Abstract. Founded on the work of Gibbs' at the end of the 19th century, a geometric theory of reversible Thermodynamic systems has been formulated. The equilibrium properties of thermodynamic systems may be defined in terms of a Legendre submanifold of the Thermodynamic Phase Space endowed with a contact form. Later R. Balian and and P. Valentin have suggested to express this properties on an Symplectised Thermodynamic Phase Space, thereby unifying the entropy and energy expressions of Gibbs' equations. In this talk we shall present how open (or controlled) irreversible thermodynamic systems, may be defined as input-output or port-Hamiltonian systems and shall illustrate this construction on simple examples. Then we shall present some nonlinear control laws preserving the symplectic structure and derive some conditions in terms of matching equations between closed loop contact forms and closed-loop contact Hamiltonian functions. Finally we give some conditions for the stabilization of the system for a structure preserving control.