

## **Experiences of Combining the Radio Baton with the Director Musices Performance Grammar**

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In this paper, the authors outline the method used and experiences gained in combining two independent musical systems: the Radio Baton (RB), and the Director Musices Performance Grammar (DM). This article represents an interesting melding of two systems we have studied previously, both of which seemed to have certain limitations. Though the combination of the two systems seems to be a natural symbiotic extension, the resulting composite system still leaves much to be desired.

The RB is a sequencer system developed by Max Mathews that allows a conductor to control a computer performance through the use of two batons equipped with radio transmitters. One baton controls tempo while the other allows for variation in loudness. While this system allows for control of beat frequency, it lacks a means of producing expressive deviations from the nominal. Thus, the DM system seems to be a perfect candidate to fill an important gap in the RB system. The DM system is a generative grammar of music performance that automatically introduces expressive deviations depending on the musical context found in the score. These expressive deviations include tempo changes and micropauses, accents, lengthening and shortenings, and variations of sound level.

To explore the combination of these two systems, the authors examined seven pieces for solo and ensemble. The procedure involved first converting the score into MIDI format using the Encore program, and then converting the MIDI file into the mus-file format used in the DM environment. An extra voice was added to the score, representing the notes used as triggers by the RB system. DM then generated a performance of the piece that was transferred to the RB system. At this point, the RB system could be used as normal, with the underlying performance being the one produced by DM.

The authors note that the preparation of the score was a time intensive task, especially since conversion from MIDI to mus-file format introduced errors that required hand-editing. Additionally, each DM performance needed to be adjusted by hand, according to the authors' judgment as to which rules were most relevant to the given piece. Interestingly, they left out the Final Ritard and Phrasing rules, allowing these expressive deviations to be controlled by the RB system.

Overall, the experiences in combining the two systems proved promising, but the conversion of the score was one of the most impractical steps. Additionally, there were a few compatibility issues in which the tone duration rules caused difficulties in the control of beats in the RB performance. The authors speculate that this was caused by interaction between the rule-induced variations and the variations introduced by the conductor. The net result was that the RB system's beat prediction function became less precise.

In conclusion, this seemed to be a natural extension of two independent systems, each with their own strengths and weaknesses. While the two systems seem to complement each other very well, their combination still left much to be desired. The RB system forces the performer to be more of a percussionist than a conductor while the DM system is still unable to produce truly natural sounding performances. Additionally, the use of a synthesizer proved to be problematic for reproducing string instruments. Perhaps further refinement of both systems will result in a more natural sounding performance.