J(J-1) and J(J+3) spectra with a Q.Q interaction - Elliott Rotations. ARUN KINGAN, XIAOFEI YU, LARRY ZAMICK, Rutgers Univ — To get Elliott’s SU3 results with a Q.Q interaction without the momentum terms in a shell model calculation one must introduce a single particle splitting in which the highest L state lies highest e.g. D higher than S in the SD shell. When this is done one gets the multi-degenerate states predicted by Elliott. We have here taken a hard look at the spectra of 20Ne. We obtain the well studied ground state band with the spectrum of a K=0 rotational band J(J+1) with J=0,2,4,6, 8. But our main point concerns 2 excited bands, A and B. Band A has a J(J+1) spectrum J=1,2,3,4,5,6,7. Band B covers the same energy levels but with J values J=2,3,4,5,6,7,8. Our main result is that the spectrum of Band B is J(J-1). By calculating magnetic moments we find that Band A is of the form [LS]J= [L1]L and Band B [L1](L+1) starting with L=1. Because the interaction is spin independent we can stretch out the spin in Band A to form Band B at no cost in energy. There is also a third band C starting with [1 1]0 J=0,1,2,6 with E(J)-E(0)= 0.149 J(J+3 ). All bands have the same moments of inertia. Elliott noted that the static quadrupole moments of the ground state band agree with those of the rotational model, not the B(E2)’s. For excited bands B(E2)’s have many branchings.