



Officials Use 'Virtual Ribbon-Cutting' to Open Joint Army-NASA Virtual Innovations Laboratory at Center



Army Missile Command Commander Maj. Gen. James Link and Marshall Center Director Dr. Wayne Littles "virtually" cut the ribbon to open the new Virtual Innovations Laboratory. Looking on are Jerry Evans (left) from MICOM and Joe Hale of Marshall's Mission Operations Laboratory. Photo by Dennis Keim

A new, cutting-edge, virtual reality laboratory — created as a joint venture by the Marshall Center and the Army Missile Command (MICOM) — was dedicated Monday with a ribbon cutting by Marshall Center Director Dr. Wayne Littles and MICOM Commanding General Maj. Gen. James Link.

The facility, designated the Army-NASA Virtual Innovations Laboratory or ANVIL Lab, is housed in Marshall's Building 4663.

Creation of the Virtual Innovations Laboratory marks a significant stride in the Army-NASA partnership, as the two organizations pool resources and capabilities for greater cooperation in applied virtual reality technologies, while continuing to pursue their own missions.

In opening the facility, Littles and Link donned special glasses that enabled them to see a virtual reality display on a computer monitor, then used scissors to

snip a "virtual ribbon" that was part of the display. Following the ceremony, Littles and Link answered questions from news media covering the event.

"This is an area where we both have technology needs, so we're working together in a partnership to move that technology forward for both of our programs," said Littles.

Link noted that "Much of this came about just through engineers and scientists talking to each other. Frankly, it's amazing what can happen by empowering our employees."

Those attending the opening included Huntsville Mayor Loretta Spencer; Sen. Dwayne Freeman of the Alabama Legislature; members of the Virtual Reality Valley Alliance; the Huntsville-Madison County Chamber of Commerce; representatives of area universities and of industry firms.

Officials characterized opening of the laboratory as a step closer toward the goal of creating a "virtual reality valley" in Huntsville. Because of the significant work in virtual reality simulation in Huntsville, the Virtual Reality Valley Alliance was created in the early 1990s. It is comprised of more than 40 entities, including the Marshall Center, the U.S. Army's "Team Redstone," industry, universities and the Chamber of Commerce.

New Rocket Engine Designed by Marshall Center Clears Hurdle

by Deana Nunley

A rocket engine that could power the next generation of space launch vehicles passed a major milestone recently. The Fastrac engine, developed by engineers at the Marshall Center, has been cleared for the final stage of design.

The engine is being designed at Marshall and built by NASA's industry partners — including several small businesses. Major subcontractors include: Summa Technology, Inc. of Huntsville, which is building components such as a gas generator, propellant lines, ducts and brackets; Allied Signal, Inc. of Tempe, Ariz., and Marotta Scientific Controls, Inc. of Montville, N.J., which are supplying valves; Barber-Nichols, Inc. of Arvada, Colo., which is building the turbopump; and Thiokol Corp. of Ogden, Utah, which is building the chamber nozzle.

The Fastrac engine will help NASA meet its goal to dramatically reduce the cost of access to space. Each Fastrac

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Teledyne Brown Gets Lab Support Contract

Teledyne Brown Engineering has been awarded a contract by the Marshall Center to provide propellants, pressurants and calibration services in support of operations at the center, for a period of up to five years.

If all options are exercised, the contract could be worth approximately \$28.9 million.

Services to be provided under the contract are operation and maintenance of propellants and pressurants, which are substances such as nitrogen, hydrogen, helium and oxygen that are used in conjunction with propulsion testing activities in Marshall Center laboratories. The effort also involves operating and maintaining systems at the center for generating, storing and distributing high-purity air, as well as providing instrument calibration services.

The performance-based contract, with provision for performance incentives and deductions, will be divided into a one-year base period and four one-year options which may be exercised at the NASA's discretion.

The services to be provided are a continuation of an effort currently being performed under contract by Teledyne Brown Engineering.

'Take Our Children to Work' Set for June 19 at Center

Children of Marshall Center employees will get a first-hand look at their parents on the job when Marshall celebrates "Take Our Children to Work Day" on June 19. The day will be designed for employees' children in grades 3 through 12.

Activities will include a program in Morris Auditorium beginning at 8:30 a.m., tours of Center facilities and time for children to spend with parents at work.

Employees may register until June 16 by picking up forms in the Equal Opportunity Office, Building 4200, Room 220. For more information, contact Alicia Beam at 4-2849 or Rita Evans-McCoy at 4-7507.



David Hoppe, EH33, briefs Alabama A&M University President Dr. John Gibson (fourth from left) and Dr. Oscar Montgomery, interim vice president for Research and Development at the Productivity Enhancement Complex during a tour of the Center last week. Looking on are Gail Gordon, EH33 and Equal Opportunity Deputy Director Charles Scales. Photo by Terry Liebold

ISO 9000 Quality Audit Program to Start; Malone Chosen as Marshall Audit Manager

by Linda Carpenter,
ISO 9000 Team

As Marshall continues to forge ahead in its effort to obtain ISO 9000 Registration in early 1998, new activities which support the implementation of the ISO 9000 quality Management System will be brought into place. One such activity, which will affect all Marshall personnel whose work falls within the Scope of ISO 9000, is the Marshall Internal Quality Audit Program.

The Quality Audit Program will be used to verify compliance with, and effectiveness of, the Marshall Quality System and is an important management tool used to achieve the Marshall Quality policy objective to "provide quality products and services to our customers." Internal Quality Audit Teams (12-15) will be formed from approximately 125 internal auditors and approximately 35 lead auditors.

To implement the new program, the ISO 9000 Steering Group has named Roy Malone from the Safety and Mission Assurance (S&MA) Shuttle Integration Office to be the Marshall Audit Manager. He will be responsible for implementing,

managing, and reporting on the performance of the Marshall Internal Quality Audit system. Malone has an Electrical Engineering Degree from Georgia Institute of Technology. He came to the Marshall Center in 1994 from PRC Inc., where he supported Marshall as a Quality Engineer on the S&MA Support Contract.



Roy Malone

Robert Schwinghamer, Marshall's ISO-9000 Management Representative, expressed his confidence that Marshall personnel will respond in the Marshall traditional way and cooperate fully with Malone in his new assignment and appreciates everyone's support for the ISO 9000 initiative.

Employees are encouraged to visit the ISO 9000 Home Page via Inside Marshall (<http://www/inside>).

Japanese Astronaut Named to Station Assembly Flight

Japanese Astronaut Koichi Wakata will fly on STS-92, the third Space Shuttle mission to assemble the International Space Station, set for a January 1999 launch on Atlantis.

Wakata's assignment to the mission was announced by NASA Administrator Daniel S. Goldin and Japanese Science and Technology Agency Minister Riichiro Chikaoka, in Tokyo, Japan, Monday.

"NASA is honored to have Mr. Wakata participate in such an early and significant space station assembly mission," Goldin said. His participation on this flight is symbolic of the close bond that has developed between the American and Japanese space programs, and the extent to which we rely upon one another to meet our mutual objectives in space."

Wakata was selected as an astronaut in 1992 and has one previous space flight to his credit. He flew as a Mission Specialist on STS-72 in January 1996 aboard Endeavour. During that flight, the crew retrieved the orbiting Space Flyer Unit satellite which was launched from Japan 10 months earlier, and deployed and retrieved the OAST-Flyer satellite.

On STS-92, he will be the primary operator of the Shuttle's Remote Manipulator System robot arm supporting Space Station assembly tasks to be performed during four scheduled spacewalks.

STS-92 will be the fifth assembly flight and will build on previous American and Russian flights beginning with the launch of the Functional Cargo Block (FCB) in June 1998.

Prior to the arrival of Atlantis and the STS-92 crew, space station elements already delivered to orbit will include the FCB; Node 1 and two Pressurized Mating Adapters; the Service Module; and various logistical cargos that will be carried aboard the second Shuttle assembly mission in December 1998.



Marshall Center Director Dr. Wayne Little presents suggestion awards to Biliyar N. Bhat (top photo) of the Materials and Processes Laboratory and Jeffrey D. Brown and Jerry L. Hudgins (bottom photo) of the Astrionics Laboratory. Bhat was selected for an award to recognize his effort in locating and acquiring a Hot Isostatic Press excessed by the Department of Defense, Naval Aviation Depot, Cherry Point, North Carolina. Bhat's suggestion resulted in tangible savings estimated at approximately \$1.2 million, for which he received a cash award of \$3,587.50. Brown and Hudgins jointly suggested putting into operation a totally electronic approval, routing, tracking, and storage system for Marshall 8-1/2" x 11" documents in the configuration management system and other paper systems requiring transfer, review, and/or certification. They subsequently designed and implemented the system for tangible cost savings of \$94,890, which resulted in a cash award of \$3,196.70 and intangible benefits at the exceptional/extended range for an award of \$1,250. They shared a cash award of \$4,446.70.

Committee Seeks CFC Slogan

Marshall Center employees are invited to submit ideas for the 1997 Combined Federal Campaign (CFC) slogan contest.

The winner will receive recognition and a prize that will be awarded by the Commanding General, Army Missile Command, who is the Tennessee Valley CFC executive chairperson.

The slogan should be short and concise and submitted by June 10 via email to: steve.gaddis@msfc.nasa.gov.

Examples of past slogans include "Giving for a Better Tomorrow" - (1995) and "Giving Hope to Others" - (1996).



Seventeen faculty members of the Vanderbilt University School of Engineering visited Marshall Center laboratories last week to discuss opportunities for collaborating on projects with Marshall. From left are Dr. Kim Galloway, dean and professor of Vanderbilt University School of Engineering, Chris Coppens of Marshall's Structures Design Branch, Dr. Tom Cruse, associate dean from Vanderbilt; and Structures and Dynamics Laboratory Director Dr. Randy Humphries.

Dry Cleaners Offers Services to Marshall Employees

by Carol Wasserman,
NASA Exchange

On January 9, Valiant Dry Cleaners, Inc., opened in building 4200, room G37, under a concessionaire agreement with the NASA Exchange at the Marshall Center.

Offering a full line of laundry, dry cleaning, alterations, and shoe repair services, the hours of operation are 7:30 a.m. to 4:30 p.m., Monday through Friday, and the services are available to all Center employees, retirees, and on-site contractors.

profession for over five years, and has been independent for over two years. Moore is very dedicated and desires to provide the best service possible.

Cynthia Ewing is the friendly person who will process your order. She has many titles including operations clerk; student; novelist; and official public relations representative of Valiant Cleaners. She holds an associate's degree in accounting and is pursuing a degree in physical therapy at Calhoun Community College. She is an aspiring author and is completing her first novel.

According to Ewing, the usual turnaround period for laundry and dry cleaning is 48 hours with 24-hour turnaround available upon request. Shoe repair normally takes 48 hours and alterations take 5-7 days.

Moore and Ewing invite all employees, retirees, and on-site contractors to take advantage of these services by stopping by room G37/4200 or calling 4-1006 for more information.



Cynthia Ewing of Valiant Cleaners cheerfully waits on customers.

Photo by Dennis Olive

Michael Moore, Valiant owner, is a Huntsville native and Johnson High School graduate. As a young entrepreneur, Michael began as a delivery person and worked his way up to owning a cleaning plant and numerous drop-off/pick-up stations. He has been in the cleaning

Stamp Show to Recognize Apollo 17

The Huntsville Philatelic Club will sponsor its 30th annual stamp show June 14-15 at the Tom Beville Center. The 25th anniversary of Apollo 17 will be recognized by the issue of a special philatelic cover and postage cancellation. Admission is free. The club, which annually recognizes significant space events, selected Apollo 17 for the special cancellation due to its importance to the U.S. Space Program and the involvement of area engineers and scientists.



Benita Hayes (foreground), of Marshall's Technology Transfer Office, hosts members of the Alabama Technology Network Manufacturing Extension Partnership at the Productivity Enhancement Complex where they are briefed at the Vacuum Plasma Spray Coatings research cell. Photo by Emmett Given



Susan Cloud, deputy director of Marshall's Human Resources and Administrative Support Office, bids farewell to Gloria Cornett. Cornett worked as a courier for the Center for eight years.

Departing Courier Extends Thanks

Thanks goes to Jeanette Bedwell, Jeff Jackson and Kathy Blevins for all their help. I have enjoyed these eight years as your courier. Thanks especially to Henry Hill for looking out for me all these years. My parents and I are moving to Marietta, Georgia to be close to my sister.

Fastrac Engine

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engine will initially cost approximately \$1 million — about one-seventh of the cost of similar engines. The Fastrac provides 60,000 pounds of thrust to boost payloads weighing up to 500 pounds. As design improvements are discovered through test experience, the cost is expected to drop even more.

The Low Cost Boost Technologies effort, which oversees development of the Fastrac engine, is focused on making space launch more affordable — especially for small payload and research markets stymied by high launch costs. The space agency has bridled Fastrac engine costs by keeping the engine simple, shortening the design cycle and adapting commercial off-the-shelf technologies and manufacturing techniques.

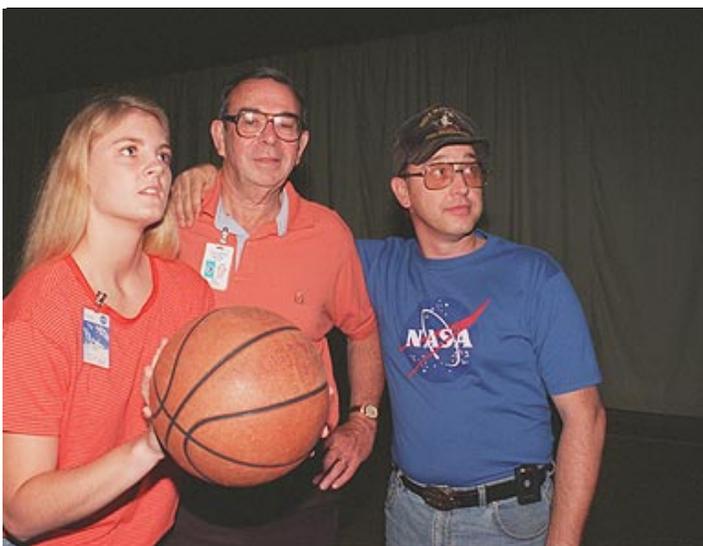
A detailed analysis — called a critical design review — concluded the Fastrac engine meets design requirements and can continue on its “fast-track” schedule for launch next year. The focus now shifts to building and testing the engine.

Technology development and design for the engine began in early 1996. The Fastrac engine is scheduled to power the X-34 technology demonstration vehicle on its first flight in late 1998. The two-and-a-half year design cycle sharply contrasts with the average seven years spent designing previous American rocket engines.

“In addition to meeting a much faster-than-usual design schedule, NASA and its business partners are responding successfully to the challenge to build rocket engines that are smaller, cheaper and better,” said Danny Davis, manager of the Low Cost Boost Technologies Project. The effort is one segment of NASA’s Advanced Space Transportation Program, managed at



750K injector test for the Marshall-developed Fastrac engine in the Center's east test area. Photo by Dennis Olive



Kellie Jolly, starting guard for the two time NCAA Champion Tennessee Volunteers women's basketball team, gives shooting pointers to Bill Burns (left) of Native American Services and Ralph Young of EH52. Jolly, who was visiting her uncle Burns at the Center last week, set an NCAA record for assists in a championship game. Photo by Emmett Given

Marshall Center. The program is an initiative to reduce the cost of space launch and develop technologies for space transportation needs for the next 25 years.

The Fastrac engine may be one of the world's simplest turbopump rocket engines. It's fueled by a mixture of liquid oxygen and kerosene, and has significantly fewer parts than previous American-made rocket engines.

Chamber pressure is supplied by a single turbopump. The booster relies on a simple gas generator cycle, which burns a small amount of kerosene and oxygen to provide gas to drive the turbine and then exhausts the spent fuel.

Another simple feature is the avionics — or electronic control system. The engine is tuned to a specific thrust and mixture ratio. There are no expensive electronics that continually monitor and adjust the engine valves.

The Fastrac engine is 7 feet long and 4 feet wide, and weighs almost 2,000 pounds — less than half the size and about one-third the weight of a Space Shuttle main engine.

Individual components, such as the gas generator, turbopump assembly and fuel tanks, are undergoing testing at Marshall. The first-stage booster, with the tanks and engine assembled, will be tested at Stennis Space Center in Mississippi beginning in early 1998.

Flying Club to Hold Open House

Marshall employees, contractors and family members are invited to a free Redstone Flying Activity Open House, 10 a.m. to 3 p.m. Saturday, on the southwest side of Redstone Airfield. Mini flying lessons will be offered at \$20 for adults and \$15 for children. Aerial tours of Huntsville will also be available. The open house is intended to acquaint potential users with the full range of flight training and aircraft rental services available here. For more information contact the Flying Activity at 881-3980 or 880-9495.

Employee Ads

Miscellaneous

- ★ Bass Buggy Boat 2-man, trolling motor, swivel seats, paddles, anchor, life-vests \$450 o.b.o. 880-1606
- ★ Golf Clubs - Calloway S2H2 irons, 3-pw, Memphis steel shafts, new grips \$325. 353-8989
- ★ Murray 12HP 30" riding mower w/grass catcher/mulch kit \$700. Call after 5 p.m. 851-1720
- ★ Burley lite bicycle trailer for kids. 100lb capacity quick release hitch \$175. 881-0533
- ★ Solar system, working when removed, seven panels, plumbing, stove, fireplace insert \$1,800 o.b.o. 615-363-8217
- ★ Sailboat Chrysler 22', swing keel 6HP, Evinrude o/b. New main, storm jib \$3,300. 830-6655
- ★ Laundry sink with faucet \$12; CD player \$30; Papa-san chair with cushion \$15. 536-8951
- ★ Lawn mower 3.5HP, Briggs and Stratton Sprint engine, push mower, mulcher, never been used \$150. 205-518-9802
- ★ Ladies bicycle, Trek 800, all terrain. Includes helmet and pump. New \$356, sell for \$200. 882-9417
- ★ 1, 3, 5 Oversized titan-alloy woods, graphite shafts. New \$150 3-pw irons cavity back \$50. 881-5190
- ★ Solid wood frame couch/loveseat, reupholstered, hunter green/burgundy stripe \$150 o.b.o. 837-9717
- ★ King size waterbed, bookcase headboard, six drawer pedestal \$150. 355-7156
- ★ Two 10-speed bicycles \$35 each. 355-6525
- ★ Living/dining room, German buffet credenza sofa, 2 arm chairs, coffee/dining table w/4 chairs, lamp \$500. 881-5269
- ★ 1988 Astroglass 178 fish & ski, 150HP x XR2, many extras, garage kept \$6,300. 721-9101
- ★ Den furniture, black oak, burgundy upholstery: sofa, rocker, coffee/side tables, lamp, large berber rug \$250. 881-5269
- ★ Clogging shoes with toe guards and taps, size 9 \$30. 532-8223

Miscellaneous

- ★ Trios skeet mini trap \$20. 881-5269
- ★ Pet mini sport utility divider. Fits Explorer, Blazer S10, Bronco, Jimmy Cherokee, used \$40. 532-8223

Vehicles

- ★ 1985 Oldsmobile Firenza Wagon, 111K miles, sport wheels, needs minor a/c repair \$875 firm. 753-2278
- ★ 1990 Jeep Cherokee Laredo 4x4, 78K miles \$9,200 firm. 851-2929
- ★ 1987 Acura Integra LS, 5-speed, two-door hatchback, A/C stereo, one owner \$2,995. 230-0789
- ★ 1985 626 Mazda, less than 100K miles, 4-dr., A/C, 5-speed. 837-2783
- ★ 1989 Chevy Beretta, 4 cyl., 117K miles, A/T, A/C, one owner \$2,500. 772-3584
- ★ 1994 GW Invader Bravo w/trailer, inboard/outboard, 5.0 V8. New \$26,000, sell for \$16,900. 536-8223
- ★ 1979 Caprice Landau, original owner, 2-door, 305 V8, \$1,100. 881-1249
- ★ 1995 Chevy Silverado, 4x4 \$17,900. 247-5780
- ★ 220 Kawasaki ATV, one owner \$2,900 o.b.o. 615-363-8217
- ★ 1985 Olds Cutlass Salon T-tops, new tires tinted windows, one owner \$4,500. 551-0696 or 852-8505

Wanted

- ★ Baby changing table and high chair. 232-8311
- ★ Cap and/or T-shirt (Large) used by volunteers at Marshall open house. 461-4254

Free

- ★ German Shepherd, female, 1 yr., all shots, spayed, small build, affectionate & playful. 534-8186

Found

- ★ Camera found in Building 4203, Room 3004, call 4-4541 to identify.

Center Announcements

- ☛ **MARS**— The MARS Scuba club is offering a beginning Scuba class. Classes begin in June and will run for three weeks. The class is open to all Marshall employees and on-site contractors. Contact J. Patterson, 4-6023.
- ☛ **Dry Cleaning**—The new hours for the laundry/dry cleaning and shoe repair drop-off service, located in Bldg. 4200, Room G-37 are 7:30 a.m. to 4:30 p.m. Monday through Friday.
- ☛ **MARS**—The MARS Golf Club tournament is scheduled for June 7 at Joe Wheeler. The format will be 2-man best ball and is open to all Marshall employees and retirees.
- ☛ **Toastmasters**— Redstone Toastmasters International will meet every Tuesday at 6 p.m. in the Morrison's Cafeteria in Madison Square Mall. For more information call 461-0476.
- ☛ **MARS**— The MARS fishing club held a tournament at the Elk River on May 17. Tournament results are as follows: 1st - Charles Cothren/Ross Evans, 6 fish at 8.85lb; 2nd - Charles Nola/John Pea, 5 fish at 6.99lb and 3rd - Ken Anthony/Alex Rawleigh, 6 fish at 5.75lb. Charles Nola caught big fish at 2.92lb. The next tournament will be June 7 at Waterfront Grocery Ramp on Lake Gunterville. An organization meeting will be held at 12 noon on June 5 at the MSFC picnic pavilion.
- ☛ **Retirement Breakfast**— Facilities Office will have a retiree breakfast at Shoney's located on University Drive and Parkway on June 10 at 8 a.m.

Job Opportunities

- CPP 97-45-CP, Budget Analyst, GS-560-13** (2 Vacancies), Office of Chief Financial Officer, Resources Management Office, Institutional Operations Office. Closes June 5.
- CPP 97-46-PL, Secretary (OA), GS-318-06,** S&E, Astrionics Laboratory, Optics & RF Division. Closes June 11.

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