

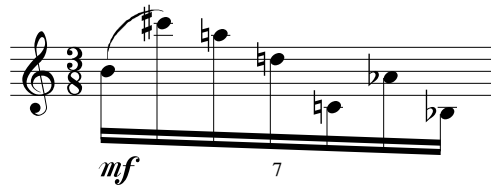
Boulez's *Le marteau sans maître* (begun in 1952 and is still undergoing revision) was Boulez's response to the "totalitarianism" of *Structures* and the rigorous treatment of the serial technique was "loosened." In *Marteau*, the twelve pitches of the chromatic scale are divided into five segments (A-E):

A **B** **C** **D** **E**
 F-Eb || B-D-Bb-C# || A-C || G# || G-E-F

These five segments were subject to "multiplication." Any of the segments could be multiplied by another segment. For example, AB (AxB) would be obtained by taking the m7th of segment A and finding a m7th above each pitch of segment B. This would produce the following pitches:

B-A D-C Bb-Ab C#-B

When the redundant pitch B is removed only seven pitches (B, A, D, C, Bb, Ab, C#) are left. These are the pitches at the beginning of the alto flute melody in movement three (note order is not retained).



Stockhausen's *Gruppen* for three orchestras (1957) expanded serial procedures to include form, tempi, texture, and the number and speed of events within a section.