Neurospora crassa has been an excellent model organism for studying circadian rhythms for more than half a century. In Neurospora cells, circadian timekeeping is regulated by interlocking positive and negative feedback loops, which lead to oscillating levels of White Collar Complex (WCC) and Frequency (FRQ) protein over time. Previous differential equation models (Dovzhenok et al., 2015; Bellman et al., 2018) have replicated these oscillations in a single nucleus. However, Neurospora cells are multinucleic; FRQ and WCC activity needs to be coordinated between nuclei for circadian rhythm to be maintained. In this work, we adapt the previous models to track FRQ and WCC levels in multiple nuclear compartments. We show that diffusion of FRQ and WCC protein between compartments is sufficient to coordinate mRNA and protein activity across the entire cell. We also study how number of frq mRNAs scales with compartment size. (Received September 17, 2019)