BI-MONTHLY PROGRESS REPORT

March 1, 1985 through April 30, 1985

Stress Analysis of the Space Telescope Focal Plane Structure Joint

Prepared by

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Two major efforts were begun during March and April, they were: (1) the 3-D solid finite element modeling of the bipod flexure plate;and (2) the development of conceptual models for the load transfer through the three major bolts to the flexure plate.

The flexure plate drawings were reconstucted using CADAM for the purpose of developing a file from which the coordintes of any point on the flexure plate could be determined and also to locate the attachment points of the various components which connect with the flexure plate. A typical CADAM drawing is shown in Fig. 1. For modeling convenience the CADAM drawing of the flexure plate has been divided into several regions which will be subdivided into finite elements using MSGMESH, which is a finite element mesh generator available with MSC/NASTRAN. A schematic of six typical blocks is shown in Fig. 2 and the finite element model generated from them is shown in Fig. 3. The 3-D modeling is quite tedious and time consuming even with the mesh generator, particularly in the early stages. However, this part of the work is beginning to move much smoother and the modeling should be finished by late June or early July.

In addition to the CADAM work on the flexure plate, an effort was also begun to develop computer aided drawings of the peripheral beam which will be used to assist in modeling the connection between it and the flexure plate. A preliminary CADAM drawing is shown in Figure 4.

During the current reporting period the co-principal investigator made a trip to MSFC to discuss with the contract monitor various details concerning the construction, materials and drawings of the focal plane structure. Concepts for modeling the load transfer through the three main bolts to the flexure plate were also discussed and these ideas are currently being evaluated.

The total expenditures charged against the contract to date are $10,957.77 which represents 16% of the total budget. The expenditures are representative of the percentage completion of the overall contract objectives.

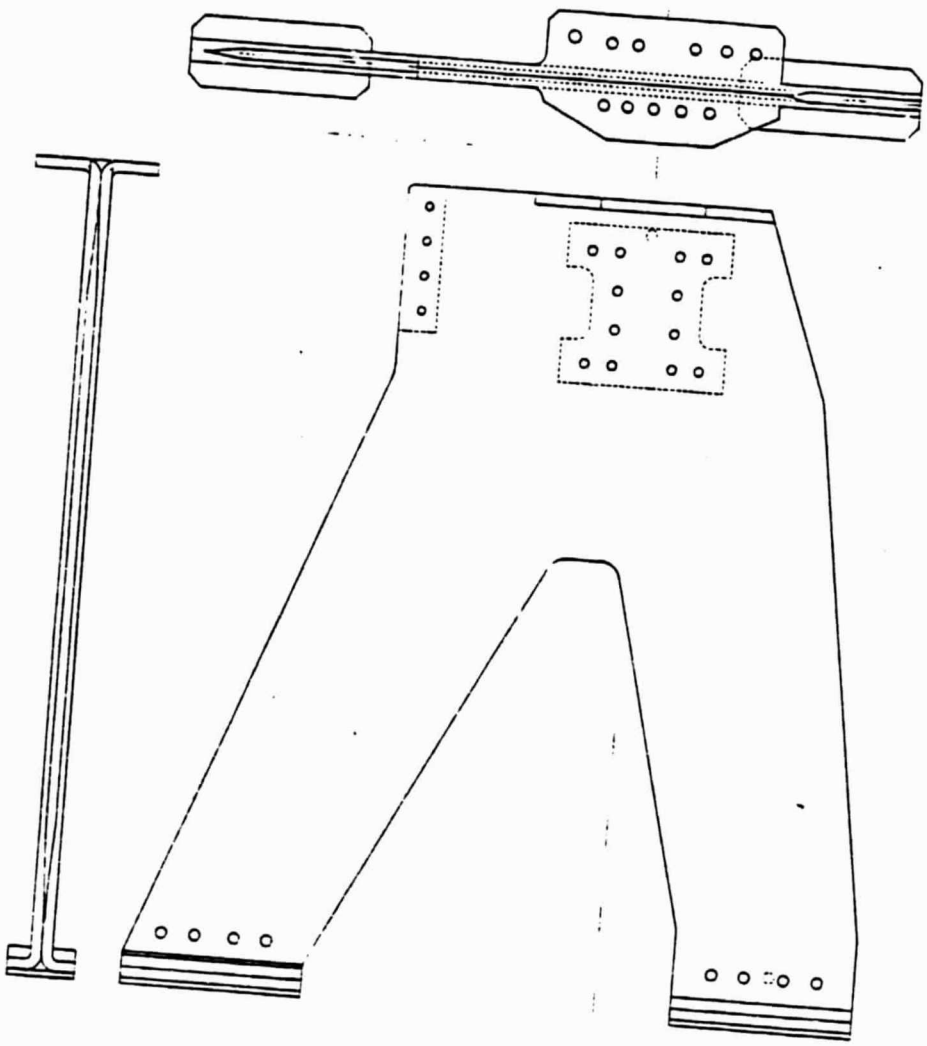

Figure 1. CADAM Drawing of Flexure Plate

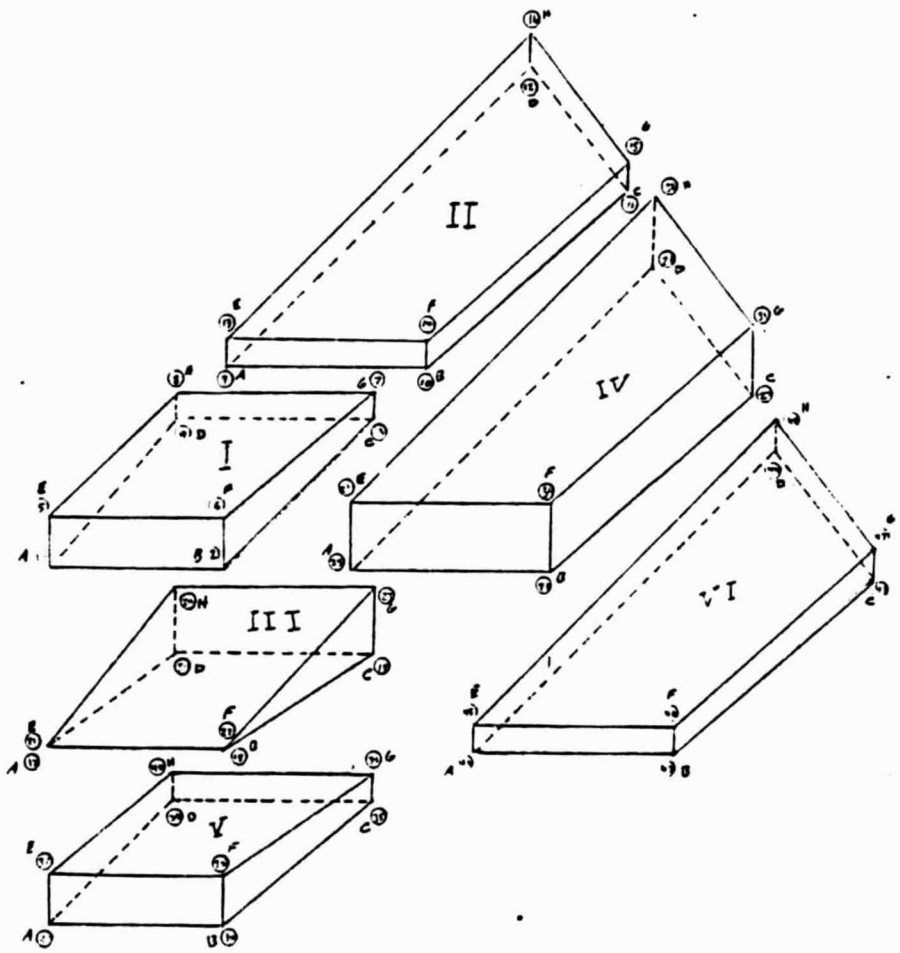

Figure 2. Schematic showing Major Subdivisions of a portion of the Flexure Plate model.

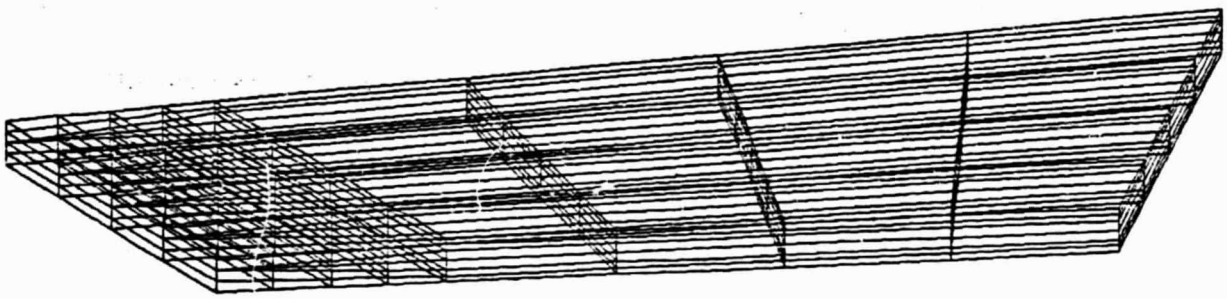

Figure 3. Finite Element Break-Up of a portion of the Flexure Plate.

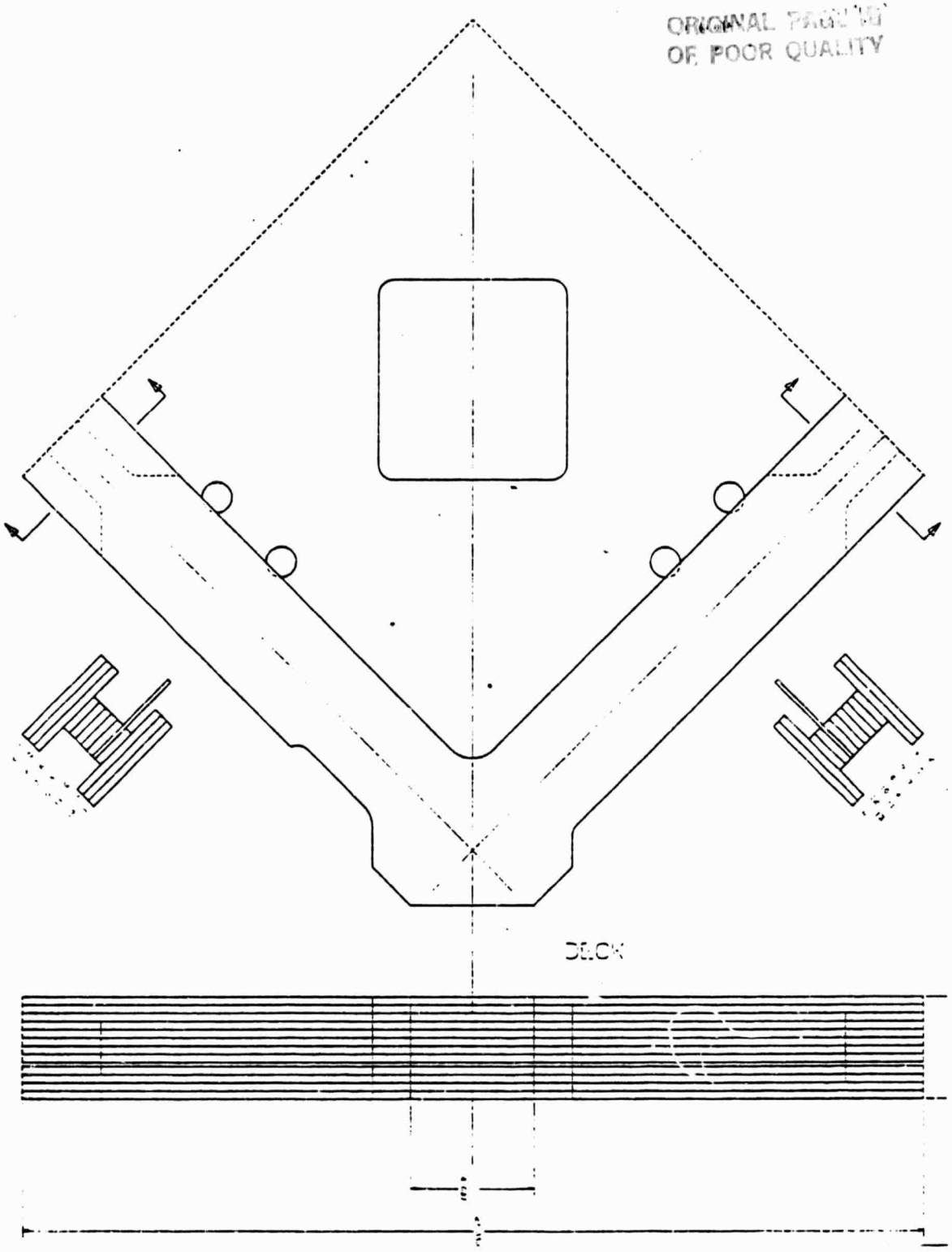

Figure 4: CADAM Drawing of a Corner Section of the Peripheral Beam.