The ability to automatically orient our attention to an unexpected stimulus is a basic cognitive function that is important for survival. Shortly after attending to a stimulus we show a slower reaction time (RT) to a similar subsequent stimulus, termed inhibition of return (IOR). This study aimed to define brain activity associated with auditory inhibition of return. Subjects (n=7) heard pairs of cue and target stimuli separated by 750 ms. Each stimulus had a random combination of frequency and location. Subjects pressed a button to targets under three separate task conditions (detection, frequency or location discrimination). Scalp electrodes (EEG) were used to record brain activity in the form of event-related potentials (ERPs) to targets. Analysis focused on two attention-related ERP components: the N100 (100 ms latency) and the Negative Difference (Nd) wave (150-250 ms). Behavioral results showed slower RTs to targets with the same features as cues vs. those that differed from cue (p<.06), suggesting inhibition of return. Nd amplitude was largest when the cue and target shared the same features, intermediate in amplitude when they shared one feature, and smallest when they shared none (p<.001). There were no significant differences in the N100. These data suggest that the brain is automatically comparing targets to cues, and encoding incoming stimuli as holistic auditory objects rather than only attending to the feature that is relevant to the task.