Beam Beam Tune Shifts for 36 Bunch Operation in the Tevatron, P. BAGLEY, Fermilab* - We are preparing to upgrade the Tevatron Collider from 6 to 36 bunch operation. The 36 bunches are in 3 "trains" of 12 bunches. The spacing between bunches within a train is 21 RF buckets (53.106 MHz) and 139 empty buckets separate the trains. Because the 36 bunches are not evenly spaced around the machine, the different bunches within a train pass the opposing bunches at different points in the ring and so feel different beam beam effects. Through most of the machine the beams have helical separation, so these are mainly long range beam beam effects. As a first, very simple step, we've looked at the differences in the tunes of the different anti-proton (pbar) bunches. During the 36 bunch studies in Fall 1995, we used a new tune measurement system to measure these in several different machine conditions. We compare these measurements to calculations of the tunes for a pbar with zero transverse and longitudinal oscillation amplitudes. We discuss experimental problems, and the assumptions, approximations, and effects included in the calculations. Our main intent is to gain confidence that we can accurately model beam beam effects in the Tevatron.

* Operated by the Universities Research Association, Inc. under contract with the U.S. Department of Energy.