The characterization of intrinsic nonlinearities in the visual system is a challenging task. The reason for the difficulty lies in the complex nature of nonlinear dynamics, and our inability to conform to the theoretical requirement that complete characterization of a complex system requires an infinite stimulus set. This theoretical impossibility notwithstanding, we have developed a methodology for characterizing receptive field nonlinearities which employs non-linear m-sequence analysis. The primary benefit of using non-linear m-sequence analysis is the ability to reveal significant portions of the possible stimulus space in the most mathematically efficient manner possible. Furthermore, m-sequences — in contrast to other “random” stimulus paradigms — are nearly perfectly “well-balanced”, thereby simplifying nonlinear analysis.