LOCKHEED MARTIN MICHOUD SPACE SYSTEMS

MISSION SUCCESS®

BULLETIN

June 28, 1999

New riveter set to come on-line

Michoud Space Systems is now in the business of making its own Intertank panels.

A new riveter designed for this purpose is about to go on-line, bringing a significant segment of ET production to the Michoud Assembly Facility.

A total of eight panels (two thrust panels and six skin/stringer panels) are needed to build each Intertank for the ET. Until now, the panels had been purchased ready-made from hardware supplier Learjet.

Following arrival of these panels at Michoud, the procedure has been for Lockheed Martin to join them together using Michoud's GEMCOR Vertical Riveter to form a complete Intertank skin. (A number of further key activities, including installation of the Solid Rocket Booster Beam, are required to finish each Intertank.)

After completing a study on the benefits of bringing production of the panels in-house, Michoud Space Systems and NASA proceeded with procuring a new riveting machine to make the panels at Michoud.

GEMCOR, a Buffalo, New York-based machine tool company with 60-plus years of experience building riveting machines was chosen to design and manufacture the panel riveter.

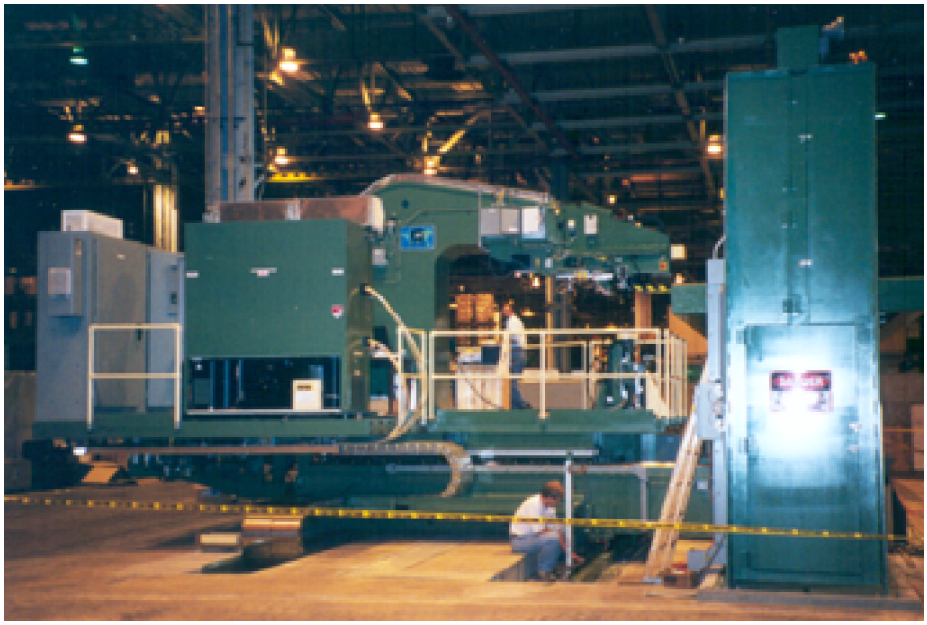
The decision to build the panels at Michoud was motivated by the company's need to have greater quality control over the hardware, to improve production schedules and to lower costs.

The new GEMCOR Riveter is located adjacent to the original Vertical Riveter in the Intertank assembly area of Building 103. The new riveter incorporates numerous technical advances, some of them driven by the ET project's unique requirements. For example, this is the first non-hydraulic machine of its type in the industry.

As preparation of the riveter for production continues, a team of GEMCOR personnel is currently completing installation and fine tuning of the riveter's operating and control systems.

When the riveter is up and running, Lockheed Martin employees will use it to make Intertank panels from parts including a rectangular section of aluminum skin, stringers and doublers. Approximately 10,000 rivets per panel will be used to join all the parts mechanically.

Production tests are currently scheduled to begin in mid-July with the start of a pathfinder article.



GEMCOR technicians and engineers ready the new Intertank panel riveter for production activities.

SLWT team effort recognized by NASA

NASA Administrator **Dan Goldin** recently acknowledged the Space Shuttle Super Lightweight Tank team through the presentation of Special Recognition Certificates.

The honor is a result of the team's outstanding achievement in designing, assembling and successfully flying the SLWT in 1998.

The certificate reads "For your contributions to the development and flight certification of the Super Lightweight Tank which flew first on STS-91 June 2, 1998, on STS-95 October 29, 1998 and on the inaugural flight of the International Space Station on STS-88 on December 4, 1998."

SECTOR NEWS

THAAD test successful

The Theater High Altitude Area Defense (THAAD) weapon system built by Lockheed Martin Missiles & Space successfully intercepted a target missile over White Sands Missile Range, NM on June 10.

The test was conducted by the U.S. Army Ballistic Missile Defense Organization (BMDO) and a contractor team led by Missiles & Space. The interception took place at a high altitude, and the target, which simulated a Scud ballistic missile, was destroyed on impact.

The test was the tenth in a planned series of THAAD Program Definition Risk Reduction (PDRR) flight tests to verify the THAAD prototype design and performance of system components.

All segments of the THAAD weapon system were successfully integrated during the flight test.

Corporation reduces earnings outlook for 1999 and 2000

Lockheed Martin announced that it has completed a detailed financial review as part of an ongoing assessment of the company's strategy, operations and organization. The assessment already has resulted in several actions including management changes in key business units.

The financial review resulted in a substantial reduction of the current earnings outlook for 1999 and 2000. The Corporation now expects, excluding the effects of nonrecurring and unusual items, earnings per diluted share of at least $1.50 for 1999, and at least $2.15 in 2000. For the second quarter 1999, a loss per diluted share between $0.10 and $0.15 is expected. Free cash flow estimates are also being reduced to $0.5 billion in 1999 and $0.9 billion in 2000.

The principal reasons for the revised financial outlook are increased cost growth, reduced production rates and delivery delays on the C-130J program; recent launch vehicle failures; and delays of launches and commercial satellite deliveries.

Music, fireworks light up A Capitol Fourth

Washington, D.C. sizzles on the 4th of July when the Lockheed Martin-sponsored *A Capitol Fourth 1999* broadcasts live from the west lawn of the U.S. Capitol.

The 90-minute special airs at 7 p.m., Sunday, July 4 on local PBS station Channel 12.

The last Independence Day celebration before the new millennium, *A Capitol Fourth 1999* kicks off with patriotic songs representing each decade of the 20th century.

A Capitol Fourth 1999 will celebrate the 100th anniversary of the birth of two musical masters, with a salute to Washington's most famous musical son, the legendary **Duke Ellington**, and featuring a medley of songwriter **Hoagy Carmichael**'s popular compositions.

External Tank Progress Report

Selected Highlights as of June 28, 1999

HARDWARE	STATUS
ET-103	
100th assembled Flight Tank	Building 420, Position 1. Completed DD250 of the Tank on 6/22. Tank is staged for shipment to KSC on 7/28 (under review).
ET-105	
Tank	Building 420, Position 2. Closeouts under way on Aft Interface and the Aft Dome. Intertank and LH2 Tank shakedowns are in work. Plan to complete the Tank by 7/15.
ET-106	
LO2 Tank	Cell K. Primer touchups and Conathane applications are complete. Respray of the Tank using BX250 is planned for 6/29.
LH2 Tank	Cell A. Tank is staged, waiting for new supply of BX250 to complete the closeout sprays.
ET-107	
LO2 /Intertank	Cell H. Spray preps are in work with spray planned for 6/30.
LH2 Tank	Cell B. Completed Forward Dome SOFI spray using BX250 in place of SS1174. Barrel spray preps in work.
ET-108	
LO2 Tank	7419 Tool. Single heat repair on OFO-2/O-2 weld is in work. Move to Cell F for proof test is next.
LH2 Tank	Building 451. Plan to proof test the Tank 6/28 and return to Building 103 to start post-proof test NDE activities on 6/29.
ET-109	
LO2 Tank	7023 Tool. Completed heat repairs; dye penetrant inspection and Lug welds remain to be completed.
LH2 Tank	5069 Tool. X-ray activities continue in work. Mechanical installations are next.
ET-110	
LO2 Tank	5018 Tool. Both Ogives are loaded. Weld preps in work.
LH2 Tank	5019 Tool. Aft Dome is loaded; waiting for Barrel 1.

Broad sweep of activities means a full menu of safety rules

Continuing the Mission Success Bulletin*'s series of articles on safety is* ***Tom Mobley****, Acting Vice President, Technical Operations.*

Tom Mobley

Technical Operations is generally assumed to be an easy environment for maintaining safety at work. The common vision of Technical Operations is engineers at their work stations using computers. On this view, their safety precautions would amount to: don't stack your data so high that someone could be hurt in an avalanche of paper; be careful not to trip over all the wires that connect various components of your computer system; maintain your keyboard at the appropriate level and provide proper seating to avoid back and hand strain; etc.

However, many Technical Operations employees work side-by-side with Production, Product Assurance and Facilities personnel. They climb tank access platforms, enter tanks, operate machine tools and work with hazardous materials.

These employees typically provide production technical support and/or work in the technical laboratories. Therefore, the proactive safety procedures and practices used by other functional operations are equally important in Technical Operations.

The on-going reemphasis on safety requires all Michoud Space Systems employees to participate in the safety initiatives. Several articles written by Leadership Team members have appeared in prior Mission Success Bulletins, and the safety guidelines and advice contained in each of these articles are appropriate for Technical Operations personnel.

Since a large number of Technical Operations personnel work in an office environment, housekeeping is a major proactive safety initiative. The retention of historical technical data is important, and proper storage of this data improves the working environment and enhances safety inspection by the area's safety representative.

In order to assure the maximum safety environment in an office environment, each employee should take the responsibility to notify the area safety representative of any unsafe condition.

This can be achieved by simply reporting the condition to the department secretary. The secretary will accept the responsibility to inform the proper representative.

It should be noted that Michoud Space Systems has chosen to include safety as a major incentive for ISO 9001 registration. This demonstrates the commitment by the Leadership Team to provide and ensure compliance to safety procedures. A safe work environment results in delivery of products that meet the customer's requirements and is an essential element in Mission Success.

ISO 9001 internal assessment, training under way

Since mid-May the ISO 9001 Implementation Team has been "out on the floor" doing internal assessments to determine progress as Michoud Space Systems continues to prepare for the big test in September — ISO registration.

The team's primary focus is evaluating and reviewing Michoud's Product Delivery System, according to **Feltus Kennedy**, ISO Senior Management Representative.

He pointed out the following benefits of an internal assessment:

• Provides an opportunity to "get up close and personal" with the workforce in conveying the ISO messages

• Familiarizes those employees who have been identified as most

Standards Institution (BSI) auditors in September

• Identifies process and system improvement possibilities and implements the changes necessary

• Establishes the baseline and verifies Michoud's compliance to the ISO 9001 standard.

"Following the ISO implementation team's internal assessment, the BSI auditors acting as an independent third party will visit Michoud on July 13-15 to conduct a similar pre-assessment," Kennedy said. "Both the Michoud ISO team and the BSI team have the common objective of preparing the company for the September compliance audit and registration."

"Training in the principles of ISO 9001 is nearly completed for about 240 supervisors who could be called on to support the pre-assessment," said **Bob Ottley**, Human Resources.

Following the completion of supervisory training, 45 sessions are planned during August to train all other Lockheed Martin employees working at Michoud.

An additional five sessions will be conducted in August by videoconference for company personnel at Kennedy Space Center, at Marshall Space Flight Center and on field assignments. According to Ottley, all ISO 9001 training is scheduled to be wrapped up in advance of the start of the September compliance audit.

1999 Hurricane Season June 1 - November 30

The hurricane names for 1999 provided by the National Hurricane Center are:

Arlene	**Floyd**	**Jose**	**Nate**	**Stan**
Bret	**Gert**	**Katrina**	**Ophelia**	**Tammy**
Cindy	**Harvey**	**Lenny**	**Philippe**	**Vince**
Dennis	**Irene**	**Maria**	**Rita**	**Wilma**
Emily				

Communications

Find out the official status of work at Michoud Assembly Facility by calling (504) 257-1MAF or 1-800-611-3116; checking EWS; listening to WWL-870 or WWL-TV; or accessing the MAF Site Status web site at: www.mafstatus.com

Internet users will find links from this site to the National Weather Service and a variety of other weather reporting and hurricane information web sites.

Protect your family and property by planning ahead

The Hurricane season is just beginning. Hurricanes and tropical storms can be dangerous killers. Learning the hurricane warning messages and planning ahead can reduce the chances of injury or major property damage.

This tracking map features some suggestions on how to prepare for a hurricane. For additional information, look into the Federal Emergency Management Agency hurricane facts web site at www.fema.gov/library/hurricaf.htm

Tropical Weather — A Glossary of Terms

Tropical wave or disturbance — A cluster of clouds or thunderstorms without an organized circulation, moving through the tropics. Tropical waves are the starting point of stronger storms.

Tropical depression — A system of clouds and thunderstorms with a defined circulation, having winds up to 39 mph.

Tropical storm — A system of strong thunderstorms with an organized circulation, having top winds from 39 to 74 mph.

Hurricane — An intense tropical weather system with a well developed circulation and sustained wind speeds of 74 mph or greater. A nearly calm area or "eye" is formed in the center of the circulation.

Tropical storm watch — Tropical storm conditions are possible within 36 hours.

Tropical Storm warning — A tropical storm is expected within 24 hours.

Hurricane watch — Hurricane conditions are possible within 36 hours. Preparations for a hurricane should be under way.

Hurricane warning — A hurricane is expected to arrive within 24 hours. Preparations should be completed.

The National Weather Service categorizes hurricanes on a scale of one to five:

Category	***Winds***	***Storm Surge***
Category I	74-95 mph	4-5 feet
Category II	96-110 mph	6-8 feet
Category III	111-130 mph	9-12 feet
Category IV	131-155 mph	13-18 ft
Category V	155+ mph	19+ feet

Hurricane Precautions

Before any hurricane...

• Know the storm surge history and flooding potential of your area.
• Learn evacuation routes inland.
• Know where offical shelters are.
• Check out your emergency equipment (flashlights, radios, etc.).
• Make sure you have several weeks supply of water and nonperishable food.
• Check home for clogged gutters or spouts and loose awnings, shutters and so on.
• Trim trees or shrubs that could damage your house.
• Determine where to move your boat.
• Buy emergency materials such as plywood and plastic in advance.
• Be sure first aid kits are well stocked.

During a Hurricane watch...

• Frequently monitor the hurricane's location on TV or radio.
• Prepare to cover doors and windows with shutters, plywood or other materials.
• Check prescription medicines — have at least a two weeks supply on hand.
• Fill all vehicles with gas.
• Be sure you have extra batteries, an adequate stock of food and water and first aid supplies.
• Have extra cash on hand.
• Be ready to secure movable outdoor items such as garbage cans and lawn furniture.

During a Hurricane Warning...

• **Follow instructions issued by local officials. Evacuate immediately if ordered to do so.**
• If evacuating, notify someone outside the storm area of your evacuation plans.
• Closely monitor progress of the storm and local conditions on radio or TV.
• If not in conflict with evacuation orders, complete preparations, such as putting up shutters and securing loose items.
• Follow instructions issued by local officials. Evacuate immediately if ordered to do so

"Girl Power to the Moon" winners see STS-96 launch

"5-4-3-2-1 and liftoff of Space Shuttle *Discovery*!"

Their eyes got bigger.

Orange flame and smoke shot from under *Discovery* as it roared away from Kennedy Space Center (KSC) into the early morning sky on May 27.

They tensed for the coming sound waves.

"Bam! Bam! Bam! Bam! Bam!" The booming sounds from Pad 39-B finally reached them, three and a half miles away.

"I could feel it inside my chest," said **Mandy Walkenhorst** of Lusher Extension School.

Mandy, one of sixteen New Orleans seventh grade girls to watch the shuttle from a VIP viewing site at KSC, said she had never seen a launch before and didn't know it would be that thrilling.

"As long as I can remember, I've wanted to be an astronaut," said Lusher's **Megan Myers** while craning her neck to follow the shuttle's smoke trail. "I've wanted to go up in space and see other planets. The three women make me think of my dream – that I could make it happen."

Megan was referring to astronauts **Ellen Ochoa**, **Julie Payette** and **Tamara Jernigan**, members of the seven-person STS-96 crew zooming toward a rendezvous with the International Space Station. After all, this was the purpose of the trip – to expose girls to non-traditional roles like *aerospace engineer* or *astronaut*.

Lockheed Martin Michoud Space Systems and Southwest Airlines teamed up to take the girls to the launch after judging their entries in the contest "Mission Possible: Girl Power to the Moon!"

The New Orleans Public School students designed and built their own model of a spaceport on the moon and wrote an essay on the spaceport role they would assume.

LaTrina Antoine from Eleanor McMain Secondary School wanted to be a controls manager. "They make sure everything's running right or correctly."

Some of the contest winners and their teachers wait with growing anticipation for the moment of launch at the VIP viewing site.

Mandy Walkenhorst thought an atmospheric chemist would be a good choice. "They deal with weather up in space. They take samples."

Named grand prize winners in the Girl Power contest, LaTrina and Mandy had seen astronaut and shuttle commander **Steve Oswald** the day before when he congratulated the group and told girls that maybe someday they could go up in space, too.

"Nothing like seeing it in person," said **Virgil Byers** of Lusher, one of five science teachers accompanying the girls. "Actually being here and experiencing it surpassed my expectations."

What a break from teaching six classes and 180 students a day, he said.

Pooped from waking at 2:30 that morning and getting to the viewing site two hours prior to the 6:48 a.m. launch, the girls slept on the bus trip to Sea World, their final destination before returning home.

Many of the girls had never flown before, so from beginning to end they described the trip as "awesome, cool."

"We're looking at this trip as a stepping stone for careers," said **Erica Mitchell**, Livingston Middle School teacher. "Math, science and technology. And especially space aviation. All our girls are turned on to science."

"I never thought I'd get to see all this stuff," confided **Christie Duvernay** of Thurgood Marshall Middle School after seeing the Saturn moon rocket during the KSC tour. "But I finally got my chance."

BITS & PIECES

Long Term Care special

The enrollment period for Long Term Care Insurance for active salaried employees is going on now: June 14th – July 16. Employees may enroll now, regardless of medical condition.

Please contact the Long Term Care web site: lockheedmartin.jhancock.com (password: lockheedmartin; username;jhancock) or call the dedicated Lockheed Martin John Hancock Customer Service Center at 1-888-562-7353 for information or to obtain an enrollment kit.

Mailroom procedure

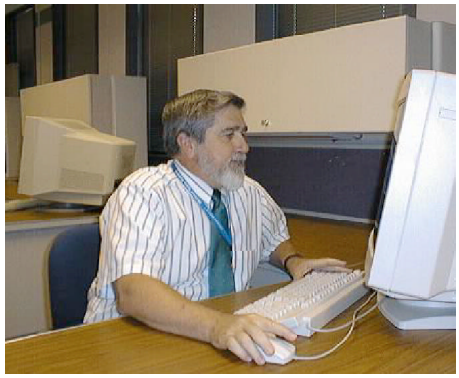
Mailroom service will be faster if all employees correctly list department numbers on all incoming and outgoing correspondence. New employees and employees who have transferred to different departments should take special note of this in order to expedite their mail delivery.

CAD Learning Center Opens

The Michoud Space Systems CAD Learning Center is open for business! CAD stands for Computer Aided Design, a critical capability that is used not only in our current programs, but is also crucial for winning new business.

"It is difficult to predict which design systems will be required by future customers," said **Mike Steiner**, Management Information Systems, who was instrumental in establishing the Center. "The plan is to begin now to develop expertise in a variety of CAD applications. The Center will be useful to cross-train designers on various Computer Aided Design and Computer Aided Engineering applications."

The CAD Learning Center is in Building 101, 2nd floor, column EC13 and is available to approved users 24 hours per day, 7 days per week.



Mike Steiner tries out one of the new Learning Center's training stations.

"We want to encourage all directorates to utilize this valuable resource," said **Eric Leonard**, Human Resources. "This CAD Learning Center is open to everyone who is willing to invest in themselves and the enterprise. Most of the CAD training will be in the form of self-directed learning materials such as CBT (computer based training) and there is no cost to the users."

The CAD applications available for immediate use include CATIA and Pro-E. Future plans call for SDRC Master Series, Unigraphics, ComputerVision CADDS V, and AutoCAD, as well as CAE applications to be added to the workstations.

There are five Hewlett Packard and IBM workstations.

All use of the workstations in the CAD Learning Center is for training purposes only. Any production use will violate the software license agreements.

As a result, no production use of these workstations will be allowed. Production examples may be brought in to the Center to enhance learning, but nothing can leave the Center.

Use of the Center must be coordinated with local management and with Computer Training. Contact **Kim Tran** of Computer Training via email or telephone (7-1529) for more information or to apply for access to the CAD Learning Center.

Supervisors finish rigorous training

Human Resources recognized first line supervisors on June 11 at a commencement luncheon that marked the completion of the Michoud Space Systems First Line Supervisory Development Program.

"Being a first line supervisor is one of the toughest jobs there is," said **Hugh Farabaugh**, Human Resources Director. "This training was designed to prepare them for a big challenge."

The program includes 24 training sessions, providing a wide view of what a new supervisor needs to know. Topics range from shop folders and grievance procedures to communication and employee motivation.

In-house subject-matter experts facilitated the sessions, using a variety of teaching methods

For example, the session entitled "The Supervisor's Role and Authority" used a panel of mid-level managers to present an open discussion of "real world" issues in the workplace.

Mike Javery, Director of Manufacturing & Test, addressed the graduates of the course, offering personal tips for achieving success in a leadership role.

Participants, rating each session, overall felt strongly that the training was relevant and will help them do their jobs better.

Part I of the program was offered to all new supervisors, while Part II targeted topics that are specifically related to the supervision of hourly personnel. In total, 25 supervisors completed Part I and 30 completed Part II.

All were recognized at the commencement luncheon where each was presented a Certificate of Achievement by program facilitator **Jerry Fabre**, of the Organization Development and Training team.

MILESTONES

Employees celebrating milestone anniversaries with Lockheed Martin in May include:

25 years
Suzette Archie
Tom Graham
James Jones
Robert McElveen

20 years
David Farin
Thomas Fitts
Gunther Gillat
Gregory Hanrahan
Gwendolyn Harrington
Bruce Maquar
Lloyd Meekins
Deborah Pastoret
Brenda Retif
Greg Taylor
Reginald Walker
David White
Thomas Wiltz

15 years
Norris Chaisson
Robert Champagne
Bruce Forest
John Rosche

10 years
Weldon Linden
Carlos Molina
Linda Salisbury
Doris Smith
Carlos Yingst

5 years
Floyd Daniels
Roderick Jones
Robert Mason
Irwin Savoye

MISSION SUCCESS® BULLETIN

Volume 18, Number 6
June 28, 1999

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Mission Success Bulletin is published by the Public Affairs Department.

New vessel for the External Tank begins service

A ceremony was held on June 7 at Michoud Assembly Facility to commission NASA's new External Tank barge, Pegasus. *At a dramatic moment during the ceremony, Marshall Space Flight Center Deputy Director Carolyn Griner broke a bottle of champagne over the bow rail of the vessel as representatives of NASA, United Space Alliance and Lockheed Martin looked on.*

Explorer Post in Superdome

Exploring is an activity sponsored by the Boy Scouts of America to familiarize teenage boys and girls with career opportunities in a variety of fields.

The Lockheed Martin Science and Engineering Explorer Post brings together experienced engineers with local high school students to familiarize them with career opportunities in science and engineering disciplines.

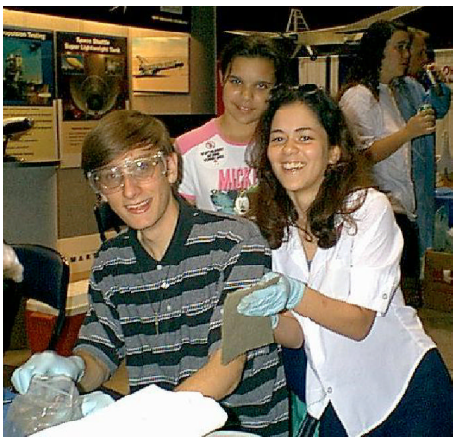
On May 15th, the Explorer Post wrapped up its year with a high profile show at the Boy Scout Good Turn Fair in the New Orleans Superdome.

The students created displays on aeronautics, mechanical engineering, computer technology and chemistry. Lockheed Martin engineers volunteered their time to demonstrate thermal protection materials, cryogenics and rocket propulsion, and they provided literature, pictures and explanations of External Tank and Reusable Launch Systems technologies to several thousand Boy Scouts and their families.

The Explorer Post, established two years ago as part of a corporate-wide initiative on Exploring, meets twice a month during the school year at the University of New Orleans.

The Post has an urgent need for adult advisors from within the Lockheed Martin community. The adult advisors are asked to share their technical expertise along with their practical, real-life experiences in science and technology with these gifted boys and girls.

If you are interested in serving in any capacity from Post Advisor to part-time assistant Advisor, please contact **Jim Mc Allister**, 7-5294 or **Gordon Dyer**, 7-0352.



Explorers gain practical experience at the scientific displays at the Good Turn Fair at the Superdome. Front: Garrett May (left) and Stacey Gobert.

Questions on ethics?

To obtain clarification on ethical matters or to report possible wrongdoing, contact the Michoud Space Systems ethics officer, **Stuart Stine**, at 7-3842, or call the Corporate Office of Ethics and Business Conduct, 1-800-563-8442.