The performance of the circular loop antenna (CLA) largely improves in terms of impedance matching and directive gain when a body of revolution (BOR)-type of reflector is placed symmetrically relative to the loop. The input impedance, reflection coefficient, VSWR, directivity, and radiation patterns of a loop antenna for cases of a reflector-hemisphere and a reflector-cone are investigated in this letter. It is found that for a resonant loop, directivity over 9 dB and VSWR less than 2 over a bandwidth of 48.5 MHz can be obtained. The study also shows that the characteristics of the CLA depend mainly on the height of the loop over the reflector and the total surface area of the reflector-body irrespective of the body shape