A large, white C-130J aircraft is shown in the process of assembly within a massive industrial hangar. The aircraft is positioned horizontally, with its wings and fuselage clearly visible. The hangar's interior is characterized by a complex network of steel trusses and beams, illuminated by numerous overhead lights that create a warm, industrial atmosphere. The aircraft's tail section, featuring a four-bladed propeller emblem, is visible on the right side. The overall scene conveys a sense of scale and the intricate nature of modern aircraft manufacturing.

Old-fashioned dedication meets modern high-technology manufacturing techniques on the C-130J assembly line.

Some Assembly Required

Photographs by Paul Kennedy and Guy Aceto, Art Director



The newest version of the legendary Lockheed Martin C-130 Hercules transport is the advanced-technology C-130J. The journey from the start of assembly to rollout takes thirteen months. Two C-130s roll out the door of Air Force Plant Six, in Marietta, Ga., every month, crafted by a Lockheed Martin Aeronautical Systems "family," many of whom are the sons and daughters of those who built this aircraft's predecessors.

For construction milestones, such as this October 1995 rollout of the C-130j at right, the eight-million-square-foot, 918-acre Plant Six falls quiet for a moment. It is one of the few times the workers have a chance to admire their handiwork. Then a work bell sounds, and it's back to the next C-130, moving down one of the longest-running aircraft production lines in history.



Staff photo by Guy Aceto

Photo by Paul Kennedy



No matter how automated the production process becomes, it still takes people to build aircraft. Computers and high-tech design systems help determine the most efficient way to design, cut, and assemble the parts, but it is experienced men and women who ultimately create the aircraft. The process begins with such workers as Randy Ledford (left), who prepares a newly crafted part for its next stop in the C-130 assembly process.

The C-130's communications, avionics, navigation, and information systems require hundreds of miles of wiring, carefully laid out on pattern boards. A technician works on one at right. Once the wiring has been arranged and cut to length, the wiring bundles move on to the installation in subassemblies.



Photo by Paul Kennedy



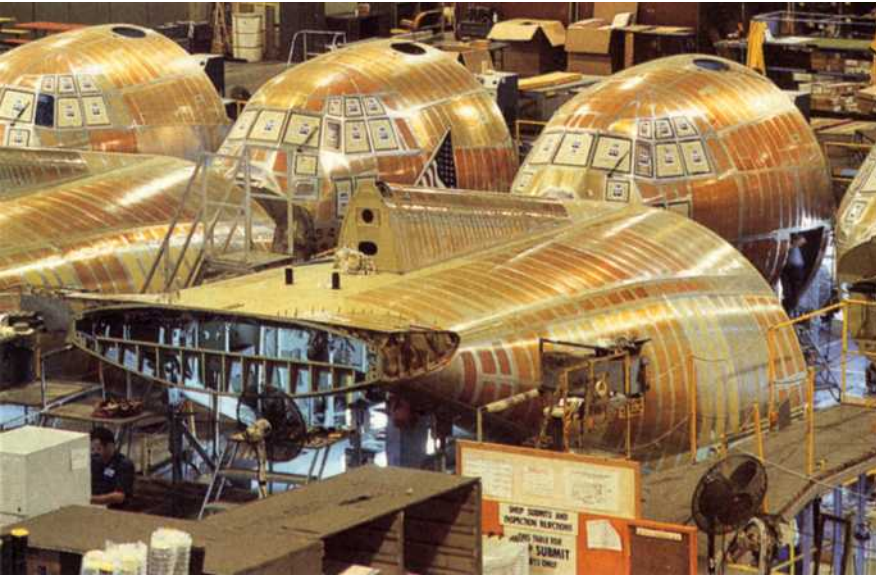
In a compact section overlooking the 3.5-million-square-foot main assembly area, electronics technicians assemble, check, and install wiring bundles to some of the avionics boxes for later installation on the floor below. At right, Freda M. Wingard and other workers install some of the wiring in the cockpit subassembly. This requires squeezing into some tight corners where even a future crew chief will never have to go. Nearly 9,700 people work at this Marietta plant, more than 6,000 of them in the Hercules program.



Aluminum scrap material (right) gets routed out from major structural parts during the aircraft assembly. It will be recycled.



Staff photo by Guy Aceto



Feeder plants in Clarksburg, W. Va., and Meridian, Miss., produce some of the C-130J's components, such as the cargo bay floor, and subcontractors fabricate some parts, but most of the actual assembly takes place in the cavernous Plant Six. At left, a row of nose subassemblies faces a row of tail subassemblies. One of each will eventually be part of the same C-130, separated by about 100 feet of aircraft.

A single person on the shop floor can operate one of the huge five-ton- or ten-ton-capacity cranes suspended from the plant's ceiling, and it will take only two people—like crane operator Mike Longano and mechanic Cherie Jones—to move a 2,000-pound vertical stabilizer into position on the tail assembly. Once it is in position, two more mechanics will install it, and another pair will finish the job. While awaiting this installation, the huge vertical pieces must always be stored in an east-west direction so the wind won't knock them over when the hangar doors at each end of the building are opened.



One of the next major steps is adding the engines. The C-130J has four new Allison AE 2100D3 engines that will be eighteen percent more fuel-efficient and will provide thirty-one percent more takeoff thrust. They also turn the transport's most visible new item—a Dowty Aerospace R391 all-composite six-blade propeller. The C-130J shares some technology with modern fighters: two mission computers, power-by-wire technology for the engines and propellers, and head-up displays for both pilots. At left, C. J. Stegall-Evans works on an Allison T56 engine before its installation on a C-130H.



On average, an aircraft moves on to the next step on the production floor every ten days. A computer simulation program helps ensure the consistent flow of fabrication work in the back shops, determining what tasks need to be done each day. Above: The view from thirty feet up on a Hercules's tail shows that the addition of wings, engines, and other assemblies has moved the aircraft closer to rollout.

At right, Ms. Jones and Senior Structural Mechanic Darryl Scroggs attach an identification plate before the rudder is installed.

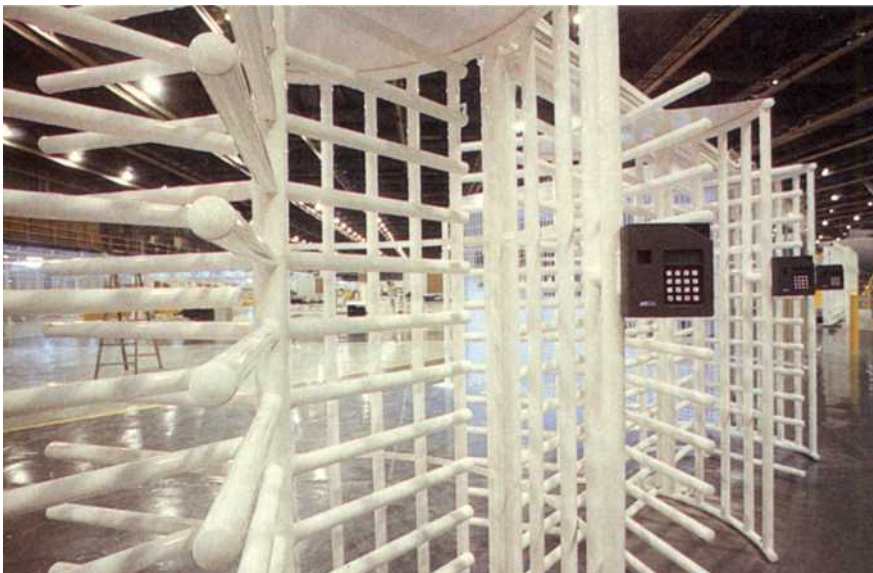


The tail assemblies at right reflect the various options ordered by some of the C-130's customers.

The basic Hercules transport serves sixty-four countries and is called the most popular tactical airlifter in the world.



Staff photo by Guy Aceto



Air Force Plant Six also houses the F-22 production line. The next-generation fighter requires far more security than the C-130J. Beyond these coded-entry turnstiles, the future of air combat is being assembled in the same building that fifty years ago produced B-29s, now produces P-3s, and continues to build C-130 transports.

The Manufacturing Assembly Tracking System for work assignments means that C-130 workers check a computer terminal in their area to learn what their day's tasks will be. Most tasks in the assembly process are performed by individuals or teams of two to four people.

The plant is nearly finished converting to a Focused Factory system, in which all operations for a particular manufacturing operation are brought together in one area, reducing time and costs.



Lockheed Martin has produced seventy-four versions of the Hercules. Once an aircraft moves out of the plant, it is towed to the paint hangar. This factory-fresh LC-130H, with a special ski-and-wheel landing gear system, is headed for the 109th Airlift Group (ANG), Schenectady Airport, N. Y., which has an Arctic resupply mission.



Whether it's a fighter, a bomber, or a transport, the first wholly different version of an aircraft type is cause for celebration. The rollout of this next-generation C-130J Hercules, after months of redesign and construction, gave everyone a chance to tour the new airlifter (above). After the ceremony and speeches (left), company crews will inspect and fly the airplane before it is handed over to the customer. The first of the new C-130Js will be built in two versions, one for the Royal Air Force and another built to USAF's specifications. After testing, the first two USAF C-130Js will join Air Combat Command's 314th Airlift Wing, Little Rock AFB, Ark., for further evaluation.



Preceded by more than 2,000 of its ancestors, some of which have been flying since the 1950s, the C-130J takes its place as the latest in the long line of Hercules transports. ■