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FINAL REPORT

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MECHANICALLY SCANNED DEPLOYABLE ANTENNA STUDY

PREPARED FOR

GODDARD SPACEFLIGHT CENTER

9 MARCH 1983

HARRIS

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This report presents the conceptual design of a Mechanically Scanned Deployable Antenna which can be launched by the STS (Space Shuttle) to provide radiometric brightness temperature maps of the earth and oceans at selected frequency bands in the frequency range of 1.4 GHz to 11 GHz. Unlike previous scanning radiometric systems, multiple radiometers for each frequency are required in order to fill in the resolution cells across the swath created by the 15 meter diameter spin stabilized system. This multiple beam radiometric system (reference Figure 1.0-1) is sometimes designated as a "whiskbroom" system in that it combines the techniques of the scanning and "pushbroom" type systems.

The scope of the study includes (a) the definition of the feed system including possible feed elements and location, (b) determination of the fundamental reflector-feed offset geometry including offset angles and f/D ratio, (c) preliminary estimates of the beam efficiency of the feed reflector system, (d) a summary of reflector mesh losses at the proposed radiometric frequency bands, (e) an overall conceptual configuration design and (f) preliminary structural and thermal analyses.

This Final Report is organized as follows:

- Section 2.0 - Requirements Summary.
- Section 3.0 - Description of the Conceptual Design.
- Section 4.0 - Projected System Performance.
- Appendix - Detailed Description of the NLSA (Harris Proprietary Non-Linear Structural Analysis Program) Model of the Design.

The Mechanically Scanned Deployable Antenna (MSDA) is a 15 meter offset fed parabolic antenna designed for use in a mechanically scanned spaceborne sensor system. The sensor measures brightness temperatures and normalized backscatter coefficients to determine sea surface temperatures

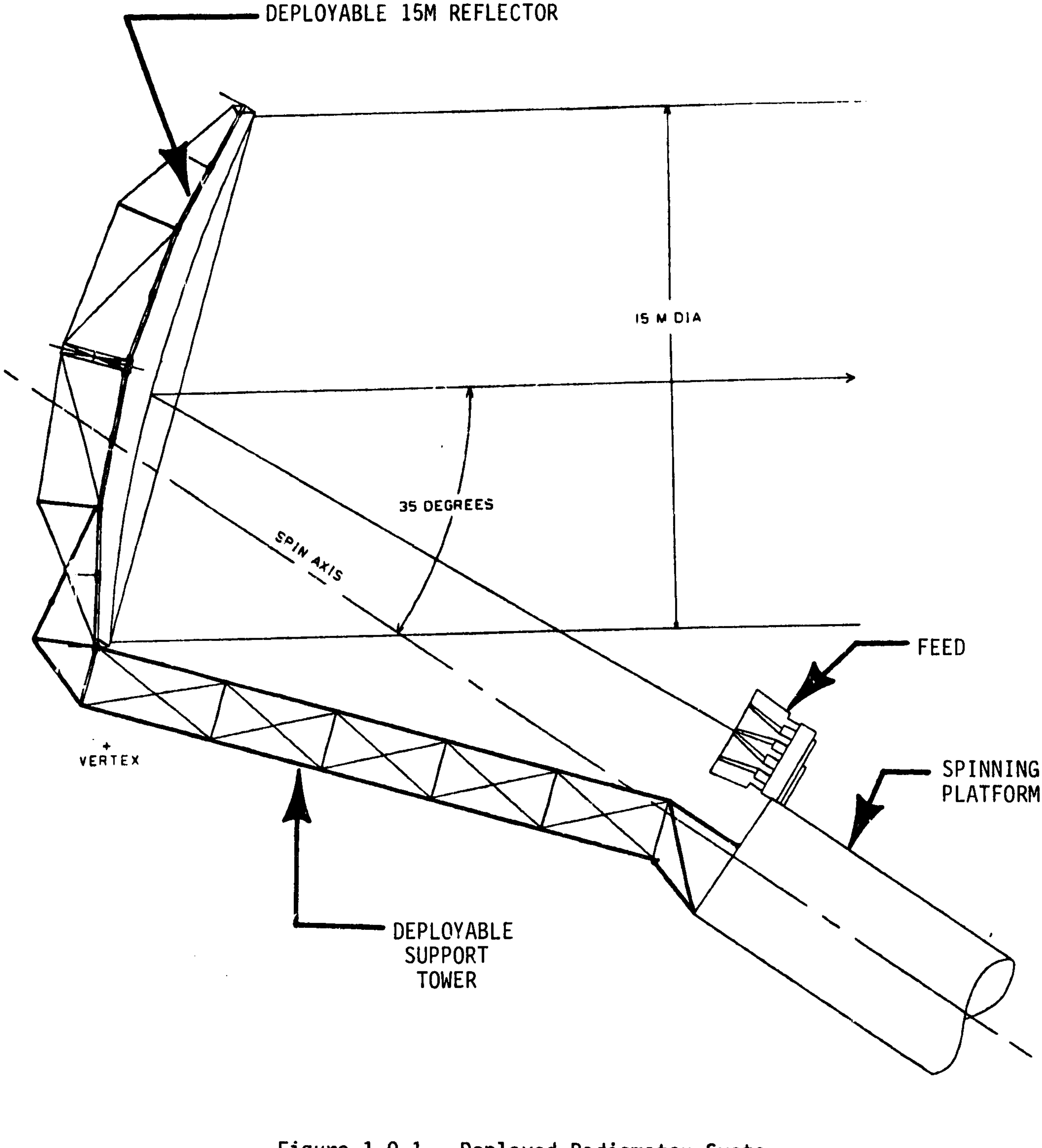

Figure 1.0-1. Deployed Radiometer System

(SST), wind speed, soil moisture, and precipitation (active channel) from a low orbiting satellite (700 KM). The antenna improves up to 4 times the spatial resolution for sea surface temperature over the Large Antenna Multi-frequency Microwave Radiometer (LAMMR).

Based upon the background of such remote sensing needs, the MSDA system was conceived with the detailed requirements in Section 2.0, Table 2.0. The basic system under consideration is a scanning antenna, where the feed and reflector system are fixed relative to the spacecraft bus and the entire system is spun at a 6 rpm rate. At this rate, chosen deliberately slow in order to allow a flexible deployable antenna, a single-beam one-radiometer-per-frequency system will not have contiguous beams at the end of each rotation due to spacecraft motion relative to the earth's surface. Therefore, a multibeam antenna with an independent radiometer connected to each beam at each frequency is required. Such a system, or so called "whiskbroom" radiometer is depicted in Figure 1.0-2.

Use of a multibeam feed, while simplifying and improving system radiometer performance, necessitates use of much heavier feed hardware and electronics. One must then trade supporting either the feed or the reflector from a boom. Since they both weigh approximately the same the structural trade is of minor concern. Thus the conceptual approach supports the reflector with the boom allowing the feed to reside on the bus itself, thereby minimizing transmission losses from feed to receiver.

The conceptual antenna feed system developed by Harris Government Electronic Systems Division (GESD) is an offset fed, 15M, deployable reflector antenna connected to the main spacecraft by an 18M deployable boom. The offset angle of approximately 35^{0} was choosen to place the feed hardware sufficiently out of the projected reflector aperature to minimize diffractions. The deployable mast and reflector system stows in a launch configuration next to the feed on the spacecraft. The total weight of the tower support and deployment structure is about 394 pounds. The antenna feeds weigh 184 pounds assuming that corrugated horns are used as the baseline design. The baseline narrow-angle corrugated horns at 1.4 GHz, 4.3 GHz, 5.1* GHz and 11.0 GHz horns exhibit low spill-over

*4.3 and 5.1 GHz in one horn.

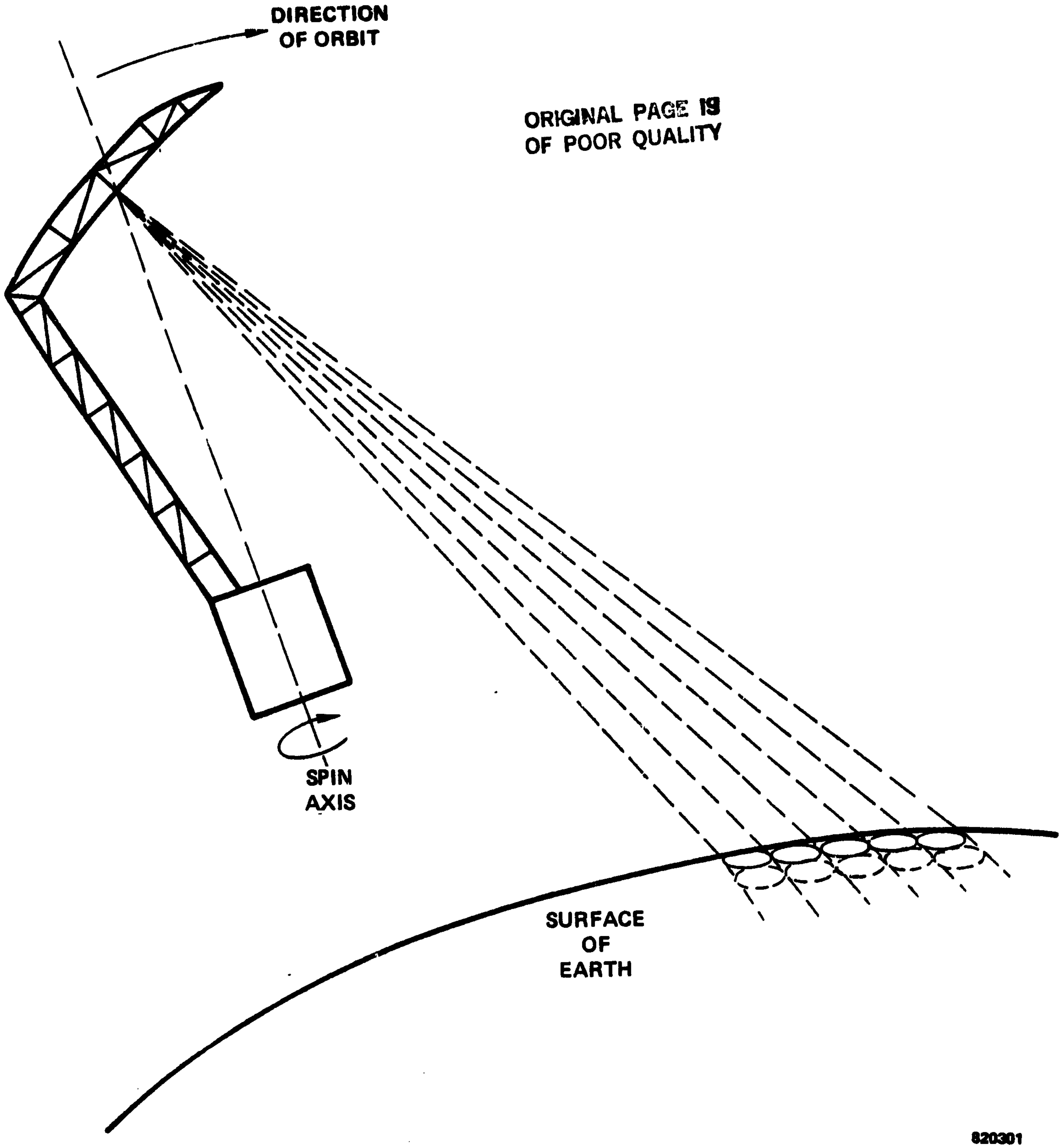

Figure 1.0-2. Whiskbroom Scanning Radiometer System

efficiencies (<5%). These horns, when placed physically in-line and adjacent, produce a surface resolution cell pattern with missing alternating cells. In order to fill in the empty cells, the time scanning whiskbroom feature of the system is used with horns placed on the side and staggered in between the first line of horns. We may physically stagger the horns in this manner with minimum degradation in performance due to the offset f/D ratio of 1.2. Such a large f/D ratio was chosen not only to allow scanning but to reduce the cross-polarization levels to about -30 dB. The preliminary beam efficiency calculations (Figure 1.0-3) indicate that the specification of 90% can be met even for four or five horn displacements off-axis.

The electrical properties of the mesh surface were investigated and all data from past programs was compiled and reviewed. This surface loss property is of particular concern in space radiometric applications due to the environmental effects upon the antenna loss. All present data and modeling calculations for the 10 openings per inch gold-plated molybdenum mesh chosen for this application indicate that loss values less than 0.1 dB are possible for frequencies up to 11.0 GHz. No significant change in the mesh reflector surface impedance is expected under changing solar conditions.

The mechanical-thermal analysis performed on the Harris concept clearly indicate that the spin effects produce only minor distortions. Indeed the antenna can be dynamically balanced by changing the attachment location on the spacecraft. The largest distortion is an axial defocus of about 0.628 inches due to thermal gradients. Axial defocusing in such long focal length optics systems is generally acceptable. The RMS surface tolerance error for this design degrades the beam efficiency of the antenna system at X-Band to a value below 90%.

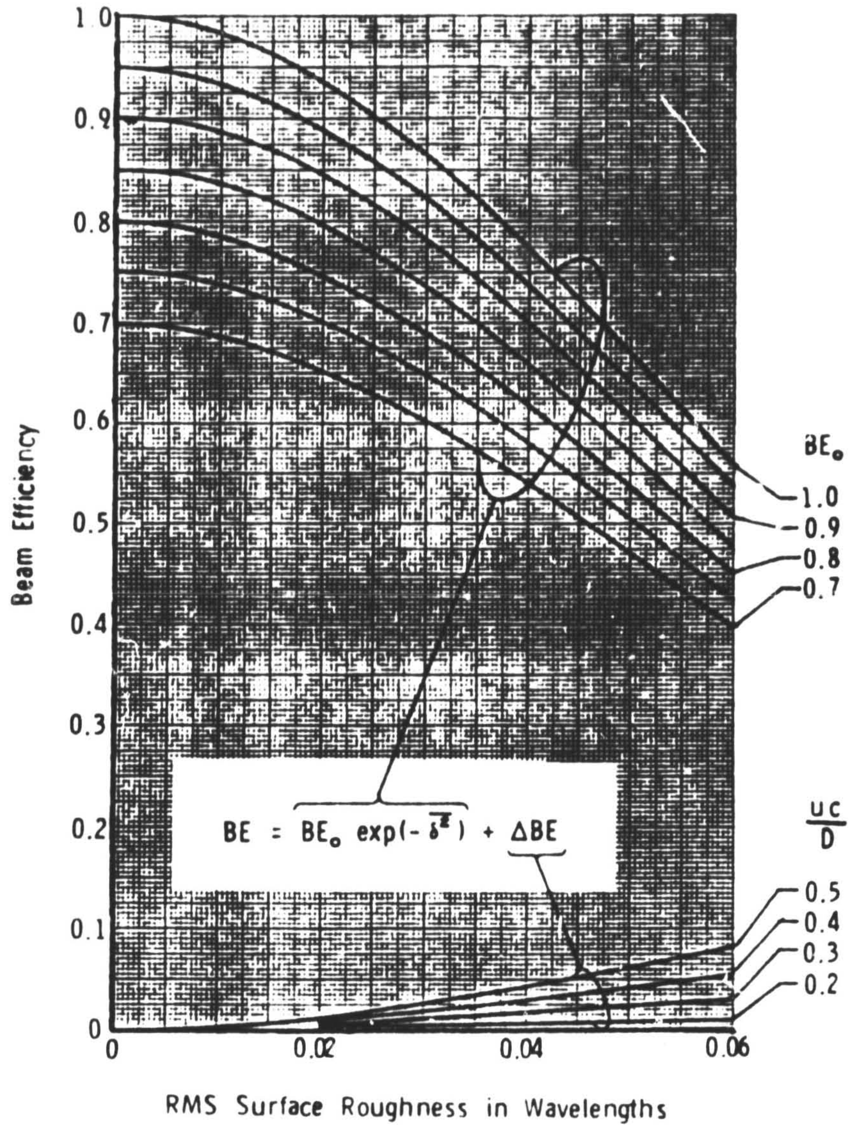

Figure 1.0-3. Beam Efficiency of a Random Rough Surface Reflector

2.0 REQUIREMENTS

The MSDA system is a mechanically scanned radiometric system attached to a spinning spacecraft. The basic requirements for the system are given in Table 2.0.

Table 2.0. Requirements for the MSDA System

Stowed Volume	4M Diameter Cylinder X 7 Meters Long
Stowed Resonant Frequency	25 Hz
Scanning Resonant Frequency	12 Hz
Platform Spin Rate	6 rpm
Conical Scan Axis	35^{o}
Altitute	700 KM
Orbit	Sun-Synchronous
Aperture Size	15M
Operating Frequencies	1.4, 4.3, 5.1, 11 GHz
Beamwidth	1.03 (1.4 GHz), 0.35 (4.3 GHz) 0.3 (5.1 GHz), 0.35 (11 GHz)
Number of Beams in Track	5 (1.414 GHz), 11 (4.3, 5.1 GHz) 11 (11 GHz)
Beam Efficiency	90%
Surface Mesh Loss	<0.1 dB
Cross-Polarization	>28 dB

In addition to these basic requirements, the system must be dynamically balanced and capable of being launched in a single shuttle flight.

3.0 PRELIMINARY DESIGN

3.1 Stowed System Description

The stowed radiometer system, Figure 3.1, is mounted to the forward bulkhead of the spacecraft. The tower and reflector stow above the feed assembly. The reflector is supported both by the tower and by a pair of auxiliary support trusses (not shown) that reach from the forward bulkhead of the spacecraft to support the reflector hub.

3.2 Deployed System Description

The deployed radiometer system, Figure 3.2, consists of the spacecraft, with the feed/radiometer assembly attached, the tower support and deployment structure consisting of a four-bar linkage formed from a supporting truss and a screw-jack assembly, a deploying, rigid, three-sided tower, and the deployable reflector. The reflector surface forms a section of a paraboloid, 15 meters in diameter, starting 3 meters out from the vertex of the parent parabola. The entire rigid assembly, including the spacecraft, spins about the axis of the spacecraft, sweeping a 70 degree included-angle cone. In normal use, the feed points away from the Earth and the reflector collimates the beam and reflects it back toward the Earth. Thus, the rotation traces overlapping circles across its track along the ground.

To select this configuration, a trade between supporting the feed or reflector from the boom became apparent. By placing the feed on the spacecraft, the multiple horns are in close proximity to the receivers and on-board power supplies and processors. The weights of the reflector and feed are 225 and 184 lbs respectively, thus supporting the reflector from the boom or the feed from the boom present similar structural problems. Because of the advantages of having the feed in close proximity to the bus, the configuration as shown is selected. While this does not meet the 12 Hz fundamental frequency, the effects of lower stiffness is addressed in Section 4.0.

3.3 Deployment Sequence

The radiometer system reaches orbit with the tower and reflector stowed. Upon reaching orbit, the reflector support braces swing away, freeing the reflector. The screw jack then retracts, Figure 3.3-1, rotating the

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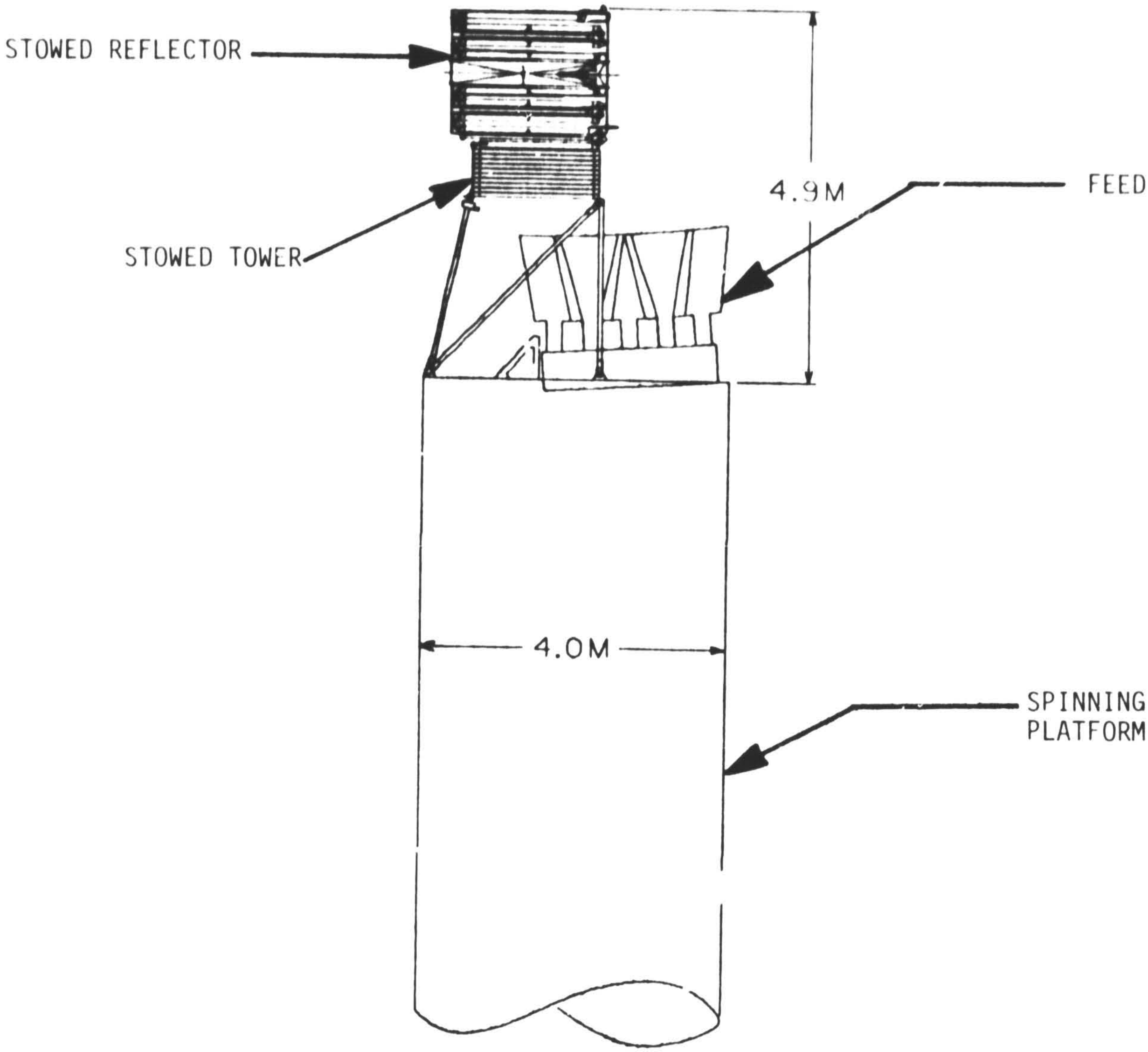

Figure 3.1. Stowed Radiometer System

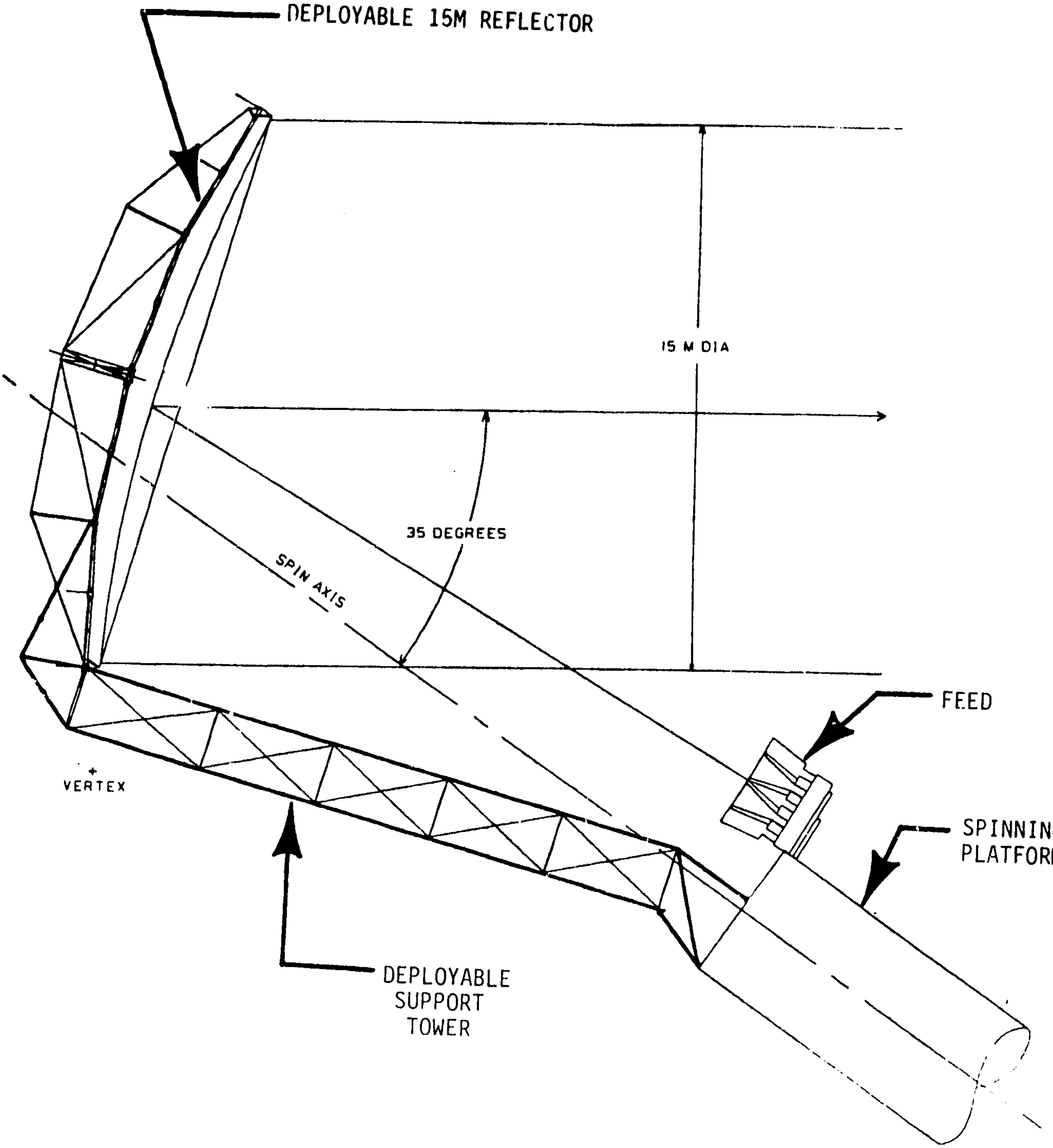

Figure 3.2. Deployed Radiometer System

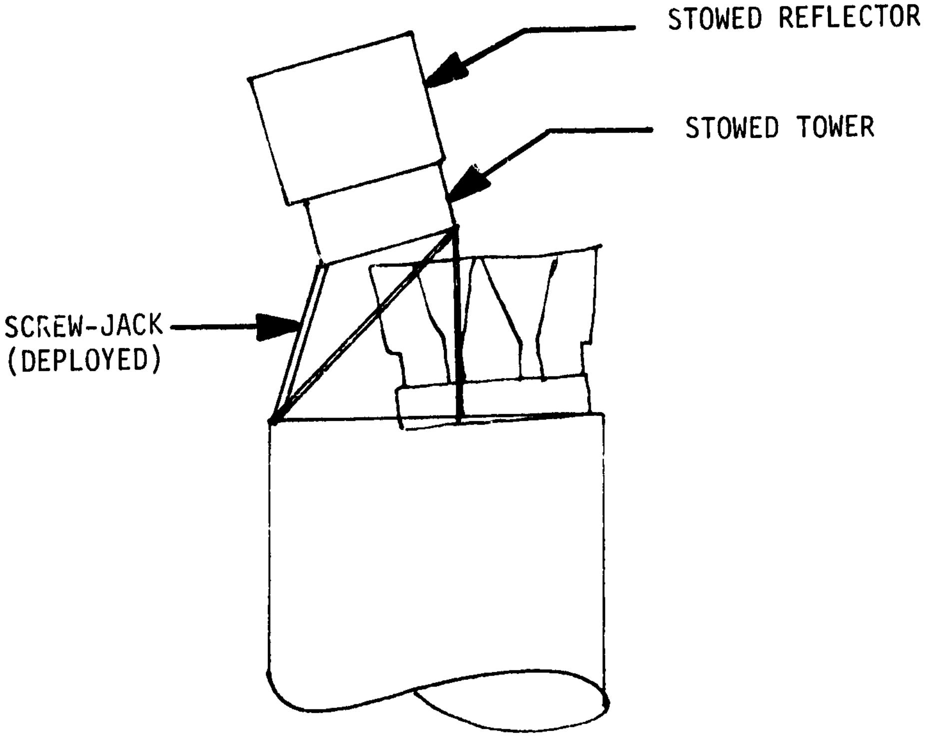

Figure 3.3-1. Tower is Rotated by Screw-Jack
During First Stage of Deployment

tower and reflector to their final offset angle. The tower deploys, Figure 3.3-2, carrying the stowed reflector with it. The last section of the tower forms the transition between the triangular section of the tower and the two folded reflector ribs. Next, the reflector deploys, Figure 3.3-3. The reflector is deployed by the gearmotor and ballscrew assembly located in the hub. As the reflector unfolds, the rib-to-tower transition segments, located at the ends of two of the ribs, also unfold being driven and controlled by the same linkage that deploys the rest of the reflector. As deployment nears completion, two folded struts on each of the two reflector mounting ribs are pulled straight. As they come straight, the folding joints lock, making the struts rigid and capable of withstanding compressive loads. As the reflector deploys and the ribs separate, the last section of the tower opens laterally, completing the triangular section out to the reflector. Finally, the feed assembly deploys laterally, Figure 3.3-4, to its proper position with respect to the reflector. At this point, the radiometer system is a rigid assembly, capable of withstanding torsional and moment loads in any direction, and with its spin balance axis coincident with the centerline of the spacecraft.

3.4 Feed Preliminary Design

A sketch detailing the layout of the feed array appears in Figure 3.4-1. The circles represent the outer contours of the corrugated feed horns as viewed from the antenna along the principal axis. The vertical axis (y_f) in Figure 3.4-1 corresponds to the vertical feed axis appearing in the antenna system geometry sketch (Figure 3.4-2). Feed horns are numbered 1 thru 27 for simplification of identification. The coordinates of the geometric center of each feed, as measured in the feed plane (Figure 3.4-1), are listed in Table 3.4-1.

A corrugated conical horn is considered to be an ideal feed for a parabolic reflector system because of its high efficiency, nearly equal E- and H-plane beamwidths, and a wide frequency bandwidth. Typically, at C-band or higher frequencies, the entire horn is made from aluminum, either cast or machined in sections. At L-band the horn can be fabricated from aluminum sheet. The latter technique requires each corrugation ring to be machined separately, then inserted into an aluminum cone. The corrugation depth of each feed is

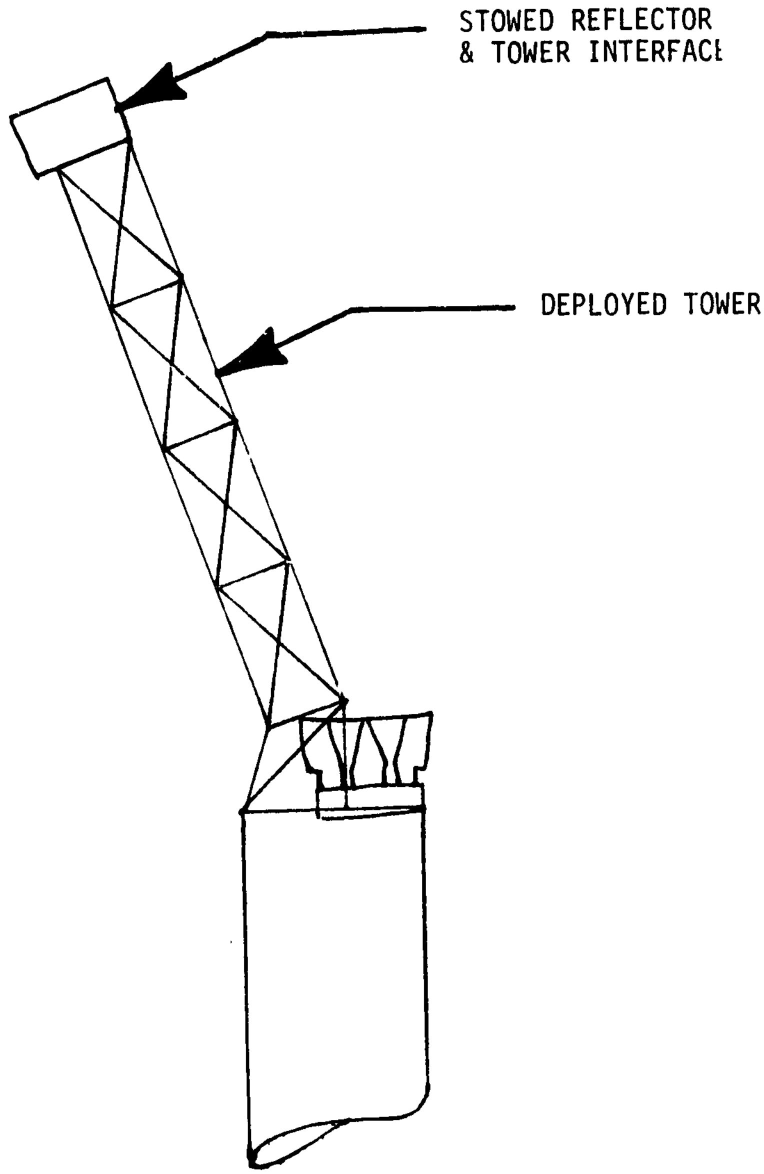

Figure 3.3-2. Tower Deploys a[illegible]tches to Support Reflector

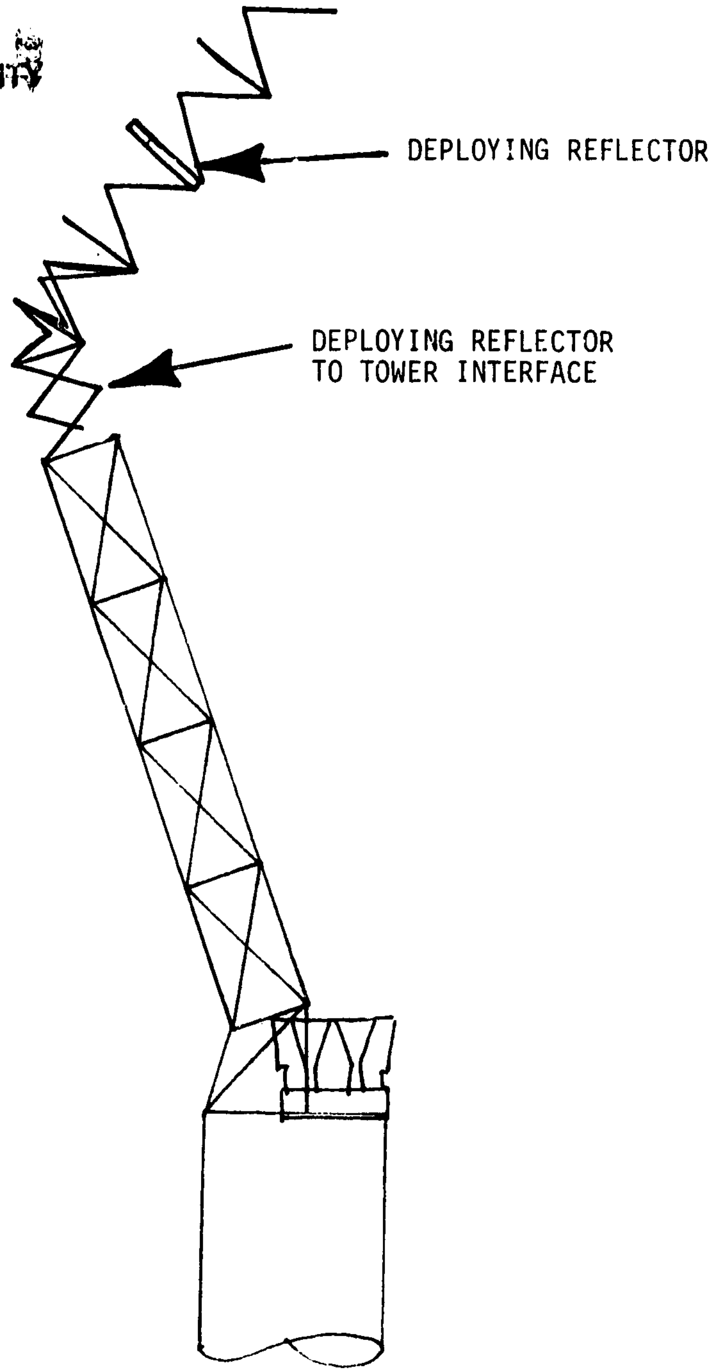

Figure 3.3-3. The Deploying Reflector Drives the Tower Interface

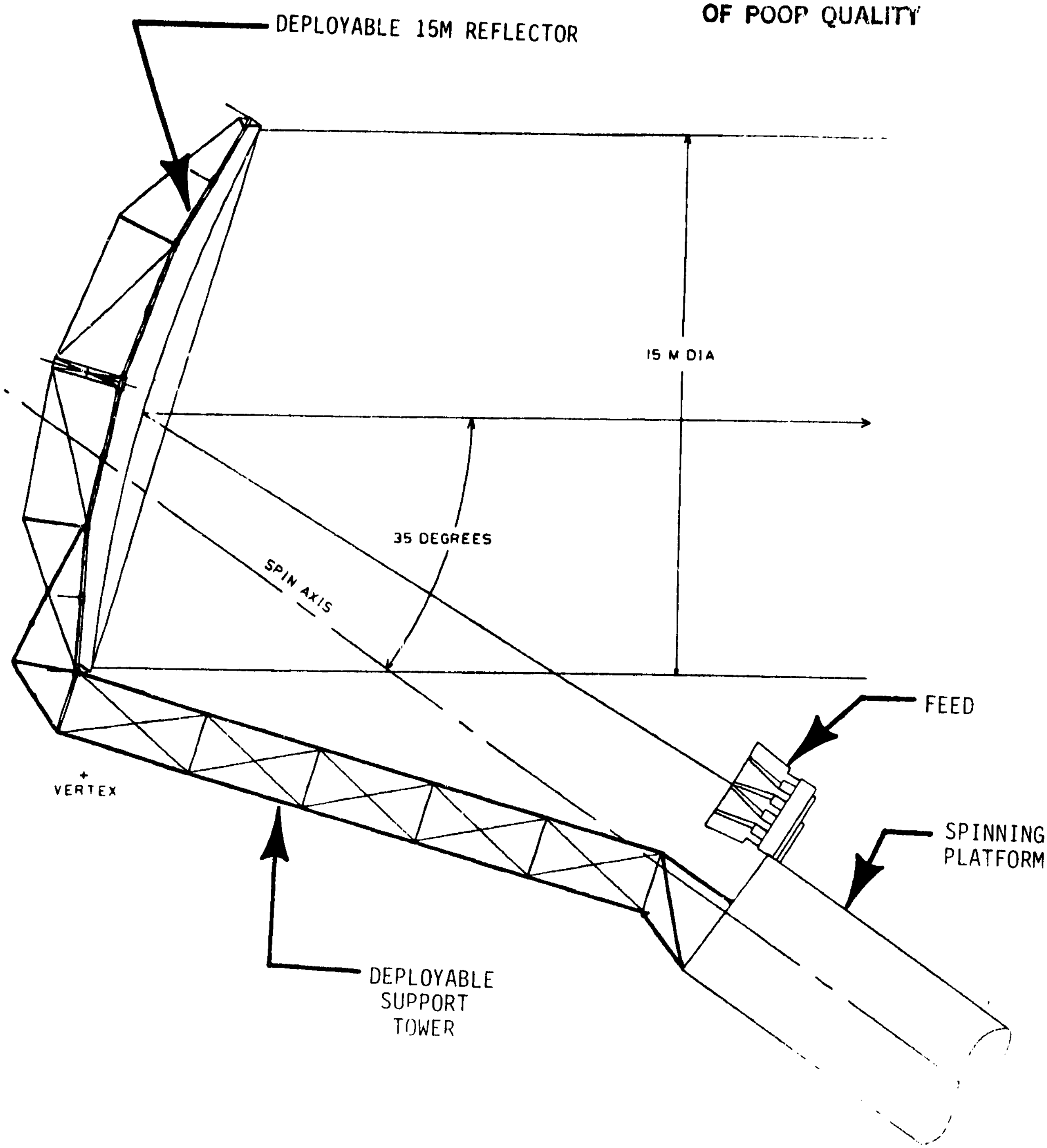

Figure 3.3-4. The Feed Slides Out and Latches In-Place

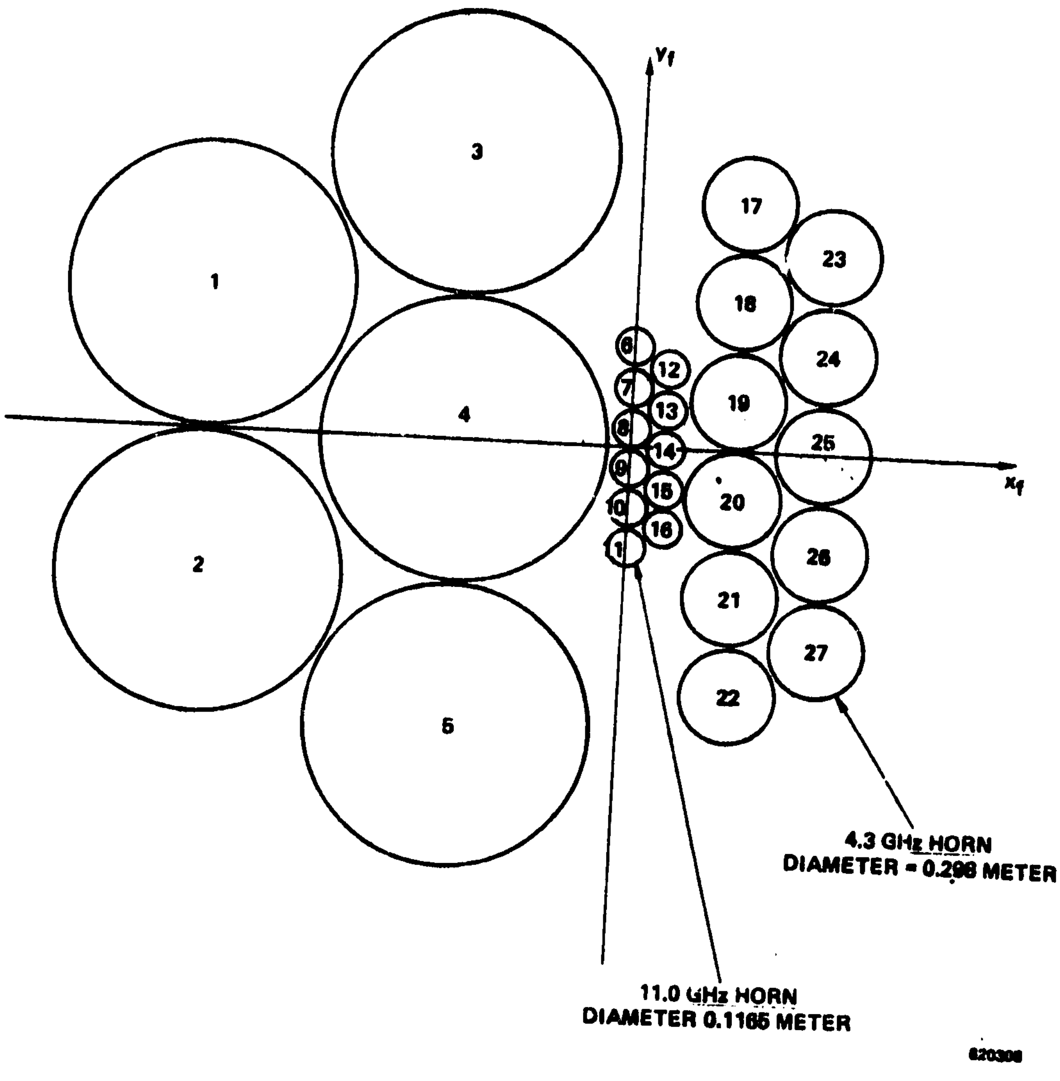

Figure 3.4-1. Feed Array Layout

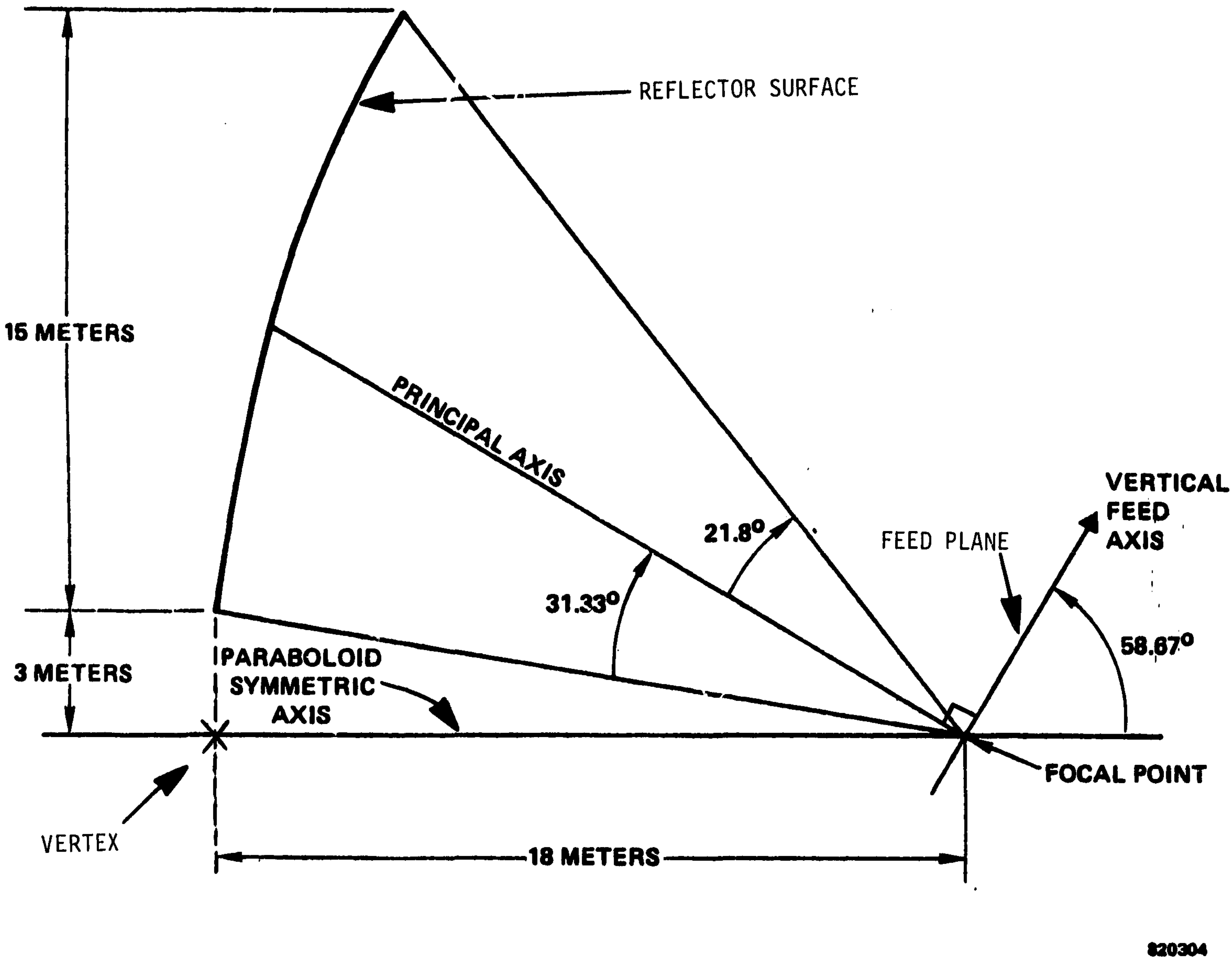

Figure 3.4-2. Antenna System Geometry

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Table 3.4-1.

Feed Number	X_f-Displacement (meters)	Y_f-Displacement (meters)
1	-1.300	0.455
2	-1.300	-0.455
3	-0.513	0.909
4	-0.513	0.000
5	-0.513	-0.909
6	0.0	0.291
7	0.0	0.175
8	0.0	+0.058
9	0.0	-0.058
10	0.0	-0.175
11	0.0	-0.291
12	0.101	0.233
13	0.101	0.117
14	0.101	0.000
15	0.101	-0.117
16	0.101	-0.233
17	0.308	0.745
18	0.308	0.447
19	0.308	0.149
20	0.308	-0.149
21	0.308	-0.447
22	0.308	-0.745
23	0.566	0.596
24	0.566	0.298
25	0.566	0.000
26	0.566	-0.298
27	0.566	-0.596

assumed to be 3/8 λ. The remaining physical dimensions are listed in Table 3.4-2, with an associated sketch in Figure 3.4-3. It should be noted that the length, L, of the horn is approximate in that it is calculated assuming a circular waveguide radius of 0.5 λ. Other horn types such as the Potter horn can be useful for this application at 1.4 GHz and 11.0 GHz due to the narrowband performance required. It should be noted that in this preliminary design, the 11.0 GHz horns produce a 0.16^{o} beamwidth. Ways of increasing the beamwidth to 0.35^{o} are discussed in Paragraph 4.4.

3.5 Tower Design

The design requirements of the deploying tower are as follows:

- Small stowed package (25 inch height envelope)
- High stiffness (dynamic loads)
- Structural capability during deployment (stiffness of partially open structure)
- Repeatable joints (repeatable tower length)
- No rotation during deployment (electrical interfaces)

The proposed tower design meets all of these requirements and creates a stable link between the reflector and the spacecraft (Figure 3.5-1). The tower design was developed by HGESD on IR&D Program No. 82-4150. On this IR&D program a breadboard model of the tower design has been built and tested. Figure 3.5-2 shows the tower model. The tower is constructed of four identical structural bays and one adapter bay. Tower bay dimensions and element descriptions are shown in Figure 3.5-3. The tower is a folding triangular truss structure, that deploys as shown in Figure 3.5-4. Note that the basic tower design is easily scaled to fit a wide range of applications and requires no built-in twist during deployment. These features make it more attractive than an astromast type design.

During deployment the longerons unfold and latch at joints in the center and at each bay interface. As all three longerons unfold simultaneously, the upper and lower bay platforms move farther apart, increasing bay height. When the tower is stowed, the rod diagonals are elastically buckled outward into a circular arc. This stored energy is used to deploy the tower. The longerons are stowed along side the platforms, from corner to corner. Deployment of the tower is controlled by a central lanyard as depicted in Figure 3.5-5. Addition of delatch cords also allows restow of the tower if required.

Table 3.4-2. Feed Geometry

1.414 GHz Horn		4.3 GHz Horn		11.0 GHz Horn	
a	= 0.375 meter	a	= 0.123 meter	a	= 0.048 meter
R	= 1.60 meter	R	= 0.526 meter	R	= 0.206 meter
θ_0	= 13.555°	θ_0	= 13.52°	θ_0	= 13.47°
Δ	= 0.21 wavelength	Δ	= 0.209 wavelength	Δ	= 0.208 wavelength
D_{1A}	= 0.909 meter	D_{aA}	= 0.298 meter	D_{1A}	= 0.1165 meter
L	= 1.33 meter	L	= 0.439 meter	L	= 0.172 meter

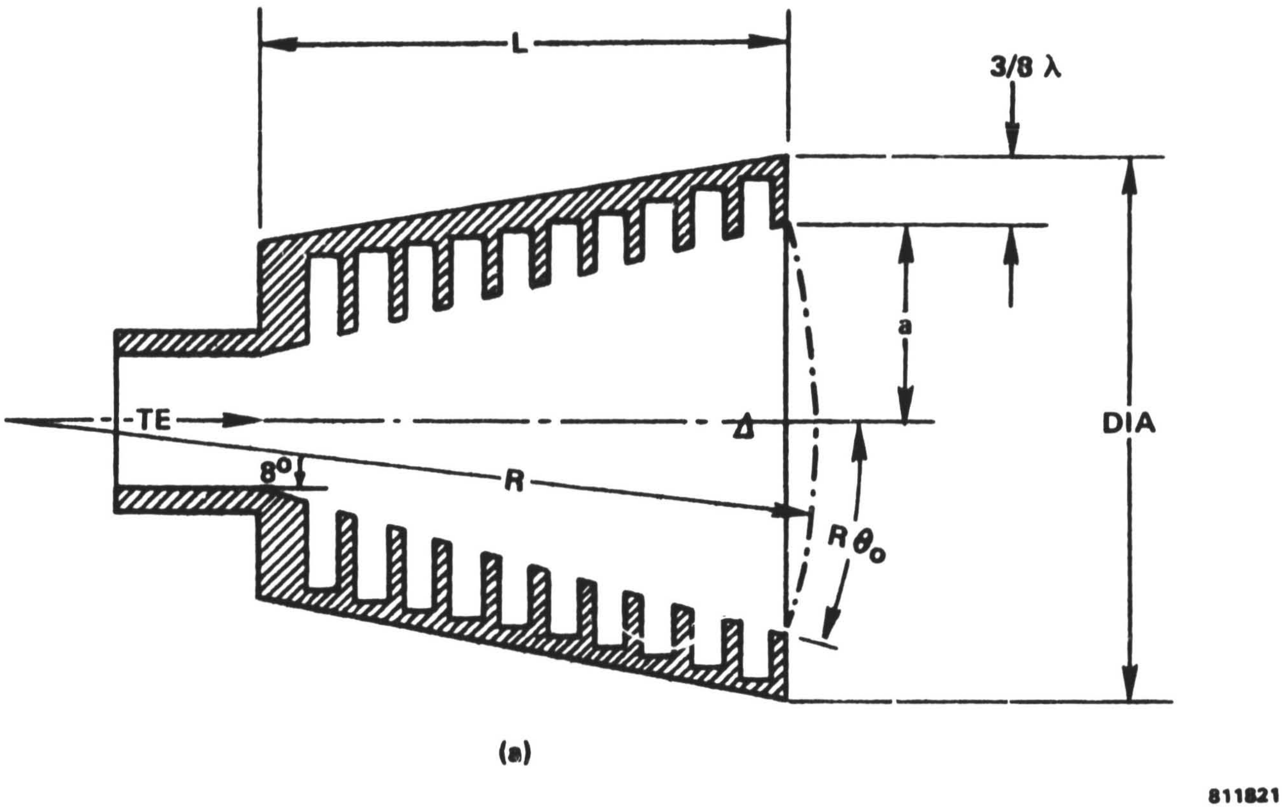


Figure 3.4-3. Corrugated Feed Horn Geometry

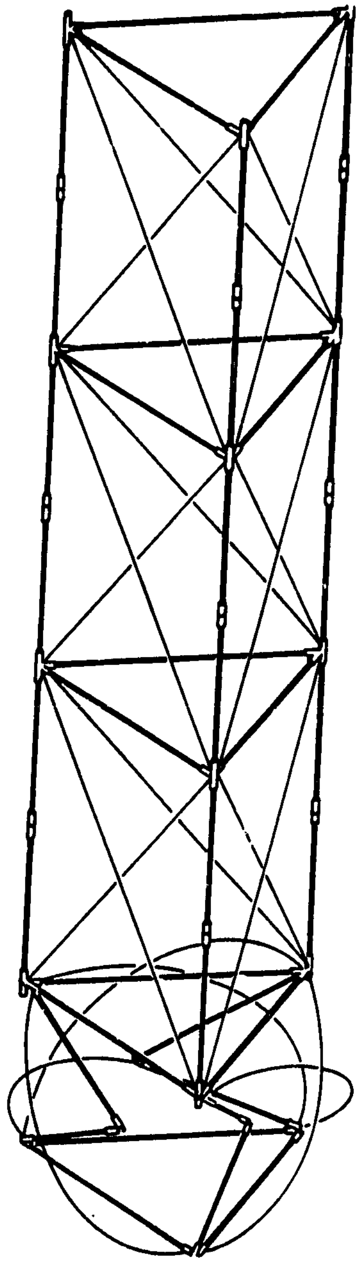
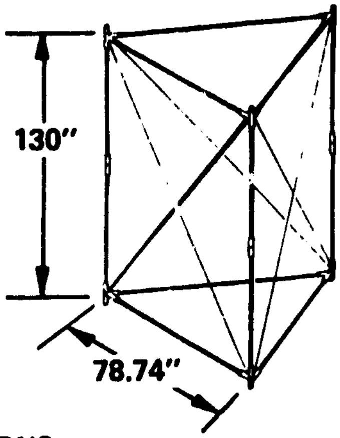


Figure 3.5-1. Five Sections of the Deployable Tower Form the 18M Tower

Figure 3.5-2. The Tower Design Has Been Built and Tested on IR&D Program No. 82-4150.



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LONGERONS

2.0 INCH OD

0.060 INCH THICK GFRP

PLATFORM MEMBERS

1.0 INCH OD

0.020 INCH THICK GFRP

LONGERON AND PLATFORM GFRP

MODULUS $E = 18 \times 10^6$ PSI

CTE – $0.1 \times 10^{-6}/^oF$

(0^o_2, $\pm 50^o$ HMS LAYUP)

DIAGONALS

0.025 INCH OD GFRP ROD

MODULUS $E = 29 \times 10^6$ PSI

CTE = $-0.12 \times 10^{-6}/^oF$

TOWER PROPERTIES

BENDING STIFFNESS, $EI = 2 \times 10^{10}$ PSI

AXIAL STIFFNESS, $EA = 2 \times 10^7$ LB

BENDING, $M_{CR} = 1.96 \times 10^5$ IN-LB*

COMPRESSION, $P_{CR} = 2530$ LB*

WEIGHT = 120 POUNDS

TORSIONAL STIFFNESS = 0.5×10^6 IN*/RAD TOTAL TOWER

*LOCAL LONGERON CONDITION

810747A

Figure 3.5-3. Tower Design and Performance Parameters

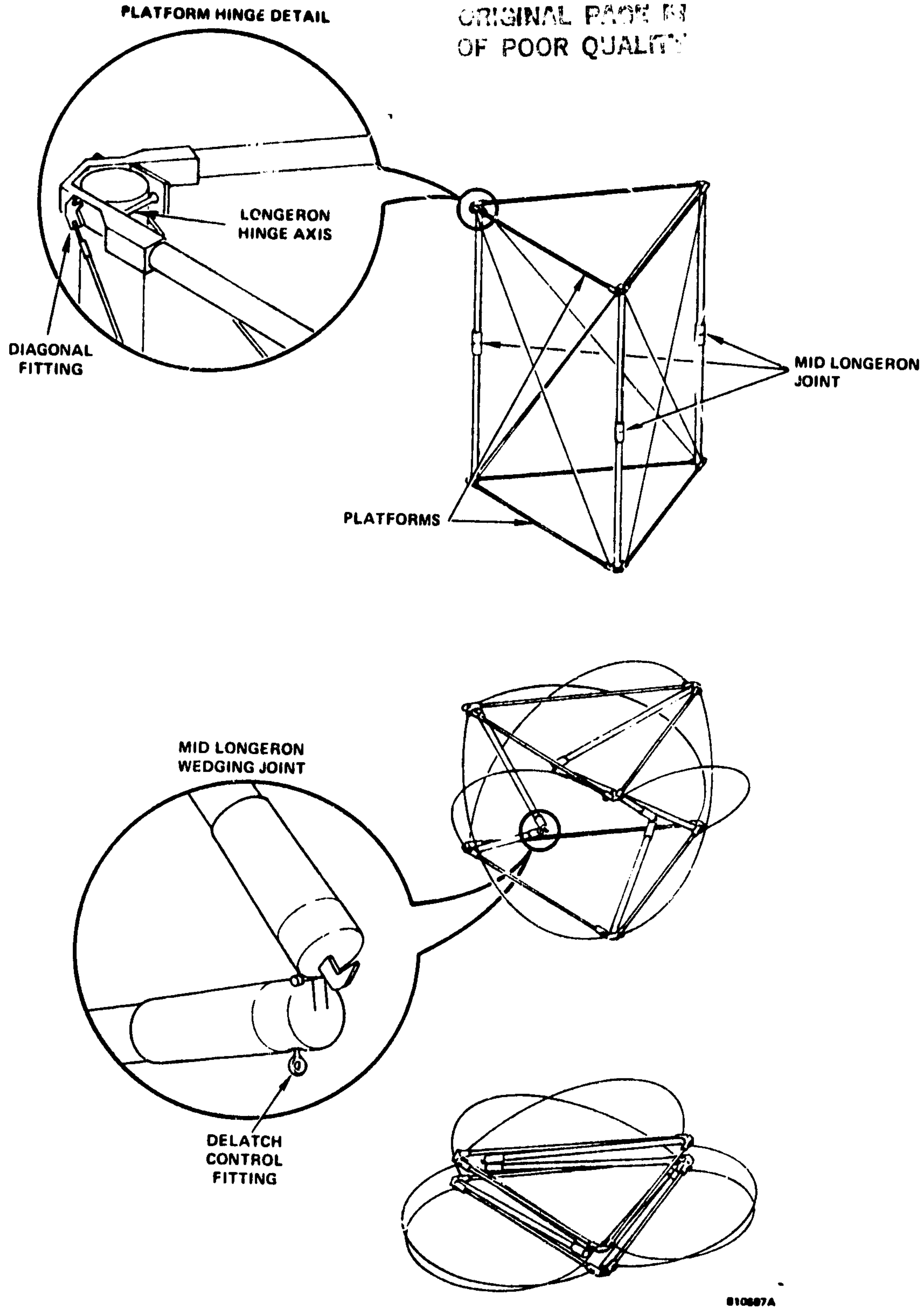

Figure 3.5-4. Tower Deployment Sequence

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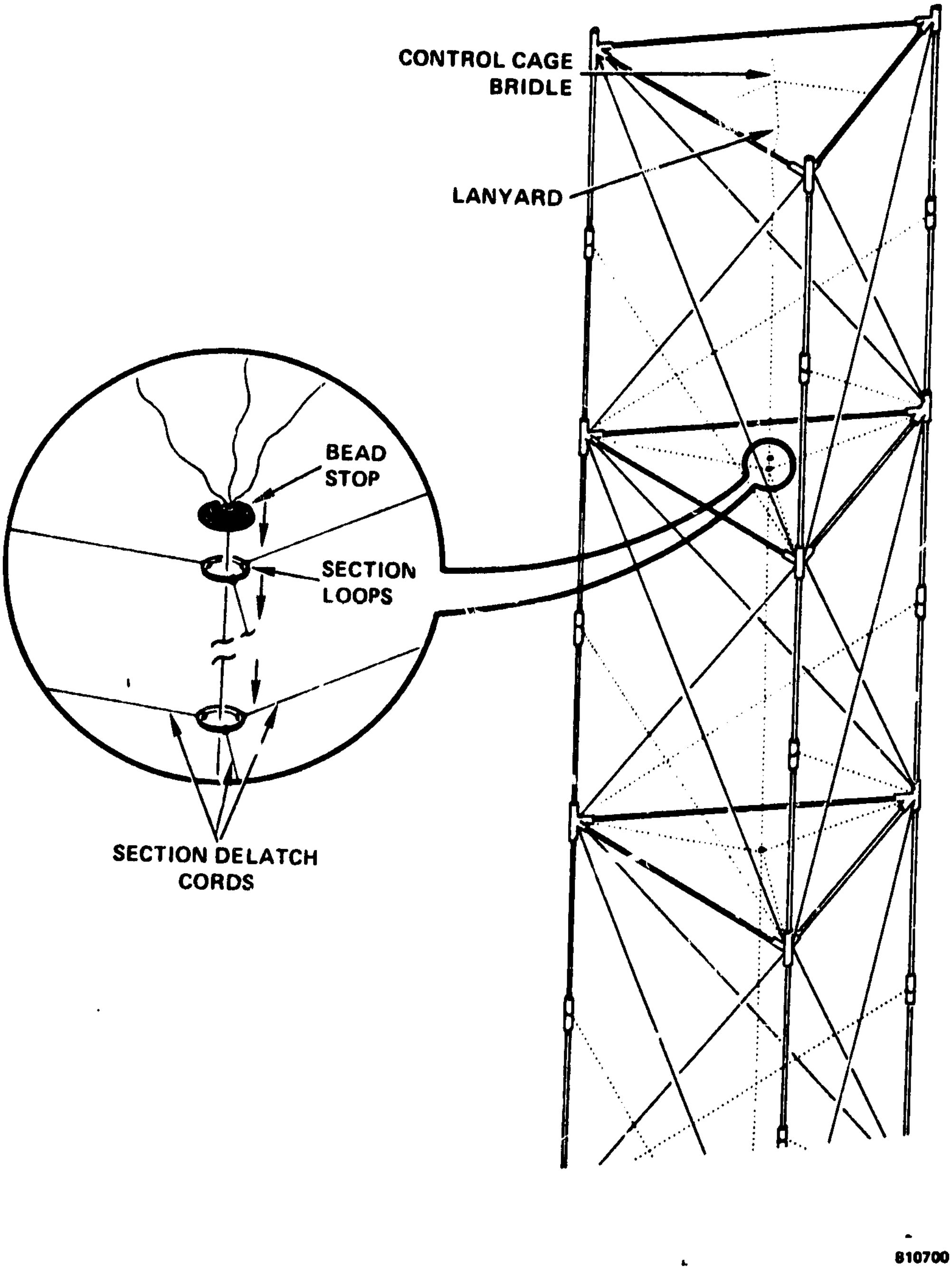

Figure 3.5-5. A Central Lanyard Controls Deployment of the Tower Sections.

3.6 FRR Reflector Design Description

Figure 3.6 illustrates the basic Folded Radial Rib Reflector (FRR). The FRR concept uses a highly efficient truss design to provide a high FRR stiffness to weight ratio. The rib structure of the truss is segmented with articulating joints to give a compact stowed package. This design is then mated with the mesh surface design as used on the TDRSS antenna. The potential benefits of the concept are:

- Compact Packaging
- High Reflector Surface Accuracy
- High Stowed and Deployed Stiffness
- Low Weight
- Low Moments of Inertia
- Slow, Motor Controlled Deployment

3.6.1 FRR Structure Design

The baseline FRR design, illustrated in Figure 3.6.1-1 shows the elements of the truss rib as well as the members which connect adjacent ribs. Figure 3.6.1-2 shows the side view of a single rib attached to the reflector hub. Latching joints are shown at two locations, inboard and outboard of the intersection of the radial rib members and the compressive, vertical strut. These latching joints must lock to form inboard and outboard rigid members. The non-latching joint between them remains free to rotate in the plane of the truss preserving the structural characteristics of the pinjointed truss. These joints are discussed later in this paragraph.

Figure 3.6.1-2 also shows the location of joints in the solid, graphite composite rods which form the truss. The placement of these joints is selected to allow the truss to fold and deploy with only planar motion. Figures 3.6.1-? through 3.6.1-5 illustrate the FRR rib deployment sequence. Small clips, or rod guides, attach to the main structural members and joints to support the tension rods while stowed. The deployment of the rib pulls the rods free from the rod guides. As discussed previously, a four-bar linkage connecting the radial rib members synchronizes and controls the deployment.

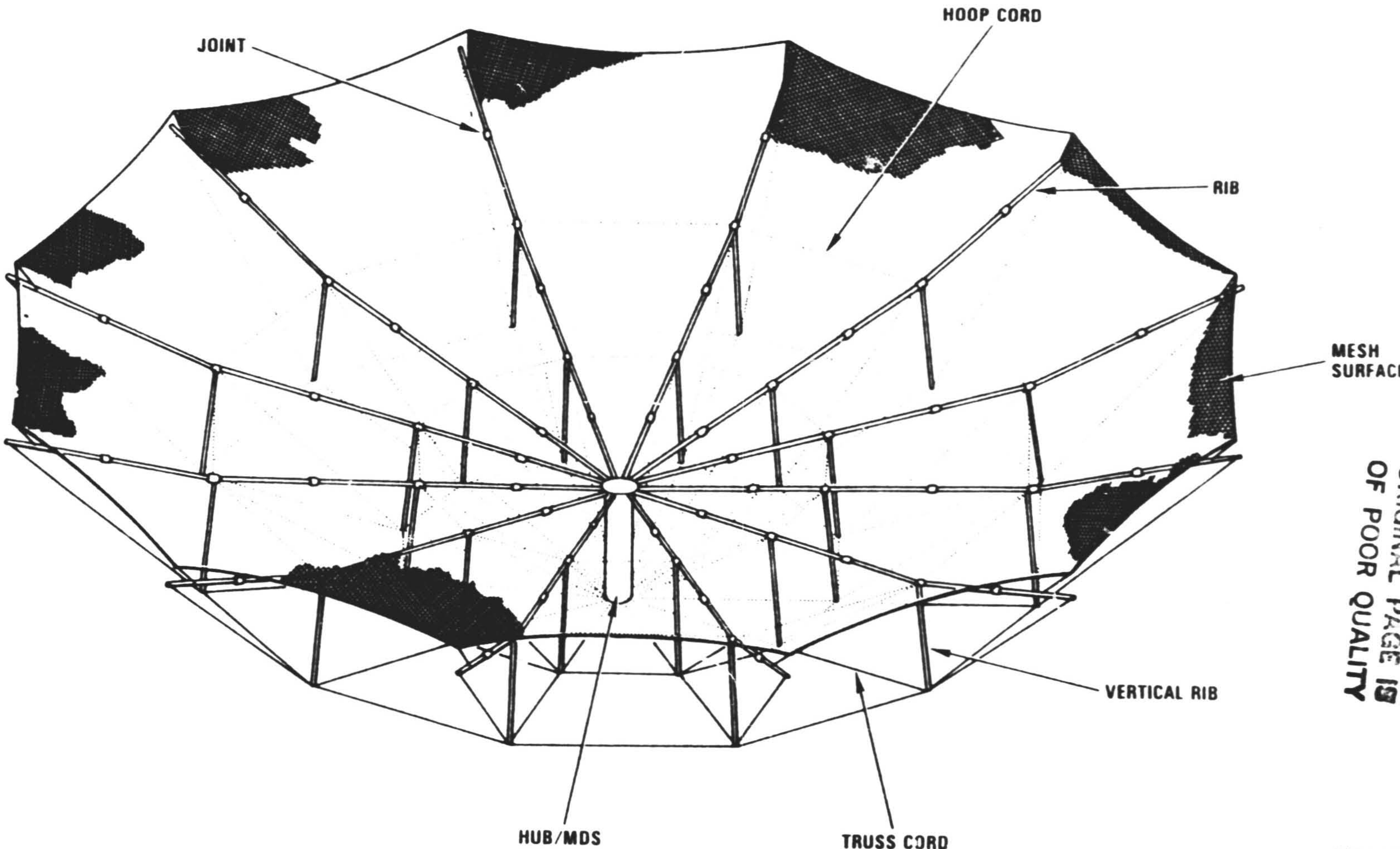

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Figure 3.6. Basic Folded Radial Rib Antenna

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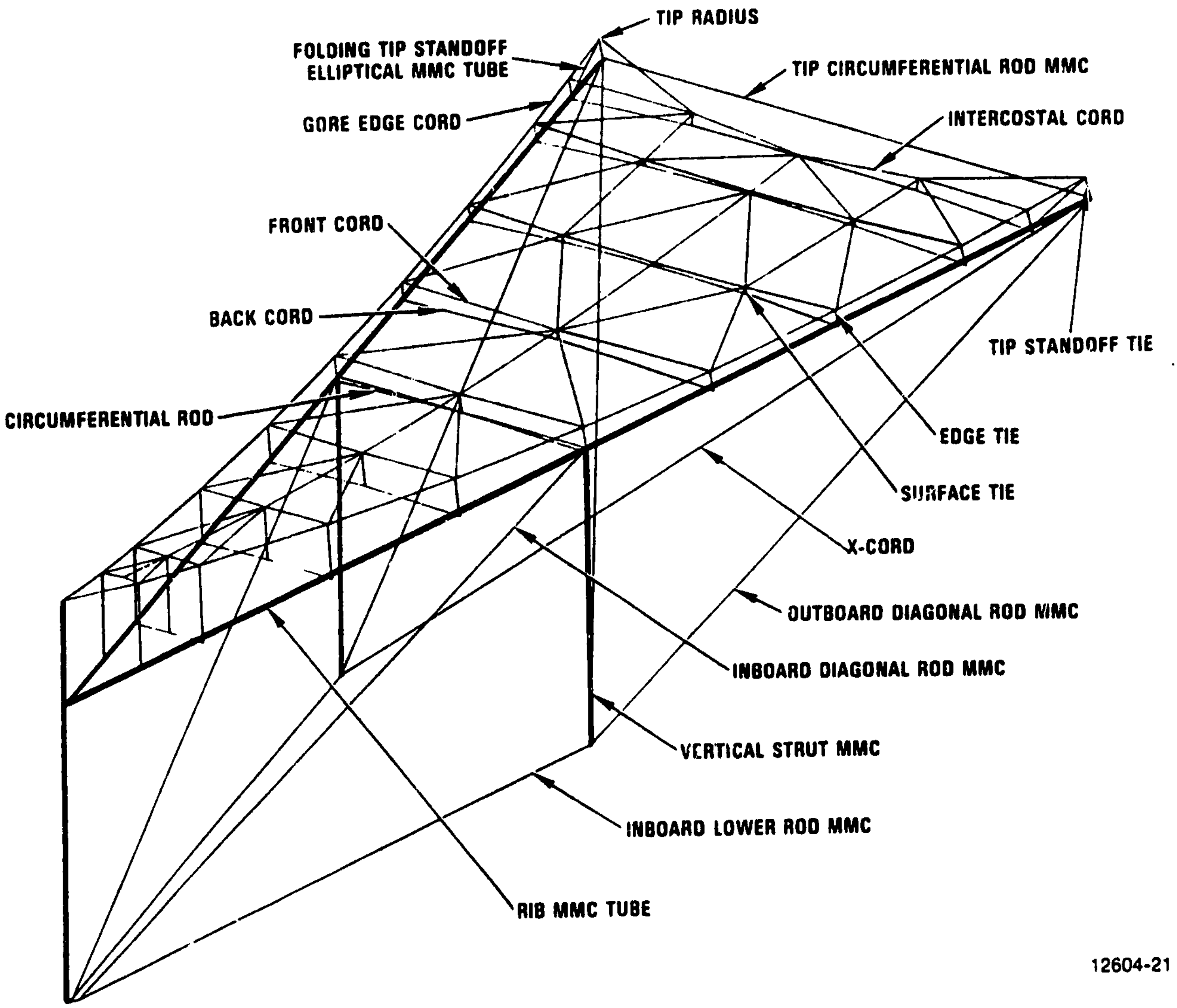

Figure 3.6.1-1. FRR - Two Rib Geometry and Materials

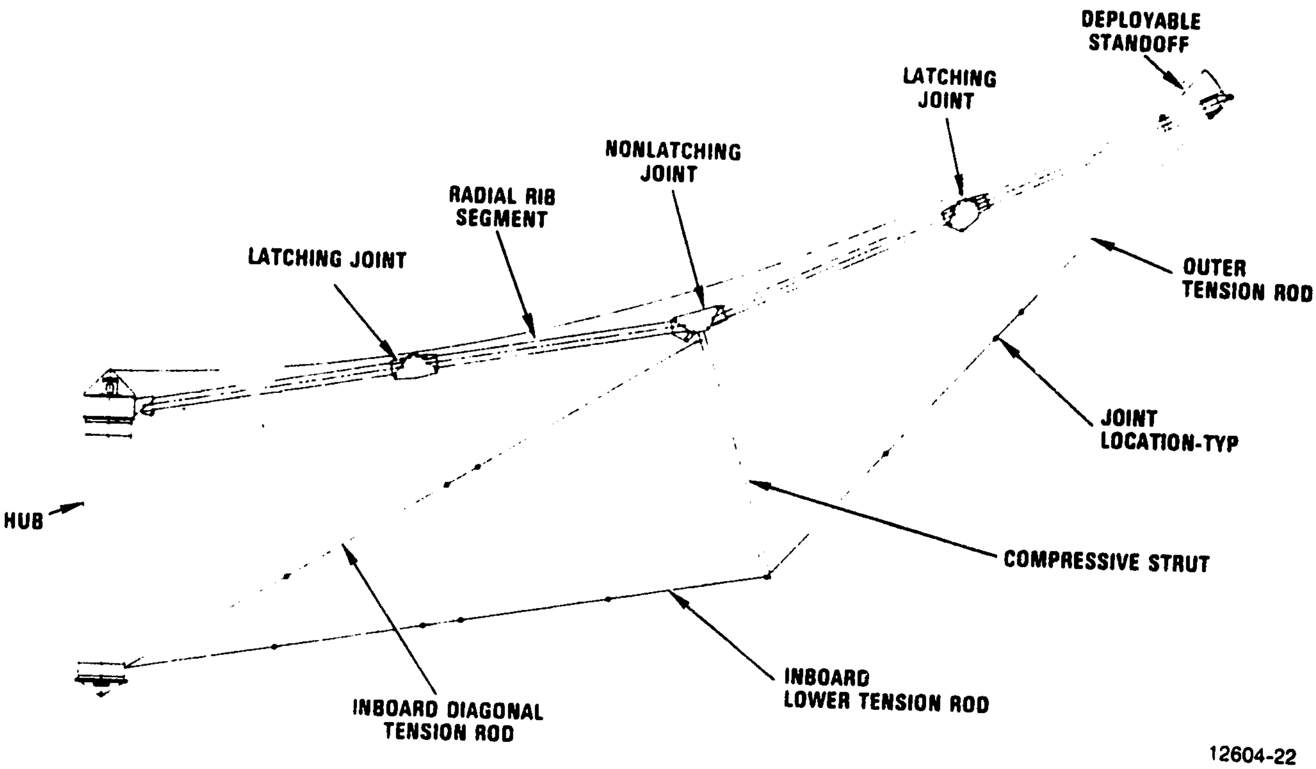

Figure 3.6.1-2. FRR - Single Truss (Side View)

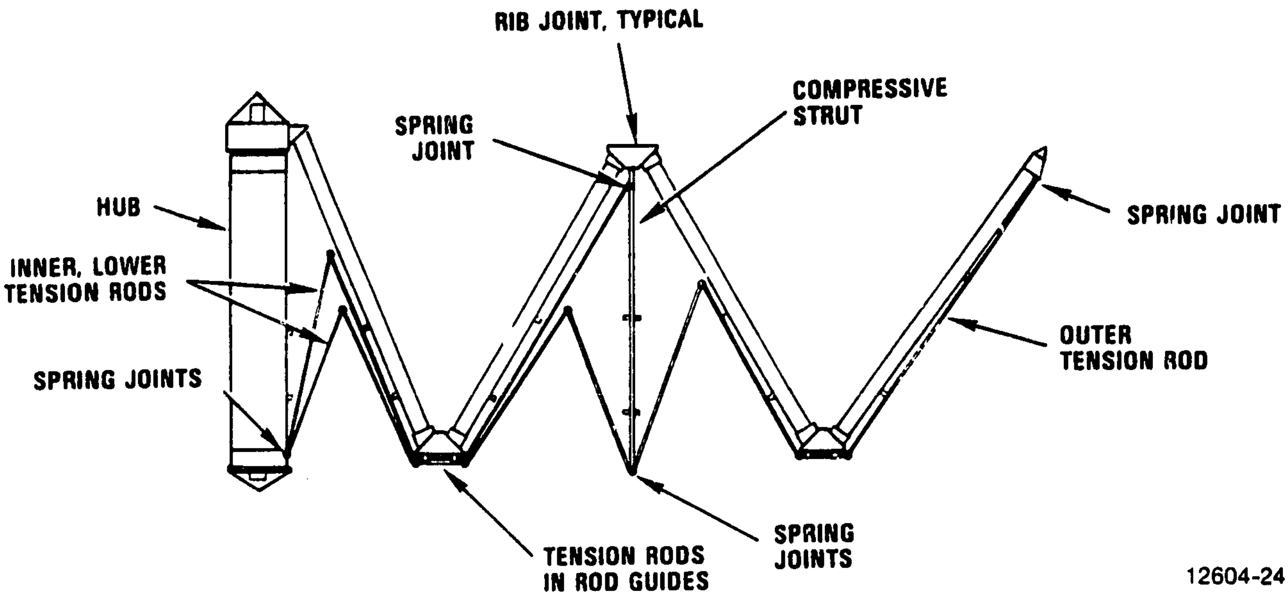

Figure 3.6.1-3. Rib Deployment Initial Phase

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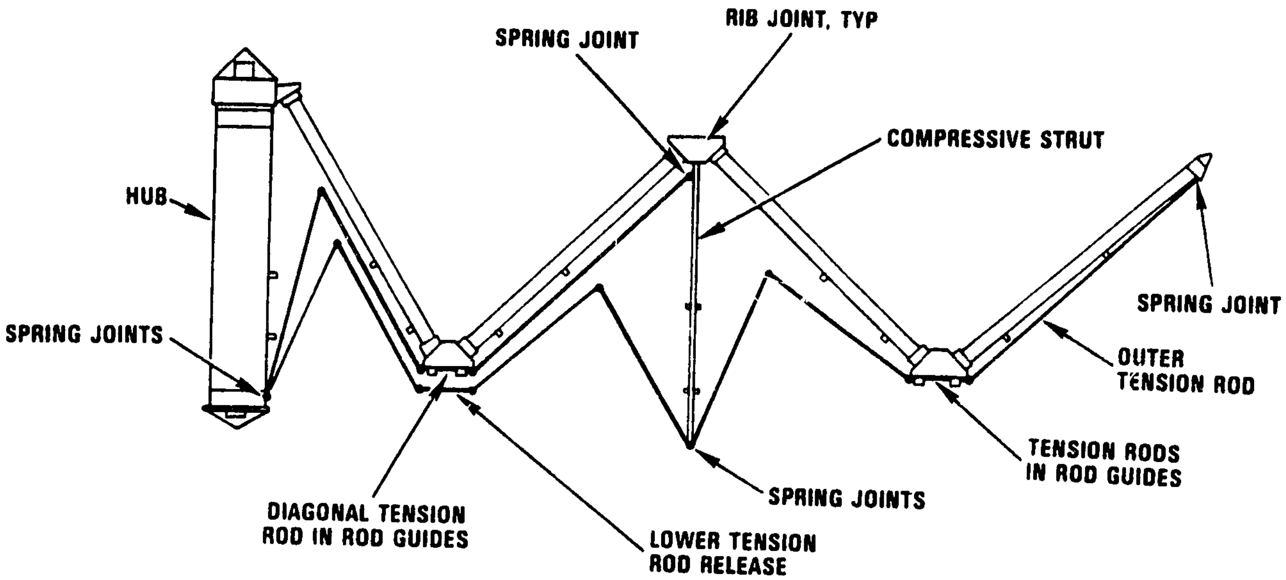

Figure 3.6.1-4. Rib Deployment Sequence Intermediate Phase

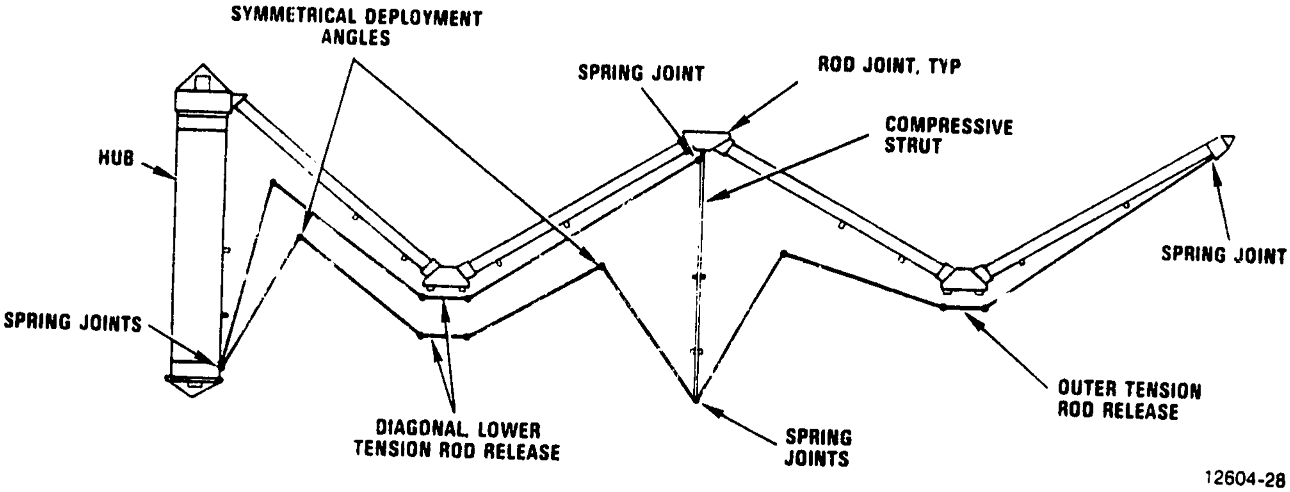

Figure 3.6.1-5. Rib Deployment Sequence - Final Phase

Figure 3.6.1-6 shows the 12-rib structure fully stowed. Mesh and surface cords have been omitted for clarity. In this position all tension rods are folded and held in the tension rod guides. Deploying standoffs at the rib tips are held parallel to the ribs by clips.

The rib launch restraint design is shown in Figure 3.6.1-7. The restraint spoke attached to the rib tip and outer joint is made from a titanium cable with a ball fastened to the free end. These balls are held inside sockets during a deployment sequency by actuation of non-explosive initiators in the restraints. The spokes (with balls) remain attached to the rib, but do not interfere with the reflective surface. The proper preload in the spokes, while stowed, locks the ribs together. This concept has been successfully used in the Tracking and Data Relay Satellite Antenna.

The Mechanical Drive System (MDS) controls the deployment of the reflector. It is located at the upper end of the hub (see Figure 3.6.1-8) and is attached to the innermost radial-rib member. Deployment force is transmitted to the other three radial members by the four-bar linkage. Tension rods are pulled free from the tesnion rod guides and clips by the rib action. Figure 3.6.1-9 shows more detail of the MDS with the right-half stowed and the left-half deployed. A threaded carrier, moved by the drive screw rotation, is shown in both positions. Linkages drive the 12 ribs to their deployed positions simultaneously. Once fully deployed with the inner and outer rib joints latched, the rib assumes the characteristics of a pinned-end truss. Restowing the reflector is possible by releasing the latched joints and reversing the drive motor. Restowage on-orbit is not a requirement of the anticipated mission application, but is valuable for ground handling capability.

The proposed latching joint for the radial rib members is shown in Figure 3.6.1-10. The mechanism is similar to a compass divider where the drive link roller slides inside tracks. This results in symmetric deployment of the link rollers. It is lightweight and has a high deployed stiffness when fully preloaded. Latching is accomplished by the overcenter travel of the drive link roller. This same joint can be constructed to be nonlatching by preventing the overcenter travel. Figure 3.6.1-11 illustrates the deployed joint.

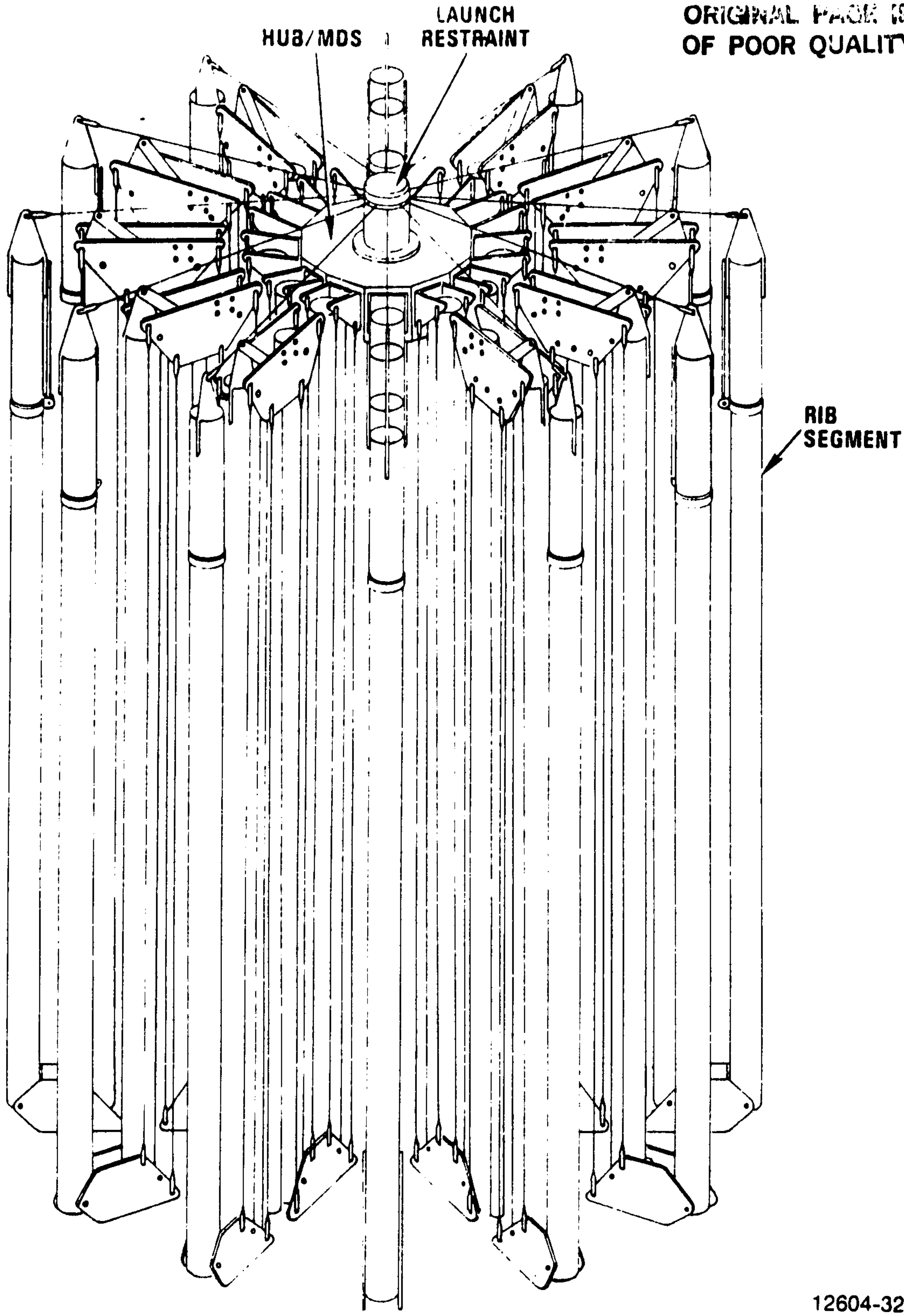

Figure 3.6.1-6. FRR Stowed Reflector (Shown Without Mesh)

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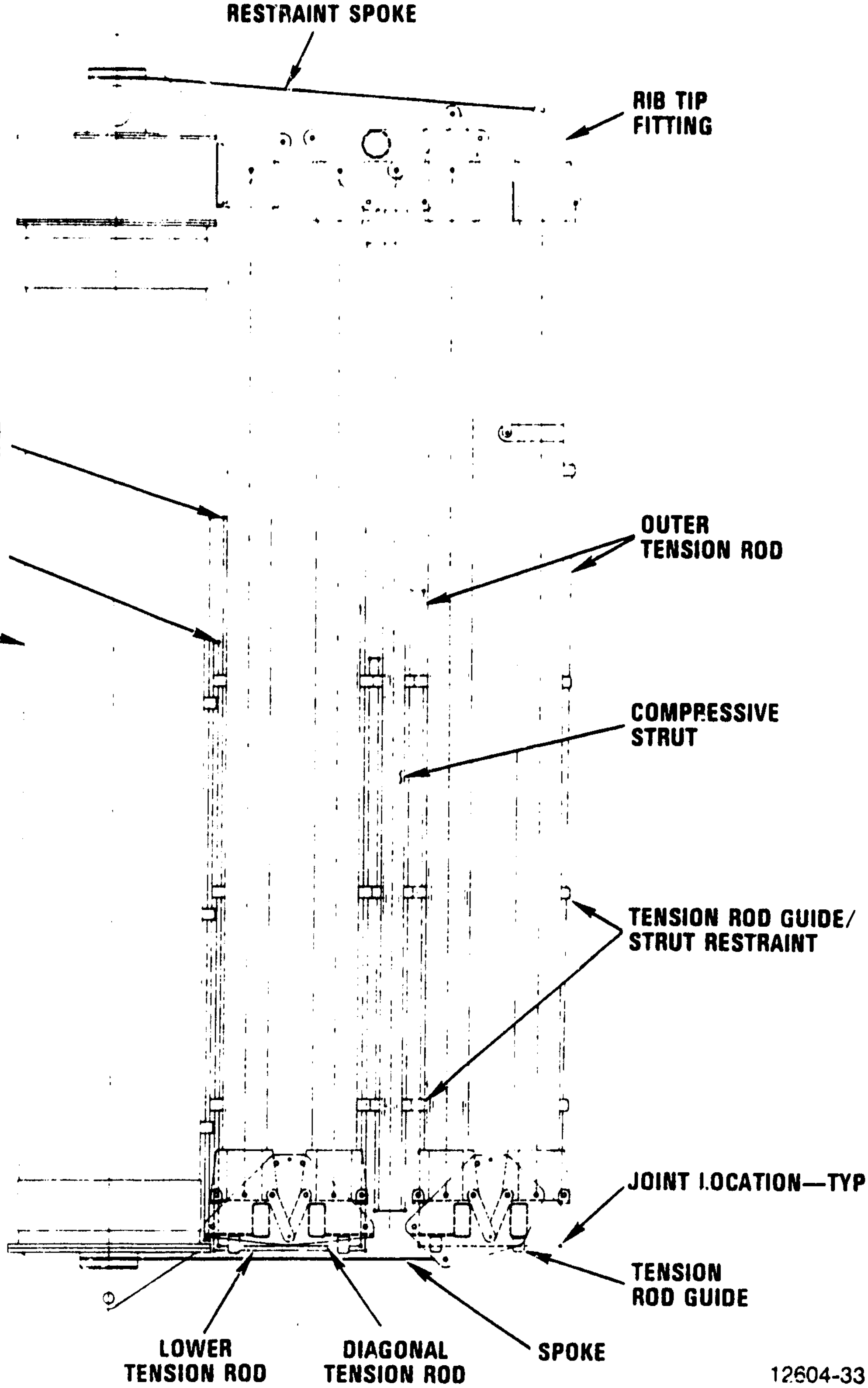

Figure 3.6.1-7. Rib Launch Restraint Design

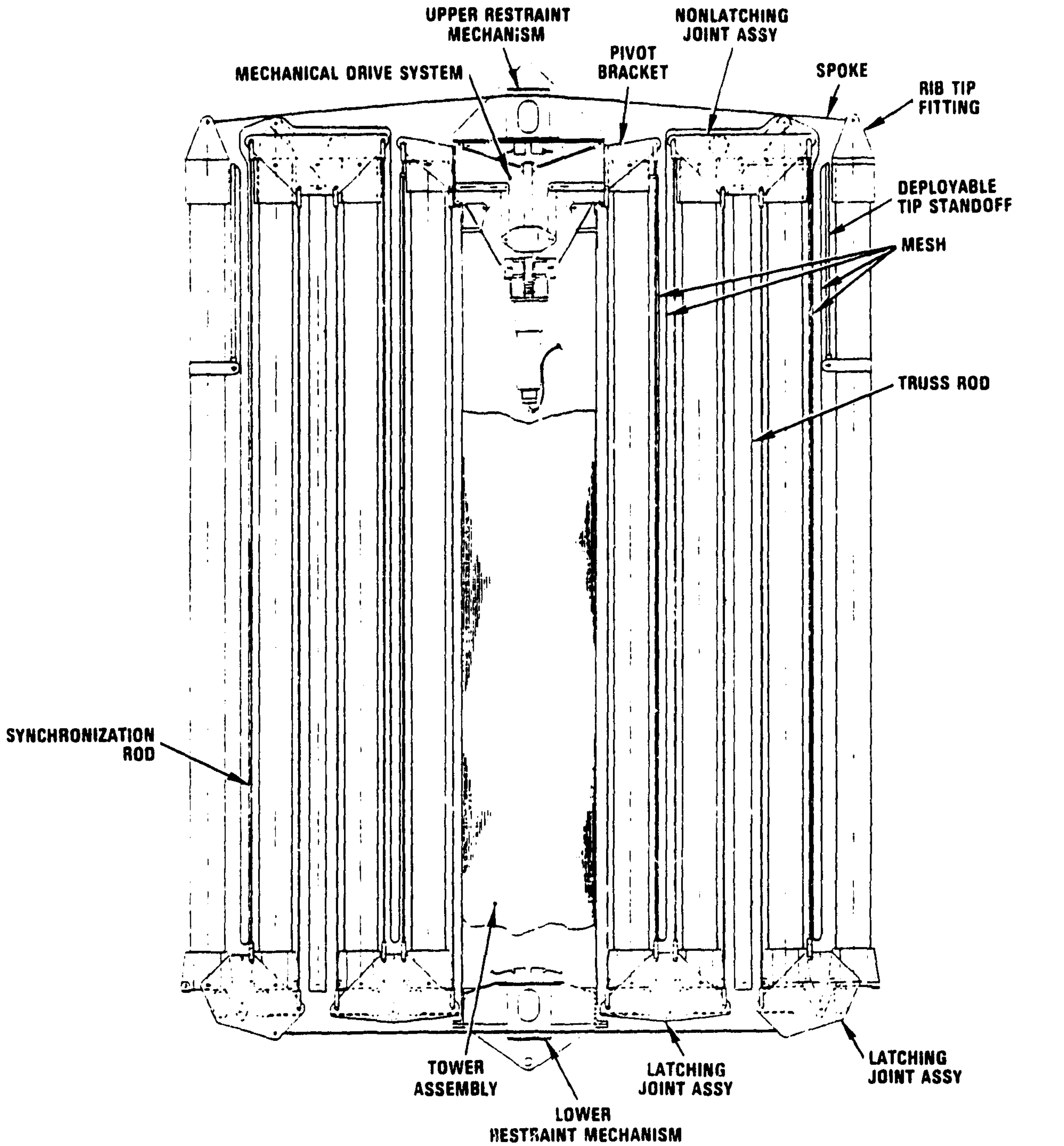

Figure 3.6.1-8. FRR - Stowed Antenna Assembly (Section)

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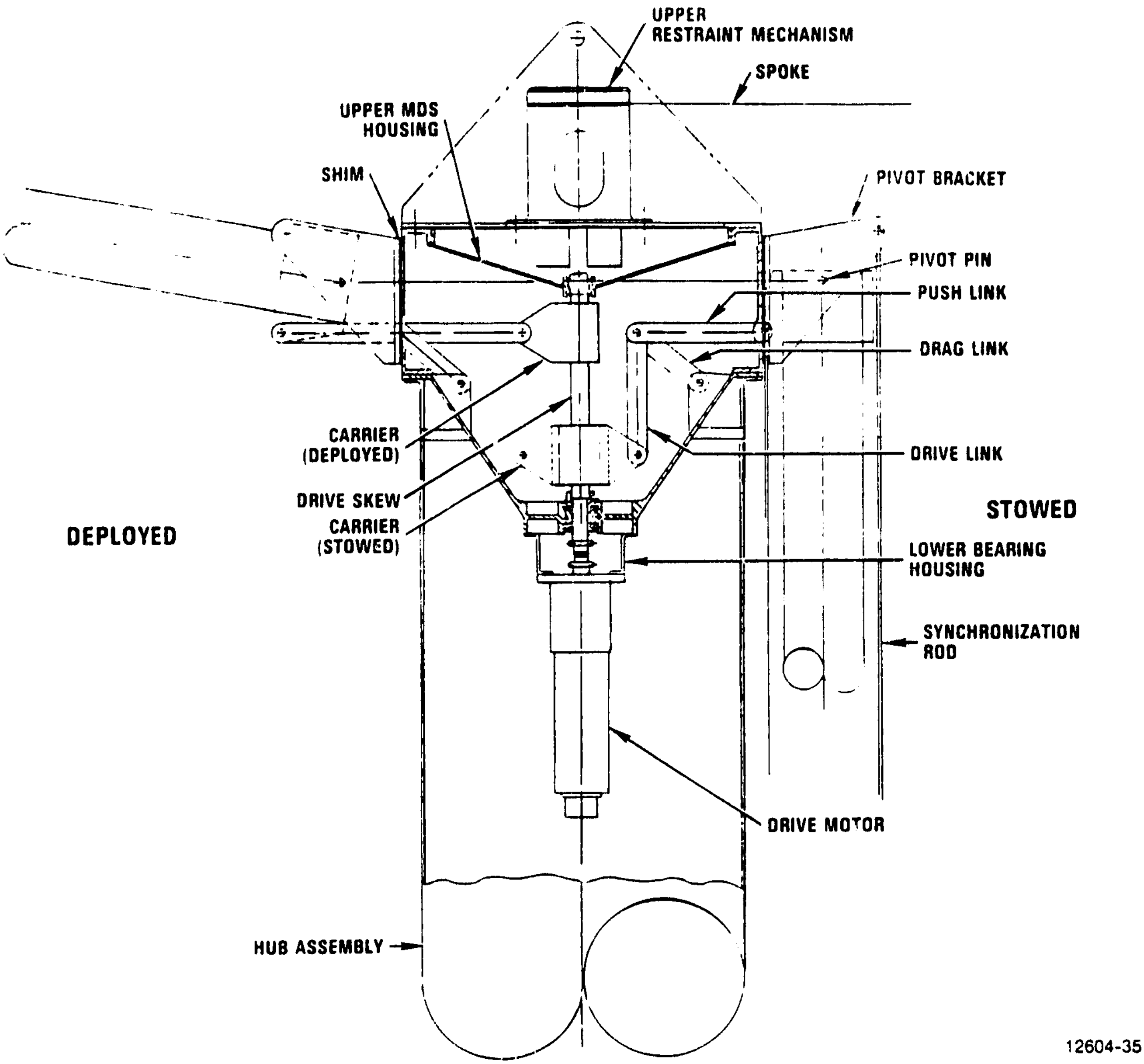

Figure 3.6.1-9. FRR - Mechanical Drive System and Restraint Mechanism

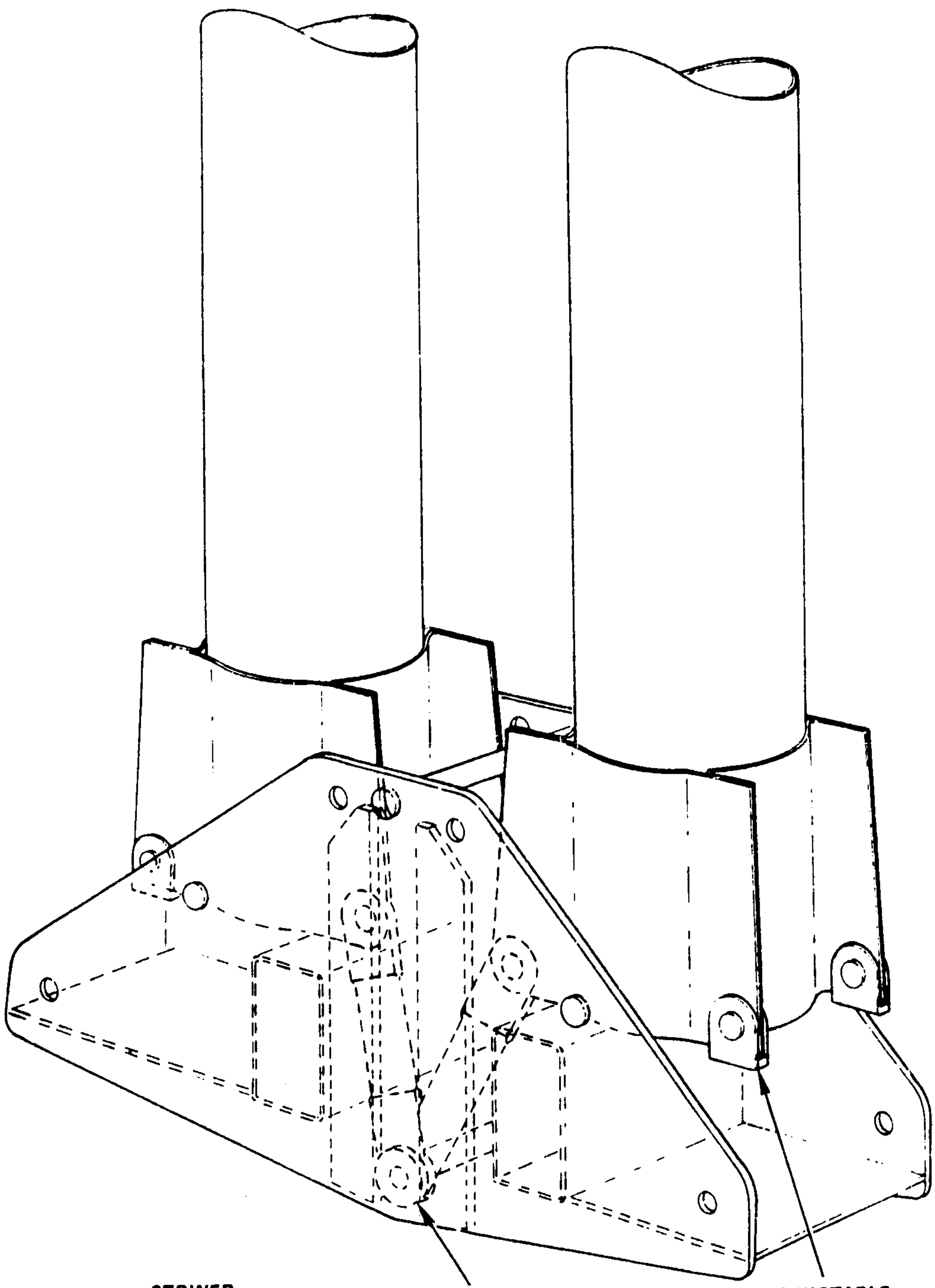

Figure 3.6.1-10. Latching Joint, Stowed Position

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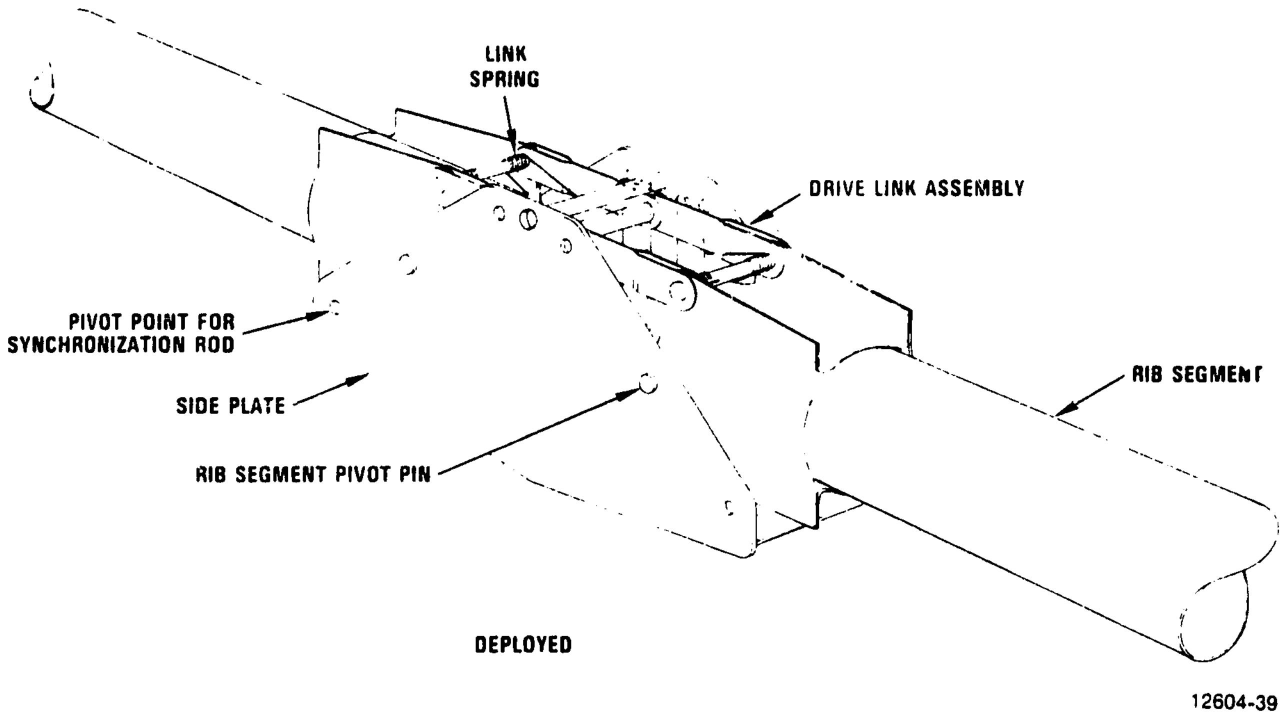

Figure 3.6.1-11. Latching Joint Deployed (Operational) Position

3.6.2 Surface Design

The surface design used on the FRR structure is a dual drawing surface system. The design involves the placement of a secondary structure behind the primary reflective surface and joining the two with a sufficient number of ties to achieve the desired surface accuracy. Figures 3.6.2-1 and 3.6.2-2 illustrate the dual drawing surface concept, showing the placement of the connecting ties.

The implementation of this surface involves the use of a gold plated mesh to from the reflective surface, multistrand graphite cords to create the surface contour, graphite epoxy strips to establish gore boundaries, and adjustable standoffs by which the reflective surface assembly is attached to the graphite radial ribs. The reflective mesh is a 0.0012 inch diameter gold plated molybdenum wire knitted into a tricot pattern with ten openings per inch. Molybdenum with its high strength, low coefficient of thermal expansion, and excellent plating characteristics results in a highly reflective surface with relatively low tensions, good resistance to handling, and minimal thermal interaction with the graphite cord and graphite rib supporting structure. Pre-plating with gold assures minimal interfilament friction with uniform, optimum thickness for RF reflectivity. The tricot knit is most familar as the double-knit fabrics that are popular for their ability to "give" in two directions without unravelling at the edges or with broken strands.

Structural and RF properties of the mesh are discussed in Section 4.0.

Multistrand graphite cords are used to form a thermal insensitive substructure which combines with the GFRP ribs to form a foundation for the mesh. The circumferential arrangement of cords increases the effective resistance of the ribs to axisymmetric loading produced by thermally induced mesh tension variations. The negative thermal coefficient of expansion of the cords interacts with the rib and mesh thermal properties to produce a near optimum condition for thermal stability.

Cords on the front (feed) side of the reflector are drawn into the desired parabolic contour by connecting these front cords to a parallel set of cords located behind the ribs through a number of Beta-glass ties. The ties are made of Beta-glass to provide a measure of handling strength (15 pounds tension) and for ease of joining.

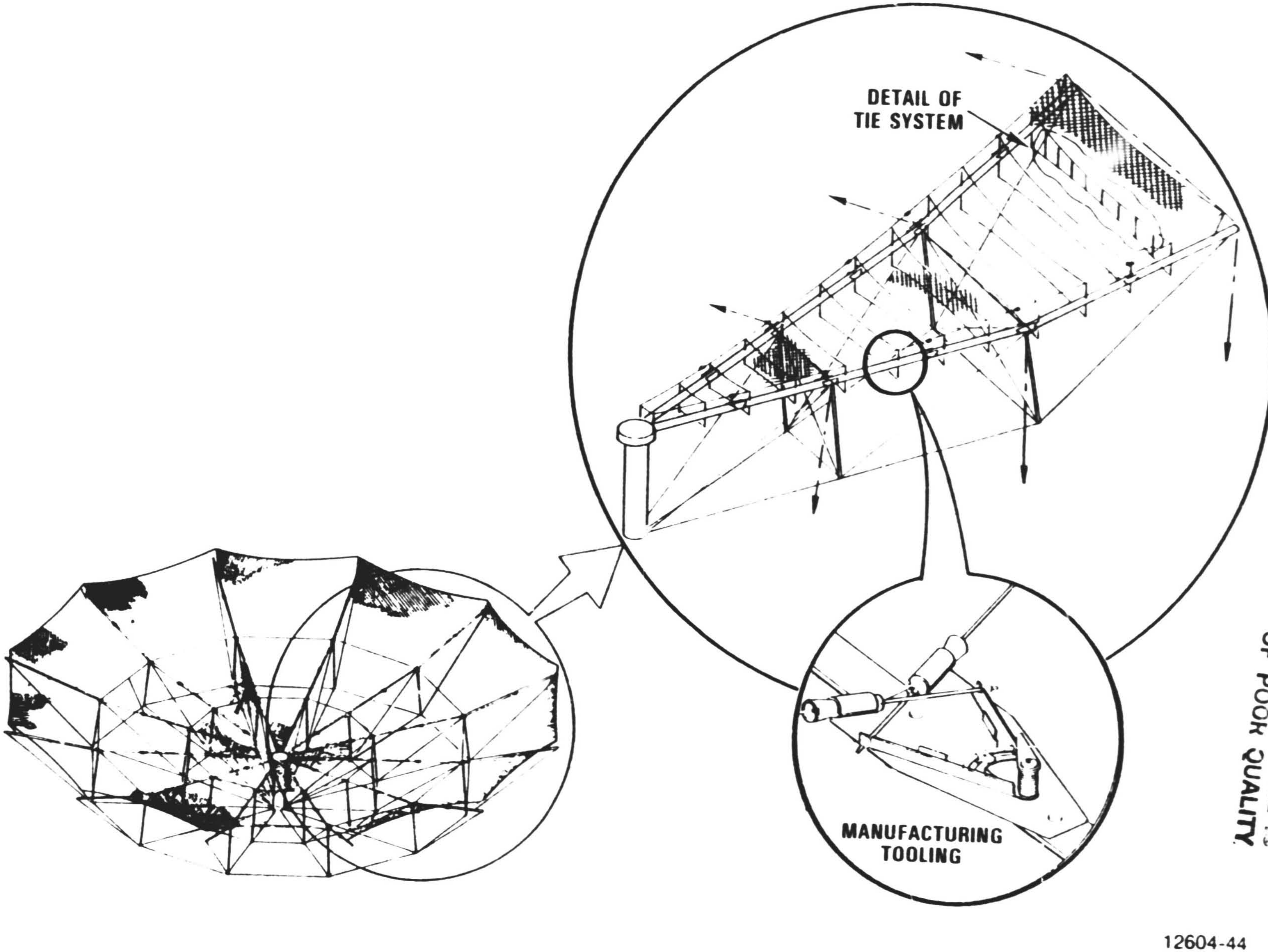

Figure 3.6.2-1. The Contour and Contour Attachment Design Utilizes Technology from the TDRSS Program

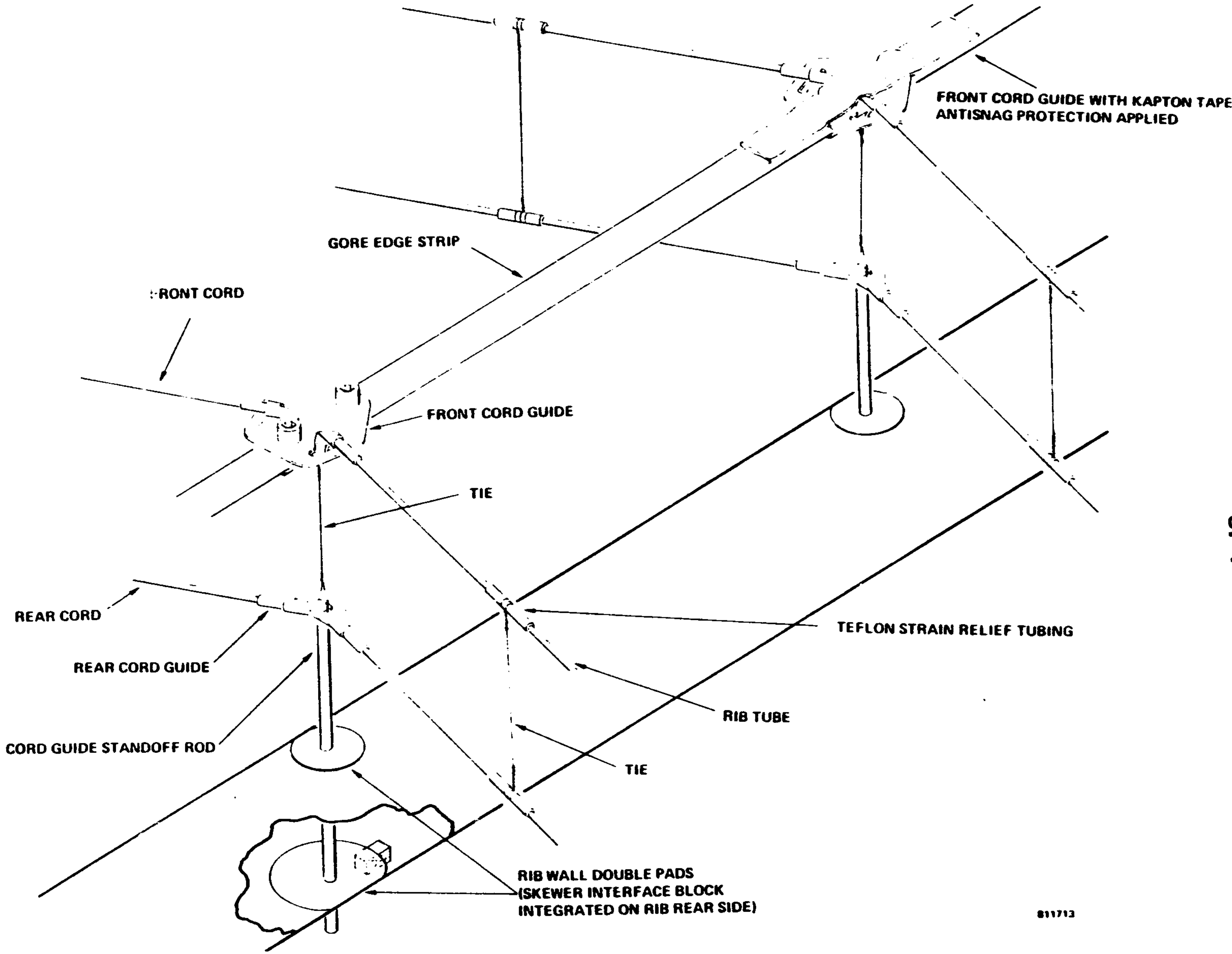

Figure 3.6.2-2. Rib Segment and Cord Interfaces

The mesh is bonded to unidirectional graphite strips over each rib. Strips from adjacent gores are overlapped with a mesh-to-mesh interface, riveted together, and suspended by rib standoffs. A deployable standoff at the rib tip defines the location of the strip at the periphery of the reflector and adjustable ties provide axial "float" in the remaining locations. Invar hinges allow the edge strips to fold for stowage.

4.0 SYSTEM PERFORMANCE

4.1 Weight and Stowed Volume

The complete radiometer system, including polarizers, horns, tower and reflector, but not including the radiometer circuitry and its packaging, weighs 578 pounds, Table 4.1, and stows in a volume 4.0 meters in diameter, 4.9 meters long. A detailed weight distribution is included in the Appendix.

4.2 Deployed Analytic Model Description

To estimate performance of the offset fed reflector and tower system, the finite element model (FEM) of Figures 4.2-1 through 4.2-5 was developed. The model, consisting of 200 nodes, simulates all members of the FRR rib and truss backup structure and condenses the RF reflective surface into 4 cord pairs and 12 mesh elements per gore. The reflective contour itself is represented by 85 surface nodes to accurately characterize RF performance. A detail listing of the model is presented in the Appendix.

As with all structures of this nature, the stiffness of the system depends upon, to some extent, the pretension in the mesh and cord elements. This pretension stiffness is modelled with pretensional "stringer" elements and triangular, pretensioned, orthotropic "membrane" elements. The single gore of Figure 4.2-6 indicates the preloads associated with each member, including the compression loads in the ribs and vertical strut. For details of member sizes, material properties, etc., reference the Appendix.

4.3 Deployed Analyses

Having generated model of the deployed system, performance of the spinning reflector is estimated. The effects of the 6 rpm spin rate, thermal environment and basic vibrational modes are investigated.

Table 4.1. Weight Budget

		Weight (Pounds)
Feed Horns and Polarizers		
1.4 GHz	5 @ 28 lbs. ea.	= 140
4.3 GHz	11 @ 3.2 lbs. ea.	= 35
11 GHz	11 @ 0.8 lbs. ea.	= 9
Tower Support and Deployment Structure		46
Tower		95
Reflector		225
Cabling		28
Total Weight		578 Pounds

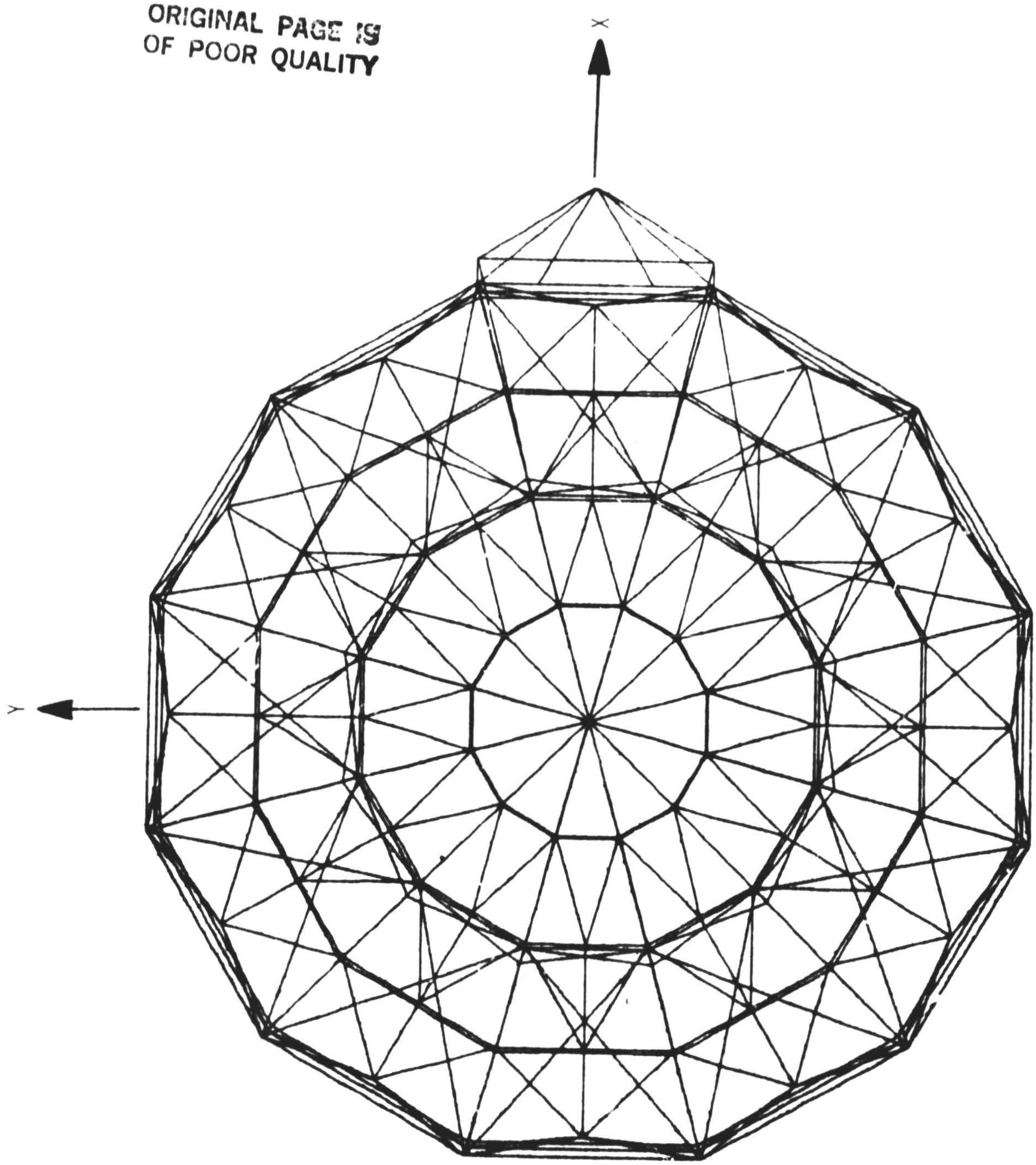

Figure 4.2-1. MSDA Finite Element Model

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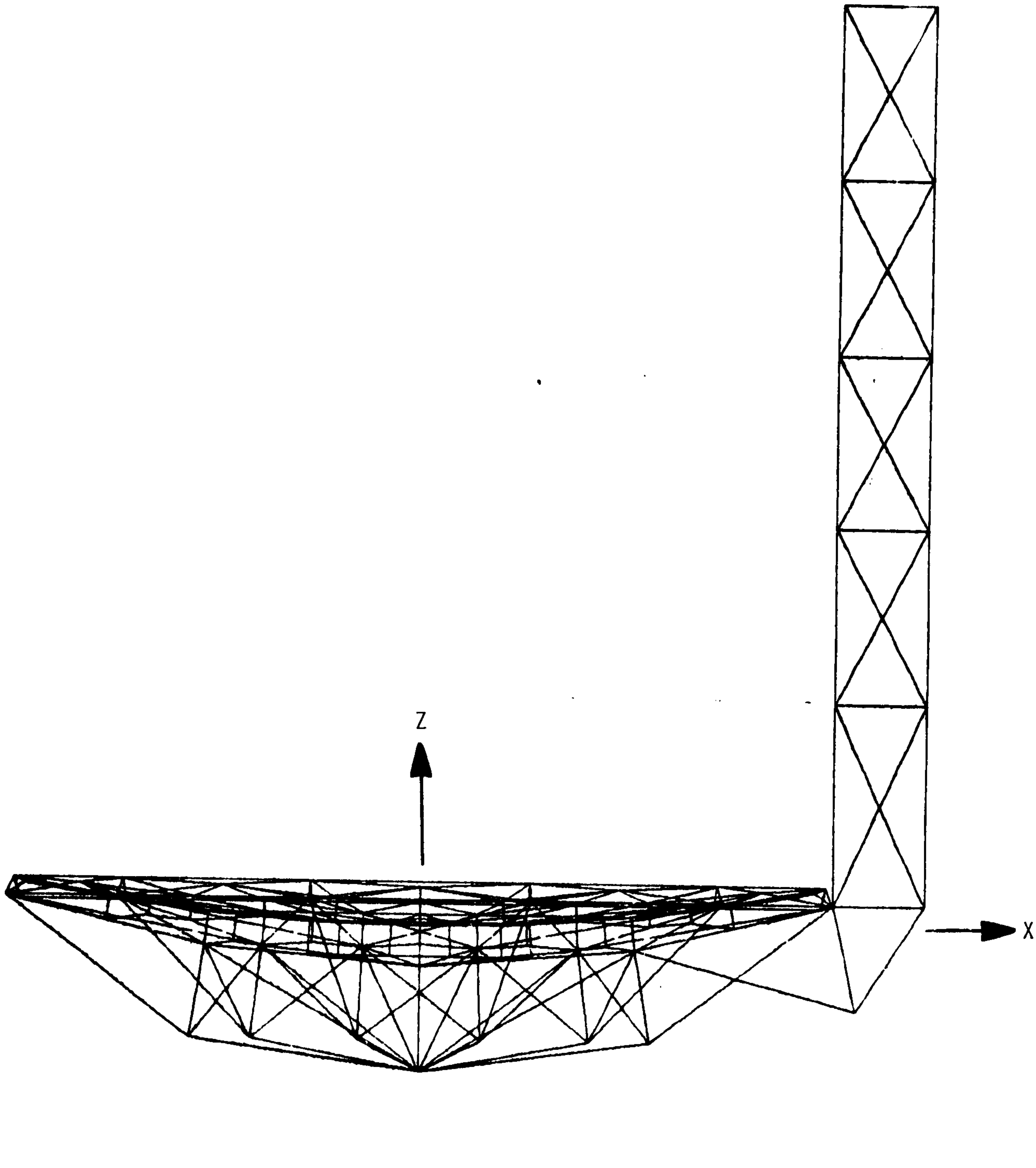

Figure 4.2-2. MSDA Finite Element Model

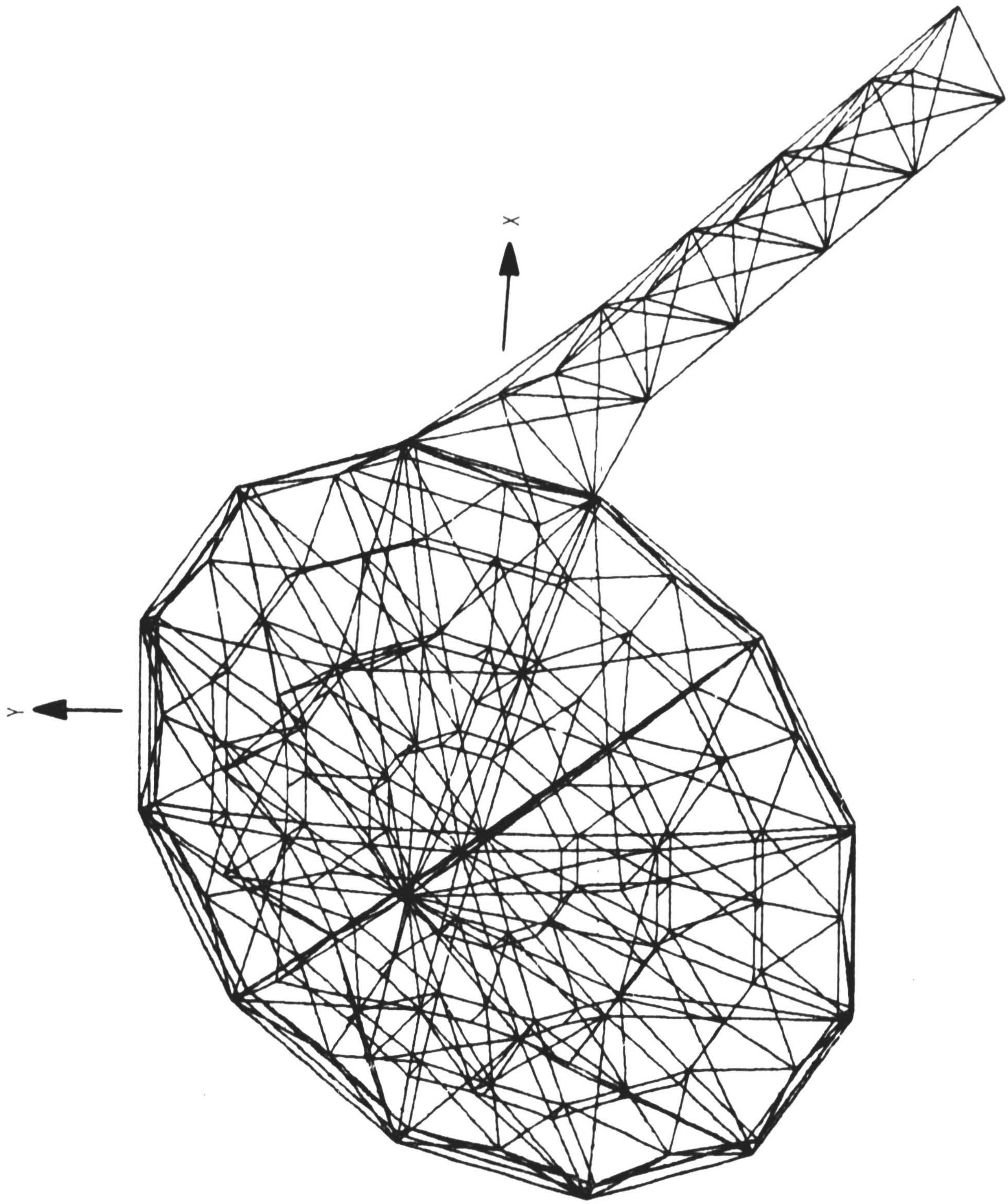

Figure 4.2-3. MSDA Finite Element Model

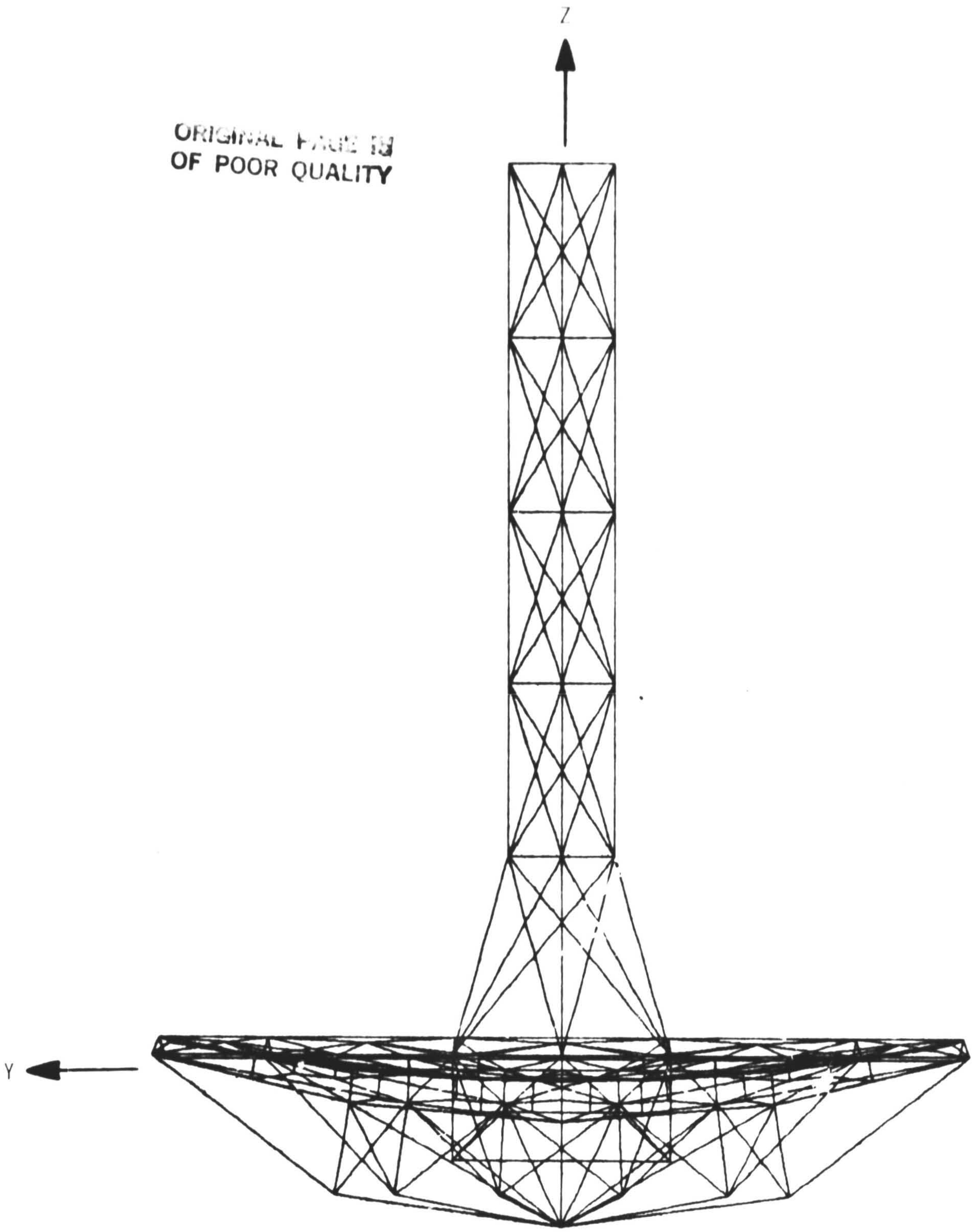

Figure 4.2-4. MSDA Finite Element Model

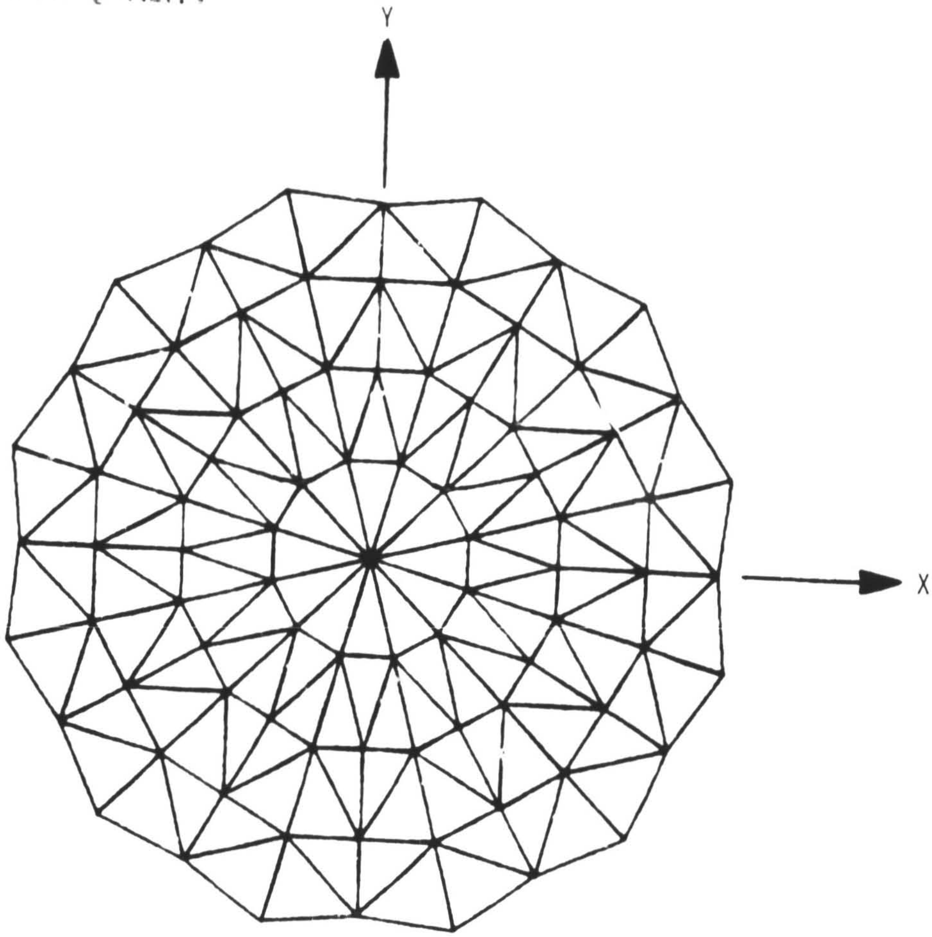

Figure 4.2-5. Mesh Surface Modelled with 144 Triangular Membrane Elements Connecting 85 Nodes

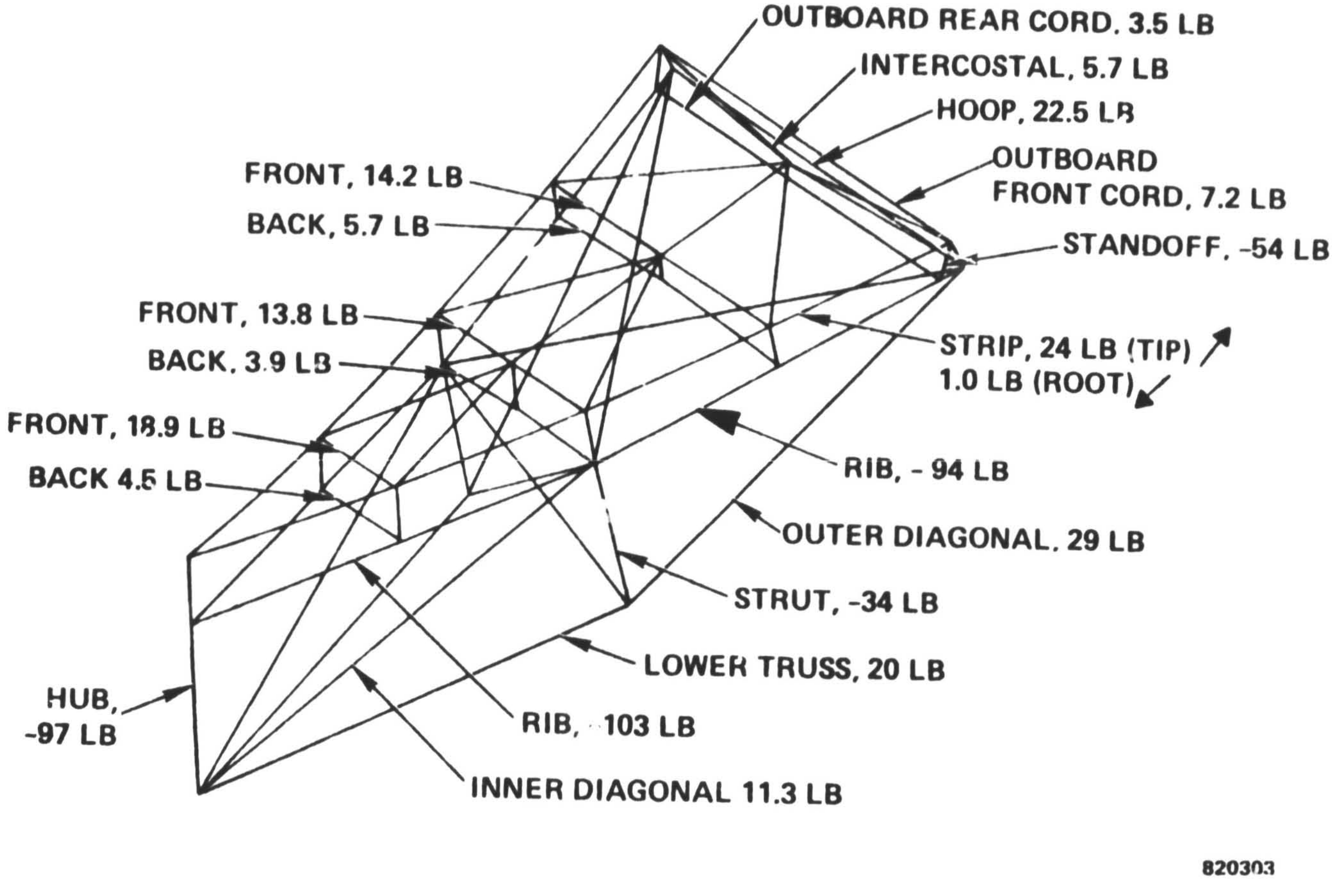

Figure 4.2-6. Structural Preloads are Included in the Modelling Process

4.3.1 Dynamic and Spin Effects

The most important aspect of this effort is to quantify the effect of the 6 rpm spin rate on surface performance. This task consisted of two parts: align the reflector and spin axis to balance the tower and reflector system, and predict surface distortions at 6 rpm. Dynamic balancing of the system is achieved by positioning the spin axis so that it passes through the CG of the system. The final geometry selected to achieve this goal is depicted in Figure 4.3.1. The weight moments of inertia of the structure about the axis system defined in the figure are:

Structure Weight: 319.7 lb. (includes tower and reflector, excludes feed and cabling)

Center of Mass:

$\bar{x}$ 69.16 inches

$\bar{y}$ = 0.0 inches

$\bar{z}$ = 0.0 inches

$I_{XX} = 1.0331 \times 10^7$ in^2 lb

$I_{YY} = 2.0521 \times 10^7$ in^2 lb

$I_{ZZ} = 2.3537 \times 10^7$ in^2 lb

$I_{XY} = 4.7458 \times 10^6$ in^2 lb

$I_{XZ} = 0.0$ in^2 lb

$I_{YZ} = 0.0$ in^2 lb

At a spin rate of 6 rpm the surface distorts, in terms of parabolic parameters, by:

Defocus (ΔF)	-0.126 inches
Surface Roughness RMS	0.007 inches
Mechanical Mispointing	0.021 degree

The negative defocus, opposite of what one might expect, results from the compliance of the truss rods and high axial stiffness in the rib members. Spinning causes a small elongation in the upper (rib) members and a larger

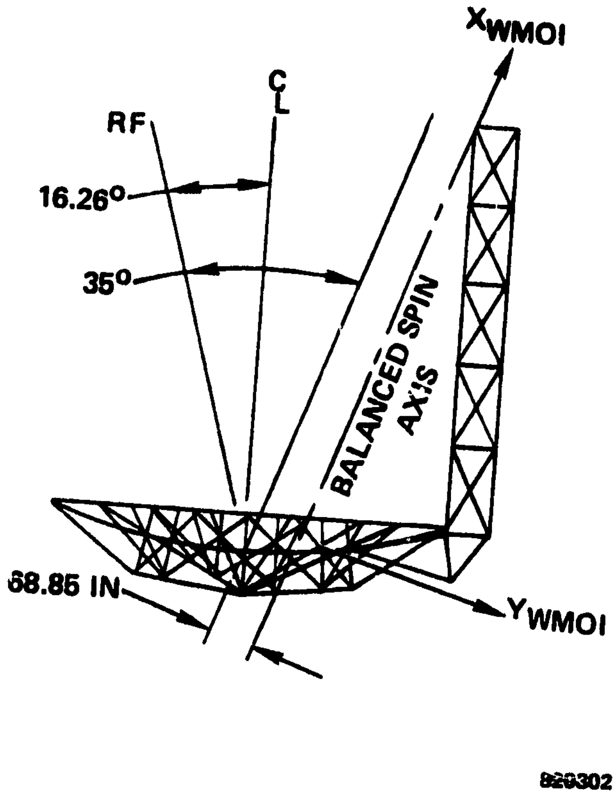

Figure 4.3.1. An Offset Spin Axis Dynamically
Balances the Reflector System

elongation in the lower (rod) truss members forcing the reflector to close and hence drive the defocus negative. Given adequate knowledge of the spin rate, geometry and mass properties, all or at least a significant amount of this defocus can be removed by biasing the antenna during manufacture.

The two lowest natural modes of the antenna were found by eigenvalue extraction to be:

0.55 Hz combination of tower twist and bending mode.

1.54 Hz rocking of the antenna about the tower to reflector interface.

4.4 RF Performance

An initial tradeoff study was performed to define the possible range of f/D ratios, feed aperture sizes, and feed spacings. Baseline parameters used in this analysis were an operational frequency of 4.3 GHz, a circular feed aperture, a 15 meter offset reflector, feeds located at, or in a plane containing, the focal point of the paraboloid, and a circularly symmetric far-field pattern with a cosine amplitude and phase distribution. This feed pattern is characteristic of a wideband corrugated conical horn as described in Reference (1), with the aperture amplitude and phase distributions given by:

$$A\ (r) = \cos\left(\frac{\pi r}{2a}\right)$$

$$P\ (r) = \pi\left(1 - \cos\frac{\pi r}{2a}\right)$$

where A is the aperture radius and r ranges from 0 to A. The variable for the tradeoff study were f/D ratio, aperture radius, feed spacing, and reflector offset.

For this analysis, it is assumed that the phase center of each feed horn is located near the aperture plane, thereby allowing all feed apertures to lie in the feed plane as defined in Figure 4.4-1. The principal axis, defined to be orthogonal to the feed plane, bisects the angle which subtends the reflector when viewed from the focal point. This then determines the feed tilt angle.

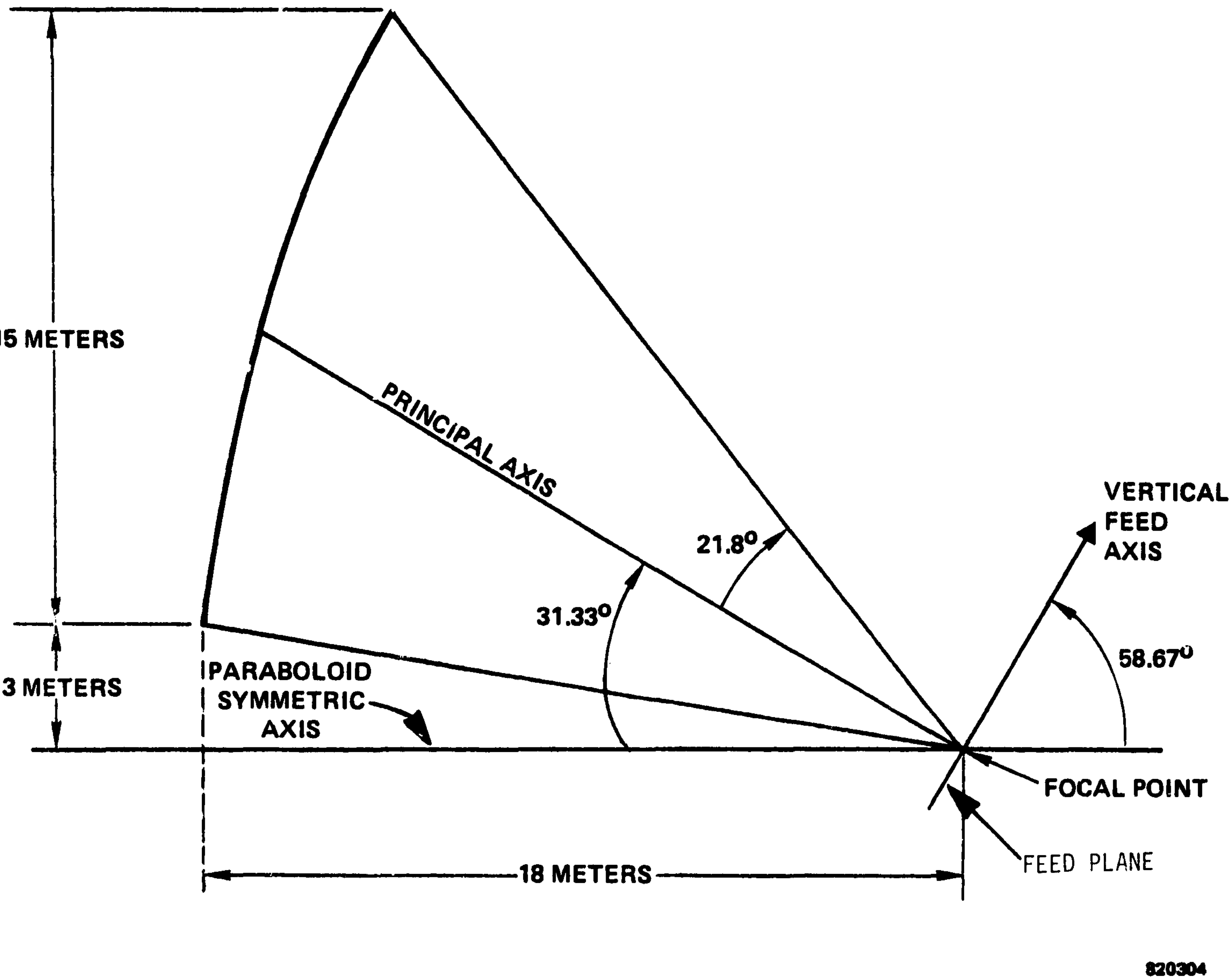

Figure 4.4-1. Antenna System Geometry

The initial tradeoff study was performed at 4.3 GHz, using the above mentioned wideband feed horn. To obtain low cross-polarization levels in the secondary beam, f/D ratios greater than 0.5 are necessary in accordance with Figure 4 of Reference (3). Values for f/D of 0.5, 0.7, and 0.9 were then chosen. In order to meet the high beam efficiency requirement (>90%), reflector edge illumination in the range -10 dB to -20 dB is needed. It was determined that this requirement leads to an exceedingly large wideband feed horn. As a compromise, the edge illumination requirement was relaxed to -7 dB, resulting in a 0.45 meter aperture radius with approximately 65% beam efficiency. Two patterns were then computed for each f/D ratio; the first, with the feed horn located at the focus, and the second, with the feed offset one diameter along the vertical feed axis (feeds adjacent to one another). It was found in each case that the far-field beam crossover points were in the range of 20 dB to 25 dB down from the peak value. To obtain a continuous mapping of the earth's surface, it is necessary for the beam overlay to fall within 3 dB to 6 dB down from the maximum value of the beam. The wideband horn, therefore, appears to be unacceptable for this design unless unreasonably large feed dimensions can be tolerated.

To reduce the overall size of the feed and attempt to meet the far-field beam crossover and beam efficiency requirements, a narrowband corrugated conical horn was selected. A procedure identical to the one followed for the wideband feed analysis was used in this analyses. The assumed horn aperture amplitude and phase distribution is given by:

$$A\ (r) = \cos\left(\frac{\pi r}{2a}\right)$$

$$P\ (r) = \Delta\pi\left(1 - \cos\frac{\pi r}{2a}\right)$$

At 4.3 GHz, using an aperture radius of 0.123 meter, the calculated radiation patterns revealed that the far-field beam crossover points were still greater than 15 dB down from the beam peak. It was noted at this point that a feed horn offset one-half the diameter of the aperture would yield a far-field beam displacement of approximately one beamwidth, which corresponds to a 3 dB to 4 dB beam overlay. With the sweep scanning nature of this antenna in mind, a 3 dB to 6 dB beam crossover can then be obtained with the feed layout of Figure 4.4-2.

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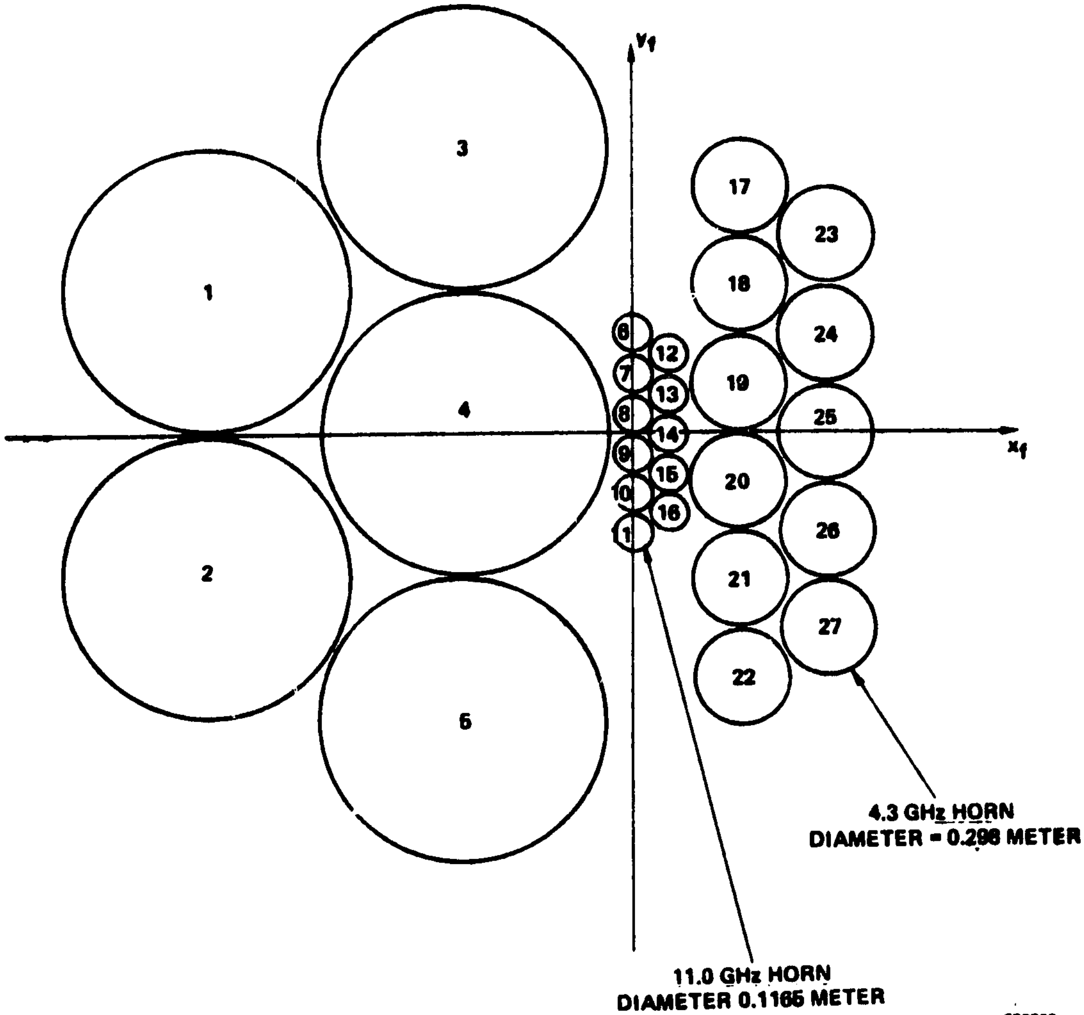

Figure 4.4-2.

Using the feed arrangement, it is then possible to choose the lower f/D ratio (=0.5), yielding a shorter boom length. The remaining analysis was then performed using the antenna system geometry of Figure 4.4-1.

The narrowband corrugated conical horn design procedure given in Reference (2) was then used to refine the design of the 4.3 GHz horn, and this design was scaled to 1.414 GHz and 11.0 GHz. Final design parameters for each horn are given in Table 4.4-1, with an associated sketch in Figure 4.4-3. The feed beam efficiency is approximately 93% and reflector edge illumination is -12 dB. A corrugation depth of $3\lambda/8$ was assumed, adding $3\lambda/4$ to the total diameter. The final feed horn layout as it appears in the feed plane is seen in Figure 4.4-4.

Computer analysis was performed on the 4.3 GHz case to verify the 3 dB to 6 dB beam overlay. A computer run catalog appears in Table 4.4-2 with the corresponding plots in Figures 4.4-5 through 4.4-10. Only a vertical offset was considered for this analysis, i.e., x_f - offset equal to zero. Beam crossover, for each scan case, lies between 4 dB and 6 dB, with a 3 dB beamwidth of approximately 0.32^o. The maximum cross-polarization level was 29.86 dB below the beam peak. This compares favorably with the predicted value in Reference (2). At the maximum feed offset position, gain loss due to scan was less than 1 dB.

Entering the curve in Figure 4.4-11 and assuming a 93% beam efficiency in the perfect reflector case, and a roughness of 0.01λ, the proposed design is close to 90% beam efficiency. Further refinement in these calculations are required to obtain precise calculations.

4.5 Mesh Analyses

The most commonly used mesh is composed of gold-plated molybdenum wire 1.2 thousandths of an inch in diameter. A closeup view of the wire knitted onto a conducting mesh is shown in Figure 4.5-1 which also shows an optical target located on the surface.

Table 4.4-1. Feed Geometry

1.414 GHz Horn		4.3 GHz Horn		*11.0 GHz Horn	
a	= 0.375 meter	a	= 0.123 meter	a	= 0.048 meter
R	= 1.60 meter	R	= 0.526 meter	R	= 0.206 meter
θ_0	= 13.555°	θ_0	= 13.52°	θ_0	= 13.47°
Δ	= 0.21 wavelength	Δ	= 0.209 wavelength	Δ	= 0.208 wavelength
Dia	= 0.909 meter	Dia	= 0.298 meter	Dia	= 0.1165 meter

*The 11.0 GHz horn was obtained by scaling the 4.3 GHz design. This smaller horn then results in a far field beamwidth of 0.16°, approximately one-half the desired 0.35°. To increase the beamwidth several approaches are available.

1. Increase the size of the horn, thereby under-illuminating the disk and increasing the beamwidth. This would require moving the 4.3 GHz feeds to make additional space available for these larger horns.

2. Defocus the 11.0 GHz feeds along the principal axis toward the reflector, producing a quadratic phase distribution in the aperture of the dish, thereby increasing the beamwidth.

3. Loading of the existing feeds to under-illuminate the reflector, and thereby increase the beamwidth.

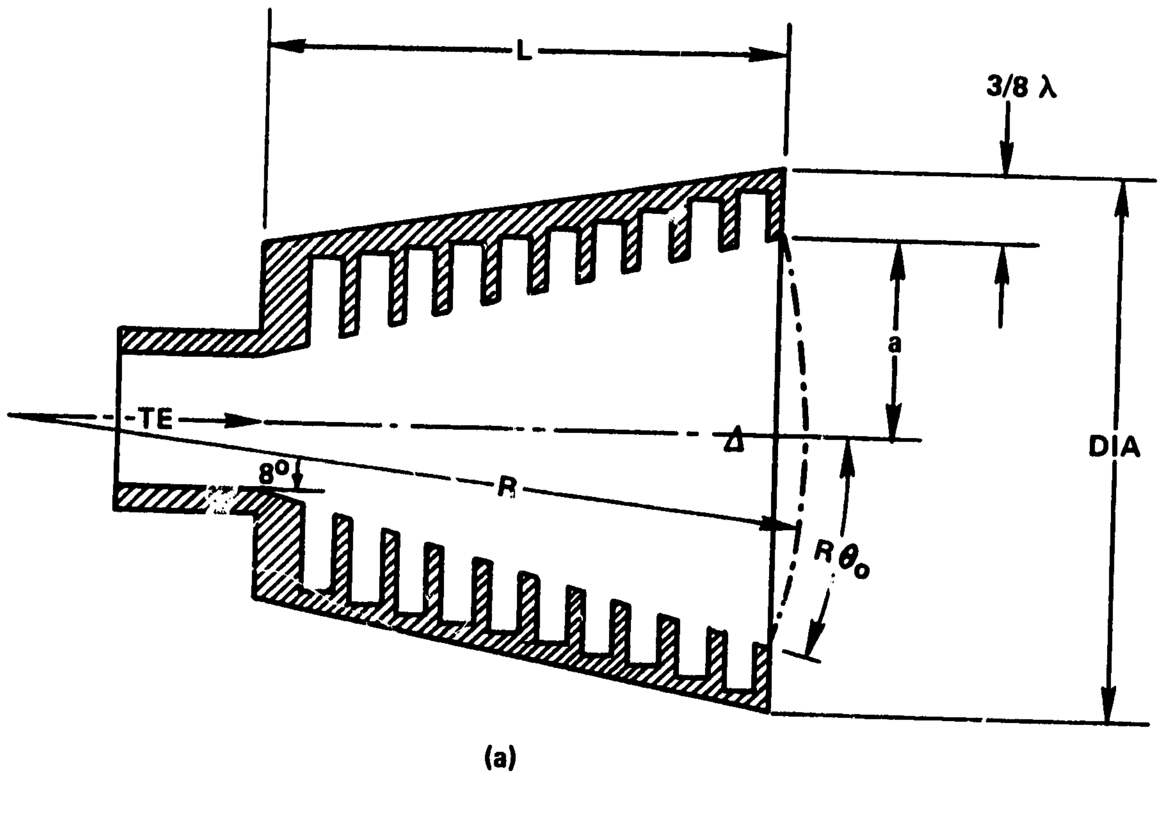

Figure 4.4-3.

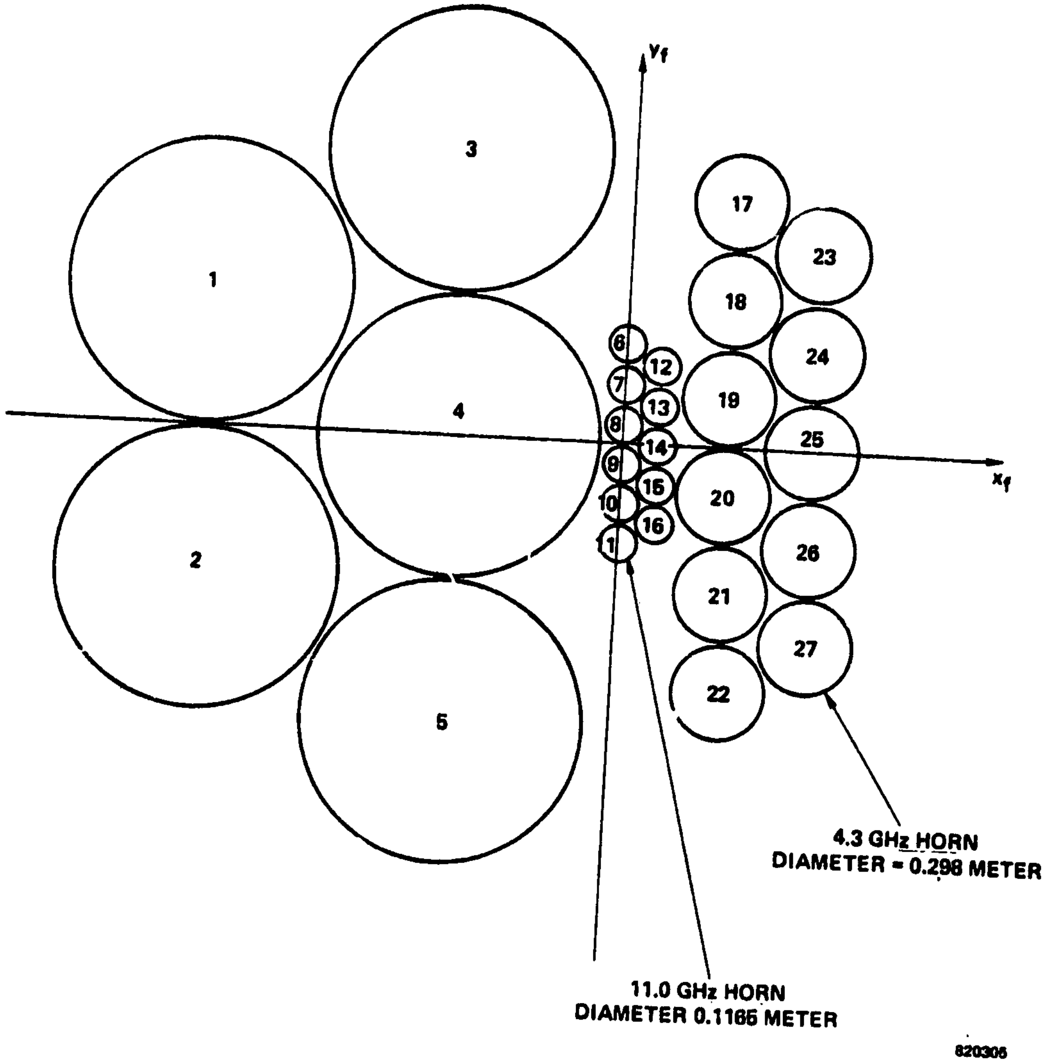

Figure 4.4-4. Feed Array Layout

Table 4.4-2. Computer Run Catalog

Y-Offset (Meters)	Figure Number	Corresponding Feed Horn Number in Figure 3.2.3.3-4
0.0	5	25
0.149	6	19
0.298	7	24
0.447	8	18
0.596	9	23
0.745	10	17

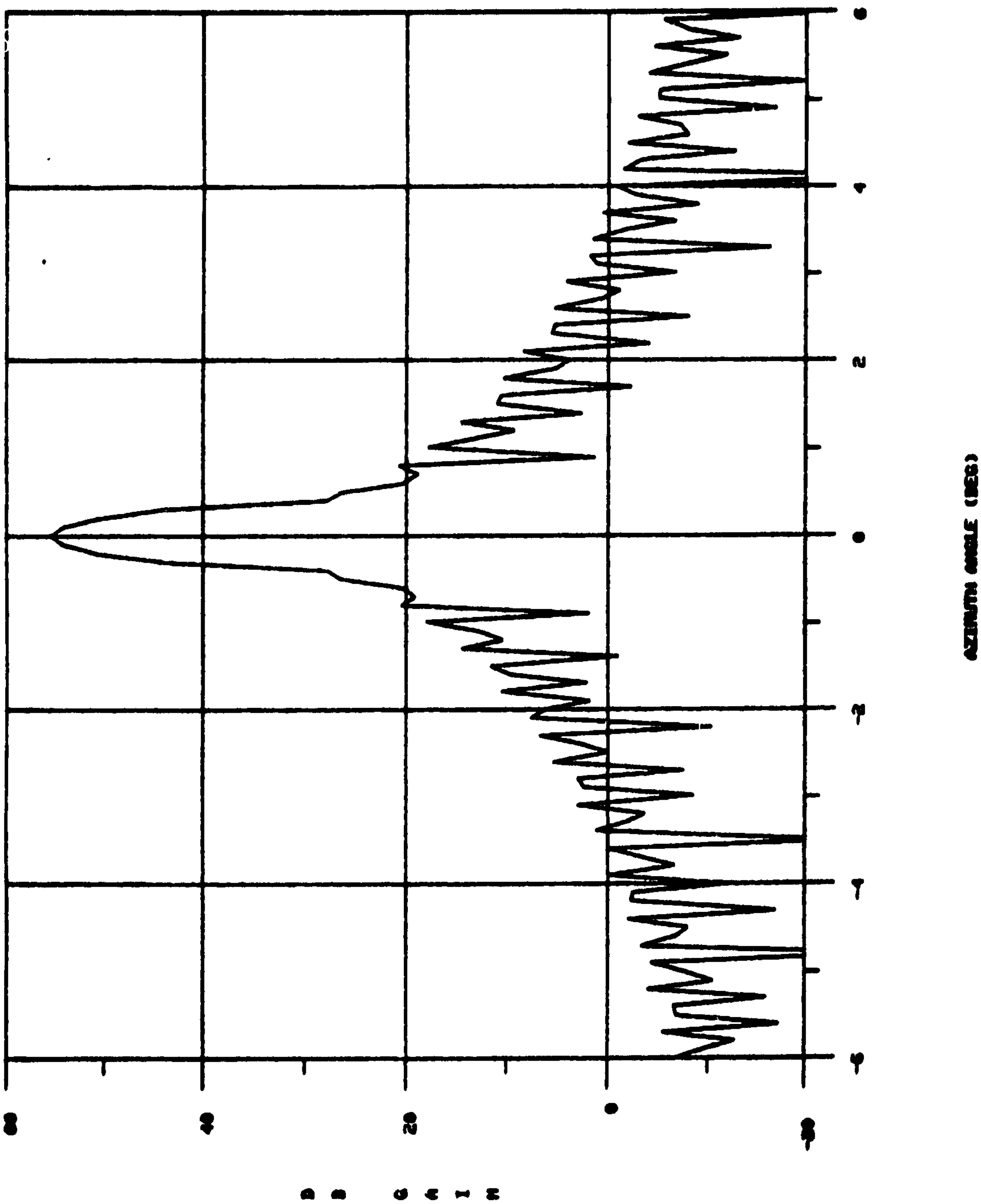

Figure 4.4-5.

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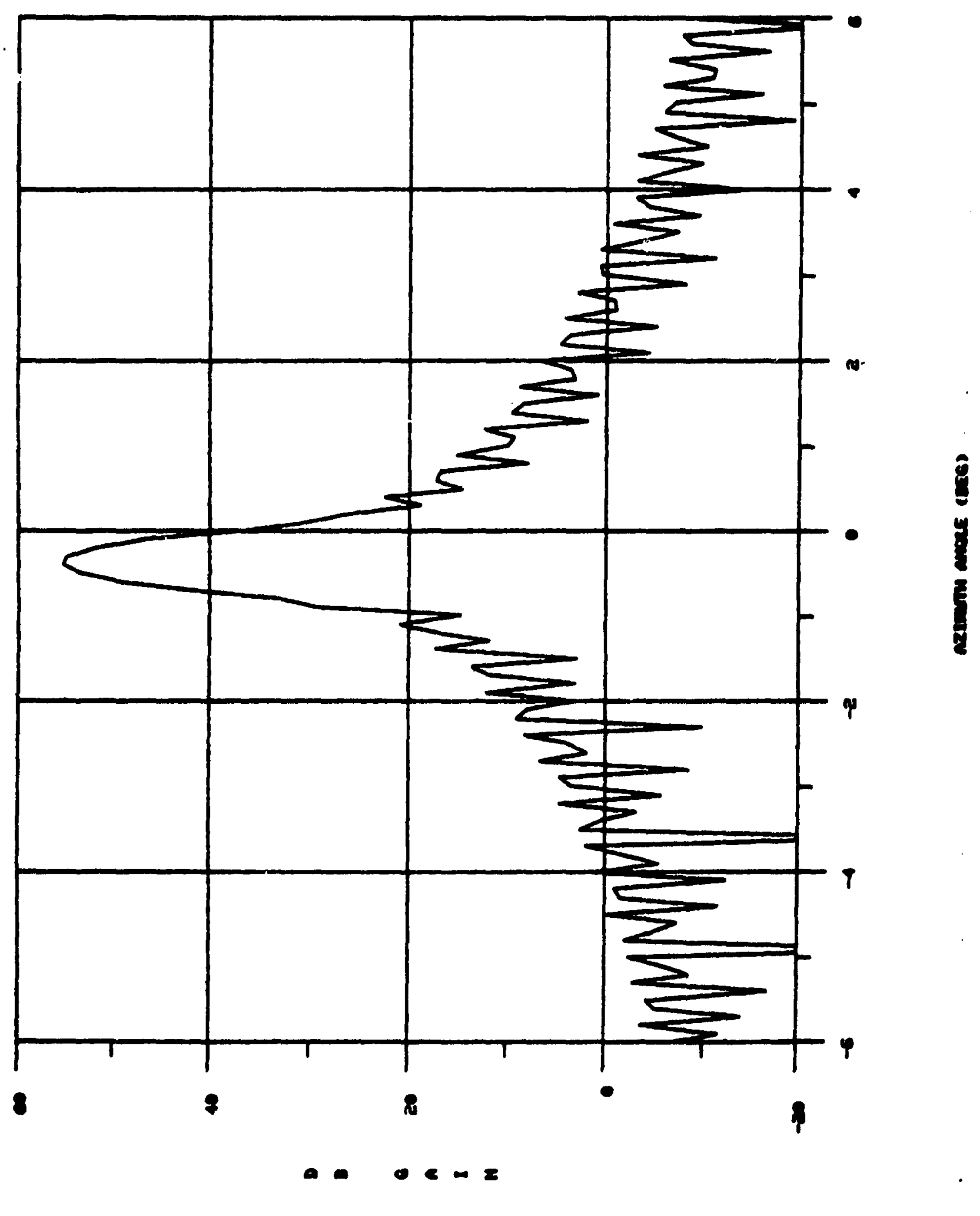

Figure 4.4-6.

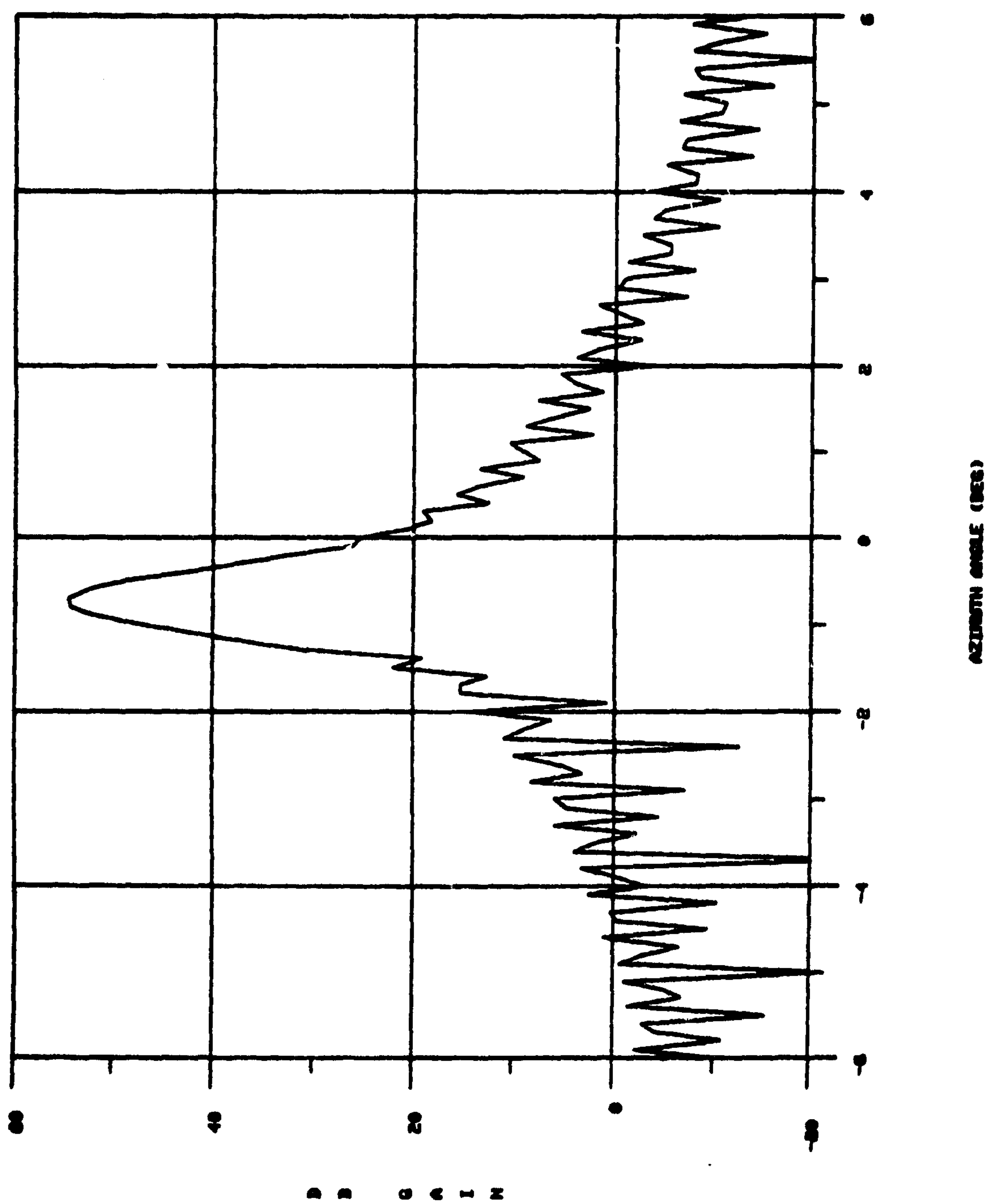

Figure 4.4-7.

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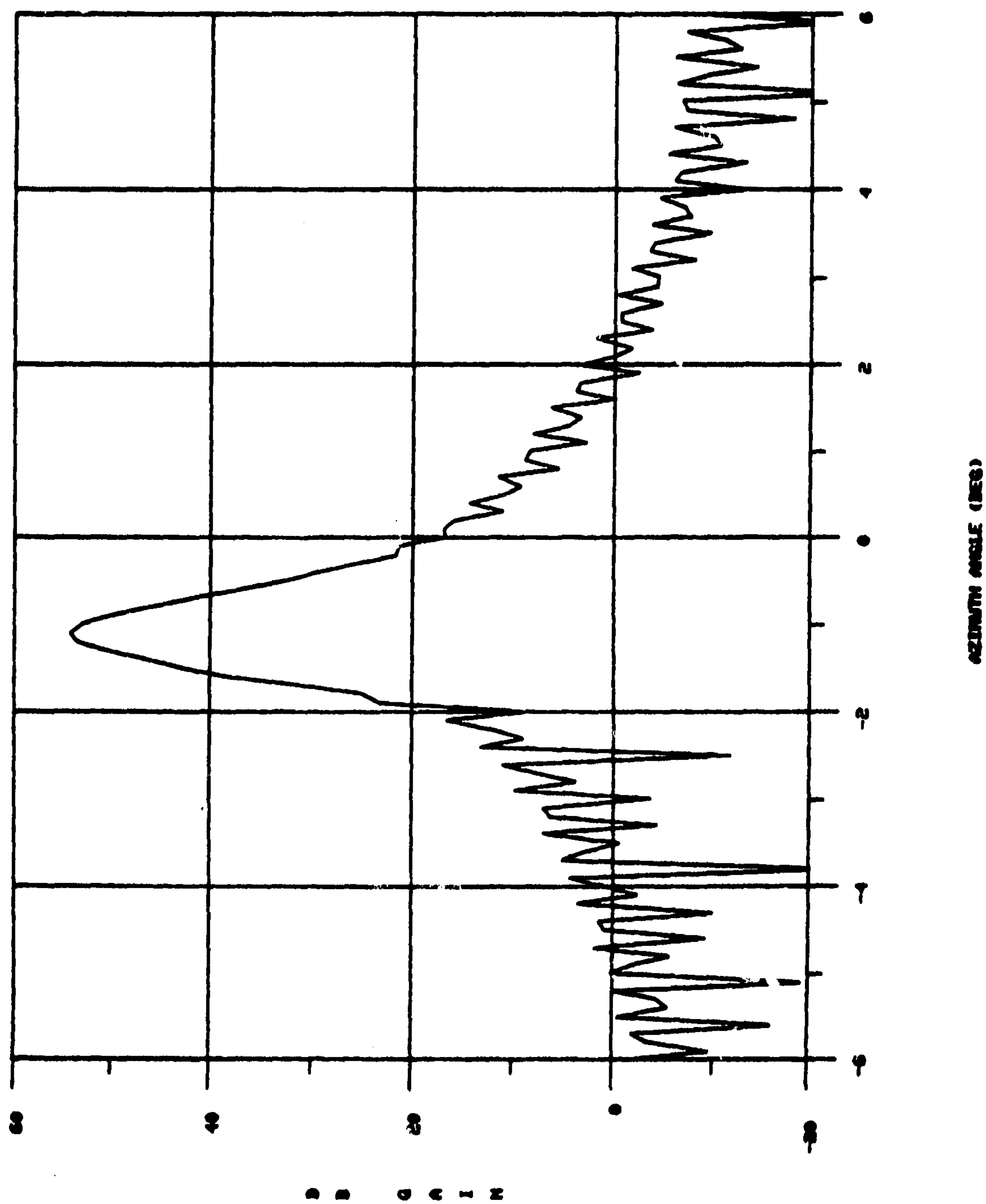


Figure 4.4-8.

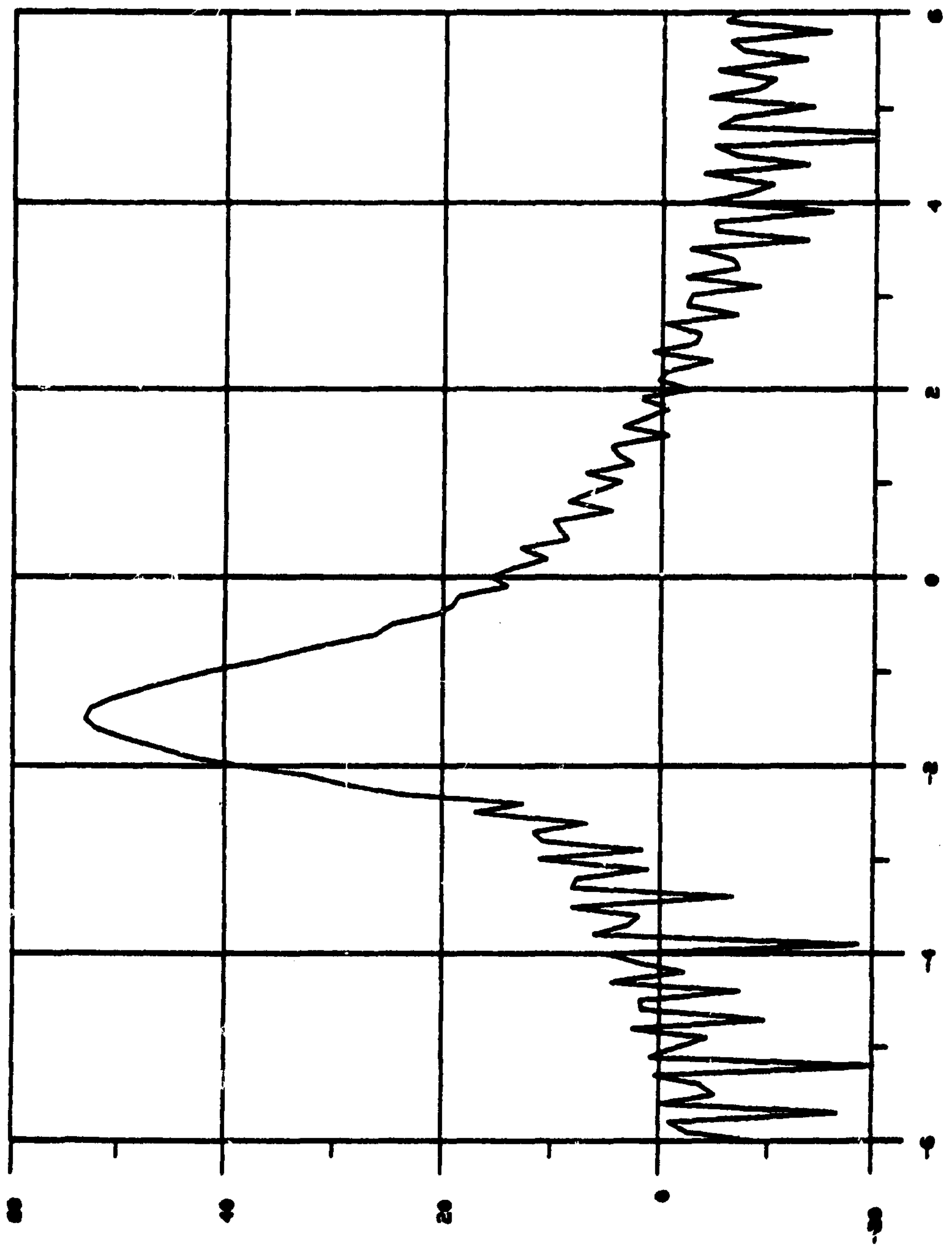


Figure 4.4-9.

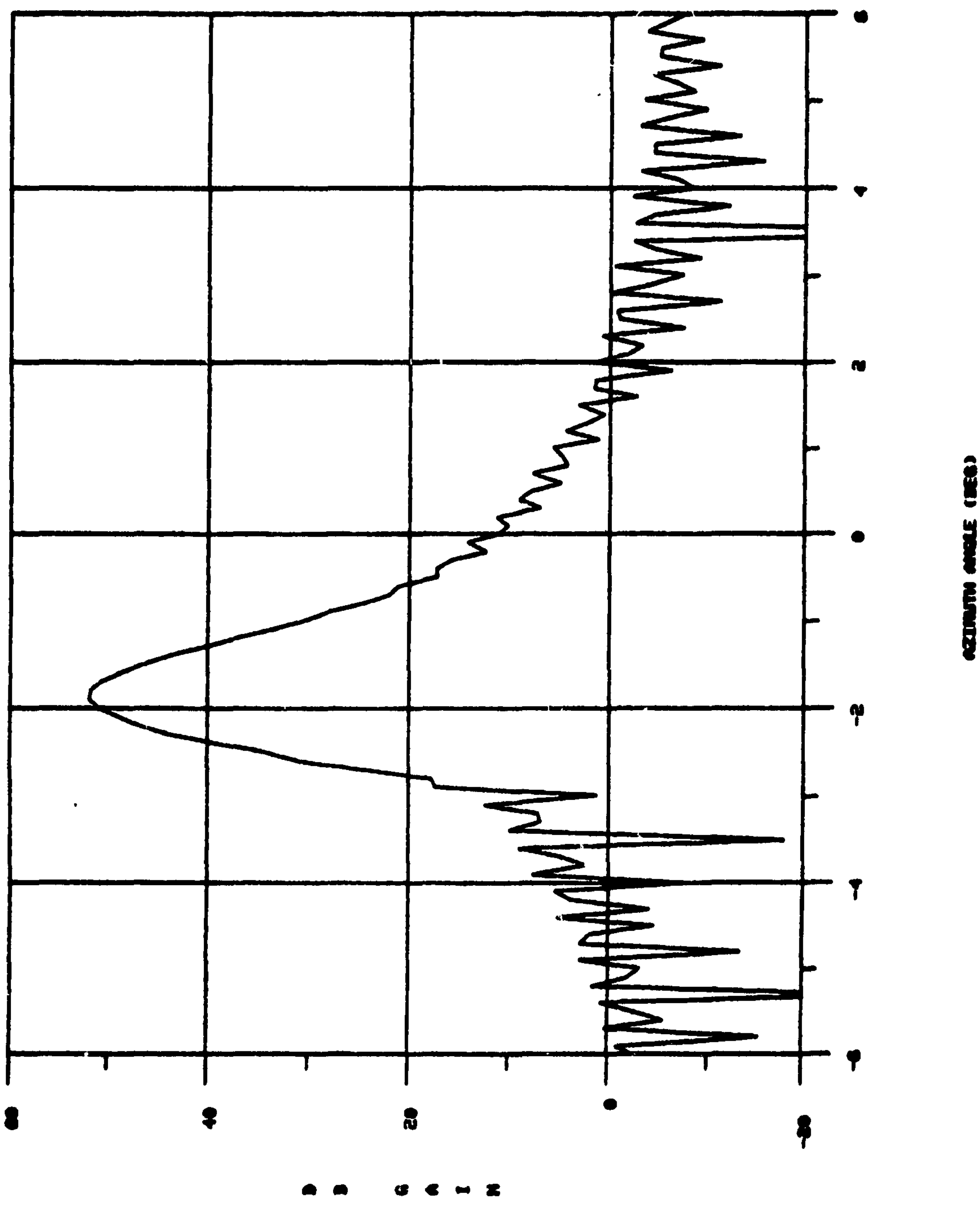


Figure 4.4-10.

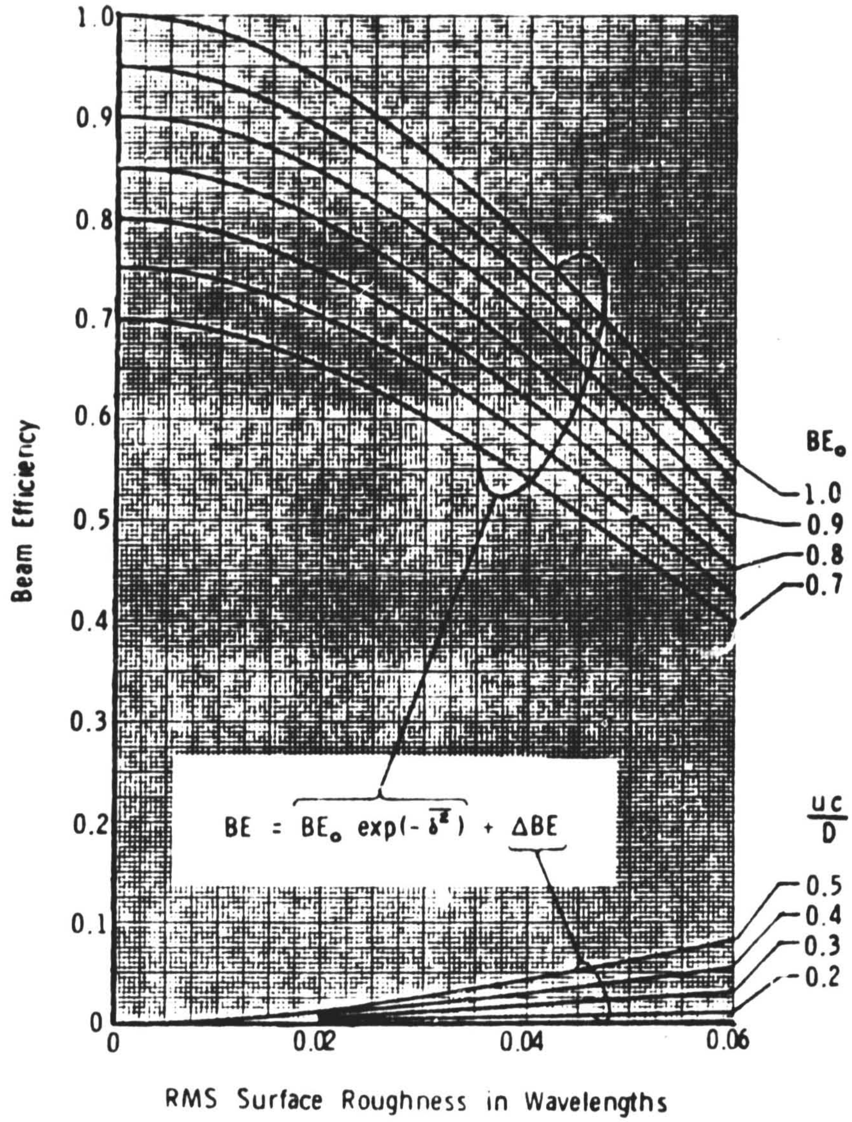


Figure 4.4-11. Beam Efficiency of a Random Rough Surface Reflector

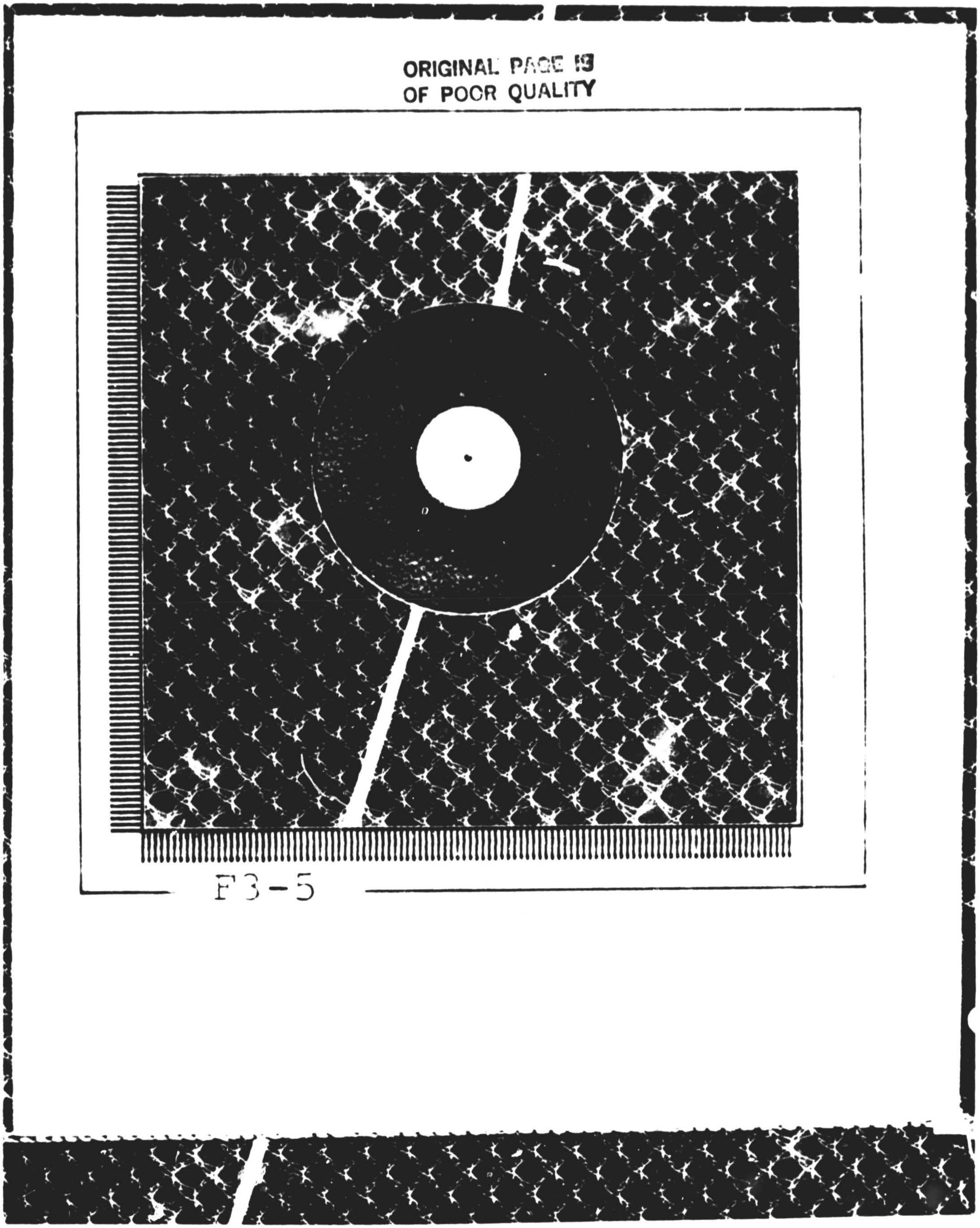


Figure 4.5-1.

A number of methods have been used to characterize the electrical properties including waveguide sample insertion methods, free space transmission methods, etc. The most common method presently used at Harris is the free space method shown in Figure 4.5-2. Here a sweeper method is used which allows the clear resolution of any space standing waves between the horns and the sample holder. Measurements are readily made over a wide range of frequencies and incidence angles. Using this system extensive measurements of transmissivity loss have been made, a sample of which is given in Figure 4.5-3. The calculations shown in Figure 4.5-3 were performed by a mesh analysis program developed and verified in extensive measurements on the TDRSS program. The basic theoretical model of the mesh is given in Figure 4.5-4. This model which includes the surface impedance and junction impedances is very adequate for mesh with up to 10 openings per inch. For such mesh, as found on TDRSS, if the openings are in the order of 0.1 wavelengths, polarization effects can result in different loss values.

FREE SPACE TRANSMISSIVITY MEASUREMENT SYSTEM

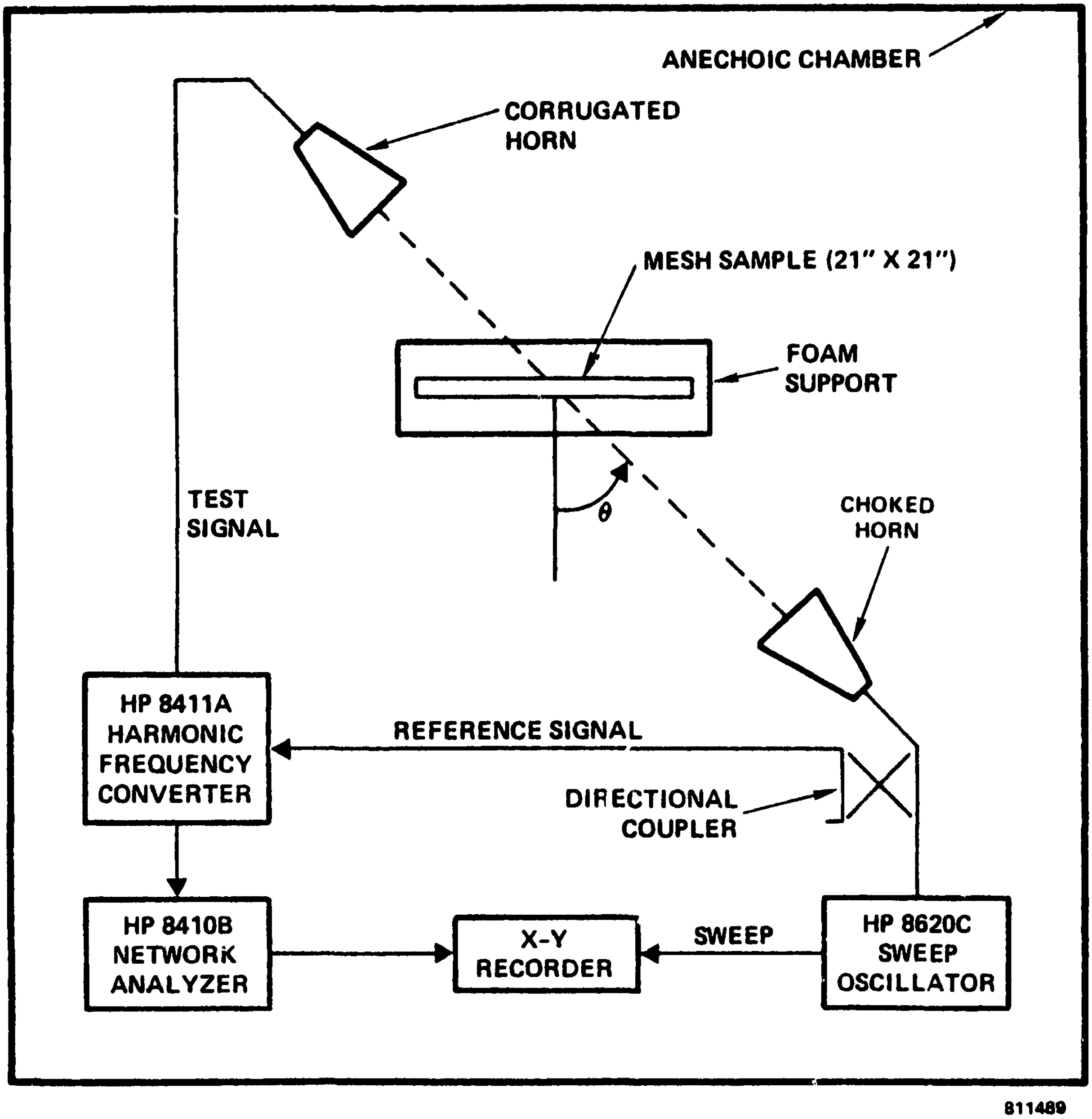
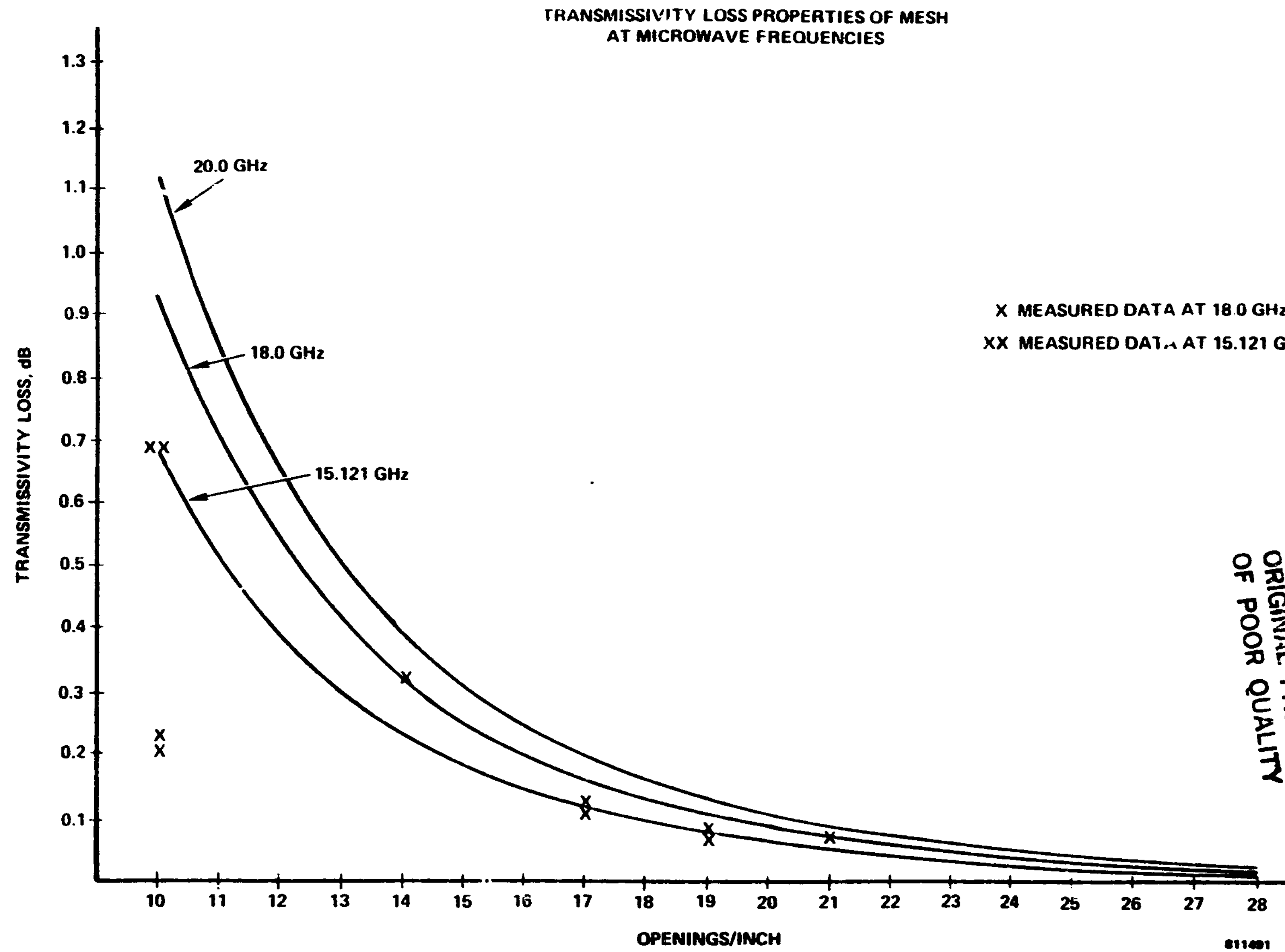


Figure 4.5-2.


TRANSMISSIVITY LOSS PROPERTIES OF MESH
AT MICROWAVE FREQUENCIES
TRANSMISSIVITY LOSS, dB
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
20.0 GHz
18.0 GHz
15.121 GHz
X MEASURED DATA AT 18.0 GHz
XX MEASURED DATA AT 15.121 GHz
10
11
12
13
14
15
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17
18
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OPENINGS/INCH
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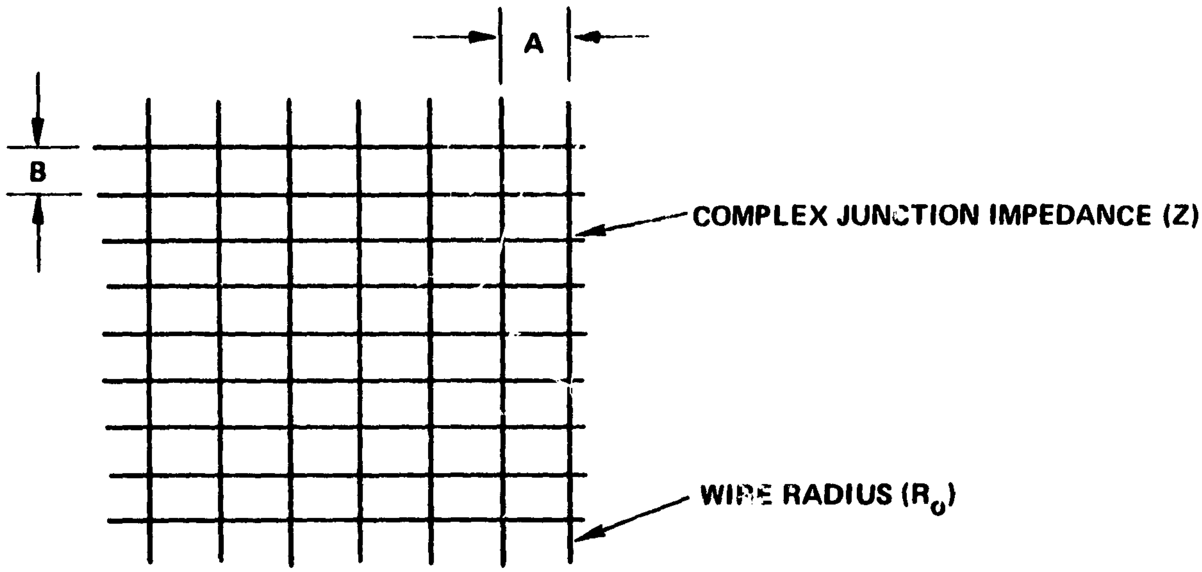
Figure 4.5-3.



- AVERAGE BOUNDARY CONDITIONS
- INCLUDES CONDUCTIVITY LOSS
- JUNCTION IMPEDANCE CAN BE CAPACITIVE OR INDUCTIVE
- CALCULATES CROSS POLARIZATION TERMS DUE TO SURFACE IMPEDANCE

THEORETICAL MODEL OF MESH

811490

Figure 4.5-4.

REFERENCES

Reference (1) "High Resolution Passive Microwave Satellites" edited by D. H. Staelin and P. W. Rosenkramfz, Research Laboratory for Electronics, MIT, Cambridge, Massachusetts, 02139, 14 April 1978.

Reference (2) Bruce Mac A. Thomas, "Design of Corrugated Conical Horns," IEEE Transactions on Antennas and Propagation, AP-26, No. 2, March 1978, pp 367-372.

Reference (3) Ta-shing Chu and R. H. Turrin, "Depolarization Properties of Offset Reflector Antennas," IEEE Transactions on Antennas and Propagation, AP-21, May, 1973, pp 339-345.

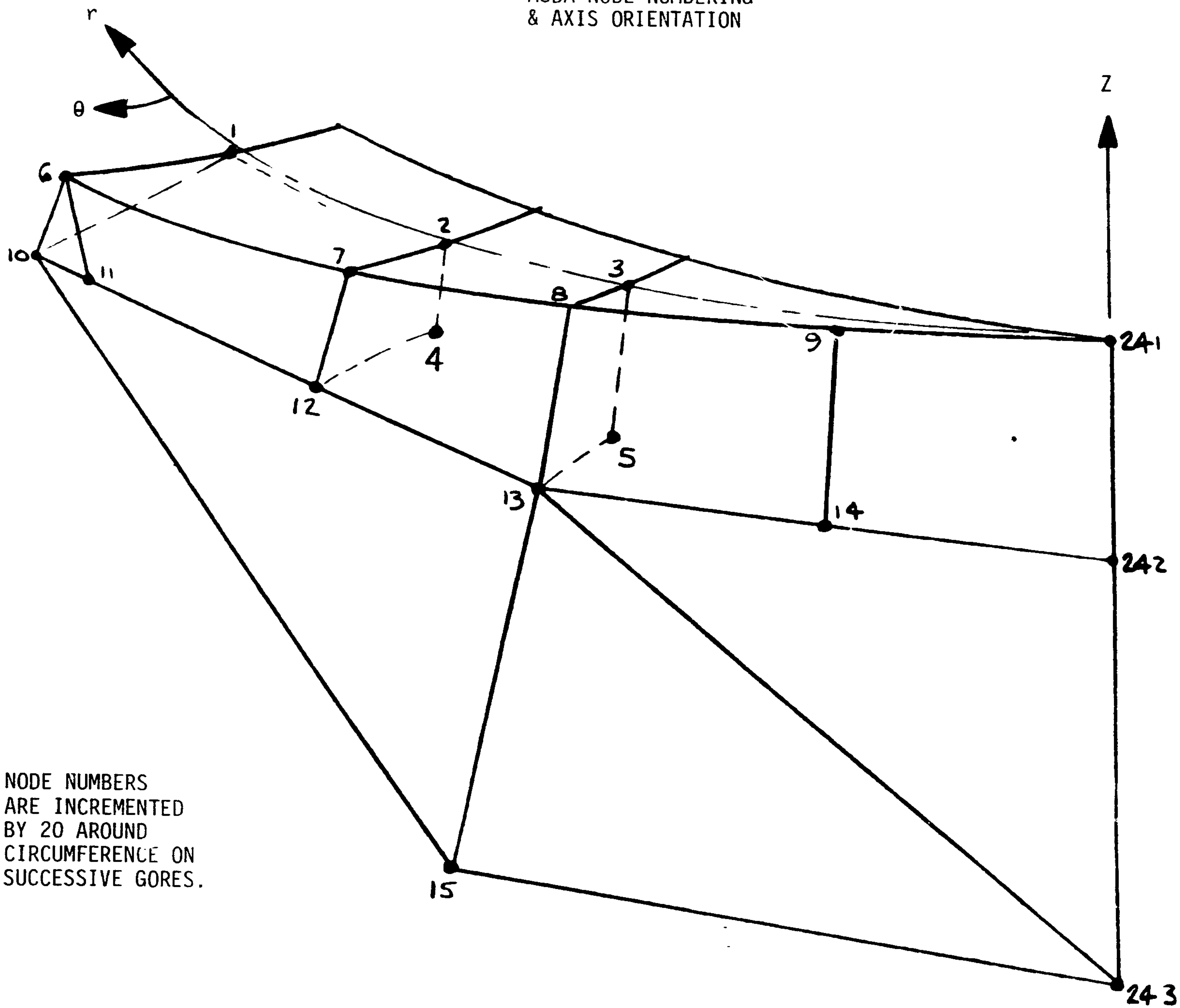
APPENDIX

ANALYTIC MODEL

The finite element presented herein employs the Non-Linear Structural Analysis (NLSA) program, a general purpose finite element program proprietary to Harris, Government Electronic Systems Division. While the model does not employ NASTRAN, the inputs presented are readily adapted to NASTRAN.

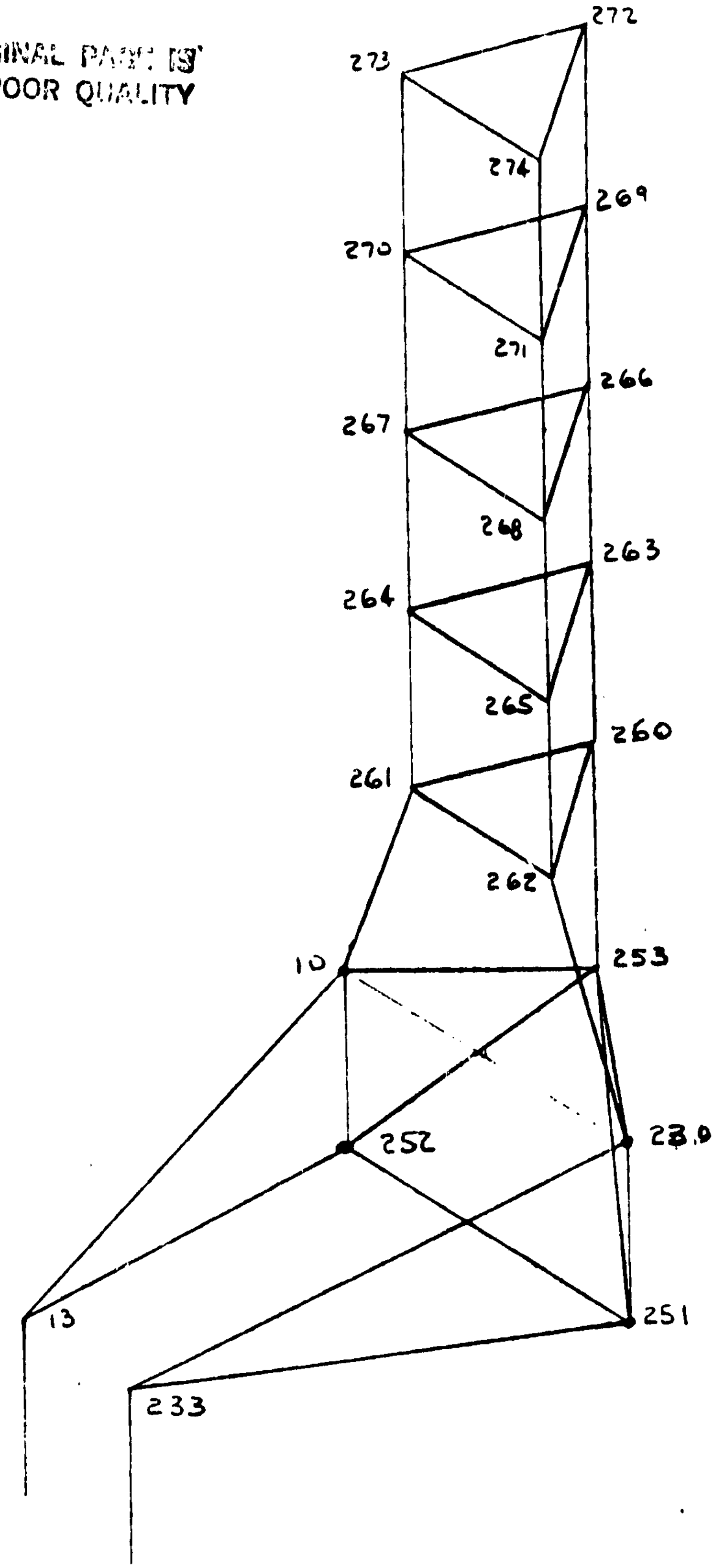
In the listing that follows, the reader will find the raw data for material properties definition, node point geometry, stringer, mesh, and beam element connecturaties, beam crossectional data and a complete nodal weight distribution. In addition, the data is listed in convenient, easy-to-read tables.

MSDA NODE NUMBERING
& AXIS ORIENTATION

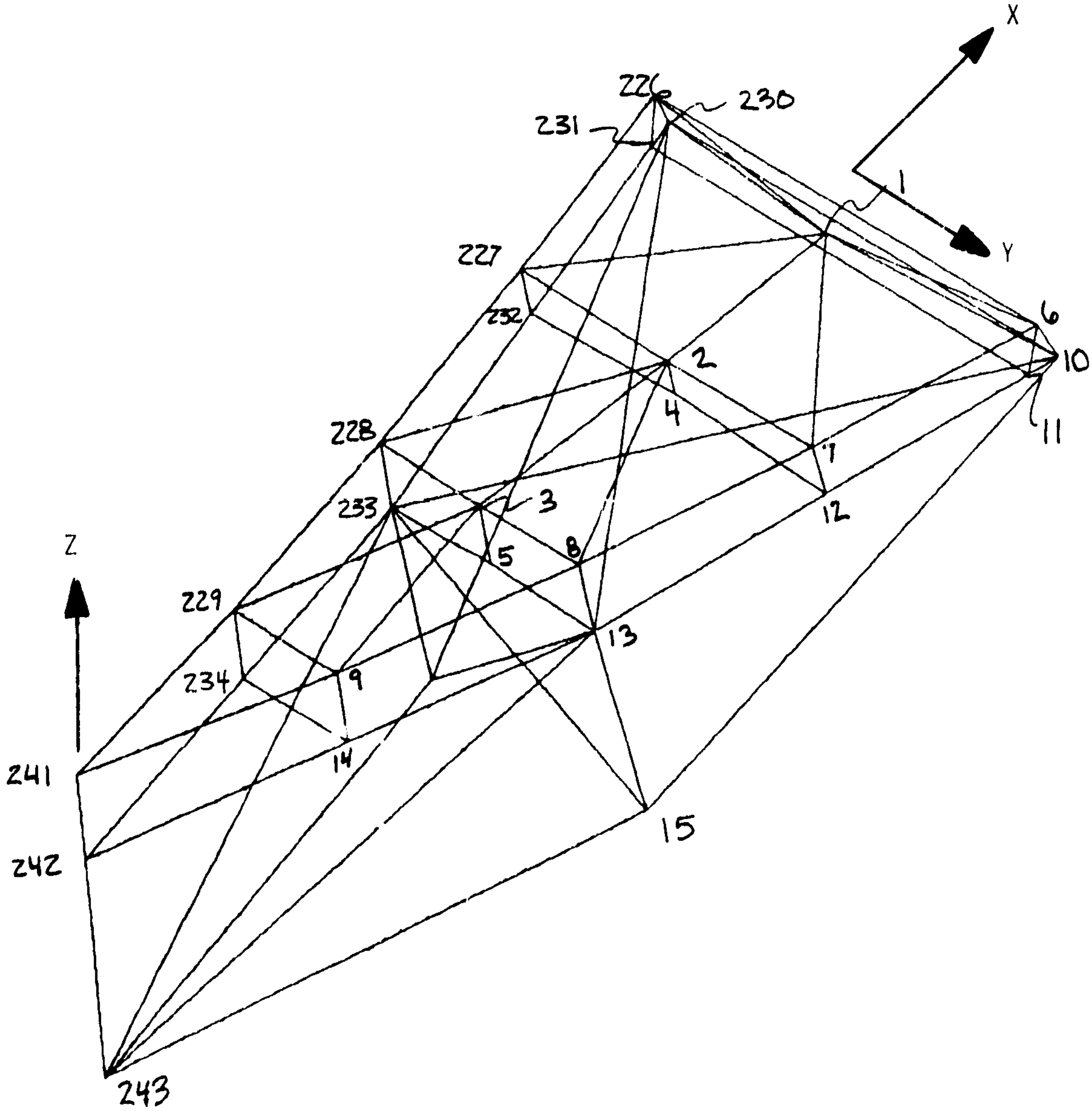


NODE NUMBERS
ARE INCREMENTED
BY 20 AROUND
CIRCUMFERENCE ON
SUCCESSIVE GORES.

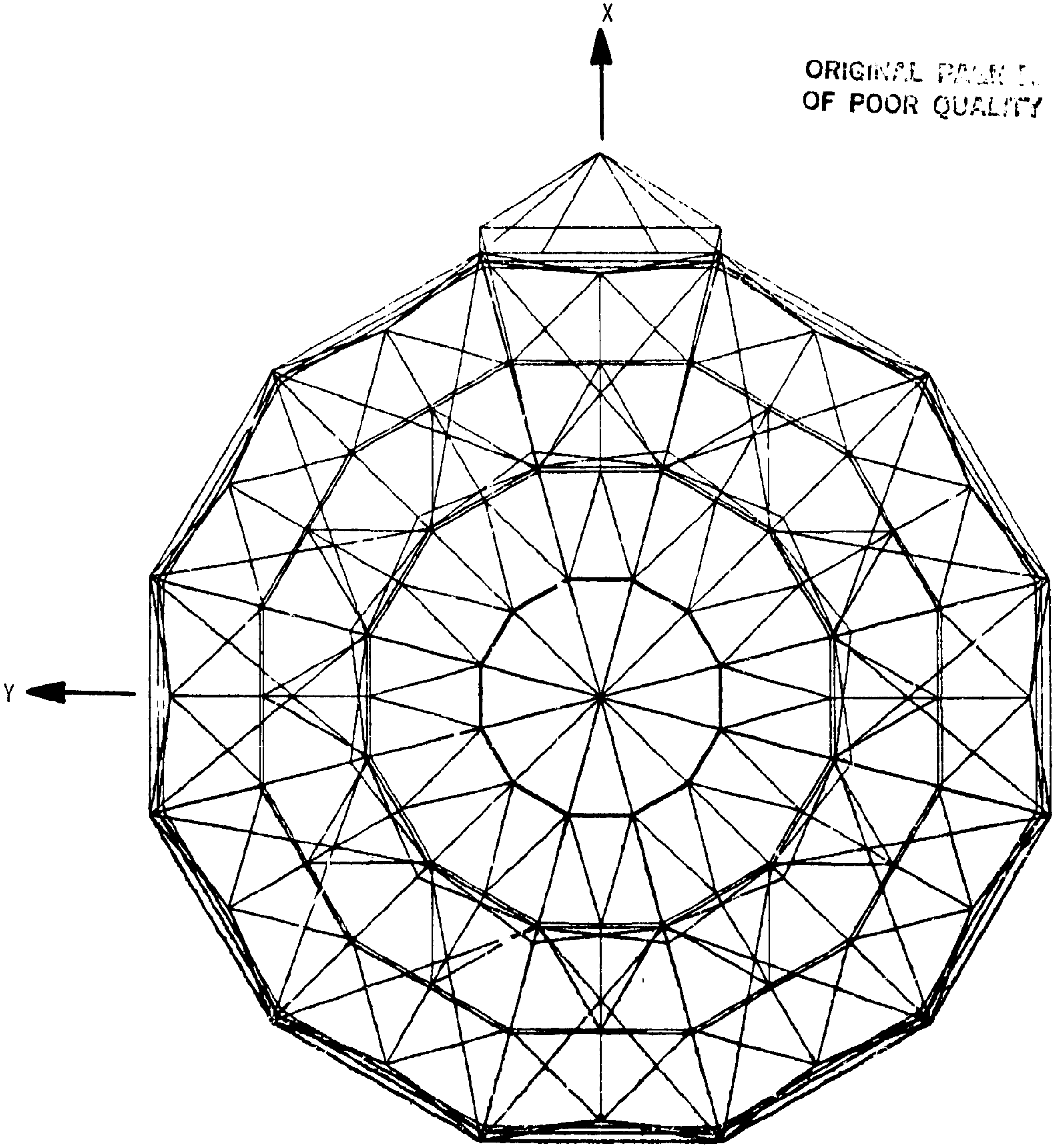
MSDA TOWER MODEL
NODE NUMBERS



NOTE: DIAGONALS ARE OMITTED FOR CLARITY



MSDA MODEL - SINGLE GORE PLOT
(SELECT NODE NUMBERS SHOWN)



MSDA (W/TOWER) MODEL, TOP VIEW (X-Y PLANE)

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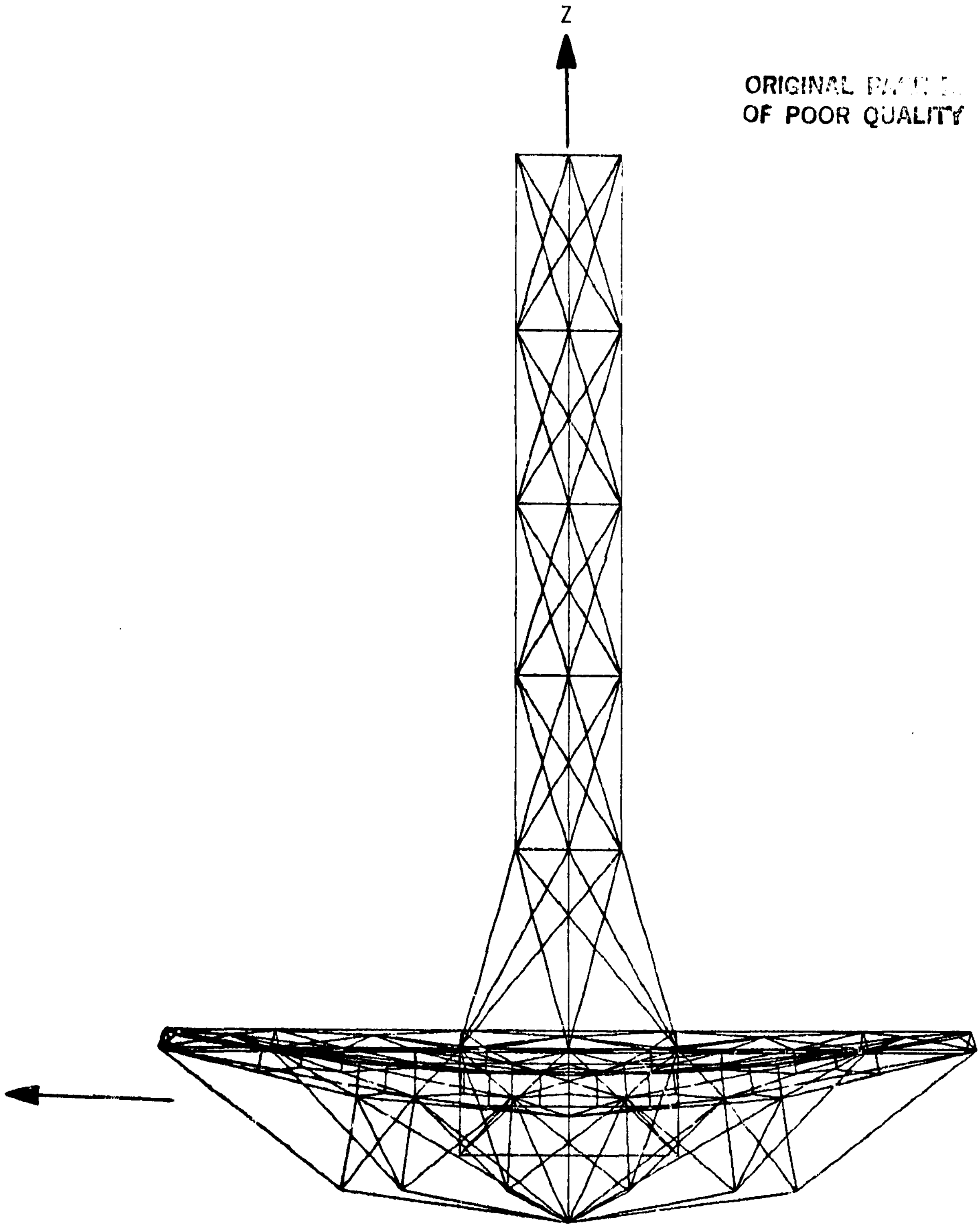
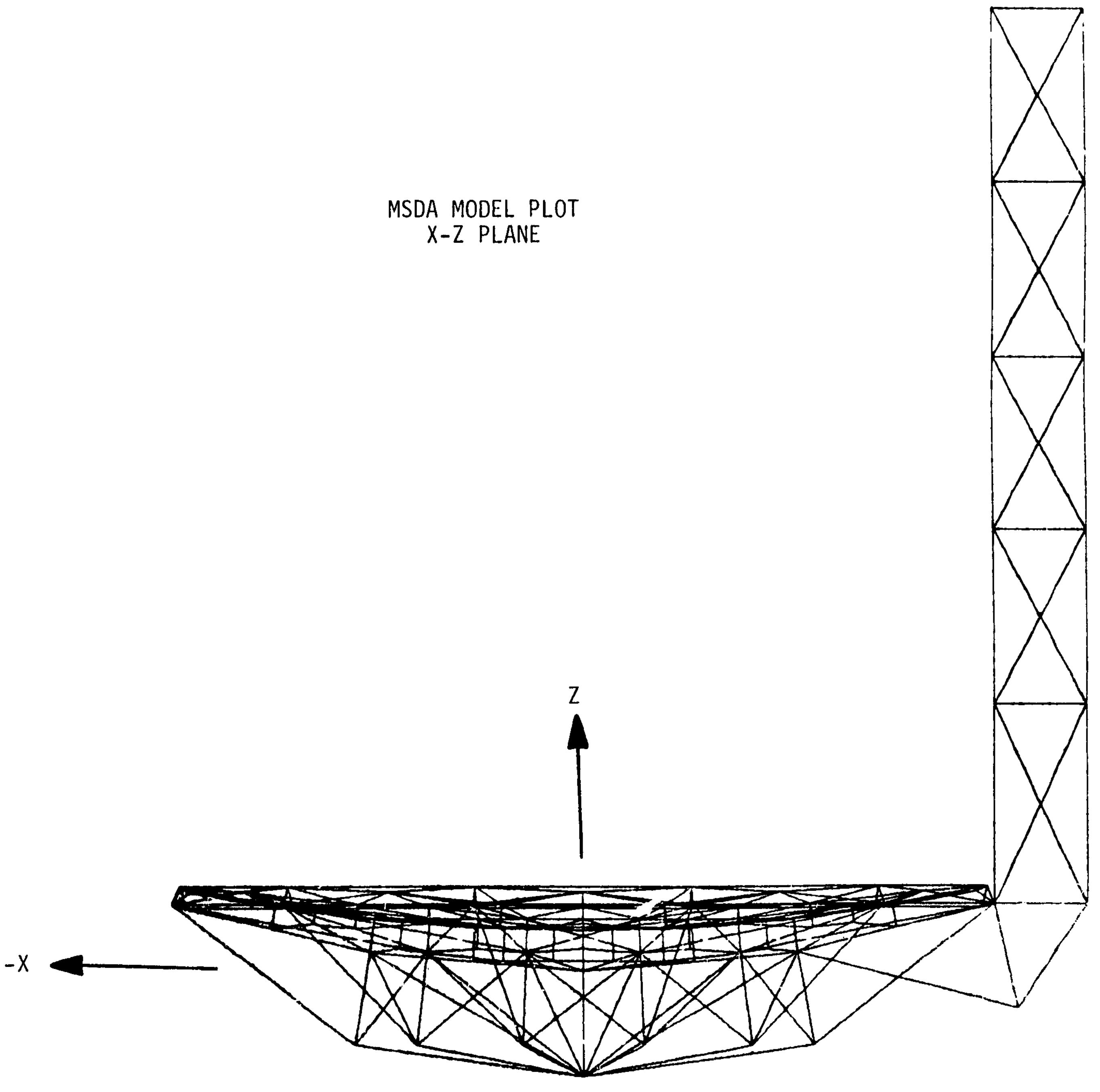
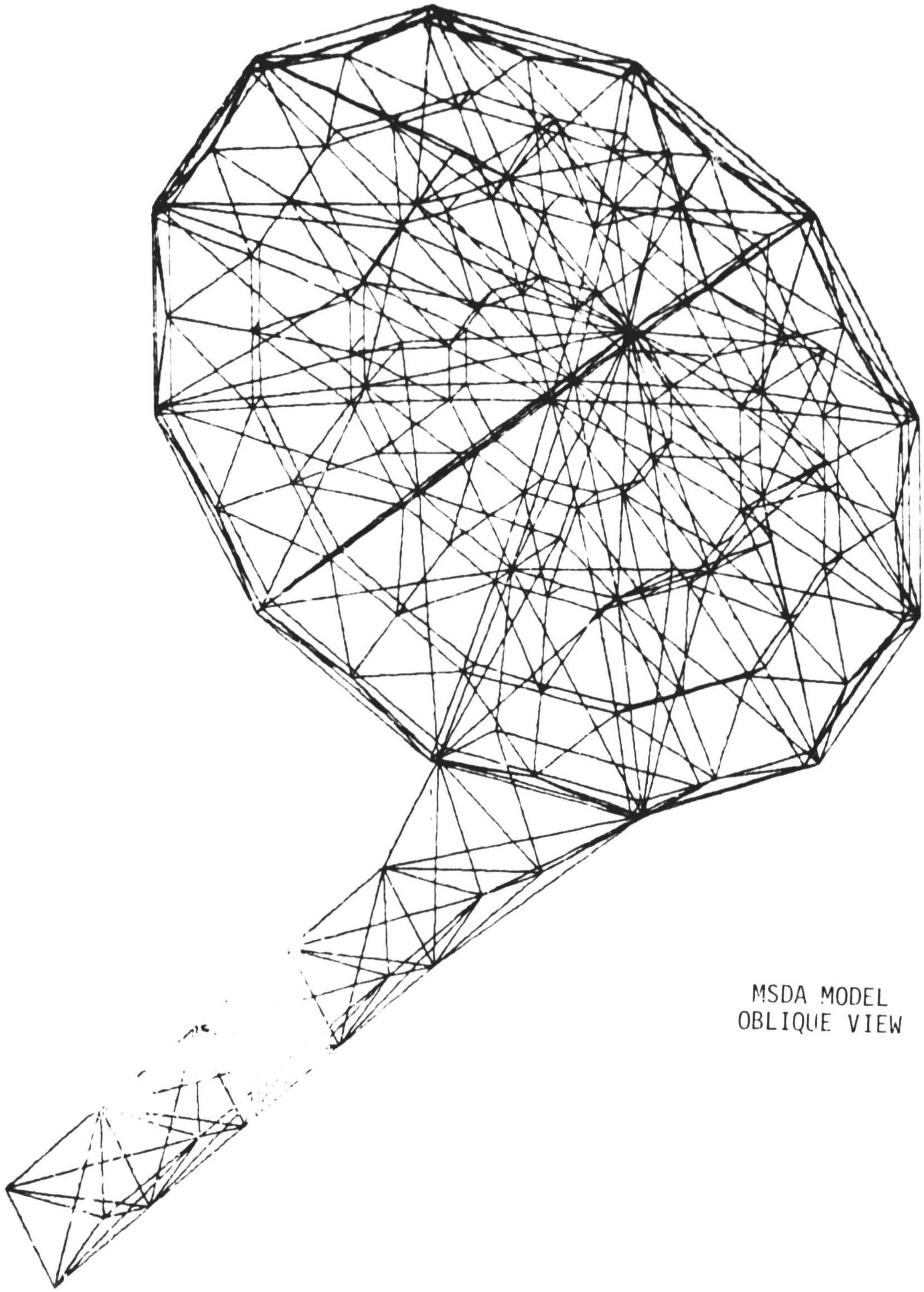


MSDA MODEL PLOT Z-Y PLANE

MSDA MODEL PLOT
X-Z PLANE





MSDA MODEL
OBLIQUE VIEW

```
0*********1*********2*********3*********4*********5*********6*********7*********8
:ECHO=ON
:
:     MECHANICALLY SCANNED DEPLOYABLE ANTENNA
:              DEPLOYED MODEL
:
:       CARD DECK FOR USE ON THE NON-LINEAR STRUCTURAL ANALYSIS
:                         PROGRAM
:                     ( N L S A )
:       HARRIS GOVERNMENT ELECTRONIC SYSTEMS DIVISION
:                P.O. BOX 37
:           MELBOURNE FLORIDA 32901
:
:       FOR FURTHER INFORMATION CONTACT:
:         RICK HARLESS (305) 729-2207 OR
:         RICK DEADWYLER (305) 727-4259
:END
:C        CONTROL CARDS FOR CASE CONTROL
:    1    1    0  248  249                0    0    0                     1    0
:    0                               10
:
:   708.662
: 1 1 0 0 0 0        5 .6283185                         6             .002588
:MATL
:C        MATERIAL DEFINITION TABLE
:C  NO NAME       E,DX       G,DY       D1         DXY         DENSITY   CTE-X      CTE-Y
:     1 MESH      2.50        .80       1.20        .80                    1.0        1.0
:     2FRONT     1494.                                                    1.0
:     3 BACK     1494.                                                    1.0
:     4OBINT     2988.                                                    1.0
:     5  TIF       30.                                                    1.0
:     6SUTIL      300.                                                    1.0
:     7STRIP    13.7E+6                                                   1.0
:     8STRIP    13.7E+6    .65E+6                                         1.0
:     9  RIB    18.3E+6                                                   1.0
:    10  RIB    18.3E+6   2.72E+6                                         1.0
:    11  ROD    29.6E+6                                                   1.0
:    12  ROD    29.6E+6    .65E+6                                         1.0
:    13TCORD     66000.                                                   1.0
:    14  HUB    18.3E+6                                                   1.0
:    15  HUB    18.3E+6   2.72E+6                                         1.0
:    16STRUT    18.3E+6                                                   1.0
:    17STRUT    18.3E+6   2.72E+6                                         1.0
:    18TIPSO    18.3E+6                                                   1.0
:    19TIPSO    18.3E+6   2.72E+6                                         1.0
:    20INTTY     2988.                                                    1.0
:END
:GLOB
:C        GLOBAL COORDINATE TABLE
:C        REFLECTOR COORDINATES
:C NODE         SYSTEM      X            Y           Z
:     1             3 288.97877    0.00000    29.43588
:     2             3 227.35321    0.00000    18.23453
:     3             3 154.72062    0.00000     8.44484
:     4             3 229.45156    0.00000     5.18960
:     5             3 157.17047    0.00000   -13.98591
```

```
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57.    :    7                3 227.15425  60.86580  19.50970
58.    :    8                3 154.65475  41.43962   9.04384
59.    :    9                3  79.91529  21.41324   2.41491
60.    :   10                3 302.64581  81.09370  19.59000
61.    :   11                3 293.25315  78.57694  17.25500
62.    :   12                3 230.03813  61.63853   1.54300
63.    :   13                3 157.44494  42.18725 -16.49900
64.    :   14                3  81.37152  21.80343 -23.38900
65.    :   15                3 168.46906  45.14115 -86.57600
66.    :   16                0   0.00000   0.00000   0.00000
67.    :   17                0   0.00000   0.00000   0.00000
68.    :   18                0   0.00000   0.00000   0.00000
69.    :   19                0   0.00000   0.00000   0.00000
70.    :   20                0   0.00000   0.00000   0.00000
71.    :   21                3 250.26292 144.48937  29.43596
72.    :   22                3 196.89366 113.67660  18.23453
73.    :   23                3 133.99199  77.36031   8.44484
74.    :   24                3 198.71087 114.72578   5.18960
75.    :   25                3 136.11362  78.58524 -13.98592
76.    :   26                3 217.48929 217.48929  33.37418
77.    :   27                3 166.28845 166.28845  19.50970
78.    :   28                3 113.21513 113.21513   9.04384
79.    :   29                3  58.50205  58.50205   2.41491
80.    :   30                3 221.55211 221.55211  19.59000
81.    :   31                3 214.67620 214.67620  17.25500
82.    :   32                3 168.39960 168.39960   1.54300
83.    :   33                3 115.25770 115.25770 -16.49900
84.    :   34                3  59.56809  59.56809 -23.38900
85.    :   35                3 123.32791 123.32791 -86.57600
86.    :   36                0   0.00000   0.00000   0.00000
87.    :   37                0   0.00000   0.00000   0.00000
88.    :   38                0   0.00000   0.00000   0.00000
89.    :   39                0   0.00000   0.00000   0.00000
90.    :   40                0   0.00000   0.00000   0.00000
91.    :   41                3 144.48937 250.26292  29.43596
92.    :   42                3 113.67660 196.89366  18.23453
93.    :   43                3  77.36031 133.99199   8.44484
94.    :   44                3 114.72578 198.71087   5.18960
95.    :   45                3  78.58524 136.11362 -13.98592
96.    :   46                3  79.60660 297.09589  33.37419
97.    :   47                3  60.86580 227.15425  19.50970
98.    :   48                3  41.43962 154.65475   9.04384
99.    :   49                3  21.41324  79.91529   2.41491
100.   :   50                3  81.09370 302.64581  19.59000
101.   :   51                3  78.57694 293.25315  17.25500
102.   :   52                3  61.63853 230.03813   1.54300
103.   :   53                3  42.18725 157.44494 -16.49900
104.   :   54                3  21.80343  81.37152 -23.38900
105.   :   55                3  45.14115 168.46906 -86.57600
106.   :   56                0   0.00000   0.00000   0.00000
107.   :   57                0   0.00000   0.00000   0.00000
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```

0*********1*********^2*********3*********4*********5*********6*********7*********8

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116.	:	66	3	-79.60660	297.09569	33.37419
117.	:	67	3	-60.86580	227.15425	19.50970
118.	:	68	3	-41.43962	154.65475	9.04384
119.	:	69	3	-21.41324	79.91529	2.41491
120.	:	70	3	-81.09370	302.64581	19.59000
121.	:	71	3	-78.57694	293.25315	17.25500
122.	:	72	3	-61.63853	230.03813	1.54300
123.	:	73	3	-42.18725	157.44494	-16.49900
124.	:	74	3	-21.80343	81.37152	-23.38900
125.	:	75	3	-45.14115	168.46906	-86.57600
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134.	:	84	3	-114.72578	198.71087	5.18960
135.	:	85	3	-78.58524	136.11362	-13.98592
136.	:	86	3	-217.48929	217.48929	33.37418
137.	:	87	3	-166.28845	166.28845	19.50970
138.	:	88	3	-113.21513	113.21513	9.04384
139.	:	89	3	-58.50205	58.50205	2.41491
140.	:	90	3	-221.55211	221.55211	19.59000
141.	:	91	3	-214.67620	214.67620	17.25500
142.	:	92	3	-168.39960	168.39960	1.54300
143.	:	93	3	-115.25770	115.25770	-16.49900
144.	:	94	3	-59.56809	59.56809	-23.38900
145.	:	95	3	-123.32791	123.32791	-86.57600
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147.	:	97	0	0.00000	0.00000	0.00000
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149.	:	99	0	0.00000	0.00000	0.00000
150.	:	100	0	0.00000	0.00000	0.00000
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154.	:	104	3	-198.71087	114.72578	5.18960
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156.	:	106	3	-297.09589	79.60660	33.37419
157.	:	107	3	-227.15425	60.86580	19.50970
158.	:	108	3	-154.65475	41.43962	9.04384
159.	:	109	3	-79.91529	21.41324	2.41491
160.	:	110	3	-302.64581	81.09370	19.59000
161.	:	111	3	-293.25315	78.57694	17.25500
162.	:	112	3	-230.03813	61.63853	1.54300
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165.	:	115	3	-168.46906	45.14115	-86.57600

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 172.   :  122            3-227.35321   0.00000  18.23453
 173.   :  123            3-154.72062   0.00000   8.44484
 174.   :  124            3-229.45156   0.00000   5.18960
 175.   :  125            3-157.17047   0.00000 -13.98591
 176.   :  126            3-297.09589 -79.60660  33.37419
 177.   :  127            3-227.15425 -60.86580  19.50970
 178.   :  128            3-154.65475 -41.43962   9.04384
 179.   :  129            3 -79.91529 -21.41324   2.41491
 180.   :  130            3-302.64581 -81.09370  19.59000
 181.   :  131            3-293.25315 -78.57694  17.25500
 182.   :  132            3-230.03813 -61.63853   1.54300
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 194.   :  144            3-198.71087-114.72578   5.18960
 195.   :  145            3-136.11362 -78.58524 -13.98592
 196.   :  146            3-217.48929-217.48929  33.37419
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 203.   :  153            3-115.25770-115.25770 -16.49900
 204.   :  154            3 -59.56809 -59.56809 -23.38900
 205.   :  155            3-123.32791-123.32791 -86.57600
 206.   :  156            0    0.00000   0.00000   0.00000
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 212.   :  162            3-113.67660-196.89366  18.23453
 213.   :  163            3 -77.36031-133.99199   8.44484
 214.   :  164            3-114.72578-198.71087   5.18960
 215.   :  165            3 -78.58524-136.11362 -13.98592
 216.   :  166            3 -79.60660-297.09589  33.37419
 217.   :  167            3 -60.86580-227.15425  19.50970
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 219.   :  169            3 -21.41324 -79.91529   2.41491
 220.   :  170            3 -81.09370-302.64581  19.59000
```

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          0*********1*********2*********3*********4*********5*********6*********7*********8

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 222.   :  172            3 -61.63853-230.03813   1.54300
 223.   :  173            3 -42.18725-157.44494 -16.49900
 224.   :  174            3 -21.80343 -81.37152 -23.38900
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 231.   :  181            3   0.00000-288.97873  29.43596
 232.   :  182            3   0.00000-227.35321  18.23453
 233.   :  183            3   0.00000-154.72062   8.44484
 234.   :  184            3   0.00000-229.45156   5.18960
 235.   :  185            3   0.00000-157.17047 -13.98591
 236.   :  186            3  79.60660-297.09589  33.37419
 237.   :  187            3  60.86580-227.15425  19.50970
 238.   :  188            3  41.43962-154.65475   9.04384
 239.   :  189            3  21.41324 -79.91529   2.41491
 240.   :  190            3  81.09370-302.64581  19.59000
 241.   :  191            3  78.57694-293.25315  17.25500
 242.   :  192            3  61.63853-230.03813   1.54300
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 245.   :  195            3  45.14115-168.46906 -86.57600
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 249.   :  199            0   0.00000   0.00000   0.00000
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 252.   :  202            3 113.67660-196.89366  18.23453
 253.   :  203            3  77.36031-133.99199   8.44484
 254.   :  204            3 114.72578-198.71087   5.18960
 255.   :  205            3  78.58524-136.11362 -13.98592
 256.   :  206            3 217.48929-217.48929  33.37418
 257.   :  207            3 166.28845-166.28845  19.50970
 258.   :  208            3 113.21513-113.21513   9.04384
 259.   :  209            3  58.50205 -58.50205   2.41491
 260.   :  210            3 221.55211-221.55211  19.59000
 261.   :  211            3 214.67620-214.67620  17.25500
 262.   :  212            3 168.39960-168.39960   1.54300
 263.   :  213            3 115.25770-115.25770 -16.49900
 264.   :  214            3  59.56809 -59.56809 -23.38900
 265.   :  215            3 123.32791-123.32791 -86.57600
 266.   :  216            0   0.00000   0.00000   0.00000
 267.   :  217            0   0.00000   0.00000   0.00000
 268.   :  218            0   0.00000   0.00000   0.00000
 269.   :  219            0   0.00000   0.00000   0.00000
 270.   :  220            0   0.00000   0.00000   0.00000
 271.   :  221            3 250.26292-144.48937  29.43596
 272.   :  222            3 196.89366-113.67660  18.23453
 273.   :  223            3 133.99199 -77.36031   8.44484
 274.   :  224            3 198.71087-114.72578   5.18960
 275.   :  225            3 136.11362 -78.58524 -13.98592
```

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0*********1*********2*********3*********4*********5*********6*********7*********8
:  226                    3 297.09589 -79.60660  33.37418
:  227                    3 227.15425 -60.86580  19.50970
:  228                    3 154.65475 -41.43962   9.04384
:  229                    3  79.91529 -21.41324   2.41491
:  230                    3 302.64581 -81.09370  19.59000
:  231                    3 293.25315 -78.57694  17.25500
:  232                    3 230.03813 -61.63853   1.54300
:  233                    3 157.44494 -42.18725 -16.49900
:  234                    3  81.37152 -21.80343 -23.38900
:  235                    3 168.46906 -45.14115 -86.57600
:  236                    0   0.00000   0.00000   0.00000
:  237                    0   0.00000   0.00000   0.00000
:  238                    0   0.00000   0.00000   0.00000
:  239                    0   0.00000   0.00000   0.00000
:  240                    0   0.00000   0.00000   0.00000
:  241                    3   0.00000   0.00000   0.00000
:  242                    3   0.00000   0.00000 -30.75900
:  243                    3   0.00000   0.00000-109.86300
:END
:GLOB
:C          ADDTIONAL COORDINATES FOR DEFINTION OF SPECIAL COORDINATE SYSTEMS
:C NODE                     X         Y         Z
:  245                     0.0       0.0       0.0
:  246                     422.340   0.0       61.718
:  247                     223.920   0.0       742.032
:  248                     72.704    0.0       0.0
:  249                       394.428              946.986
:  250                     1000.     0.0       100.
:END
:SYST
:C          THESE SPECIAL COORDINATE SYSTEMS ARE USED AS FOLLOWS
:C          SYSTEM 3 IS A CYLINDRICAL POLAR SYSTEM FOR DISPLAY OF STRUCTURAL
:C                    DISPLACEMENTS.  THE GLOBAL 'Z' AXIS IS THE AXIS OF SYMMETRY.
:C                    THUS IN VIEWING DISPLACEMENTS, DOF1 IS A RADIAL DIPLACEMENT
:C                    AND DOF2 AND DOF2 ARE CIRCUMFERENTIAL AND BORE AXIS 'OR Z'
:C                    DISPLACEMENTS.
:C                    NOTE, FORCES (APPLIED LOADS) ARE ALSO IN THIS SYSTEM.
:C          SYSTEM 5 IS A CARTESIAN SYSTEM THAT DEFINES THE VERTEX AND
:C                    BORE AXIS OF THE OFFSET PARABOLA.  JA (246) TO JB (247)
:C                    DEFINES THE BORE AXIS (POINTING DIRECTION) OF THE ANTENNA.
:C          SYSTEM 6 IS A SYSTEM THAT DEFINES THE SPIN AXIS OF THE SYSTEM
:C                    WITH RESPECT TO THE REFLECTOR.
:C                    JA (248) TO JB (249) DEFINES THE SPIN AXIS.
:C                    THIS SYSTEM IS ALSO USED TO DISPLAY THE WEIGHT MOMENTS OF
:C                    INERTIA OF THE SYSTEM.
:     6  248  249  250
:     3    3
:     5  246  247  250
:END
:STRI
:C                    STRINGER ELEMENT TABLE.
:C                    THESE ARE PRETENSIONED, AXIAL LOAD ELEMENTS.
:C        JA   JB              MATL     AREA      PRELOAD
:C      THESE ARE OUTBOARD INTERCOSTALS
:          1    6                 4  1.00       5.69
```

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331.    :          21   26                      4  1.00         5.69
332.    :          41   46                      4  1.00         5.69
333.    :          61   66                      4  1.00         5.69
334.    :          81   86                      4  1.00         5.69
335.    :         101  106                      4  1.00         5.69
336.    :         121  126                      4  1.00         5.69
337.    :         141  146                      4  1.00         5.69
338.    :         161  166                      4  1.00         5.69
339.    :         181  186                      4  1.00         5.69
340.    :         201  206                      4  1.00         5.69
341.    :         221  226                      4  1.00         5.69
342.    :           6   21                      4  1.00         5.69
343.    :          26   41                      4  1.00         5.69
344.    :          46   61                      4  1.00         5.69
345.    :          66   81                      4  1.00         5.69
346.    :          86  101                      4  1.00         5.69
347.    :         106  121                      4  1.00         5.69
348.    :         126  141                      4  1.00         5.69
349.    :         146  161                      4  1.00         5.69
350.    :         166  181                      4  1.00         5.69
351.    :         186  201                      4  1.00         5.69
352.    :         206  221                      4  1.00         5.69
353.    :         226    1                      4  1.00         5.69
354.    :C      THESE ARE FRONT SURFACE CORDS
355.    :           6   26                      2  5.00         7.19
356.    :          26   46                      2  5.00         7.19
357.    :          46   66                      2  5.00         7.19
358.    :          66   86                      2  5.00         7.19
359.    :          86  106                      2  5.00         7.19
360.    :         106  126                      2  5.00         7.19
361.    :         126  146                      2  5.00         7.19
362.    :         146  166                      2  5.00         7.19
363.    :         166  186                      2  5.00         7.19
364.    :         186  206                      2  5.00         7.19
365.    :         206  226                      2  5.00         7.19
366.    :         226    6                      2  5.00         7.19
367.    :           2    7                      2  10.0         14.2
368.    :          22   27                      2  10.0         14.2
369.    :          42   47                      2  10.0         14.2
370.    :          62   67                      2  10.0         14.2
371.    :          82   87                      2  10.0         14.2
372.    :         102  107                      2  10.0         14.2
373.    :         122  127                      2  10.0         14.2
374.    :         142  147                      2  10.0         14.2
375.    :         162  167                      2  10.0         14.2
376.    :         182  187                      2  10.0         14.2
377.    :         202  207                      2  10.0         14.2
378.    :         222  227                      2  10.0         14.2
379.    :           7   22                      2  10.0         14.2
380.    :          27   42                      2  10.0         14.2
381.    :          47   62                      2  10.0         14.2
382.    :          67   82                      2  10.0         14.2
383.    :          87  102                      2  10.0         14.2
384.    :         107  122                      2  10.0         14.2
385.    :         127  142                      2  10.0         14.2
```

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          0*********1*********2*********3*********4*********5*********6*********7*********8
 386.   :        147  162                 2  10.0       14.2
 387.   :        167  182                 2  10.0       14.2
 388.   :        187  202                 2  10.0       14.2
 389.   :        207  222                 2  10.0       14.2
 390.   :        227    2                 2  10.0       14.2
 391.   :          3    8                 2  10.0       13.8
 392.   :         23   28                 2  10.0       13.8
 393.   :         43   48                 2  10.0       13.8
 394.   :         63   68                 2  10.0       13.8
 395.   :         83   88                 2  10.0       13.8
 396.   :        103  108                 2  10.0       13.8
 397.   :        123  128                 2  10.0       13.8
 398.   :        143  148                 2  10.0       13.8
 399.   :        163  168                 2  10.0       13.8
 400.   :        183  188                 2  10.0       13.8
 401.   :        203  208                 2  10.0       13.8
 402.   :        223  228                 2  10.0       13.8
 403.   :          8   23                 2  10.0       13.8
 404.   :         28   43                 2  10.0       13.8
 405.   :         48   63                 2  10.0       13.8
 406.   :         68   83                 2  10.0       13.8
 407.   :         88  103                 2  10.0       13.8
 408.   :        108  123                 2  10.0       13.8
 409.   :        128  143                 2  10.0       13.8
 410.   :        148  163                 2  10.0       13.8
 411.   :        168  183                 2  10.0       13.8
 412.   :        188  203                 2  10.0       13.8
 413.   :        208  223                 2  10.0       13.8
 414.   :        228    3                 2  10.0       13.8
 415.   :          9   29                 2  15.0       18.9
 416.   :         29   49                 2  15.0       18.9
 417.   :         49   69                 2  15.0       18.9
 418.   :         69   89                 2  15.0       18.9
 419.   :         89  109                 2  15.0       18.9
 420.   :        109  129                 2  15.0       18.9
 421.   :        129  149                 2  15.0       18.9
 422.   :        149  169                 2  15.0       18.9
 423.   :        169  189                 2  15.0       18.9
 424.   :        189  209                 2  15.0       18.9
 425.   :        209  229                 2  15.0       18.9
 426.   :        229    9                 2  15.0       18.9
 427.   :C      THESE  ARE  BACK SURFACE  CORDS
 428.   :         11   31                 3   5.00       3.50
 429.   :         31   51                 3   5.00       3.50
 430.   :         51   71                 3   5.00       3.50
 431.   :         71   91                 3   5.00       3.50
 432.   :         91  111                 3   5.00       3.50
 433.   :        111  131                 3   5.00       3.50
 434.   :        131  151                 3   5.00       3.50
 435.   :        151  171                 3   5.00       3.50
 436.   :        171  191                 3   5.00       3.50
 437.   :        191  211                 3   5.00       3.50
 438.   :        211  231                 3   5.00       3.50
 439.   :        231   11                 3   5.00       3.50
 440.   :          4   12                 3  10.0        5.72
```

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0*********1*********2*********3*********4*********5*********6*********7*********8
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441.	:	24	32	3	10.0	5.72
442.	:	44	52	3	10.0	5.72
443.	:	64	72	3	10.0	5.72
444.	:	84	92	3	10.0	5.72
445.	:	104	112	3	10.0	5.72
446.	:	124	132	3	10.0	5.72
447.	:	144	152	3	10.0	5.72
448.	:	164	172	3	10.0	5.72
449.	:	184	192	3	10.0	5.72
450.	:	204	212	3	10.0	5.72
451.	:	224	232	3	10.0	5.72
452.	:	12	24	3	10.0	5.72
453.	:	32	44	3	10.0	5.72
454.	:	52	64	3	10.0	5.72
455.	:	72	84	3	10.0	5.72
456.	:	92	104	3	10.0	5.72
457.	:	112	124	3	10.0	5.72
458.	:	132	144	3	10.0	5.72
459.	:	152	164	3	10.0	5.72
460.	:	172	184	3	10.0	5.72
461.	:	192	204	3	10.0	5.72
462.	:	212	224	3	10.0	5.72
463.	:	232	4	3	10.0	5.72
464.	:	5	13	3	10.0	3.89
465.	:	25	33	3	10.0	3.89
466.	:	45	53	3	10.0	3.89
467.	:	65	73	3	10.0	3.89
468.	:	85	93	3	10.0	3.89
469.	:	105	113	3	10.0	3.89
470.	:	125	133	3	10.0	3.89
471.	:	145	153	3	10.0	3.89
472.	:	165	173	3	10.0	3.89
473.	:	185	193	3	10.0	3.89
474.	:	205	213	3	10.0	3.89
475.	:	225	233	3	10.0	3.89
476.	:	13	25	3	10.0	3.89
477.	:	33	45	3	10.0	3.89
478.	:	53	65	3	10.0	3.89
479.	:	73	85	3	10.0	3.89
480.	:	93	105	3	10.0	3.89
481.	:	113	125	3	10.0	3.89
482.	:	133	145	3	10.0	3.89
483.	:	153	165	3	10.0	3.89
484.	:	173	185	3	10.0	3.89
485.	:	193	205	3	10.0	3.89
486.	:	213	225	3	10.0	3.89
487.	:	233	5	3	10.0	3.89
488.	:	14	34	3	15.0	4.50
489.	:	34	54	3	15.0	4.50
490.	:	54	74	3	15.0	4.50
491.	:	74	94	3	15.0	4.50
492.	:	94	114	3	15.0	4.50
493.	:	114	134	3	15.0	4.50
494.	:	134	154	3	15.0	4.50
495.	:	154	174	3	15.0	4.50

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0*********1*********2*********3*********4*********5*********6*********7*********8
:       174  194              3  15.0     4.50
:       194  214              3  15.0     4.50
:       214  234              3  15.0     4.50
:       234   14              3  15.0     4.50
:C    THESE ARE THE OUTBOARD DIAGONALS
:         1   10             20  1.00     1.24
:        21   30             20  1.00     1.24
:        41   50             20  1.00     1.24
:        61   70             20  1.00     1.24
:        81   90             20  1.00     1.24
:       101  110             20  1.00     1.24
:       121  130             20  1.00     1.24
:       141  150             20  1.00     1.24
:       161  170             20  1.00     1.24
:       181  190             20  1.00     1.24
:       201  210             20  1.00     1.24
:       221  230             20  1.00     1.24
:        10   21             20  1.00     1.24
:        30   41             20  1.00     1.24
:        50   61             20  1.00     1.24
:        70   81             20  1.00     1.24
:        90  101             20  1.00     1.24
:       110  121             20  1.00     1.24
:       130  141             20  1.00     1.24
:       150  161             20  1.00     1.24
:       170  181             20  1.00     1.24
:       190  201             20  1.00     1.24
:       210  221             20  1.00     1.24
:       230    1             20  1.00     1.24
:C    THESE ARE THE VERTICAL TIES
:         2    4              5  10.0     0.685
:        22   24              5  10.0     0.685
:        42   44              5  10.0     0.685
:        62   64              5  10.0     0.685
:        82   84              5  10.0     0.685
:       102  104              5  10.0     0.685
:       122  124              5  10.0     0.685
:       142  144              5  10.0     0.685
:       162  164              5  10.0     0.685
:       182  184              5  10.0     0.685
:       202  204              5  10.0     0.685
:       222  224              5  10.0     0.685
:         3    5              5  10.0     0.465
:        23   25              5  10.0     0.465
:        43   45              5  10.0     0.465
:        63   65              5  10.0     0.465
:        83   85              5  10.0     0.465
:       103  105              5  10.0     0.465
:       123  125              5  10.0     0.465
:       143  145              5  10.0     0.465
:       163  165              5  10.0     0.465
:       183  185              5  10.0     0.465
:       203  205              5  10.0     0.465
:       223  225              5  10.0     0.465
:         6   10              6  5.00     51.1
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         0*********1*********2*********3*********4*********5*********6*********7*********8
551.     :        26   30              6  5.00      51.1
552.     :        46   50              6  5.00      51.1
553.     :        66   70              6  5.00      51.1
554.     :        86   90              6  5.00      51.1
555.     :       106  110              6  5.00      51.1
556.     :       126  130              6  5.00      51.1
557.     :       146  150              6  5.00      51.1
558.     :       166  170              6  5.00      51.1
559.     :       186  190              6  5.00      51.1
560.     :       206  210              6  5.00      51.1
561.     :       226  230              6  5.00      51.1
562.     :         7   12              6  10.0      1.73
563.     :        27   32              6  10.0      1.73
564.     :        47   52              6  10.0      1.73
565.     :        67   72              6  10.0      1.73
566.     :        87   92              6  10.0      1.73
567.     :       107  112              6  10.0      1.73
568.     :       127  132              6  10.0      1.73
569.     :       147  152              6  10.0      1.73
570.     :       167  172              6  10.0      1.73
571.     :       187  192              6  10.0      1.73
572.     :       207  212              6  10.0      1.73
573.     :       227  232              6  10.0      1.73
574.     :         8   13              6  10.0      1.19
575.     :        28   33              6  10.0      1.19
576.     :        48   53              6  10.0      1.19
577.     :        68   73              6  10.0      1.19
578.     :        88   93              6  10.0      1.19
579.     :       108  113              6  10.0      1.19
580.     :       128  133              6  10.0      1.19
581.     :       148  153              6  10.0      1.19
582.     :       168  173              6  10.0      1.19
583.     :       188  193              6  10.0      1.19
584.     :       208  213              6  10.0      1.19
585.     :       228  233              6  10.0      1.19
586.     :         9   14              6  15.0     0.948
587.     :        29   34              6  15.0     0.948
588.     :        49   54              6  15.0     0.948
589.     :        69   74              6  15.0     0.948
590.     :        89   94              6  15.0     0.948
591.     :       109  114              6  15.0     0.948
592.     :       129  134              6  15.0     0.948
593.     :       149  154              6  15.0     0.948
594.     :       169  174              6  15.0     0.948
595.     :       189  194              6  15.0     0.948
596.     :       209  214              6  15.0     0.948
597.     :       229  234              6  15.0     0.948
598.     :       241  242              6  12.0     0.505
599.     :C      THESE ARE THE TIP STANDOFFS (COMPRESSION MEMBERS)
600.     :         6   11             18 2.770E-03 -54.1
601.     :        26   31             18 2.770E-03 -54.1
602.     :        46   51             18 2.770E-03 -54.1
603.     :        66   71             18 2.770E-03 -54.1
604.     :        86   91             18 2.770E-03 -54.1
605.     :       106  111             18 2.770E-03 -54.1
```


C-2

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0*********1*********2*********3*********4*********5*********6*********7*********8
:         126  131             18 2.770E-03 -54.1
:         146  151             18 2.770E-03 -54.1
:         166  171             18 2.770E-03 -54.1
:         186  191             18 2.770E-03 -54.1
:         206  211             18 2.770E-03 -54.1
:         226  231             18 2.770E-03 -54.1
:C     THESE ARE THE FRONT BOUNDARY CORDS
:           6    7              7 1.970E-02  24.0
:          26   27              7 1.970E-02  24.0
:          46   47              7 1.970E-02  24.0
:          66   67              7 1.970E-02  24.0
:          86   87              7 1.970E-02  24.0
:         106  107              7 1.970E-02  24.0
:         126  127              7 1.970E-02  24.0
:         146  147              7 1.970E-02  24.0
:         166  167              7 1.970E-02  24.0
:         186  187              7 1.970E-02  24.0
:         206  207              7 1.970E-02  24.0
:         226  227              7 1.970E-02  24.0
:           7    8              7 1.970E-02  17.1
:          27   28              7 1.970E-02  17.1
:          47   48              7 1.970E-02  17.1
:          67   68              7 1.970E-02  17.1
:          87   88              7 1.970E-02  17.1
:         107  108              7 1.970E-02  17.1
:         127  128              7 1.970E-02  17.1
:         147  148              7 1.970E-02  17.1
:         167  168              7 1.970E-02  17.1
:         187  188              7 1.970E-02  17.1
:         207  208              7 1.970E-02  17.1
:         227  228              7 1.970E-02  17.1
:           8    9              7 1.970E-02  10.4
:          28   29              7 1.970E-02  10.4
:          48   49              7 1.970E-02  10.4
:          68   69              7 1.970E-02  10.4
:          88   89              7 1.970E-02  10.4
:         108  109              7 1.970E-02  10.4
:         128  129              7 1.970E-02  10.4
:         148  149              7 1.970E-02  10.4
:         168  169              7 1.970E-02  10.4
:         188  189              7 1.970E-02  10.4
:         208  209              7 1.970E-02  10.4
:         228  229              7 1.970E-02  10.4
:           9  241              7 1.000E-08 1.000
:          29  241              7 1.000E-08 1.000
:          49  241              7 1.000E-08 1.000
:          69  241              7 1.000E-08 1.000
:          89  241              7 1.000E-08 1.000
:         109  241              7 1.000E-08 1.000
:         129  241              7 1.000E-08 1.000
:         149  241              7 1.000E-08 1.000
:         169  241              7 1.000E-08 1.000
:         189  241              7 1.000E-08 1.000
:         209  241              7 1.000E-08 1.000
:         229  241              7 1.000E-08 1.000
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0*********1*********2*********3*********4*********5*********6*********7*********8
:C      THESE ARE THE RIBS (COMPRESSION MEMBERS)
:           10   11                  9 0.295      -64.9
:           30   31                  9 0.295      -64.9
:           50   51                  9 0.295      -64.9
:           70   71                  9 0.295      -64.9
:           90   91                  9 0.295      -64.9
:          110  111                  9 0.295      -64.9
:          130  131                  9 0.295      -64.9
:          150  151                  9 0.295      -64.9
:          170  171                  9 0.295      -64.9
:          190  191                  9 0.295      -64.9
:          210  211                  9 0.295      -64.9
:          230  231                  9 0.295      -64.9
:           11   12                  9 0.295      -91.6
:           31   32                  9 0.295      -91.6
:           51   52                  9 0.295      -91.6
:           71   72                  9 0.295      -91.6
:           91   92                  9 0.295      -91.6
:          111  112                  9 0.295      -91.6
:          131  132                  9 0.295      -91.6
:          151  152                  9 0.295      -91.6
:          171  172                  9 0.295      -91.6
:          191  192                  9 0.295      -91.6
:          211  212                  9 0.295      -91.6
:          231  232                  9 0.295      -91.6
:           12   13                  9 0.295      -94.3
:           32   33                  9 0.295      -94.3
:           52   53                  9 0.295      -94.3
:           72   73                  9 0.295      -94.3
:           92   93                  9 0.295      -94.3
:          112  113                  9 0.295      -94.3
:          132  133                  9 0.295      -94.3
:          152  153                  9 0.295      -94.3
:          172  173                  9 0.295      -94.3
:          192  193                  9 0.295      -94.3
:          212  213                  9 0.295      -94.3
:          232  233                  9 0.295      -94.3
:           13   14                  9 0.295      -101.
:           33   34                  9 0.295      -101.
:           53   54                  9 0.295      -101.
:           73   74                  9 0.295      -101.
:           93   94                  9 0.295      -101.
:          113  114                  9 0.295      -101.
:          133  134                  9 0.295      -101.
:          153  154                  9 0.295      -101.
:          173  174                  9 0.295      -101.
:          193  194                  9 0.295      -101.
:          213  214                  9 0.295      -101.
:          233  234                  9 0.295      -101.
:           14  242                  9 0.295      -103.
:           34  242                  9 0.295      -103.
:           54  242                  9 0.295      -103.
:           74  242                  9 0.295      -103.
:           94  242                  9 0.295      -103.
:          114  242                  9 0.295      -103.
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0*********1*********2*********3*********4*********5*********6*********7*********8
:        134  242                  9 0.295      -103.
:        154  242                  9 0.295      -103.
:        174  242                  9 0.295      -103.
:        194  242                  9 0.295      -103.
:        214  242                  9 0.295      -103.
:        234  242                  9 0.295      -103.
:C      THESE ARE THE STRUTS (COMPRESSION MEMBERS)
:         13   15                 16 0.146      -34.1
:         33   35                 16 0.146      -34.1
:         53   55                 16 0.146      -34.1
:         73   75                 16 0.146      -34.1
:         93   95                 16 0.146      -34.1
:        113  115                 16 0.146      -34.1
:        133  135                 16 0.146      -34.1
:        153  155                 16 0.146      -34.1
:        173  175                 16 0.146      -34.1
:        193  195                 16 0.146      -34.1
:        213  215                 16 0.146      -34.1
:        233  235                 16 0.146      -34.1
:C      THESE ARE THE SUPPORT RODS
:         10   15                 11 1.636E-02  28.9
:         30   35                 11 1.636E-02  28.9
:         50   55                 11 1.636E-02  28.9
:         70   75                 11 1.636E-02  28.9
:         90   95                 11 1.636E-02  28.9
:        110  115                 11 1.636E-02  28.9
:        130  135                 11 1.636E-02  28.9
:        150  155                 11 1.636E-02  28.9
:        170  175                 11 1.636E-02  28.9
:        190  195                 11 1.636E-02  28.9
:        210  215                 11 1.636E-02  28.9
:        230  235                 11 1.636E-02  28.9
:         15  243                 11 1.636E-02  19.8
:         35  243                 11 1.636E-02  19.8
:         55  243                 11 1.636E-02  19.8
:         75  243                 11 1.636E-02  19.8
:         95  243                 11 1.636E-02  19.8
:        115  243                 11 1.636E-02  19.8
:        135  243                 11 1.636E-02  19.8
:        155  243                 11 1.636E-02  19.8
:        175  243                 11 1.636E-02  19.8
:        195  243                 11 1.636E-02  19.8
:        215  243                 11 1.636E-02  19.8
:        235  243                 11 1.636E-02  19.8
:         13  243                 11 1.636E-02  11.3
:         33  243                 11 1.636E-02  11.3
:         53  243                 11 1.636E-02  11.3
:         73  243                 11 1.636E-02  11.3
:         93  243                 11 1.636E-02  11.3
:        113  243                 11 1.636E-02  11.3
:        133  243                 11 1.636E-02  11.3
:        153  243                 11 1.636E-02  11.3
:        173  243                 11 1.636E-02  11.3
:        193  243                 11 1.636E-02  11.3
:        213  243                 11 1.636E-02  11.3
```

```
0*********1*********2*********3*********4*********5*********6*********7*********8
:       233  243             11 1.636E-02  11.3
:        10   30             11 1.00        22.5
:        30   50             11 1.00        22.5
:        50   70             11 1.00        22.5
:        70   90             11 1.00        22.5
:        90  110             11 1.00        22.5
:       110  130             11 1.00        22.5
:       130  150             11 1.00        22.5
:       150  170             11 1.00        22.5
:       170  190             11 1.00        22.5
:       190  210             11 1.00        22.5
:       210  230             11 1.00        22.5
:       230   10             11 1.00        22.5
:C      THESE ARE THE CROSSTIE CORDS
:        10   33             13  1.00      10.00
:        33   50             13  1.00      10.00
:        50   73             13  1.00      10.00
:        73   90             13  1.00      10.00
:        90  113             13  1.00      10.00
:       113  130             13  1.00      10.00
:       130  153             13  1.00      10.00
:       153  170             13  1.00      10.00
:       170  193             13  1.00      10.00
:       193  210             13  1.00      10.00
:       210  233             13  1.00      10.00
:       233   10             13  1.00      10.00
:        13   35             13  1.00       15.0
:        33   55             13  1.00       15.0
:        53   75             13  1.00       15.0
:        73   95             13  1.00       15.0
:        93  115             13  1.00       15.0
:       113  135             13  1.00       15.0
:       133  155             13  1.00       15.0
:       153  175             13  1.00       15.0
:       173  195             13  1.00       15.0
:       193  215             13  1.00       15.0
:       213  235             13  1.00       15.0
:       233   15             13  1.00       15.0
:        33   15             13  1.00       15.0
:        53   35             13  1.00       15.0
:        73   55             13  1.00       15.0
:        93   75             13  1.00       15.0
:       113   95             13  1.00       15.0
:       133  115             13  1.00       15.0
:       153  135             13  1.00       15.0
:       173  155             13  1.00       15.0
:       193  175             13  1.00       15.0
:       213  195             13  1.00       15.0
:       233  215             13  1.00       15.0
:        13  235             13  1.00       15.0
:C      THIS IS THE HUB (COMPRESSION MEMBER)
:       242  243             14  3.56      -97.4
:C      THESE ARE THE CROSSTIE CORDS
:        30   53             13  1.00      10.00
:        53   70             13  1.00      10.00
```

ORIGINAL PAGE IS
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0*********1*********2*********3*********4*********5*********6*********7*********8
:          70   93              13  1.00      10.00
:          93  110              13  1.00      10.00
:         110  133              13  1.00      10.00
:         133  150              13  1.00      10.00
:         150  173              13  1.00      10.00
:         173  190              13  1.00      10.00
:         190  213              13  1.00      10.00
:         213  230              13  1.00      10.00
:         230   13              13  1.00      10.00
:          13   30              13  1.00      10.00
:END
:MEMB
:C                            MEMBRANE ELEMENTS - USED TO MODEL THE MESH SURFACE.
:C                            THESE ARE PRETENSIONED, ORTHOTROPIC MEMBRANE ELEMENTS.
:C        JA   JB   JC                  MATL     NXX        NYY        NXY
:          1    6    7                     1 1.012E-02 1.985E-02-1.157E-03
:         21   26   27                     1 1.012E-02 1.985E-02-1.157E-03
:         41   46   47                     1 1.012E-02 1.985E-02-1.157E-03
:         61   66   67                     1 1.012E-02 1.985E-02-1.157E-03
:         81   86   87                     1 1.012E-02 1.985E-02-1.157E-03
:        101  106  107                     1 1.012E-02 1.985E-02-1.157E-03
:        121  126  127                     1 1.012E-02 1.985E-02-1.157E-03
:        141  146  147                     1 1.012E-02 1.985E-02-1.157E-03
:        161  166  167                     1 1.012E-02 1.985E-02-1.157E-03
:        181  186  187                     1 1.012E-02 1.985E-02-1.157E-03
:        201  206  207                     1 1.012E-02 1.985E-02-1.157E-03
:        221  226  227                     1 1.012E-02 1.985E-02-1.157E-03
:          7    2    1                     1 9.942E-03 1.994E-02 2.662E-06
:         27   22   21                     1 9.942E-03 1.994E-02 2.652E-06
:         47   42   41                     1 9.942E-03 1.994E-02 2.659E-06
:         67   62   61                     1 9.942E-03 1.994E-02 2.653E-06
:         87   82   81                     1 9.942E-03 1.994E-02 2.652E-06
:        107  102  101                     1 9.942E-03 1.994E-02 2.660E-06
:        127  122  121                     1 9.942E-03 1.994E-02 2.654E-06
:        147  142  141                     1 9.942E-03 1.994E-02 2.653E-06
:        167  162  161                     1 9.942E-03 1.994E-02 2.662E-06
:        187  182  181                     1 9.942E-03 1.994E-02 2.655E-06
:        207  202  201                     1 9.942E-03 1.994E-02 2.654E-06
:        227  222  221                     1 9.942E-03 1.994E-02 2.661E-06
:          2  227    1                     1 9.942E-03 1.994E-02-2.662E-06
:         22    7   21                     1 9.942E-03 1.994E-02-2.661E-06
:         42   27   41                     1 9.942E-03 1.994E-02-2.654E-06
:         62   47   61                     1 9.942E-03 1.994E-02-2.655E-06
:         82   67   81                     1 9.942E-03 1.994E-02-2.662E-06
:        102   87  101                     1 9.942E-03 1.994E-02-2.653E-06
:        122  107  121                     1 9.942E-03 1.994E-02-2.654E-06
:        142  127  141                     1 9.942E-03 1.994E-02-2.660E-06
:        162  147  161                     1 9.942E-03 1.994E-02-2.652E-06
:        182  167  161                     1 9.942E-03 1.994E-02-2.653E-06
:        202  187  291                     1 9.942E-03 1.994E-02-2.659E-06
:        222  207  221                     1 9.942E-03 1.994E-02-2.652E-06
:        226    1  227                     1 1.012E-02 1.985E-02 1.157E-03
:          6   21    7                     1 1.012E-02 1.985E-02 1.157E-03
:         26   41   27                     1 1.012E-02 1.985E-02 1.157E-03
:         46   61   47                     1 1.012E-02 1.985E-02 1.157E-03
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ORIGINAL PAGE IS
OF POOR QUALITY

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         0*********1*********2*********3*********4*********5*********6*********7*********8
881.   :        66   81   67                 1 1.012E-02 1.985E-02 1.157E-03
882.   :        86  101   87                 1 1.012E-02 1.985E-02 1.157E-03
883.   :       106  121  107                 1 1.012E-02 1.985E-02 1.157E-03
884.   :       126  141  127                 1 1.012E-02 1.985E-02 1.157E-03
885.   :       146  161  147                 1 1.012E-02 1.985E-02 1.157E-03
886.   :       166  181  167                 1 1.012E-02 1.985E-02 1.157E-03
887.   :       186  201  187                 1 1.012E-02 1.985E-02 1.157E-03
888.   :       206  221  207                 1 1.012E-02 1.985E-02 1.157E-03
889.   :         2    7    8                 1 9.992E-03 1.999E-02-1.320E-06
890.   :        22   27   28                 1 9.992E-03 1.999E-02-1.333E-06
891.   :        42   47   48                 1 9.992E-03 1.999E-02-1.326E-06
892.   :        62   67   68                 1 9.992E-03 1.999E-02-1.333E-06
893.   :        82   87   88                 1 9.992E-03 1.999E-02-1.334E-06
894.   :       102  107  108                 1 9.992E-03 1.999E-02-1.325E-06
895.   :       122  127  128                 1 9.992E-03 1.999E-02-1.332E-06
896.   :       142  147  148                 1 9.992E-03 1.999E-02-1.334E-06
897.   :       162  167  168                 1 9.992E-03 1.999E-02-1.325E-06
898.   :       182  187  188                 1 9.992E-03 1.999E-02-1.332E-06
899.   :       202  207  208                 1 9.992E-03 1.999E-02-1.334E-06
900.   :       222  227  228                 1 9.992E-03 1.999E-02-1.327E-06
901.   :         8    3    2                 1 9.986E-03 1.999E-02 1.747E-06
902.   :        28   23   22                 1 9.986E-03 1.999E-02 1.736E-06
903.   :        48   43   42                 1 9.986E-03 1.999E-02 1.747E-06
904.   :        68   63   62                 1 9.986E-03 1.999E-02 1.745E-06
905.   :        88   83   82                 1 9.986E-03 1.999E-02 1.734E-06
906.   :       108  103  102                 1 9.986E-03 1.999E-02 1.747E-06
907.   :       128  123  122                 1 9.986E-03 1.999E-02 1.746E-06
908.   :       148  143  142                 1 9.986E-03 1.999E-02 1.735E-06
909.   :       168  163  162                 1 9.986E-03 1.999E-02 1.748E-06
910.   :       188  183  182                 1 9.986E-03 1.999E-02 1.746E-06
911.   :       208  203  202                 1 9.986E-03 1.999E-02 1.735E-06
912.   :       228  223  222                 1 9.986E-03 1.999E-02 1.745E-06
913.   :         3  228    2                 1 9.986E-03 1.999E-02-1.747E-06
914.   :        23    8   22                 1 9.986E-03 1.999E-02-1.745E-06
915.   :        43   28   42                 1 9.986E-03 1.999E-02-1.735E-06
916.   :        63   48   62                 1 9.986E-03 1.999E-02-1.746E-06
917.   :        83   68   82                 1 9.986E-03 1.999E-02-1.748E-06
918.   :       103   88  102                 1 9.986E-03 1.999E-02-1.735E-06
919.   :       123  108  122                 1 9.986E-03 1.999E-02-1.746E-06
920.   :       143  128  142                 1 9.986E-03 1.999E-02-1.747E-06
921.   :       163  148  162                 1 9.986E-03 1.999E-02-1.734E-06
922.   :       183  168  182                 1 9.986E-03 1.999E-02-1.745E-06
923.   :       203  188  202                 1 9.986E-03 1.999E-02-1.747E-06
924.   :       223  208  222                 1 9.986E-03 1.999E-02-1.736E-06
925.   :       227    2  228                 1 9.992E-03 1.999E-02 1.320E-06
926.   :         7   22    8                 1 9.992E-03 1.999E-02 1.327E-06
927.   :        27   42   28                 1 9.992E-03 1.999E-02 1.334E-06
928.   :        47   62   48                 1 9.992E-03 1.999E-02 1.332E-06
929.   :        67   82   68                 1 9.992E-03 1.999E-02 1.325E-06
930.   :        87  102   88                 1 9.992E-03 1.999E-02 1.334E-06
931.   :       107  122  108                 1 9.992E-03 1.999E-02 1.332E-06
932.   :       127  142  128                 1 9.992E-03 1.999E-02 1.325E-06
933.   :       147  162  148                 1 9.992E-03 1.999E-02 1.334E-06
934.   :       167  182  168                 1 9.992E-03 1.999E-02 1.333E-06
935.   :       187  202  188                 1 9.992E-03 1.999E-02 1.326E-06
```

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0*********1*********2*********3*********4*********5*********6*********7*********8
:        207  222  208                       1 9.992E-03 1.999E-02 1.335E-06
:          3    8    9                       1 9.988E-03 1.999E-02-1.741E-06
:         23   28   29                       1 9.988E-03 1.999E-02-1.752E-06
:         43   48   49                       1 9.988E-03 1.999E-02-1.741E-06
:         63   68   69                       1 9.988E-03 1.999E-02-1.743E-06
:         83   88   89                       1 9.988E-03 1.999E-02-1.754E-06
:        103  108  109                       1 9.988E-03 1.999E-02-1.741E-06
:        123  128  129                       1 9.988E-03 1.999E-02-1.743E-06
:        143  148  149                       1 9.988E-03 1.999E-02-1.754E-06
:        163  168  169                       1 9.988E-03 1.999E-02-1.741E-06
:        183  188  189                       1 9.988E-03 1.999E-02-1.743E-06
:        203  208  209                       1 9.988E-03 1.999E-02-1.754E-06
:        223  228  229                       1 9.988E-03 1.999E-02-1.743E-06
:          9  229    3                       1 9.975E-03 1.998E-02-4.805E-13
:         29    9   23                       1 9.975E-03 1.998E-02-9.145E-09
:         49   29   43                       1 9.975E-03 1.998E-02 1.195E-08
:         69   49   63                       1 9.975E-03 1.998E-02-6.581E-10
:         89   69   83                       1 9.975E-03 1.998E-02-1.293E-08
:        109   89  103                       1 9.975E-03 1.998E-02 1.223E-08
:        129  109  123                       1 9.975E-03 1.998E-02-4.391E-13
:        149  129  143                       1 9.975E-03 1.998E-02-1.223E-08
:        169  149  163                       1 9.975E-03 1.998E-02 1.293E-08
:        189  169  183                       1 9.975E-03 1.998E-02 6.571E-10
:        209  189  203                       1 9.975E-03 1.998E-02-1.195E-08
:        229  209  223                       1 9.975E-03 1.998E-02 9.144E-09
:        228    3  229                       1 9.988E-03 1.999E-02 1.741E-06
:          8   23    9                       1 9.988E-03 1.999E-02 1.743E-06
:         28   43   29                       1 9.988E-03 1.999E-02 1.754E-06
:         48   63   49                       1 9.988E-03 1.999E-02 1.743E-06
:         68   83   69                       1 9.988E-03 1.999E-02 1.741E-06
:         88  103   89                       1 9.988E-03 1.999E-02 1.754E-06
:        108  123  109                       1 9.988E-03 1.999E-02 1.743E-06
:        128  143  129                       1 9.988E-03 1.999E-02 1.741E-06
:        148  163  149                       1 9.988E-03 1.999E-02 1.754E-06
:        168  183  169                       1 9.988E-03 1.999E-02 1.743E-06
:        188  203  189                       1 9.988E-03 1.999E-02 1.741E-06
:        208  223  209                       1 9.988E-03 1.999E-02 1.752E-06
:        229    9  241                       1 9.949E-03 1.995E-02 6.175E-14
:          9   29  241                       1 9.949E-03 1.995E-02-9.770E-09
:         29   49  241                       1 9.949E-03 1.995E-02 1.337E-08
:         49   69  241                       1 9.949E-03 1.995E-02-8.116E-10
:         69   89  241                       1 9.949E-03 1.995E-02-1.444E-08
:         89  109  241                       1 9.949E-03 1.995E-02 1.327E-08
:        109  129  241                       1 9.949E-03 1.995E-02-1.687E-13
:        129  149  241                       1 9.949E-03 1.995E-02-1.327E-08
:        149  169  241                       1 9.949E-03 1.995E-02 1.443E-08
:        169  189  241                       1 9.949E-03 1.995E-02 8.114E-10
:        189  209  241                       1 9.949E-03 1.995E-02-1.337E-08
:        209  229  241                       1 9.949E-03 1.995E-02 9.771E-09
:END
:EDM
:C                             MEMBRANE MATERIAL AXES ROTATION ANGLES.
:C ELEMENT NOS.                     ANGLE
:     1   12    1    6    6.4503
:    37   48    1    6   -6.4503
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0*********1*********2*********3*********4*********5*********6*********7*********8
:END
:BEAM
:C                  BEAM ELEMENT TALBLE
:C                   THESE ARE USED TO MODEL RIB BENDING STIFFNESS OF THE
:C                  RIBS,STRUTS,AND HUB.
:   12   10   11    6   20   20   20   10    21
:   12   11   12    6   20   20   20   10    21
:   12   12   13    7   20   20   20   10    21
:   12   13   14    8   20   20   20   10    21
:   12   14  242    9   20    0   20   10    2100010
:   12   13   15   12   20   20   20   17    51010
:    1  242  243   14                  15    41
:   12    6   11   10   20   20   20   19    6101010
:   12    6    7   10   20   20   20    8    11
:   12    7    8   12   20   20   20    8    11
:   12    8    9   13   20   20   20    8    11
:   12    9  241   14   20    0   20    8    11
:END
:DATB
:         1      .0197  4.210E-6  2.104E-6  2.418E-4  .44  .44           STRIP
:         2      .1872  4.157E-1  2.078E-1  2.078E-1  .53  .53             RIB
:         3  1.636E-2  4.266E-5  2.132E-1  2.132E-1  .89  .89             RUD
:         4      3.557     132.7     66.35     66.35  .53  .53             HUB
:         5  1.460E-1  8.318E-2  4.160E-2  4.160E-2  .53  .53           STRUT
:         6  2.770E-3  3.504E-4  1.752E-4  1.752E-4  .20  .20           TIPSO
:END
:C     MSDA TOWER MODEL
:MATL
:   21TGRPH      18.+6       4.+6                           0.081
:   22ANTG       18.+6       4.+6
:END
:GLUB
:C     THESE ARE THE TOWER NODES
:  251  252    1    3   320.000   -81.094   -60.000   320.000    81.094   -60.000
:  253              3   370.837     0.0      19.590
:  260  272    3    3   370.837     0.0     169.590   370.837     0.0     689.590
:  261  273    3    3   302.646    39.37    169.590   302.646    39.37    689.590
:  262  274    3    3   302.646   -39.37    169.590   302.646   -39.37    689.590
:END
:DATB
:        10      0.251                                                LONG
:        11      0.049                                                DIAG
:        12      0.125                                                PLAT
:        13      0.500      2.000      1.000      1.000               ANT
:END
:BEAM
:          251  252                       21    10 110101010
:     2    251  253          1     0      21    10 110101010
:     2    230  253       -220     0      21    10 110101010
:          251  230                       21    10 110101010
:          252   10                       21    10 110101010
:          251  233                       21    10 110101010
:          252   13                       21    10 110101010
:          230  262                       21    10 110101010
:           10  261                       21    10 110101010
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ORIGINAL PAGE IS
OF POOR QUALITY

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0*********1*********2*********3*********4*********5*********6*********7*********8
:       253  260                         21    10 110101010
:     4 260  263          3    3         21    10 110101010
:     4 261  264          3    3         21    10 110101010
:     4 262  255          3    3         21    10 110101010
:     5 260  261          3    3         21    12 110101010
:     5 261  262          3    3         21    12 110101010
:     5 262  260          3    3         21    12 110101010
:        10  262                         21    11 110101010
:       230  261                         21    11 110101010
:       230  260                         21    11 110101010
:       253  262                         21    11 110101010
:       253  261                         21    11 110101010
:        10  260                         21    11 110101010
:     4 262  263          3    3         21    11 110101010
:     4 260  265          3    3         21    11 110101010
:     4 260  264          3    3         21    11 110101010
:     4 261  263          3    3         21    11 110101010
:     4 261  265          3    3         21    11 110101010
:     4 262  264          3    3         21    11 110101010
:END
:REST
:  272  274     1
:END
:WGHT
:C      THESE ARE THE NODAL WEIGHTS (FITTINGS AND OTHER HARDWARE)
:C   NODE     APPLIED WEIGHTS IGNORE ENTRY THIS SIDE OF DOLLAR SIGN
:      1            9.143E-02-3.326E-13  0.00       0.00       0.00       0.00
:      2            0.152    -5.530E-13  0.00       0.00       0.00       0.00
:      3            0.118    -4.293E-13  0.00       0.00       0.00       0.00
:      4            1.859E-02-6.763E-14  0.00       0.00       0.00       0.00
:      5            1.279E-02-4.653E-14  0.00       0.00       0.00       0.00
:      6            0.193    -7.021E-13  0.00       0.00       0.00       0.00
:      7            0.354    -1.288E-12  0.00       0.00       0.00       0.00
:      8            0.311    -1.131E-12  0.00       0.00       0.00       0.00
:      9            0.321    -1.168E-12  0.00       0.00       0.00       0.00
:     10             4.70    -1.708E-11  0.00       0.00       0.00       0.00
:     11             1.49    -5.421E-12  0.00       0.00       0.00       0.00
:     12             2.75    -1.000E-11  0.00       0.00       0.00       0.00
:     13             5.91    -2.148E-11  0.00       0.00       0.00       0.00
:     14             3.11    -1.131E-11  0.00       0.00       0.00       0.00
:     15             1.23    -4.475E-12  0.00       0.00       0.00       0.00
:     16             0.00      0.00      0.00       0.00       0.00       0.00
:     17             0.00      0.00      0.00       0.00       0.00       0.00
:     18             0.00      0.00      0.00       0.00       0.00       0.00
:     19             0.00      0.00      0.00       0.00       0.00       0.00
:     20             0.00      0.00      0.00       0.00       0.00       0.00
:     21            9.143E-02-3.326E-13  0.00       0.00       0.00       0.00
:     22            0.152    -5.530E-13  0.00       0.00       0.00       0.00
:     23            0.118    -4.293E-13  0.00       0.00       0.00       0.00
:     24            1.859E-02-6.763E-14  0.00       0.00       0.00       0.00
:     25            1.279E-02-4.653E-14  0.00       0.00       0.00       0.00
:     26            0.193    -7.021E-13  0.00       0.00       0.00       0.00
:     27            0.354    -1.288E-12  0.00       0.00       0.00       0.00
:     28            0.311    -1.131E-12  0.00       0.00       0.00       0.00
:     29            0.321    -1.168E-12  0.00       0.00       0.00       0.00
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1101.	:	30	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1102.	:	31	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1103.	:	32	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1104.	:	33	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1105.	:	34	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1106.	:	35	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1107.	:	36	0.00	0.00	0.00	0.00	0.00	0.00
1108.	:	37	0.00	0.00	0.00	0.00	0.00	0.00
1109.	:	38	0.00	0.00	0.00	0.00	0.00	0.00
1110.	:	39	0.00	0.00	0.00	0.00	0.00	0.00
1111.	:	40	0.00	0.00	0.00	0.00	0.00	0.00
1112.	:	41	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1113.	:	42	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1114.	:	43	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1115.	:	44	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1116.	:	45	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1117.	:	46	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1118.	:	47	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1119.	:	48	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1120.	:	49	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1121.	:	50	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1122.	:	51	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1123.	:	52	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1124.	:	53	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1125.	:	54	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1126.	:	55	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1127.	:	56	0.00	0.00	0.00	0.00	0.00	0.00
1128.	:	57	0.00	0.00	0.00	0.00	0.00	0.00
1129.	:	58	0.00	0.00	0.00	0.00	0.00	0.00
1130.	:	59	0.00	0.00	0.00	0.00	0.00	0.00
1131.	:	60	0.00	0.00	0.00	0.00	0.00	0.00
1132.	:	61	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1133.	:	62	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1134.	:	63	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1135.	:	64	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1136.	:	65	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1137.	:	66	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1138.	:	67	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1139.	:	68	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1140.	:	69	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1141.	:	70	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1142.	:	71	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1143.	:	72	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1144.	:	73	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1145.	:	74	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1146.	:	75	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1147.	:	76	0.00	0.00	0.00	0.00	0.00	0.00
1148.	:	77	0.00	0.00	0.00	0.00	0.00	0.00
1149.	:	78	0.00	0.00	0.00	0.00	0.00	0.00
1150.	:	79	0.00	0.00	0.00	0.00	0.00	0.00
1151.	:	80	0.00	0.00	0.00	0.00	0.00	0.00
1152.	:	81	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1153.	:	82	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1154.	:	83	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1155.	:	84	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00

ORIGINAL PAGE IS
OF POOR QUALITY

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1156.	:	85	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1157.	:	86	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1158.	:	87	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1159.	:	88	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1160.	:	89	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1161.	:	90	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1162.	:	91	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1163.	:	92	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1164.	:	93	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1165.	:	94	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1166.	:	95	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1167.	:	96	0.00	0.00	0.00	0.00	0.00	0.00
1168.	:	97	0.00	0.00	0.00	0.00	0.00	0.00
1169.	:	98	0.00	0.00	0.00	0.00	0.00	0.00
1170.	:	99	0.00	0.00	0.00	0.00	0.00	0.00
1171.	:	100	0.00	0.00	0.00	0.00	0.00	0.00
1172.	:	101	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1173.	:	102	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1174.	:	103	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1175.	:	104	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1176.	:	105	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1177.	:	106	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1178.	:	107	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1179.	:	108	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1180.	:	109	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1181.	:	110	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1182.	:	111	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1183.	:	112	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1184.	:	113	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1185.	:	114	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1186.	:	115	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1187.	:	116	0.00	0.00	0.00	0.00	0.00	0.00
1188.	:	117	0.00	0.00	0.00	0.00	0.00	0.00
1189.	:	118	0.00	0.00	0.00	0.00	0.00	0.00
1190.	:	119	0.00	0.00	0.00	0.00	0.00	0.00
1191.	:	120	0.00	0.00	0.00	0.00	0.00	0.00
1192.	:	121	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1193.	:	122	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1194.	:	123	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1195.	:	124	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1196.	:	125	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1197.	:	126	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1198.	:	127	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1199.	:	128	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1200.	:	129	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1201.	:	130	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1202.	:	131	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1203.	:	132	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1204.	:	133	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1205.	:	134	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1206.	:	135	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1207.	:	136	0.00	0.00	0.00	0.00	0.00	0.00
1208.	:	137	0.00	0.00	0.00	0.00	0.00	0.00
1209.	:	138	0.00	0.00	0.00	0.00	0.00	0.00
1210.	:	139	0.00	0.00	0.00	0.00	0.00	0.00

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1211.	:	140	0.00	0.00	0.00	0.00	0.00	0.00
1212.	:	141	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1213.	:	142	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1214.	:	143	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1215.	:	144	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1216.	:	145	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1217.	:	146	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1218.	:	147	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1219.	:	148	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1220.	:	149	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1221.	:	150	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1222.	:	151	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1223.	:	152	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1224.	:	153	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1225.	:	154	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1226.	:	155	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1227.	:	156	0.00	0.00	0.00	0.00	0.00	0.00
1228.	:	157	0.00	0.00	0.00	0.00	0.00	0.00
1229.	:	158	0.00	0.00	0.00	0.00	0.00	0.00
1230.	:	159	0.00	0.00	0.00	0.00	0.00	0.00
1231.	:	160	0.00	0.00	0.00	0.00	0.00	0.00
1232.	:	161	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1233.	:	162	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1234.	:	163	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1235.	:	164	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1236.	:	165	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1237.	:	166	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1238.	:	167	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1239.	:	168	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1240.	:	169	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1241.	:	170	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1242.	:	171	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1243.	:	172	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1244.	:	173	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1245.	:	174	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1246.	:	175	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1247.	:	176	0.00	0.00	0.00	0.00	0.00	0.00
1248.	:	177	0.00	0.00	0.00	0.00	0.00	0.00
1249.	:	178	0.00	0.00	0.00	0.00	0.00	0.00
1250.	:	179	0.00	0.00	0.00	0.00	0.00	0.00
1251.	:	180	0.00	0.00	0.00	0.00	0.00	0.00
1252.	:	181	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1253.	:	182	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1254.	:	183	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1255.	:	184	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1256.	:	185	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1257.	:	186	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1258.	:	187	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1259.	:	188	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1260.	:	189	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1261.	:	190	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1262.	:	191	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1263.	:	192	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1264.	:	193	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1265.	:	194	3.11	-1.131E-11	0.00	0.00	0.00	0.00

ORIGINAL PAGE IS
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1266.	:	195	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1267.	:	196	0.00	0.00	0.00	0.00	0.00	0.00
1268.	:	197	0.00	0.00	0.00	0.00	0.00	0.00
1269.	:	198	0.00	0.00	0.00	0.00	0.00	0.00
1270.	:	199	0.00	0.00	0.00	0.00	0.00	0.00
1271.	:	200	0.00	0.00	0.00	0.00	0.00	0.00
1272.	:	201	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1273.	:	202	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1274.	:	203	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1275.	:	204	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1276.	:	205	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1277.	:	206	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1278.	:	207	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1279.	:	208	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1280.	:	209	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1281.	:	210	0.461	-1.677E-12	0.00	0.00	0.00	0.00
1282.	:	211	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1283.	:	212	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1284.	:	213	4.15	-1.510E-11	0.00	0.00	0.00	0.00
1285.	:	214	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1286.	:	215	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1287.	:	216	0.00	0.00	0.00	0.00	0.00	0.00
1288.	:	217	0.00	0.00	0.00	0.00	0.00	0.00
1289.	:	218	0.00	0.00	0.00	0.00	0.00	0.00
1290.	:	219	0.00	0.00	0.00	0.00	0.00	0.00
1291.	:	220	0.00	0.00	0.00	0.00	0.00	0.00
1292.	:	221	9.143E-02	-3.326E-13	0.00	0.00	0.00	0.00
1293.	:	222	0.152	-5.530E-13	0.00	0.00	0.00	0.00
1294.	:	223	0.118	-4.293E-13	0.00	0.00	0.00	0.00
1295.	:	224	1.859E-02	-6.763E-14	0.00	0.00	0.00	0.00
1296.	:	225	1.279E-02	-4.653E-14	0.00	0.00	0.00	0.00
1297.	:	226	0.193	-7.021E-13	0.00	0.00	0.00	0.00
1298.	:	227	0.354	-1.288E-12	0.00	0.00	0.00	0.00
1299.	:	228	0.311	-1.131E-12	0.00	0.00	0.00	0.00
1300.	:	229	0.321	-1.168E-12	0.00	0.00	0.00	0.00
1301.	:	230	4.70	-1.708E-11	0.00	0.00	0.00	0.00
1302.	:	231	1.49	-5.421E-12	0.00	0.00	0.00	0.00
1303.	:	232	2.75	-1.000E-11	0.00	0.00	0.00	0.00
1304.	:	233	5.91	-2.148E-11	0.00	0.00	0.00	0.00
1305.	:	234	3.11	-1.131E-11	0.00	0.00	0.00	0.00
1306.	:	235	1.23	-4.475E-12	0.00	0.00	0.00	0.00
1307.	:	236	0.00	0.00	0.00	0.00	0.00	0.00
1308.	:	237	0.00	0.00	0.00	0.00	0.00	0.00
1309.	:	238	0.00	0.00	0.00	0.00	0.00	0.00
1310.	:	239	0.00	0.00	0.00	0.00	0.00	0.00
1311.	:	240	0.00	0.00	0.00	0.00	0.00	0.00
1312.	:	241	1.29	-4.693E-12	0.00	0.00	0.00	0.00
1313.	:	242	31.7	-1.153E-10	0.00	0.00	0.00	0.00
1314.	:	243	14.6	-5.311E-11	0.00	0.00	0.00	0.00
1315.	:	244	0.00	0.00	0.00	0.00	0.00	0.00
1316.	:	245	0.00	0.00	0.00	0.00	0.00	0.00
1317.	:	246	0.00	0.00	0.00	0.00	0.00	0.00
1318.	:	247	0.00	0.00	0.00	0.00	0.00	0.00
1319.	:	248	0.00	0.00	0.00	0.00	0.00	0.00
1320.	:	249	0.00	0.00	0.00	0.00	0.00	0.00

```
0*********1*********2*********3*********4*********5*********6*********7*********8
: 250              0.00       0.00     0.00       0.00       0.00       0.00
: 251              5.50   -2.000E-11   0.00       0.00       0.00       0.00
: 252              5.50   -2.000E-11   0.00       0.00       0.00       0.00
: 253              6.88   -2.504E-11   0.00       0.00       0.00       0.00
: 254              0.00       0.00     0.00       0.00       0.00       0.00
: 255              0.00       0.00     0.00       0.00       0.00       0.00
: 256              0.00       0.00     0.00       0.00       0.00       0.00
: 257              0.00       0.00     0.00       0.00       0.00       0.00
: 258              0.00       0.00     0.00       0.00       0.00       0.00
: 259              0.00       0.00     0.00       0.00       0.00       0.00
: 260              4.96   -1.810E-11   0.00       0.00       0.00       0.00
: 261              5.02   -1.827E-11   0.00       0.00       0.00       0.00
: 262              5.02   -1.827E-11   0.00       0.00       0.00       0.00
: 263              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 264              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 265              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 266              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 267              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 268              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 269              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 270              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 271              4.65   -1.690E-11   0.00       0.00       0.00       0.00
: 272              2.72   -9.903E-12   0.00       0.00       0.00       0.00
: 273              2.72   -9.903E-12   0.00       0.00       0.00       0.00
: 274              2.72   -9.903E-12   0.00       0.00       0.00       0.00
:END
:DONE
```

ORIGINAL PAGE IS
OF POOR QUALITY

MECHANICALLY SCANNED DEPLOYABLE ANTENNA

DEPLOYED MODEL

CARD DECK FOR USE ON THE NON-LINEAR STRUCTURAL ANALYSIS

PROGRAM

(N L S A)

HARRIS GOVERNMENT ELECTRONIC SYSTEMS DIVISION

P.O. BOX 37

MELBOURNE FLORIDA 32901

FOR FURTHER INFORMATION CONTACT:

RICK HARLESS (305) 729-2207 OR

RICK DEADWYLER (305) 727-4259

```
BEGIN PROCESSING MATL  FILE.
BEGIN PROCESSING GLOB  FILE.
BEGIN PROCESSING GLOB  FILE.
BEGIN PROCESSING SYSI  FILE.
BEGIN PROCESSING STRI  FILE.
BEGIN PROCESSING MEMB  FILE.
BEGIN PROCESSING EDM   FILE.
BEGIN PROCESSING BEAM  FILE.
BEGIN PROCESSING DATB  FILE.
BEGIN PROCESSING MATL  FILE.
BEGIN PROCESSING GLOB  FILE.
BEGIN PROCESSING DATB  FILE.
BEGIN PROCESSING BEAM  FILE.
BEGIN PROCESSING REST  FILE.
```

```
     THE FOLLOWING NODES ARE REFERENCE NODES ONLY

          16   17   18   19   20   36   37   38   39   40   56   57   58   59   60   76   77   78   79   80
          96   97   98   99  100  116  117  118  119  120  136  137  138  139  140  156  157  158  159  160
         176  177  178  179  180  196  197  198  199  200  216  217  218  219  220  236  237  238  239  240
         244  245  246  247  248  249  250  254  255  256  257  258  259
BEGIN PROCESSING WGHT  FILE.
BEGIN PROCESSING DONE  FILE.

     THE FOLLOWING FILES WHERE PROCESSED IN THE ORDER SHOWN.

          1.  MATL

          2.  GLOB

          3.  GLOB

          4.  SYST

          5.  STRI

          6.  MEMB

          7.  EDM

          8.  BEAM

          9.  DATB

         10.  MATL

         11.  GLOB

         12.  DATB

         13.  BEAM

         14.  REST

         15.  WGHT

         16.  DONE
OUTPUT FOR RESTART     10
MATERIALS OUPUT FOR RESTART     22
GLOBAL COORDINATES OUTPUT    274
SYST OUTPUT      6
STRI,MEMB,BEAM OUTPUT    494   144   202
DATB OUTPUT    13


UMP OF BLOCK 82
      26        27        24         0         0         0         0         0         0         6
```

494	144	202	0	0	0	0	274	0	0
1	4882812	4194338	0	0	274	5242880	4	10	0
0	12850	28	700	20	21	22	23	0	0
0	129	0	0	5805359	872202	0	4	0	0
1	1	0	0	0	0	0	0	0	0
0	0	13	0	0	0	246	249	22	3
25	6	0	30	29	18	19	2	300	100
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	129	0	0	1	5270717	4996608	0	129	0
129	0	5557687	5712858	0	200				

ORIGINAL PAGE IS
OF POOR QUALITY

MATERIAL TABLE

NO.	NAME	DX,E	DY,G	D1	DXY	WEIGHT	CTE X	CTE Y
1	MESH	2.5	0.80	1.2	0.80	0.0	1.0	1.0
2	FRONT	1.49E+03	0.0	0.0	0.0	0.0	1.0	0.0
3	BACK	1.49E+03	0.0	0.0	0.0	0.0	1.0	0.0
4	OBINT	2.99E+03	0.0	0.0	0.0	0.0	1.0	0.0
5	TIE	30.	0.0	0.0	0.0	0.0	1.0	0.0
6	SCTIF	3.00E+02	0.0	0.0	0.0	0.0	1.0	0.0
7	STRIP	1.37E+07	0.0	0.0	0.0	0.0	1.0	0.0
8	STRIP	1.37E+07	6.50E+05	0.0	0.0	0.0	1.0	0.0
9	RIB	1.83E+07	0.0	0.0	0.0	0.0	1.0	0.0
10	RIB	1.83E+07	2.72E+06	0.0	0.0	0.0	1.0	0.0
11	ROD	2.96E+07	0.0	0.0	0.0	0.0	1.0	0.0
12	ROD	2.96E+07	6.50E+05	0.0	0.0	0.0	1.0	0.0
13	TCORD	6.60E+04	0.0	0.0	0.0	0.0	1.0	0.0
14	HUB	1.83E+07	0.0	0.0	0.0	0.0	1.0	0.0
15	HUB	1.83E+07	2.72E+06	0.0	0.0	0.0	1.0	0.0
16	STRUT	1.83E+07	0.0	0.0	0.0	0.0	1.0	0.0
17	STRUT	1.83E+07	2.72E+06	0.0	0.0	0.0	1.0	0.0
18	TIPSU	1.83E+07	0.0	0.0	0.0	0.0	1.0	0.0
19	TIPSU	1.83E+07	2.72E+06	0.0	0.0	0.0	1.0	0.0
20	INTTY	2.99E+03	0.0	0.0	0.0	0.0	1.0	0.0
21	TGRPH	1.80E+07	4.00E+06	0.0	0.0	8.10E-02	0.0	0.0
22	ANTG	1.80E+07	4.00E+06	0.0	0.0	0.0	0.0	0.0

ORIGINAL PAGE IS
OF POOR QUALITY

NODAL COORDINATE TABLE

NODE	SYS	X	Y	Z	NODE	SYS	X	Y	Z
1	3	288.979	0.000	29.436	2	3	227.353	0.000	18.235
3	3	154.721	0.000	8.445	4	3	229.452	0.000	5.190
5	3	157.170	0.000	-13.986	6	3	297.096	79.607	33.374
7	3	227.154	60.866	19.510	8	3	154.655	41.440	9.044
9	3	79.915	21.413	2.415	10	3	302.646	81.094	19.590
11	3	293.253	78.577	17.255	12	3	230.038	61.639	1.543
13	3	157.445	42.187	-16.499	14	3	81.372	21.803	-23.389
15	3	168.469	45.141	-86.576	16	0	0.000	0.000	0.000
17	0	0.000	0.000	0.000	18	0	0.000	0.000	0.000
19	0	0.000	0.000	0.000	20	0	0.000	0.000	0.000
21	3	250.263	144.489	29.436	22	3	196.894	113.677	18.235
23	3	133.992	77.360	8.445	24	3	198.711	114.726	5.190
25	3	136.114	78.585	-13.986	26	3	217.489	217.489	33.374
27	3	166.288	166.288	19.510	28	3	113.215	113.215	9.044
29	3	58.502	58.502	2.415	30	3	221.552	221.552	19.590
31	3	214.676	214.676	17.255	32	3	168.400	168.400	1.543
33	3	115.258	115.258	-16.499	34	3	59.568	59.568	-23.389
35	3	123.328	123.328	-86.576	36	0	0.000	0.000	0.000
37	0	0.000	0.000	0.000	38	0	0.000	0.000	0.000
39	0	0.000	0.000	0.000	40	0	0.000	0.000	0.000
41	3	144.489	250.263	29.436	42	3	113.677	196.894	18.235
43	3	77.360	133.992	8.445	44	3	114.726	198.711	5.190
45	3	78.585	136.114	-13.986	46	3	79.607	297.096	33.374
47	3	60.866	227.154	19.510	48	3	41.440	154.655	9.044
49	3	21.413	79.915	2.415	50	3	81.094	302.646	19.590
51	3	78.577	293.253	17.255	52	3	61.639	230.038	1.543
53	3	42.187	157.445	-16.499	54	3	21.803	81.372	-23.389
55	3	45.141	168.469	-86.576	56	0	0.000	0.000	0.000
57	0	0.000	0.000	0.000	58	0	0.000	0.000	0.000
59	0	0.000	0.000	0.000	60	0	0.000	0.000	0.000
61	3	0.000	288.979	29.436	62	3	0.000	227.353	18.235
63	3	0.000	154.721	8.445	64	3	0.000	229.452	5.190
65	3	0.000	157.170	-13.986	66	3	-79.607	297.096	33.374
67	3	-60.866	227.154	9.510	68	3	-41.440	154.655	9.044
69	3	-21.413	79.915	415	70	3	-81.094	302.646	19.590
71	3	-78.577	293.253	17 55	72	3	-61.639	230.038	1.543
73	3	-42.187	157.445	-16.[illegible]9	74	3	-21.803	81.372	-23.389
75	3	-45.141	168.469	-86.576	76	0	0.000	0.000	0.000
77	0	0.000	0.000	0.000	78	0	0.000	0.000	0.000
79	0	0.000	0.000	0.000	80	0	0.000	0.000	0.000
81	3	-144.489	250.263	29.436	82	3	-113.677	196.894	18.235
83	3	-77.360	133.992	8.445	84	3	-114.726	198.711	5.190
85	3	-78.585	136.114	-13.986	86	3	-217.489	217.489	33.374
87	3	-166.288	166.288	19.510	88	3	-113.215	113.215	9.044
89	3	-58.502	58.502	2.415	90	3	-221.552	221.552	19.590
91	3	-214.676	214.676	17.255	92	3	-168.400	168.400	1.543
93	3	-115.258	115.258	-16.499	94	3	-59.568	59.568	-23.389
95	3	-123.328	123.328	-86.576	96	0	0.000	0.000	0.000
97	0	0.000	0.000	0.000	98	0	0.000	0.000	0.000
99	0	0.000	0.000	0.000	100	0	0.000	0.000	0.000

NODAL COORDINATE TABLE

NODE	SYS	X	Y	Z	NODE	SYS	X	Y	Z
101	3	-250.263	144.489	29.436	102	3	-196.894	113.677	18.235
103	3	-133.992	77.360	8.445	104	3	-198.711	114.726	5.190
105	3	-136.114	78.585	-13.966	106	3	-297.096	79.607	33.374
107	3	-227.154	60.866	19.510	108	3	-154.655	41.440	9.044
109	3	-79.915	21.413	2.415	110	3	-302.646	81.094	19.590
111	3	-293.253	78.577	17.255	112	3	-230.038	61.639	1.543
113	3	-157.445	42.187	-16.499	114	3	-81.372	21.803	-23.389
115	3	-168.469	45.141	-86.576	116	0	0.000	0.000	0.000
117	0	0.000	0.000	0.000	118	0	0.000	0.000	0.000
119	0	0.000	0.000	0.000	120	0	0.000	0.000	0.000
121	3	-288.979	0.000	29.436	122	3	-227.353	0.000	18.235
123	3	-154.721	0.000	8.445	124	3	-229.452	0.000	5.190
125	3	-157.170	0.000	-13.966	126	3	-297.096	-79.607	33.374
127	3	-227.154	-60.866	19.510	128	3	-154.655	-41.440	9.044
129	3	-79.915	-21.413	2.415	130	3	-302.646	-81.094	19.590
131	3	-293.253	-78.577	17.255	132	3	-230.038	-61.639	1.543
133	3	-157.445	-42.187	-16.499	134	3	-81.372	-21.803	-23.389
135	3	-168.469	-45.141	-86.576	136	0	0.000	0.000	0.000
137	0	0.000	0.000	0.000	138	0	0.000	0.000	0.000
139	0	0.000	0.000	0.000	140	0	0.000	0.000	0.000
141	3	-250.263	-144.489	29.436	142	3	-196.894	-113.677	18.235
143	3	-133.992	-77.360	8.445	144	3	-198.711	-114.726	5.190
145	3	-136.114	-78.585	-13.966	146	3	-217.489	-217.489	33.374
147	3	-166.288	-166.288	19.510	148	3	-113.215	-113.215	9.044
149	3	-58.502	-58.502	2.415	150	3	-221.552	-221.552	19.590
151	3	-214.676	-214.676	17.255	152	3	-168.400	-168.400	1.543
153	3	-115.258	-115.258	-16.499	154	3	-59.568	-59.568	-23.389
155	3	-123.328	-123.328	-86.576	156	0	0.000	0.000	0.000
157	0	0.000	0.000	0.000	158	0	0.000	0.000	0.000
159	0	0.000	0.000	0.000	160	0	0.000	0.000	0.000
161	3	-144.489	-250.263	29.436	162	3	-113.677	-196.894	18.235
163	3	-77.360	-133.992	8.445	164	3	-114.726	-198.711	5.190
165	3	-78.585	-136.114	-13.966	166	3	-79.607	-297.096	33.374
167	3	-60.866	-227.154	19.510	168	3	-41.440	-154.655	9.044
169	3	-21.413	-79.915	2.415	170	3	-81.094	-302.646	19.590
171	3	-78.577	-293.253	17.255	172	3	-61.639	-230.038	1.543
173	3	-42.187	-157.445	-16.499	174	3	-21.803	-81.372	-23.389
175	3	-45.141	-168.469	-86.576	176	0	0.000	0.000	0.000
177	0	0.000	0.000	0.000	178	0	0.000	0.000	0.000
179	0	0.000	0.000	0.000	180	0	0.000	0.000	0.000
181	3	0.000	-288.979	29.436	182	3	0.000	-227.353	18.235
183	3	0.000	-154.721	8.445	184	3	0.000	-229.452	5.190
185	3	0.000	-157.170	-13.966	186	3	79.607	-297.096	33.374
187	3	60.866	-227. 54	19.510	188	3	41.440	-154.655	9.044
189	3	21.413	-79.915	2.415	190	3	81.094	-302.646	19.590
191	3	78.577	-293.253	17.255	192	3	61.639	-230.038	1.543
193	3	42.187	-157.445	-16.499	194	3	21.803	-81.372	-23.389
195	3	45.141	-168.469	-86.576	196	0	0.000	0.000	0.000
197	0	0.000	0.000	0.000	198	0	0.000	0.000	0.000
199	0	0.000	0.000	0.000	200	0	0.000	0.000	0.000

NODAL COORDINATE TABLE

NODE	SYS	X	Y	Z	NODE	SYS	X	Y	Z
201	3	144.489	-250.263	29.436	202	3	113.677	-196.894	18.235
203	3	77.360	-133.992	8.445	204	3	114.726	-198.711	5.190
205	3	78.585	-136.114	-13.986	206	3	217.489	-217.489	33.374
207	3	166.288	-166.288	19.510	208	3	113.215	-113.215	9.044
209	3	58.502	-58.502	2.415	210	3	221.552	-221.552	19.590
211	3	214.676	-214.676	17.255	212	3	168.400	-168.400	1.543
213	3	115.258	-115.258	-16.499	214	3	59.568	-59.568	-23.389
215	3	123.328	-123.328	-86.576	216	0	0.000	0.000	0.000
217	0	0.000	0.000	0.000	218	0	0.000	0.000	0.000
219	0	0.000	0.000	0.000	220	0	0.000	0.000	0.000
221	3	250.263	-144.489	29.436	222	3	196.894	-113.677	18.235
223	3	133.992	-77.360	8.445	224	3	198.711	-114.726	5.190
225	3	136.114	-78.585	-13.986	226	3	297.096	-79.607	33.374
227	3	227.154	-60.866	19.510	228	3	154.655	-41.440	9.044
229	3	79.915	-21.413	2.415	230	3	302.646	-81.094	19.590
231	3	293.253	-78.577	17.255	232	3	230.038	-61.639	1.543
233	3	157.445	-42.187	-16.499	234	3	81.372	-21.803	-23.389
235	3	168.469	-45.141	-86.576	236	0	0.000	0.000	0.000
237	0	0.000	0.000	0.000	238	0	0.000	0.000	0.000
239	0	0.000	0.000	0.000	240	0	0.000	0.000	0.000
241	3	0.000	0.000	0.000	242	3	0.000	0.000	-30.759
243	3	0.000	0.000	-109.863	244	0	0.000	0.000	0.000
245	0	0.000	0.000	0.000	246	0	422.340	0.000	61.718
247	0	223.920	0.000	742.032	248	0	72.704	0.000	0.000
249	0	394.428	0.000	946.986	250	0	1000.000	0.000	100.000
251	3	320.000	-81.094	-60.000	252	3	320.000	81.094	-60.000
253	3	370.837	0.000	19.590	254	0	0.000	0.000	0.000
255	0	0.000	0.000	0.000	256	0	0.000	0.000	0.000
257	0	0.000	0.000	0.000	258	0	0.000	0.000	0.000
259	0	0.000	0.000	0.000	260	3	370.837	0.000	169.590
261	3	302.646	39.370	169.590	262	3	302.646	-39.370	169.590
263	3	370.837	0.000	299.590	264	3	302.646	39.370	299.590
265	3	302.646	-39.370	299.590	266	3	370.837	0.000	429.590
267	3	302.646	39.370	429.590	268	3	302.646	-39.370	429.590
269	3	370.837	0.000	559.590	270	3	302.646	39.370	559.590
271	3	302.646	-39.370	559.590	272	3	370.837	0.000	689.590
273	3	302.646	39.370	689.590	274	3	302.646	-39.370	689.590

NODAL SYSTEMS

NO.	TYPE	NA	NB	NC
1	0			
2	0			
3	3			
4	0			
5		246	247	250
6		248	249	250

ORIGINAL PAGE IS
OF POOR QUALITY

STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
1	1	6	4	OBINT	80.1162	1.00	5.69	0.00
2	21	26	4	UBINT	80.1162	1.00	5.69	0.00
3	41	46	4	UBINT	80.1162	1.00	5.69	0.00
4	61	66	4	UBINT	80.1162	1.00	5.69	0.00
5	81	86	4	UBINT	80.1162	1.00	5.69	0.00
6	101	106	4	UBINT	80.1162	1.00	5.69	0.00
7	121	126	4	UBINT	80.1162	1.00	5.69	0.00
8	141	146	4	UBINT	80.1162	1.00	5.69	0.00
9	161	166	4	UBINT	80.1162	1.00	5.69	0.00
10	181	186	4	UBINT	80.1162	1.00	5.69	0.00
11	201	206	4	UBINT	80.1162	1.00	5.69	0.00
12	221	226	4	UBINT	80.1162	1.00	5.69	0.00
13	6	21	4	UBINT	80.1162	1.00	5.69	0.00
14	26	41	4	UBINT	80.1162	1.00	5.69	0.00
15	46	61	4	UBINT	80.1162	1.00	5.69	0.00
16	66	81	4	UBINT	80.1162	1.00	5.69	0.00
17	86	101	4	UBINT	80.1162	1.00	5.69	0.00
18	106	121	4	UBINT	80.1162	1.00	5.69	0.00
19	126	141	4	UBINT	80.1162	1.00	5.69	0.00
20	146	161	4	UBINT	80.1162	1.00	5.69	0.00
21	166	181	4	UBINT	80.1162	1.00	5.69	0.00
22	186	201	4	UBINT	80.1162	1.00	5.69	0.00
23	206	221	4	UBINT	80.1162	1.00	5.69	0.00
24	226	1	4	UBINT	80.1162	1.00	5.69	0.00
25	6	26	2	FRONT	159.2132	5.00	7.19	0.00
26	26	46	2	FRONT	159.2132	5.00	7.19	0.00
27	46	66	2	FRONT	159.2132	5.00	7.19	0.00
28	66	86	2	FRONT	159.2132	5.00	7.19	0.00
29	86	106	2	FRONT	159.2132	5.00	7.19	0.00
30	106	126	2	FRONT	159.2132	5.00	7.19	0.00
31	126	146	2	FRONT	159.2132	5.00	7.19	0.00
32	146	166	2	FRONT	159.2132	5.00	7.19	0.00
33	166	186	2	FRONT	159.2132	5.00	7.19	0.00
34	186	206	2	FRONT	159.2132	5.00	7.19	0.00
35	206	226	2	FRONT	159.2132	5.00	7.19	0.00
36	226	6	2	FRONT	159.2132	5.00	7.19	0.00
37	2	7	2	FRONT	60.8795	10.0	14.2	0.00
38	22	27	2	FRONT	60.8795	10.0	14.2	0.00
39	42	47	2	FRONT	60.8795	10.0	14.2	0.00
40	62	67	2	FRONT	60.8795	10.0	14.2	0.00
41	82	87	2	FRONT	60.8795	10.0	14.2	0.00
42	102	107	2	FRONT	60.8795	10.0	14.2	0.00
43	122	127	2	FRONT	60.8795	10.0	14.2	0.00
44	142	147	2	FRONT	60.8795	10.0	14.2	0.00
45	162	167	2	FRONT	60.8795	10.0	14.2	0.00
46	182	187	2	FRONT	60.8795	10.0	14.2	0.00
47	202	207	2	FRONT	60.8795	10.0	14.2	0.00
48	222	227	2	FRONT	60.8795	10.0	14.2	0.00
49	7	22	2	FRONT	60.8795	10.0	14.2	0.00
50	27	42	2	FRONT	60.8795	10.0	14.2	0.00

ORIGINAL PAGE IS
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STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
51	47	62	2	FRONT	60.8795	10.0	14.2	0.00
52	67	82	2	FRONT	60.8795	10.0	14.2	0.00
53	87	102	2	FRONT	60.8795	10.0	14.2	0.00
54	107	122	2	FRONT	60.8795	10.0	14.2	0.00
55	127	142	2	FRONT	60.8795	10.0	14.2	0.00
56	147	162	2	FRONT	60.8795	10.0	14.2	0.00
57	167	182	2	FRONT	60.8795	10.0	14.2	0.00
58	187	202	2	FRONT	60.8795	10.0	14.2	0.00
59	207	222	2	FRONT	60.8795	10.0	14.2	0.00
60	227	2	2	FRONT	60.8795	10.0	14.2	0.00
61	3	8	2	FRONT	41.4440	10.0	13.8	0.00
62	23	28	2	FRONT	41.4440	10.0	13.8	0.00
63	43	48	2	FRONT	41.4440	10.0	13.8	0.00
64	63	68	2	FRONT	41.4440	10.0	13.8	0.00
65	83	88	2	FRONT	41.4440	10.0	13.8	0.00
66	103	108	2	FRONT	41.4440	10.0	13.8	0.00
67	123	128	2	FRONT	41.4440	10.0	13.8	0.00
68	143	148	2	FRONT	41.4440	10.0	13.8	0.00
69	163	168	2	FRONT	41.4440	10.0	13.8	0.00
70	183	188	2	FRONT	41.4440	10.0	13.8	0.00
71	203	208	2	FRONT	41.4440	10.0	13.8	0.00
72	223	228	2	FRONT	41.4440	10.0	13.8	0.00
73	8	23	2	FRONT	41.4440	10.0	13.8	0.00
74	28	43	2	FRONT	41.4440	10.0	13.8	0.00
75	48	63	2	FRONT	41.4440	10.0	13.8	0.00
76	68	83	2	FRONT	41.4440	10.0	13.8	0.00
77	88	103	2	FRONT	41.4440	10.0	13.8	0.00
78	108	123	2	FRONT	41.4440	10.0	13.8	0.00
79	128	143	2	FRONT	41.4440	10.0	13.8	0.00
80	148	163	2	FRONT	41.4440	10.0	13.8	0.00
81	168	183	2	FRONT	41.4440	10.0	13.8	0.00
82	188	203	2	FRONT	41.4440	10.0	13.8	0.00
83	208	223	2	FRONT	41.4440	10.0	13.8	0.00
84	228	3	2	FRONT	41.4440	10.0	13.8	0.00
85	9	29	2	FRONT	42.8265	15.0	18.9	0.00
86	29	49	2	FRONT	42.8265	15.0	18.9	0.00
87	49	69	2	FRONT	42.8265	15.0	18.9	0.00
88	69	89	2	FRONT	42.8265	15.0	18.9	0.00
89	89	109	2	FRONT	42.8265	15.0	18.9	0.00
90	109	129	2	FRONT	42.8265	15.0	18.9	0.00
91	129	149	2	FRONT	42.8265	15.0	18.9	0.00
92	149	169	2	FRONT	42.8265	15.0	18.9	0.00
93	169	189	2	FRONT	42.8265	15.0	18.9	0.00
94	189	209	2	FRONT	42.8265	15.0	18.9	0.00
95	209	229	2	FRONT	42.8265	15.0	18.9	0.00
96	229	9	2	FRONT	42.8265	15.0	18.9	0.00
97	11	31	3	BACK	157.1539	5.00	3.50	0.00
98	31	51	3	BACK	157.1539	5.00	3.50	0.00
99	51	71	3	BACK	157.1539	5.00	3.50	0.00
100	71	91	3	BACK	157.1539	5.00	3.50	0.00

STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
101	91	111	3	BACK	157.1539	5.00	3.50	0.00
102	111	131	3	BACK	157.1539	5.00	3.50	0.00
103	131	151	3	BACK	157.1539	5.00	3.50	0.00
104	151	171	3	BACK	157.1539	5.00	3.50	0.00
105	171	191	3	BACK	157.1539	5.00	3.50	0.00
106	191	211	3	BACK	157.1539	5.00	3.50	0.00
107	211	231	3	BACK	157.1539	5.00	3.50	0.00
108	231	11	3	BACK	157.1539	5.00	3.50	0.00
109	4	12	3	BACK	61.7491	10.0	5.72	0.00
110	24	32	3	BACK	61.7491	10.0	5.72	0.00
111	44	52	3	BACK	61.7491	10.0	5.72	0.00
112	64	72	3	BACK	61.7491	10.0	5.72	0.00
113	84	92	3	BACK	61.7491	10.0	5.72	0.00
114	104	112	3	BACK	61.7491	10.0	5.72	0.00
115	124	132	3	BACK	61.7491	10.0	5.72	0.00
116	144	152	3	BACK	61.7491	10.0	5.72	0.00
117	164	172	3	BACK	61.7491	10.0	5.72	0.00
118	184	192	3	BACK	61.7491	10.0	5.72	0.00
119	204	212	3	BACK	61.7491	10.0	5.72	0.00
120	224	232	3	BACK	61.7491	10.0	5.72	0.00
121	12	24	3	BACK	61.7491	10.0	5.72	0.00
122	32	44	3	BACK	61.7491	10.0	5.72	0.00
123	52	64	3	BACK	61.7491	10.0	5.72	0.00
124	72	84	3	BACK	61.7491	10.0	5.72	0.00
125	92	104	3	BACK	61.7491	10.0	5.72	0.00
126	112	124	3	BACK	61.7491	10.0	5.72	0.00
127	132	144	3	BACK	61.7491	10.0	5.72	0.00
128	152	164	3	BACK	61.7491	10.0	5.72	0.00
129	172	184	3	BACK	61.7491	10.0	5.72	0.00
130	192	204	3	BACK	61.7491	10.0	5.72	0.00
131	212	224	3	BACK	61.7491	10.0	5.72	0.00
132	232	4	3	BACK	61.7491	10.0	5.72	0.00
133	5	13	3	BACK	42.2629	10.0	3.89	0.00
134	25	33	3	BACK	42.2629	10.0	3.89	0.00
135	45	53	3	BACK	42.2629	10.0	3.89	0.00
136	65	73	3	BACK	42.2629	10.0	3.89	0.00
137	85	93	3	BACK	42.2629	10.0	3.89	0.00
138	105	113	3	BACK	42.2629	10.0	3.89	0.00
139	125	133	3	BACK	42.2629	10.0	3.89	0.00
140	145	153	3	BACK	42.2629	10.0	3.89	0.00
141	165	173	3	BACK	42.2629	10.0	3.89	0.00
142	185	193	3	BACK	42.2629	10.0	3.89	0.00
143	205	213	3	BACK	42.2629	10.0	3.89	0.00
144	225	233	3	BACK	42.2629	10.0	3.89	0.00
145	13	25	3	BACK	42.2629	10.0	3.89	0.00
146	33	45	3	BACK	42.2629	10.0	3.89	0.00
147	53	65	3	BACK	42.2629	10.0	3.89	0.00
148	73	85	3	BACK	42.2629	10.0	3.89	0.00
149	93	105	3	BACK	42.2629	10.0	3.89	0.00
150	113	125	3	BACK	42.2629	10.0	3.89	0.00

ORIGINAL PAGE IS
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STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
151	133	145	3	BACK	42.2629	10.0	3.89	0.00
152	153	165	3	BACK	42.2629	10.0	3.89	0.00
153	173	185	3	BACK	42.2629	10.0	3.89	0.00
154	193	205	3	BACK	42.2629	10.0	3.89	0.00
155	213	225	3	BACK	42.2629	10.0	3.89	0.00
156	233	5	3	BACK	42.2629	10.0	3.89	0.00
157	14	34	3	BACK	43.6069	15.0	4.50	0.00
158	34	54	3	BACK	43.6069	15.0	4.50	0.00
159	54	74	3	BACK	43.6069	15.0	4.50	0.00
160	74	94	3	BACK	43.6069	15.0	4.50	0.00
161	94	114	3	BACK	43.6069	15.0	4.50	0.00
162	114	134	3	BACK	43.6069	15.0	4.50	0.00
163	134	154	3	BACK	43.6069	15.0	4.50	0.00
164	154	174	3	BACK	43.6069	15.0	4.50	0.00
165	174	194	3	BACK	43.6069	15.0	4.50	0.00
166	194	214	3	BACK	43.6069	15.0	4.50	0.00
167	214	234	3	BACK	43.6069	15.0	4.50	0.00
168	234	14	3	BACK	43.6069	15.0	4.50	0.00
169	1	10	20	INTTY	82.8246	1.00	1.24	0.00
170	21	30	20	INTTY	82.8246	1.00	1.24	0.00
171	41	50	20	INTTY	82.8246	1.00	1.24	0.00
172	61	70	20	INTTY	82.8246	1.00	1.24	0.00
173	81	90	20	INTTY	82.8246	1.00	1.24	0.00
174	101	110	20	INTTY	82.8246	1.00	1.24	0.00
175	121	130	20	INTTY	82.8246	1.00	1.24	0.00
176	141	150	20	INTTY	82.8246	1.00	1.24	0.00
177	161	170	20	INTTY	82.8246	1.00	1.24	0.00
178	181	190	20	INTTY	82.8246	1.00	1.24	0.00
179	201	210	20	INTTY	82.8246	1.00	1.24	0.00
180	221	230	20	INTTY	82.8246	1.00	1.24	0.00
181	10	21	20	INTTY	82.8246	1.00	1.24	0.00
182	30	41	20	INTTY	82.8246	1.00	1.24	0.00
183	50	61	20	INTTY	82.8246	1.00	1.24	0.00
184	70	81	20	INTTY	82.8246	1.00	1.24	0.00
185	90	101	20	INTTY	82.8246	1.00	1.24	0.00
186	110	121	20	INTTY	82.8246	1.00	1.24	0.00
187	130	141	20	INTTY	82.8246	1.00	1.24	0.00
188	150	161	20	INTTY	82.8246	1.00	1.24	0.00
189	170	181	20	INTTY	82.8246	1.00	1.24	0.00
190	190	201	20	INTTY	82.8246	1.00	1.24	0.00
191	210	221	20	INTTY	82.8246	1.00	1.24	0.00
192	230	1	20	INTTY	82.8246	1.00	1.24	0.00
193	2	4	5	TIE	13.2126	10.0	0.685	0.00
194	22	24	5	TIE	13.2126	10.0	0.685	0.00
195	42	44	5	TIE	13.2126	10.0	0.685	0.00
196	62	64	5	TIE	13.2126	10.0	0.685	0.00
197	82	84	5	TIE	13.2126	10.0	0.685	0.00
198	102	104	5	TIE	13.2126	10.0	0.685	0.00
199	122	124	5	TIE	13.2126	10.0	0.685	0.00
200	142	144	5	TIE	13.2126	10.0	0.685	0.00

STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
201	162	164	5	TIE	13.2126	10.0	0.685	0.00
202	182	184	5	TIE	13.2126	10.0	0.685	0.00
203	202	204	5	TIE	13.2126	10.0	0.685	0.00
204	222	224	5	TIE	13.2126	10.0	0.685	0.00
205	3	5	5	TIE	22.5641	10.0	0.465	0.00
206	23	25	5	TIE	22.5641	10.0	0.465	0.00
207	43	45	5	TIE	22.5641	10.0	0.465	0.00
208	63	65	5	TIE	22.5641	10.0	0.465	0.00
209	83	85	5	TIE	22.5641	10.0	0.465	0.00
210	103	105	5	TIE	22.5641	10.0	0.465	0.00
211	123	125	5	TIE	22.5641	10.0	0.465	0.00
212	143	145	5	TIE	22.5641	10.0	0.465	0.00
213	163	165	5	TIE	22.5641	10.0	0.465	0.00
214	183	185	5	TIE	22.5641	10.0	0.465	0.00
215	203	205	5	TIE	22.5641	10.0	0.465	0.00
216	223	225	5	TIE	22.5641	10.0	0.465	0.00
217	6	10	6	SOTIE	14.9337	5.00	51.1	0.00
218	26	30	6	SOTIE	14.9337	5.00	51.1	0.00
219	46	50	6	SOTIE	14.9338	5.00	51.1	0.00
220	66	70	6	SOTIE	14.9338	5.00	51.1	0.00
221	86	90	6	SOTIE	14.9337	5.00	51.1	0.00
222	106	110	6	SOTIE	14.9338	5.00	51.1	0.00
223	126	130	6	SOTIE	14.9338	5.00	51.1	0.00
224	146	150	6	SOTIE	14.9337	5.00	51.1	0.00
225	166	170	6	SOTIE	14.9338	5.00	51.1	0.00
226	186	190	6	SOTIE	14.9338	5.00	51.1	0.00
227	205	210	6	SOTIE	14.9337	5.00	51.1	0.00
228	226	230	6	SOTIE	14.9337	5.00	51.1	0.00
229	7	12	6	SOTIE	18.2131	10.0	1.73	0.00
230	27	32	6	SOTIE	18.2131	10.0	1.73	0.00
231	47	52	6	SOTIE	18.2131	10.0	1.73	0.00
232	67	72	6	SOTIE	18.2131	10.0	1.73	0.00
233	87	92	6	SOTIE	18.2131	10.0	1.73	0.00
234	107	112	6	SOTIE	18.2131	10.0	1.73	0.00
235	127	132	6	SOTIE	18.2131	10.0	1.73	0.00
236	147	152	6	SOTIE	18.2131	10.0	1.73	0.00
237	167	172	6	SOTIE	18.2131	10.0	1.73	0.00
238	187	192	6	SOTIE	18.2131	10.0	1.73	0.00
239	207	212	6	SOTIE	18.2131	10.0	1.73	0.00
240	227	232	6	SOTIE	18.2131	10.0	1.73	0.00
241	8	13	6	SOTIE	25.7057	10.0	1.19	0.00
242	28	33	6	SOTIE	25.7057	10.0	1.19	0.00
243	48	53	6	SOTIE	25.7057	10.0	1.19	0.00
244	68	73	6	SOTIE	25.7057	10.0	1.19	0.00
245	88	93	6	SOTIE	25.7057	10.0	1.19	0.00
246	108	113	6	SOTIE	25.7057	10.0	1.19	0.00
247	128	133	6	SOTIE	25.7057	10.0	1.19	0.00
248	148	153	6	SOTIE	25.7057	10.0	1.19	0.00
249	168	173	6	SOTIE	25.7057	10.0	1.19	0.00
250	188	193	6	SOTIE	25.7057	10.0	1.19	0.00

ORIGINAL PAGE IS
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STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
251	208	213	6	SOTIE	25.7057	10.0	1.19	0.00
252	228	233	6	SOTIE	25.7057	10.0	1.19	0.00
253	9	14	6	SOTIE	25.8479	15.0	0.948	0.00
254	29	34	6	SOTIE	25.8479	15.0	0.948	0.00
255	49	54	6	SOTIE	25.8479	15.0	0.948	0.00
256	69	74	6	SOTIE	25.8479	15.0	0.948	0.00
257	89	94	6	SOTIE	25.8479	15.0	0.948	0.00
258	109	114	6	SOTIE	25.8479	15.0	0.948	0.00
259	129	134	6	SOTIE	25.8479	15.0	0.948	0.00
260	149	154	6	SOTIE	25.8479	15.0	0.948	0.00
261	169	174	6	SOTIE	25.8479	15.0	0.948	0.00
262	189	194	6	SOTIE	25.8479	15.0	0.948	0.00
263	209	214	6	SOTIE	25.8479	15.0	0.948	0.00
264	229	234	6	SOTIE	25.8479	15.0	0.948	0.00
265	241	242	6	SOTIE	30.7590	12.0	0.505	0.00
266	6	11	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
267	26	31	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
268	46	51	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
269	66	71	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
270	86	91	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
271	106	111	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
272	126	131	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
273	146	151	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
274	166	171	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
275	186	191	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
276	206	211	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
277	226	231	18	TIPSO	16.6029	2.770E-03	-54.1	0.00
278	6	7	7	STRIP	73.7243	1.970E-02	24.0	0.00
279	26	27	7	STRIP	73.7243	1.970E-02	24.0	0.00
280	46	47	7	STRIP	73.7243	1.970E-02	24.0	0.00
281	66	67	7	STRIP	73.7243	1.970E-02	24.0	0.00
282	86	87	7	STRIP	73.7243	1.970E-02	24.0	0.00
283	106	107	7	STRIP	73.7243	1.970E-02	24.0	0.00
284	126	127	7	STRIP	73.7243	1.970E-02	24.0	0.00
285	146	147	7	STRIP	73.7243	1.970E-02	24.0	0.00
286	166	167	7	STRIP	73.7243	1.970E-02	24.0	0.00
287	186	187	7	STRIP	73.7243	1.970E-02	24.0	0.00
288	206	207	7	STRIP	73.7243	1.970E-02	24.0	0.00
289	226	227	7	STRIP	73.7243	1.970E-02	24.0	0.00
290	7	8	7	STRIP	75.7832	1.970E-02	17.1	0.00
291	27	28	7	STRIP	75.7832	1.970E-02	17.1	0.00
292	47	48	7	STRIP	75.7832	1.970E-02	17.1	0.00
293	67	68	7	STRIP	75.7832	1.970E-02	17.1	0.00
294	87	88	7	STRIP	75.7832	1.970E-02	17.1	0.00
295	107	108	7	STRIP	75.7832	1.970E-02	17.1	0.00
296	127	128	7	STRIP	75.7832	1.970E-02	17.1	0.00
297	147	148	7	STRIP	75.7832	1.970E-02	17.1	0.00
298	167	168	7	STRIP	75.7832	1.970E-02	17.1	0.00
299	187	188	7	STRIP	75.7832	1.970E-02	17.1	0.00
300	207	208	7	STRIP	75.7832	1.970E-02	17.1	0.00

STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
301	227	228	7	STRIP	75.7832	1.970E-02	17.1	0.00
302	8	9	7	STRIP	77.6594	1.970E-02	10.4	0.00
303	28	29	7	STRIP	77.6594	1.970E-02	10.4	0.00
304	48	49	7	STRIP	77.6594	1.970E-02	10.4	0.00
305	68	69	7	STRIP	77.6594	1.970E-02	10.4	0.00
306	88	89	7	STRIP	77.6594	1.970E-02	10.4	0.00
307	108	109	7	STRIP	77.6594	1.970E-02	10.4	0.00
308	128	129	7	STRIP	77.6594	1.970E-02	10.4	0.00
309	148	149	7	STRIP	77.6594	1.970E-02	10.4	0.00
310	168	169	7	STRIP	77.6594	1.970E-02	10.4	0.00
311	188	189	7	STRIP	77.6594	1.970E-02	10.4	0.00
312	208	209	7	STRIP	77.6594	1.970E-02	10.4	0.00
313	228	229	7	STRIP	77.6594	1.970E-02	10.4	0.00
314	9	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
315	29	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
316	49	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
317	69	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
318	89	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
319	109	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
320	129	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
321	149	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
322	169	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
323	189	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
324	209	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
325	229	241	7	STRIP	82.7696	1.000E-08	1.00	0.00
326	10	11	9	RIB	10.0004	0.295	-64.9	0.00
327	30	31	9	RIB	10.0004	0.295	-64.9	0.00
328	50	51	9	RIB	10.0004	0.295	-64.9	0.00
329	70	71	9	RIB	10.0004	0.295	-64.9	0.00
330	90	91	9	RIB	10.0004	0.295	-64.9	0.00
331	110	111	9	RIB	10.0004	0.295	-64.9	0.00
332	130	131	9	RIB	10.0004	0.295	-64.9	0.00
333	150	151	9	RIB	10.0004	0.295	-64.9	0.00
334	170	171	9	RIB	10.0004	0.295	-64.9	0.00
335	190	191	9	RIB	10.0004	0.295	-64.9	0.00
336	210	211	9	RIB	10.0004	0.295	-64.9	0.00
337	230	231	9	RIB	10.0004	0.295	-64.9	0.00
338	11	12	9	RIB	67.3046	0.295	-91.6	0.00
339	31	32	9	RIB	67.3046	0.295	-91.6	0.00
340	51	52	9	RIB	67.3046	0.295	-91.6	0.00
341	71	72	9	RIB	67.3046	0.295	-91.6	0.00
342	91	92	9	RIB	67.3046	0.295	-91.6	0.00
343	111	112	9	RIB	67.3046	0.295	-91.6	0.00
344	131	132	9	RIB	67.3046	0.295	-91.6	0.00
345	151	152	9	RIB	67.3046	0.295	-91.6	0.00
346	171	172	9	RIB	67.3046	0.295	-91.6	0.00
347	191	192	9	RIB	67.3046	0.295	-91.6	0.00
348	211	212	9	RIB	67.3046	0.295	-91.6	0.00
349	231	232	9	RIB	67.3046	0.295	-91.6	0.00
350	12	13	9	RIB	77.2893	0.295	-94.3	0.00

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OF POOR QUALITY

STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
351	32	33	9	RIB	77.2893	0.295	-94.3	0.00
352	52	53	9	RIB	77.2893	0.295	-94.3	0.00
353	72	73	9	RIB	77.2893	0.295	-94.3	0.00
354	92	93	9	RIB	77.2893	0.295	-94.3	0.00
355	112	113	9	RIB	77.2893	0.295	-94.3	0.00
356	132	133	9	RIB	77.2893	0.295	-94.3	0.00
357	152	153	9	RIB	77.2893	0.295	-94.3	0.00
358	172	173	9	RIB	77.2893	0.295	-94.3	0.00
359	192	193	9	RIB	77.2893	0.295	-94.3	0.00
360	212	213	9	RIB	77.2893	0.295	-94.3	0.00
361	232	233	9	RIB	77.2893	0.295	-94.3	0.00
362	13	14	9	RIB	79.0578	0.295	-101.	0.00
363	33	34	9	RIB	79.0578	0.295	-101.	0.00
364	53	54	9	RIB	79.0578	0.295	-101.	0.00
365	73	74	9	RIB	79.0578	0.295	-101.	0.00
366	93	94	9	RIB	79.0578	0.295	-101.	0.00
367	113	114	9	RIB	79.0578	0.295	-101.	0.00
368	133	134	9	RIB	79.0578	0.295	-101.	0.00
369	153	154	9	RIB	79.0578	0.295	-101.	0.00
370	173	174	9	RIB	79.0578	0.295	-101.	0.00
371	193	194	9	RIB	79.0578	0.295	-101.	0.00
372	213	214	9	RIB	79.0578	0.295	-101.	0.00
373	233	234	9	RIB	79.0578	0.295	-101.	0.00
374	14	242	9	RIB	84.5638	0.295	-103.	0.00
375	34	242	9	RIB	84.5638	0.295	-103.	0.00
376	54	242	9	RIB	84.5638	0.295	-103.	0.00
377	74	242	9	RIB	84.5638	0.295	-103.	0.00
378	94	242	9	RIB	84.5638	0.295	-103.	0.00
379	114	242	9	RIB	84.5638	0.295	-103.	0.00
380	134	242	9	RIB	84.5638	0.295	-103.	0.00
381	154	242	9	RIB	84.5638	0.295	-103.	0.00
382	174	242	9	RIB	84.5638	0.295	-103.	0.00
383	194	242	9	RIB	84.5638	0.295	-103.	0.00
384	214	242	9	RIB	84.5638	0.295	-103.	0.00
385	234	242	9	RIB	84.5638	0.295	-103.	0.00
386	13	15	16	STRUT	71.0003	0.146	-34.1	0.00
387	33	35	16	STRUT	71.0003	0.146	-34.1	0.00
388	53	55	16	STRUT	71.0003	0.146	-34.1	0.00
389	73	75	16	STRUT	71.0003	0.146	-34.1	0.00
390	93	95	16	STRUT	71.0003	0.146	-34.1	0.00
391	113	115	16	STRUT	71.0003	0.146	-34.1	0.00
392	133	135	16	STRUT	71.0003	0.146	-34.1	0.00
393	153	155	16	STRUT	71.0003	0.146	-34.1	0.00
394	173	175	16	STRUT	71.0003	0.146	-34.1	0.00
395	193	195	16	STRUT	71.0003	0.146	-34.1	0.00
396	213	215	16	STRUT	71.0003	0.146	-34.1	0.00
397	233	235	16	STRUT	71.0003	0.146	-34.1	0.00
398	10	15	11	ROD	174.8348	1.636E-02	28.9	0.00
399	30	35	11	ROD	174.8348	1.636E-02	28.9	0.00
400	50	55	11	ROD	174.8348	1.636E-02	28.9	0.00

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STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
401	70	75	11	ROD	174.8348	1.636E-02	28.9	0.00
402	90	95	11	ROD	174.8348	1.636E-02	28.9	0.00
403	110	115	11	ROD	174.8348	1.636E-02	28.9	0.00
404	130	135	11	ROD	174.8348	1.636E-02	28.9	0.00
405	150	155	11	ROD	174.8348	1.636E-02	28.9	0.00
406	170	175	11	ROD	174.8348	1.636E-02	28.9	0.00
407	190	195	11	ROD	174.8348	1.636E-02	28.9	0.00
408	210	215	11	ROD	174.8348	1.636E-02	28.9	0.00
409	230	235	11	ROD	174.8348	1.636E-02	28.9	0.00
410	15	243	11	ROD	175.9597	1.636E-02	19.8	0.00
411	35	243	11	ROD	175.9597	1.636E-02	19.8	0.00
412	55	243	11	ROD	175.9597	1.636E-02	19.8	0.00
413	75	243	11	ROD	175.9597	1.636E-02	19.8	0.00
414	95	243	11	ROD	175.9597	1.636E-02	19.8	0.00
415	115	243	11	ROD	175.9597	1.636E-02	19.8	0.00
416	135	243	11	ROD	175.9597	1.636E-02	19.8	0.00
417	155	243	11	ROD	175.9597	1.636E-02	19.8	0.00
418	175	243	11	ROD	175.9597	1.636E-02	19.8	0.00
419	195	243	11	ROD	175.9597	1.636E-02	19.8	0.00
420	215	243	11	ROD	175.9597	1.636E-02	19.8	0.00
421	235	243	11	ROD	175.9597	1.636E-02	19.8	0.00
422	13	243	11	ROD	187.8444	1.636E-02	11.3	0.00
423	33	243	11	ROD	187.8444	1.636E-02	11.3	0.00
424	53	243	11	ROD	187.8444	1.636E-02	11.3	0.00
425	73	243	11	ROD	187.8444	1.636E-02	11.3	0.00
426	93	243	11	ROD	187.8444	1.636E-02	11.3	0.00
427	113	243	11	ROD	187.8444	1.636E-02	11.3	0.00
428	133	243	11	ROD	187.8444	1.636E-02	11.3	0.00
429	153	243	11	ROD	187.8444	1.636E-02	11.3	0.00
430	173	243	11	ROD	187.8444	1.636E-02	11.3	0.00
431	193	243	11	ROD	187.8444	1.636E-02	11.3	0.00
432	213	243	11	ROD	187.8444	1.636E-02	11.3	0.00
433	233	243	11	ROD	187.8444	1.636E-02	11.3	0.00
434	10	30	11	ROD	162.1874	1.00	22.5	0.00
435	30	50	11	ROD	162.1874	1.00	22.5	0.00
436	50	70	11	ROD	162.1874	1.00	22.5	0.00
437	70	90	11	ROD	162.1874	1.00	22.5	0.00
438	90	110	11	ROD	162.1874	1.00	22.5	0.00
439	110	130	11	ROD	162.1874	1.00	22.5	0.00
440	130	150	11	ROD	162.1874	1.00	22.5	0.00
441	150	170	11	ROD	162.1874	1.00	22.5	0.00
442	170	190	11	ROD	162.1874	1.00	22.5	0.00
443	190	210	11	ROD	162.1874	1.00	22.5	0.00
444	210	230	11	ROD	162.1874	1.00	22.5	0.00
445	230	10	11	ROD	162.1874	1.00	22.5	0.00
446	10	33	13	TCORD	193.8657	1.00	10.0	0.00
447	33	50	13	TCORD	193.8657	1.00	10.0	0.00
448	50	73	13	TCORD	193.8657	1.00	10.0	0.00
449	73	90	13	TCORD	193.8657	1.00	10.0	0.00
450	90	113	13	TCORD	193.8657	1.00	10.0	0.00

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STRINGER ELEMENTS

NO.	JA	JB	MAT.	NAME	LENGTH	AREA	FORCE	TEMP.
451	113	130	13	TCORD	193.8657	1.00	10.0	0.00
452	130	153	13	TCORD	193.8657	1.00	10.0	0.00
453	153	170	13	TCORD	193.8657	1.00	10.0	0.00
454	170	193	13	TCORD	193.8657	1.00	10.0	0.00
455	193	210	13	TCORD	193.8657	1.00	10.0	0.00
456	210	233	13	TCORD	193.8657	1.00	10.0	0.00
457	233	10	13	TCORD	193.8657	1.00	10.0	0.00
458	13	35	13	TCORD	112.5103	1.00	15.0	0.00
459	33	55	13	TCORD	112.5103	1.00	15.0	0.00
460	53	75	13	TCORD	112.5103	1.00	15.0	0.00
461	73	95	13	TCORD	112.5103	1.00	15.0	0.00
462	93	115	13	TCORD	112.5103	1.00	15.0	0.00
463	113	135	13	TCORD	112.5103	1.00	15.0	0.00
464	133	155	13	TCORD	112.5103	1.00	15.0	0.00
465	153	175	13	TCORD	112.5103	1.00	15.0	0.00
466	173	195	13	TCORD	112.5103	1.00	15.0	0.00
467	193	215	13	TCORD	112.5103	1.00	15.0	0.00
468	213	235	13	TCORD	112.5103	1.00	15.0	0.00
469	233	15	13	TCORD	112.5103	1.00	15.0	0.00
470	33	15	13	TCORD	112.5103	1.00	15.0	0.00
471	53	35	13	TCORD	112.5103	1.00	15.0	0.00
472	73	55	13	TCORD	112.5103	1.00	15.0	0.00
473	93	75	13	TCORD	112.5103	1.00	15.0	0.00
474	113	95	13	TCORD	112.5103	1.00	15.0	0.00
475	133	115	13	TCORD	112.5103	1.00	15.0	0.00
476	153	135	13	TCORD	112.5103	1.00	15.0	0.00
477	173	155	13	TCORD	112.5103	1.00	15.0	0.00
478	193	175	13	TCORD	112.5103	1.00	15.0	0.00
479	213	195	13	TCORD	112.5103	1.00	15.0	0.00
480	233	215	13	TCORD	112.5103	1.00	15.0	0.00
481	13	235	13	TCORD	112.5103	1.00	15.0	0.00
482	242	243	14	HUB	79.1040	3.56	-97.4	0.00
483	30	55	13	TCORD	193.8657	1.00	10.0	0.00
484	53	70	13	TCORD	193.8657	1.00	10.0	0.00
485	70	93	13	TCORD	193.8657	1.00	10.0	0.00
486	93	110	13	TCORD	193.8657	1.00	10.0	0.00
487	110	133	13	TCORD	193.8657	1.00	10.0	0.00
488	133	150	13	TCORD	193.8657	1.00	10.0	0.00
489	150	173	13	TCORD	193.8657	1.00	10.0	0.00
490	173	190	13	TCORD	193.8657	1.00	10.0	0.00
491	190	213	13	TCORD	193.8657	1.00	10.0	0.00
492	213	230	13	TCORD	193.8657	1.00	10.0	0.00
493	230	13	13	TCORD	193.8657	1.00	10.0	0.00
494	13	30	13	TCORD	193.8657	1.00	10.0	0.00

MEMBRANE ELEMENTS

NO.	JA	JB	JC	MAT.	MATL. NAME	AREA	ANGLE A	ANGLE B	ANGLE C	NX	NY	NXY	TEMP.	PRES.	MATL. ANGLE	STRESS ANGLE
1	1	6	7	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
2	21	26	27	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
3	41	46	47	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
4	61	66	67	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
5	81	86	87	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
6	101	106	107	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
7	121	126	127	1	MESH	2.75E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
8	141	146	147	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
9	161	166	167	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
10	181	186	187	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
11	201	206	207	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
12	221	226	227	1	MESH	2.76E+03	52.0	69.0	58.9	1.01E-02	1.98E-02	-1.16E-03	0.0	0.0	6.5	0.0
13	7	2	1	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.66E-06	0.0	0.0	0.0	0.0
14	27	22	21	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
15	47	42	41	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.66E-06	0.0	0.0	0.0	0.0
16	67	62	61	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
17	87	82	81	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
18	107	102	101	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.66E-06	0.0	0.0	0.0	0.0
19	127	122	121	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
20	147	142	141	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
21	167	162	161	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.66E-06	0.0	0.0	0.0	0.0
22	187	182	181	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
23	207	202	201	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.65E-06	0.0	0.0	0.0	0.0
24	227	222	221	1	MESH	1.91E+03	45.8	90.0	44.2	9.94E-03	1.99E-02	2.66E-06	0.0	0.0	0.0	0.0
25	2	227	1	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.66E-06	0.0	0.0	0.0	0.0
26	22	7	21	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.66E-06	0.0	0.0	0.0	0.0
27	42	27	41	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
28	62	47	61	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
29	82	67	81	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.66E-06	0.0	0.0	0.0	0.0
30	102	87	101	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
31	122	107	121	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
32	142	127	141	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.66E-06	0.0	0.0	0.0	0.0
33	162	147	161	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
34	182	167	181	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
35	202	187	201	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.66E-06	0.0	0.0	0.0	0.0
36	222	207	221	1	MESH	1.91E+03	90.0	45.8	44.2	9.94E-03	1.99E-02	-2.65E-06	0.0	0.0	0.0	0.0
37	226	1	227	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
38	6	21	7	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
39	26	41	27	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
40	46	61	47	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
41	66	81	67	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
42	86	101	87	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
43	106	121	107	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
44	126	141	127	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
45	146	161	147	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
46	166	181	167	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
47	186	201	187	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
48	206	221	207	1	MESH	2.76E+03	69.0	52.0	58.9	1.01E-02	1.98E-02	1.16E-03	0.0	0.0	-6.5	0.0
49	2	7	8	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.32E-06	0.0	0.0	0.0	0.0
50	22	27	28	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0

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MEMBRANE ELEMENTS

NO.	JA	JB	JC	MAT.	MATL. NAME	AREA	ANGLE A	ANGLE B	ANGLE C	NX	NY	NXY	TEMP.	PRES.	MATL. ANGLE	STRESS ANGLE
51	42	47	48	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
52	62	67	68	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
53	82	87	88	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
54	102	107	108	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.32E-06	0.0	0.0	0.0	0.0
55	122	127	128	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
56	142	147	148	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
57	162	167	168	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.32E-06	0.0	0.0	0.0	0.0
58	182	187	188	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
59	202	207	208	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
60	222	227	228	1	MESH	2.23E+03	60.5	75.2	44.4	9.99E-03	2.00E-02	-1.33E-06	0.0	0.0	0.0	0.0
61	8	3	2	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
62	28	23	22	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
63	48	43	42	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
64	68	63	62	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
65	88	83	82	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.73E-06	0.0	0.0	0.0	0.0
66	108	103	102	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
67	128	123	122	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
68	148	143	142	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.73E-06	0.0	0.0	0.0	0.0
69	168	163	162	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
70	188	183	182	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
71	208	203	202	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.73E-06	0.0	0.0	0.0	0.0
72	228	223	222	1	MESH	1.52E+03	60.5	90.0	29.5	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
73	3	228	2	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
74	23	8	22	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
75	43	28	42	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.73E-06	0.0	0.0	0.0	0.0
76	63	48	62	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
77	83	68	82	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
78	103	88	102	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.73E-06	0.0	0.0	0.0	0.0
79	123	108	122	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
80	143	128	142	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
81	163	148	162	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.73E-06	0.0	0.0	0.0	0.0
82	183	168	182	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
83	203	188	202	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
84	223	208	222	1	MESH	1.52E+03	90.0	60.5	29.5	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
85	227	2	228	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.32E-06	0.0	0.0	0.0	0.0
86	7	22	8	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
87	27	42	28	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
88	47	62	48	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
89	67	82	68	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.32E-06	0.0	0.0	0.0	0.0
90	87	102	88	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
91	107	122	108	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
92	127	142	128	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.32E-06	0.0	0.0	0.0	0.0
93	147	162	148	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
94	167	182	168	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
95	187	202	188	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
96	207	222	208	1	MESH	2.23E+03	75.2	60.5	44.4	9.99E-03	2.00E-02	1.33E-06	0.0	0.0	0.0	0.0
97	3	8	9	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
98	23	28	29	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
99	43	48	49	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
100	63	68	69	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0

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MEMBRANE ELEMENTS

NO.	JA	JB	JC	MAT.	MATL. NAME	AREA	ANGLE A	ANGLE B	ANGLE C	NX	NY	NXY	TEMP.	PRES.	MATL. ANGLE	STRESS ANGLE
101	83	88	89	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
102	103	108	109	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
103	123	128	129	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
104	143	148	149	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
105	163	168	169	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
106	183	188	189	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
107	203	208	209	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.75E-06	0.0	0.0	0.0	0.0
108	223	228	229	1	MESH	1.55E+03	74.1	75.1	30.9	9.99E-03	2.00E-02	-1.74E-06	0.0	0.0	0.0	0.0
109	9	229	3	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-4.80E-13	0.0	0.0	0.0	0.0
110	29	9	23	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-9.14E-09	0.0	0.0	0.0	0.0
111	49	29	43	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	1.19E-08	0.0	0.0	0.0	0.0
112	69	49	63	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-6.56E-10	0.0	0.0	0.0	0.0
113	89	69	83	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-1.29E-08	0.0	0.0	0.0	0.0
114	109	89	103	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	1.22E-08	0.0	0.0	0.0	0.0
115	129	109	123	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-4.39E-13	0.0	0.0	0.0	0.0
116	149	129	143	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-1.22E-08	0.0	0.0	0.0	0.0
117	169	149	163	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	1.29E-08	0.0	0.0	0.0	0.0
118	189	169	183	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	6.57E-10	0.0	0.0	0.0	0.0
119	209	189	203	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	-1.19E-08	0.0	0.0	0.0	0.0
120	229	209	223	1	MESH	1.61E+03	74.1	74.1	31.8	9.97E-03	2.00E-02	9.14E-09	0.0	0.0	0.0	0.0
121	228	3	229	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
122	8	23	9	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
123	28	43	29	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
124	48	63	49	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
125	68	83	69	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
126	88	103	89	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
127	108	123	109	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
128	128	143	129	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
129	148	163	149	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
130	168	183	169	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
131	188	203	189	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.74E-06	0.0	0.0	0.0	0.0
132	208	223	209	1	MESH	1.55E+03	75.1	74.1	30.9	9.99E-03	2.00E-02	1.75E-06	0.0	0.0	0.0	0.0
133	229	9	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	8.17E-14	0.0	0.0	0.0	0.0
134	9	29	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-9.77E-09	0.0	0.0	0.0	0.0
135	29	49	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	1.34E-08	0.0	0.0	0.0	0.0
136	49	69	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-8.12E-10	0.0	0.0	0.0	0.0
137	69	89	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-1.44E-08	0.0	0.0	0.0	0.0
138	89	109	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	1.33E-08	0.0	0.0	0.0	0.0
139	109	129	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-1.69E-13	0.0	0.0	0.0	0.0
140	129	149	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-1.33E-08	0.0	0.0	0.0	0.0
141	149	169	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	1.44E-08	0.0	0.0	0.0	0.0
142	169	189	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	8.11E-10	0.0	0.0	0.0	0.0
143	189	209	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	-1.34E-08	0.0	0.0	0.0	0.0
144	209	229	241	1	MESH	1.71E+03	75.0	75.0	30.0	9.95E-03	1.99E-02	9.77E-09	0.0	0.0	0.0	0.0

TOTAL AREA=2.79055E+05

BEAM PROPERTY TABLE

PROP NO.	AREA	J	I3	I2	SF2	SF3	H2	H3	NAME
1	1.970E-02	4.210E-06	2.104E-06	2.418E-04	0.44	0.44	0.000	0.000	STRIP
2	0.187	0.416	0.208	0.208	0.53	0.53	0.000	0.000	RIB
3	1.636E-02	4.266E-05	0.213	0.213	0.89	0.89	0.000	0.000	ROD
4	3.56	133.	66.3	66.3	0.53	0.53	0.000	0.000	HUB
5	0.146	8.318E-02	4.160E-02	4.160E-02	0.53	0.53	0.000	0.000	STRUT
6	2.770E-03	3.504E-04	1.752E-04	1.752E-04	0.20	0.20	0.000	0.000	TIPSO
7	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
10	0.251	0.00	0.00	0.00	0.00	0.00	0.000	0.000	LONG
11	4.900E-02	0.00	0.00	0.00	0.00	0.00	0.000	0.000	DIAG
12	0.125	0.00	0.00	0.00	0.00	0.00	0.000	0.000	PLAT
13	0.500	2.00	1.00	1.00	0.00	0.00	0.000	0.000	ANT

ORIGINAL PAGE IS
OF POOR QUALITY

BEAM CONNECTIVITY TABLE

BEAM NO.	JA	JB	JC	MAT. NO.	MAT. NAME	PROP. NO.	PROP. NAME	FIXITY	LENGTH	FIX	WEIGHT	TA	TB	TYA	TYB	TZA	TZB
1	10	11	6	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
2	30	31	26	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
3	50	51	46	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
4	70	71	66	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
5	90	91	86	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
6	110	111	106	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
7	130	131	126	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
8	150	151	146	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
9	170	171	166	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
10	190	191	186	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
11	210	211	206	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
12	230	231	226	10	RIB	2	RIB	110101010	10.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
13	11	12	6	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
14	31	32	26	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
15	51	52	46	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
16	71	72	66	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
17	91	92	86	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
18	111	112	106	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
19	131	132	126	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
20	151	152	146	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
21	171	172	166	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
22	191	192	186	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
23	211	212	206	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
24	231	232	226	10	RIB	2	RIB	110101010	67.305		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
25	12	13	7	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
26	32	33	27	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+09	0.E+00
27	52	53	47	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
28	72	73	67	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
29	92	93	87	10	RIB	2	RIB	110101010	77.289		0.0	0.F+00	0.F+00	0.E+00	0.E+00	0.E+00	0.E+00
30	112	113	107	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
31	132	133	127	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
32	152	153	147	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
33	172	173	167	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
34	192	193	187	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
35	212	213	207	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
36	232	233	227	10	RIB	2	RIB	110101010	77.289		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
37	13	14	8	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
38	33	34	28	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
39	53	54	48	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
40	73	74	68	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
41	93	94	88	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
42	113	114	108	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
43	133	134	128	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
44	153	154	148	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
45	173	174	168	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
46	193	194	188	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
47	213	214	208	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
48	233	234	228	10	RIB	2	RIB	110101010	79.058		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
49	14	242	9	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
50	34	242	29	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00

BEAM CONNECTIVITY TABLE

BEAM NO.	JA	JB	JC	MAT. NO.	MAT. NAME	PROP. NO.	PROP. NAME	FIXITY	LENGTH	FIX	WEIGHT	TA	TB	TYA	TYB	TZA	TZB
51	54	242	49	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
52	74	242	69	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
53	94	242	89	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
54	114	242	109	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
55	134	242	129	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
56	154	242	149	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
57	174	242	169	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
58	194	242	189	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
59	214	242	209	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
60	234	242	229	10	RIB	2	RIB	110001010	84.564		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
61	13	15	12	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
62	33	35	32	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
63	53	55	52	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
64	73	75	72	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
65	93	95	92	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
66	113	115	112	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
67	133	135	132	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
68	153	155	152	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
69	173	175	172	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
70	193	195	192	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
71	213	215	212	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
72	233	235	232	17	STRUT	5	STRUT	100101010	71.000		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
73	242	243	14	15	HUB	4	HUB	110101010	79.104		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
74	6	11	10	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
75	26	31	30	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
76	46	51	50	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
77	66	71	70	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
78	86	91	90	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
79	106	111	110	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
80	126	131	130	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
81	146	151	150	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
82	166	171	170	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
83	186	191	190	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
84	206	211	210	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
85	226	231	230	19	TIPSO	6	TIPSO	100001010	16.603		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
86	6	7	10	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
87	26	27	30	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
88	46	47	50	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
89	66	67	70	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
90	86	87	90	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
91	106	107	110	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
92	126	127	130	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
93	146	147	150	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
94	166	167	170	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
95	186	187	190	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
96	206	207	210	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
97	226	227	230	8	STRIP	1	STRIP	110101010	73.724		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
98	7	8	12	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
99	27	28	32	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
100	47	48	52	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00

BEAM CONNECTIVITY TABLE

BEAM NO.	JA	JB	JC	MAT. NO.	MAT. NAME	PROP. NO.	PROP. NAME	FIXITY	LENGTH	FIX	WEIGHT	TA	TB	TYA	TYB	TZA	TZB
101	67	68	72	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
102	87	88	92	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
103	107	108	112	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
104	127	128	132	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
105	147	148	152	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
106	167	168	172	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
107	187	188	192	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
108	207	208	212	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
109	227	228	232	8	STRIP	1	STRIP	110101010	75.783		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
110	8	9	13	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
111	28	29	33	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
112	48	49	53	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
113	68	69	73	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
114	88	89	93	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
115	108	109	113	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
116	128	129	133	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
117	148	149	153	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
118	168	169	173	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
119	188	189	193	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
120	208	209	213	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
121	228	229	233	8	STRIP	1	STRIP	110101010	77.659		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
122	9	241	14	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
123	29	241	34	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
124	49	241	54	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
125	69	241	74	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
126	89	241	94	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
127	109	241	114	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
128	129	241	134	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
129	149	241	154	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
130	169	241	174	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
131	189	241	194	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
132	209	241	214	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
133	229	241	234	8	STRIP	1	STRIP	110101010	82.770		0.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
134	251	252	0	21	TGRPH	10	LONG	1000000000	162.19	B-B	3.3	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
135	251	253	0	21	TGRPH	10	LONG	1000000000	124.48	B-B	2.5	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
136	252	253	0	21	TGRPH	10	LONG	1000000000	124.48	B-B	2.5	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
137	230	253	0	21	TGRPH	10	LONG	1000000000	105.95	B-B	2.2	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
138	10	253	0	21	TGRPH	10	LONG	1000000000	105.95	B-B	2.2	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
139	251	230	0	21	TGRPH	10	LONG	1000000000	81.460	B-B	1.7	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
140	252	10	0	21	TGRPH	10	LONG	1000000000	81.460	B-B	1.7	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
141	251	233	0	21	TGRPH	10	LONG	1000000000	172.71	B-B	3.5	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
142	252	13	0	21	TGRPH	10	LONG	1000000000	172.71	B-B	3.5	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
143	230	262	0	21	TGRPH	10	LONG	1000000000	155.69	B-B	3.2	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
144	10	261	0	21	TGRPH	10	LONG	1000000000	155.69	B-B	3.2	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
145	253	260	0	21	TGRPH	10	LONG	1000000000	150.00	B-B	3.0	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
146	260	263	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
147	263	266	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
148	266	269	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
149	269	272	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
150	261	264	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00

BEAM CONNECTIVITY TABLE

BEAM NO.	JA	JB	JC	MAT. NO.	MAT. NAME	PROP. NO.	PROP. NAME	FIXITY	LENGTH	FIX	WEIGHT	TA	TB	TYA	TYB	TZA	TZB
151	264	267	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
152	267	270	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
153	270	273	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
154	262	265	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
155	265	268	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
156	268	271	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
157	271	274	0	21	TGRPH	10	LONG	1000000000	130.00	B-B	2.6	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
158	260	261	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
159	263	264	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
160	266	267	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
161	269	270	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
162	272	273	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
163	261	262	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
164	264	265	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
165	267	268	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
166	270	271	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
167	273	274	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
168	262	260	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
169	265	263	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
170	268	266	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
171	271	269	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
172	274	272	0	21	TGRPH	12	PLAT	1000000000	78.740	B-B	0.80	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
173	10	262	0	21	TGRPH	11	DIAG	1000000000	192.38	B-B	0.76	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
174	230	261	0	21	TGRPH	11	DIAG	1000000000	192.38	B-B	0.76	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
175	230	260	0	21	TGRPH	11	DIAG	1000000000	183.65	B-B	0.73	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
176	253	262	0	21	TGRPH	11	DIAG	1000000000	169.41	B-B	0.67	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
177	253	261	0	21	TGRPH	11	DIAG	1000000000	169.41	B-B	0.67	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
178	10	260	0	21	TGRPH	11	DIAG	1000000000	183.65	B-B	0.73	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
179	262	263	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
180	265	266	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
181	268	269	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
182	271	272	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
183	260	265	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
184	263	268	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
185	266	271	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
186	269	274	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
187	260	264	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
188	263	267	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
189	266	270	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
190	269	273	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
191	261	263	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
192	264	266	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
193	267	269	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
194	270	272	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
195	261	265	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
196	264	268	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
197	267	271	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
198	270	274	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
199	262	264	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
200	265	267	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00

BEAM CONNECTIVITY TABLE

BEAM NO.	JA	JB	JC	MAT. NO.	MAT. NAME	PROP. NO.	PROP. NAME	FIXITY	LENGTH	FIX	WEIGHT	TA	TB	TYA	TYB	TZA	TZB
201	268	270	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
202	271	273	0	21	TGRPH	11	DIAG	1000000000	151.99	B-B	0.60	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00

ORIGINAL PAGE IS
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NODAL WEIGHTS (IN ADDITION TO DISTRIBUTED WEIGHTS)

NODE	WEIGHT	NODE	WEIGHT	NODE	WEIGHT	NODE	WEIGHT	NODE	WEIGHT
1	.91430E-01	2	.15200	3	.11800	4	.18590E-01	5	.12790E-01
6	.19300	7	.35400	8	.31100	9	.32100	10	4.7000
11	1.4900	12	2.7500	13	5.9100	14	3.1100	15	1.2300
16	0.0000	17	0.0000	18	0.0000	19	0.0000	20	0.0000
21	.91430E-01	22	.15200	23	.11800	24	.18590E-01	25	.12790E-01
26	.19300	27	.35400	28	.31100	29	.32100	30	.46100
31	1.4900	32	2.7500	33	4.1500	34	3.1100	35	1.2300
36	0.0000	37	0.0000	38	0.0000	39	0.0000	40	0.0000
41	.91430E-01	42	.15200	43	.11800	44	.18590E-01	45	.12790E-01
46	.19300	47	.35400	48	.31100	49	.32100	50	.4610
51	1.4900	52	2.7500	53	4.1500	54	3.1100	55	1.2300
56	0.0000	57	0.0000	58	0.0000	59	0.0000	60	0.0000
61	.91430E-01	62	.15200	63	.11800	64	.18590E-01	65	.12790E-01
66	.19300	67	.35400	68	.31100	69	.32100	70	.46100
71	1.4900	72	2.7500	73	4.1500	74	3.1100	75	1.2300
76	0.0000	77	0.0000	78	0.0000	79	0.0000	80	0.0000
81	.91430E-01	82	.15200	83	.11800	84	.18590E-01	85	.12790E-01
86	.19300	87	.35400	88	.31100	89	.32100	90	.46100
91	1.4900	92	2.7500	93	4.1500	94	3.1100	95	1.2300
96	0.0000	97	0.0000	98	0.0000	99	0.0000	100	0.0000
101	.91430E-01	102	.15200	103	.11800	104	.18590E-01	105	.12790E-01
106	.19300	107	.35400	108	.31100	109	.32100	110	.46100
111	1.4900	112	2.7500	113	4.1500	114	3.1100	115	1.2300
116	0.0000	117	0.0000	118	0.0000	119	0.0000	120	0.0000
121	.91430E-01	122	.15200	123	.11800	124	.18590E-01	125	.12790E-01
126	.19300	127	.35400	128	.31100	129	.32100	130	.46100
131	1.4900	132	2.7500	133	4.1500	134	3.1100	135	1.2300
136	0.0000	137	0.0000	138	0.0000	139	0.0000	140	0.0000
141	.91430E-01	142	.15200	143	.11800	144	.18590E-01	145	.12790E-01
146	.19300	147	.35400	148	.31100	149	.32100	150	.46100
151	1.4900	152	2.7500	153	4.1500	154	3.1100	155	1.2300
156	0.0000	157	0.0000	158	0.0000	159	0.0000	160	0.0000
161	.91430E-01	162	.15200	163	.11800	164	.18590E-01	165	.12790E-01
166	.19300	167	.35400	168	.31100	169	.32100	170	.46100
171	1.4900	172	2.7500	173	4.1500	174	3.1100	175	1.2300
176	0.0000	177	0.0000	178	0.0000	179	0.0000	180	0.0000
181	.91430E-01	182	.15200	183	.11800	184	.18590E-01	185	.12790E-01
186	.19300	187	.35400	188	.31100	189	.32100	190	.46100
191	1.4900	192	2.7500	193	4.1500	194	3.1100	195	1.2300
196	0.0000	197	0.0000	198	0.0000	199	0.0000	200	0.0000
201	.91430E-01	202	.15200	203	.11800	204	.18590E-01	205	.12790E-01
206	.19300	207	.35400	208	.31100	209	.32100	210	.46100
211	1.4900	212	2.7500	213	4.1500	214	3.1100	215	1.2300
216	0.0000	217	0.0000	218	0.0000	219	0.0000	220	0.0000
221	.91430E-01	222	.15200	223	.11800	224	.18590E-01	225	.12790E-01
226	.19300	227	.35400	228	.31100	229	.32100	230	4.7000
231	1.4900	232	2.7500	233	5.9100	234	3.1100	235	1.2300
236	0.0000	237	0.0000	238	0.0000	239	0.0000	240	0.0000
241	1.2900	242	31.700	243	14.600	244	0.0000	245	0.0000
246	0.0000	247	0.0000	248	0.0000	249	0.0000	250	0.0000
251	5.5000	252	5.5000	253	6.8800	254	0.0000	255	0.0000
256	0.0000	257	0.0000	258	0.0000	259	0.0000	260	4.9800
261	5.0200	262	5.0200	263	4.6500	264	4.6500	265	4.6500
266	4.6500	267	4.6500	268	4.6500	269	4.6500	270	4.6500
271	4.6500	272	2.7200	273	2.7200	274	2.7200		

```
WEIGHT MOMENTS OF INERTIA ABOUT THE SYSTEM DEFINED BY JA, JB, JC =   248  249  250 ARE:
      0.31965E+03 0.00000E+01 0.00000E+01 0.00000E+01-0.27176E-05 0.22034E+01
      0.00000E+01 0.31965E+03 0.00000E+01 0.27176E-05 0.00000E+01 0.22106E+05
      0.00000E+01 0.00000E+01 0.31965E+03-0.22034E+01-0.22106E+05 0.00000E+01
      0.00000E+01 0.27176E-05-0.22034E+01 0.10331E+08-0.47458E+07 0.38624E-04
     -0.27176E-05 0.00000E+01-0.22106E+05-0.47458E+07 0.20521E+08 0.10824E-03
      0.22034E+01 0.22106E+05 0.00000E+01 0.38624E-04 0.10824E-03 0.23537E+08
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FORCES APPLIED W.R.T. ASSEMBLY D.O.F.

NODE	SYS	DOF 1	DOF 2	DOF 3	DOF 4	DOF 5	DOF 6

```
TOTAL FORCE FOR DOF 1 =  0.0000
TOTAL FORCE FOR DOF 2 =  0.0000
TOTAL FORCE FOR DOF 3 =  0.0000
TOTAL FORCE FOR DOF 4 =  0.0000
TOTAL FORCE FOR DOF 5 =  0.0000
TOTAL FORCE FOR DOF 6 =  0.0000
```

NODE VS. DOF TABLE

NODE	SYS	LDOF	EQU	BAND	NODE	SYS	LDOF	EQU	BAND	NODE	SYS	LDOF	EQU	BAND
1	3	111000	1	1	2	3	111000	4	4	3	3	111000	7	4
4	3	111000	10	7	5	3	111000	13	7	6	3	111111	16	16
7	3	111111	22	22	8	3	111111	28	25	9	3	111111	34	28
10	3	111111	40	40	11	3	111111	46	31	12	3	111111	52	43
13	3	111111	58	46	14	3	111111	64	31	15	3	111111	70	31
16	0	0	0	-2	17	0	0	0	-2	18	0	0	0	-2
19	0	0	0	-2	20	0	0	0	-2	21	3	111000	76	61
22	3	111000	79	58	23	3	111000	82	55	24	3	111000	85	34
25	3	111000	88	31	26	3	111111	91	76	27	3	111111	97	22
28	3	111111	103	25	29	3	111111	109	76	30	3	111111	115	76
31	3	111111	121	76	32	3	111111	127	43	33	3	111111	133	94
34	3	111111	139	76	35	3	111111	145	88	36	0	0	0	-2
37	0	0	0	-2	38	0	0	0	-2	39	0	0	0	-2
40	0	0	0	-2	41	3	111000	151	61	42	3	111000	154	58
43	3	111000	157	55	44	3	111000	160	34	45	3	111000	163	31
46	3	111111	166	76	47	3	111111	172	22	48	3	111111	178	25
49	3	111111	184	76	50	3	111111	190	76	51	3	111111	196	76
52	3	111111	202	43	53	3	111111	208	94	54	3	111111	214	76
55	3	111111	220	88	56	0	0	0	-2	57	0	0	0	-2
58	0	0	0	-2	59	0	0	0	-2	60	0	0	0	-2
61	3	111000	226	61	62	3	111000	229	58	63	3	111000	232	55
64	3	111000	235	34	65	3	111000	238	31	66	3	111111	241	76
67	3	111111	247	22	68	3	111111	253	25	69	3	111111	259	76
70	3	111111	265	76	71	3	111111	271	76	72	3	111111	277	43
73	3	111111	283	94	74	3	111111	289	76	75	3	111111	295	88
76	0	0	0	-2	77	0	0	0	-2	78	0	0	0	-2
79	0	0	0	-2	80	0	0	0	-2	81	3	111000	301	61
82	3	111000	304	58	83	3	111000	307	55	84	3	111000	310	34
85	3	111000	313	31	86	3	111111	316	76	87	3	111111	322	22
88	3	111111	328	25	89	3	111111	334	76	90	3	111111	340	76
91	3	111111	346	76	92	3	111111	352	43	93	3	111111	358	94
94	3	111111	364	76	95	3	111111	370	88	96	0	0	0	-2
97	0	0	0	-2	98	0	0	0	-2	99	0	0	0	-2
100	0	0	0	-2	101	3	111000	376	61	102	3	111000	379	58
103	3	111000	382	55	104	3	111000	385	34	105	3	111000	388	31
106	3	111111	391	76	107	3	111111	397	22	108	3	111111	403	25
109	3	111111	409	76	110	3	111111	415	76	111	3	111111	421	76
112	3	111111	427	43	113	3	111111	433	94	114	3	111111	439	76
115	3	111111	445	88	116	0	0	0	-2	117	0	0	0	-2
118	0	0	0	-2	119	0	0	0	-2	120	0	0	0	-2
121	3	111000	451	61	122	3	111000	454	58	123	3	111000	457	55
124	3	111000	460	34	125	3	111000	463	31	126	3	111111	466	76
127	3	111111	472	22	128	3	111111	478	25	129	3	111111	484	76
130	3	111111	490	76	131	3	111111	496	76	132	3	111111	502	43
133	3	111111	508	94	134	3	111111	514	76	135	3	111111	520	88
136	0	0	0	-2	137	0	0	0	-2	138	0	0	0	-2
139	0	0	0	-2	140	0	0	0	-2	141	3	111000	526	61
142	3	111000	529	58	143	3	111000	532	55	144	3	111000	535	34
145	3	111000	538	31	146	3	111111	541	76	147	3	111111	547	22
148	3	111111	553	25	149	3	111111	559	76	150	3	111111	565	76
151	3	111111	571	76	152	3	111111	577	43	153	3	111111	583	94
154	3	111111	589	76	155	3	111111	595	88	156	0	0	0	-2
157	0	0	0	-2	158	0	0	0	-2	159	0	0	0	-2
160	0	0	0	-2	161	3	111000	601	61	162	3	111000	604	58
163	3	111000	607	55	164	3	111000	610	34	165	3	111000	613	31
166	3	111111	616	76	167	3	111111	622	22	168	3	111111	628	25

169	3	111111	634	76	170	3	111111	640	76	171	3	111111	646	76
172	3	111111	652	43	173	3	111111	658	94	174	3	111111	664	76
175	3	111111	670	88	176	0	0	0	-2	177	0	0	0	-2
178	0	0	0	-2	179	0	0	0	-2	180	0	0	0	-2
181	3	111000	676	61	182	3	111000	679	58	183	3	111000	682	55
184	3	111000	685	34	185	3	111000	688	31	186	3	111111	691	76
187	3	111111	697	22	188	3	111111	703	25	189	3	111111	709	76
190	3	111111	715	76	191	3	111111	721	76	192	3	111111	727	43
193	3	111111	733	94	194	3	111111	739	76	195	3	111111	745	88
196	0	0	0	-2	197	0	0	0	-2	198	0	0	0	-2
199	0	0	0	-2	200	0	0	0	-2	201	3	111000	751	61
202	3	111000	754	58	203	3	111000	757	55	204	3	111000	760	34
205	3	111000	763	31	206	3	111111	766	76	207	3	111111	772	22
208	3	111111	778	25	209	3	111111	784	76	210	3	111111	790	76
211	3	111111	796	76	212	3	111111	802	43	213	3	111111	808	94
214	3	111111	814	76	215	3	111111	820	88	216	0	0	0	-2
217	0	0	0	-2	218	0	0	0	-2	219	0	0	0	-2
220	0	0	0	-2	221	3	111000	826	61	222	3	111000	829	58
223	3	111000	832	55	224	3	111000	835	34	225	3	111000	838	31
226	3	111111	841	841	227	3	111111	847	847	228	3	111111	853	850
229	3	111111	859	853	230	3	111111	865	865	231	3	111111	871	826
232	3	111111	877	868	233	3	111111	883	871	234	3	111111	889	826
235	3	111111	895	838	236	0	0	0	-2	237	0	0	0	-2
238	0	0	0	-2	239	0	0	0	-2	240	0	0	0	-2
241	3	111111	901	868	242	3	111111	907	844	243	3	111111	913	856
244	0	0	0	-2	245	0	0	0	-2	246	0	0	0	-2
247	0	0	0	-2	248	0	0	0	-2	249	0	0	0	-2
250	0	0	0	-2	251	3	111000	919	55	252	3	111000	922	883
253	3	111000	925	886	254	0	0	0	-2	255	0	0	0	-2
256	0	0	0	-2	257	0	0	0	-2	258	0	0	0	-2
259	0	0	0	-2	260	3	111000	928	889	261	3	111000	931	892
262	3	111000	934	895	263	3	111000	937	10	264	3	111000	940	13
265	3	111000	943	16	266	3	111000	946	10	267	3	111000	949	13
268	3	111000	952	16	269	3	111000	955	10	270	3	111000	958	13
271	3	111000	961	16	272	3	0	0	-2	273	3	0	0	-2
274	3	0	0	-2										

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THE LARGEST STRUCTURAL NODE NUMBER  =       274
THE TOTAL NUMBER OF EQUATIONS       =       963
THE TOTAL NUMBER OF RECORDS         =    131193
THE MAXIMUM D.O.F. AT ANY NODE      =         6
THE NUMBER OF SOLUTION INCREMENTS   =         1
THE VALUE OF THE GROUND SPRING      = 0.100000E+11
THE GRAVITY DIRECTION IS FROM NODE   248 TO NODE   249
THE ROTATION LIMIT                  = 0.100000E+02

IWGHTS =      0     IWGHTM =      0     IWGHTB =      0
ITEMPS =      0     ITEMPM =      0     ITEMPB =      0
IPRESM =      0
LOCG   =      0     LOCS   =      0     LOCM   =      0
IPUT   =      1     ISTART =      0     IROOT  =      1
ITER   =      0     LOCB   =      0     LOCR   =      0
IFORCE =      0     LOCSTF =     10     NRFRMK =      0
NASTY  =      0     IRSTRT =      0     IPREF  =      0
IPGLOB =      0     IPSTRI =      0     IPMEMB =      0
IPBEMP =      0     IPBEAM =      0     IPFGLO =      0
IPDOF  =      0     IPDISP =      0     IPDGLB =      0
IPSTRL =      0     IPMEML =      0     IPBML  =      0
IPKU   =      0     F      = 0.7087E+03 ZOO    = 0.0000E+01
FMAXA  = 0.0000E+01
@ASG,T 1.,D///     144044  .
@ASG,T 2.,D///     144044  .
@ASG,T 3.,D///     144044  .

INPUT DATA PROCESSED AND CHECKED. EXECUTION NOT REQUESTED
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