The inverse Galois problem is still one of the greatest open problems in group theory. It asks, given a group $G$ and a field $F$, can we always find a Galois extension of $F$ having Galois group $G$? Kummer theory answers this question for fields $F$ containing primitive $p$th-roots of unity and groups $G$ that are direct sums of $\mathbb{Z}/p\mathbb{Z}$s. In such cases, adjoining $p$th-roots of elements to $F$ yields finite Galois extensions with abelian Galois groups of exponent $p$, and conversely every such Galois extension is of this form. Furthermore, if we are given that $F$ is a finite Galois extension over some field $B$, and $L$ is a Kummer extension of $F$, it is straightforward to determine whether $L$ is also Galois over $B$. In that case, it is possible to characterize the Galois group of $L$ over $B$ by computations within $F$. The goal of my research is to extend this result to Artin Schreier theory, the positive characteristic analogue to Kummer theory. (Received September 22, 2009)