

MARTIN MARIETTA

news

DENVER DIVISION

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Backpack delivered for Space Shuttle crews

Space telescope funding delayed

Funding for the Space Telescope program, the first large payload planned for Space Shuttle, has been deferred until Fiscal Year 1978 by NASA because of current restraints in government spending.

As an indication of continued support for the program, Kenneth P. Timmons, program manager for the division's effort to win the Space Telescope contract, said NASA will have new plans for the program's procurement cycle ready April 1 of this year.

"The Space Telescope is the highest priority astronomy program," Timmons said. "NASA, Congress, and the scientific community are supporting the program with efforts to fund it in Fiscal Year 1978—which begins Oct. 1, 1977."

Competition for the contract could begin yet this year, but more likely in early 1977, Timmons added.

In anticipation of the competition, Timmons said the division will maintain a team in 1976 to keep the division in step with technical developments and ready to respond to a request for proposal for Space Telescope.

Viking II to reach mid-point in February

Viking II, following its sister spacecraft Viking I on an 11-month flight to Mars, will reach the mid-point of its journey February 22. Viking I was halfway in its journey January 19.

On the fourth Sunday in February, Viking II will be 166.1 days from Earth and 166.7 days from Mars. The spacecraft will have traveled 255.8 million miles on its curving path around the Sun. On a direct line, the spacecraft will be 80 million miles from Earth and 18.9 million miles from Mars.

The Viking sister ships make up this nation's project to land two sophisticated spacecraft on Mars this summer to search for life, and to examine its atmosphere, its geology, its physical and chemical properties.

Martin Marietta Aerospace is the principal industrial contract to the National Aeronautics and Space Administration for its Project Viking lander, scientific experiments, and mission integration.

Like Viking I, Viking II has flown a near-perfect mission.



Tommy J. Perry

Division employee named lecturer

Tommy J. Perry of the division's professional and industrial relations department will be the first participant in the Black Executive Exchange Program (BEEP) lecture series at Philander Smith College, Little Rock, Ark.

Developed six years ago by the National Urban League, BEEP offers black college and university students a first-hand view of business and industry. More than 40,000 students have participated in the program, learning of current and future business practices and patterns.

The BEEP labor and industrial relations lecture series, cosponsored by the Philander Smith College social science division, uses black professionals chosen from some 400 corporations and government agencies. Expenses are paid by the corporations and agencies.

Courses are designed to show students that theory and practical experience are equal essentials in business.

Perry is involved in litigation, conciliation, and predetermination settlements for the division with the Equal Employment Opportunity Commission, Department of Defense, and Department of Labor. He is also involved with design and implementation of affirmative action plans and special programs to accelerate progression of minorities and females.

A native of Van Buren, Ark., Perry has a B.S. in economics and a master's degree in business administration from Pepperdine University and a Certificate of Management from the University of Southern California.

He is a member of the Society for the Advancement of Management and the Urban League of Colorado.

A design evaluation model of the backpack maneuvering unit for use by Space Shuttle crews has been delivered to NASA.

The model will be used at the Johnson Space Center to test manual controls for position, reach, and handling. The 65-pound model is mechanically operable in all latching and handling functions. It does not contain electronic or propulsion systems.

Accompanying the model is a flight support station mockup similar to those that will fit inside the Space Shuttle orbiter. The station is used to store and service the backpacks and air crewman in putting on and taking off units.

The backpack, called MMU (Manned Maneuvering Unit), is based on a highly successful predecessor flown and tested aboard Skylab.

The maneuvering units will allow shuttle crewmen to maneuver freely in space in six directions either inside or outside of the shuttle. Each crewman can fly forward, backward, sideways, up and down in translation or in pitch, roll, and yaw in rotation.

Ranging up to 100 yards from the shuttle with these units, crewmen will be able to perform operations and adjustments with payloads and orbiting satellites; conduct experiments; clean and service space systems; assemble space structures; and assist with rescue operations.

Key to the design is a fail-safe feature that prevents a single hardware failure from interfering with the crewman's ability to return to the shuttle. This is accomplished with a dual isolated system with independent electrical, propulsion, and control units.

Each isolated system contains a cold gas pressure vessel, pressure regulator and manifold system, 10 fix thrusters, a battery, a power supply, and a control system.

The maneuvering unit weighs 220 pounds, with pressure vessels weighing 87 pounds, and batteries 29 pounds. For use outside the shuttle, the crewman will also wear a space suit and a life support system.

The crewman manages his movement by using hand controllers mounted on the arm rests of each unit.

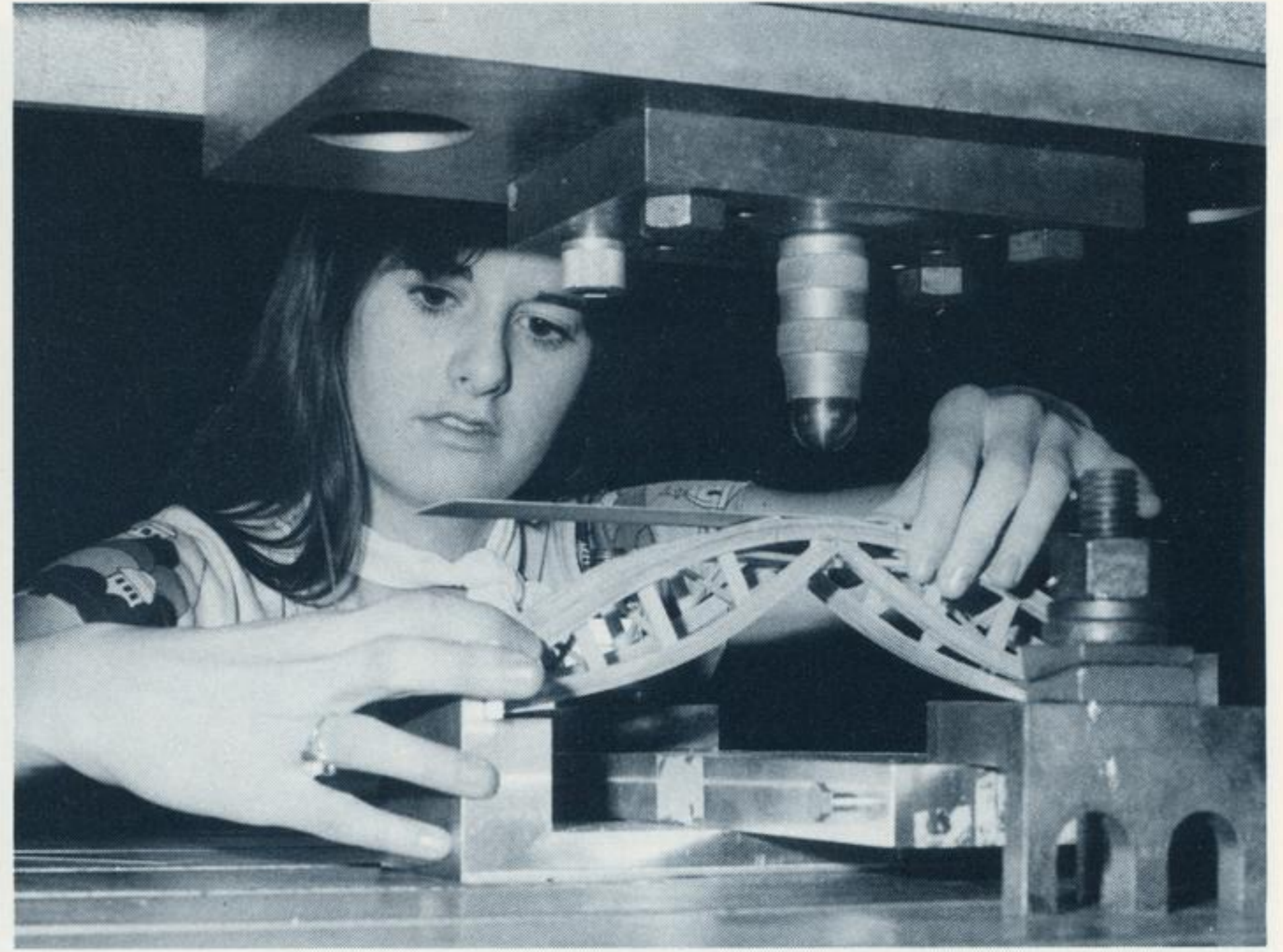
On the cover

Backpack maneuvering unit for Space Shuttle crews shown on the cover has been delivered to NASA for evaluation.

Students test bridges in structures laboratory



Sixteen students from John F. Kennedy high school in southwest Denver recently used the division's structures laboratory in the plasma arc facility to test bridges in preliminaries of a state-wide contest. In the photos: At left, Scott Lett weighs his bridge under the supervision of



Ron Baldwin, physics instructor at the high school. At right, Alice Fredrickson places her work in the stress testing device. The contest is sponsored by the Professional Engineers of Colorado and the U.S. Bureau of Reclamation.

Bridges may be constructed of any combination of wood and glue. The trick is to design a bridge as light as possible, but one that will resist the greatest force. This is the third year JFK students have used division facilities to test their structures.

Project Confidence presents economic facts of life

Promoting public understanding of economic problems and the role of business and industry in solving these problems is the aim of Project Confidence, a program launched recently by the Colorado Association of Commerce and Industry (CACI).

Detecting a continuing and serious deterioration of confidence in business, CACI saw an immediate need to rebuild that confidence.

John H. Boyd Jr., director of public relations for the Denver division and a member of the Project Confidence committee, said, "We are taking action to reverse the anti-business trends of the country—specifically in Colorado—and to restore a climate of government and public opinion that will permit our free enterprise system to survive."

Project Confidence is primarily an educational program, with special emphasis on presenting the economic facts of life to employees of Colorado business and to the general public.

"Business must adopt an attitude about itself that will permit it to promote business, the private enterprise system, and economic education with the same tools and vigor that business uses to promote and sell its products," Boyd said.

Internally and externally, people must be "given a recognizable Face of Business—a face, a personality, a creditable being—trained in speaking for business in terms easily understood."

Project Confidence subcommittees have been established to prepare programs specially designed for employees, students and teachers, and the general public.

"Misconceptions about business, particularly on the size of profit, have been growing for many years," Boyd said. "It is unfortunate that youngsters grow up thinking business gets to keep as much as 50 cents out of every dollar it takes in.

"Not many businesses have attempted to

correct this belief, even though their profits have been only three or four cents out of each dollar," he added. "Nor have these businesses explained that these pennies don't all go into the owners' pockets, but are used to replace machines, develop new products, improve facilities, and help create more jobs."

Project Confidence, a cooperative effort of all Colorado business and industry, will seek to correct these misconceptions and enlist employees' aid in communicating the economic facts of life.

Profit -- A dirty word ?

Nothing obscene about profit, says one businessman. In fact, he adds, the proper description is skimpy.

"One of the fallacies which has been most damaging to our nation's economy is that corporation's profits have been climbing outrageously," Martin Stone, chairman, Monogram Industries, Inc., said in *Nation's Business*.

If you factor in inflation, he adds, real profits of nonfinancial corporations have dropped 20 percent in the past 10 years.

Also, he points out, profits shrank from 13.3 percent of national income in 1966 to 9.2 percent in 1974. In the same period, employee compensation rose from 70.2 percent of national income to 75.1 percent.

Looking at return on investment, the results are even more dismal.

After adjusting for inflation, Stone says, corporate return on investment declined from 10 percent in 1966 to 5 percent in 1974.

Critics who damn profit as a dirty, six-letter word, he says, do the nation a disservice.

Why?

Because shrinking profits mean a shortage of investment capital that produces jobs.

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Build-to-print maintains skills, business base



Harold Scholar performs the final reaming process for the grip on a radial drill press.

Back in the mid-1960s, workload fluctuations gave impetus to a manufacturing program with these two goals:

1. Stabilize manpower and retain skills
2. Add to the business base in the factory to help overhead rates.

Called "build-to-print work" in manufacturing jargon, the program was a success then and has continued into the mid-1970s as an important part of the division's business.

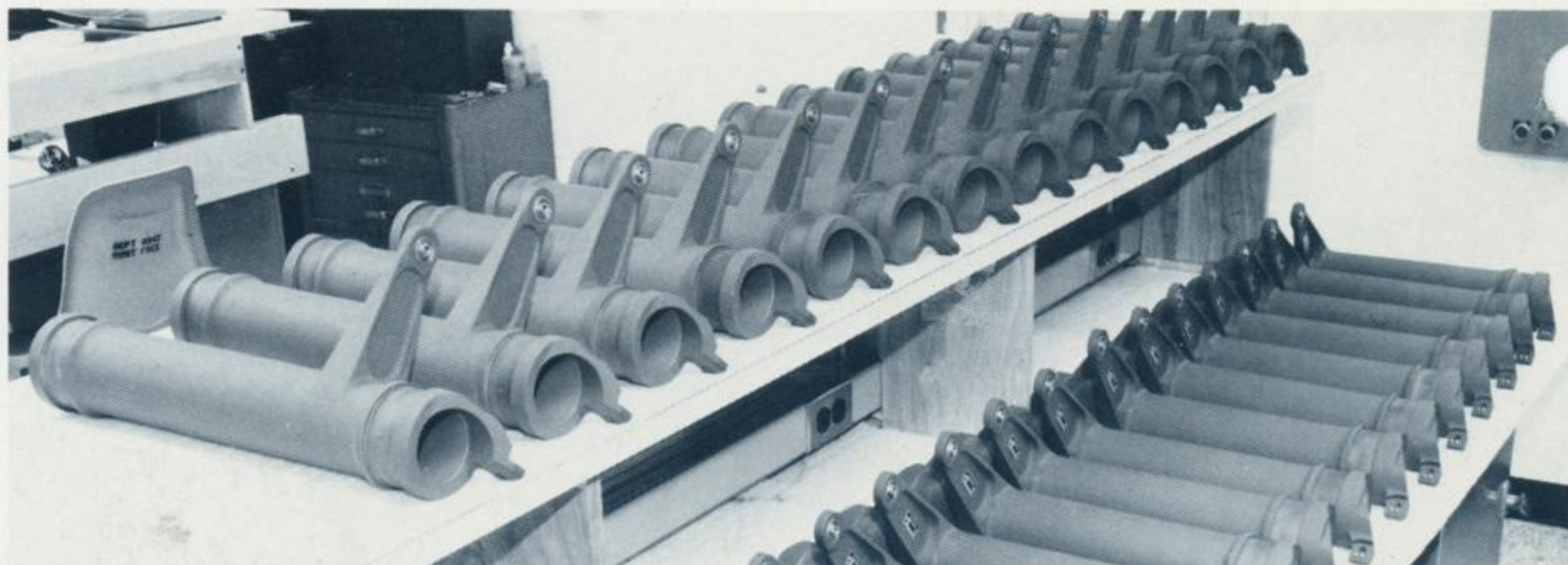
A. J. Fria has been the guiding hand in this manufacturing endeavor which, under contract, takes blueprints from other firms and builds parts according to those prints, thus the build-to-print tag.

The work is primarily in structural parts, currently for Bell helicopters (see photos); for Space Shuttle parts for Grumman and Rockwell International; and the Boeing B52G bomber and the 727 jetliner.

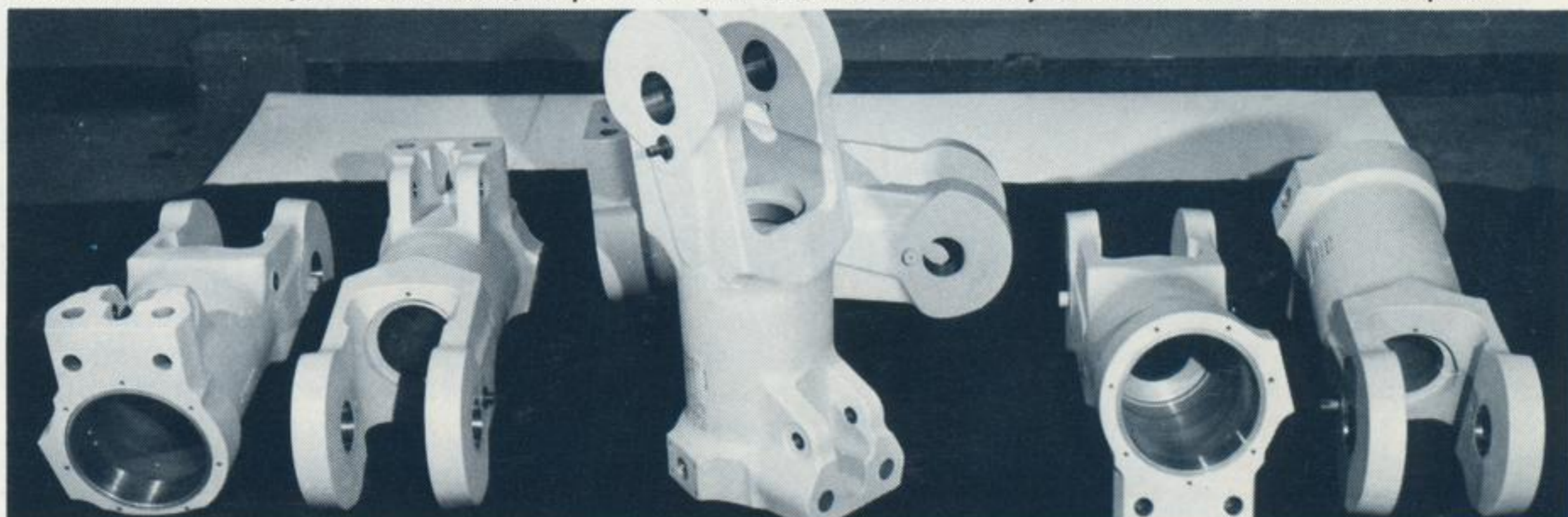
In the past, parts have been fabricated for The Boeing Company's 727, 737, and 747 passenger jets and its Vertol division's Chinook helicopters; for LTV; for Ball Brothers; and Gulf General Atomic's work at the St. Vrain nuclear power plant.

Sales for build-to-print manufacturing are running about \$2.5 million annually, providing jobs for 45 to 50 employees.

In keeping with the established goals, the program continues to provide jobs and retain manufacturing skills and the business is helping overhead rates.



The horn assembly, shown here, is part of the aileron control system for the Bell helicopter.



Main rotor assembly grips ready for shipment for Bell helicopters. The grips hold the rotor blades.

An unstated goal also has been achieved. Other manufacturing programs continue to benefit from the experience employees

get in performing on fixed-price, highly competitive contracts, and from work on large lot sizes.

Apollo Soyuz test may aid treatment of leukemia

Benefits from the United States space program often appear in unanticipated places.

Take, for example, a spin-off of one of the scientific experiments on last July's Apollo Soyuz (ASTP) mission. The experiment was designed to separate certain blood cells using a process called electrophoresis under the weightless conditions of space flight.

The experiment required that after the separation process was carried out the cells would be frozen in a medium that contained no chemicals toxic enough to pose a potential hazard to the crew in the spacecraft.

This has led to an application that may make it easier to perform transfusions of a certain type white blood cells in the treatment of leukemia.

The cells, called granulocytes, combat infections in humans by attacking and eating invading bacteria. The transfusion of the cells to a patient is used to maintain resistance to infection in cases where granulocytes are not produced. Donors of the cells must be close relatives of the patient and the timing of

transfusions is important because the lifetimes of the granulocytes in the patient's blood are limited.

Dr. Carel J. Van Oss of the State University of New York at Buffalo has found that the preservative medium developed for the ASTP mission when used to freeze granulocytes may improve their survivability. This could make it possible to build up a stock of frozen cells contributed by donors at their convenience, so that the transfusions would be available when and as the patient needed them. This would reduce granulocyte transfusion from a complicated operation to a routine procedure that could be managed for optimum control over the patient's condition.

The freezing medium that may make this possible probably would have been developed in time without being part of a space experiment. However, the space program made it available sooner.

The State University of New York at Buffalo has applied for a National Institutes of Health grant for a clinical assessment of the new technique's benefits.