4-2-2 Helmholtz energy 2

Provide the differential expression for the Helmholtz energy, da, by using du. What are the variables for the Helmholtz energy?

$a = u - Ts \rightarrow da = du - d(Ts) = Tds - Pdv - Tds - sdT = -Pdv - sdT.$
The variables for the Helmholtz energy are T and v.