Polynomial assignments for a torus $T$-action on a smooth manifold $M$ were introduced by Ginzburg, Guillemin, and Karshon; they form a module over $\mathbb{S}(t^*)$, the algebra of polynomial functions on $t$, the Lie algebra of $T$. In this talk we describe the assignment module $\mathcal{A}_T(M)$ for a natural $T$-action on a Bott-Samelson manifold $M = Z_t$, and present a method for computing its generators. This talk is based on joint work with Catalin Zara.