

Style Approaches in Composition Education: Twelve Tone Technique and Analysis

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Abstract

It is crucially important to follow up recent approaches in composition training. It is crucial to know; the meaning of twelve tone technique, how variety of forms are determined, how fret classes and sequence number are determines, how a series can be distinguished in a cluster, how all forms of series can be listed and how the position of forms of series in twelve tone composition education and analysis. Today, the Twelve Tone Technique still preserves its style in composition. Following the 1st World War, there happened advances almost in every field. Twelve Tone Technique, is amongst the manifesting trend in the field of music. When Schoenberg composed his first Twelve Tone piece in 1920 (Prelud; Op.21 Suit), this opened a new door into the 20th Century music. With this opening, chromatism was extensively used by composers. The use of Atonality or the feeding of non-tonal centered music with chromatic materials created the base of Twelve Tone Technique (TTT). Free Atonality revealed with extended use of Chromatism in early 1900's and development of this technique in 1910 which can be termed as decent of tonal system. The methodology developed by Schoenberg used also this. There are several concepts within the structure of TTT. The most important structure of this system is the material of series. So called serie can be used at four different structure. Abbreviations and terminology used at TTT structure are termed as; Prime-P, Retrograde-R, Inversion -I, and Retrograde inversion -RI. For each four scale, there are 12 transmission possibility. Thus, it is reached up to 48 scale. Basically, Twelve Tone study includes the presentation of scale forms with diversify.

Keywords: twelve tone, schoenberg, chromatism

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Kompozisyon Eğitiminde Stil Yaklaşımları: On İki Ton Tekniği ve Analizi

Öz

Bestecilik eğitiminde güncel yaklaşımları takip etmek çok önemlidir. On iki ton serisinin ne anlama geldiği, nasıl oluşturulduğu, ismi, çeşitli formlarının nasıl belirlendiği, perde sınıfları ve sıra numaralarının nasıl belirlendiği, bir kümedeki serinin ve seri formunun birbirinden nasıl ayırt edilebileceği, tüm seri formlarının nasıl listelenebileceği ve bir parçadaki seri ve seri formlarının konularının nasıl belirleneceği konuları on iki ton besteleme eğitiminde ve analizinde çok önemlidir. Günümüzde bile on iki ton tekniği tarzını koruyan bir stildir. Birinci Dünya Savaşının ardından dünyadaki gelişmeler her alanda kendini göstermiştir. Müzik alanında da on iki ton tekniği kendini gösteren akımlardan sadece biridir. Schoenberg 1921 yazında ilk on iki ton parçasını (Prelud; Op.21 Süit) bestelediğinde 20 yy. için çok büyük kapı açmıştır. Bu kapının açılmasını hazırlayan en büyük gelişme de müzikte kromatizmin büyük bir alanda ve besteciler tarafından kullanılmasıdır. Önceleri atonalite ya da herhangi bir ton merkezi olmayan müziklerin kromatik materyal ile bestelenmesi on iki ton tekniğinin zeminini oluşturmuştur. Tonal sistemin çöküşü olarak adlandırılan serbest atonalite kromatizm hakimiyetinin 1900 başlarında daha yoğun bir şekilde kullanılması ve 1910 yıllarına doğru geliştirilmesiyle ortaya çıkmıştır. Schoenberg'in geliştirdiği yöntem de bu yolda geliştirilmiştir. On iki ton sisteminin yapısında bulunan bazı kavramlar vardır. Bu sistemin en önemli yapısı dizi materyalidir. Söz konusu dizi dört farklı yapıda kullanılır. On iki ton yapısı analizinde kullanılan terimler ve kısaltmaları, Birincil dizi (Prime-P), Deriye Doğru Dizi (Retrograde-R), çevirme (Inversion – I), Geriye doğru çevirme (Retrograde inversion –RI) şeklinde adlandırılır. Her dört dizi için 12 tane aktarım ihtimali bulunmaktadır. Bu şekilde 48 adet diziyeye varılır. Basitçe vurgulanırsa, on iki ton çalışması dizi formlarının çeşitlendirilerek sunumunu içerir.

Anahtar Sözcükler: on iki ton tekniği, Schoenberg, kromatizm

Introduction

Musical Progress in 20th Century

Materials used in music are avant-garde components presented in a manner of innovation, background and emotionally reflexed intellectual data bases through the history. Perceptions occurring with the clustering of similar samples became the Avant Garde strand of episodes. Thus, concepts termed as avant garde particularly in 20th century, constitutes the philosophy of the change of existing concepts. In this episode, the diversity and the productivity of strands can be displayed in retroactive approaches. Neo-Classical Strand is the best response to that. Along with the minimal thinking, strands made by indefiniteness, coincidence, electronic music can be accepted as innovative strands of 20th century music.

Modernism and Contemporaneity

When recent concepts are taken up with innovative approaches, modernist mentality become dominant. Every new strand and occurrence experienced in 20th century, can be accepted as modern movement of its time. As the new strands occurs, former strands distinguishes within the contemporary frame.

Musical style figured in 20th century, didn't mature in this century. Individualism and diversity that was distinguished in the Romantic Period became more popular. Romanticism has not finished as the century came to an end, however new ideas and methodologies driven compositions lessened the effect of Romanticism. During the World War 1, many composers left this tradition. Mass media and perfect communication systems made audience better listen and realize new ideas and express their emotions. New technology, caused the emergence of new musical ideas and types.

Avant Garde, symbolism, futurism, minimalism, post-modern ideas within the frame of modernism can directly and indirectly be interrelated. There are several musical strands in 20th century in spite of the long termed periods like Barok, Classical and Romantic eras. From this aspect, 20th century is the prime period for the composers with their miscellaneous products. Composers brought sound element and duration into the forefront. By doing so, quietness (silence) constituent was accepted as an important component. Following the composition of Pierrot Lunaire as expressionist style by Schoenberg, with the rehandling of tone and melody elements, new system was called as Twelve Tone System. During the existence of Atonality System, TTS can be accepted as a modernist approach.

Schoenberg and Twelve Tone Serie

What is the systematic feature of Twelve Tone Serie , How it works and what are their forms are amongst the most important questions one may ask. Arnold Schoenberg is one of the prominent composer who structured 20th Century music into a different axe. Twelve voice in which Chromatic serie is dominant was arised

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through equality to each other principle. None of the sound repeats until the twelve sound sentence is completed at Schoenberg's music. Schoenberg is a composer who is adhered to tonal music and form mentality and is dominated to the discipline of two concept. Within this technique, theoretical dependence to those topics still continues. Atonal music is the avoidance of tonal music from its tonic (modulate) dependency. Twelve Ton Serie, is a gradation consisting of twelve pitch class where each pitch exists once. Primary rule within the system is the determination of lining sounds and consecutive repetition. The composer may select the determination of sounds or different approaches may be used in determination of sounds. Vocalisation of voices without repetition, obtaining varieties of series and protection of their continuity forms an unity.

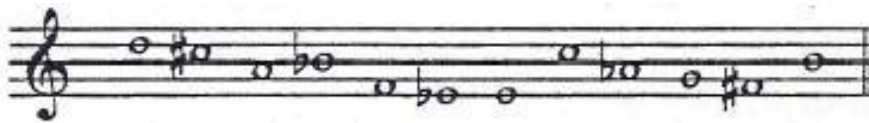
There are serial forms of a scale for the continuity of a twelve-tone composition (piece). These structures are consists of series;

- 1) Prime (P): Beginning Form.
- 2) Retrograde (R): Retrograded, Prime Form.
- 3) Inversion (I): Named as inversion and replaces as the subsidiary of each prime scale interval.
- 4) Retrograde Inversion (RI): Retrograde Inversion process.

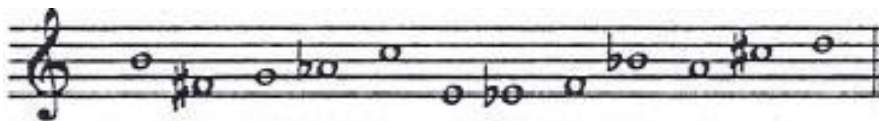
Series are as follows in the Schoenberg's string quartet which is referenced in the literature.

Example 1

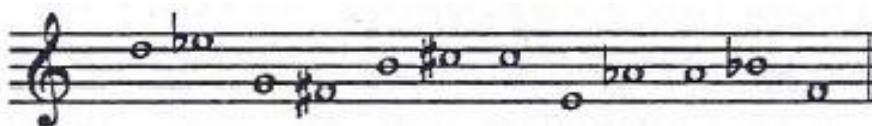
Schoenberg String Quartet N.4 Series.



Prime Serie P0, Series consisted of primary sounds.

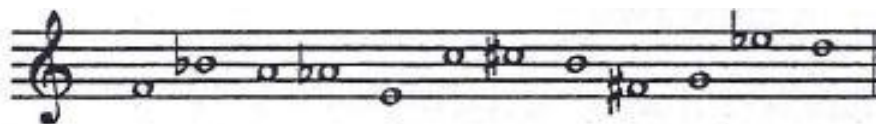


Retrograde Serie R0, Retrograde Prime Form.



Inversion Serie I0, named as Inversion and relocates with the subsidiary of each prime serie.

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Retrograde Inversion Serie RI0, It is a retrograde Inversion process.

Any of the form of the serie can be termed as Prime Form. Prime Form is the inverse of I Form, retrogressive of R Form. As the rule, in a given composition first serie form is termed as P, whereas others are termed as corresponding. In Example 1 beside the P, R, I and RI there is number zero. This number shows the original status of the serie.

Example 2

Names of the Pitch

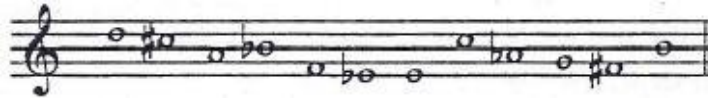
Analysis of the 1. Method	Analysis of the 2. Method
0 Re	1 Do
1 Do Sharp	2 Do Sharp
2 La	3 Re
3 Si Flat	4 Mi Flat
4 Fa	5 Mi
5 Mi Bemol	6 Fa
6 Mi	7 Fa Sharp
7 Do	8 Sol
8 La Flat	9 La Flat
9 Sol	10 La
10 Fa Sharp	11 Si Flat
11 Si	12 Si

There are similarities in the termination and analysis of the frets of Twelve Tone System with free atonality analysis approach. In the atonality and serial musical reference literature, there are two different analysis methodologies. In the first analysis methodology, reference point corresponds to the voice where first prime serie starts with. Grading of the sounds occurs accordingly. Second analysis is used more frequently where there reference musical note is accepted as C and graded half fret tones. The each of four form of the serie may start within any of the fret class. Assignment of numbers from 0 to 11 and the assignment of letters (characters) shows the replacement of serie form (veya serial form). First musical note P0 shows the 0 fret class for all serial forms. As an example; P2 fret class means the prime form transferred to the beginning of 2 and 18

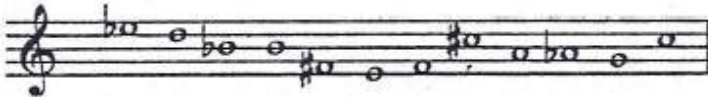
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Example 3

In the 3th example, diversification of Prime Serie,



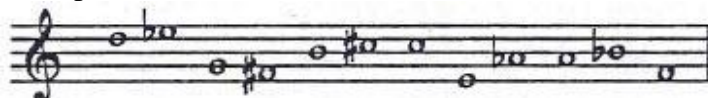
Prime 0



Prime Serie sharpened via P1 half tone.

As you will see, the serie is concluded by selecting Prime 0 starting from D. Similarly, when P0 serie is transferred to E Bemol, P1 serie is obtained. In the example 4 you can see the comparison of I0 with I5.

Example 4



I0 Serie



Inversion Serie of half tone sharpened I5

Example 5 from the Piece



The image shows a musical score for a 4-measure section of Schoenberg's string quartet No. 2. The top staff is in 4/4 time and contains six measures, each marked with a circled number from 1 to 6. The first measure starts with a fortissimo (ff) dynamic. The notation includes various rhythmic values, accidentals, and articulation marks like accents and slurs. Below the main staff is a single staff showing the corresponding twelve-tone prime series for the section.

Example above shows the 4 measured section and the use of twelve tone serie (Prime) from violin partition of Schoenberg's string quartet No:2.

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Example 6

Musical score for Example 6, measures 27-30. The score is in 4/4 time and consists of three staves. The first staff (Violin I) starts at measure 27 with a circled number '27' above it. It contains a melodic line with notes G4, A4, B4, C5, B4, A4, G4, with slurs and accents. The second staff (Violin II) starts with a circled number '28' above it and contains a pizzicato line with notes G4, F4, E4, D4, C4, B3, A3, G3. The third staff (Cello/Double Bass) contains a line of notes G3, F3, E3, D3, C3, B2, A2, G2. Dynamics include *p* and *pizz.*

In the example above there is a view from the 27th measure of the same quartet. It is shown the shared use of first form of the serie at 1st and 2nd violin partitions.

Example 7

Musical score for Example 7, measures 280-283. The score is in 4/4 time and consists of four staves. The first staff (Violin I) starts at measure 280 with a circled number '280' above it. It contains a chordal line with notes G4, A4, B4, C5, B4, A4, G4. The second staff (Violin II) contains a chordal line with notes G4, F4, E4, D4, C4, B3, A3, G3. The third staff (Viola) contains a chordal line with notes G3, F3, E3, D3, C3, B2, A2, G2. The fourth staff (Cello/Double Bass) contains a chordal line with notes G2, F2, E2, D2, C2, B1, A1, G1. Dynamics include *ff*. The bottom staff shows a melodic line with notes G3, F3, E3, D3, C3, B2, A2, G2.

In the above example it is shown that how twelve voice serie is linked with chord structure in the 280th measure. By grouping sextet groups of the serie, it is distributed to 2 violin, viola and cello.

Please pay attention the the the last musical note determines the transfer level at R and R1 forms. So, R0 is the reversed version of P0 and RI0 is the retro inverted version of 10. Please investigate R0 and RI0 forms in the Ex. 10. There are 48 forms of each serie by 4 forms of each serie and 12 transferring of each form (4 forms

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multiplied by 12 transferring of each form) At some series, two forms may be equivalent to each other. So, series number different to each other is reduced by half.

series and serial forms.

The term of serial is the name given to the sorting of twelve tone class and the 48 series of the fret class. All examples from 10-1 and 10-3 belong to one single series.

What are the names of fret classes within this serial ?

When we decide to name P0 on a serial form, serial form in P0 fret class corresponds to 0's first fret class.

rotation number.

Numbers starting from 0 to 11, correspond to the location of all fret classes in a serial form. It provides the information in a given fret class and 1st, 2nd, 3rd or 4th.

Example 8

Schoenberg String Quartet No.4, OP.37, First Movement.

Allegro molto; energico ♩ = 152

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The image displays a musical score for a twelve-tone composition, spanning measures 5 through 15. The score is arranged in four systems. The first system (measures 5-9) includes staves for Violin I, Violin II, Viola, and Cello/Double Bass. It features dynamic markings such as *f* and *sf*, articulation marks like 'H' and 'A', and fingerings. Below the main score are two short melodic lines labeled 'PO' and 'I5'. The second system (measures 10-15) includes staves for Violin I, Violin II, Viola, and Cello/Double Bass. It features dynamic markings such as *ff* and articulation marks like 'H' and 'A'. The score is annotated with various musical notations, including slurs, accents, and specific performance instructions.

Between movement 6-9, during the 2nd violin melody, chords accompanying to the main melody consists of 3 consecutive rotation numbers.

Even tonal classes can be derived from the serial of the piece, it is not possible to derive tone classes of the melody and accompanying chord at the same time. In the m.1, rotation numbers of 1st violin comes after 3,4, and 5.

In m.2 first violin A, sequence number 2, comes after the numbers of the serie from 3 to 11.

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First violin voice between mm.1-6 and second violin voice between mm.6-9 shows serial forms. However, remaining pitch classes can be extracted serial forms, clusters.

Ways of Listing of All Serial Forms

When analyzing a piece, turning back to PO for a given serial form is the dustiest methodology. Having a list of all serial forms is more convenient methodology. There are two ways in forming such a list:

If you want to see the serial forms inside the composition, take a 12 portre paper and draw a perpendicular line from the mid of the page. Write P0 to the upper left corner and I0 to upper right. Then shift simply the each line (sıra) half tone to upwards. First line P0 and I0, second line P1 and I1, third line P2 and I2 and continues like this. By reading lines from right to left, we obtain R and RI forms. In the example 10-5, opening serial forms of Schoenberg's String Quartet No.4 is seen.

Example 9

The image shows three staves of musical notation, each representing a serial form. The first staff is labeled P0 and has arrows pointing to R0 I0 and RI0. The second staff is labeled P1 and has arrows pointing to R1 I1 and RI1. The third staff is labeled P2 and has arrows pointing to R2 I2 and RI2.

Before starting the analysis it is not necessary to completely write the whole serial form. Only place the paper as described, then place the serial forms to appropriate part within the music.

Another way in order to list all serial forms is the matrix methodology. A matrix is the list where all 48 forms on a serial is shown (It is needed to write 13 forms in order to create 48 forms). Start with writing P0form by using the letters. In this example Schoenberg's String Quartet No. 4 serial is given;

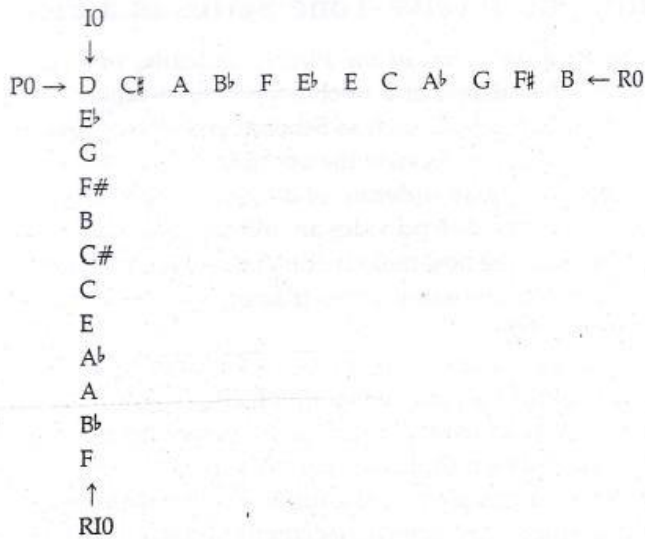
Example 10

P0 → D C# A Bb F Eb E C Ab G F# B ← R0

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Reading from right to left in the given order gives the R0 serial. Then write the I0 form from top to down starting from the leftmost column. By reading from down to the top, RIO form is obtained.

Example 11



matrix.

By considering the each leftmost pitch, the form related with the beginning of each pitch.

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Example 12

	I	I	I	I	I	I	I	I	I	I	I	
	0	11	7	8	3	1	2	10	6	5	4	9
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
P0 →	D	C#	A	Bb	F	Eb	E	C	Ab	G	F#	B ← R0
P1 →	Eb	D	Bb	B	F#	E	F	C#	A	Ab	G	C ← R1
P5 →	G	F#	D	Fb	Bb	Ab	A	F	C#	C	B	E ← R5
P4 →	F#	F	C#	D	A	G	Ab	E	C	B	Bb	Eb ← R4
P9 →	B	Bb	F#	G	D	C	C#	A	F	E	Eb	Ab ← R9
P11 →	C#	C	Ab	A	E	D	Eb	B	G	F#	F	Bb ← R11
P10 →	C	B	G	Ab	Eb	C#	D	Bb	F#	F	E	A ← R10
P2 →	E	Eb	B	C	G	F	F#	D	Bb	A	Ab	C# ← R2
P6 →	Ab	G	Eb	E	B	A	Bb	F#	D	C#	C	F ← R6
P7 →	A	Ab	E	F	C	Bb	B	G	Eb	D	C#	F# ← R7
P8 →	Bb	A	F	F#	C#	B	C	Ab	E	Eb	D	G ← R8
P3 →	F	E	C	C#	Ab	F#	G	Eb	B	Bb	A	D ← R3
	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	RI	RI	RI	RI	RI	RI	RI	RI	RI	RI	RI	RI
	0	11	7	8	3	1	2	10	6	5	4	9

When completed, all 48 forms of the serial is seen. P forms lined from left to right, R forms lined from right to left, I Forms from top to down and RI forms from down to top are created.

Harmonical Structures in Series

Particularly harmony, musical factors affected from from the changes in tonal mentality. Chromatism of late 19th century created a more complex harmony comparing the early periods.

In spite of the Barok, Classical or romantic period musics composed during this period depends mainly on new discipline in terms of harmony, whereas depends on classical discipline in terms of process. The underlying reason for this is the very robust foundation of Schoenberg's past. Three harmony resonances of Classical Period, axes, Subdominant, Dominant, are fused within twelve-tone strand of functional harmony. Chord structure come to the forefront with their chord colors rather than their functional features. Chord structures were also able to be identified within 48 type twelve tone serial obtained by the composer. Chord structures , within the frame of their colorfull harmony, have been removed from the center of tone.

From the structure point of view, musical styles those created form mentality in the 20th century showed progress. As the classical form mentality like Double part,

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triple part, rondo, sonat, canon fugue, etc., themes continued, extra-thematic form connection were also used. Schoenberg with his form mentality showed his Classicist side.

In his Variations for Orchestra, Op.31, Schoenberg used below serie-sound serial: As shown below a serial with 12 voices and a total of four different serial exists.

In the below example, four states of the serial is given. A line of sound serial can be transported to a pitch. By saving the original structures of the apertures, it can start on the each of the chromatic sound. As explained above, four different types of serial can be produced from the original serial. When this four type of serial is applied to any of the twelve chromatic sound, 48 (12x4) different type of a serial can be produced. When a rhythmic movement is given to an original serial, melody line appears in the cello partition.

Arnold Schoenberg have coincided atonality with certain rules by the new system that he created in 20th century. This shows the strong classicist feature of Arnold Schoenberg. Twelve-tone music, which is accepted as an important progress in terms of composition, brought several composers different points of views.

Twelve-tone composition technique became the most effective 20th century musical strand. Almost each composer either applied or impressed from this technique. The first step to atonality by Arnold Schoenberg is considered as the most radical and bravest step in the history of classical music.

Positioning of Twelve Tone Serial in a Piece

How do you determine the serial of a piece? During the analysis of twelve tone composition, primary duty is to determine the serial. In many of the pieces (compositions), as the example the determination of the serial of Schoenberg's String Quartet No. 4 is an easy task. In this piece, within the melodic task of the first violin partition, perceiving the twelve pitch class provide several clues and it is not possible to make any mistake. It is similarly easy to find serials in many of the pieces with twelve tonal feature. Two or more serial forms may start simultaneously or serial grading may have been become uncertain within an acoustic structure. Or the piece may not start with a serial form. Full serial may be given in steps within the opening part. Or there might be more than one series used in the piece.

Schoenberg's *Klavierstück*, op. 33a deserves to be investigated in detail. As seen in below example, it is impossible to determine the serial within the first three measure because the acoustical structure confuses all pitch classes with others. But it could be assumed that ground of chords (sounds) in the three chord structures at the first and second measures, forms a serial of each measure.

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Example 13

Schoenberg, Klavierstück, op. 33a

In order to determine the grading in these serial forms, passage from which each pitch class passes is tried to be determined by looking forward. These types of passages occur between measures 3 and 5 given in the below example. Sharp notes follow the grading given in the pitch 2.

Example 14

Schoenberg, Klavierstück, op. 33a

When investigating a serial of a new composition, to have a knowledge about the composer may be helpful. As an example, in Schoenberg and Berg's twelve tone pieces melodies and accompanying parts mainly consist of clusters those can not be determined from grading of serial Webern's twelve tone music, on the other hand, follows the serial grading. In Webern's and Schoenberg's studies, a single serial underlies the whole composition. In Berg's compositions, and also in many of the twelve-tone composers, different series may be seen in a single composition work.

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The issue of “How to determine a serial form within a piece” could be explained as follows: Listing of serial forms as a full list helps to determine the serial forms in a music. Typically, determination of two or three pitch class and the reviewing the results may be enough. Once the the space is realized, deliberate predictions could be made.

If the Schoenberg's fourth quartet is used as the model, the opening spaces of P, I, R, RI forms of the serial could be investigated in detail (Example 10-2, p177). Each serial form starts with a different space;

P space starts with 11

I starts with 1

R starts with 7

RI starts with 5

If there is a problem in where serial form starts in the piece (composition), by determining any consecutive 3 pitch B-C –C –I 11

If there is a problem in determining where the serial form starts within a piece, any consecutive 2 pitch is determined. Space followed by B-C –C-I11 investigates second serial form and space templates can be determined.

I2 followed by I11 can only seen in I Form between 4-5 and 6. Grading numbers with 4, 5 and 6 B-C -C and I has IO form.

Conclusion

Twelve tone system which was formed in 20th century was established by Schoenberg is a system established on robust base. This system is very well structured in the history of musical science and its base is similar to the discipline of classical harmony. The system that uses four serial forms is a grading of sequencing of each pitch class to be seen at one By giving numbers from 0 to 11 to each voice in this system positions in the serial form may also be seen. There is a need for necessary preparations before composing by using twelve tone technique.

System has faultlessly working background and Schoenberg has shared this system with his pupils Alban Berg and Anton Webern. The system which is preferred by several composers worldwide maintains its characteristics at present.

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