



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Jan. 7, 2010



The Marshall Center

2009

Year in Review



Director's Corner

A great year for Marshall

2009 was a great year for Marshall as we embarked on NASA's sixth decade and celebrated the 40th anniversary of America's walk on the moon. We ended the year with a workforce engaged in challenging and exciting work critical to NASA's exploration mission, and we expect that to continue throughout 2010.

In some respects, 2009 was a year of transition. We worked our way through transitions as an agency and as a center, never losing sight of our mission. As you know, the Administration is developing its position on the nation's future space policy and has commissioned a review by a panel of experts. This team has stepped up throughout that process, and I can't thank you enough. As an agency we've completed our assessment of the Augustine Committee's final report and have provided our feedback to the White House. With that behind us, we look forward to a decision by the President and subsequent deliberations by Congress. While we wait for additional direction, we are diligently working to accomplish great things for the space program.

In terms of the development of launch vehicles and hardware, nothing is more important to us than flying out the remaining shuttle missions safely until its scheduled retirement later this year. Our shuttle team turned in five very successful missions last year, demonstrating our continued commitment to fly the shuttle safely until its retirement.

The Ares team has worked hard under immense pressure and has met every milestone. Last year, our Ares team successfully completed tests on the drogue parachute, the J-2X gas generator, the ullage settling motor and the Ares I first-stage development motor. Of course, the first real test of the integrated stack was the Ares I-X. The culmination of years of work, NASA's Ares I-X lifted off on October 28 for a two-minute powered flight. It was a great effort by our team, providing a tremendous amount of data to anchor our models going forward.

In March of last year, we marked the eighth anniversary of around-the-clock operations of our Payload Operations Center. We also provided several racks to Kennedy Space Center for delivery to the station, including the Oxygen Generation System, the Water Recovery System and the Materials Science Research Rack.

While the engineering side of the house has been building rockets, the science side of the house has been rewriting the textbooks. The Chandra Observatory celebrated its 10th anniversary last year. Our SERVIR team is now using its satellite visualization system in Africa to help speed response time to environmental changes and natural disasters. We tested the first mirrors for the James Webb Space Telescope. And the Lunar



Precursor Robotics Program helped to successfully launch the Lunar Reconnaissance Orbiter and Lunar Crater Observation Sensing satellite to the moon, verifying that water does indeed exist in a permanently shadowed lunar crater.

We also had great success on the institutional side. We opened the second building in our new engineering complex – the second building in NASA to meet the LEED gold standard. In terms of outreach, 68 teams from all over the world competed in our Great Moonbuggy Race, and more than 350 students from 17 states competed in our Student Launch Initiative. We also reached out to the business community. Last year Marshall won NASA's first-ever Administrator's Cup Award for having the best small business program in the agency. In fiscal 2008, we and our large business primes obligated more than half a billion dollars to small businesses through direct contracts and the large business subcontracting programs.

Due to your hard work and remarkable accomplishments, we begin 2010 well positioned to support the agency in behalf of the American people. Thanks again for all you do!

Robert Lightfoot
Center Director

Selected highlights of Marshall's 2009 year of great accomplishments

January

2009
Year in Review

Ares I-X rocket successfully tests separation system in Utah

The development of NASA's next-generation crew launch vehicle, the Ares I rocket, took a critical step forward Jan. 29 as ATK Space Systems successfully conducted a full-scale separation test of the forward skirt extension for the Ares I-X flight test at its facility in Promontory, Utah.



February

2009
Year in Review

NASA successfully tests drogue parachute for Ares I rocket

On Feb. 28, the Marshall Space Flight Center and industry engineers successfully completed the second drop test of a drogue parachute for the Ares I rocket at the Army's Yuma Proving Ground near Yuma, Ariz.



March

2009
Year in Review

Payload Operations Center at Marshall marks 8th anniversary

March 8 marked the eighth anniversary of round-the-clock operations at Marshall's Payload Operations Center, supporting scientific research aboard the International Space Station. The Payload Operations Center team has been helping crew members on the station and researchers on the ground accomplish their science goals since 2001. The Marshall team also provides the Backup Control Center for the space station, which can be activated in the event of an emergency that requires the evacuation and shutdown of the Mission Control Center at Johnson Space Center in Houston.



Final pieces of Ares I-X rocket head to launch site

The final pieces of the Ares I-X flight test rocket left the manufacturing facility in Utah on March 12, to begin a seven-day, 2,917-mile, cross-country journey to the launch site at NASA's Kennedy Space Center in Florida.

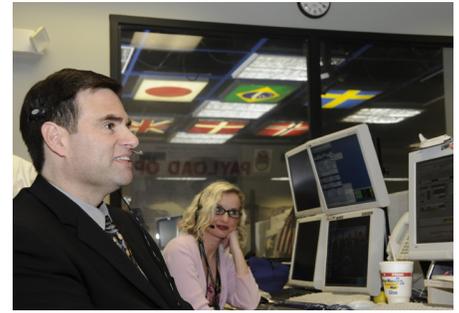
First shuttle mission of 2009 powers up space station for science experiments, crew expansion

Space shuttle Discovery and its seven-member crew launched March 15 from the Kennedy Space Center on the STS-119 mission to the International Space Station. The flight delivered the final set of power-generating solar array wings, completing the orbiting facility's truss, or backbone, to generate enough electricity to fully power science experiments and accommodate a six-member station crew. The 13-day mission included three spacewalks and delivered a replacement unit for a Marshall-built, Marshall-managed system that converts urine to potable water. Landing was March 28 at Kennedy.



Station astronaut shares mission highlights with Marshall

Expedition 17/18 astronaut Greg Chamitoff talked to his former crewmates on the International Space Station during a visit to the Payload Operations Center April 1. Jessica Zeller, a payload communicator with a direct link to astronauts on the station, assisted Chamitoff with his call. Chamitoff stopped by the operations center to thank Marshall team members who helped him accomplish many science goals during his six months on the station in 2008.



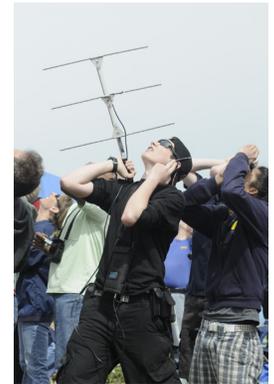
Great Moonbuggy Race draws record number of teams

Sixty-eight high school, college and university student teams competed in the 16th annual NASA Great Moonbuggy Race April 3-4 at the U.S. Space & Rocket Center in Huntsville. The record number of teams – two dozen more than participated in the 2008 race – were from 20 states, Puerto Rico, Canada, Germany, India and Romania. The event, planned and hosted by the Marshall Center, commemorates the Apollo 11 lunar mission, which included the first excursion by the lunar rover developed at Marshall. Hundreds cheered the racers; hundreds more followed real-time race updates posted to Marshall's presence on Facebook and Twitter; and hundreds of thousands may have seen dozens of race-day television interviews with teams from their areas via NASA satellite.



Rockets away! Students answer NASA challenge, send 32 rockets aloft

The 2008-2009 Student Launch Initiative and University Student Launch Initiative rocketry challenges – known as the NASA Student Launch Projects – culminated April 18 with a marathon "launchfest" in Toney, Ala. More than 350 middle school, high school, college and university students from 17 states launched powered vehicles of their own design to an altitude of 1 mile and returned sophisticated science payloads safely to Earth again. The NASA Student Launch Projects, organized by the Marshall Academic Affairs Office, are sponsored by NASA's Exploration Systems Mission Directorate, Space Operations Mission Directorate and Education Flight Projects, all at NASA Headquarters in Washington.



Two shuttles on the pad

Two space shuttles stood on launch pads at the same time at the Kennedy Space Center – likely for the last time before the shuttle fleet is retired in 2010. Shuttle Endeavour was on Launch Pad 39B, on standby had a rescue mission been necessary for shuttle Atlantis' STS-125 Hubble servicing mission, which launched May 11. After Endeavour was cleared as a rescue spacecraft, it was moved to Pad 39A for its STS-127 mission to the station, which launched July 15.

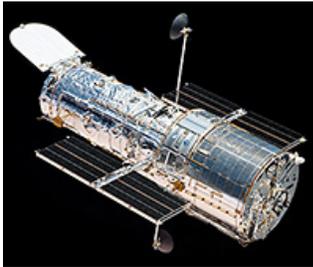
Ares I five-segment development motor readied for testing

On April 16, NASA moved the first segment of the Ares I rocket's five-segment development motor, or DM-1, from a production facility in Utah to the nearby test stand.



NASA awards contract for support at Michoud Assembly Facility

In May, NASA awarded a contract to Jacobs Technology of Tullahoma, Tenn., for manufacturing support and facilities operations at the Marshall-managed Michoud Assembly Facility in New Orleans. For 35 years, the Space Shuttle Program manufactured and built the external fuel tank at Michoud. Today, it is a multi-project facility supporting several major NASA projects for the Constellation Program and the Space Shuttle Program as well as the National Center for Advanced Manufacturing, federal tenants and future green space development and collaborative partnerships with the state of Louisiana.



STS-125 – the final visit to Hubble

Space shuttle Atlantis launched May 11 from the Kennedy Space Center on the fifth and final mission to service NASA's Hubble Space Telescope. Five spacewalks were performed during the almost 13-day mission to refurbish Hubble with state-of-the-art science instruments to extend the telescope's capabilities and lifetime through at least 2014. Landing was May 24 at Edwards Air Force Base, Calif.

Marshall engineers successfully test world's largest rocket parachutes for Ares I

Unfurling in majestic patriotic colors, the three, 150-foot-diameter main parachutes for the Ares I rocket first stage successfully completed their first cluster test May 20 at the U.S. Army Yuma Proving Ground in Arizona.



Discovery lands at Kennedy after cross-country ferry flight

Space shuttle Atlantis returned to the Kennedy Space Center on June 2 after a two-day, cross-country ferry flight from Edwards Air Force Base in California. A Marshall public affairs officer traveled with the orbiter and blogged about its journey. Atlantis completed the STS-125 mission and landed at Edwards May 24 after several consecutive days of rain prevented a Florida landing.



Marshall's Payload Operations Center adjusts to 'six in the mix'

Marshall's Payload Operations Center, the command post for science activities on the International Space Station, became twice as busy in June, when six crew members began living and working on the orbiting laboratory. To support the increase in activity, the payload operations team added two new positions to enable the execution of crew activities during their work day.

NASA successfully launches lunar missions

NASA successfully launched two new moon missions June 18 aboard an Atlas V rocket from Cape Canaveral Air Force Station in Florida. The Lunar Crater Observation and Sensing Satellite, or LCROSS, sought to confirm the presence of water ice at the point of impact in the Cabeus crater near the moon's south pole. The Lunar Reconnaissance Orbiter, or LRO, will help identify safe landing sites for future human explorers, locate potential resources, characterize the radiation environment and test new technology.



More than 260 honored at 2009 NASA Honor Awards

On June 24, the Marshall Center and NASA honored more than 260 members of the Marshall work force for exceptional contributions to NASA's continuing mission of discovery. Among those recognized were Presidential Rank of Meritorious Executive award recipients John Chapman, manager of the External Tank Project in the Shuttle Propulsion Office; Raymond G. Clinton, acting manager of the Science & Mission Systems Office; and Carl Preston Jones, manager of the Engineering Directorate's Spacecraft & Vehicle Systems Department. For a complete listing of award recipients, visit <http://marshallstar.msfc.nasa.gov/6-18-09.pdf>.

Ares I-X stacking begins

Following nearly three years of work and significant contributions by dedicated Marshall Center team members and industry partners around the country, stacking operations for the Ares I-X rocket began July 8 in the Vehicle Assembly Building at the Kennedy Space Center.



Marshall stirs up Ares I upper stage development dome

Using a metal joining technique called friction stir welding, the Ares Projects team at Marshall completed welding operations on the first Ares I rocket demonstration fuel tank dome July 14, marking the first development hardware assembled for the rocket's upper-stage liquid hydrogen fuel tank.

STS-127 delivers 'porch' to space station

Space shuttle Endeavour launched July 15 on a 16-day mission to deliver the final components of the Kibo Japanese Experiment Module Exposed Facility and Experiment Logistics Module Exposed Section to the International Space Station. The facility provides a type of "front porch" for experiments in the exposed environment. Managers delayed two previous launch attempts so that workers at the Kennedy Space Center could replace hardware on the external tank's Ground Umbilical Carrier Plate where a leak occurred during tanking June 13 and 17. During the mission, astronauts performed five spacewalks. Landing was July 31 at Kennedy.



July

2009 Year in Review

NASA chills: James Webb Space Telescope mirrors are readied for test

Three of the 18 James Webb Space Telescope mirror segments were mounted on a test stand July 30 at the X-ray & Cryogenic Facility, or XRCF, at the Marshall Center. Mirror testing is key to the development of the Webb Telescope, which requires a large mirror to collect as much light as possible, enabling the telescope to “see” galaxies some 13 billion light-years away. Webb Telescope scientists and engineers have determined that a primary mirror 6.5 meters wide, or 21 feet 4 inches, is needed to measure the light from these galaxies. A mirror this large has never been launched into outer space before. Mirror testing will continue at Marshall through September 2011.

August

2009 Year in Review

Marshall engineers complete gas generator test series for Ares I

The 100th test of the J-2X workhorse gas generator was conducted Aug. 12 at Test Stand 116 at the Marshall Center's East Test Area. The J-2X engine is being developed to power the second stage of the new Ares I rocket.



Ares I-X team completes assembly of test rocket

The final segments of the Ares I-X rocket, including the simulated crew module and launch abort system, were stacked Aug. 13 on a mobile launch platform in the Vehicle Assembly Building at the Kennedy Space Center, completing the 327-foot launch vehicle and providing the first complete look at the distinctive shape of the Ares I-X.

Robert Lightfoot named director of Marshall

NASA named Robert M. Lightfoot Jr. director of the Marshall Center. He manages a broad range of propulsion, scientific and space transportation activities contributing to the nation's space program. Lightfoot served as acting director of the center from March 2009 until his appointment as director.



Night launch propels shuttle Discovery on science mission to station



Space shuttle Discovery's 13-day STS-128 flight to the International Space Station launched Aug. 28 from the Kennedy Space Center. Discovery delivered the Materials Science Research Rack, developed and managed by the Marshall Center, to the orbiting outpost. It was installed in the U.S. Destiny Laboratory and will be used for basic materials research in the microgravity environment. Landing was Sept. 11 at Edwards Air Force Base.

Chandra celebrates 10th anniversary

In August, Chandra – NASA's X-ray Observatory, which is managed by the Marshall Center – celebrated its 10th anniversary. The science that has been generated by Chandra – both on its own and in conjunction with other telescopes in space and on the ground – has had a widespread, transformative impact on 21st-century astrophysics. Chandra has provided the strongest evidence yet that dark matter must exist. It has independently confirmed the existence of dark energy and made spectacular images of titanic explosions produced by matter swirling toward supermassive black holes.



Materials Science Research Rack allows for study of variety of materials

In August, the Materials Science Research Rack, or MSRR, launched aboard space shuttle Atlantis on STS-128. MSRR allows for study of a variety of materials – including metals, ceramics, semiconductor crystals and glass – aboard the International Space Station. MSRR is housed in the U.S. Destiny Laboratory Module. Materials science is an integral part of development of new materials for everyday life here on Earth. The development of the research rack was a cooperative effort between the Marshall Center and the European Space Agency.

MISSE comes home after more than a year in space

The fourth set of test hardware in the Materials International Space Station Experiment series, known as MISSE-6A and 6B, returned to Earth Sept. 11 after spending more than a year outside the International Space Station. The experiment tests how various materials react to the harsh environment of space. Marshall engineer Miria Finckenor, a MISSE-6A and 6B investigator, is studying heat shield materials that could be used on the Orion crew exploration vehicle, and aluminum-lithium alloys that could save vehicle weight on lunar and Mars missions.



NASA successfully tests Ares I first-stage development motor

Engineers from the Marshall Center and ATK Space Systems lit up the Utah sky Sept. 10 with the first full-scale, full-duration test firing of the Ares I rocket's first-stage motor. The successful stationary firing of the five-segment solid development motor 1, or DM-1, lasted for 2 minutes and produced 3.5 million pounds of thrust. Engineers will use the measurements gathered from the test to evaluate thrust, roll control, acoustics and motor vibrations as NASA develops the Ares I and Ares V vehicles. Another ground test is planned for summer 2010.

Completion of first test cycle of Stirling engines

In September, a major achievement was accomplished at Marshall – for the first time Stirling engines were heated with a pumped liquid metal, replicating how heat could be delivered from reactor to a converter. This was a major accomplishment in demonstrating the feasibility of fission surface power. The Marshall Center has a one-of-a-kind test facility that enables engineers to simulate the nuclear power process of heat transfer from a reactor to a power converter – without using nuclear materials.

September 2009 Year in Review

NASA, partners celebrate first anniversary of vital air quality communications resource in Mesoamerica, Caribbean

In September, NASA and its partners celebrated the first anniversary of the Air Quality Blog, a critical communications tool delivering satellite-based air quality data to researchers, forecasters and communities throughout Mesoamerica and the Caribbean. The Air Quality Blog provides timely information about air pollution and its sources in the region, helping the public, governments and health officials monitor air quality and mitigate health impacts. The blog is part of SERVIR, the highly acclaimed regional environmental monitoring system that integrates the satellite resources of the United States and other countries to put Earth observation data and other tools into action across Mesoamerica.

October 2009 Year in Review

Successful ullage motor development test completed

On Oct. 8, engineers at Marshall's East Test Stand successfully completed the first round of development testing for the Ares ullage settling motor. The ullage motors ensure the rocket's liquid fuel is properly pushed to the bottom of the upper stage fuel tank prior to ignition of the J-2X engine.



LCROSS impacts moon in search for water ice

The Lunar Crater Observation and Sensing Satellite, or LCROSS, impacted the Cabeus crater on Oct. 9, and preliminary data indicated the mission successfully uncovered water in a permanently shadowed lunar crater. The discovery of water by LCROSS opened a new chapter in our understanding of the moon.

Marshall team research cooks up water from the moon

When LCROSS impacted a lunar crater Oct. 9 and found water, Marshall materials engineer Ed Ethridge was ready to get cooking. Ethridge and his team, including Dr. William Kaukler of the University of Alabama in Huntsville's Center for Materials Research, and Frank Hepburn, also a Marshall materials engineer, have been investigating the use of microwaves to extract water and other volatiles – unstable gases such as hydrogen and nitrogen – from the moon's silicate rock-based top soil, known as regolith. Using a conventional kitchen microwave and lunar soil simulant, the team has literally "cooked" water out of the soil. This research paves the way for In Situ Resource Utilization, the use of resources found on other astronomical objects, like the moon, to complete a science mission. In this case, water could be harvested in the form of ice from the moon to sustain life and produce rocket propellant.

'NASA Marshall' Facebook welcomes 3,000th friend

On Oct. 13, the "NASA Marshall" Facebook presence added its 3,000th friend – just six months after launch of Marshall's page on the high-profile social media network. By the close of 2009, more than 3,900 friends – Marshall and NASA team members and their families, industry and academic partners, members of the news media and space enthusiasts worldwide – had friended NASA Marshall on Facebook. The page features Marshall news and events; online photo albums highlighting the center's diverse work force and broad spectrum of work; and links to NASA, science and exploration news as it breaks around the world – and offworld. Visit the page at <http://www.facebook.com/nasa.marshall>.



ET-134 begins sea journey from Michoud to Kennedy

Space shuttle external tank ET-134, the first tank to be built using the friction stir welding technique, began its sea journey from the Michoud Assembly Facility to the Kennedy Space Center Oct. 18. The tank was loaded onto NASA's covered barge Pegasus for the six-day, 900-mile journey. Friction stir welding is a technique that forges a bond between two metal alloys without melting the metal. Arriving at Kennedy, ET-134 was joined with solid rocket boosters and space shuttle Endeavour and will be flown on the STS-130 mission in February 2010. See what the voyage was like in a Marshall public affairs office blog at http://blogs.nasa.gov/cm/blog/sailing_with_nasa/posts/index.html?cdt=1262031285254.

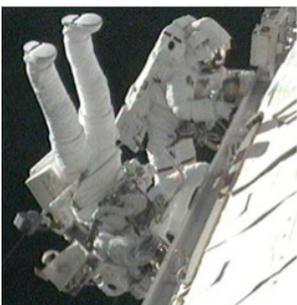


Liftoff! Successful flight test for Ares I-X

NASA's Ares I-X test rocket lifted off Oct. 28 from the Kennedy Space Center for a two-minute powered flight. The entire test flight lasted about six minutes, from the rocket's launch from the newly modified Launch Complex 39B until splashdown of the booster stage nearly 150 miles down range in the Atlantic Ocean.

Ares rocket named Best Invention of 2009 by Time magazine

Headlining Time magazine's list of "The 50 Best Inventions of 2009," NASA's Ares I rocket, managed at the Marshall Center, was selected as the No. 1 invention of the year. According to the article, "the Ares I rocket is the best and smartest and coolest thing built in 2009 – a machine that can launch human beings to cosmic destinations we'd never considered before."



Fifth, final shuttle mission of 2009 delivers 14 tons of supplies, spare parts to space station

On Nov. 16, Marshall-managed propulsion systems boosted space shuttle Atlantis into space for the fifth shuttle mission in 2009. The shuttle main engines, reusable solid rocket boosters and external tanks performed in an excellent manner during all missions – testimony to the dedicated efforts and members of Marshall's shuttle propulsion team. Launch was from the Kennedy Space Center on a mission to deliver spare hardware to the International Space Station. During STS-129's three spacewalks, astronauts installed two platforms to the station's truss, or backbone, for storing spare parts to sustain station operations after the shuttle fleet is retired. Landing was Nov. 27 at Kennedy.

NASA 'drops' next generation robotic lander

In November, NASA successfully completed a series of autonomous "drop" tests of a robotic lander test article to demonstrate the ability to perform a controlled landing on the moon or other airless planetary bodies. During these tests at the Marshall Center, the lander test article was suspended 10.5 feet from the landing pad. Released from its hoist, the lander simultaneously received a command to activate its onboard thrusters to carry it to a controlled landing using a preprogrammed descent profile.



Marshall raises \$702,315 for 2009 CFC



During Marshall's annual Combined Federal Campaign fundraiser Sept. 30 to Dec. 11, team members were challenged to raise \$625,000 for local, regional and national charitable organizations. By the campaign's end, Marshall raised \$702,315. The Tennessee Valley campaign, which raised more than \$2.1 million in 2009, is a joint effort between Marshall, the Army's Aviation and Missile Command and other federal agencies at Redstone Arsenal and in surrounding Alabama and Tennessee counties.



Orion launch abort system attitude control motor lights up sky

NASA ground tested a full-scale attitude control motor, or ACM, on Dec. 15, in Elkton, Md. The motor operated with precision as its elaborate eight-valve control system opened and closed each valve at exactly the right moment with alternating bursts of light. The Marshall Center is responsible for overseeing the development of the ACM, one of three motors that make up the Orion crew exploration vehicle's launch abort system, or LAS – a system that would pull the Orion crew to safety if needed.

NASA, contractor team develop one fast satellite

NASA completed environmental testing of the Fast, Affordable Science and Technology Satellite, or FASTSAT-HSV01, in early December. FASTSAT-HSV01 is a unique platform that can carry multiple small instruments or experiments to low-Earth orbit on a wide range of expendable launch vehicles for a fraction of the cost traditionally required for such missions. The satellite or "bus" will carry six small payloads, including three technology demonstration experiments and three atmospheric research instruments. FASTSAT-HSV01 and all six experiments/instruments flying on the STP-S26 multi-spacecraft/payload mission have been manifested for launch in 2010.



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

Sonor five-piece drum set, black, accessories, \$500. 205-394-1307

Washer and dryer, \$150 for both. 837-0327

Weslo Cadence 1015 spacesaver treadmill, \$50 if you pick up. 509-3928

Large beige rocker recliner massage chair. 536-5132

Youth Stanley bedroom set, twin bed/mattress, dresser, mirror, desk, hutch, night table, \$500. 881-0551

Lily Flagg pool membership, \$600. 651-2257

Five capsule-type vending machines, four in working condition, pictures available, \$100. 885-2448

Solid oak entertainment center, four shelves, glass door, storage area, \$300. 895-9520

AKC Yorkie puppies, males \$500, females, \$600. 275-9935

Keys 503T treadmill, \$450; Huffy 16" ProThunder bicycle, \$59. 776-7248

Wood executive desk, 4x6 feet, matching two-drawer file cabinet, \$450. 858-3600

16-bulb SunQuest tanning bed, \$500; Shopsmith multipurpose wood working machine, 1-1/8 HP, \$350. 677-5217

Malti-Poo puppies, family raised, vet checked, first shots,

one-year health guarantee, rlnknight1981@bellsouth.net. 931-425-0830

Women's clothes, sizes 14-16, many Coldwater Creek jackets. 468-4219

Kasson pool table, fruitwood, Queen Anne feet, leather pockets, \$2,500. 880-6563

Princess-cut white gold bridal set, jeweler will confirm value, \$8,000 obo. 604-9790

Round solid wood table, four captain chairs, \$250. 233-5599

Ford F-150 fiberglass tonneau cover and mounting hardware, lockable, \$800 obo. 931-438-1730

Thermopane fireplace, bi-fold glass doors, antique brass finish, fits 36"W x 24"H opening, \$50. 881-0457

Traxxas R/C truck, charger, \$50; PS2 with games, \$30. 417-5334

Inline skates, ladies 7 1/2 -8 or equivalent boys' size, six pads, \$15. 955-2040

Horizon E95 elliptical, \$400; Sunvision by Wolff Pro 28LE tanning bed, \$1,200. 755-1580

Black-Wintec 500 all-purpose English saddle, \$200; brown leather western saddle, \$200. 776-9294

Vehicles

2008 Honda CBR 600RR, orange and black, three-year warranty, 1,100 miles, \$7,500. 505-2418

2008 Honda Odyssey EX-L, MP3/multi CD, sunroof, leather, 18k miles, \$26,900. 714-3769

2007 Toyota Highlander, red, 42k miles, 4 cyl., trailer hitch, luggage rack, AM/FM/CD/cassette, \$16,900. 881-3527 or 520-6951

2006 YZ450F, \$3,500 obo. 615-417-3157

2005 Honda Accord Hybrid, navigation, 36-month BTB

warranty remaining, \$16,900. 850-496-7329

2005 Lexus ES330, silver, loaded, 99k miles, \$15,000 obo. 651-8965

2004 Honda ATV, 350cc, 4WD, electronic shift, yellow, 225 hours, 1,300 miles, \$2,500 obo. 509-2524

1998 Buick Regal GS, leather, 180k miles, \$2,500. 881-6154

1995 Nissan Altima GXE, automatic, silver, cruise, air bags, sunroof, 185k miles, \$1,300 obo. 679-2875

1993 F350 crew, seats six adults, long bed, \$2,200. 723-8877

1993 Bronco, green/tan, leather, winch, new mudders, 96k miles, \$5,250. 658-8241

1982 Landcruiser 165K miles brown, new tires, great interior, some rust on exterior \$3,450 658-8241

1992 GMC diesel pickup truck, white, 150k miles, \$3,500. 379-4010

1987 Pontiac Fiero 2M4, CarFax certified, burgundy/gray, 50k miles, \$2,200 obo. 258-0288

1985 Ford F-150, 4X4, hunter green, tan interior, chrome wheels, new engine/tires, \$2,950. 259-1523

1971 Corvette convertible, white, blue interior, 350 auto, power steering/brakes, new tires/ top, \$24,500 obo. 232-0246

1952 blue 3/4-ton Chevrolet pickup, rebuilt original 216 engine in 2004, \$6,000. 532-3129

Wanted

Motorcycles to repair, HD or metric, certified HD technician. 430-9667

Wireless pet containment system. 566-1554

Elliptical exercise machine, good condition and reasonably priced. 828-5550 after 4:30 p.m.

Free

Handles for professional seal embossing dies. 722-2821

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