Here we show that electrical stimulation of the SNr influences the generation of saccadic eye movements. The directions and amplitudes of saccade vectors were altered with stimulation. The changes in saccade vectors occurred primarily during memory-guided saccades. We also found that electrical stimulation had a biphasic effect on saccade latency. Electrical stimulation both decreased saccade latency and increased saccade latency. Finally electrical stimulation of the SNr decreased the likelihood of both contralateral and ipsilateral memory-guided saccades. Visually-guided saccade probability was unaltered. We conclude from these results that electrical stimulation of the SNr influences saccades in a manner consistent with an activation of SNr outputs. The pattern of effects of SNr stimulation on saccades indicates that the SNr has widespread effects on the SC. This is consistent with an alteration in the pattern of activity across the map of saccadic eye movements bilaterally. Preliminary reports of this work appeared previously (Day et al. 2005; Liu et al. 2003).

METHODS

General Behavioral Procedures. We used a real-time experimental data acquisition and visual stimulus generation system (*Tempo* and *VideoSync*; *Reflective Computing, Inc*.) to create the behavioral paradigms and acquire eye position and neuronal data. Monkeys were trained to sit in a custom-designed primate chair with head fixed during the experimental session (typically 3-5 hr). Visual stimuli were rear-projected on a tangent screen at 51cm distance using a DLP projector (LP335, *Infocus*) with a native resolution of 1024x768 and