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After the NA31 discovery in 1987 of the first evidence of Direct CP violation in neutral Kaon to two-pion decays, the NA48 Collaboration at CERN designed a new experiment, with the aim of improving significantly the statistical and systematic accuracy of the measurement. A description of the beam, experimental apparatus and strategy of data collection and analysis will be given, emphasizing the features which were most relevant for the success of this second generation experiment. The results obtained for ϵ'/ϵ and other selected measurements will be reported. The experimental study at CERN for Direct CP violation effects has been extended with high statistics and systematically accurate comparisons between positive and negative Kaon decays into three-charged pions and into one charged and two neutral pions. For this, NA48/2, experimental phase, the main change was the substitution of the neutral Kaon beams with a double beam of unseparated, momentum analized, K+ and K – produced simultaneously and spatially overlapping throughout the fiducial decay region. The analysis of the data collected during 2003 and 2004 is approaching completion. Results will be reported which superseed in precision by more than an order of magnitude those of previous experiments.