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V/STOL blown lip inlet test installation



First Pilot Report:
USAF/General Dynamics F-16





Soviet Hind D Fires Antitank Missile

Soviet Mi-24 Hind D attack helicopter fires an antitank missile, probably the AT-3 Sagger, which is similar to the Hughes TOW missile in the U. S. inventory. The Sagger has a minimum range of 500 meters (1,640 ft.) and a maximum range of 3,000 meters (9,843 ft.) and the entire weapon system is in the same category as the Bell

Helicopter Textron Cobra. The Soviet missile weighs 24.9 lb. This firing, which took place in Hungary, was aimed at a target not destroyed by artillery during a military exercise called Shield 79. Taking part were troops from Bulgaria, Czechoslovakia, Hungary, Romania and the Soviet Union. (UPI)

China Beginning Manned Space Effort

Washington—People's Republic of China is in the earliest stages of developing a Chinese manned space flight capability.

China already has launched dogs and mice into space on suborbital trajectories. The U. S. and the Soviet Union both progressed to manned flights relatively soon after flying successful space missions with animals.

"We have made some preparations for developing the techniques of launching manned spacecraft. We have made some technical preparations and carried out some [man-oriented] work," Jen Hsi-min, a high-level Chinese space program official, said during a visit in Japan. "We also are actively conducting research on the launching of 'Skylabs'."

The Chinese Space Technology Institute is leading a major drive to advance space projects in the country. The institute

manages and coordinates the activities of 4,000 persons spread through four research centers, three factories and one research station. About 40% are technicians, while 42% are assembly workers.

A 13-member U. S. space delegation, including top and middle management National Aeronautics and Space Administration personnel, currently is touring Chinese space facilities previously not open to foreign visitors (AW&ST May 21, p. 13). NASA already has tentatively

reserved space shuttle payload bay space for about July, 1982, and late 1982 for possible launch of Chinese domestic communications spacecraft that the Chinese would purchase from the U. S. or in Europe.

The Chinese have designated space technology development as one of eight areas that will be emphasized as national goals over the next seven years. Although China is considering significant aircraft-oriented procurements, aviation development is not listed as a priority among the eight areas to be pushed. The areas in addition to space technology are agriculture, forestry, materials development, computer development, laser applications, high-energy applications and genetic engineering.

The Chinese view launch vehicle and spacecraft work as cutting-edge technology that will stimulate directly basic industrial progress and research and development.

"The development of space flight projects cannot be divorced from the industrial base as a whole," Jen Hsi-min told Japanese space officials.

China has launched eight spacecraft into orbit since 1970 and recovered three of them. Chinese space officials acknowledged earlier that development of military reconnaissance spacecraft capabilities is among their objectives in designing recoverable vehicles (AW&ST Sept. 25, 1978, p. 9). The launch of one or more Chinese spacecraft also is tentatively scheduled later this year.

In addition to its launch facilities at Shuang-cheng-tzu, the primary Chinese space technology facilities are:

- Control Engineering Institute in Peking—The facility is responsible for devel-

Fairchild Directors Agree to Acquisition Plan

San Francisco—Directors of Fairchild Camera and Instrument Corp., who twice recently rebuffed offers to merge with Gould, Inc., agreed May 19 to a plan for the company's acquisition by Schlumberger, Ltd., a French-Dutch oil service and electronics company.

The two companies agreed that Schlumberger would tender an offer of \$66 per share for all Fairchild common stock, and that any shares outstanding after the tender offer would be converted into cash at the same price in a merger transaction. The total value of the acquisition will be approximately \$363 million.

In agreeing to the Schlumberger acquisition, Fairchild's directors turned down a revised Gould offer to acquire about 40% of Fairchild's stock for \$70 cash per share and exchange the remaining shares for shares of a new issue of Gould preferred stock, as part of a subsequent merger of the two companies. The terms of this exchange would have been worked out by the two companies' investment banking representatives. In its two earlier proposals, Gould had offered first \$54, then \$57 cash and stock per share of Fairchild common.

Jean Riboud, chief executive of Schlumberger, said Fairchild would be operated after the acquisition as a separate subsidiary under its present management. In expanding beyond the petroleum business on which it was founded, Schlumberger has acquired Weston, Sagamo Electric and Electro-Mechanical Research, manufacturers of electrical components, meters and instrumentation systems, and Heath Co., which produces the Heathkit line of electronic equipment.

opment and manufacture of spacecraft attitude and propulsion subsystems.

■ Hsi-an Radio Technical Research Institute in Peking—Satellite fabrication and specialized electrical and radio systems are done in this facility.

■ Lanchow space technology institute in Lanchow—This facility works on low temperature and vacuum technology for use in China's space program.

■ Environmental Engineering Test Station in Peking—Spacecraft subsystems involved in environmental protection such as thermal controls are developed at this facility.

■ Tung-Fang Scientific Instrument Plant in Peking—This facility is responsible for the production, general assembly and testing of satellite structures.

■ Shansi electronic equipment factory in Shansi—Various electronic hardware used in spacecraft and ground systems are fabricated here.

■ Shanghai electronic equipment factory in Shanghai—basic spacecraft electronics and satellite ground sensing equipment are manufactured in this facility.

Additional basic research facilities and military organizations are involved in the Chinese space program.

Chinese space hardware management is not unlike that carried out by the Soviet Union and the U. S. In some cases, space hardware users provide specifications to manufacturing facilities, which then build the equipment for the users. In other cases, the users themselves are actively involved both in spacecraft design and manufacturing.

Weight of Chinese spacecraft has reached 1,200-1,900 kg. (2,645-4,188 lb.). The three heaviest spacecraft, in the 4,000-lb. class, have been recovered on land.

The Chinese considered their spacecraft overly heavy for their basic capabilities, largely as a result of a lack of high-technology electronics.

Near-term space missions are likely to be carried out in cosmic ray, X-ray and high-energy particle research. On a longer-term basis, the Chinese intend to launch basic communications and direct broadcast communications spacecraft, weather satellites, earth resources observation spacecraft and navigation spacecraft.

In addition, space astronomy and ocean observation spacecraft are part of China's long-range plans. Only technology-oriented orbital missions have been flown to date by China. Various departments in the Chinese government are being organized to manage development of future missions.

Most ambitious near-term project is the planned development of a space launch vehicle comparable to the General Dynamics Atlas-Centaur or European Space Agency Ariane. The Chinese plan for this booster to have a liquid oxygen/liquid hydrogen upper stage to enable launch of Chinese communications spacecraft, possi-

bly as early as next year (AW&ST Sept. 4, 1978, p. 27).

U. S. space officials believe this is more of a hope than a goal that can be fulfilled, since not even the Soviet Union has yet developed a hydrogen/oxygen upper stage like the Centaur, which the U. S. developed in the 1960s.

Launch of a domestic Chinese communications spacecraft from the space shuttle, with the spacecraft procured from U. S. or European manufacturers, is much more likely in the near term.

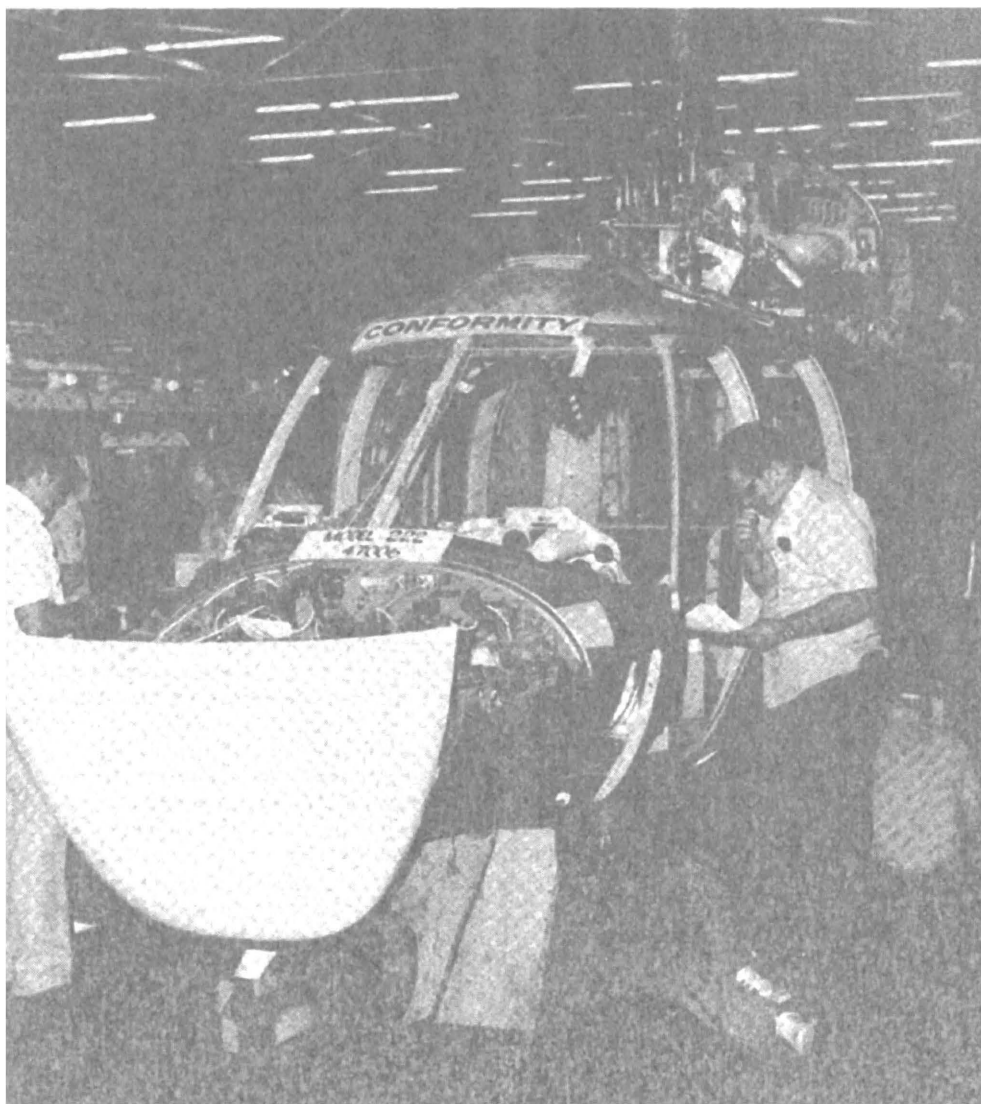
China has discussed communications satellite technology with U. S. spacecraft manufacturers, such as General Electric and Hughes. Since China indicated it might desire launch of a system in about 1982, NASA has reserved shuttle cargo bay space for two missions on a tentative basis. NASA would have to receive earnest money of about \$100,000 to hold that space but wanted to at least log the

mission on the shuttle manifest, since missions are filling up quickly.

Initial indications are that the Chinese are seeking communications capability that would require a large spacecraft, so space has been reserved under a pseudo NASA payload designation for launch of spacecraft that could require a large spin-stabilized upper stage (SSUS A) to achieve synchronous orbit. Such a vehicle could weigh about 4,000 lb. in synchronous transfer orbit.

NASA expects to learn more about the Chinese plans as a result of the current visit to China by several NASA officials. Chinese procurement of Landsat ground station hardware also is being discussed on the trip.

One of those on the trip is Allen Watkins, chief of the U. S. Geological Survey's EROS Data Center in Sioux Falls, S. D., the primary distribution facility for Landsat images.



First Production Bell 222 Assembled

First production twin-turbine Model 222 moves down final assembly at Bell Helicopter Textron's Hurst, Tex., facility. Four others, not visible, are in various stages of assembly. Initial deliveries are scheduled to begin in late October, 1979.