

MTO 7.3 Examples: Wannamaker, Structure and Perception in *Herma* by Iannis Xenakis

(Note: audio, video, and other interactive examples are only available online)

<http://www.mtosmt.org/issues/mto.01.7.3/mto.01.7.3.wannamaker.php>

Figure 1. Graphical demonstration of equivalence for the two representations of the set F given by Equations 1 and 2 (after Xenakis, *Formalized Music*)

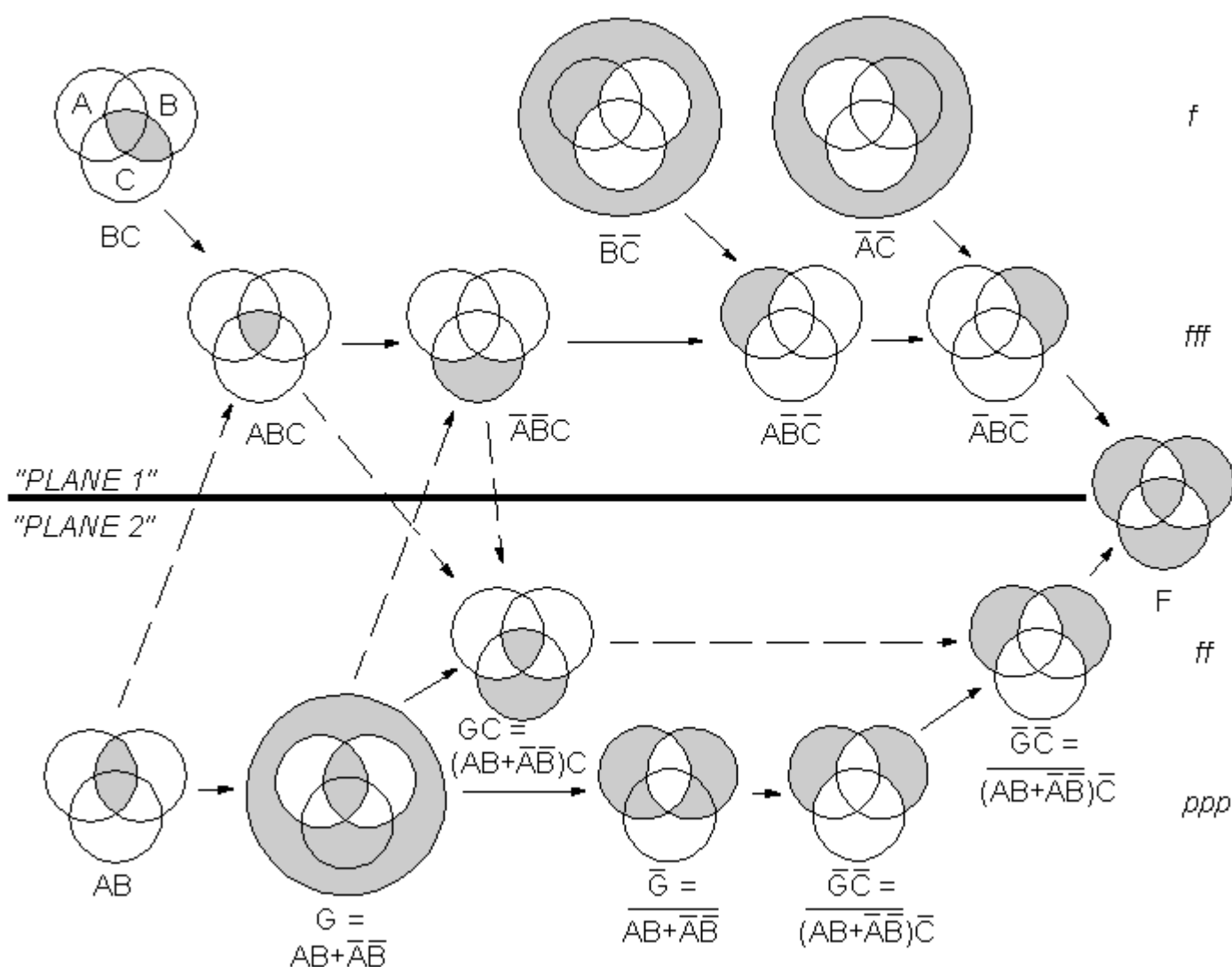


Figure 2. Temporal flow chart for *Herma* indicating changes in musical parameters, perceived high-level temporal gestalts, and different pitch sets articulated over the course of the work. The dynamic curve is multiple valued where multiple dynamics are marked simultaneously. Times are taken from Yuji Takahashi's Denon recording (Iannis Xenakis, *Herma*, Yuji Takahashi, piano. Denon 33CO-1052 [1972]. Compact disc.)

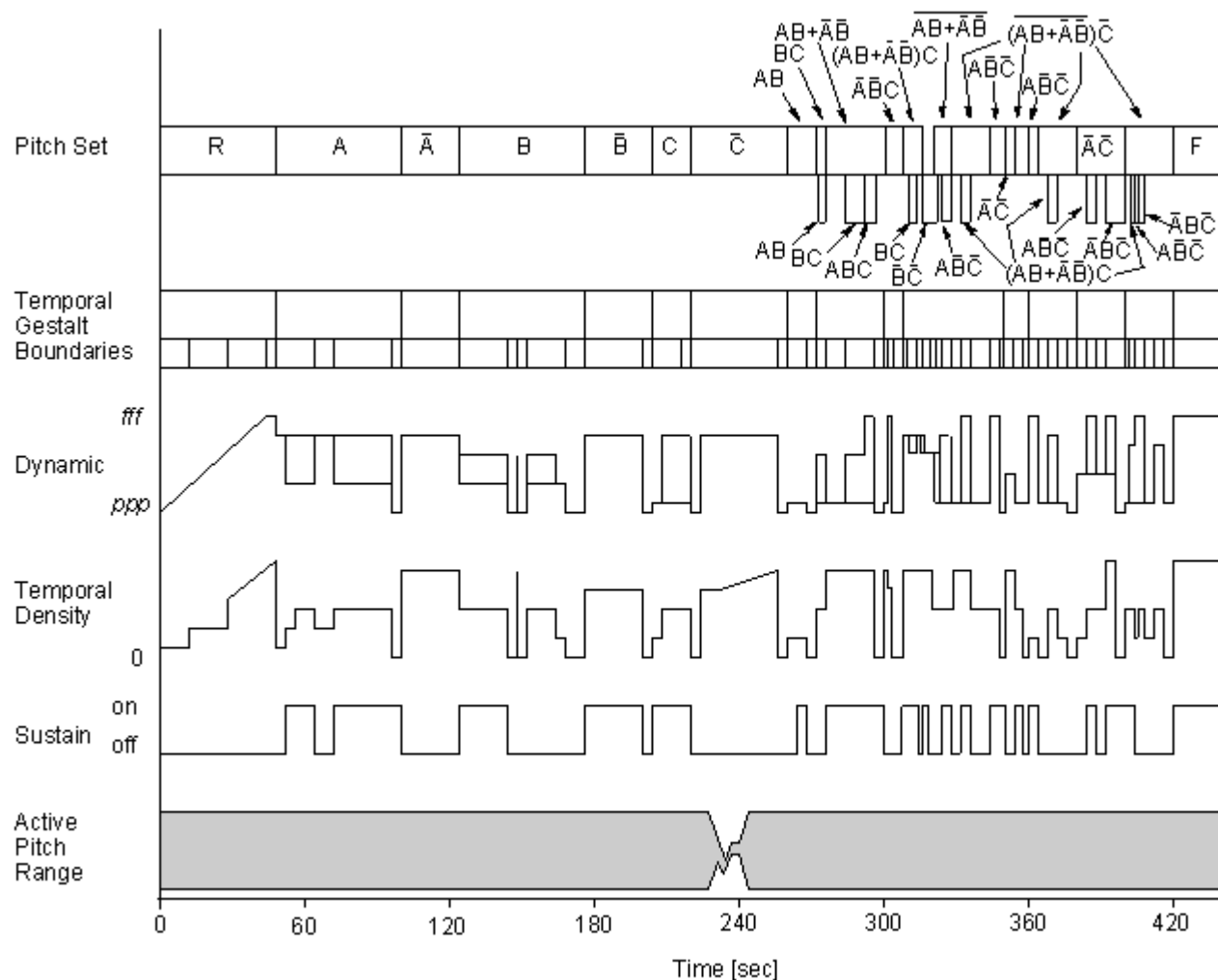


Figure 3. Pitch occurrence frequencies within specific pitch sets articulated in Herma Bullets indicate notes which did not occur in the given section. Shaded areas represent “best-guess” versions of the sets *A*, *B* and *C* and sets algebraically computed from them. As in hexadecimal notation, the decimal numbers 10, 11, 12 . . . are represented by the capital letters *A*, *B*, *C* . . . so that all entries in the table are single characters.

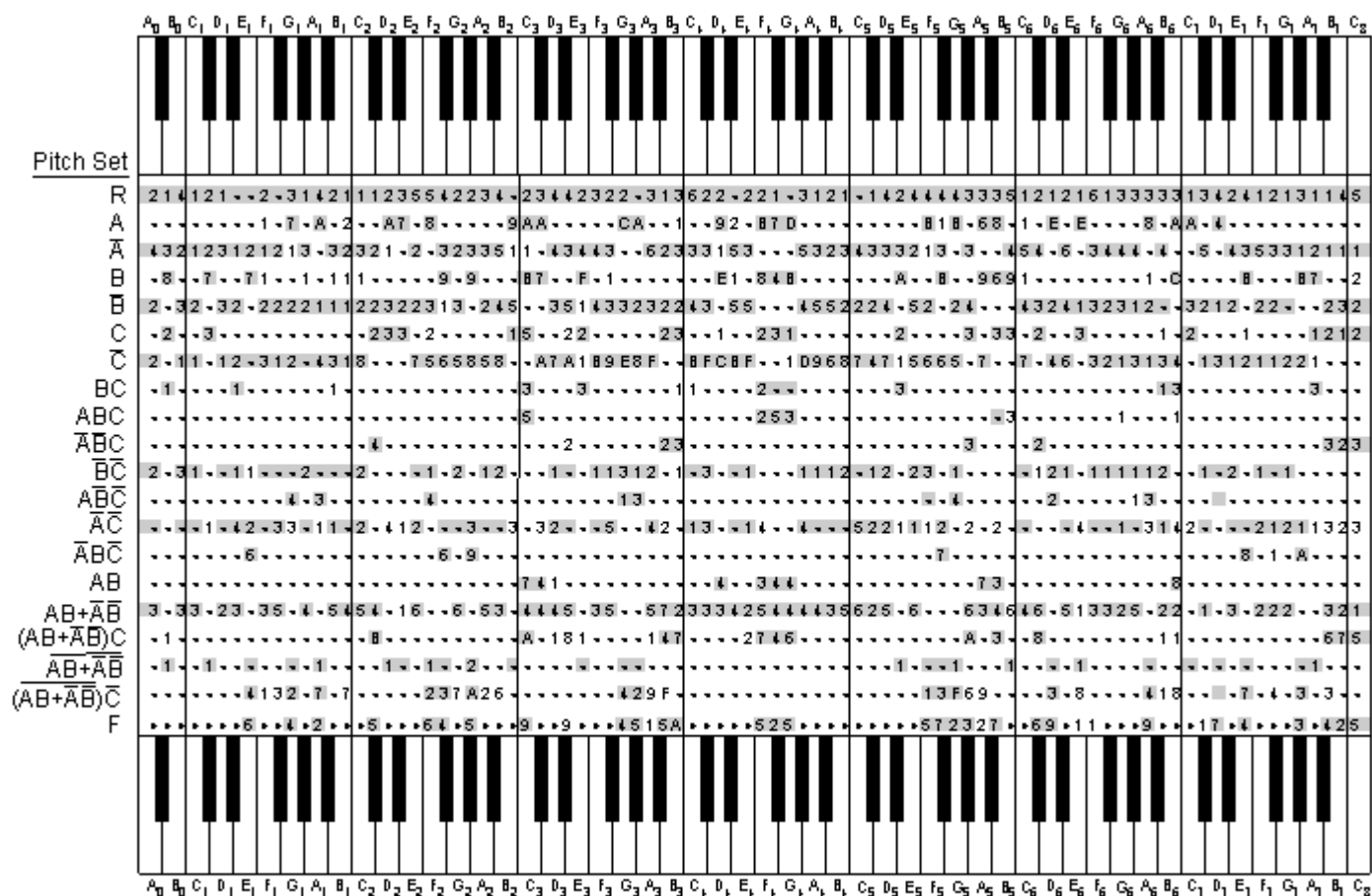


Figure 4. Score excerpt from *Herma* showing the last four measures of the exposition of set A indicating clangs (circled) and sequences (tied)

The image displays a musical score excerpt from *Herma*, specifically the last four measures of the exposition of set A. The score is written for two staves, Treble and Bass clef, in 12/8 time. The tempo is marked as 180. The score includes various musical notations such as notes, rests, and dynamic markings (ff, pp). Clangs are indicated by circles around specific notes, and sequences are indicated by ties. The score is divided into two systems, each containing two staves. The first system shows measures 1 and 2, and the second system shows measures 3 and 4. The score is annotated with various markings, including 'dd', 'ff', 'pp', and '8va-1'. A tempo marking of 180 is present at the top right. The score is divided into two systems, each containing two staves. The first system shows measures 1 and 2, and the second system shows measures 3 and 4. The score is annotated with various markings, including 'dd', 'ff', 'pp', and '8va-1'. A tempo marking of 180 is present at the top right.

Figure 5. A universal set, R , comprising a set, A , and its complement, $\bar{A}$

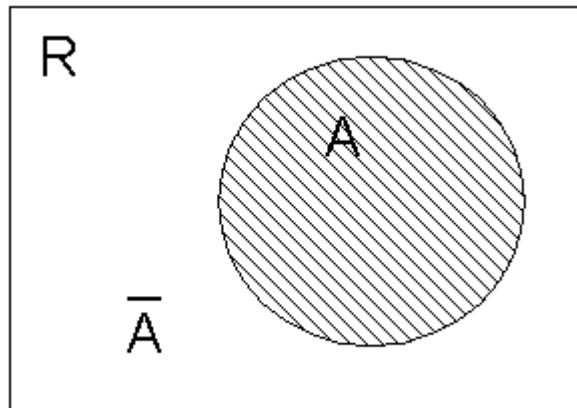
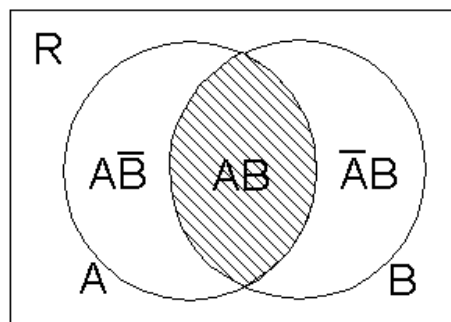
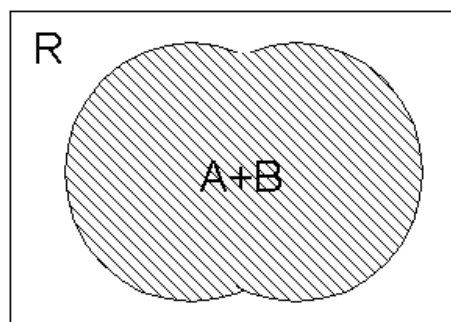


Figure 6. (a) The intersection, AB , of two sets, A and B (b) The union, $A+B$, of two sets A and B



(a)



(b)

Figure 7. A pair of disjoint sets

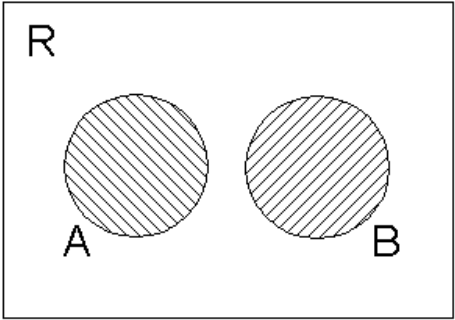


Figure 8. Intersections between three sets, A , B , C , and their complements

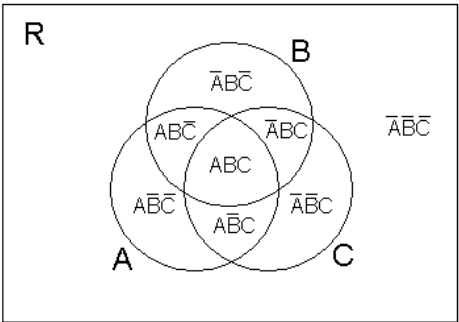


Figure 9. Venn diagram of the target set, F , in *Herma*

