The NOVAAR Free Press

May – June 2007

Inside this Issue

Section 205
Flying Since 1970

NOVAAR *Free Press*

May – June 2007

This is the official newsletter of the *Northern Virginia Association of Rocketry* (NOVAAR), Section 205 of the *National Association of Rocketry* (NAR). This newsletter is a benefit of being a member – ***You are a member, aren't you?***

Section Officers

President:.....Joe Woodford
president@novaar.org

Secretary:.....Trip Barber
secretary@novaar.org

Treasurer: .....Will Marchant
treasurer@novaar.org

Senior Advisor: .....John Hochheimer
senioradvisor@novaar.org

Membership and Dues

To maintain the clubs launch equipment and pay for our website we collect dues. Dues are collected annually and are; $5 for members age 13 and younger, $8 for members age 14 to 18 and $10 for everyone else. A membership application can be found at many local hobby shops and on our website.

Meetings

NOVAAR holds meetings on the first and third Tuesday of the month, from 7:00 pm to 8:30 pm, at the King's Park Community Center in Springfield, VA. The most current topics to be discussed and directions to our meeting room can be found on our website.

Build Sessions

Once a month, on the third Sunday of the month from 1:00 pm to 5:00 pm, at the King's Park Community Center, the club gets together to build rockets and share construction techniques. The schedule and directions to our meeting room are on our website.

Launches

NOVAAR conducts monthly launches at *Great Meadow* which is located in The Plains, VA – approximately 50 minutes south of Washington DC on Route 66. Launches start at 9 am and run until 5 pm (10 am to 4 pm during the winter). The most current schedule and directions to *Great Meadow* can be found on our website.

There is no charge to fly at club launches (*motor sizes A to F*). However, there is a $5 charge to launch high-powered rockets (motor sizes *G to I -- the field is not large enough for bigger motors*). **AND,** you don't have to be a member to fly with us. Though, after you meet us and, realize that we don't bite – *as long as we take our medication* – ***we know you will want to join***.

If weather threatens the launch day, our website will report the status of the launch by 8:00 pm the day before.

Website

The club's website (**www.novaar.org**) is where the most current information about future club activities can be found. The site is maintained by...

Webmaster: .....Dan Winings
webmaster@novaar.org

Newsletter

The club's newsletter is published 6 times a year or, as close to that schedule that is humanly possible for the editor to achieve. The newsletter reports on the club's activities and features articles written by club members about their endeavors within the Model Rocketry Hobby. The articles include, *but are not limited to*, topics on sport rocketry, competitive rocketry and high-powered rocketry. Send submissions to ...

Editor:.....Frank Prekel
nfp@novaar.org

Calendar

August 2007

SUN	MON	TUE	WED	THU	FRI	SAT
29 NARAM 49	30 NARAM 49	31 NARAM-49	1 NARAM 49	2 NARAM 49	3 NARAM 49	4
5	6	7 NOVAAR Meeting	8	9	10	11
12	13	14	15	16	17	18 NOVAAR Launch
19 NOVAAR Build	20	21 NOVAAR Meeting	22	23	24	25
26	27	28	29	30	31	

September 2007

SUN	MON	TUE	WED	THU	FRI	SAT
						1 RAMTEC 13
2 RAMTEC 13	3	4 NOVAAR Meeting	5	6	7	8
9 NOVAAR Launch	10	11	12	13	14	15
16 NOVAAR Build	17	18 NOVAAR Meeting	19	20	21	22
23	24	25	26	27	28	29 Scout Launch
30						

October 2007

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2 NOVAAR Meeting	3	4	5	6
7	8	9	10	11	12	13
14	15	16 NOVAAR Meeting	17	18	19	20
21 NOVAAR Build	22	23	24	25	26	27 NOVAAR Launch
28	29	30	31			

Editor's Ramblings

The fifth edition of TARC has come to an end and boy was it a nice day to fly rockets. NASA brought out a model of the Ares 1 Crew Launch Vehicle. It peeked my interest in the new rockets and you get a few articles I found interesting.

All Together now … "Articles, Articles, Pictures, Pictures, Please, Please". And of course "Thank you, Thank You and Thank You".

NOVAAR Hatpins

Available from Frank Prekel -- fjprekel@aol.com.

The NAR pin is available from NARTS (www.nar.org/narts)

The Flag Ribbon is out-of-print and no longer available.

Competition Rocketry

NAR Annual Meet #49 Set for July

NARAM 49 will be hosted by SMASH (the Southwest Michigan Association of Spacemodeling Hobbyists -- NAR 500) in Delton/Kalamazoo, Michigan on July 28, 2007 to August 3, 2007:

The scheduled events are:

- Research & Development
- C-Scale Altitude
- C-Rocket Glide Duration
- A-Helicopter Duration
- B-Egg Loft Altitude
- A-Boost Glide Duration
- E- Super-Roc Altitude -- A&B Division
- G- Super-Roc Altitude -- C&T Division
  6' x 1/4" rod and 6' rails are provided
- B- Streamer Duration
- Open Spot Landing

Club website:
http://smashnar500.homestead.com/

NARAM-49 website
http://smashnar500.homestead.com/NARAM-49.html

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RAMTEC set for September

RAMTEC-13 will be hosted by SPAAR (the Southern Pennsylvania Area Association of Rocketry -- NAR 503) in Fort Indiantown Gap, Pennsylvania on September 1st and 2nd.

- 1/2A Streamer Duration
- A Rocket Glider Duration
- B Helicopter Duration
- B Eggloft Altitude
- Set Altitude - 150 meters

Club website:
http://www.spaar.org/

RAMTEC-13 website
http://www.spaar.org/RAMTEC/

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Club News

Scout Launch in October

Twice a year, NOVAAR sponsors a build and launch session at Boy Scout Camp Snyder. In the morning participants build a rocket and that afternoon, weather permitting, they launch there new rockets so they can complete requirement three of the *Space Exploration merit badge*.

Additional information about the Boy Scout build-n-launch
http://www.novaar.org/scouting.htm

Boy Scout Camp Snyder
http://www.boyscouts-ncac.org/pages/18_camp_william_b_snyder_cub_world.cfm?redirect=yes

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October Club Launch to Feature a FAI Competition

World Cup FAI-sanctioned international competition flown under FAI rules. Events to be announced.

Fédération Aéronautique Internationale (FAI) Website:
http://www.fai.org/

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TARC 2007

If it's May its got to time of the Team America Rocketry Challenge. 100 High School Teams, with 100 rockets, joined 100 NAR members for 100 flights to prove who could get an egg the closest to 850 feet in the air and back to the ground in 45 seconds. Without breaking the egg, of course.

The sky was clear, the weather ideal, a great day for a rocketry contest.


RocketContest.org


VON BRAUN
RANGE
NATIONAL
ASSOCIATION
OF ROCKETRY


RocketContest.org
Honeywell


RocketContest.org
TEXTRON


RocketContest.org
BAE SYSTEMS


GREAT COMMISSION ACADEMY
FREE
FREE
ROCKET
EMERGENCY
CLINIC
FREE
FREE

See ya'all next year

☆☆☆

Real World Rocketry

The Ares I Crew Launch Vehicle

NASA Fact Sheet from
George C. Marshall Space Flight Center
from: *http://www.nasa.gov/centers/marshall/pdf/151450main_8-40598-CLV.pdf*

NASA is designing, testing and evaluating hardware and related systems for the agency's Ares I crew launch vehicle – the rocket that will carry a new generation of space explorers into orbit.

Concept image of launch of Ares I (*NASA/MSFC*)

Under the goals of the Vision for Space Exploration, Ares I is a chief component of the cost-effective space transportation infrastructure being developed by NASA's Constellation Program. These transportation systems will safely and reliably carry human explorers back to the moon, and then onward to Mars and other destinations in the solar system.

The Ares I effort includes multiple project element teams at NASA centers and contract organizations around the nation, and is led by the Exploration Launch Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala. Together, these teams are developing vehicle hardware, evolving proven technologies, and testing components and systems. Their work builds on powerful, reliable space shuttle propulsion elements and nearly a half-century of NASA spaceflight experience and technological advances.

Ares I is an in-line, two-stage rocket configuration topped by the Orion crew exploration vehicle, its service module and a launch abort system.

The launch vehicle's first stage is a single, five-segment reusable solid rocket booster derived from the Space Shuttle Program's reusable solid rocket motor that burns a specially formulated and shaped solid propellant called polybutadiene acrylonitrile (PBAN).

A newly designed forward adapter will mate the vehicle's first stage to the second, and will be equipped with booster separation motors to disconnect the stages during ascent.

The second or upper stage – a wholly new element – is propelled by a J-2X main engine fueled with liquid oxygen and liquid hydrogen. The J-2X is an evolved variation of two historic predecessors: the powerful J-2 upper-stage engine that propelled the Apollo-era Saturn 1B and Saturn V rockets to the moon and the J-2S, a simplified version of the J-2 developed and tested in the early 1970s but never flown.

In addition to its primary mission — carrying crews of four to six astronauts to Earth orbit — the launch vehicle's 25-ton payload capacity might be used for delivering cargo to space, bringing resources and supplies to the International Space Station or dropping payloads off in orbit for retrieval and transport to exploration teams on the moon.

Concept image of the J-2X engine.
(*NASA/MSFC*)

During the first two-and-a-half minutes of flight, the first stage booster powers the vehicle to an altitude of about 200,000 feet and a speed of Mach 6.1. After its propellant is spent, the reusable booster separates and the upper stage's J-2X engine ignites and powers the crew vehicle to an altitude of about 63 miles. Then, the upper stage separates and Orion's service module propulsion system completes the trip to a circular orbit 185 miles above Earth.

Once in orbit, the crew vehicle and its service module will rendezvous and dock either with the space station or with a lunar lander and Earth Departure Stage that will send the astronauts on their way to the moon.

Crew transportation to the space station is planned to begin no later than 2014. The first lunar excursion is scheduled for the 2020 timeframe.

Ares I Team, Partners

The Ares I effort and associated element project teams are led by the Exploration Launch Projects Office at Marshall, on behalf of the Constellation Program, hosted by

NASA's Johnson Space Center, Houston, and NASA's Exploration Systems Mission Directorate in Washington.

Participating agency facilities include NASA's Johnson Space Center, which is responsible for the Orion and flight operations projects; Stennis Space Center near Bay St. Louis, Miss., which is primarily responsible for J-2X and stage testing; NASA Glenn Research Center's Plum Brook Station in Sandusky, Ohio, which is responsible for vacuum chamber testing of the J-2X upper stage engine, developing the ascent development flight test upper stage mass simulator, and upper stage power, thrust vector control and sensor development; NASA's Langley Research Center in Hampton, Va., which is responsible for aerodynamic characterization, ascent development flight test vehicle integration and Orion mass simulator development, and support to flight mechanics and structure development; NASA's Ames Research Center in Sunnyvale, Calif., which is responsible for integrated health monitoring, blast modeling and reliability analysis support; NASA's Michoud Assembly Facility in New Orleans, which will assemble the upper stage; and NASA's Kennedy Space Center, Fla., which is home to all Constellation launch operations and associated ground activities.

ATK Thiokol of Brigham City, Utah, is the prime contractor for the first stage. Pratt & Whitney Rocketdyne in Canoga Park, Calif., is the prime contractor for the crew launch vehicle upper stage engine.

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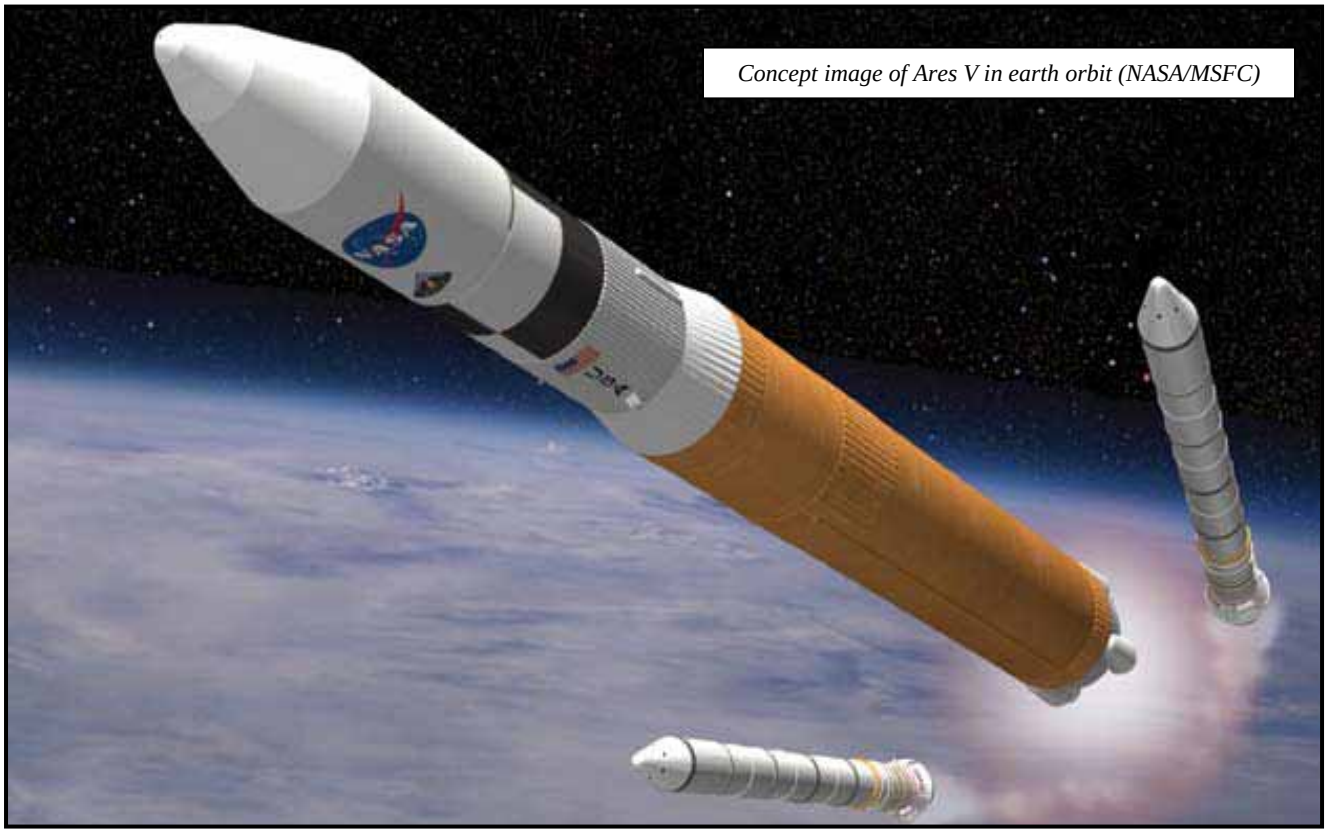
Real World Rocketry

The Ares V Cargo Launch Vehicle

NASA Fact Sheet from
George C. Marshall Space Flight Center
from: http://www.nasa.gov/centers/marshall/pdf/151451main_8-40599-CaLV.pdf

Planning and early design are under way for hardware, propulsion systems and associated technologies for NASA's Ares V cargo launch vehicle — the "heavy lifter" of America's next-generation space fleet.



Concept image of Ares V in earth orbit (NASA/MSFC)

Ares V will serve as NASA's primary vessel for safe, reliable delivery of resources to space – from large-scale hardware and materials for establishing a permanent moon base, to food, fresh water and other staples needed to extend a human presence beyond Earth orbit.

Under the goals of the Vision for Space Exploration, Ares V is a vital part of the cost-effective space transportation infrastructure being developed by NASA's Constellation Program to carry human explorers back to the moon, and then onward to Mars and other destinations in the solar system.

The Ares V effort includes multiple project element teams at NASA centers and contract organizations around the nation, and is led by the Exploration Launch Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala. These teams rely on nearly a half a century of NASA spaceflight experience and aerospace technology advances. Together, they are developing new vehicle hardware and flight systems and maturing technologies evolved from powerful, reliable Apollo-era and space shuttle propulsion elements.

The versatile, heavy-lifting Ares V is a two-stage, vertically stacked launch system. The launch vehicle can carry about 290,000 pounds to low Earth orbit and 144,000 pounds to the moon.

For its initial insertion into Earth orbit, the first stage relies on two five-segment reusable solid rocket boosters. These are derived from the space shuttle solid rocket boosters and are similar to the single booster that serves as the first stage for the cargo vehicle's sister craft, the Ares I crew launch vehicle (see "Ares I" fact sheet). This hardware commonality makes operations more cost effective by using the same manufacturing facilities for both the crew and cargo vehicles.

The twin reusable solid rocket boosters of the cargo lifter's first stage flank a single, liquid-fueled central booster element, known as the core propulsion stage. Derived from the Saturn V-class core, this central booster tank delivers liquid oxygen/liquid hydrogen fuel to five RS-68 rocket engines — an upgraded version of those currently used in the Delta IV, the largest of the Delta rocket family developed in the 1990s by the U.S. Air Force for its Evolved Expendable Launch Vehicle program and commercial

launch applications. Together, these propulsion elements comprise the Ares V's first stage.

An RS-68 engine undergoes hot-fire testing at NASA's Stennis Space Center near Bay St. Louis, MS., during the engine's development phase (*Pratt& Whitney Rocketdyne*)

Atop the central booster element is an interstage cylinder, which includes booster separation motors and a newly designed forward adapter that mates the first stage with the second, or Earth Departure Stage. This unique upper stage, being designed at Marshall, is propelled by a J-2X main engine fueled with liquid oxygen and liquid hydrogen. The J-2X is an evolved variation of two historic predecessors: the powerful J-2 upper-stage engine that propelled the Apollo-era Saturn 1B and Saturn V rockets to the moon and the J-2S, a simplified version of the J-2 developed and tested in the early 1970s but never flown.

Anchored atop the departure stage is a composite shroud protecting the lunar surface access module, which includes the descent stage that will carry explorers to the moon's surface and the ascent stage that will return them to lunar orbit to rendezvous with the Orion crew exploration vehicle for their return home.

During launch of an Ares V, the reusable solid rocket boosters and core propulsion stage power the vehicle into low-Earth orbit. After separation from the spent core stage, the Earth Departure Stage J-2X engine takes over, placing the vehicle in a circular orbit. The Orion, carrying the astronauts, is delivered to space separately by the Ares I launcher, then docks with the orbiting Earth Departure Stage and its lunar module payload. Once mated, the Earth Departure Stage fires its engine to achieve "escape velocity," the speed necessary to break free of Earth's gravity, and the lunar vessel begins its journey to the moon.

The Earth Departure Stage is jettisoned after it puts the mated crew and lunar modules on course for their lunar destination. Once the four astronauts arrive in lunar orbit, they transfer to the lunar module and descend to the moon's surface. The crew module remains in lunar orbit until the astronauts depart from the moon in the lunar vessel, rendezvous with the crew module in orbit and return to Earth.

The cargo vehicle's rockets can lift up heavy payloads, such as equipment and hardware, to Earth orbit or trans-lunar injection, a trajectory designed to intersect with the moon. Such lift capabilities will enable NASA to carry a variety of science and exploration payloads to space and, in time, undertake crewed missions to Mars and beyond.

The first crewed lunar excursion is scheduled for launch in the 2020 timeframe.

The Ares V effort and associated element project teams are led by the Exploration Launch Projects Office at Marshall, which reports to the Constellation Program Office at NASA's Johnson Space Center in Houston. Constellation is a key program of NASA's Exploration Systems Mission Directorate in Washington.

ATK Thiokol of Brigham City, Utah, is the prime contractor of the reusable solid rocket boosters. Pratt & Whitney Rocketdyne is the prime contractor for both the J-2X upper stage engine and the RS-68 main engine.

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Real World Rocketry

Ares: How the Name was Selected

from: *http://www.nasa.gov/mission_pages/constellation/ares/ares_naming.html*

When NASA announced that the names of the next generation of launch vehicles that will return humans to the moon and later take them to Mars and other destinations. They also explained why the crew launch vehicle will be called Ares I, and the cargo launch vehicle will be known as Ares V.

"It's appropriate that we named these vehicles Ares, which is a pseudonym for Mars," said Scott Horowitz, associate administrator for NASA's Exploration Systems Mission Directorate, Washington. "We honor the past with the number designations and salute the future with a name that resonates with NASA's exploration mission."

The "I and V" designations pay homage to the Apollo program's Saturn I and Saturn V rockets, the first large U.S. space vehicles conceived and developed specifically for human spaceflight.

The crew exploration vehicle, which will succeed the space shuttle as NASA's spacecraft for human space exploration, will be named later. This vehicle will be carried into space by Ares I, which uses a single five-segment solid rocket booster, a derivative of the space shuttle's solid rocket booster, for the first stage. A liquid oxygen/liquid hydrogen J-2X engine derived from the J-2 engine used on Apollo's second stage will power the crew exploration vehicle's second stage. The Ares I can lift more than 55,000 pounds to low Earth orbit.

Ares V, a heavy lift launch vehicle, will use five RS-68 liquid oxygen/liquid hydrogen engines mounted below a larger version of the space shuttle's external tank, and two five-segment solid propellant rocket boosters for the first stage. The upper stage will use the same J-2X engine as the Ares I. The Ares V can lift more than 286,000 pounds to low Earth orbit and stands approximately 360 feet tall. This versatile system will be used to carry cargo and the components into orbit needed to go to the moon and later to Mars.

☆☆☆

Competition Rocketry

The Big "Five – Oh" is just around the Corner

July 26 - August 1, 2008

Hosted by: NARHAMS, http://www.narhams.org/ and NOVAAR http://www.novaar.org/

Contest Director: Jim Filler, mailto:zog139@yahoo.com

Events Coordinator: Jennifer Ash-Poole, mailto:jpoole@cablespeed.com

Contest Events:

- Set Duration (50 sec)
- B Streamer Duration Multiround
- D Boost Glider Duration
- D Egg Lofting Altitude
- C Payload Altitude
- B Helicopter Duration
- Research & Development
- Scale

Special Events:

- Old Rocketeer Reunion
- Drag Race

Meet Hotel:

Sheraton 4 Points (formerlly Holiday Inn)
Manassas, VA
(703) 335-0000

Ask for the NARAM-50 rate of $89/night

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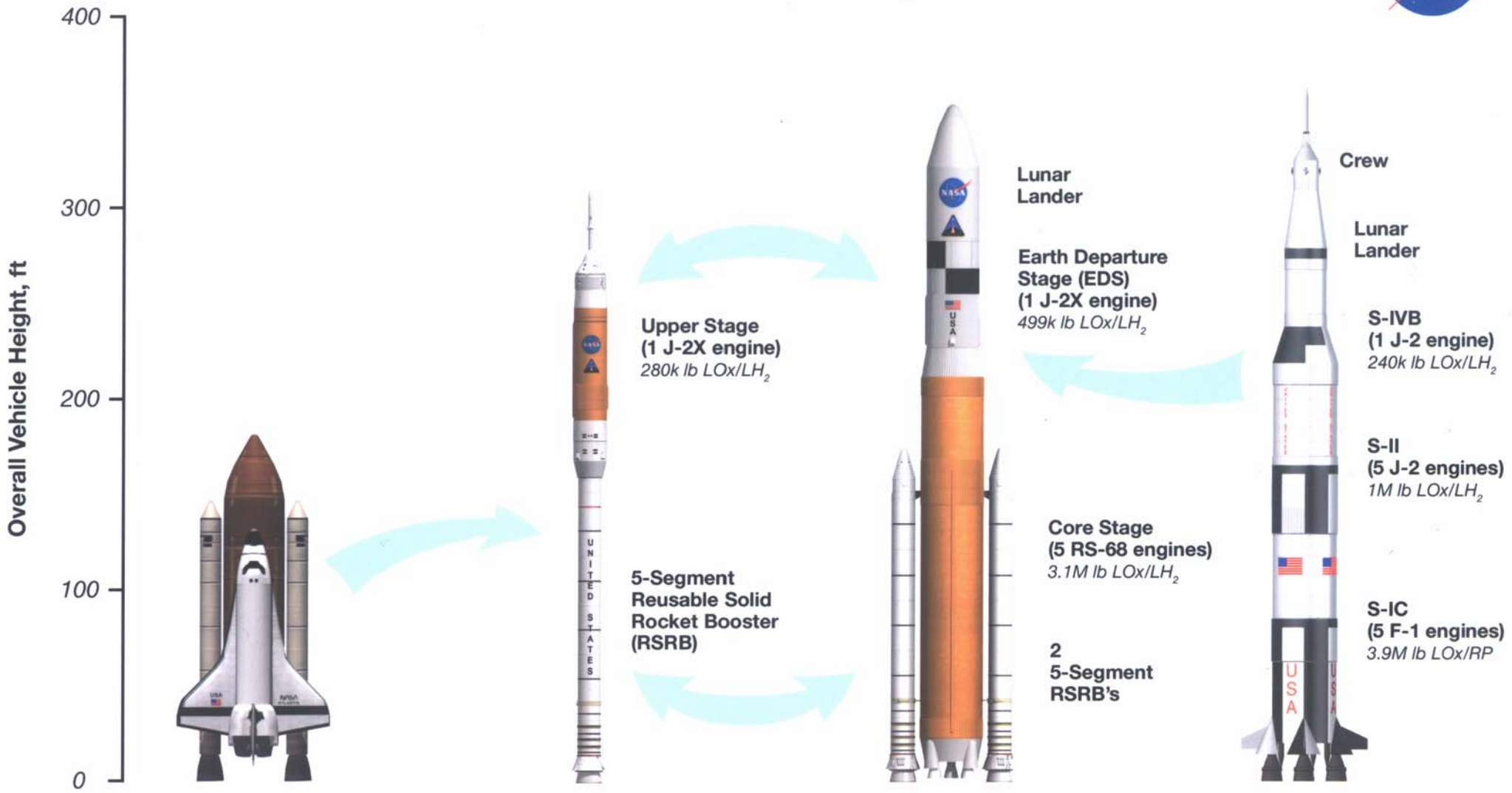
Launch Vehicles Comparisons



Space Shuttle

Height: 184.2 ft
Gross Liftoff Mass: 4.5M lb

55k lbm to LEO

Ares I

Height: 321 ft
Gross Liftoff Mass: 2.0M lb

48k lbm to LEO

Ares V

Height: 358 ft
Gross Liftoff Mass: 7.3M lb

117k lbm to Trans-Lunar Injection (TLI)
144k lbm to TLI in Dual-Launch Mode with CLV
290k lbm to LEO

Saturn V

Height: 364 ft
Gross Liftoff Mass: 6.5M lb

99k lbm to TLI
262k lbm to LEO

NP-2006-10-160-MSFC

October 2006

The Capitol Cup

FAI World Cup Spacemodeling Contest
October 27-28, 2007
Great Meadow at The Plains, VA

Flown under the FAI Space Models Sporting Code, www.fai.org/aeromodelling/documents/sc4. Fliers with FAI Sporting Licenses, remember to bring them.

Flown only with rocket motors having current NAR approval for contest use in the US, as listed at www.nar.org/SandT/NARenglist.shtml.

Events and schedule:

Model checkin and contestant briefing	9 AM Saturday
S4A (A-engine boost-glider)	First round 10 AM Saturday
S8E/P (E-engine radio-controlled rocket glider)	First round 1:30 PM Saturday
US 2008 Team Meeting	At end of flying Saturday
S9A (A engine gyrocopter)	First round 9 AM Sunday
S6A (A engine streamer duration)	First round 12:30 PM Sunday

Entry fee: $10, advance registration not required

Directions to the field:

Take Interstate 66 to Exit 31, 16 miles west of Manassas, VA. At the exit turn left and follow the signs 1.5 miles to the Great Meadow Outdoor Center at "Old Tavern".

Recommended Motels: All motels are at I-66 exit 47B in Manassas, VA.

Best Western Battlefield Inn - 10820 Balls Ford Rd., Manassas, VA 20109 - (703) 361-8000
Quality Inn Manassas (formerly Days Inn) - 10653 Balls Ford Road, Manassas, VA 20109
(703) 368-2800
Red Roof Inn Manassas - 10610 Automotive Drive, Manassas, VA 20109 - (703) 335-9333

Contest Director: Tony Reynolds, tonyr@night.net, Richardson, TX (214) 869-6645
On-site coordinator: Trip Barber, ahbarber@alum.mit.edu, Springfield, VA (703) 866-4710

Hosted by the Northern Virginia Association of Rocketry, www.novaar.org