

## Basic Atonal Theory

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| <ol style="list-style-type: none"> <li>1. Pitch notation</li> <li>2. Octave equivalence</li> <li>3. Twelve-tone equal temperament (12TET)</li> <li>4. Enharmonic equivalence</li> <li>5. Pitch class (pc)             <ol style="list-style-type: none"> <li>a. Staff notation</li> <li>b. Letter name notation</li> <li>c. Integer notation</li> <li>d. Fixed-zero notation [C=0]</li> <li>e. Movable-zero notation</li> <li>f. TE substitution</li> </ol> </li> <li>6. Mathematical set theory             <ol style="list-style-type: none"> <li>a. Set notation</li> <li>b. Set relations (e.g., <math>\cup</math> and <math>\cap</math>)</li> <li>c. Other concepts (e.g., <math>\emptyset</math> and <math>U</math>)</li> </ol> </li> <li>7. Pitch-class set (pc set)</li> <li>8. Cardinality             <ol style="list-style-type: none"> <li>a. Set type under cardinality<sup>1</sup></li> </ol> </li> <li>9. Modulo 12 (Mod 12)             <ol style="list-style-type: none"> <li>a. PC clockface diagram</li> <li>b. Equivalence under Mod 12</li> </ol> </li> <li>10. Interval measurement             <ol style="list-style-type: none"> <li>a. 12TET semitone: the unit interval</li> <li>b. Traditional tonal interval conversion chart</li> <li>c. Equivalence under inversion</li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>11. Interval types             <ol style="list-style-type: none"> <li>a. Ordered pitch interval (opi)</li> <li>b. Ordered pitch-class interval (opci)</li> <li>c. Unordered pitch interval (upi)</li> <li>d. Unordered pitch-class interval (upci)</li> </ol> </li> <li>12. Interval class (ic)             <ol style="list-style-type: none"> <li>a. IC content of a pc set</li> <li>b. Straus IC content scoreboard</li> <li>c. IC vector (also called interval vector)</li> </ol> </li> <li>13. Normal form</li> <li>14. PC transformations             <ol style="list-style-type: none"> <li>a. Transposition (<math>T_n</math>)</li> <li>b. PC inversion (<math>I</math>)</li> <li>c. Inversion (<math>T_nI</math>)</li> </ol> </li> <li>15. Set class (equivalence under <math>T_n/T_nI</math>)             <ol style="list-style-type: none"> <li>a. Prime form</li> <li>b. Forte name</li> <li>c. Set class name</li> <li>d. <i>Set Class List</i></li> </ol> </li> <li>16. Z-relation</li> <li>17. Complement relation             <ol style="list-style-type: none"> <li>a. Complementary pc set</li> <li>b. Complementary set class</li> </ol> </li> <li>18. All-interval tetrachords: 4-Z15 and 4-Z29</li> <li>19. Self-complementary hexachords</li> <li>20. Segmentation and analysis</li> </ol> |
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### Atonal Theory Notation Quick Reference<sup>2</sup>

	<b>Letter Name</b>	<b>Integer [C=0]</b>
PC set:	(B $\flat$ ,A,C,B)	(10,9,0,11)
Normal form:	[A,B $\flat$ ,B,C]	[9,10,11, 0]
Prime form:	(0123)	
Forte name:	4-1	
Set class:	4-1 (0123)	
IC vector:	321000	
Complementary set class:	8-1 (01234567)	

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### For Study

Schoenberg, *Three Piano Pieces*, Op. 11, No. 1 (1909) and *Six Short Piano Pieces*, Op. 19, No. 6 (1911)  
 Webern *Five Pieces for Orchestra*, Op. 10, No. 1 (1911-13)  
 Varèse *Density 21.5* (1936)

### Reference

Bain, *Atonal Assistant*, Available at: <<http://reginaldbain.com/software/>>.  
 Forte, Allen. *The Structure of Atonal Music*. New Haven: Yale University Press, 1973.  
 Rahn, John. *Basic Atonal Theory*. New York: Longman, 1980.  
 Straus, Joseph. *Introduction to Post-Tonal Theory*, 3rd ed. Upper Saddle River, NJ: Prentice Hall, 2004.

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<sup>1</sup> Rahn (1980) provides the following names for the 13 set types formed under cardinality: 0—the *null set*; 1—*monad*; 2—*dyad*; 3—*trichord*; 4—*tetrachord*; 5—*pentachord*; 6—*hexachord*; 7—*septachord*, 8—*octachord*, 9—*nonachord*; 10—*decachord*; 11—*undecachord*; 12—*aggregate*.

<sup>2</sup> Notational conventions follow Straus 2004..