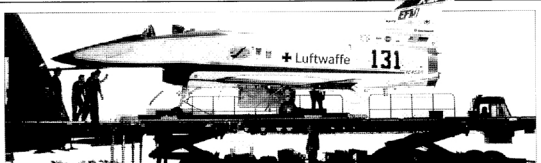
DESIGN & ENGINEERING AWARDS

X-31 ENHANCED MANEUVERABILITY AIRCRAFT
Rockwell International Corp.



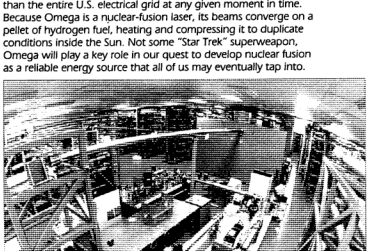
The X-31 aircraft is, flatly, the most agile flying machine ever invented and actually flown. Simulated air-combat engagements between the X-31 and military aircraft gave the X-31 a 32:1 kill ratio. And at the Paris Air Show last June, the X-31 upstaged everything else there with heart-stopping aerobatic maneuvers. During its demonstration flights, it performed rapid rolls and directional shifts while the airplane bellied through the air at a 70° angle of attack. And it pulled an unbelievable 150° heading change during a sharp left bank. These stunning maneuvers are made possible by the X-31's engine-nozzle thrust-vectoring paddles. These devices allow flight at angles that send other planes tumbling into aerodynamic stall. But much more than a show machine, the X-31 was developed as a flying test program to evaluate technologies that may contribute to future highly agile military combat fighters—and save the lives of those who pilot them.

ORBITER DOCKING SYSTEM
National Aeronautics & Space Administration

Getting there might have been half the fun, but once the Space Shuttle *Atlantis* approached the Russian Space Station *Mir* last July, how did the two actually link together? That was the question facing engineers from NASA and the space shuttle's builder, Rockwell Space Systems Division, three years ago when the joint mission was first proposed. Key to the operation was a Russian-designed, American-modified mechanism called the Orbiter Docking System, which had to be installed on both spacecraft. From each system, a motorized capture ring was first extended outward. Three triangular petals on one ring interleaved with corresponding petals on the other, and latches on each petal grappled the other side's ring. Then, the shuttle fired rocket thrusters to force the two spacecraft together. The mated rings were pushed back onto their supports, where 12 more latches completed the docking. The Orbiter Docking System is another step toward establishing international cooperation in space—the dream of man's last great frontier—a reality shared by all of us on Earth.

OMEGA LASER SYSTEM
Laboratory for Laser Energetics, The University of Rochester

The world's mightiest laser. The ultimate in ultraviolet light. Those are some of Omega's credentials. The Omega Laser System, in its entirety, is larger than a football field—and its pulse of light packs more power than the entire U.S. electrical grid at any given moment in time. Because Omega is a nuclear-fusion laser, its beams converge on a pellet of hydrogen fuel, heating and compressing it to duplicate conditions inside the Sun. Not some "Star Trek" superweapon, Omega will play a key role in our quest to develop nuclear fusion as a reliable energy source that all of us may eventually tap into.



FREE-WING TILT-BODY
Freewing Aerial Robotics Corp.

This award winner is a radically different type of aircraft from anything you—or we—have previously seen. It's called a free-wing tilt-body and it can literally tilt the forward portion of its body—and, hence, its propeller—in flight, independently of its wings. The result is vectored thrust that permits near-vertical takeoffs and landings. First uses will be primarily for unmanned drones where the aircraft can vector its thrust to pass slowly over a target to gather intelligence for military operations. Commercially, the craft could find work spotting fish for ocean trawlers or serving as a traffic-control vehicle, as a police surveillance aircraft or even as a platform for live TV news broadcasts. It's another instance of military technology trickling down to eventually benefit all of us in our daily lives.