We analyze the use of the convolution quadrature (CQ) method for the temporal discretization of some time domain boundary integral equations arising in acoustic and electromagnetic scattering problems. By choosing a suitable A-stable multistep method, the CQ method can provide a stable numerical time evolution method. The analysis of this approach is based on deriving new parameter dependent bounds on integral operators in the Laplace transform domain. In particular, we study the electric field integral equation in electromagnetism and several combined field integral equations in acoustics and electromagnetism. A full error analysis is derived in two cases, and numerical results are also presented.