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MARSHALL STAR

Serving the Marshall Space Flight Center Community

Aug. 23, 2007

Endeavour crew returns home after successful mission

NASA Headquarters News Release

The space shuttle Endeavour and its crew are home after completing a 13-day journey of more than 5.2 million miles in space. Endeavour's STS-118 mission successfully added another truss segment, a new gyroscope and an external spare parts platform to the International Space Station.

Endeavour's Commander Scott Kelly, pilot Charlie Hobaugh and mission specialists Tracy Caldwell, Rick Mastracchio, Barbara R. Morgan, Alvin Drew and Canadian Space Agency astronaut Dave Williams landed at NASA's Kennedy Space Center in Florida on Tuesday at 11:32 a.m. CDT.

Williams, Mastracchio and station flight engineer Clayton Anderson, with the help of their crewmates, made four spacewalks

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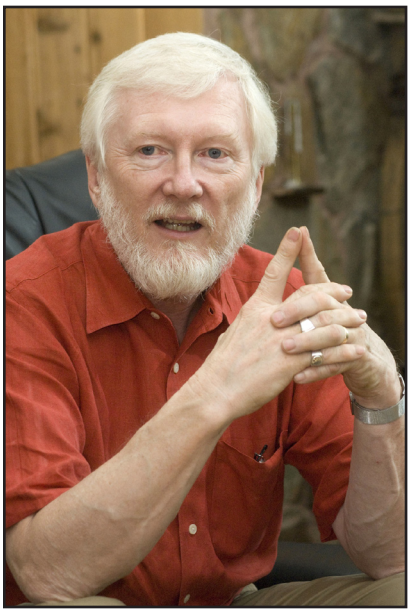
NASA

Space shuttle Endeavour touches down on runway 15 at NASA's Kennedy Space Center on Aug. 21.

An interview with former Marshall Center chief technologist James Bilbro

Redefining Marshall's role as a technology leader



Emmett Givery/MSFC

James Bilbro says full comprehension of the technology development process is necessary to achieving success for the center and for NASA.

James W. Bilbro, who retired from the Marshall Center in June, was the center's first chief technologist and assistant director for technology. He served in those roles from 2002 to 2007, helping guide technology development and assessment activities across the center. He remains a NASA advisor on optics and flight hardware technology development through his private consulting firm.

Since joining NASA in 1971 as an aero-astrodynamics engineer, Bilbro has achieved numerous successes on critical NASA missions, most notably development of advanced optics systems for the Chandra X-ray Observatory, launched to orbit in 1999, and its next-generation cousin, the James Webb Space Telescope, now being built and tested for launch in 2014.

From your vantage point as the Marshall Center's first chief technologist, what role does technology development have in determining Marshall's future course?

Above all, a development center like Marshall must have an intimate knowledge of what happens in the course of technology development — just as we must understand any other aspects of this business. Whether we are doing internal research and development, or drawing on the technology capabilities of other centers, agencies, industry or academia to meet or support our requirements, it is imperative that we fully comprehend the technology development process, and everything that is involved in seeing it through to completion.

See Bilbro on page 4

Steven C. Miley reassigned to SES position of associate director for operations in Marshall's Engineering Directorate

Steven Miley

Steven Miley has been reassigned to the Senior Executive Service position of associate director for operations in Marshall's Engineering Directorate. He will be responsible for planning, directing, and coordinating engineering project management and integration activities in support of Marshall's programs/projects and will represent the Engineering Directorate at critical center and agency institutional budget, human resources and facility reviews. Miley will officially report to Marshall on Oct. 1.

The Senior Executive Service is the personnel system covering top managerial positions in approximately 75 federal agencies

Miley has nearly 20 years of experience in both civilian and military programs in the business and acquisitions environment. He began his career in 1988 at the Aeronautical Systems Center at Wright-Patterson Air Force Base in Dayton, Ohio, as a contracting officer on the Maverick Missile, C-130 and Advanced Cruise Missile programs. Joining NASA in 1992, Miley served in leadership positions at NASA Headquarters and at the Johnson Space Center in Houston.

At NASA Headquarters, Miley served as manager of the Sponsored Research Business Office; executive officer in the Office of the Administrator; portfolio business manager in the Office of Space Operations; and assistant associate administrator for Institutional Assets Management and Investments, also in the Office of Space Operations.

At Johnson Space Center, he served as team leader in the International Space Station Payloads Business Office and manager of the Engineering Change and Integration Team. Since September 2006, Miley has served as director of the Strategic Capabilities Assets Program Division in NASA's Office of Infrastructure and Administration where he is responsible for leadership, oversight and management of NASA's strategic capability assets to ensure their availability and readiness to support NASA and national mission needs.

Commissioned through the Air Force ROTC in 1986, Miley is now a lieutenant colonel in the Air Force Reserve, where he serves on the Acquisition Staff of Headquarters Air Force at the Pentagon.

Miley earned a master's degree in business administration from Wright State University in Dayton, Ohio. He is currently performing dissertation research for a doctorate at the School of Public Policy at George Mason University in Fairfax, Va., where his research focuses on federal science and technology policy. Awards and honors include the NASA Exceptional Service Medal, the NASA Acquisition Improvement Award, a NASA Space Flight Awareness Honoree Award and the Air Force Meritorious Service Medal.

Marshall announces personnel changes in Engineering Directorate

Dr. Paul McConnaughey has been reassigned to the position of chief engineer in Marshall's Engineering Directorate. Rick Burt has been reassigned to the position of manager in Marshall's Test Laboratory. Dr. Pete Rodriguez has been reassigned to the position of deputy manager in the Spacecraft and Vehicle Systems Department.

McConnaughey has served as deputy manager of the Spacecraft and Vehicle Systems Department since December 2004. His background at Marshall is centered on computational fluid dynamics supporting propulsion, launch vehicle, payload and spacecraft programs. Three years after joining Marshall in 1986 as a mathematician, McConnaughey advanced to a supervisory position in the Systems Dynamics Laboratory. He also held positions as supervisory team lead, branch chief and division chief in the Structures and Dynamics Laboratory; manager of the Structures, Mechanics, and Thermal Department; and technical assistant to the engineering director and to the Office of the Director of the Space Transportation Directorate.

Paul McConnaughey

Burt has served in several technical program and project management positions at Marshall, including deputy manager of the Space Shuttle Projects Office, and deputy project manager, business manager and chief engineer of the Reusable Solid Rocket Motor Project. As chief engineer of the RSRM Project, Burt also was a member of the Independent Technical Authority. Prior to his new assignment, Burt served as manager of the First Stage Office in the Ares Project Office. He has more than 16 years of experience managing the design, development, manufacture, testing and flight operational aspects of the human-rated solid propulsion system for the space shuttle.

Rick Burt

See Changes on page 5

Marshall reclaims old Saturn test tunnel for new capability in East Test Area; 'RATT' roams tunnel to test laser technology

By Lori Meggs

There's a new "RATT" roaming one of the old tunnels under the Marshall Center's East Test Area.

The "RATT," or Remote Automated Target Transporter, is a robot that moves targets up and down this 300-meter tunnel where engineers are testing sensors that could be used for automated docking to the International Space Station — or even landing on the moon.

Marshall engineers are using the tunnel to test the Laser Detection And Ranging system. Developed by the Raytheon Missile Systems Company in Tucson, Ariz., for Department of Defense customers, LADAR technology uses laser sensors to guide missiles.

"Laser radar brings the ability to use three-dimensional scene information to autonomously select and measure the tilt and angle to a docking port or provide a range profile of the surface of a landing site," said Cliff Andressen, a Raytheon engineer.

But for Marshall engineers working in the tunnel, the real question is whether the system has applications to NASA projects.

"The advantages to this laser system are that it's small and lightweight, and every ounce counts when we go to the moon," said Dave Jacobson, integration manager in the Lunar Program and Projects Office in Marshall's Science and Mission Systems Office. "The less weight we have to include with our instruments for automated docking and precision landing, the more payloads we can carry to and from the lunar surface."

"Raytheon has proposed to the Marshall Center to test LADAR systems as candidates for Lunar Landing and Lunar Surface Mobility applications," said Harry Atkins, Raytheon's business development manager.

Automated sensor testing is typically conducted in the Flight Robotics Laboratory in Building 4619, but this 300-meter test tunnel — the only one of its kind in the country — is expanding Marshall's capability to the distances needed for testing lunar projects.

In a tunnel under the Marshall Center's East Test Area, engineers conduct a recent test with the Laser Direction And Ranging system — developed by the Raytheon Company in Tucson, Ariz.

Dennis Olive/MSFC

The Remote Automated Target Transporter, or RATT, is a robot that moves targets up and down this 300-meter tunnel under the Marshall Center's East Test Area.

"LADAR is a kind of radar used in airplanes and spacecraft right now because its optics have better resolution," said Tom Bryan, senior engineer in Marshall's Flight Robotics Laboratory. "What's unique about using it in our tunnel is that we can work at a computer and make the robot move as if it were flying a spacecraft, which is ideal for testing these laser sensors."

The tunnel stretches the length of three football fields from under Building 4570, an old blockhouse where engineers conducted and watched engine tests, to the historic Propulsion and Structural Test Facility — or, as it is sometimes referred to, the Saturn IB test stand. Built in 1957, the tunnel held miles and miles of cables and wiring used to transmit data during engine testing until the tunnel was cleaned out last summer. Now, more information than those cables could ever hold runs the length of the tunnel on one piece of fiber optic cable, no bigger than the size of an index finger.

"They've done an amazing job of turning something that was once mothballed into a useful facility unlike any other," said Susan Spencer, deputy for Automated Rendezvous and Docking Projects in Marshall's Science and Mission Systems Office. "This tunnel represents our ability to enhance Marshall's long heritage with testing video guidance sensor technology, along with the automated rendezvous and docking using our flat floor and Flight Robotics Lab."

A place that's been around 50 years also provides a constant and safe work environment. "We don't have to worry about anyone walking in unexpectedly and getting in the way of a laser beam; we can pretty well simulate the darkness of the space environment, without much optical distortion; and if bad weather strikes, we're protected," said Bryan.

"Just seems kind of fitting that we are working underneath the birthplace of the Saturn rocket to develop technology to help us return to the moon."

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Bilbro

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One of the basic truths about technology development is that you often don't fully know whether you can get from point A to point B. It's all about maximizing probabilities.

It is also true that we often don't realize we are involved in technology development until we encounter problems. This is particularly true of heritage equipment where we end up having to make changes that are more complex than we initially thought.

If you're a program manager or an engineer responsible for some segment of a technology development process, long-term assessment and analysis of the job is critical. It's not just a matter of getting a set of requirements, laying out milestones and marching off to meet your deliverables. You're working with a fixed amount of time and fixed number of dollars in most cases. You have to recognize what's needed to meet your requirements, and whether you can feasibly bring it off with the budget and deadline you've been given.

For technology developers, that's always the challenge. During that initial time period, when you really need to be developing new technologies, it's always difficult to get the resources to do it. Your people, your money and your facilities are primarily engaged in supporting today's business, not tomorrow's. There's this magic point separating mission-critical, next-generation technologies from those drawing-board technologies deemed promising but still too far downstream. Good technology developers need the know-how to determine which is which — which one is vital to meeting your mission requirements and which is feasible given your budget, resources and timeline.

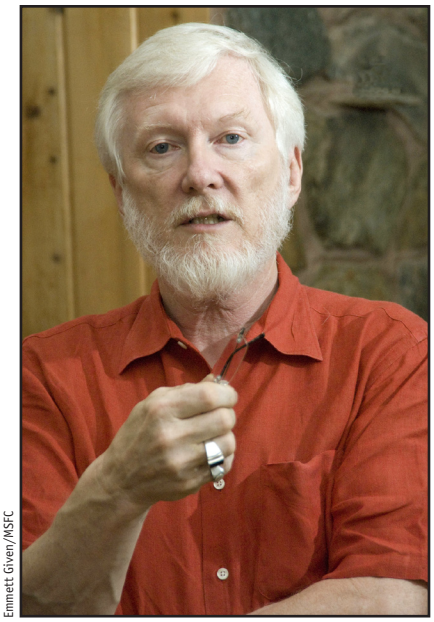
You have to have critical areas of focus or expertise as a development center. In terms of technological leadership, you can't be everything to everyone. We once were. Forty years ago, Marshall was the best at everything in aerospace. Today, we need to be able to pick and choose those areas of focus that will put us in the best position to grow and sustain future business for the center and the agency.

What are the primary technology challenges we face today?

One of the biggest, certainly, is positioning ourselves to deliver the Ares I crew launch vehicle, enabling us to return to the moon and travel beyond. The biggest challenge is understanding what is needed, and setting down a successful roadmap to achieve that.

That's a tough thing because money is always an issue. We have to make smart choices. What do we do in-house? What do we contract out? We have to carefully choose our way, and that's what NASA Administrator Michael Griffin is doing. He's fostered a pay-as-you-go plan, which is the only way I think it's possible to do it. It would be easy to set certain challenges of the exploration mission aside, let the cost of secondary or peripheral requirements drift into next year or the following year to pay for other things we want to do today — but then we end up with serious hurdles to overcome downstream, when the risks to mission success are even greater.

Budget constraints always present a challenge relative to maintaining a spectrum of business interests and technology programs. There's an essential practical nature to things. The needs of the center necessarily are second to the needs of the agency, and the needs of the agency second to the needs of the nation.



Emmett Given/MSFC

Bilbro, who joined the Marshall Center in 1971, believes NASA must "find ways to emulate the long-term business models of certain key industries," conducting more internal research and development in order to be successful in the future.

I think, however, that we often fall prey to the erroneous belief that we need huge amounts of money in place to launch a project or program. There are always certain things that aren't cheap, but you don't need to put a billion-dollar program in play to launch the development of technologies you're going to need 10 or 20 years from now.

What you do need is a sustained budget: $10-20 million dollars a year, even just $5 million. If you have a fixed amount of money, and you know it's going to be there over time, you can actually plan and develop. It's harder to see tangible progress if you've got $50 million one year and nothing the next. Or you ramp up to $100 million and then drop down to $50 million. A stable, long-term plan for paying for technology development is key.

How do we achieve that kind of long-term success?

We need to find ways to emulate the long-term business models of certain key industries. We can't really play in the world of consumer electronics and high-speed computers, for example. The kind of money we put up for technology development is a drop in the bucket compared to the billions awarded for development of next-generation computers. Industries such as computers and pharmaceuticals put about 15 percent of their profits into internal research and development! That's a rarity — companies primarily are in business for near-term dollars.

Right now, in the aerospace business, the average amount directed to R&D is about 3 percent. At NASA, it's more difficult to calculate such a number because we are not "for profit," and the way it's often defined can be misleading. It is safe to say that if we are to be successful in the future, we need to boost the amount we're investing in R&D, whatever it is.

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Bilbro

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There are areas that NASA needs to invest in now, in an ordered, sustained way, to meet our long-term goals. Consider shuttle-derived technologies. We've seen tremendous advances — in electronics, for example — thanks to commercial adaptation. But other technologies are much the same as they were 30 years ago.

When there are no outside drivers, no associated commercial activity or when the Department of Defense doesn't need it, when we're the only users, there's typically no forward driver for progress, for advancement of the cutting edge.

We have to change that. We have to determine those technology development areas that will be critical to our success in the long term and begin investing in them now. Or we risk that 20 years from now we'll still be sitting right here.

What strengths does Marshall possess to help realize this goal? How can we maintain our technological advantages?

The Marshall Center is one of the most broadly experienced ventures in NASA. Look at our history: the Saturn rocket program to enable the Apollo moon missions, the Skylab and Spacelab orbital science programs, the Hubble Space Telescope, Chandra. We're the only NASA field center with a history of major crewed and uncrewed flight programs. We have talent to spare here.

The environment changes, of course. When I first came to Marshall in 1967, there were 15,000 people working here, some 7,500 civil servants and a similar number of contractors. Marshall was still very much a part of Redstone in those days, and we followed the Army's approach, building everything in-house. It may not be the cheapest way to do business, but it got the job done back then.

The real challenge ahead of us is to go out and identify what areas of research and development are really critical to Marshall's future. Things are good right now — we're leading development of Ares I, and then there'll be Ares V. But what then?

It's the irony of the development cycle: You're always going out of business. So we have to adapt continuously, and keep redefining our place in the order of things.

I've been working a lot over the last few years to refine how we define and measure technology maturation. The Technology Readiness Level scale (a nine-level system used by NASA and other government agencies to assess the maturity of evolving technologies) has been around since the late 1980s. One of the last things I was working on as chief technologist is a formalized calculator, a set of questions and criteria that will help us better assess technology maturity.

My favorite one that always comes up is TRL-6, "Model or prototype demonstration in a relevant environment." Well, what accurately defines a prototype? What's a relevant environment? We end up with lots of grounds for argument. I've quizzed managers and told them they're not really at TRL-6 by my definition, and they've said, "We understand that, but there's not enough time or money to get it to your level of definition." I understand that reality. There may not be enough time and money to build a real system-level prototype and test it in a truly relevant environment. But then you're not at TRL-6! You have in effect transferred the risk to the next phase of the project — and that is not a good thing!

It may be manageable if the project makes the decision to carry the risk, and if the risk assessment is accurate. But nothing is worse than to assume you've retired risk when in reality you've just carried that risk downstream, where there's likely to be much greater chance of issues developing that cannot be easily resolved, if at all. It's my hope to leave the center and the agency with a clearer means of avoiding those issues, by working with a more defined technology maturity identification plan in hand, and an expanded set of definitions and criteria for the TRL levels.

The new calculator is being used in the Ares I development. The processes and criteria are in the final review stages as a new NASA Procedural Requirement for research and development, and will become a revision of NASA's Systems Engineering Handbook. I truly hope it will help Marshall and the agency effectively move forward with its new missions.

Rick Smith, an ASRI employee who supports the Office of Strategic Analysis and Communications, contributed to this article.

Changes

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Prior to reassignment, Rodriguez was the manager of Marshall's Test Laboratory. He began his NASA career in 1976 as an engineer, designing special test equipment at the Marshall Center. Previous positions include deputy manager of the Structures, Mechanics and Thermal Department; chief, Structural Development Branch; and chief, Structural Design Division. Rodriguez managed NASA's Meteoroid and Orbital Debris Technology Program and was lead systems engineer for the X-34 Experimental Launch Vehicle Program.

He also served as the leader of the solid rocket booster accident investigation team following the space shuttle Columbia accident in February 2003 and was a project manager for the Space Launch Initiative Program.

Pete Rodriguez

Landing

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to accomplish the construction tasks. The spacewalkers also completed work in preparation for upcoming assembly missions, such as relocating an equipment cart and installing support equipment and communication upgrades.

During the mission, a new system that enables docked shuttles to draw electrical power from the station to extend visits to the outpost was activated successfully. Because the system worked, two additional days were added to Endeavour's mission.

STS-118 was the 119th space shuttle flight, the 22nd flight to the station, the 20th flight for Endeavour and the second of four missions planned for 2007.

Although managers addressed several issues with Endeavour's heat shield, including a small gouge in the protective tile on the orbiter's belly, inspections in orbit revealed no critical damage. Endeavour's thermal protection system was declared safe for re-entry on Monday. The orbiter will be processed immediately for its next flight, targeted for February 2008.

With Endeavour and its crew safely home, the stage is set for the next phase of International Space Station assembly. Preparations continue for space shuttle Discovery's scheduled launch in October of the STS-120 mission to deliver the pressurized Node 2 connecting module to the station.

For more on the STS-118 mission and the upcoming STS-120 mission, visit http://www.nasa.gov/shuttle.

NASA

The open drag chute helps slow Endeavour as it lands.

County, state license office on Redstone Arsenal open to Marshall personnel

By Kari Hawkins

A satellite office of the Madison County Licensing Department and the Alabama Department of Public Safety's driver license bureau now is open in the Redstone Arsenal commissary shopping mall off Goss Road, near Gate 8.

The joint license office is open to anyone with authorized access to Redstone Arsenal, including Marshall Center employees, contractors and their dependents. Team members can use the new office to obtain or renew driver's licenses and license plates, state identification cards, boat registrations, and hunting and fishing licenses.

The county satellite office is open Tuesdays, Wednesdays and Thursdays. The state office is open on Wednesdays. Operating hours are 8:30 a.m. to 4:30 p.m. The county satellite office is closed for lunch from noon to 1 p.m. The state office is closed from 12:30 to 1 p.m.

The satellite office provides only the written exam for those needing driver's licenses. It does not provide road testing for private or commercial licenses.

The office has been in the planning stages for several months as Redstone Arsenal, county and state officials worked out issues regarding staffing and equipping the office, according to Bob Lott, team lead for the Base Realignment and Closure support team on Redstone Arsenal.

"We wanted to make sure we had consistency in our operations before we made a formal announcement about the licensing office," Lott said. "We expect this thing to really take off once it becomes well known that the office is on the Arsenal."

Lott's support team worked with Madison County License Director Mark Craig, Madison County Commission Chairman Mike Gillespie and state officials to make the satellite office a reality.

Some 238,000 residents in the Tennessee Valley have access to the Arsenal. An average of 48,000 cars drive onto the Arsenal each day. Those numbers are expected to increase substantially as the largest wave of Base Realignment and Closure transferees begin working on Redstone Arsenal between 2009-2011.

A version of this article appeared in the Aug. 15 issue of the Redstone Rocket.

Marshall's Business Systems & Support Office to host open house Aug. 23

The Marshall Center's Business Systems & Support Office from the Office of the Chief Financial Officer will host its quarterly open house Aug. 23 in the Self Study Learning Center, G-Level of Building 4200.

The open house is one of Marshall's main training venues for the Integrated Enterprise Management Program, or IEMP. The goal of the event is to build the knowledge and skills to equip Marshall's IEMP user community with the technical, management and leadership tools essential to move the organization to the future and accomplish results.

For this event, Marshall will have 12 subject matter experts to support 10 sessions. The training opportunities include a Purchase Card Refresher Training Course, i-View Portal training and an Integrated Asset Management overview. For a complete list of courses being offered, go to http://inside.msfc.nasa.gov/train/bsso_082307.html.

To learn more about this event, contact Angela Saile at angela.m.saile@nasa.gov.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue is 4:30 p.m. Thursday.

Miscellaneous

Assortment of clay pots; Weider Pro 9940 weight machine. 503-7060

Marble-based lamps; candle holders, $10 each. 852-1726

ATX P/S 380W, $40. 335-9707

Oak entertainment center, $250; oak roll-top desk, $200; bistro set, $40; wavy slide, $50. 656-5059

Carpet pad, 162 square feet, $12; carpet pad, 72 square feet, $5. 348-9381

Maytag Performa refrigerator, white, ice, water in door, $650. 348-3109

Computer desk, $65; skier, $100; Compaq 7594 computer, Windows 2000, $100. 772-1870

Yard Machines wood chipper, 10 hp, $650 obo. 721-3370

Boys' clothing, sizes 3 months to 3T. 837-5380

Pub table, two chairs, black, chrome, white piping on chairs. 565-2193

Gas golf cart $1,150; Harvard foosball/pool table, $45, pressure washer, pump, motor, $20. 325-2919

1941 J.C. Higgins bicycle, $225. 852-1726

Weslo Cadence 840 treadmill, $50. 213-9915

Black metal daybed, spring, $100. 772-1870

Two formal antique armchairs, ottoman, $200; cherry ball-and-claw end table, $100. 503-6773

Coffee table, wood, glass top, $80; king mattress, http://lmachamer.home.mchsi.com/forsale/, $100. 426-6026

AKC German Shepherd puppy, male, born June 22, black/tan, first shots, $500. 828-3373

Antique dining table, 40 inches by 60 inches, $500. 536-8415

Lenox Winter Greetings Christmas china, will sell together or by piece. 508-6840

Coffee table, glass top, beveled edges, walnut ball-and-claw base, $75; dinette table, $75. 508-3408

Seeburg jukebox, $800. 837-7916

Sofa, $150; magazine tables, $15; rocker, $25; ladies formals, $10-$30. 534-0939 or 527-6898

Washburn X50 Pro electric guitar, red, case, $400. 655-6293

Shoei RF-700 motorcycle helmet, full-face, extra visor, black, $75. 882-2654

Shelby utility trailer, 5 feet by 8 feet, ramp, plank bed, 15-inch wheels, $550. 431-8603

Two-axle trailer, 5 feet by 16 feet, new tires, $1,875 obo. 880-6335

Whirlpool bathtub, 72 inches by 42 inches, almond, six jets, working pump, $150. 655-6701

Vehicles

2007 Chrysler 300, V6, gray, power, factory warranty, 20k miles, $19,995. 520-2802

2007 Lexus IS350, silver, black leather, navigation, 306 hp, six-speed automatic, 7k miles. $37,380. 694-3404

2006 1756 G3 Gator Tough Jon boat, 60 hp, two-year warranty, $13,200 obo. 603-7834

2006 Jeep Commander Ltd., gold, V8 Hemi, leather, sunroof, 18k miles, $27,500. 353-0933 or 509-3241

2005 Ford F-150, lariat super cab, tan leather, 30k miles, $20,000. 684-0089

2005 Nissan Quest S, V6, automatic, power sliding door, AM/FM/CD, navy, $14,100. 658-5684

2005 Subaru Forester XS, L.L. Bean edition, 31,700 miles, $18,500 obo. 541-3404

2004 R-Vision Class-A Motorhome, slide, workhorse chassis, extended warranty, www.thewillettfamily.com/rv, $59,995. 883-7021

2004 Nissan Pathfinder LE, platinum, leather, sunroof, all power, Bose stereo, 40k miles, $18,500. 429-8534

2003 John Deere X585, 4X4, 54-inch mowing deck, 60-inch mid-deck blade, dump bucket, $7,000. 232-0246

2003 Tahoe, leather, captain seats, rear bench, rear air, $18,000. 468-0854

2003 Ford Expedition XLT, silver, leather, built-in DVD, six-disc CD changer, 78k miles, $14,900. 426-8187

2002 Honda Odyssey EX, red, gray interior, 121k miles, $9,800. 776-1652

2001 Acura Integra GS-R, black, five-speed, 102k miles, $7,000. 325-2717

2001 BMW X5 3.0i SUV, black, auto, moon roof, 84k miles, $17,999. 536-8995

2001 PT Cruiser LE, loaded, 81k miles, $6,999; Chevy 350 turbo transmission, $300. 797-8895

2001 Chevy Suburban LT, 2WD, leather, heated seats, towing package, 91k miles, $12,500 obo. 714-1941

2000 GMC Sonoma, custom-designed work truck, 4x4, automatic, 90K miles, off-road skid plates, regular cab, green, $7,500. (931) 967-7307

2000 Jeep Wrangler, six-cylinder, automatic, red, soft top, air, 65k miles, $13,000. (931) 625-1144

1999 Ford F-150 XLT, super cab, 5.4 V8, burgundy, 92k miles, $8,900. 508-8246

1999 Chevrolet Silverado Ltd., extended cab, leather, automatic, cover, 10,500 obo. 468-2493

1999 Honda Accord EX, V6, white, tan leather, moon roof, CD, 117k miles, $8,000. 508-7366

1994 Dodge Dakota pickup truck, new tires, $2,500. 722-9989

1988 Harley-Davidson Softail Custom motorcycle, teal and white, custom chrome, five-spoke front rim, $10,000. 714-4989

1986 Nissan 300ZX, red, 168k miles, $2,200 obo. 858-9655

1974 Mercedes 450SL Roadster, V8, automatic, yellow, hard, soft tops, $14,500 obo. 961-0678 or 883-4177

Two-seater go-kart, 6 hp, $400. 652-6287

Wanted

Dorm refrigerator. 724-2270

Futon. 777-8229

Pool cover, 18-by-36-foot in-ground pool. 858-9655

Dog kennel, any size. 882-0461

Pontiac Trans-Am, prefer 1969-1974, 1998-2002 models, will consider others. 509-3510

Suspended ceiling parts, 24-inch cross-tees, older style for 25- to 40-year-old grid system. 233-0705

Free

Soft HP laptop case; soft briefing bag. 679-8797

Lost

Silver bracelet, first or second floor of Bldg. 4200 or parking lot. 961-0358

Michoud hosts briefing, tours

Marshall-managed facility to support major projects for Constellation program

By Sherrie Super

NASA's Michoud Assembly Facility in New Orleans recently hosted a briefing and facility tour to highlight its role in manufacturing large structures and composites for the Orion crew exploration vehicle — the spacecraft that will carry up to six astronauts to space. Making its first flights early in the next decade, Orion is part of NASA's Constellation Program to send human explorers back to the moon and then on to Mars and other destinations in the solar system.

Managed by the Marshall Center, the Michoud manufacturing facility contains one of the largest production buildings in the nation, which includes a vertical assembly building for stacking external tank components for the Space Shuttle Program. The external tank is the single largest element of the shuttle, 27.6 feet in diameter and standing as tall as a 15-story building.

NASA selected Michoud to support several major projects for the Constellation Program, which is responsible for development of NASA's next-generation crew exploration and launch vehicles. Including Orion, the facility will manufacture and assemble the upper stage for the Ares I crew launch vehicle and the Earth departure stage and the core stage for the Ares V cargo launch vehicle.

Michoud is also the site chosen for the assembly of a commercial vehicle for NASA's Commercial Orbital Transportation Services project, a NASA effort to partner with industry to deliver crew and cargo to the International Space Station.

Event speakers included Sheila Cloud, transition director and acting chief operating officer at the Michoud facility; Caris "Skip" Hatfield, project manager for the Orion Crew Exploration Vehicle at NASA's Johnson Space Center in Houston; Cleon Lacefield, vice president and Orion program manager at Lockheed Martin Corp. in Houston; and Jim Bray, the Lockheed Martin Orion program manager of Michoud operations in New Orleans. Michoud also welcomed Jim Landry, director of Advanced Materials of the Louisiana Department of Economic Development and Dr. Tim Ryan, chancellor of the University of New Orleans.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Chip Howat, Lockheed Martin

Marshall's Sheila Cloud, transition director and acting chief operating officer at the Michoud facility, participates in the unveiling of a model of the Orion crew exploration vehicle.

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