellent performance. 34 musicians of TOKK ensemble travelled around from Iran, Germany, Italy, France, Belgium, USA, Canada with Japanese Buddhist monks and a Biwa player. During the tour, *Dimension* was played by Shizuo Aoki, Ayako Shinozaki and Yasunori Yamaguchi.

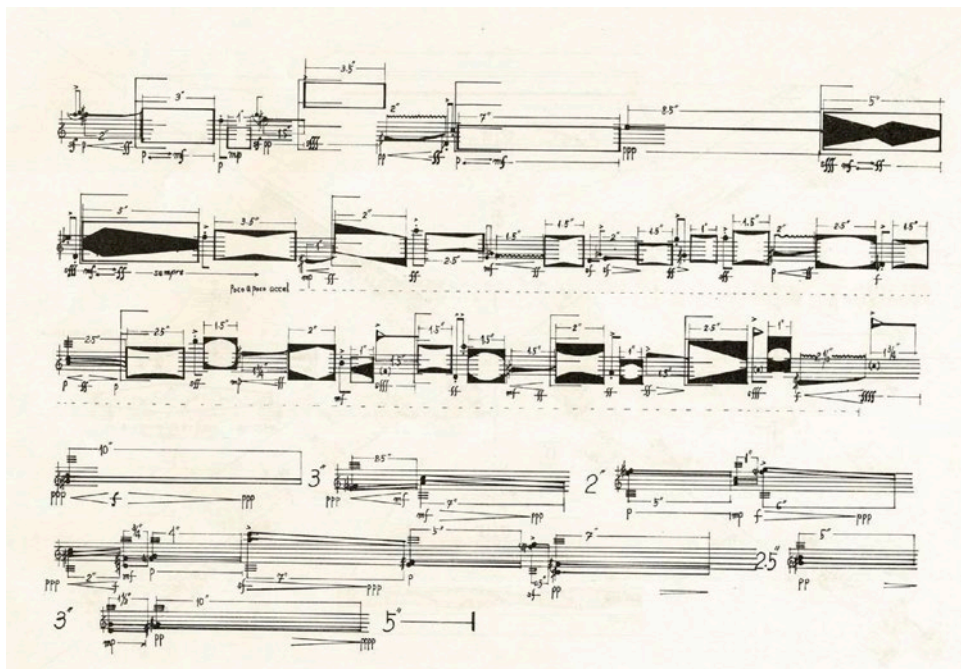


Figure 6. Shakuhachi part in *Dimension*.

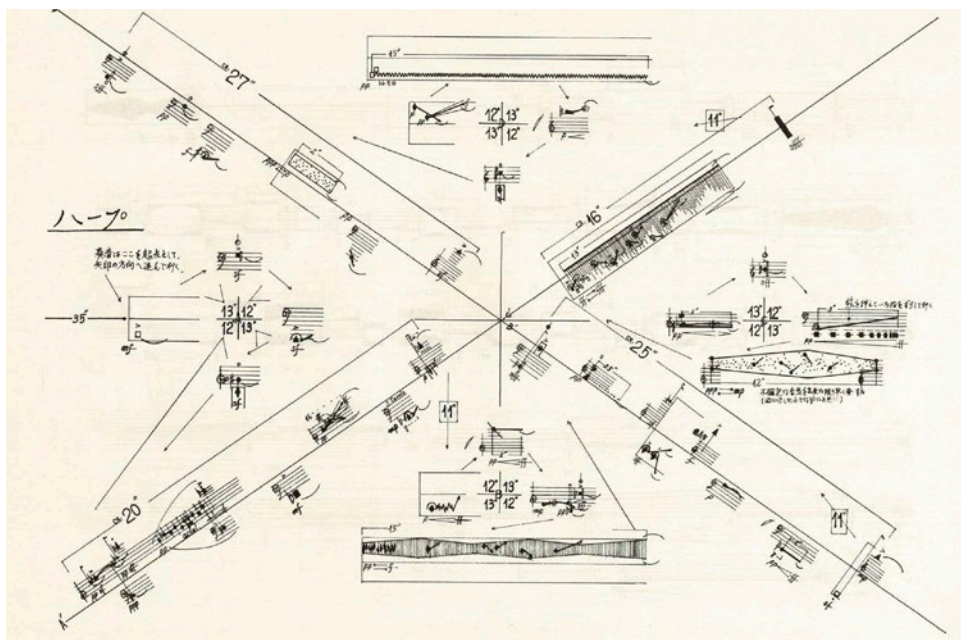


Figure 7. Harp part in *Dimension*.

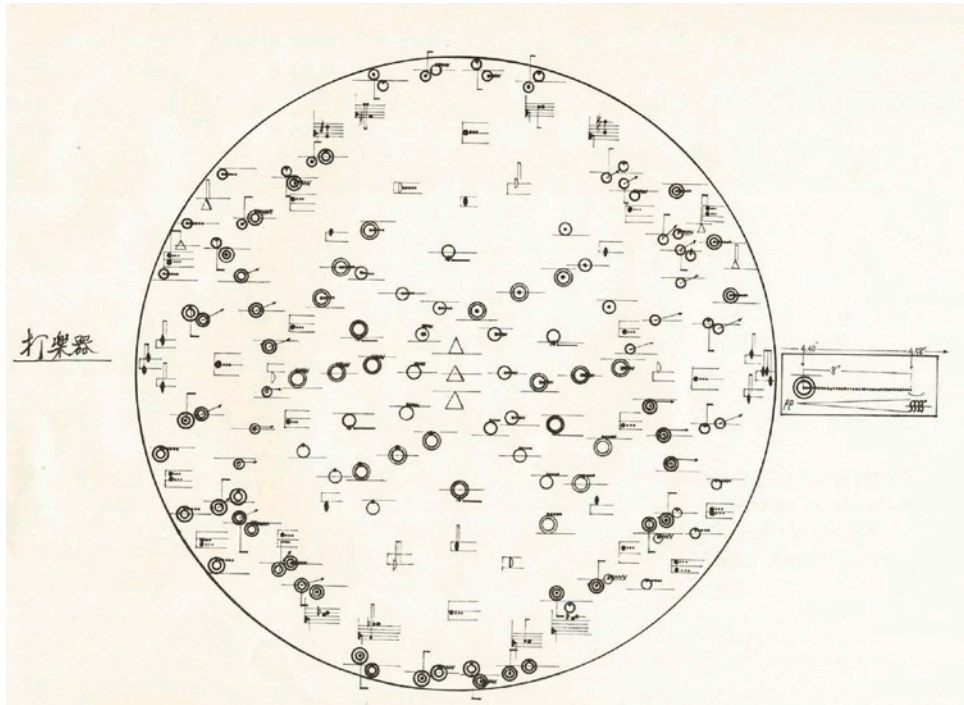


Figure 8. Percussion part in *Dimension*.

Tam-tams and Beckens, for example, *beat the margins of the instrument, beat the center, rub quickly around the centre with hand, tremolo on the centre notating electronics* etc. Concerning the intervals between two notes, three sections are indicated. In the first section (0-4'30), the intervals are possible in the range from 0.5 second to 6 seconds, and the range gradually narrows until the point of 4'30. From 4'30 to 5'00, the range is limited from 0.5 to 1 second. In the third part, the range is broadened in the range from 0.5 to 3 secs. Because irregularity is extremely important, the percussionist is required to compose the rhythm himself before the performance.

5. Conclusion

To conclude, notation in Japanese electroacoustic music has been discussed from the perspective of the very special aesthetic situation in the 1960s and 1970s, when composers were struggling for a Japanese identity under the influence of European electronic music, *musique concrète*, Fluxus and John Cage.

Graphic representation of sounds was important for Joji Yuasa's aesthetic theory with white noise. For the live electronic performances, *Group Ongaku* and Kosugi denied time-based notation. They rather preferred space design and environmental notation because live electronic music was intended as an experimental finding process of objects and space.

Integration of *Hogaku* (Japanese traditional music) and electroacoustic music is critical especially for the aesthetics of timbre-pitch relation and indeterminacy. No timeline integrates all the ensemble parts. The graphical notation in *Shin-Hogaku* (New-*Hogaku*), shown in the pieces by Shibata and Fijita, comes from the Japanese concepts of timbre and un-unified time.