BUILDING

LEGEND

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hen Boeing rolled out the first
747 on September 30, 1968,
few present could have doubted
that they were witnessing the
birth of a new era in air transport.
The 747 has become one of the longest-running and most successful aircraft programmes in history, but the gamble Boeing took in launching it can hardly be overstated. The phrase "betting die company" was perhaps never more aptly used than in describing Boeing chairman Bill Allen's commitment to the programme which, by the time of the rollout, had cost more than the net worth of the company. The 747 had its origin in a US Air Force requirement for a large heavy-lift transport carrying up to 750 troops over long distances. The CX-HLS programme was competed for by Boeing, Douglas, and Lockheed, with General Electric and Pratt & Whitney devel-oping alternative high-bypass-ratio turbofans. During the C-5 competition, Boeing began a series of informal consultations with airlines to establish the demand for long-range civil transport with up to 375 seats.
In August 1965 Lockheed was awarded the $250 million Air Force contract to build what became the C-5A Galaxy, with General Elec-tric chosen to supply its 41,1001b-thrust TF39 turbofans.

Losing the C-5 contract was a heavy blow to Boeing, but the day the company lost the C-5 contract, Joe Sutter, then chief engineer, technology, was recalled from vacation to start a series of studies into a high-capacity jet transport. Sutter remembers: "I was given about 100 engineers, and we put a brochure together. We looked at three sizes, 250, 300 and 350 seats, and then we made a pretty rapid circuit of the key airlines. Most of them leaned towards the higher size."

Appointed chief engineer on the new project in October 1965, Sutter quickly decided that a stretched 707, with about 200 seats, would be too small. He says: "We reached the conclusion that we could spend a lot of money stretching the aeroplane, and it might meet the requirement for a few years, but it wouldn't last very long. The economics were good, but it looked like a halfway job." Using engines similar to those designed for

This month sees the rollout of the

747th Boeing 747, which is still the largest civil transport ever built. As the 20th anniversary of its first commercial flight approaches, John Bailey in Seattle reviews the early development of the 747 programme.

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The 747 was almost stillborn, Sutter reveals

the C-5A, a new widebody could promise fuel savings of up to 25 per cent, and new leading and trailing-edge flaps would enable it to operate from existing runways at the world's major gateway airports.
Pan American had decided it wanted an aircraft capable of cruising at around 600 m.p.h. This meant increasing both wing sweep and engine power, but, because Pan Am's custom was viewed as a key to the aircraft's future, Boeing agreed. The president of Pan Am, Juan Trippe, made a gentlemen's

agreement with Allen that, if Boeing built such an aircraft, his airline would buy it. Boeing's board of directors decided to launch the 747 in March 1966, making its decision public on April 13, along with an announcement that Pan Am had placed its first order for 25 at $20 million each.
"It was much before we engineers wanted to commit," Sutter recalls, "but Pan Am said they wanted an aeroplane for introduction in 1970. The programme had a lot of risks involved in it. The main risk was the tremen-dous amount of money required to develop an aeroplane of that size, with all of that new technology," says Sutter. Boeing's investment in research and development, tooling, man-power, and new production buildings totalled more than $1 billion by the first rollout.

Malcolm Stamper, the original vice-president and general manager in charge of the 747, and now Boeing's vice-chairman, says: "I remember everyone looking at Bill Allen down the table, and it was his call, whether to bet the company on it. The size of the aeroplane itself was not that much of a technological breakthrough—it was the fundamental scale of the project. I think it was the largest single industrial undertaking in the history of the country."

The key to building an aircraft of the required size, as with the C-5A, would be its engines. Although both Rolls-Royce and General Electric made proposals, Pratt & Whitney was chosen to develop the JT9D, to provide at least 43,0001b of thrust.
Although the 747 had become a major commitment, it was still competing within Boeing against the supersonic transport (SST) programme. This was a partly Government-funded project, with General Electric devel-oping the 60,0001b-thrust engines. Just after the 747 launch Boeing won a contract to build a mockup of its SST design, the 2707, which was to carry 250 passengers at speeds up to Mach 2-7.

"Many of the airlines were convinced that the SST was coming," says Sutter, "and many
people here at Boeing thought that the 747
was an aeroplane with a limited future,
because the SST was going to take all of the
business. I even had difficulty getting people
to work on the 747. People would come up to

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