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A method is presented for obtaining upstream superelement internal displacements and element stresses and forces using the modal acceleration method. The solution is in the form of load transformation matrices, however extrapolation to a solution sequence alter should be possible. Though NASTRAN solution 63 can employ the modal acceleration method to obtain displacements within the residual, upstream data recovery utilizes a simple expansion of each superelement boundary static reduction to obtain internal displacements and hence element forces and stresses. The new method is analytically developed for a generic superelement by solving the internal partition of the superelement equation of motion for the internal displacements. The augmented set of superelement internal displacements obtained are a function of the superelement modal accelerations, boundary accelerations, and boundary displacements. These displacements are then used to deform the superelement elemental stiffness matrix for element loads. The NASTRAN implementation of this procedure is described as a series of stand alone DMAP programs, DMAP alters and stand alone Fortran programs. A test case is used to compare the enclosed method, standard NASTRAN data recovery, and an exact finite element solution. Also included is a brief description of an exemplary analysis of a space vehicle upper stage of substantial complexity on a CRAY computer, including some of the problems incurred and their solutions.