Basic Pitch-Class Set Theory and Twelve-Tone Glossary

Pitches are notated using scientific pitch notation, where middle C = C4. Note that the guitar sounds an octave lower than written: in the text, notes are referred to by their sounding pitch.

Pitch classes (pcs) are labeled from 0 to 11: C = 0; C♯ = 1, D = 2, . . . , A = 9, B♭ = 10, B = 11. These labels apply to all enharmonic equivalents: for example, 0 stands for B♯, C, D𝄫. 10 and 11 are abbreviated as T and E.

ic *n* = interval class *n* (*n* refers to the number of semitones).

Prime-form set classes are represented by [square brackets]; **normal-form** pitch-class sets by {curly brackets}. (For readers who would appreciate a quick summary of these terms, see the brief explanation of set-theoretical terminology below.)

[***m*** = ***n***] (e.g., [034 = 014]) This notation illustrates that two sets (usually a normal form and a prime form) are inversionally equivalent.

<**Angle brackets**> represent sets either of pcs, ics, or pitches as they appear literally on the surface of the music; context makes the distinction clear. (Pitches are separated by commas; integers are not.)

Individual angle brackets represent either set-class expansion (<) or contraction (>): e.g., [0123] < [0246] > [0123].

Commas separate members of sets when they consist (or might consist) of more than one character, as in scientific pitch notation: {012}, <012>, but {C1, C♯3, D2} and <C1, C♯3, D2>.

Fuzzy transposition/inversion ($T/I_n^{*(n)}$) When a set gets larger or smaller, it is sometimes possible to understand it as a transposition or inversion (always around 0) of a pc set in *all voices but one*, which might be a number of semitones offset from its intended destination (hence the overall contraction or enlargement). This is

Oliver Chandler, *A Twelve-Tone Repertory for Guitar: Julian Bream and the British Serialists, 1956–1983*. GFA Refereed Monograph Series, vol. 4.

represented by an asterisk and a superscript number, which indicate and record the degree(s) of semitonal offset, respectively, as in the following example:

$$\{012\} \xrightarrow{T_7^{*(1)}} \{78T\}$$

Crucially, because these operations are not one-to-one, there are usually a number of possible offset transpositions/inversions possible. I try to label only those that I think are musically salient. See Joseph N. Straus, "Uniformity, Balance, and Smoothness in Atonal Voice Leading," *Music Theory Spectrum* 25, no. 2 (2003): 305–52, particularly his discussion of voice-leading "consistency" and "uniformity": 315; 318–9.

T_nI = invert around 0 and then transpose by *n*. T_n, I_n = transpose by *n* and then invert by *n*. The addition of the comma indicates a linear, cumulative process.

Integers *in bold* **between angle brackets** represent row order numbers rather than pitch classes: e.g., <0–1> equals the first two pitch classes of a given row.

Row Forms and Nomenclature

Prime forms of the row read horizontally, left to right. P_0 denotes the prime form that starts with 0.

Inverted forms of the row read vertically, top to bottom. I_0 denotes the inversion that starts with 0.

Retrograded forms of the row read horizontally, right to left. R_0 denotes the retrograde that ends with 0 (i.e., the retrograde of P_0).

Retrograde inverted forms of the row read vertically, bottom to top. RI_0 denotes the retrograde inversion that ends with 0 (i.e., the retrograde of I_0).

A Very Brief Explanation of Set-Theoretical Terminology

A succession of given pitch classes in a piece of music, e.g., <8T91> <G♯, B♭, A, C♯>, written out in its most compressed possible form (i.e., packed toward the left-hand side), e.g., {89T1} {G♯, A, B♭, C♯}, represents the *normal form* of a pc set. For ease of comparison, normal-form sets can be transposed to 0; this often produces a *prime-form* set, e.g., [0125]—the equivalent of transposing a series of extended tonal chords back to C major.

Note that some normal-form sets, e.g., {248} {D, E, A♭} and {268} {D, F♯, G♯}, might suggest different prime forms, e.g., [026] and [046]; but, the latter sc is an inversion of the former, because they contain the same intervals in reverse order: <+2, +4>;

<+4+2>. It is best, therefore, to use the most "rationalized" form, [026], which has the smallest interval (a whole tone) stacked toward the left-hand side: this is the genuine prime form.

Sets that are shown to have the same structure (when transposed to 0) belong to the same *set class*. "Structure" here simply denotes a particular series of ascending (or descending) intervals calculated from 0 (e.g., [0125] or [0246]). Distinct set classes may still have the same intervallic content (i.e., the same relative number of all possible interval classes) but that intervallic content will be distributed from 0 in a different way. Sets that have the same intervallic content, but different prime forms (e.g., [0146] and [0137], both of which are known as all-interval tetrachords because they contain one of every possible interval class between their four pitches), are described by the theorist Allen Forte as being *z-related*: *z* stands for "zygotic."

A Note on Chord Nomenclature

Seventh chords are always assumed to be dominant (e.g., C7) unless the root name is modified by either a lower-case "m" (which indicates a minor third and a minor seventh: e.g., Cm7) or a small upper-case "M" (which indicates a major third and a major seventh: e.g., CM7). Chord extensions beyond the seventh are shown in superscript and in descending order: e.g., $C7^{13/\sharp 11/9}$.

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