



- **Serialism** was the answer. Not invented by Schoenberg, but adopted by him and Berg and Webern (2<sup>nd</sup> Viennese School)

**How does it work ?**

- Serial technique makes each note of the **chromatic** scale equally important.
- Each pitch can only be used once until the rest of them have been used.
- First you need to create a **ROW**

**What's a ROW?**

- A row is your choice of the order in which the notes of the chromatic scale will be used.

C	C#	D	D#	E	F	F#	G	G#	A	A#	B
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This is a standard chromatic and would be a boring row !

- Let's pretend our row is =

C	F#	F	D#	C#	D	E	G#	G	A#	A	B
0				1							

- This is called out **PRIME ROW** (P0) as it is where we started.
- 'C' is called 0, 'C#' = 1
  2. *Fill in the rest of the numbers above*
  3. *How have **P0-P11** been created in the table below ?*
  4. *What are the missing rows in the table below ?*

<b>P0</b>	C	F#	F	D#	C#	D	E	G#	G	A#	A	B	<b>R11</b>
<b>P1</b>	C#	G	F#	E	D	D#	F	A	G#	B	A#	C	
<b>P2</b>													
<b>P3</b>													
<b>P4</b>	E	A#	A	G	F	F#	G#	C	B	D	C#	D#	
<b>P5</b>													
<b>P6</b>	F#	C	B	A	G	G#	A#	D	C#	E	D#	F	
<b>P7</b>	G	C#	C	A#	G#	A	B	D#	D	F	E	F#	
<b>P8</b>													
<b>P9</b>	A	D#	D	C	A#	B	C#	F	E	G	F#	G#	
<b>P10</b>													
<b>P11</b>	B	F	E	D	C	C#	D#	G	F#	A	G#	A#	

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Answer

- P1-11 are **transpositions** of P0, each being pushed up a **semitone**.

The prime row can also be altered by **reversing** its order. This is done simply by reading the notes of the row from last to first. This transformed version is called the **RETROGRADE** (Back to front). In this example P0 ends on B (number 11), so backwards would be R11.

5. *Fill in the other retrograde numbers (remember that each is prefixed by 'R').*

The most difficult transformation to understand is the **INVERSION** (I). Described simply, it is the upside-down version of the prime row.

<b>P0</b>	C	F#	F	D#	C#	D	E	G#	G	A#	A	B	<b>R11</b>

- To work out I0, you need to invert the direction of the intervals between each note in your prime row.
  - C – F# = up 7 semitones
  - Inverted = down 7 semitones (What's 7 semitones down from C ?)
  - F# - F = down 1
  - Inverted = up 1



6. *Fill in the inversion row*

<b>I0</b>	C												<b>Ri1</b>
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Answer

<b>I0</b>	<b>C</b>	<b>F#</b>	<b>G</b>	<b>A</b>	<b>B</b>	<b>A#</b>	<b>G#</b>	<b>E</b>	<b>F</b>	<b>D</b>	<b>D#</b>	<b>C#</b>	<b>R1</b>
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- Finally, note that the inversion row can be played backwards. This is called the **RETROGRADE INVERION** (or upside down, back to front). Because I0 ends on a C#, our retrograde-inversion = Ri1.

**Filling in the Matrix**

- So, out of our row we can create:
  - 12 **PRIME** rows (P0-11)
  - 12 **RETROGRADE** rows (R0-11)
  - 12 **INVERSION** rows (I0-11)
  - 12 **RETROGRADE-INVERSION** rows (RI0-11)
- A **Matrix** is an easy way of showing all rows:

	I0	I	I	I	I	I	I	I	I	I	I	I	
P0	C												R
P													R
P													R
P													R
P													R
P													R
P													R
P													R
P													R
P													R
P													R
P													R
	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri	Ri

**Filling it in:**

- Fill in the **prime row** across the top (P0 →)
- Next, fill in the **inversion row** going down (I0 ↓)
- Using the chart from Qu2 to help you, fill in the numbers against the ‘Ps’ in the first column. Each note from your inversion row will be the starting note of a prime row (so F# in your inversion row will be the start of P6).
- Copy the rows from Qu4 across into their correct places against the **PRIMES**.
- Finally, label all rows.

## How do you use the rows to compose ?

Let's ask Arnie



1. When you start using a row to compose a melody, you must only use each note once. You are allowed to repeat a note, but you cannot go back to it after you have left it.

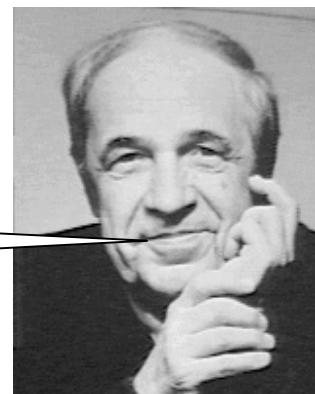
4. Some rows have the same notes as the other ends of other rows. In this case, you can overlap them.

3. It is possible to create chords. This is called **verticalisation**. You just play consecutive notes of the rows simultaneously.

2. You can use the rows to create **canons**.



I'm **Berg** and I was a pupil of Schoenberg. I used serial technique in my **violin concerto**. But I'm not as strict as my teacher and would often break the rules or mix serial music with more traditional music.



I'm **Boulez** and I am nearly 80! I like serial technique so much that I use it really strictly. I have also written pieces in which the **rhythm** and **dynamics** are also serialised. They sound very random.



# 'Panic'

For Quintet.

G. Bunce.  
(1999)

*♩=50 Adagio*

Flute

Clarinet in Bb

Violin

Violin

Piano

*p* *cresc.* *ff*

Fl.

Cl.

Vln

Vln

Pno

*mp*

G. Bunce © 20/1/99  
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## Vocabulary

Serialism	Tone row	Prime	Retrograde	Inversion
Retrograde-Inversion	Verticalisation	Chromatic	Canon	Semi-tone
Transpose	Schoenberg	Berg	Webern	atonal

## Possible Questions

- Sometime you are given the PRIME ROW and another row and asked how they relate. In this case, your answer would be one of the following: a transposition, retrograde, inversion, retrograde-inversion.
- You may have to identify a piece as being serial. Listen out for atonal music but played on acoustic instruments.
- You may be asked about how serialism works. Keep it simple and just say: “*you create a prime row by using all semi-tones of the chromatic scale one. This row can be transposed, played backwards (retrograde), upside-down (inversion), or backwards and upside-down (retrograde-inversion). You can then compose a piece using the 144 rows but cannot go back to notes when you have started a row. You can also create chords by verticalisation.*” As long as you use all the vocab correctly, you’ll be fine.
- Sometimes they ask a variation on this question: “*how can interest be sustained in serial music?*” or “*how can you create variations?*” Both these questions are exactly the same, and (if you think about it) will require a similar answer to the one above!!