MARTIN MARIETTA



DENVER DIVISION

#### **NUMBER 17/1978**

#### **Division Expenses** 1978

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#### 260 WORKING DAYS

SALARIES AND WAGES (113 DAYS)

GOODS, UTILITIES, TRANSPORTATION AND SERVICES (103 DAYS)

LOCAL, STATE, FEDERAL TAXES (16 DAYS)

PENSIONS, INSURANCE, AND DEBT SERVICE (20 DAYS)

EARNINGS (PROFIT) (8 DAYS)

#### In every measure a fantastic year: Hurtt

The most significant accomplishment for the Denver Division in 1978, according to Vice President and General Manager C. B. Hurtt, was the development of a broad business base producing solid, long-term growth for the division.

But Hurtt added that 1978 "was a year that was fantastic by almost every measure. Financially, we exceeded all our forecasts. We have increased our sales every year since 1975 at about a 15 percent rate compounded."

The broadened business base and the steady increase in sales have been responsible for the 1978 growth in employment; growth that has brought total division population to more than 8,000.

"That is the first time since 1972 we have had 8,000 employees," Hurtt said. "We have had only two other years since 1963 when employment was 8,000."

These 8,000 employees are working on more contracts for more customers than ever before, both in Denver and at offsite centers around the country, Hurtt pointed out.

"Looking ahead, I believe we will continue to show some positive growth," said Hurtt. "In 1979 our sales plan shows 95 percent form and follow-on business—business for which we do not have to compete. Our five-year sales plan also has a record high percentage of firm and follow-on business with about 75 percent of our planned business in that category."

"In 1978, we won more than 50 percent of the new business we sought," he said. "We will make a considerable investment in the pursuit of new business in 1979. I believe we have outstanding qualifications to gain the new business. We have the experience, the qualified people, and the facilities needed to assure customers a quality product.

"We value our reputation for mission success. We take it seriously in every one of our programs. Our customers see that.

"Therefore when there is a tie in a competition, I believe our mission success record is taken into consideration.

Hurtt defines mission success as meeting the commitments of the contract and delivering a product, both hardware and software, that function properly.

"If it is a rocket that is to fly, it flies; if it is a spacecraft that is to orbit, it orbits; or if it is to land on Mars, it lands," Hurtt said. "It is this kind of across-the-board performance, highlighted by technical performance, that makes the division tick and brings success.

"Our 1978 performance is outstanding," said Hurtt. "I'm looking forward to another outstanding year in 1979.

(Editor's Note: Additional comments from the general manager have been incorporated in the discussions that follow.)

#### Division to pursue TRS-type programs

The division will continue efforts, although at a reduced level, to develop and market a teleoperator retrieval system type program despite the recent announcement by NASA that it is halting work on the TRS contract with the division.

"We believe a versatile robotic vehicle designed to operate remotely from the space shuttle orbiter to deploy, retrieve, and service orbiting spacecraft is vital to the total space shuttle program," C. B. Hurtt said. "We will continue to pursue TRS-type programs as a business opportunity and will invest discretionary resources in the effort.

"We are quite disappointed that NASA has halted work on the TRS," he said. "In no way do I see the cancellation as a reflection on our work. I am proud of the tremendous effort our employees have made on the program—both technically and physically."

Efforts are also underway to reassign employees not involved in the limited efforts on TRS. Several other programs in the division need manpower and have been working overtime.

"I am confident we will be able to place most of the people affected by the NASA decision," Hurtt said.

### Program development meets objectives

"We continued in 1978 our excellent momentum towards acquiring new business with long-lasting impact on the Denver Division," Howard F. Keyser of program development said in looking at highlights of the year. "And I am pleased with the significant increase in firm and follow-on business. A year ago that type of business was declining. Now we are definitely in an upbeat mode for the next five years based on programs we have already won, assuming funding continues."

Funding is a question mark for 1979 as efforts continue to trim the federal beget.

"Many of the programs we are prepared to pursue are subject to great debate as the budget is being put together," Keyser said, "but I am happy to say that no matter what happens in the budget process we will still have a good many high-quality programs to pursue in 1979 and following years."

Keyser recalled that in the 1977 year-end edition of *Martin Marietta News* he said the division was striving to improve the business balance to avoid the impact the cancellation or loss of a major program would have.

"Analyzing the five-year plan shows we have achieved that balanced customer mix," he said.

That mix, according to C. B. Hurtt, shows "one half the division's business will be with the Department of Defense, about one-third with NASA, and the remainder with a variety of other customers, including the Energy Research and Development Administration."

Keyser said that with the balanced business base "I do not see any major point of vulnerability to our continued growth."

New business accomplishments in 1978 were headed by the win of the Missile X assembly, test, and system support contract.

"The MX competition was very, very difficult against a company that was firmly entrenched in the Minuteman ICBM program," Keyser reported. "It is a tribute to the entire division that we captured this large program. I believe the MX program will move into full-scale development and provide business for us for 10 to 20 years."

Keyser detailed other major programs won in 1978 including Clipper Bow, the OASIS command and control system, the mission operations contract for the payload integration contract, the teleoperator retrieval system, and high technology contracts won in technical operations.

"All in all, 1979 looks like an outstanding, challenging, and exciting year," said Keyser.

## SCATHA delivery tops defense systems work

Completion of the assembly and test of the SCATHA spacecraft and its delivery to Cape Canaveral five days ahead of schedule was a significant accomplishment for defense systems in 1978. H. Wayne Terbush, who heads defense systems said, "The January 25, 1979 launch of SCATHA will begin a year-long data gathering sequence that will provide information on which to base spacecraft sign."

It will be a little longer before another product of defense systems gets into space. The autonomous navigation and reference system will fly aboard the SIRE spacecraft in 1980. Design and detail fabrication were completed in 1978, and 1979 will be devoted primarily to assembly and test. The system can compute the position of the spacecraft it is aboard within 800 feet without external commands and without Earth viewing sensors.

Clipper Bow, a competitive undertaking for the Department of Defense, is nearing the end of the validation phase and the division is competing for the conceptual design contract and ultimately for the hardware. "I feel quite good about the work we've done," Terbush said, "and I believe we are the leading competitor."

Defense systems will be a major user of two new division facilities, the near field antenna lab and the attitude control systems (ACS) lab.

"The antenna facility will enhance our competitive position in radio frequency systems," Terbush said. "The ACS lab is unique. With it, we can simulate a common control system completely by comter, completely with hardware, or with a combination of computer and hardware."

Simulations in the ACS lab will begin in the first quarter of 1979.

"We are investing substantial funds to acquire new business," Terbush said. "We will be submitting two or three major proposals in 1979. In each case, we have been engaged in work leading to these opportunities for several years. We believe our prospects are good."

# Command, information systems makes gains

Eugene C. Wood, recently named director of command and information systems, reports the organization has made "inroads with new types of command and information systems, particularly in the broader aspects of tactical information fusion (TAC fusion) and command and control activities."

TAC fusion, Wood explains, is the blending of tactical weapon command centers the data gathering facilities to provide litary commanders with information necessary for tactical decisions.

A prime example of such a system and a significant new contract for the division from the Air Force's Electronic System

Division (ESD) is the operational analysis of special intelligence systems (OASIS) program.

C. B. Hurtt calls OASIS "a pivotal contact to what we are attempting to do in command and information systems. It can show our capability to upgrade military command centers and define the role we can play in the evolution of command centers."

In space-related work, specifically for space shuttle, the CIS organization has delivered all of the checkout control and monitoring subsystem (CCMS) hardware for the launch of the first space shuttle in 1979.

Wood, who was the former head of the CCMS program, said 1978 was a banner year for CCMS. "Essentially, CCMS has exceeded all expectations in quality and reliability. Its performance has earned four consecutive perfect evaluations."

CCMS hardware is being built for supporting shuttle launch activities at Vandenberg. The first phase has been delivered and is scheduled for acceptance on March 1, 1979.

In new business activity, one of the most significant proposals is for the navstar control center for the global positioning system.

Wood said, "We expect to be one of the three firms selected for the design definition phase to be awarded in January."

The AN/MSR-T1 van is another significant new business opportunity expected to be proposed in late 1979. Other pending bid opportunities exist for follow-on Central Valley Project activity, automatic test equipment, space defense, and Army tactical command systems.

We also hope to work with the MX project on operational ground equipment," Wood said.

A command, control and communications systems laboratory has been developed in 1978. The lab permits frontend requirement analysis for many of the programs we are pursuing. It also will permit customers to see, touch, and use a system very similar to their final product before large scale development begins. The laboratory will be among the best of its kind in the country.

The challenge of 1979, Wood said, is "to maintain the balance between getting new business and making sure we perform well on the business we have."

### Plant operations manages expansion

The facilities expansion and improvements begun in 1977 went forward in 1978 and will continue in 1979, according to Daniel A. Linn, who heads plant operations.

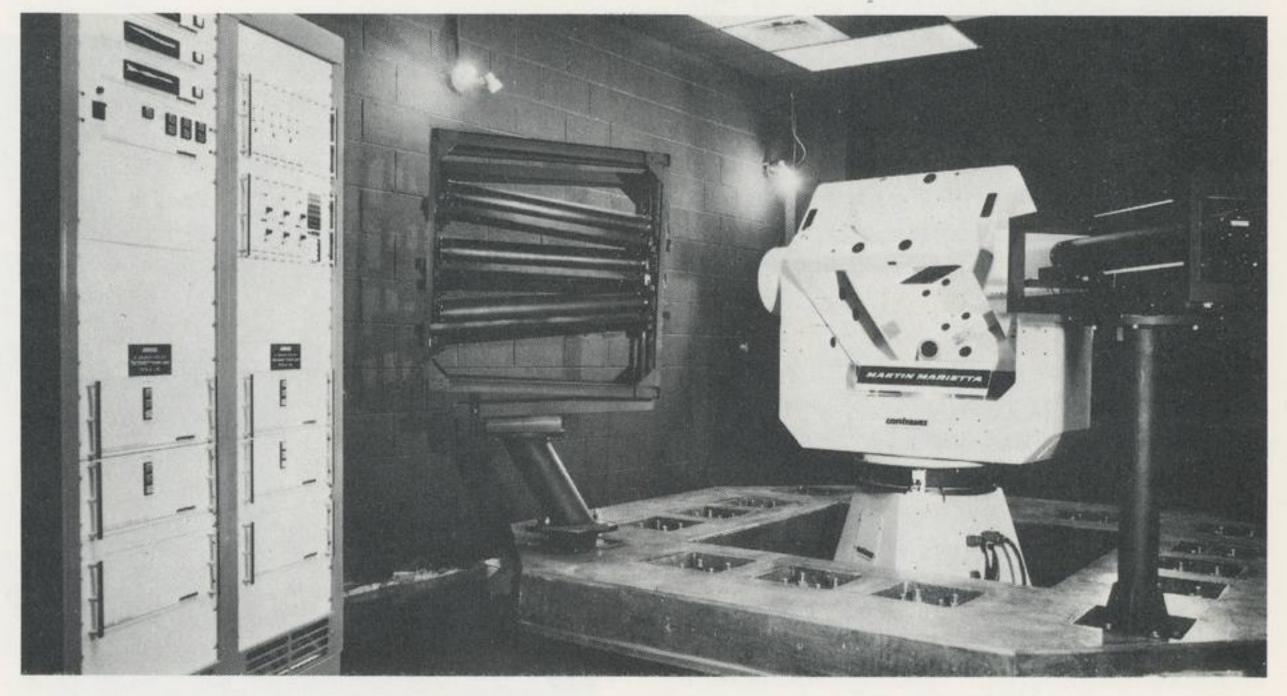
"I reported last year that capital expenditures in 1977 were the largest since the plant opened and that we would spend more in 1978," Linn said. "We have spent more."

Largest expenditures have been for addition of the near-field antenna test facility to the SSB; the command, control and communications lab; and the attitude control system (ACS) lab.

"We are making these large capital investments," C. B. Hurtt said, "because we believe the investment will help us accomplish our mission."

The three major facility additions will be completed in 1979, with the ACS lab scheduled for use in March; the antenna facility tests to begin in April; and the command, control, and communications lab complete in May.

The cafeteria remodeling announced recently will begin during the Christmas holidays and be completed in April. Parking lot improvements, also announced and begun in 1978, will continue in 1979.



ACS lab will be completed in 1979.

"One parking lot will become easier for employees to use," Linn said. "The addition of the antenna facility reduces parking adjacent to SSB. That makes the upper lot essential. For easier and safer access, we will construct a pedestrian walkway from the lot directly to about the third floor of SSB."

Another plan is also aimed at improving working condition, this time inside. "We expect to buy about 100 new typewriters and to rebuild many others," Linn said. Also continuing will be steps to update machine tools in the factory.

"We have talked before about natural resource conservation," Linn said, "and have achieved some success. For example, we have been recycling waste water through our treatment plant and using it to water the lawn and for fire protection," he said. "We have saved about 54 million gallons. We will continue the recycling in 1979."

Water recycling is only one conservation measure planned.

Air conditioning and heating controls will be reworked to improve operation of the equipment, make buildings more comfortable for employees, and save energy. The automated building system will be expanded.

Next year will be a busy one, Linn agrees, and one in which "we will listen to all suggestions and comments on ways to improve facilities and services."

# Business operations grows in first year

In its first full year as a separate function, business operations has grown in size and reputation, said Albert E. Hawkins, vice president in charge of the organization. "We have added about 100 employees since the beginning of the year, and they and others in our organization are providing services that are gaining acceptance. Program and central organization managers are budgeting for our services. I take this as evidence we are doing our jobs well."

While 1978 was very much a growth year, Hawkins sees 1979 as a year of consolidation. "Although division growth will continue in 1979, I see it as a year when we take the resources we have acquired in 1978, consolidate them, and get ready for the significant growth years of the 1980s."

The functions of business operations—finance, planning, contracts, and legal—are involved in some way in all aspects of the division's business.

"Right now that means we are working on some 370 active contracts with some 27 different customers", said Hawkins.

We have the responsibility for helping the people who manage these contracts attain their goals.

"We have highly trained, highly skilled people who are making certain the division earns a reasonable profit on its business. Our involvement starts early in the program when we help select the way the program will be managed. We help in planning, we review the contracts. Generally, we help the manager in controlling the program."

As business operations works with other organizations, it is striving to improve the basic systems of management.

"We hope to develop a system that can be tailored to the needs of each project regardless of its size," said Hawkins. "In one form it will provide the manager a shopping list from which he can choose those elements of the system that will work best for him."

In the future, business operations will have a classical management system that will contain all management needs including cost management, cost accrual, and billing. It will operate from a common data base needing only one input to cover all elements of the system.

"For us 1978 was an extremely good year," Hawkins said, "and '79 is also a year of equal promise."

## 1979 to be busy year for public relations

Public relations activity will step up in 1979 to a pace equal to that of 1976 when Viking landed on Mars.

"The difference," said John H. Boyd Jr., director of public relations," will be that we will have a variety of major events to talk about instead of one."

Among the events will be the SCATHA launch, the first space shuttle flight, and continuing Titan launches.

"As in 1978, the events of 1979 will be handled in four categories," Boyd said. "The emphasis may shift from time to time, but each will require our attention"

The categories are support of projects and their efforts; media relations (local, national, and international); community relations; and employee communication.

Highlights of 1978 in these categories:

Support of projects—an MX film for the customer and the general public; national advertisements describing division experience in launch and consigned systems; construction of a full-scale SCATHA model for use in three trade shows and a film. The model will be used to brief the press at the January launch.

Media relations—publication of Viking mission results book distributed to 2,500 newsmen, 400 libraries, 400 schools, and 30 planetariums. Employees have purchased 5,000 copies.

Community relations—more than 200 community leaders have attended breakfast briefings on division activities; tours for more than 30 community groups and college classes; Boyd chaired Project Confidence media committee for the Colorado Association of Commerce and Industry.

Employee communication—we published Martin Marietta News every three weeks and maintained the portable bulletin board system with emphasis on featuring employees, program progress, new business activities, and community activities.

"In 1979, we will attempt to improve all aspects of our work," says Boyd. "We will put increased emphasis on our speakers' bureau, getting more employees to participate in telling the division's story to the community. Plans are being made to participate in the many radio talk shows in the Denver area."

Division products will be featured in four major U.S. trade shows as well as the Paris Air Show where the teleoperator retrieval system will be featured.

"We will also continue to coordinate and manage the Martin Marietta Aerosp advertising program," Boyd report "The program has been successful with ads appearing monthly in the U.S., Europe, and England.

"I must add, particularly in a report in Martin Marietta News, that we are continually striving to improve content, readability, and the looks of this important employee communication," said Boyd.

### Technical operations expand capabilities

Technical operations, now headed by Walter O. Lowrie, expanded its laboratories, added more than 640 employees, won the largest dollar volume in contracts ever, and raised independent research and development (IR&D) scores to a new high during 1978.

"Our goals in 1979 are to repeat in most ways our accomplishments in 1978," Lowrie said. "We, of course, will not be adding as many new people, but even there we expect some modest growth, selectively acquiring people with the skineeded to meet new program requirements."

C. B. Hurtt, in his comments on technical operations, called the high IR&D scores "of great significance."

"The new high in IR&D evaluations is indicative of super attention and super performance in this important area of our business," Hurtt said. "The quality of the ork, its appropriateness, and the innovant and creativity displayed were measured by the government. We received the highest scores we have ever had."

Among important new contracts won in technical operations were the Galileo nepholometer, Galileo atmospheric structures experiment, feature identification and location experiment, cryogenic fluid management experiment, a development contract for heliostats for the U.S. solar-powered utility plant, and several building block contracts in the software area.

"Our business goals for 1979 exceed those of 1978," Lowrie said. "Our technical and design skills make me confident we can achieve the goals."

Along with the organizational changes came an emphasis in training to help employees perform well in the restructured functions.

"With the increase product base of the division," Lowrie said, "one of our major tasks now and in the future is to provide the technical overview to assure the quality of all products. We must be aware of what is going on in all areas and stand ready to technically support all projects or programs."

the same time, Lowrie added, technical operations must continue to look beyond today's technology and develop the technology of the future.

"We don't know for certain what may be needed," he said, "but we have to continue our research and technological development as we see the needs. Time tables are difficult to establish in research and development. Some projects may take the whole work likfetime of a professional before the projects mature and become part of a product."

#### 1978 a busy year for industrial relations

"A year ago, I said we expect to be busy in 1978 hiring people, implementing improved training and development programs, concentrating on improving our overall employee relations, and working toward a fair and equitable new contract with our union-represented employees in Michoud and Denver. These expectations were fulfilled," said Richard E. Weber, director of professional and industrial relations, as he reviewed 1978.

"We added about 1,000 in Denver and another 950 at our offsite locations," he said. "The net gain was not that large because of attrition, but total employment is up."

As C. B. Hurtt said in his report to employees, total division employment in Denver and other locations is 8,000. He also said "I have met many of the people hired this year. They are excellent people. It shows that we have taken our time in their selection."

In the hiring process, the division met its affirmative action goals for adding minority group members and women to the work force.

"These were not easy goals," Hurtt said, "but we met them. We will have tough goals in 1979. It is important that we be diligent in our efforts to again meet these goals."

"Major emphasis in 1979 will be to bring more training opportunity onsite," Weber said. "For example, the University of Colorado will conduct advance degree courses at the division beginning in January. Registration is being conducted.

"We will expand the offerings in the evening program and attempt to get other educational institutions to bring programs to our facilities," he said. "This is all in line with our emphasis on career development and personal growth. This area is also receiving more emphasis as part of the employee performance evaluation program. Employees are being asked to accept a greater role in planning their own development at the time of their evaluations."

"We will negotiate new contracts in 1979 with plant protection personnel in Denver and with union-represented employees at Vandenberg," Weber said.

Wage guidelines set by the federal government will have a bearing in 1979 on these negotiations and also on "the kinds of things we want to do for all employees in the compensation and benefit areas." Weber pointed out that "To assure that we qualify for government contracts, we must certify our compliance with these guidelines."

With a nonexempt salary program institued in 1978 at Cape Canaveral and Vandenberg and benefit modifications at Michoud, Weber says the division has a reasonably consistent compensation and benefit program. "We expect to have a professional industrial recreation person on the job early in 1979. This will lead to an expansion in recreation programs and facilities."

Hurtt said, "We are a people-dominated business with a unique bunch of people. Our chore in the years ahead is to be sensitive to their needs, their feelings, and their futures."

Weber responded, "Our programs are being planned to be people-oriented, people-sensitive and to help people better use their skills and talents."

# MX looks for go ahead on full-scale development

James W. McCown, who recently became director of the Missile X project, believes he is leading a project that gives the division an opportunity to play a major role in the Air Force ICBM effort for a number of years.

"We are ready for that role," said McCown. "I believe the people on the project proved that before I moved to Denver from the external tank program at Michoud. My challenge is to see that the work continues in the same excellent way."

Highlights in 1978 were the winning of the assembly, test, and support system contract and the successful completion of the trench validation tests. Tests of the breakout and erection system, the blast plug, and the shock isolation system were technically excellent, within cost, and on schedule.

"I believe there is general agreement that a new ICBM is needed and a growing acceptance of the MX system," McCown said. "I expect full-scale development to begin in mid-1979."

One decision yet to be made is the basing mode for the missile. Tests by the division have proved the trench system can be used. The division has submitted a proposal to support a study to provide design and cost information for an air-mobile basing mode to compare it with other basing concepts.

"The missile development contractor team has been selected and this team will continue work on missile system definition while basing mode evaluation is conducted by the Air Force," McCown said. "We expect the system to enter into full-scale development next summer following basing mode selection."

McCown expects the MX program to be a major business for many years.

"We should have a bright future," he said. "When we get a full-scale development go-ahead, we will begin increasing employment. We are also looking for an expanding role in this important project for our nation."

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# Space launch systems continues growth

"I believe you will hear from everyone that 1978 was an absolutely outstanding year," C. E. Carnahan, who heads space launch systems, said. "I won't be different—1978 was an absolutely outstanding year for us."

A new member of the Titan family—the Titan III 34D—moved through its initial contract phase into a full-scale, firm program. Parts are being fabricated and the first of the back-up launch vehicles for space shuttle Department of Defense missions will probably be shipped by the end of 1979. First launch of 34D will be in 1980.

"The evolution of 34D came along properly in 1978 and I believe it will become what it was intended to be—the backup vehicle for the DOD systems using the shuttle," Carnahan said.

Programmable aerospace checkout equipment (PACE) being developed by the launch systems group will be a part of 34D. However, the equipment will be launched during 1979 on Titan IIIB, C, and D missions.

The first PACE systems, which replace outdated and difficult to repair equipment used now, have been delivered to Cape Canaveral.

Among new business was a follow-on to the ground support system (GSS) for the DOD space shuttle activity.

C. B. Hurtt reported that the division "obtained the finest performance evaluations received on the GSS." He said this was also true for the payload integration contract (PIC).

Carnahan said, "PIC is a year old and a full-going operation. We expect additional contracts, perhaps before the end of this year, to do specific payload work as contrasted with the general payload support we have been doing."

In his comments Hurtt said, "I see our activities on the ground support system and the payload integration contract as excellent opportunities for long-term stability and growth."

The upswing in shuttle-related work is solid evidence that a plan to provide a continuous business base in launch systems is working.

"We developed a business plan that would offset any diminished Titan production with work for space shuttle," Carnahan said. "That plan is working and I predict a stable employment picture in launch systems for the foreseeable future."

Carnahan said there will be no decrease in emphasis on Titan. "We expect to be building and launching Titans at least until the mid-1980s. But, we must look to the future and that future is space shuttle."

And the future looks good for the multiproduct, geographically dispersed launch systems function.

#### Michoud operations readies first flight tank

Preparation for the first space shuttle manned orbital flight are progressing well at Michoud operations and at Cape Canaveral, with division employees fabricating and preparing for flight the external tank that will supply fuel to the shuttle orbiter main engines.

When that first flight is made in September 1979, George E. Smith will not be heading the successful external tank team. Smith, who has been vice president and general manager of Michoud operations since 1974, has announced plans to retire in March 1979, ending a 40-year Martin Marietta career.

Kenneth P. Timmons, who was named deputy director of Michoud operations in early December, is succeeding Smith.

The first flight tank is to be delivered to Cape Canaveral the month Smith retires. There it will be prepared for the historic first shuttle flight.

Eugene J. Horak, right, manager, thermal protection system (TPS) application at Michoud describes a sample of the TPS material to U.S. Senator Russell B. Long (center) from Louisiana who toured the facility recently to review progress on the external tank project. With Senator Long, at left, is William T. Gansert, director of production operations at Michoud. Senator Long is a member of the U.S. Senate Commerce Science, and Transportation Committee.

"The first four flight tanks are in various stages of assembly," Smith said, "and all are going well."

These four, however, are not the first to roll out the door of the 43-acre Michou assembly facility building. Others have been built for the extensive test program.

As C. B. Hurtt reported, "We have delivered all of the external tank test articles for the NASA test program. Structural testing, ground vibration testing, and the main engine firings in 1978 were all quite successful."

As evidence of the thorough preparation for first flight, employees at Cape Canaveral received their third perfect evaluation for work done there.

Smith points out that employment has increased slightly, attributable to a goahead to build 24 tanks per year and the authorization to procure long-lead items like extrusions, forgings, and castings. Michoud also has received new tasks from NASA including a program to reduce the weight of the external tank by 4,000 pounds—a reduction that translates directly into an additional 4,000 pounds of payload for the shuttle.

A major new program is a thrust augmentation study aimed at developing a method for adding solid rocket motors to the rear of the tank to provide add thrust for heavier payloads to be flown from Vandenberg Air Force Base, CA.

To prepare for the increase in work at Michoud, additional facilities worth about \$50 million will be built over the next three years.

"We are going to be building external tanks for years," Hurtt said, "However, we must do an excellent job to assure our continued work. Only through excellence can we prevent another contractor from getting the opportunity to build external tanks."

