Two Cavity Circuit QED BLAKE JOHNSON, Yale University, ANDREW HOUCK, Princeton University, JAY GAMBETTA, University of Waterloo, ALEXANDRE BLAIS, University of Sherbrooke, STEVEN GIRVIN, MICHEL DEVORET, ROBERT SCHOELKOPF, Yale University, YALE CIRCUIT QED TEAM — The circuit QED architecture has proven useful for dispersive manipulation and measurement of superconducting qubits. Previous experiments have shown how to use the AC-Stark shift to spectroscopically extract information about the photon number in the cavity[1]. Here we will show how to extend this toward building a photon statistics analyzer by adding a second cavity to the circuit QED architecture. The second cavity allows for decoupling of the preparation and readout of the cavity field state, opening the way for a measurement of the full photon statistics and reconstruction of the Wigner distribution.