Aerospace

Biggest wind tunnel to get bigger

The wind tunnel belived to be the largest in the world, a 40-by-80-foot installation at NASA's Ames Research Center in Mountain View, Calif., may become even larger. A $1.7-million project has just begun to design modifications that would expand the tunnel into a vast, 80-by-120-foot facility capable of testing full-size models of jet fighters, small and medium size transport planes, and helicopters.

Although the tunnel is used only for low-speed testing, the volume of air that must move through the large cross-section of the expanded version will require boosting the strength of the wind-generating system from 36,000 to 135,000 horsepower. This will increase the maximum air-speed that can be produced in the original test section from 230 to 345 miles per hour.

Designing the modifications is expected to take about two years, after which NASA will probably ask Congress for funding in a subsequent budget to do the actual work. One of the major uses of the enlarged tunnel is almost certain to be the developmental testing of short takeoff and landing (STOL) transports, which could get a long-needed leg up from the cost savings in preliminary work that would otherwise have to be done in flight.

More resource studies from space

With the Earth Resources Technology Satellite (ERTS-1) now beginning its third year and doing fine (it was two years old July 23), and with a second ERTS scheduled for launch early next year, the National Aeronautics and Space Administration has just awarded another huge batch of contracts to study the planet and its problems using the voluminous data from space.

Culling through 669 separate proposals, the agency has boiled the list down to 93, to be conducted by Federal, state and foreign governments, international organizations, universities and private companies. The studies will replace or extend about 200 domestic and 100 foreign projects that have already been carried out with the approximately 100,-000 pictures taken by ERTS-1.

As techniques of working with multispectral photos from space have become more refined, the goals of investigators have become more subtle. The earliest studies sought readily straightforward data on surface geology, water resources and the like. The new plans include subjects ranging from the ecological effects of reservoir construction in Missouri to marine biological research in Antarctica to the addition of ground vegetation data on aeronautical charts.

HEAO-1 for April '77

The first of the High Energy Astronomy Observatory satellites, which resumed development earlier this year after being put on the back burner by NASA in January 1973, is now targeted for launch in April of 1977.

TRW Inc. of Redondo Beach, Calif., which will build the three star-watchers, began building up its design and development team late last month. It expects to have about 600 people on the effort within a year.

The huge satellite, weighing some 7,000 pounds, will be designed primarily to scan large areas of the sky for X-ray emissions. It will be followed by a second satellite that can be precisely aimed to look at specific, individual X-ray sources. HEAO-3, also a scanning instrument, will study gamma and cosmic rays.

Environment

Pollution from air conditioners

Aluminum particles from corroded air conditioners may raise room air pollution to unacceptably high levels, according to an article in the August ENVIRONMENTAL SCIENCE AND TECHNOLOGY. The effect was discovered by Dmytro Buchnea, a chemist at the University of Toronto, working with his son Alexander, a Ph.D. candidate in physics.

The research team had been asked to help determine why certain enzyme experiments in cold rooms (below 40° F.) were being spoiled. They noticed that all the surfaces in the rooms were covered with a film of gray dust, which turned out to be aluminum powder from the laboratory's air conditioner. Puzzled that the dust was not evident in warmer air conditioned rooms (at around 70° F.), the Buchneas found that the dust was also present at the higher temperature, but that it did not precipitate as much onto exposed surfaces.

This discovery immediately raises the question, is the presence of such powder harmful to people in air conditioned rooms? The team is now studying the health effects in detail, but initial tests have shown that the pollution level can exceed legal air quality standards. Says Environmental Protection Agency chemist Sam Simmons: "Inhalation of aluminum powder does give rise to pulmonary fibrosis, also known as aluminosis, which progresses into an emphysema-like condition."

Aluminum was originally chosen for air conditioners precisely because it is resistant to corrosion, forming a protective coating of aluminum oxide on exposed surfaces. But the Buchneas suspect that circulating air somehow activates a reaction of water vapor and carbon dioxide with the oxide to corrode the underlying aluminum.

Tissue cultures in insect control

Viruses as weapons in the battle with insects have several advantages: They are effective, don't harm other species and don't pollute the environment. But producing enough insect virus to distribute commercially is a tedious business, involving cultivation of great numbers of host insects. An article in the July AGRICULTURAL RESEARCH reports progress in growing the viruses in tissue culture, which may someday eliminate the need for live insect hosts.

Entomologist Patrick V. Vail and technician Dixie L. Jay of the Western Cotton Research Laboratory in Phoenix, working with entomologist W. Fred Hink of Ohio State University, have successfully raised the nuclear polyhedrosis virus (NPV) in tissue culture. NPV causes a fatal disease in such insect pests as the cotton bollworm, the tobacco budworm, the alfalfa looper and beet armyworm.

Other experimenters have also grown NPV in tissue culture, but the Phoenix experiments mark the first mass production of the virus using the technique and the first demonstration that viruses grown in this manner are as effective as those produced by live hosts.

The coming water crisis?

Limnologist John McLaughlin of Fordham University has warned that urbanization, industrial use of water and an increase in paved areas could cause a crisis of fresh water supply in Northeastern states within five years. The conclusion, based on his studies of microscopic life in a lake near Armonk, N.Y., have one silver-lining: The damage appears to be reversible.