Boeing First Machine for Automation of C-17 Fuselage Skin Panel Assembly now in Operation in Long Beach

The first of several giant machine tools to automate fuselage skin panel assembly for the U.S. Air Force C-17 Globemaster III airlifter has been installed and is now in operation at Boeing facilities here.

The machine is a Torres Mill, a 5-axis computer numerically controlled trimming and drilling machine. It can trim and drill skin panels as long as 40 feet and as wide as 12 feet, with a curvature of up to 3 feet. It is capable of trimming panels at a rate of up to 400 inches a minute.

In addition to the trimming operation, the machine will precisely drill tool coordinating holes for location of detail parts in later assembly operations. The drilling and trimming operations are controlled by an electronic data base of the parts' dimensions, and it provides accuracy within .0002 of an inch, less than the thickness of a human hair. The machine also cuts out openings for hatches, access panels and wiring and tubing.

"This new machine, and the others that will follow, will allow us to satisfy our Air Force customer with the highest-quality product at a reduced cost, while allowing us to increase our production rate," said Bill Gendron, deputy C-17 program manager at Boeing.

"Our investment in automated machinery allows us to use and expand the skills of our workers and maintain a stable work force while increasing production," Gendron said. "The C-17 is the most modern airlifter in the world, and we want to use the most modern methods to produce it."

Using the Torres Mill will provide five times better accuracy for the assembly operations at Macon, Ga., and Long Beach, and decrease employee hours, provide more consistent quality and lower rework and repair costs.

The accuracy is necessary for two follow-on automation machines that are planned for operation beginning in 1998. One of the machines is an automated ring riveter that is 33 feet tall, more than 50 feet wide and more than 200 feet long. It will be used to combine several smaller skin panels into one large panel, and add the internal frames, or ribs, using automated drilling and fastening.

The second machine will attach the underfloor bulkheads to the cargo floor, and then attach the lower skin panels to those bulkheads. Both of those operations are now being done by hand.

The Torres Mill cost $5.8 million. Estimated savings are $258,000 per aircraft, more than enough to recover the investment in the equipment and provide substantial savings.

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