Given an irreducible crystallographic root system \( \Phi \), consider the torus obtained as the quotient of the ambient space by the coroot lattice of \( \Phi \). There is a certain cell complex structure on this torus, introduced by Steinberg and studied by Dilks, Petersen, and Stembridge. In joint work with Petersen, we exhibit a module structure on (the set of faces of) this complex over the (set of faces of the) Coxeter complex of \( \Phi \). The latter is a monoid under the Tits product of faces. The module structure is obtained from geometric considerations involving affine hyperplane arrangements. As a consequence, we obtain a module structure on the space spanned by affine descent classes of a Weyl group, over the classical descent algebra of Solomon. We provide combinatorial models when \( \Phi \) is of type \( A \) or \( C \). (Received August 12, 2014)