

# INTERACTIVE FINITE ELEMENT MODEL EDITING ON PCs

By

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This paper describes a future product of The MacNeal-Schwendler Corporation (MSC), a PC-based finite element modeler. This model editor is being developed to assist the engineer in the creation and editing of finite element models. The oral presentation describes how this product will be used to integrate MSC Mechanical Computer Aided Engineering (MCAE) software tools on PCs, workstations, and mainframes.

The model editor will provide a stand-alone, easy-to-use, interactive tool with which to create and edit three-dimensional finite element models for analysis in **MSC/pal 2**, **MSC/cal**, and **MSC/NASTRAN**. The modeler will have mesh generation, element creation, material property assignment, and load and constraint generation. The modeler will accept keyboard input, as well as geometry from CAD systems.

Node point generation options will include direct specification, two, four, and eight control points, and one and two ruled surfaces. Node point replication options will include translate, rotate, and mirror. Elements which will be supported include bar, triangular and quadrilateral plate and membrane (including axisymmetric), and hexahedron and tetrahedron solid elements. Specifications will be made over fields of elements and node points.

The central role of the editor in linking MSC's MCAE tools is shown in Figure 1. The editor will read from and write to MSC/pal 2, MSC/cal, and MSC/NASTRAN formats, as well as to any future MSC products. Geometric information from CAD systems will also be able to be input. The MSC/pal 2 interface is shown on greater detail in Figure 2. The editor will be able to read from and write to MSC/pal 2 text files and data base files, as well as to and from its own internal scratch files.

The modeler will have graphics options to show element coordinates (see Figure 3 for the numbering direction of the quadrilateral plates) and hidden elements (see Figure 4 for hidden solid elements, with element shrink). The modeler will support both CGA and EGA cards and monitors.

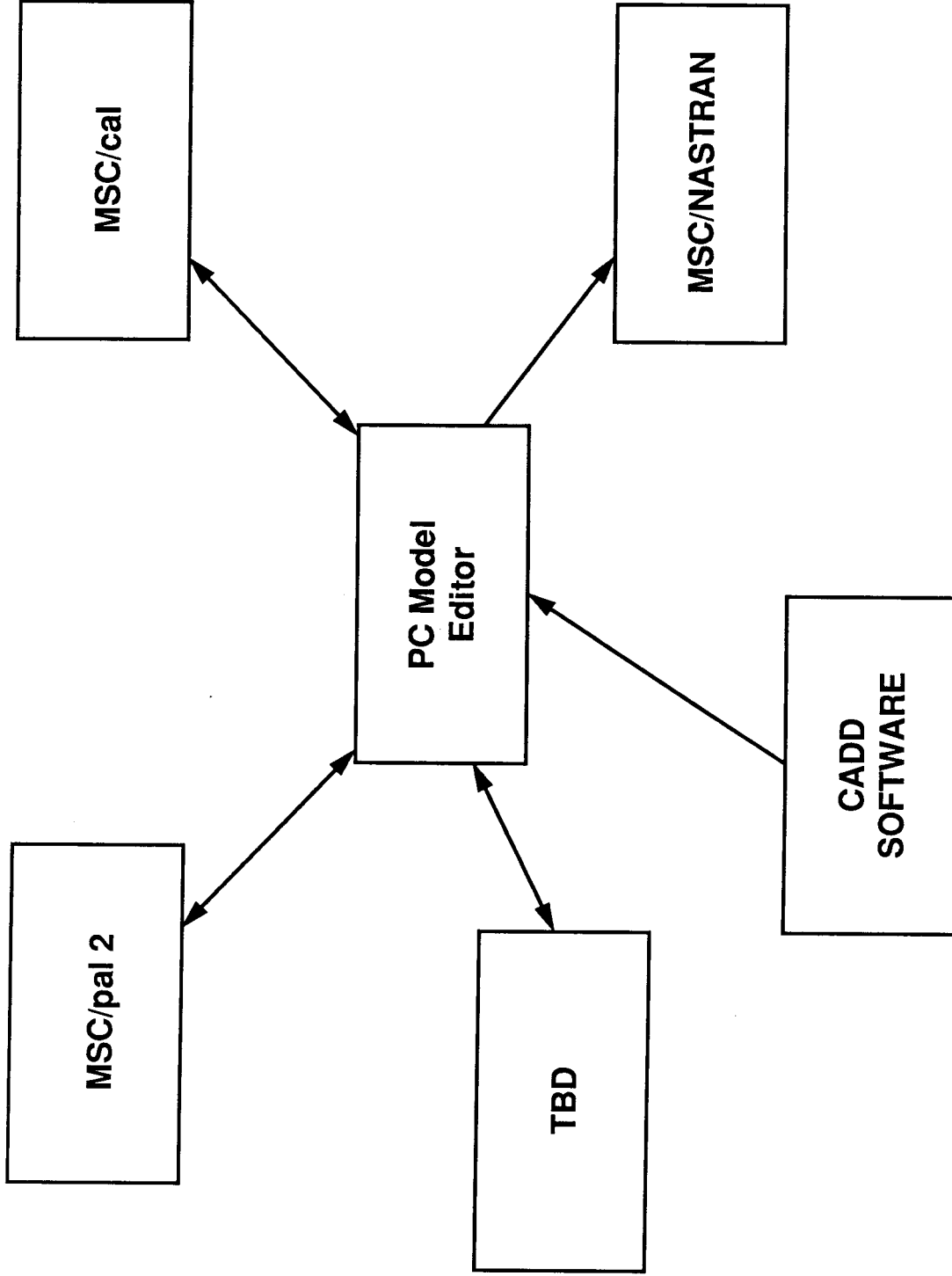


Figure 1. Role of the PC Model Editor in Linking MSC's MCAE Products.

# MSC/pal 2 INTERFACE

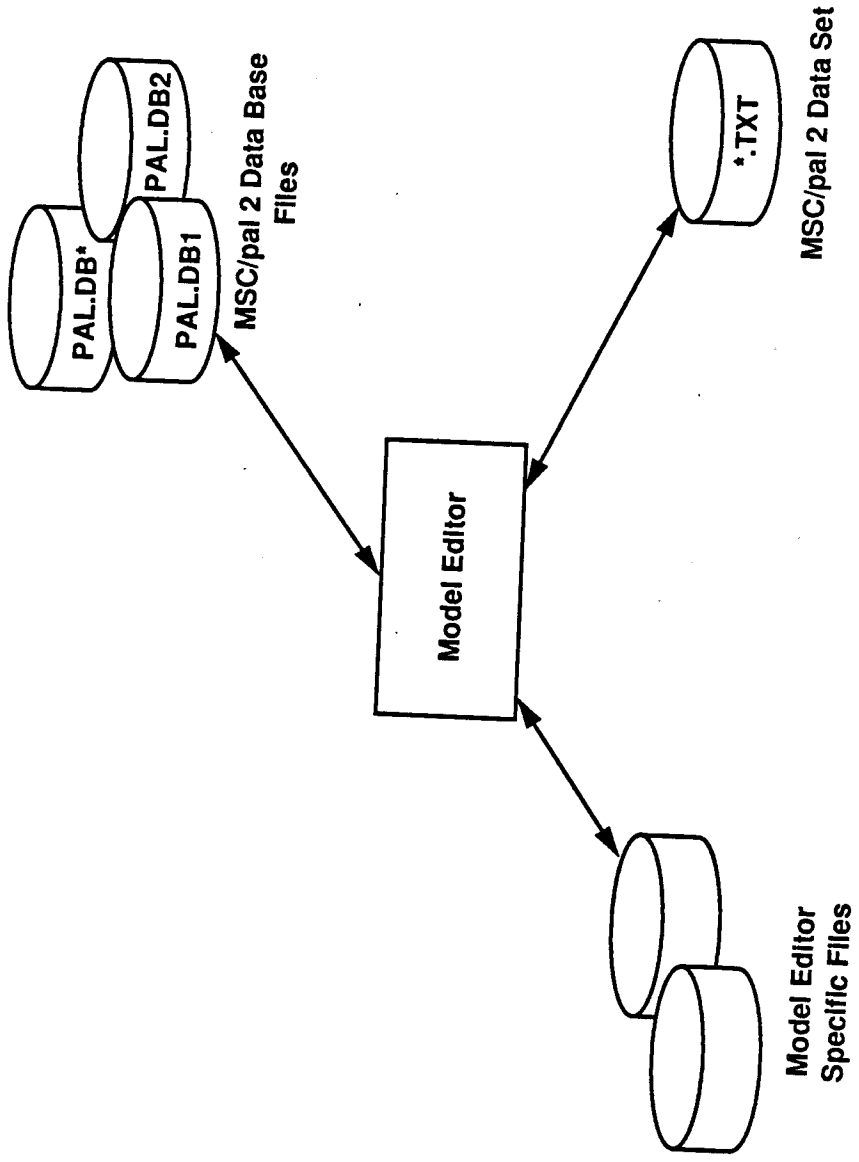


Figure 2. MSC/pal 2 Interface.

MSC PC Products Model Editor

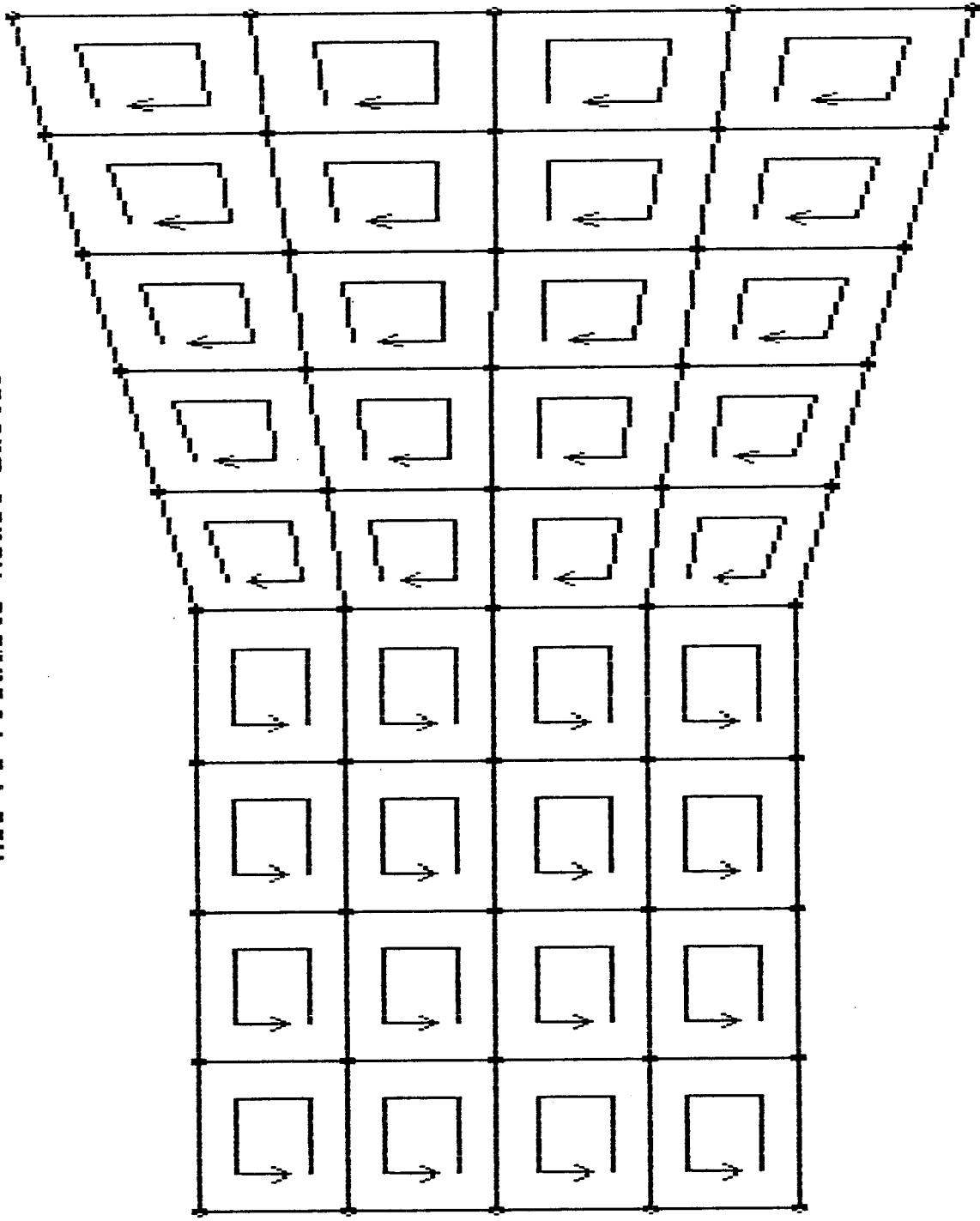
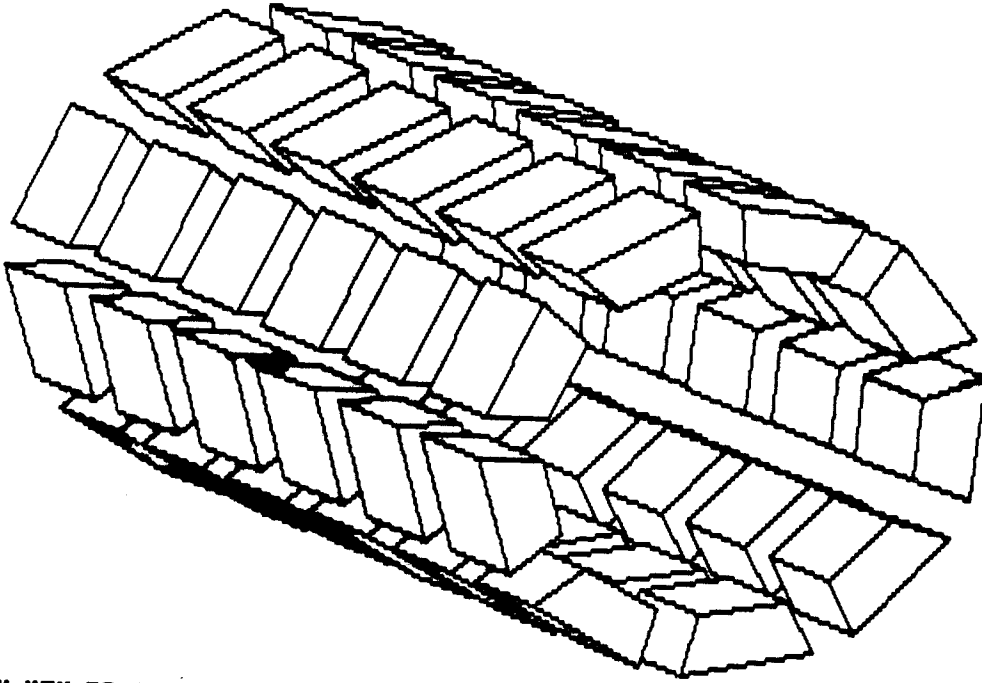


Figure 3. Numbering Direction for Quadrilateral Plates.

**MSC PC Products Model Editor**



**PRESS ANY KEY TO CONTINUE**

**Figure 4. Hidden Solid Elements.**