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Twelve-Tone Technique: *A Quick Reference*

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What is it?

The Twelve-Tone Technique is a compositional method devised by Arnold Schoenberg between the late 1910's and the early 1920's. It is meant to make it easier for the composer to structure atonal music, by providing a series of guiding principles and procedures.

A short historical note:

Schoenberg was not the only one to come up with a twelve-tone method. Other composers, such as Josef Matthias Hauer and Charles Ives also developed similar systematic uses of the chromatic scale, but Schoenberg's method is historically most significant.

Why use it?

Tonal music is bound by the traditional principles of cadences, modulations, diatonic scales, the functional hierarchy of scale degrees (tonic, dominant, subdominant, etc.), and so on. When writing atonal music, the composer has to leave behind many, if not all, of those traditional principles of tonality. The composer can no longer count on those fundamental principles to provide guidelines and structure to the musical work and, as a result, writing atonal music can become increasingly difficult and uncertain.

Schoenberg struggled for many years trying to find a solution to this dilemma, and eventually decided to use a method of pitch organization that could guarantee the dissolution of tonality in a musical work, and at the same time provide means for musical, thematic and structural development in an atonal composition. Thus, the twelve-tone technique can serve as a substitute, in atonal music, for the fundamental principles of tonality.

How does it work?

In its strict usage, the twelve-tone technique is quite simple:

- First, the composer has to "invent" a twelve-tone row. This row will contain all the twelve pitches of the chromatic scale, and they will be arranged in whichever order the composer finds suitable. This row will be used as a sort of generative seed for the creation of a composition
- The row will then be used as melodic or chordal material throughout the piece, with one fundamental rule: once a pitch has been used, it cannot be reused until all the other remaining pitches of the twelve-tone row have been used.

This rule forces equality between all pitches of the chromatic scale, avoiding preference and thus eliminating the chance for the establishment of tonality.

- Composing a piece just using a particular twelve-tone row has the potential of being very limiting and restrictive. Thus, to expand the compositional possibilities of the twelve-tone technique, the composer is allowed to manipulate the twelve-tone row in several ways: by making a retrograde out of it, by inverting its intervallic content, by transposing it, and by splitting it into several subsets. These types of row manipulation will be explained in the next pages.

The composer can then use any of these manipulations of the twelve-tone row in the piece, either separately or simultaneously. In addition, the composer can also introduce new twelve-tone rows, and manipulate them throughout the same piece of music.

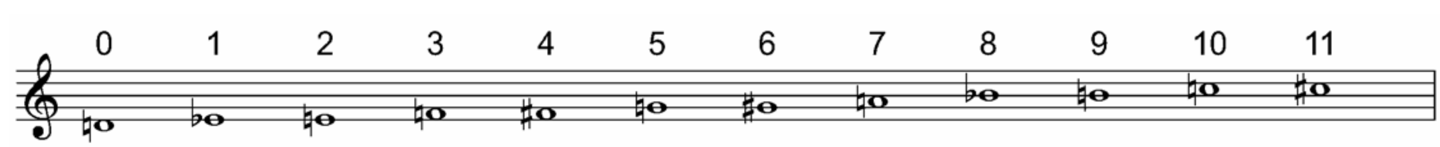
As you can see by now, the twelve-tone technique provides endless compositional possibilities, while at the same time establishing fundamental principles for the creation of atonal music. It is important to note at this point that the Schoenberg's twelve-tone technique does not have to become an absolute for the creation of a piece of music. Composers who have adopted the method, including Schoenberg himself, have been quite liberal in its application and usage. Many composers even use it as a form of creative tool that can be used in addition, or in combination to other compositional techniques.

In the following pages we will be discussing basic ways of manipulating a twelve-tone row, and how to implement the row and its possible manipulations in a piece of music…

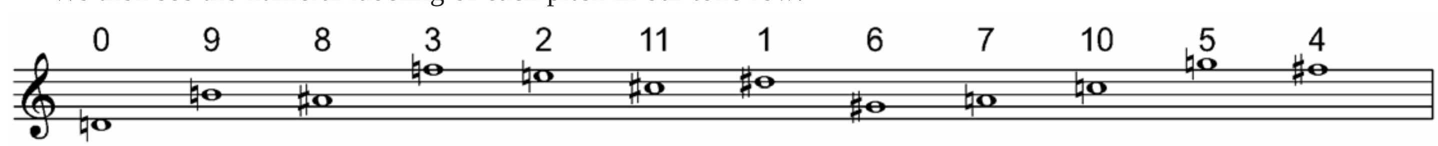
Here we have our example of a 12-tone row (tone row, or simply row)

Note how every single note shows an accidental. Although this is not entirely necessary, it is commonly done to clarify the actual pitch:

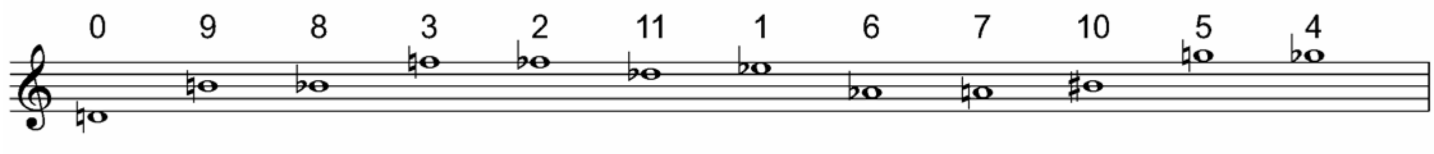
We take the first note of our tone row as a point of departure, and thus we label it with number 0. We then label all the other pitches of the ascending chromatic scale according to their position from the point of departure (and according to the number of semitones counting from the point of departure):



We then see the numeral labeling of each pitch in our tone row:



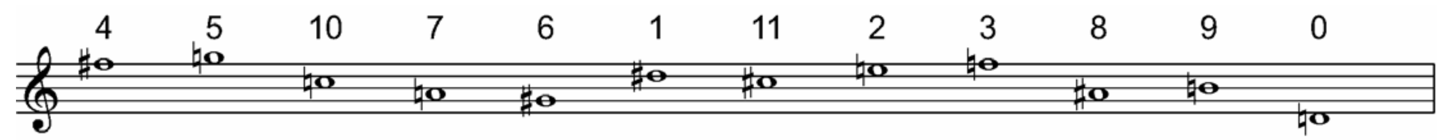
We now show how the tone row stays the same regardless of what enharmonics we use. Remember that, for example, an A-sharp and a B-flat are the same pitch class:



Pitch classes exist independently of the octave they appear in. Because of this, we can displace any of the pitches in a row to different octaves, and the row is still maintained:

Here we have again our example tone row. This unadultered presentation of the row is called the *Prime series*, or simply **P** :

We can flip the tone row backwards (starting with the end of the row). This form of the row is called a *Retrograde*, or simply **R** :

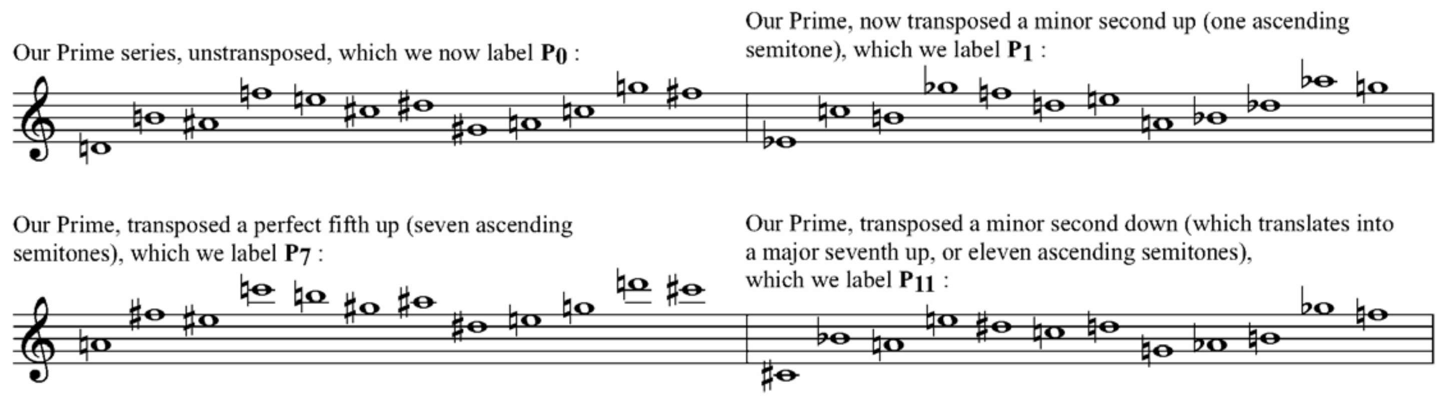


We can also flip the tone row as if we put a mirror right below it: the direction of the intervals is inverted so that, for example, an ascending minor third becomes a descending minor third.

This is called an *Inversion* of the row, or simply **I**:

Of course, we can have a *Retrograde Inversion* (**RI**), by simply creating a Retrograde of our Inverted tone row:

The tone row, in any of its forms, can be transposed. To show the level of transposition we are applying, we use a number that represents how many ascending semitones we are transposing the row. For instance, if we transpose the row a perfect fifth up, our transposition number (or value) will be 7. If we transpose the row a perfect fourth down, the transposition value will also be 7, because we are always counting the number of ascending semitones! Transposing the row a major third up will produce a transposition value of 4, while transposing the row a major third down will produce a value of 8 (a descending major third inverts to an ascending minor sixth).



We can also transpose the Retrograde (R), Inversion (I) or Retrograde Inversion (RI) if we want. For example:

The Retrograde of a row, transposed a perfect fifth up, would be labeled $\mathbf{R}_7$

The Inversion of a row, transposed a major second up, would be labeled $\mathbf{I}_2$

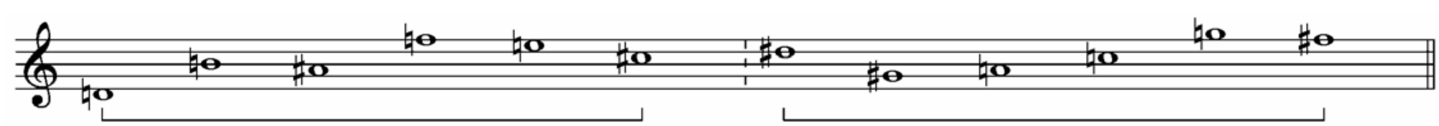
The Retrograde Inversion of a row, transposed a tritone up or down, would be $\mathbf{R}_{16}$

Please note that using a subscript for the transpositional value is highly recommended, but not absolutely necessary. Thus, for example, P8 can also be written as just P8

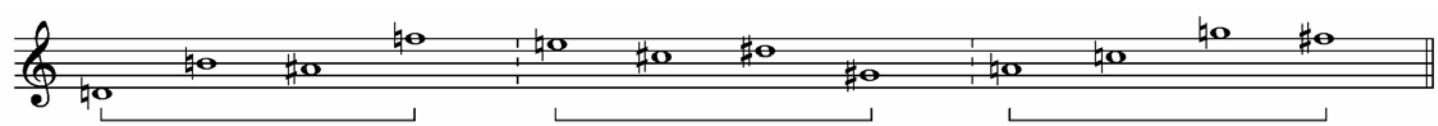
A tone row and any of its variants (P, R, I, RI or any transposition of any of these forms) can also be split into several sections (or subsets of the row), so that each section can be used individually or in combination with the other sections. In theory, the possibilities for subdividing the row are endless; however, keeping the identity of the row can be an important factor.

The simplest form of subdivision is to split the row into subsets of equal size; in other words, each subset will have the same number of notes. In addition, the pitches of a subset are normally kept in their proper sequence, meaning that there are no jumps or modifications in the order of the row.

Our row, subdivided into two subsets, each having the same amount of notes.
Because each of these subsets has six pitch classes, they are called hexachords:



Our row, subdivided into three subsets, each having the same amount of notes.
Each of these subsets has four pitch classes, so they are called tetrachords:



Our row, subdivided into four subsets, each having the same amount of notes.
Each of these subsets has three pitch classes, thus they are called trichords:

Finally, we can put our tone row and its variants to use! The following musical example demonstrates the usage of the row as the Prime, the Retrograde and the Inverted. It also shows the Prime split into four trichords (subsets of three notes each), and how they can be used in vertical fashion (as chords). The example also illustrates octave displacement of pitches within a row: