CHAPTER 39

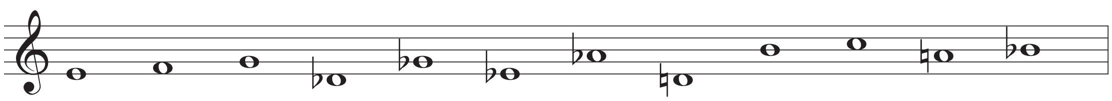
Serialism

SUPPLEMENTARY MATERIAL

Alternative Method for Completing Matrix

Building a twelve-tone matrix is a detailed and time-consuming process. There is a small margin for error, because any error that creeps into the matrix as you build it will be carried on throughout the remainder of your work as you transpose the rows.

An alternative method of building a matrix uses numbers instead of letters. This method has some similarity to set theory as discussed in the preceding chapter supplement. However, the number zero is not assigned to C, but instead represents the first note of the tone row. As an example, we will use the tone row of the Schoenberg Suite for Piano, op. 25, which was demonstrated in the textbook using letters. Here is the row on a staff and in its traditional format as the top row of a matrix.



E	F	G	D♭	G♭	E♭	A♭	D	B	C	A	B♭

When using numbers to build the matrix, the first note of the row is always zero. The element of the row that is a half step up from zero is 1, a whole step up is 2, and so on. It may be helpful to build a chart for reference, as shown to the right.

E=0	B♭=6
F=1	B=7
G♭=2	C=8
G=3	D♭=9
A♭=4	D=10
A=5	E♭=11

0	1	3	9	2	11	4	10	7	8	5	6

The next step, as in the traditional system, is to create the inversion row. This is accomplished by subtracting each of the prime row numbers from 12. This simplifies the process of creating the inversions. Move across the prime row from left to right, subtract each number from twelve, and enter the new number into the leftmost column spaces, as shown below. These number pairings are the same as those presented in Chapter 38, Table 41, on interval equivalence (see page 539 in the textbook).

0	1	3	9	2	11	4	10	7	8	5	6
11											
9											
3											
10											
1											
8											
2											
5											
4											
7											
6											

The final step is to transpose each row. Find the row that begins with 1 and compare it to the P^0 row. In each case, you will add 1 to the numbers in the P^0 row to complete the P^1 row. When you find 11 in the original row, adding 1 will give you 12, which is a higher number than you should use in the matrix. The number 12 is always equivalent to 0, so you should substitute 0 for 12 in the matrix.

The P^1 and P^2 rows are completed for you in the matrix that follows. By doing the row according to the numbers in the left-hand column, you will always be adding one to the previous row, and you will reduce the chance for errors dramatically.

0	1	3	9	2	11	4	10	7	8	5	6
11											
9											
3											
10											
1	2	4	10	3	0	5	11	8	9	6	7
8											
2	3	5	11	4	1	6	0	9	10	7	8
5											
4											
7											
6											

Once you have completed the matrix, the rows are numbered exactly as presented in the textbook. The prime and inversion row numbers will exactly match the numbers in the top row and left column. Continue to fill out the matrix above, then label all 48 versions of the row.

In order to use this numerical matrix for an analysis of a twelve-tone composition, you will need to convert the numbers back to letters (using the conversion chart on page 154 of this chapter supplement) or learn to read the music based on the numerical equivalents of pitches. Either way, you may find that this process saves time and reduces errors when creating a matrix.

Total Serialization

The idea of serializing the pitches of a composition led other composers to consider serializing other elements of music. The first composers to experiment with this compositional technique were Milton Babbitt in the United States, Pierre Boulez in France, and Karlheinz Stockhausen in Germany. The earliest compositions using total serialization date from the late 1940s.

Among the elements of music that composers controlled with serial techniques were rhythm (duration), dynamics, articulation, timbre, and texture. The most interesting outcome of the application of serial techniques to all of these elements is that the compositions took on a quality of randomness, particularly due to inability of human hearing to grasp the detailed organization of the music. Music composed using the technique of total serialization was often meant to be performed by a computer.