

Boulez

Structures Ia, Reihen

Tonhöhenreihe

A musical staff in treble clef with a key signature of one flat (B-flat). The notes are: 1. B-flat, 2. C, 3. D, 4. E-flat, 5. E, 6. F-sharp, 7. G-flat, 8. G-sharp, 9. A-flat, 10. A, 11. B-flat, 12. B. The notes are numbered 1 through 12 below the staff.

Rhythmusreihe

A musical staff showing rhythmic patterns for 12 positions. The patterns are: 1. eighth note, 2. eighth note, 3. dotted quarter note, 4. quarter note, 5. half note, 6. dotted half note, 7. dotted half note, 8. quarter note, 9. half note, 10. dotted half note, 11. dotted half note, 12. quarter note. The notes are numbered 1 through 12 below the staff.

Artikulationsreihe

A musical staff showing articulation marks for 12 positions. The marks are: 1. accent (>), 2. accent (>), 3. staccato (.), 4. ord., 5. staccato (.), 6. staccato (.), 7. staccato (.), 8. sfz, 9. accent (>), 10. staccato (.), 11. staccato (.), 12. staccato (.). The marks are numbered 1 through 12 below the staff.

Dynamikreihe

A musical staff showing dynamic markings for 12 positions. The markings are: 1. pppp, 2. ppp, 3. pp, 4. p, 5. quasi p, 6. mp, 7. mf, 8. quasi f, 9. f, 10. ff, 11. fff, 12. ffff. The markings are numbered 1 through 12 below the staff.

Boulez: Structures Ia

Zwölftonreihe Original

The image displays the original twelve-tone series for Boulez's Structures Ia. It is presented as a 12-staff musical score. Each staff contains a sequence of 12 notes, each with a unique accidental (sharps, flats, and naturals) to ensure all 12 chromatic pitches are represented. Below each note is a number from 1 to 12, indicating its position in the series. The notes are written on a five-line staff with a treble clef and a key signature of one flat (B-flat).

Staff	1	2	3	4	5	6	7	8	9	10	11	12
1	B $\flat$	C	D	E $\flat$	F	G $\sharp$	A $\flat$	B $\sharp$	C $\flat$	D $\flat$	E $\flat$	F $\sharp$
2	C	D $\sharp$	E $\flat$	F	G $\sharp$	A $\flat$	B $\flat$	C $\flat$	D	E $\flat$	F $\flat$	G $\flat$
3	D	E $\flat$	F $\flat$	G	A $\sharp$	B $\flat$	C $\flat$	D $\flat$	E $\sharp$	F $\flat$	G $\flat$	A $\flat$
4	E $\flat$	F	G	A $\sharp$	B $\flat$	C $\flat$	D $\sharp$	E $\flat$	F $\sharp$	G $\flat$	A $\flat$	B $\flat$
5	F	G $\sharp$	A $\sharp$	B $\flat$	C	D $\flat$	E $\flat$	F $\flat$	G	A	B $\flat$	C $\flat$
6	G $\sharp$	A $\flat$	B $\flat$	C	D $\flat$	E	F	G	A $\flat$	B $\sharp$	C $\flat$	D
7	A	B $\flat$	C $\flat$	D	E $\flat$	F	G	A	B $\sharp$	C $\flat$	D $\sharp$	E $\flat$
8	B $\sharp$	C $\flat$	D	E $\sharp$	F $\flat$	G	A	B	C $\flat$	D $\flat$	E $\flat$	F $\flat$
9	C	D $\sharp$	E $\sharp$	F $\flat$	G	A $\flat$	B $\sharp$	C $\flat$	D $\flat$	E	F	G
10	D $\flat$	E	F	G $\flat$	A	B $\sharp$	C $\flat$	D $\flat$	E	F	G $\flat$	A $\sharp$
11	E	F	G	A $\flat$	B	C $\flat$	D $\sharp$	E $\flat$	F	G	A	B $\sharp$
12	F $\flat$	G $\flat$	A	B	C $\flat$	D	E	F	G $\sharp$	A $\sharp$	B	C

Boulez: Structures Ia

Zwölftonreihe Inversion

1 7 3 10 12 9 2 11 6 4 8 5

7 11 10 12 9 8 1 6 5 3 2 4

3 10 1 7 11 6 4 12 9 2 5 8

10 12 7 11 6 5 3 9 8 1 4 2

12 9 11 6 5 4 10 8 2 7 3 1

9 8 6 5 4 3 12 2 1 11 10 7

2 1 4 3 10 12 8 7 11 5 9 6

11 6 12 9 8 2 7 5 4 10 1 3

6 5 9 8 2 1 11 4 3 12 7 10

4 3 2 1 7 11 5 10 12 8 6 9

8 2 5 4 3 10 9 1 7 6 12 11

5 4 8 2 1 7 6 3 10 9 11 12

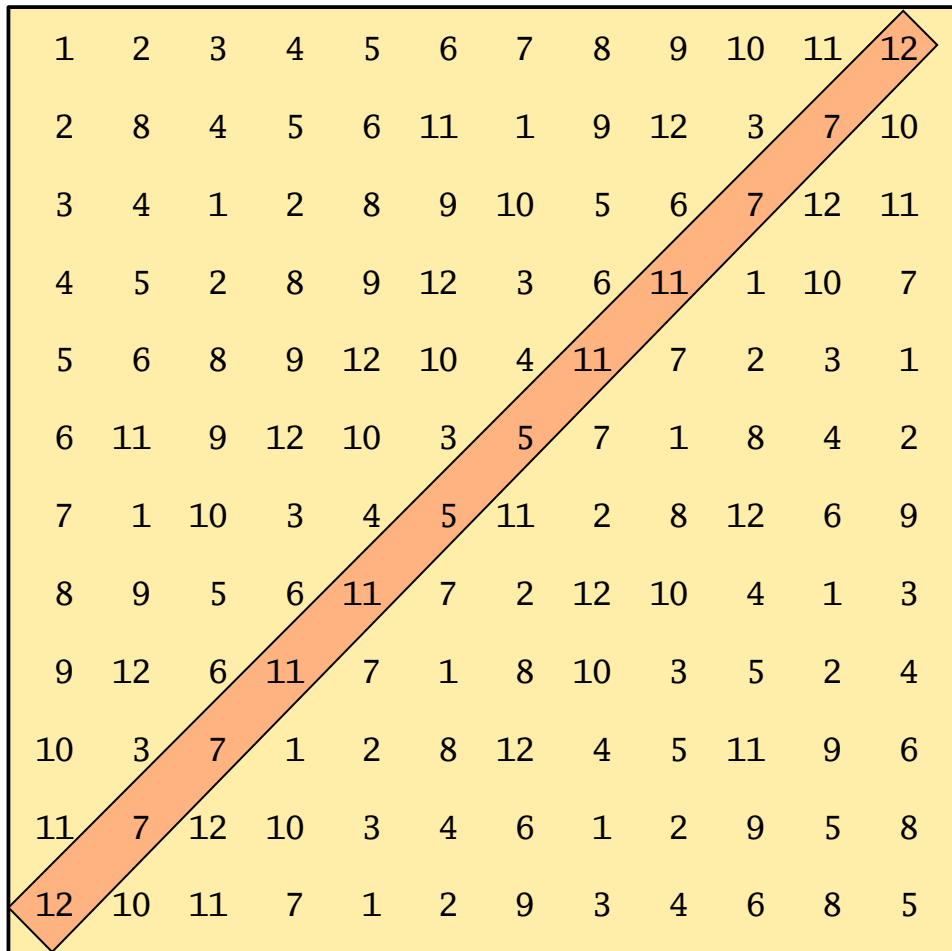
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Structures 1a, Originalmatrix

1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5

Pierre Boulez

Structures 1a, Originalmatrix, Dynamikreihe



A 12x12 matrix with a diagonal band highlighted in orange. The band contains the values 1 through 12, representing the identity permutation. The rest of the matrix contains a permutation of the numbers 1 through 12.

1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5

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Structures 1a, Originalmatrix, Dynamikreihe

1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10	2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11	3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7	4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1	5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2	6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9	7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3	8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4	9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6	10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8	11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5	12	10	11	7	1	2	9	3	4	6	8	5

Pierre Boulez
Structures 1a, Originalmatrix, Dynamikreihe

1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10	2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11	3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7	4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1	5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2	6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9	7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3	8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4	9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6	10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8	11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5	12	10	11	7	1	2	9	3	4	6	8	5

Pierre Boulez
Structures 1a, Originalmatrix, Artikulationsreihe

1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10	2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11	3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7	4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1	5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2	6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9	7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3	8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4	9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6	10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8	11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5	12	10	11	7	1	2	9	3	4	6	8	5

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Structures 1a, Originalmatrix, Artikulationsreihe

1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10	2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11	3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7	4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1	5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2	6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9	7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3	8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4	9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6	10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8	11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5	12	10	11	7	1	2	9	3	4	6	8	5

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Structures 1a, Originalmatrix, Gesamt

1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2	8	4	5	6	11	1	9	12	3	7	10	2	8	4	5	6	11	1	9	12	3	7	10
3	4	1	2	8	9	10	5	6	7	12	11	3	4	1	2	8	9	10	5	6	7	12	11
4	5	2	8	9	12	3	6	11	1	10	7	4	5	2	8	9	12	3	6	11	1	10	7
5	6	8	9	12	10	4	11	7	2	3	1	5	6	8	9	12	10	4	11	7	2	3	1
6	11	9	12	10	3	5	7	1	8	4	2	6	11	9	12	10	3	5	7	1	8	4	2
7	1	10	3	4	5	11	2	8	12	6	9	7	1	10	3	4	5	11	2	8	12	6	9
8	9	5	6	11	7	2	12	10	4	1	3	8	9	5	6	11	7	2	12	10	4	1	3
9	12	6	11	7	1	8	10	3	5	2	4	9	12	6	11	7	1	8	10	3	5	2	4
10	3	7	1	2	8	12	4	5	11	9	6	10	3	7	1	2	8	12	4	5	11	9	6
11	7	12	10	3	4	6	1	2	9	5	8	11	7	12	10	3	4	6	1	2	9	5	8
12	10	11	7	1	2	9	3	4	6	8	5	12	10	11	7	1	2	9	3	4	6	8	5

Boulez: Structures Ia

Zwölftonreihe Inversion

1 7 3 10 12 9 2 11 6 4 8 5

7 11 10 12 9 8 1 6 5 3 2 4

3 10 1 7 11 6 4 12 9 2 5 8

10 12 7 11 6 5 3 9 8 1 4 2

12 9 11 6 5 4 10 8 2 7 3 1

9 8 6 5 4 3 12 2 1 11 10 7

2 1 4 3 10 12 8 7 11 5 9 6

11 6 12 9 8 2 7 5 4 10 1 3

6 5 9 8 2 1 11 4 3 12 7 10

4 3 2 1 7 11 5 10 12 8 6 9

8 2 5 4 3 10 9 1 7 6 12 11

5 4 8 2 1 7 6 3 10 9 11 12

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Structures 1a, Inverse Matrix

1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12

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Structures 1a, Inverse Matrix, Dynamikreihe

1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12

Pierre Boulez
Structures 1a, Inverse Matrix, Dynamikreihe

1	7	3	10	12	9	2	11	6	4	8	5	1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4	7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8	3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2	10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1	12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7	9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6	2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3	11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10	6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9	4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11	8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12	5	4	8	2	1	7	6	3	10	9	11	12
1	7	3	10	12	9	2	11	6	4	8	5	1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4	7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8	3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2	10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1	12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7	9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6	2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3	11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10	6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9	4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11	8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12	5	4	8	2	1	7	6	3	10	9	11	12

Pierre Boulez
Structures 1a, Inverse Matrix, Dynamikreihe

1	7	3	10	12	9	2	11	6	4	8	5	1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4	7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8	3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2	10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1	12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7	9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6	2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3	11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10	6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9	4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11	8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12	5	4	8	2	1	7	6	3	10	9	11	12

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Structures 1a, Inverse Matrix, Artikulationsreihe

1	7	3	10	12	9	2	11	6	4	8	5	1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4	7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8	3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2	10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1	12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7	9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6	2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3	11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10	6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9	4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11	8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12	5	4	8	2	1	7	6	3	10	9	11	12

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Structures 1a, Inverse Matrix, Artikulationsreihe

1	7	3	10	12	9	2	11	6	4	8	5	1	7	3	10	12	9	2	11	6	4	8	5
7	11	10	12	9	8	1	6	5	3	2	4	7	11	10	12	9	8	1	6	5	3	2	4
3	10	1	7	11	6	4	12	9	2	5	8	3	10	1	7	11	6	4	12	9	2	5	8
10	12	7	11	6	5	3	9	8	1	4	2	10	12	7	11	6	5	3	9	8	1	4	2
12	9	11	6	5	4	10	8	2	7	3	1	12	9	11	6	5	4	10	8	2	7	3	1
9	8	6	5	4	3	12	2	1	11	10	7	9	8	6	5	4	3	12	2	1	11	10	7
2	1	4	3	10	12	8	7	11	5	9	6	2	1	4	3	10	12	8	7	11	5	9	6
11	6	12	9	8	2	7	5	4	10	1	3	11	6	12	9	8	2	7	5	4	10	1	3
6	5	9	8	2	1	11	4	3	12	7	10	6	5	9	8	2	1	11	4	3	12	7	10
4	3	2	1	7	11	5	10	12	8	6	9	4	3	2	1	7	11	5	10	12	8	6	9
8	2	5	4	3	10	9	1	7	6	12	11	8	2	5	4	3	10	9	1	7	6	12	11
5	4	8	2	1	7	6	3	10	9	11	12	5	4	8	2	1	7	6	3	10	9	11	12

Pierre Boulez
Structures 1a, Inverse Matrix, Gesamt

