

**Schoenberg's Dodecaphonic Devices**

*an exhibit  
prepared by*

**R. Wayne Shoaf, Archivist  
Susan L. Sloan, Assistant Archivist**

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The terminology and explanations used in this exhibit are based on the terminology and explanations used by Schoenberg and set forth in his 1941 lecture *Composition with Twelve Tones*. Although a wealth of new terminology in twelve-tone composition has evolved in the last forty years, the use of such terminology has been avoided in this exhibit.

*"The method of composing with twelve tones grew out of a necessity."  
Arnold Schoenberg, *Composition with Twelve Tones* (1941)*


Schoenberg believed that the rise in the use of chromaticism in music of the late nineteenth and early twentieth centuries led to the dissolution of traditional functional harmonies and tonal centers. In addition, the free use of dissonance as a central element in the music of such composers as Wagner, Richard Strauss and Debussy was a radical change in compositional technique and ended in what Schoenberg called "emancipation of the dissonance." By about 1908 Schoenberg himself had abandoned tonal harmonies and began producing works in a style based on the idea of "emancipation of the dissonance," a style which, as Schoenberg wrote in 1941, "treats dissonances like consonances." These are works in which tonal centers are completely avoided and all degrees of the chromatic scale are treated as equal in importance. But without the unifying element of a tonal center around which compositions could be structured, it was difficult for composers to continue to create complex or large-scale instrumental works. Schoenberg's own works during this period are all either very brief or relied upon a text for unification. He recognized the need for a new kind of compositional system and gradually, over a period of about twelve years, developed a procedure which "seemed fitted to replace those structural differentiations provided formerly by tonal harmonies." He called this procedure "Method of Composing with Twelve Tones Which are Related Only with One Another."

*“Now as regards your plan of writing a book on twelve-tone composition. Do not call it Twelve-Tone Theory, call it ‘Composition with Twelve Tones.’ Personally, it is on the word Composition that I place the emphasis.”*

Arnold Schoenberg, letter to Josef Rufer dated July 25, 1949  
(translated by Humphrey Searle)

1. The Twelve-Tone Row. The most basic element of twelve-tone composition is the twelve-tone row (also called set or series). The twelve-tone row is formulated from the twelve pitches of the chromatic scale.



using any octave transposition 

or enharmonic spelling 

The twelve pitches are then ordered into a row which will provide the basic pitch structure (both melodic and harmonic) of a composition. The pitches may be ordered in any way as long as each pitch occurs only once in the row. A composer may also choose to order the row so that a certain interval structure is produced which will pervade the composition. In addition to the “basic set,” as Schoenberg called it, three other row forms may be used which are derived from the basic set. The row may be inverted (inversion), reversed (retrograde), and reversed and inverted (retrograde inversion).

To illustrate these four forms, a row was formulated expressly for this exhibit based on the name Arnold Franz Schoenberg. It is easy to see that Schoenberg’s name lends itself well to the formation of this row since many letters of his name are also pitch names. Additionally and appropriately, three German spellings of pitch names were also incorporated into the row: “S” for “Es”, the German name for E-flat, “H”, the German name for B-natural, and “B”, the German name for B-flat. The remaining unused letters of “Schoenberg”, O, N, and R, were assigned the three remaining unused pitches from the chromatic scale.



Arnold F S C H o E n B er G

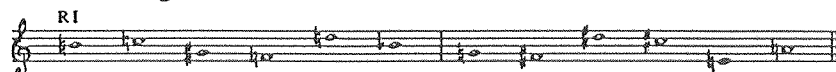
The inversion of the basic set follows the contour of the basic set but in a mirror image. Where the basic set rises, the inversion falls, and vice versa, while still maintaining the same interval content.



The retrograde is simply the basic set reversed; that is, read from right to left.



The retrograde inversion, the most far removed form from the basic set, is the basic set read right to left and inverted.



Any or all of these four row forms may also be transposed to begin on any of the twelve pitches of the chromatic scale. Hence, there are actually forty-eight row forms possible from a single basic set.

Some additional facts about the twelve-tone row:

- 479,001,600 twelve-tone row combinations are possible using the twelve pitches of the chromatic scale. This includes all transpositions, inversions, retrogrades, and retrograde inversions.
- 9,979,200 unique rows are possible which are unrelated to any others through transposition, inversion, retrograde, and retrograde inversion.
- 126 unique twelve-tone rows by Schoenberg have been identified to date. This includes a new row (see item 3) discovered during the preparation of this exhibit in addition to the 125 rows previously identified by Jan Maegaard and Ethan Haimo.

Schoenberg used both German and English abbreviations to label his row forms depending on the works' place of origin. The German "T" for "Tonika" was used to indicate the basic set, while a "B" for "Basic set" was used for the American works. The German "U" for "Umkehrung", which does mean "inversion" in English, was used versus an "I" for the American works. A few sketches also contain a "K" for "Krebs", meaning "retrograde." The designations B-3 (or T-3), I4 (or U5), T+4 (or B+4), U-6 (or I-6), etc., indicate the transposition of the row in relation to the basic set. For example, a row marked B-3 is the basic set which has been transposed *up* the interval of a minor third, while a row marked B+3 has been transposed *up* a major third. Following the fundamental premise of inversion, then, a row marked U-6 is an inversion which has been transposed *down* the interval of a

minor sixth, while a row marked U +6 has been transposed down a major sixth. The perfect intervals 4, 5 and 8, which are not subject to the same major/minor designations, were generally not labelled with a plus or minus sign. The one exception is -5 which Schoenberg normally used to indicate a tritone transposition.

Schoenberg also developed a technique for using two different row forms simultaneously in which segments of the different row forms are combined to form a new row. For example, the first half of a basic set (i.e., a hexachord) at any transposition may be combined with the first hexachord of the inversion at the same transposition plus five half-steps without producing any duplicate pitches. The second hexachords of the same two rows may also be combined in this way. Schoenberg often arranged the basic and inverted row forms on his row charts and devices in this paired fashion.

The manuscript page displayed here is the first page of the Präludium from the Suite for Piano, op. 25, dated July 24, 1921. H. H. Stuckenschmidt, in his biography of Schoenberg, calls this movement, along with the Intermezzo from the same work, the "first strict results of this [twelve-tone] technique." Josef Rufer, in his *The Works of Arnold Schoenberg*, relates this now famous story in these words: "It must have been about the time of the composition of the Prelude [from op. 25] (end of July, 1921) when Schoenberg told me, during a stroll in Traunkirchen, 'Today I have discovered something which will assure the supremacy of German music for the next hundred years.' It was the method of composition with twelve tones related only to one another."

ASI Box 25 mfl 27a

2. Chromatic scale devices and charts.\* The writing out of chromatic scales on devices and charts was often a preliminary step in Schoenberg's twelve-tone writing. In this way he was immediately able to keep track of the pitches he had used in forming his twelve-tone rows. The large chart also demonstrates a different type of musical notation which Schoenberg developed and explained in his article "Eine neue Zwölftonschrift" ("A New Twelve-Tone Notation"), published in the periodical *Anbruch* in January 1925. Schoenberg found the traditional system of notation inadequate and difficult to read, especially when multiple sharp, flat, and natural signs are used to notate different pitches on the same line or space. His system consists of a three-line staff which pitches are placed in one of three fixed

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\*All of the twelve-tone devices and row charts displayed in this exhibit are the handiwork of Arnold Schoenberg.

positions between the lines or on the lines themselves, sometimes with the addition of a slanted “ledger-line” on top of, through, or below a note. This system, Schoenberg thought, would eliminate the need for cumbersome accidentals since each pitch would have its own fixed position on the staff. On this chart Schoenberg has written out continuous chromatic scales in traditional notation on the five-line staves at the top and bottom of the chart. The inner, three-line staves show the same pitches written in Schoenberg’s notation.

ASI Drawer 21 (Compositional Devices)

3. Cylindrical devices. Encircling each of these cylindrical devices are strips of music paper on which Schoenberg has notated chromatic scales. Schoenberg could compose a twelve-tone row by rotating the strips of music paper into position, and could then find the transpositions of the row by simply rotating the entire device. The device on the left, lying horizontally, is evidence of an exciting discovery which was made during the preparation of this exhibit. Because of the remaining bits of tape and the darkened spots of tape residue on the strips of music paper where tape had once been, it was evident that Schoenberg was attempting to hold the strips in a particular position, and therefore in a specific twelve-tone row. This is a new twelve-tone row which has not been identified by either Jan Maegaard or Ethan Haimo, two musicologists who have done major research into the identification of Schoenberg’s twelve-tone rows. One of the strips of music paper is missing which, at first glance, makes the row incomplete. However, by piecing together the strips of music paper according to the pattern of residue left from the tape, the missing note was identified. Hence, the new row, the 126th of Schoenberg’s twelve-tone rows, is this:

ASI Drawer 21 (Compositional Devices)



4. Folding row charts. A very easy and logical way for Schoenberg to keep track of his rows was to simply write out the basic set and its inversion with all of their transpositions. There was no need to write out the retrograde and retrograde inversion forms since these forms could be derived simply by reading the appropriate B or I row from right to left. In all of these charts

Schoenberg paired the B forms with the I forms whose first or second hexachords could be combined to form a new row. The book-like construction of these examples made it easy for Schoenberg to carry them around as needed. The manuscript example, with its accompanying row chart (Example A), is an early sketch from the Piano Concerto op. 42, completed in 1942. Malcolm MacDonald, in his biography of Schoenberg, wrote that the Piano Concerto has “some of the most whistleable tunes in twelve-tone music.” The highlighted passage is the basic set: ASI Box 46 mfl 113



Examples:

- A) Piano Concerto op. 42 [ASI Box 46 mfl 112]
- B) String Quartet no. 4, op. 37 [ASI Box 41 ]
- C) *Israel Exists Again* [ASI Box 93 mfl U417]
- D) Symphony (1937) [ASI Box 92 mfl U312]

5. Multi-fold Row Chart. This accordion-like, multi-fold row chart was constructed for the composition of the String Quartet no. 3 op. 30, commissioned by Elizabeth Sprague Coolidge and written in 1927. It was about the first movement of this quartet that Schoenberg wrote, “As a little boy I was tormented by a picture of a scene from a fairy tale ‘Das Gespensterschiff’ (The Ghostship) whose captain had been nailed through the head to the top mast by his rebellious crew. I am sure that this was not the ‘program’ of the first movement of the third string quartet. But it might have been—subconsciously—a very gruesome premonition which caused me to write this work, because as often as I thought about this movement that picture came to my mind.” The manner of construction of this device allowed Schoenberg to manipulate his rows in a more complex way. The first panel on the left contains the basic set and its inversion at all transpositions divided by bold black lines into segments of five-two-five. When the chart is folded at its hinges so that the next panel of pitches overlays the first, twenty-four new rows are created because this second panel contains reorderings of the last seven pitches. Finally, when the verso of the end panel marked “III. Streichquartett” is folded over the second panel, another twenty-four rows are created because here again Schoenberg has reordered the last seven pitches. Essentially, then, Schoenberg had seventy-two row at his fingertips, not counting the retrograde and retrograde inversion forms. The manuscript:



example is a sketch from the first movement of the String Quartet no. 3, op. 30. The highlighted passage is the inversion of the basic set transposed down a fifth:

ASI Box 30 mfl 1000



Example:

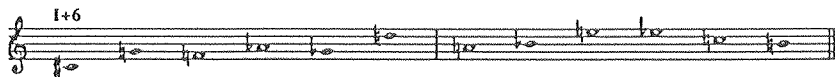
A) String Quartet no. 3, op. 30 [ASI Box 30 mfl 1002]

6. Simple One-Page Row Charts. Like the folding row charts, the one-page row chart was again an easy, at-a-glance way for Schoenberg to keep track of some or all of his row forms. Example B again shows the pairing of basic and inverted row forms whose first or second hexachords may be combined in new rows.

This manuscript page is the first page of Variation VI from the Variations for Orchestra op. 31, completed in 1928. The Variations was Schoenberg's first purely orchestral work since the Orchestral Songs op. 22, completed in 1916. Early on, one of Schoenberg's primary concerns in applying his twelve-tone method to a composition for large orchestra was the avoidance of octave doublings between instruments. Schoenberg wrote in his 1941 lecture *Composition with Twelve Tones* that, "To double is to emphasize and an emphasized tone could be interpreted as a root, or even as a tonic; the consequences of such an interpretation must be avoided." Schoenberg was able to achieve this goal through his characteristically thin and transparent orchestral scoring. However, octave doublings do occur in some of his later works, so at some point he must have reconsidered his view.

The highlighted passage, marked I+6, is the inversion of the basic set transposed down a major sixth:

ASI Box 31 mfl 1566



Examples:

A) Variations for Orchestra op. 31 [ASI Box 31 mfl U537/1646A]

B) String Trio op. 45 [ASI Box 49]

C) Unidentified [ASI Box 97]

7. Two-Directional One-Page Row Charts. These exceptionally clever devices, both constructed for the composition of the Suite op. 29, completed in 1926, are a bit deceiving. At first glance it appears as though Schoenberg

has only written out one chart of twelve-tone rows, along with some seemingly misplaced accidentals, when in fact there are two charts present formed from a single penning of the notes. Schoenberg used this grid-like structure of red and black staves to arrange the order of both his basic and inverted row forms so that the basic forms may be read on the red staves, and the inverted forms, after rotating the charts ninety degrees, on the black staves. On the larger square chart (Example B) Schoenberg has also used red and black slur marks to outline three- and four-note segments in each of the rows. The square chart has G clefs along the appropriate two sides of the chart, as well as row designations (T+2, U8, etc.) for each group. The smaller rectangular chart (Example A) has G clefs only for the black staves along with some curious row designations. The significance of these designations is unknown.

The Suite op. 29 for piano, E-flat clarinet, clarinet, bass clarinet, violin, viola, and violoncello (page one shown here), was completed in 1925 as a kind of wedding present for Schoenberg's wife Gertrud. Not only did Schoenberg dedicate this work to her with the inscription at the top of page one, "Eigentum meiner lieben Trude (geb. Kolisch) aus der Wiedner Hauptstrasse 18./III.15 [i.e., 25] Arnold Schönberg aus Mödling, Bernhargasse 6" ("Property of my dear Trude, née Kolisch..."), he also incorporated the notes G and E-flat, which in German are G and Es (Gertrud's initials), into the beginning and ending of every movement of the Suite.

The highlighted passage is the basic set:

ASI Box 29 mfl 1113



Examples:

A) Suite op. 29 [ASI Box 29 mfl 1179]

B) Suite op. 29 [ASI Box 29 ]

*"I do not compose principles, but music."*

Arnold Schoenberg, letter to René Leibowitz  
dated October 1, 1945 (translated by Erwin Stein)

8. Selected Paired Row Forms Affixed to Cardboard. This is one of several devices and row charts found in the legacy which were constructed for the composition of Schoenberg's most ambitious, albeit unfinished, twelve-tone work, the opera *Moses und Aron*. Schoenberg wrote the text for all three acts of this opera, but set to music only the first two acts, primarily between July 7, 1930 and March 10, 1932. *Moses und Aron* is remarkable in that the entire

opera is based on a single twelve-tone row and every one of the opera's more than 2,000 measures of music can be related to this row. This is what Schoenberg had been striving for in his development of the "Method of Composing with Twelve Tones," that the twelve-tone row could be used as a viable unifying element in the composition of a complex, large-scale work. As Schoenberg wrote in his 1941 lecture *Composition with Twelve Tones*, "In the first works in which I employed this method, I was not yet convinced that the exclusive use of one set would not result in monotony. Would it allow the creation of a sufficient number of characteristically differentiated themes, phrases, motives, sentences, and other forms? At this time I used complicated devices to assure variety. But soon I discovered that my fear was unfounded; I could even base a whole opera, *Moses und Aron*, solely on one set; and I found that, on the contrary, the more familiar I became with this set the more easily I could draw themes from it. Thus, the truth of my first prediction had received splendid proof. One has to follow the basic set; but, nevertheless, one composes as freely as before."

The highlighted passage, measure 697 from the first act of *Moses und Aron*, is the basic set transposed up a major seventh divided between the violins and the clarinets:

ASI Box 63 mfl 2831



Example:

A) *Moses und Aron* [ASI Box 63 mfl 3062]

9. Loosely Attached, Booklet-Type Row Charts of Combined Row Forms. The sheer number of this type of device suggests that it was a popular one with Schoenberg, especially in some of his later works. In all of the examples except for Example G, Schoenberg has written out on long horizontal strips of music paper the basic and inverted forms of the rows he wishes to combine, some of which he has affixed to heavy pieces of cardboard. These strips are then attached or "bound" on one side using such materials as metal rings, strips of leather, string and wire. This construction forms a kind of booklet which Schoenberg could page through to find a specific combination of row forms. Example G contains various "experiments" or "exercises" with pairs of chromatic scales beginning on the same or differing pitches moving in contrary motion from one another. Schoenberg may have been looking for common properties in these scale combinations because on one page he has

marked where two pitches occur simultaneously in the opposing chromatic scales.

The single-movement Phantasy for Violin with Piano Accompaniment op. 47 was composed between March 3 and March 22, 1949. Schoenberg's wording of the title of this his last instrumental work is deliberate; it was his intention that the violin be the dominant soloistic instrument throughout the piece. Schoenberg briefly described his compositional procedure in a letter to Josef Rufer dated February 5, 1951: "In order to write this piece entirely in the form of a solo work for violin, I first of all wrote the whole violin part and then added the piano accompaniment." The highlighted passage from the draft of violin part is the inversion of the basic set transposed down a fifth:

ASI Box 51 mfl 1070



Examples:

- A) Phantasy for Violin with Piano Accompaniment op. 47 [ASI Box 51]
- B) *Moses und Aron* [ASI Box 63]
- C) Violin Concerto op. 36 [ASI Box 40]
- D) *Moderne Psalmen* op. 50C [ASI Box 56]
- E) *A Survivor from Warsaw* op. 46 [ASI Box 50]
- F) *Israel Exists Again* [ASI Box 93]
- G) Compositional Devices [ASI Drawer 21]

10. Vertically Bound Booklets of Row Charts. These booklets are perhaps Schoenberg's most aesthetically pleasing twelve-tone devices since they employ another one of his many talents and hobbies—bookbinding. Like many of the volumes in Schoenberg's personal library of music scores and books, Schoenberg hand-bound these booklets himself. Example C is especially beautiful with its flowered cloth spine and colorful lines around the word "Umkehrungen" on the cover. Aside from the yellow-green booklet constructed for the composition of the Violin Concerto op. 36 (Example A) and the brown paper-wrapped booklet (Example B), these examples all again contain experiments or exercises with pairs of chromatic scales moving in contrary motion. Example B contains all of the basic and inverted forms of a row which has not been associated with any of Schoenberg's compositions.

The Violin Concerto op. 36, completed in 1936, was one of Schoenberg's first American works. The solo violin part is one of the most technically difficult in the repertoire, so much so that Schoenberg once remarked that a



The entire folder lies flat so that Schoenberg could have either flipped through the cards or simply pulled the appropriate one out as needed. The inside of the back cover contains some rather complicated mathematical computations. This device, like the folding row chart in item 4, was constructed for the composition of the Piano Concerto op. 42. The manuscript page is from the holograph fair copy. The highlighted passage is the basic set: ASI Box 46 mfl 149



Example:

A) Piano Concerto op. 42 [ASI Box 46]

13. Twelve Cards of Graduated Sizes Standing Upright in a Box. The design of this device goes perhaps one step further than the similarly designed cards in item 12. Schoenberg constructed these boxes with sloping sides and tall backs to hold the cards in an upright position.

The String Quartet no. 4 op. 37, completed in 1936, was, like the String Quartet no. 3 op. 30, also commissioned by Elizabeth Sprague Coolidge and was dedicated to her and to the Kolisch Quartet with these words: "To the ideal patron of chamber music Elizabeth Sprague Coolidge and to the ideal interpreters of it The Kolisch Quartet." In the String Quartet no. 4 Schoenberg employed a number of colorful string playing techniques, such as variation between harmonics, pizzicato, tremolo on the bridge, and playing on the fingerboard, which he had not frequently used in his previous string quartets. Willi Schuh, writing in the *Neue Zürcher Zeitung* after a performance of the String Quartet no. 4 by the Amsterdam String Quartet on November 6, 1949, called this quartet "Schoenberg's most important statement in the field of chamber music." The highlighted passage in this sketch from the fourth movement is the retrograde of the basic set transposed up a major seventh: ASI Box 41 mfl 1016



Examples:

- A) String Quartet no. 4, op. 37 [ASI Box 41]
- B) Violin Concerto op. 36 [ASI Box 40]
- C) *Moses und Aron* [ASI Box 63]
- D) Symphony (1937) [ASI Box 92]







The manuscript page is from the holograph fair copy of the third movement, Thema mit Variationen, of the Suite op. 29. The highlighted passage is the retrograde of the basic set divided between the bass clarinet and piano:

ASI Box 29 mfl 1154



Examples:

A) Suite op. 29 [ASI Box 29]

B) Compositional Devices [ASI Drawer 21]

18. Slide Rule with Basic Set Only. This second type of slide rule-like device, along with the third type in item 19, does not show a musically notated row form, only typed pitch names. This device was constructed for the composition of the *Sonnett Nr. 217 von Petrarca*, the fourth movement from the Serenade op. 24 for clarinet, bass clarinet, mandolin, guitar, violin, viola, violoncello, with baritone voice added in this movement only. The *Sonnett*, which was written in April 1924, employs, in Schoenberg's words, a "relatively primitive" twelve-tone technique. It is the only twelve-tone movement in the Serenade op. 24 and its vocal line is composed from a single row form, the basic set, which is typed on this slide rule. This row also serves as the basis for all of the instrumental parts. The poem consists of fourteen lines of eleven syllables each. The first line of the poem is set to the basic set, breaking off after the eleventh note, G. The second line of the poem begins on the twelfth note, B-flat, and continues with the beginning of the basic set, breaking off after the tenth note, F. The third line begins on the eleventh note, and so on. Schoenberg continues with this "cyclic" pattern through the poem and it is not until the thirteenth line of the poem that the basic set is again heard beginning on its first note. The intervals of the row are altered through octave transposition and this, together with rhythmic changes, varies the row enough so that the ear does not simply hear the basic set over and over again. The manuscript page is from a sketch of the vocal line of the *Sonnett*. The first three occurrences of the basic set as they correspond to the first three lines of the poem are highlighted:

ASI Box 24 mfl 859



Example:

A) Serenade op. 24, no. 4 [ASI Box 24]

19. Slide Rule with Basic Set and Inversion. The design of this slide rule, which was constructed for the composition of the Wind Quintet op. 26, is similar to the slide rule in item 18. Like item 18, this slide rule shows the basic set in typed capital letters and is not musically notated, but it also shows the inversion of the basic set typed in small letters above the basic set. The basic set is interesting in that its second hexachord, beginning on B-flat (except for the last note, F), follows the the course of the first hexachord but at a fifth higher. Schoenberg took advantage of this aspect of the basic set by at times stating the first hexachord in one instrument, only to be answered a fifth higher by another instrument. This gives some passages in the Wind Quintet a pseudo-tonal character, an interesting paradox in a twelve-tone composition whose very purpose it is to exclude consonance and tonality.

The manuscript page is from a sketch of the fourth movement, Finale, from the Wind Quintet op. 26. The highlighted passage is the basic set:

ASI Box 79 mfl Sk517



Example:

A) Wind Quintet op. 26 [ASI Box 26]

20. Row Charts Constructed of Vertical Strips with Sliding “Windows.” These maneuverable row charts were also constructed for the composition of the String Quartet no. 3 op. 30 (see item 5). It is obvious that a great deal of effort went into their assembly. It appears that Schoenberg wrote out the twelve chromatic scales on vertical strips of music paper, then formed his basic set (T) by interchanging the strips. The inversion (U) was also constructed in the same manner. In this way all of the transposition were ready-made. Once he was satisfied with his rows, Schoenberg then fastened the strips into position on cardboard. Next, Schoenberg fastened pieces of cardboard around the charts which could be slid up and down. Into these he cut out “windows”—rectangular holes just large enough to isolate a specific row. A feature of his multi-fold row chart for the String Quartet no. 3 op. 30 (see item 5) is again present in these charts. Schoenberg has divided his rows into segments of five-two-five, on the large chart (Example B) with pink lines, on the two small charts (Example A) with gold cord. It is not clear why Schoenberg went to so much effort to make essentially two of the same row chart as the large chart is merely a combination of the two smaller charts.

The highlighted row, the basic set, is from an early sketch of the Intermezzo from the String Quartet no. 3 op. 30:

ASI Box 30 mfl 996



Examples:

A) String Quartet no. 3, op. 30 [ASI Box 30]

B) String Quartet no. 3, op. 30 [ASI Box 30 mfl 1001]

21. Circular Devices. These circular devices, formed of moveable concentric circles, afforded Schoenberg another easy way of determining row transpositions. Of the three examples here, two are unidentified. The smaller, multicolored device (Example B) is missing most of the pitch names which were originally affixed around the middle circle. Example C is blank and was obviously never used in composition. But the number of concentric circles on this device suggests that Schoenberg may possibly have intended to use it in transposing more than one row form at a time. Example A, which was also constructed for the composition of the Wind Quintet op. 26 (see item 20), allowed Schoenberg to easily transpose the basic set. In addition, one transposition of the inversion of the basic set can be deduced from this device, but the construction of the device does not allow for any further transposition of the inversion. The largest circle, which rests upon a cardboard base, is divided into twelve sections and has, when read clockwise, a descending chromatic scale written on the circular music staff. The next size circle, which is affixed to the largest circle, is also divided into twelve sections and has the numbers one through twelve written on it in a specific manner. The smaller middle circle, which is moveable, is again divided into twelve sections and has, when read clockwise, an ascending chromatic scale written on the circular music staff. But it is the placement of the numbers on the middle circle that is the key to the use of this device. When the middle circle is positioned so that the D-sharp is lined up with the number 1, the pitches of the basic set are formed by locating the pitches which are lined up with the remaining numbers on the middle circle. In order to transpose the basic set so that it begins on B, the middle circle must be positioned so that the B on the staff is lined up with the number 1, and so on. The inversion of the basic set beginning on A may be determined by locating the pitches which correspond with the numbers on the largest circle. If Schoenberg had made the middle circle moveable, he would have been able to form transpositions of the inversion, but he obviously had a reason for affixing it in its present position. The manuscript page is from a sketch of the Wind Quintet op. 26.

The highlighted passage is the inversion of the basic set transposed down a fourth:  
ASI Box 79 mfl Sk531



Examples:

- A) Wind Quintet op. 26 [ASI Box 79]
- B) Compositional Devices [ASI Drawer 21]
- C) Compositional Devices [ASI Drawer 21]

22. Red Dice with German Pitch Names in Black. If only Schoenberg himself were here to explain his purpose for these dice! Were they a game for his children? Were they used for compositional purposes? Why did he choose to position the pitch names where he did? Unfortunately, these questions cannot now be answered, but some facts about the dice can be deduced. Each of the twelve pitches of the chromatic scale is written on one of the twelve sides of the dice. The pitches have been divided between the dice so that every other pitch of the chromatic scale has been assigned to each die. In other words, C appears on one die, C-sharp on the other; D on one die, D-sharp on the other, and so on. Thus, if the German pitch names on each die are written out in scale order beginning on C, the pitches on each die are a whole step apart:

Left: C, D, E, Fis (F-sharp), As (A-flat), B (B-flat)

Right: Cis (C-sharp), Dis (D-sharp), F, G, A, H (B)

Obviously then, when the dice are “rolled” certain combinations of pitches will never come up together because of their positions on opposite sides of the dice. These combinations are: C/F-sharp, D/B-flat, E/A-flat, F/A, G/C-sharp, B/D-sharp. But even with the determination of these facts, the question still remains, why? ASI Drawer 21 (Compositional Devices)

23. Pitch Names on Colored Cardboard, Multiple Pieces. All of these small colored pieces of cardboard were found in this brown envelope printed with Verein für musikalische Privatafführungen. With the exception of the single piece marked “Gis” (G-sharp), there are either six or seven colored pieces for each pitch name, which probably means that several pieces are missing given that the same colors were used for each stack of cardboard pieces. But did any of these colors have a particular meaning or purpose? If the pieces were used for composition, were only like colors used together? Or, could each of the seven colors have represented a particular octave, as in a

keyboard? Once again, there can only be speculation as to how Schoenberg might have used all of these pieces.

#### ASI Drawer 21 (Compositional Devices)

24. Notated Pitches and Clefs on Small Pieces of Cardboard in Handmade Box. One of the most interesting things about this item is the effort and detail Schoenberg put into its construction. The box is made of thin pieces of plywood and each little compartment is divided and lined with music paper. The top is hinged with cloth tape and Schoenberg even fashioned a latching mechanism to keep the box closed. In addition, each bundle of cardboard pieces was carefully wrapped in a small piece of brown paper. Unfortunately, a number of the cardboard pieces seem to be missing, but here again some facts may be deduced and a parallel may be drawn with the colored pieces in item 23. Of the remaining bundles of pieces it is obvious that Schoenberg intended for each of the compartments to hold pieces which make up a complete chromatic scale. Also, it is evident from the remaining pieces that each scale was intended to be in a particular clef (a G clef, an F clef, or one of the moveable C clefs), and therefore in a particular octave. Something that is not clear is why Schoenberg used two colors of ink, red and black, in varying ways on most of the pieces, and brown and green pencil on at least one set of the pieces. The similarity with item 23 is this: in item 23 Schoenberg used, or intended to use, seven colors for each pitch name. In this item there are seven compartments in the box, each probably intended to hold one octave of a chromatic scale. But the question remains, in what way, if any, did Schoenberg use these pieces to help him compose?

#### ASI Drawer 21 (Compositional Devices)

*“Whether one calls oneself conservative or revolutionary, whether one composes in a conventional or progressive manner, whether one tries to imitate old styles or is destined to express new ideas— whether one is a good composer or not—one must be convinced of the infallibility of one’s own fantasy and one must believe in one’s own inspiration.”*

*Arnold Schoenberg, Composition with Twelve Tones (1941)*

## Compositions Represented in the Exhibit

Composition	Exhibit Item(s)
(1920) Passacaglia for Orchestra	11
(1923) Suite for Piano op. 25	1
(1923) Serenade op. 24, no. 4	18
(1924) Wind Quintet op. 26	19, 21
(1925) Suite op. 29	7, 17
(1927) String Quartet no. 3, op. 30	5, 20
(1928) Variations for Orchestra op. 31	6
(1932) <i>Moses und Aron</i>	8, 9, 11, 13, 15
(1936) Violin Concerto op. 36	9, 10, 13, 16
(1936) String Quartet no. 4, op. 37	4, 13
(1937) Symphony	4, 13
(1942) Piano Concerto op. 42	4, 12
(1946) String Trio op. 45	6
(1947) <i>A Survivor from Warsaw</i> op. 46	9
(1949) <i>Israel Exists Again</i>	4, 9
(1949) Phantasy op. 47	9
(1950) <i>De Profundis</i> op. 50B	14
(1950) <i>Moderne Psalmen</i> op. 50C	9
Compositional Devices (Other)	2, 3, 9, 10, 13, 17, 21, 22, 24
Unidentified	6, 10, 15