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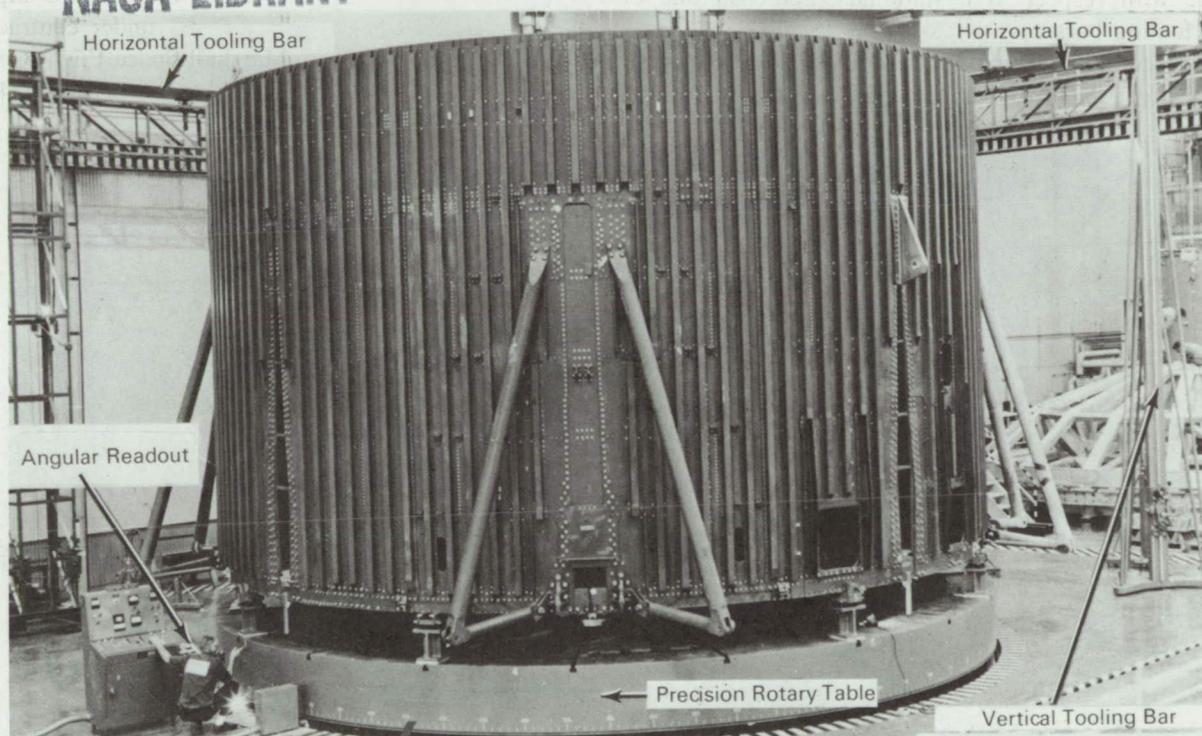
NASA TECH BRIEF

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System Enables Dimensional Inspection of Very Large Structures



The problem:

To develop a system that will enable accurate and rapid measurement of linear and angular dimensions on very large structures of any configuration.

The solution:

A precision rotary table with an integrated optical tooling bar system that can be used for measurement of structures with horizontal dimensions of up to 45 feet and a maximum height of 30 feet. Linear dimensions can be rapidly measured to an accuracy of

within 0.005 inch, and angular dimensions can be measured to within 2 seconds of arc.

How it's done:

The structure is mounted on the turntable which can be rotated 360° to expose any desired surface to sighting by the optical tooling bars. The table turns on a bearing which is fully compensated by pressurized fluid in both the radial and thrust planes. The bearing provides a precise, stable, essentially frictionless axis of rotation, and will support an object with a weight of 40 tons.

(continued overleaf)

There are three tooling bars, two horizontal and one vertical, which are located around the periphery of the turntable. The horizontal tooling bars are stationary and situated 90 degrees to each other along two sides of the turntable. The vertical tooling bar is mobile and located at the outer end of one of the horizontal tooling bars. Utilizing lateral adjusters mounted on the table, the structure to be measured is centered to within 0.005 inch (total indicated reading). The structure can then be rotated while maintaining a parallel relationship to the horizontal tooling bars and a perpendicular relationship to the vertical tooling bar. Linear measurements are made through the use of master indexing bars on each of the tooling bars, with the table in a stationary position. Angular measurements are made by rotating the table with respect to a stationary point on one of the tooling bars.

The equipment includes readout systems that provide direct linear and angular indications. The linear

readout is in inches, and the angular readout is in degrees, minutes, and seconds.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10214

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: R. R. Simpson
of The Boeing Company
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