

6.15 Surviving Serialism 3: Inversion, R, RI Secrets

Inversion (as used in serialism)

Consider the following half step interval relationships for an example interval C-E:

Original example interval:

+4 half steps

Inversion (direction reversed):

-4 half steps +12 half steps → = +8 half steps
(inversion of C-E) (raise an octave) (-4+12=8)

In fact, the inversion of an interval is always related to the original as the remainder from 12...

...for any positive (upward) interval of x half steps less than an octave, $12 - x = \text{inversion}$.

So, to *invert* the prime form, *subtract each number* (except zero) *from 12*.

As an example, given this prime form...

P_0
0 11 7 4 5 9 8 10 1 6 2 3
(=half steps above the first note B \flat)

...here's how to build the inversion:

I_0 B \flat
0 1 5 8 7 3 4 2 11 6 10 9
=12-11 =12-7 =12-4 =12-5 =12-9 =12-8 =12-10 =12-1 =12-6 =12-2 =12-3

2. Second, go up the chromatic scale with the new numbers using the method we used for transposition:

I_0 B \flat
0 1 5 8 7 3 4 2 11 6 10 9

I_0 C \sharp
0 1 5 8 7 3 4 2 11 6 10 9

Continuing up the chromatic scale, 3 is C#, 4 is D \sharp , 5 is E \flat , 6 is E \sharp , 7 is F \sharp , 8 is F \natural , 9 is G \sharp , 10 is A \flat , and 11 is A \sharp :

I_0
0 1 5 8 7 3 4 2 11 6 10 9

R, RI and Combining Operations

To get the *retrograde*, list the *prime* form backwards, starting with the last pitch class and reading right to left.

To get the *retrograde inversion*, list the *inversion* form backwards, reading the notes from right to left.

To combine inversion or transposition with retrograde, do each operation one after the other, in any order.

For instance, to find RI6, transpose the prime form up to P6, then perform the inversion operation to get I6,

and *finally* read I6 backwards to get RI6.