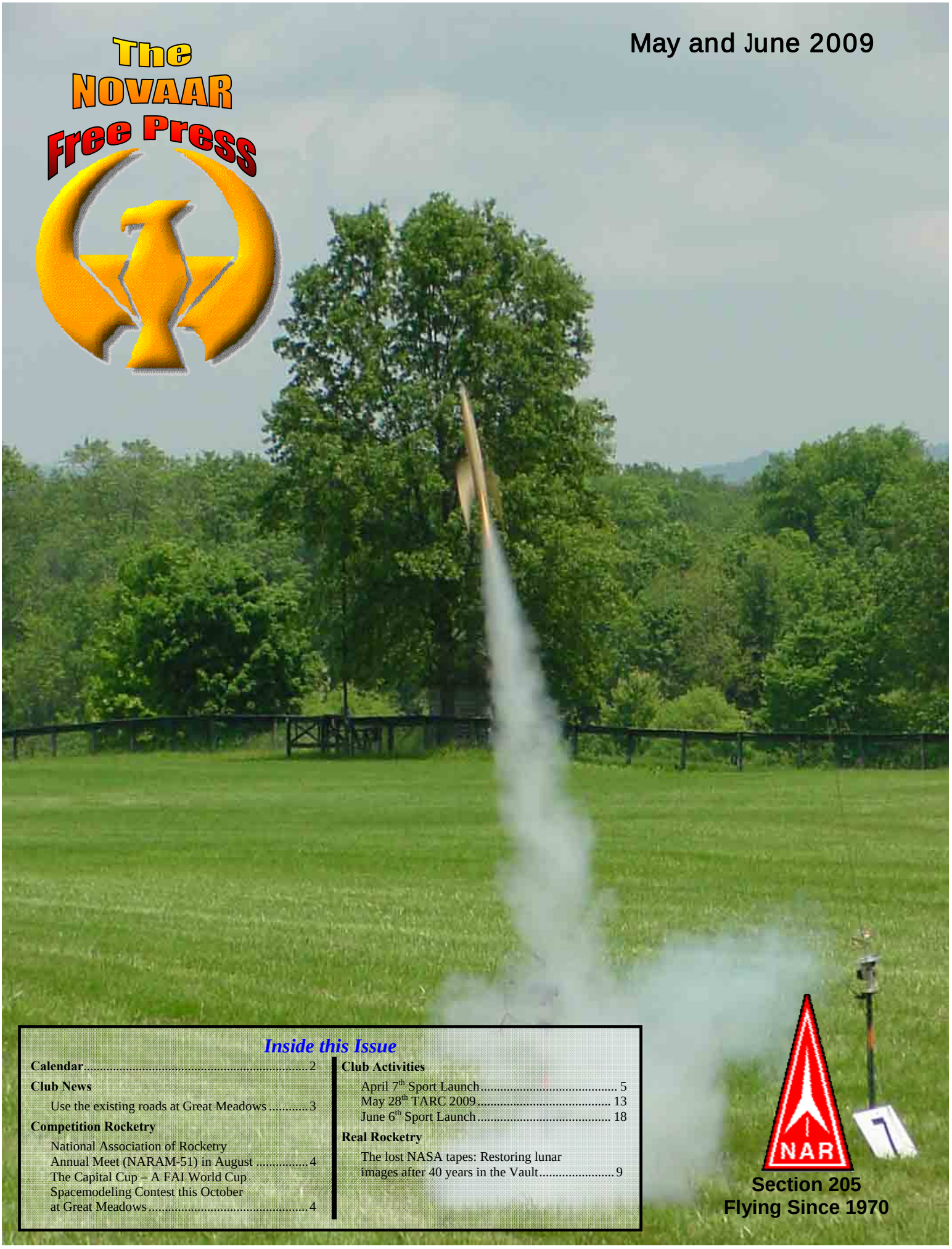
The NOVAAR Free Press

May and June 2009



Inside this Issue

NAR

Section 205
Flying Since 1970

NOVAAR *Free Press*

May – June 2009

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:.....Will Vargas
secretary@novaar.org

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

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

High Power Coordinator:.....Mitch Guess
hp@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 noon to 5 pm (noon 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 2009

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

US Coast Guard established (1790)

US Marine Corp Reserve established (1916)

September 2009

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

VJ-Day (1945)

US Air Force established (1947)

First Day of Autumn

October 2009

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

Continental Navy established (1775)

Capital Cup FAI/Regional Competition

Editor's Ramblings

This issue includes photographs from May's Team America Rocketry Challenge and June's Sport Launch.

Also in this issue are pictures from April's Sport Launch that were cut from the last issue and an article about NASA's efforts to restore video imagery taken and, until recently thought lost, from the Apollo missions.

And as usual, here is my plea for pictures and articles about any rocketry topic – a completed design, research, or anything you just learned about and you think everyone else needs to know.

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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.

Club News

Use the existing roads at Great Meadows

NOVAAR is privileged to have access to the fields of Great Meadow. NOVAAR works hard to maintain its relationship with the Great Meadows Foundation and does not wish to lose its access to what is not only our flying field but is also home of the Virginia Gold Cup Steeple Chase.

All though winter and into the spring it is not uncommon for a fair amount of rain to fall on the fields at Great Meadow. And, with the rain, mud is formed and the collects in the furrows and ruts that form the roads that lead to our launch area.

In the attempt to keep our cars clean, many of us are swerving wide at the areas that are a little muddier than the rest. Each time this happens the roadway gets a little wider and the mud puddle becomes wider.

Our actions are making the roads wider and this is something that has caused the Great Meadow Foundation comment. Stay on the existing roads.

And, don't forget to follow the other rules we all have to follow when flying rockets at Great Meadow.

1. Park in designated areas.
2. Pick up any trash that you see.
3. No pets except on leash.
4. Do not climb on fences, trees, or structures.
5. Cross fences at gates (hinge side) if possible.
6. Ask for assistance to recover rockets from trees.
7. Do not attempt to recover rockets from overhead wires.
8. Do not go onto private property without permission.
9. The flying of rockets is permitted only when NOVAAR is operating the range.

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Competition Rocketry

National Association of Rocketry Annual Meet (NARAM 51) in August

The Dates:

Saturday to Friday,
August 8 to 14, 2009

The Events:

- 1/8A Helicopter Duration
- A Streamer Duration
- 1/2A Parachute Duration (*multi-round*)
- Random Altitude
- B Rocket Glide Duration
- B Altitude
- D Dual Egg Lofting Duration
- Research and Development
- Peanut Sport Scale
- Science Fiction and Future Scale

The Prices:

A/B Contestant	$30
C/T Contestant	$45
Full-week of Sport flying	$30
Weekend Sport Flying	$15
Single day Sport Flying	$10
Picnic	$14
Banquet, adult	$28
Banquet, child (<12 yoa)	$14
extra patch	$7
t-shirt S/M/L, XL, 2XL, 3XL	$16, $17, $18, $19

The Sponsor:

Pittsburg Space Command (PSC -- NAR 473)

The Contact:

Steve Foster
naram51@nar.org

The Location:

Johnstown, PA

The Website:

http://www.naram.org

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The Capital Cup – A FAI World Cup Spacemodeling Contest – this October at Great Meadows

The Dates:

Saturday and Sunday,
October 24th and 25, 2009

The Location:

Great Meadows,
The Plains, VA

The Host:

Northern Virginia Association of Rocketry
(NOVAAR -- NAR 305)

The Events and Schedule:

SATURDAY

- Model check in and contestant briefing..... 9 AM
- S4A (A-engine boost-glider) 1st round ..... 9:30 AM
- S9A (A engine gyrocopter) 1st round ..... 10:30 AM
- S6A (A engine streamer duration) 1st round11:30 AM
- S6A (A engine streamer duration) 2nd round12:30 PM
- Lunch..... 1:30 -2:15 PM
- S4A (A-engine boost-glider) 2nd round.....2:15 PM
- S9A (A engine gyrocopter) 2nd round .....3:15 PM
- S4A (A-engine boost-glider) 3rd round .....4:15 PM
- S9A (A engine gyrocopter) 3rd round.....5:15 PM
- S6A (A engine streamer duration)` 3rd round6:15 PM

US 2008 Team Meeting At end of flying

SUNDAY

- Model check in.....9 AM
- Flyoff Round S6.....9:00 AM
- S8E/P (E-engine radio-controlled rocket glider) 1st Round .....9:15 AM
- Flyoff Round S9.....10:00 AM
- S8E/P (E-engine radio-controlled rocket glider) 2nd Round.....10:15 AM
- Flyoff Round S4.....11:00 AM
- S8E/P (E-engine radio-controlled rocket glider) 3rd Round .....11:15 AM
- Lunch .....12:15 -1:00 PM
- S8E/P (E-engine radio-controlled rocket glider) Flyoff Round.....1:00 AM
- S1 (A-engine Altitude) 3 flights Open Round ..... 1:00 – 3:30 PM

The Entry Fee:

$15, advance registration not required

The Contest Rules:

This event is flown under the FAI Space Models Sporting Code.

All S1 flights will use altimeters. For details *http://www.spacemodeling.org/WC2008/s1_guide.pdf*

www.fai.org/aeromodelling/documents/sc4. Fliers with FAI Sporting Licenses, remember to bring them.

This event will be flown using rocket motors having current NAR approval for contest use in the US, as listed at *www.nar.org/SandT/NARenglist.shtml*.

The Contest Director:

Contest Director: Tony Reynolds, tonyr@night.net, Richardson, TX (214) 869-6645

The On-site Coordinator:

Trip Barber, ahbarber@alum.mit.edu, Springfield, VA (703) 866-4710

The 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”.

The Lodging:

All motels are at I-66W exit 47B in Manassas, VA (I-66E exit 47).

Best Western Battlefield Inn - 10820 Balls Ford Rd., Manassas, VA 20109 - (703) 361-8000

Quality Inn Manassas - 10653 Balls Ford Road, Manassas, VA 20109 - (703) 368-2800

Red Roof Inn Manassas - 10610 Automotive Drive, Manassas, VA 20109 - (703) 335-9333

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April 7th Sport Launch

The April launch was scheduled for Saturday and Sunday(4th and 5th) however, an approaching pressure system caused high winds and required the early closure of the range on Saturday.

Sunday dawned with less winds and bright skies and the TARC teams came a calling.


OAKCREST


RANGE SAFETY


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15


7


7

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Real Rocketry

The lost NASA tapes: Restoring lunar images after 40 years in the Vault

A Mac Pro and 40-year-old tape drives are helping restore the original Lunar Orbiter tapes

By: Lamont Wood

From:
http://www.computerworld.com/s/article/9134771/The_lost_NASA_tapes_Restoring_lunar_images_after_40_years_in_the_vault?taxonomyId=12&pageNumber=1

June 29, 2009 Liquid nitrogen, vegetable steamers, Macintosh workstations and old, refrigerator-size tape drives. These are just some of the tools a new breed of Space Age archeologists is using to sift through the digital debris from the early days of NASA, mining the information in ways unimaginable when it was first gathered four decades ago.

At stake is data that could show Earth's risk of an asteroid strike, shed light on global warming and -- perhaps -- even satisfy those who think the moon landings were a hoax.

The most visible of the archeologists is arguably Dennis Wingo, head of Skycorp Inc., a small aerospace engineering firm in Huntsville, Ala. He's the driving force behind the Lunar Orbiter Image Recovery Project, operating out of a decommissioned McDonald's (since dubbed McMoon's) at NASA's Ames Research Center in Mountain View, Calif. The project's goal is to recover and enhance as many of the original lunar landing images as possible.

Between 1966 and 1967, five unmanned probes were sent into lunar orbit to map possible landing sites within the moon's equatorial regions at one-meter resolution and to map the rest of the surface at a resolution of 40 meters or better, Wingo explains. Those probes, known as Lunar Orbiters, sent back about 1,800 images that modern technology should be able to greatly improve.

The project's great scientific value to NASA is in enabling a comparison between the lunar surface as mapped by the Lunar Reconnaissance Orbiter, launched on June 18, with the lunar surface as it appeared 43 years ago, according to Wingo. The goal is to "get a fix on how many meteor impacts have occurred in the meantime," by cataloging the new craters.

"If we know the changes, we can establish the risk of working on the moon and even determine the small-body asteroid population of the inner solar system," Wingo says. Another valuable contribution: the ability

to plot the possible risk to Earth of the impact of an asteroid.

Detail of the Earthrise picture taken by the first Lunar Orbiter in 1966, as rendered at the time. (This picture should not be confused with the color Earthrise picture taken by the Apollo 8 astronauts from lunar orbit in 1968 and subsequently used on a U.S. postage stamp.)

The original black-and-white images were shot on 70mm film that was automatically developed and scanned within the robot spacecraft. The signal from the scanner was sent to Earth and was then displayed as partial frames on a monitor. Each monitor image was then captured with a film camera. These pictures were fit together, and then another picture was taken of the finished mosaic. Each step imposed a certain amount of image degradation.

The resulting Lunar Orbiter images are the basis of a digital lunar atlas. But Wingo figured that if he could process the tapes of the original signals, he could improve the dynamic range of the images by a factor of four, revealing far more surface features.

Although this theory has proved correct, the path has been challenging. Wingo first had to acquire the tapes, then reconstruct drives to read them and finally perform the actual processing.

Next steps

It turns out that the original 2-in. tapes were available. Around 1986, NASA archivist Nancy Evans, who is now retired, was contacted by a federal records center asking what to do with them. Feeling that the data should not be discarded, she persuaded the Jet Propulsion Laboratory (JPL) in Pasadena, Calif., to put them into climate-controlled storage.

However, the tapes were useless without compatible tape drives -- in this case, analog Ampex FR-900 reel-to-reel units. Weighing half a ton and resembling refrigerators, the drives were formerly used by the U.S. Air Force to record radar data but have not been manufactured since 1975. "There were probably thousands of them at one time, but as the radar stations refitted with new drives, most [of the old ones] were dumped in the ocean to make coral reefs," Evans says. There are "thousands" of the old drives off Kwajalein -- an atoll that's part of the Marshall Islands -- and Florida, she says.

She finally got a call from an Air Force base that had four of the old drives. She stored them, along with documentation and spare parts, at her home in Sun Valley, Calif., and tried to get funding to restore the tapes. None was forthcoming, so the machines gathered dust for two decades.

By 2006, the tapes -- still in JPL storage -- fell under a new NASA edict that no planetary data should ever be destroyed, Evans explains. However, by then she needed the storage area occupied by the tape drives for the veterinarian practice she and her daughter maintained. In an effort to preserve the drives, she submitted a white paper about the tapes and drives at a Lunar and Planetary Institute conference. After seeing the white paper in a blog post, Wingo contacted her and arranged to have the drives, and later the tapes, transported to Ames in rented trucks.

Then Wingo obtained a grant of $250,000 from NASA to get started. His largely volunteer crew was able to restore two of the drives using pieces from the other two, plus off-the-shelf parts and additional components that had to be custom-made.

"We had to pay big bucks to get the bearings replaced, the motors rebuilt and rubber parts cast. We had to dip the motors in liquid nitrogen to get the bearings off," he recalls.

So far, all the tapes have proved usable. The data is read into a quad-processor Macintosh Pro workstation with 13GB of RAM and 4TB of storage. Data acquisition is done through a PCI Express card from Canadian firm AlazarTech that can read 180 million samples per second, although only 10 million are needed, Wingo says.

After capture, the images are processed with Adobe Photoshop and Igor Pro analysis software from

WaveMetrics Inc. But the new plan is to move to a custom application written in C, largely because of its ability to take advantage of Mac OS X 10.6 (Snow Leopard). With Igor Pro and Photoshop, processing takes an hour for a high-resolution image and 20 minutes for a medium-resolution image. But after the switch to the C program, processing with the Snow Leopard version should be almost immediate, based on the testing that's been conducted, Wingo says.

Detail of the Earthrise picture taken by the first Lunar Orbiter in 1966, rendered with modern technology.

With an additional $600,000 budget, Wingo hopes to have all the files processed by February, producing a moon atlas with a resolution higher than anything previously seen. Most of this new funding is again from NASA, with about 10% from private donors.

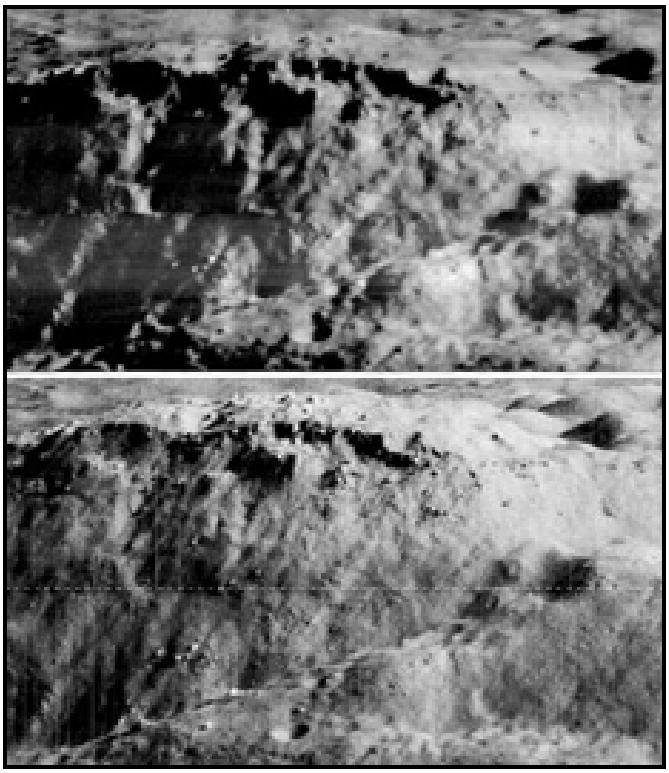
However, Wingo's "deliverable" to NASA is not the images themselves, but the raw data extracted from the tapes. "They would rather have the raw data so that someone even a thousand years from now could do their own processing," he says.

The lost Apollo 11 tapes

The NASA edict against data destruction was issued after the space agency's 2006 admission that it couldn't locate the original tapes of the Apollo 11 live slow-scan TV broadcast from the moon. The agency then initiated a search for the tapes, which remains ongoing, as is the Internet furor the admission generated among conspiracy theorists, who believe the landings were staged.

The data is assumed to be on 1-in. tapes, but, based on period photos, Wingo thinks they should be on 2-in. tapes like the Lunar Orbiter data. He is conducting his own search.

Begging to differ is Richard Nafzger, senior engineer at the Goddard Space Flight Center in Greenbelt, Md., who's been working for NASA since 1968 and was involved in television support and voice communications for the Apollo moon missions.



Orbiter image from 1966, and, below, after modern processing of the original data.

"Despite how old you get, there are certain things you don't forget, and we recorded all slow-scan images on 1-in. tapes that were 15 in. in diameter, and I have spent the last three years tracking them," he says. "I am certain that there was no slow-scan ever recorded on the Ampex 900." The video feed was one of 12 tracks of telemetry that were recorded on each tape, Nafzger explains.

Due to the low wattage of the transmitter on the lunar lander, they had only 500 kHz bandwidth to use for video, as opposed to the 4.5 MHz that was standard at the time for broadcast analog TV. So NASA used a slow-scan, black-and-white transmission at 10 frames per second with 320 lines per screen, Nafzger says. U.S. broadcast TV used 30 frames per second with 525 lines per screen. The conversion was made at each ground site with a device that basically pointed a broadcast TV camera at a special monitor displaying the slow-scan image.

The slow-scan monitor had persistent phosphor to make up for the slower scan rate, and as a result the movement of the astronauts looked ghostly and jerky, he explains. (Later moon landings used a more conventional TV broadcast system.)

The Apollo 11 TV signal was captured at NASA ground stations with 85-foot antennas in Spain, Australia and the Mojave Desert. NASA also borrowed a 210-foot radio astronomy antenna in Australia for the occasion. The signals were converted to broadcast format on-site and sent to Houston for redistribution to the TV networks. Both the slow-scan feed and the broadcast format were recorded on-site in case the live broadcast failed. The converted signals were routed through a single point in Houston so that NASA could cut off the signal if there were an "incident," Nafzger explains.

But that was the least of his worries.

"The night we landed and did the moonwalk, that is when I became scared," he recalls. Before that point, there hadn't been as much pressure to broadcast the proceedings in real time. But after the safe landing, "they were saying that they had better be able to see this on TV, and 600 million people were watching. Something as simple as plugging a wrong patch or pushing a wrong button would mean that no one would see it," Nafzger says.

Indeed, the camera had been installed on the lander upside down, Nafzger recalls. The TV technicians heard of this at the last minute and scrambled to install converters at the ground stations. The first few seconds of broadcast were upside down because the operator at the Mojave Desert ground station who understood the converter had left for the day, Nafzger recalls.

If the original tapes could be found, he estimates that they would appear three times clearer than the broadcast images. "Taking the clean data and extracting it in a digital high-definition format would let you go frame-by-frame and remove the noise, smearing, contrast problems and other things that were man-made, mostly by the original conversion. The tapes are worth getting just for that reason -- absolutely," Nafzger says.

He and others have been trying to do just that. But NASA has had at least 220,000 tapes of that variety in storage at some time, of which only about 15 might be the lost Apollo 11 tapes, he notes.

"We have gone through landfills on the tops of mountains. I have looked through rooms the size of two or three football fields, filled with rows of shelves going up 30 feet, and we have looked on every shelf that might contain the right tapes," Nafzger says. Tapes that were suspected of being the right ones were heated for hours in dry vegetable steamers to make sure the oxide was fixed to the substrate before Nafzger's team attempted to read them. Goddard has preserved the necessary 1-in. tape drives, so Nafzger did not have the refurbishing task that Wingo faced.

Nafzger is currently preparing a report on the results of the search and cannot discuss them until NASA releases the report, the date of which is uncertain. "But since I am not running down the street waving a flag and shouting 'Eureka!' you can draw your own conclusions. The big picture is that there is an explanation for everything," he says.

Other tapes

Meanwhile, in Las Vegas, Karen Person, head of the Renaissance Entertainment & Media Group, is not waiting for Nafzger's results. She says she has acquired one of the original 2-in. NASA recordings of the broadcast video and is using it as the basis of a documentary titled July Moon, which she hopes to have in theaters for the 40th anniversary of the moon landing on July 20. The video has been transferred to MPEG-4 format and parts have been enhanced, she says.

"They are about 200% clearer than anything you would have seen, and Walter Cronkite is not talking over them," she says. In fact, she showed clips to Apollo 11 astronaut Buzz Aldrin, and, according to her, he said he saw things that he had not previously remembered.

She claims she procured the tapes -- for an amount she would not disclose -- from a man who bought them at a government surplus property auction in 1976 while he was a NASA engineering intern. He reportedly paid $217.77 for a batch of 1,150 assorted tapes.

For his part, Wingo has received a grant from the National Oceanic and Atmospheric Administration to locate early Nimbus weather satellite tapes. Data from the satellites, first launched in 1964, was stored on tapes like those used with the Lunar Orbiters.

"Those images would push our knowledge of Arctic and Antarctic ice packs 14 years further into the past," he says.

Lamont Wood is a freelance writer in San Antonio. He can be reached at lwood@texas.net .

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May 28th TARC 2009

If it's May, it is time for TARC. The weekend of May 16th, saw one hundred plus members of the NAR, one hundred TARC teams, their support team and chaperons descended on Great Meadows for the 7th annual Team America Rocketry Challenge. This year the TARC Champion flew against the UKAYROC Champion to name an international champion. Next year, additional countries are expected to join the competition.


RocketContest.org
TEXTRON
Purdy Systems
TIMKEN
Where You Turn


RocketContest.org
ITT
DRS
Rockwell Collins
RocketContest.org
15


ATEL


8


BreconRidge
GOODRICH
3M
17


Honeywell
24


RocketContest.org
IBM
software
United Technologies
1


Luke


RocketContest.org
RocketContest.org
Aurora
Raytheon
12


US/UK Trans Atlantic Rocketry Challenge
Raytheon
RocketContest.org
Raytheon
RocketContest.org
Raytheon


RocketContest.org
Aurora
BreconRidge
GOODRICH
6
7
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RocketContest.org
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EMBRAER
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GOODRICH


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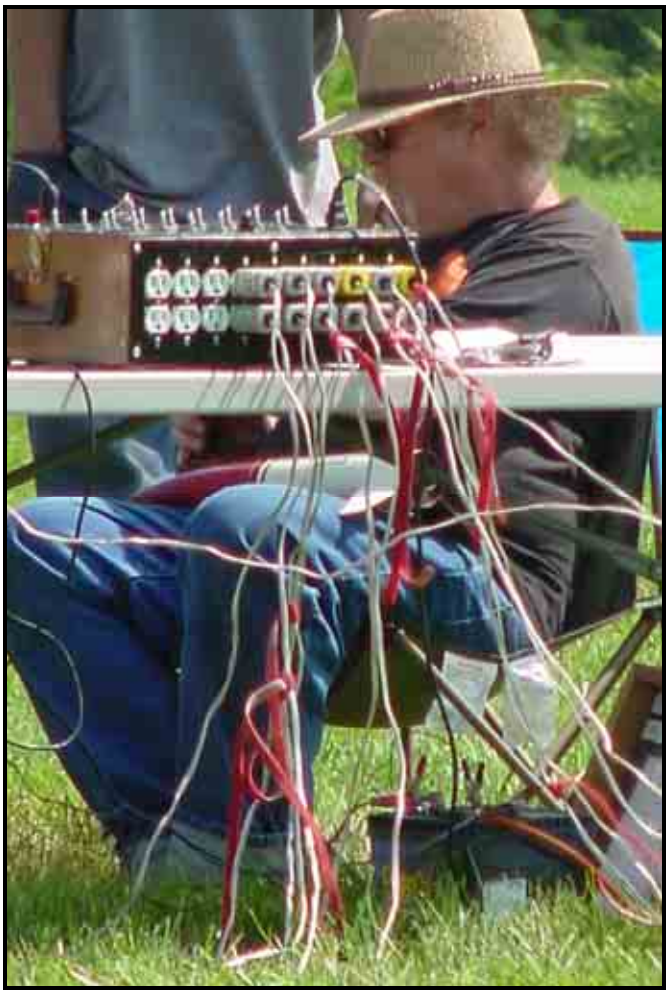
June 6th Sport Launch

TARC is over; the student teams have either graduated or are waiting for school to resume in September. With schools closed and, families considering their annual vacations, the packs and troops of Scouts are otherwise occupied. The range is again ours. A selfish statement indeed, but after the activities of the last few months it is nice to have a leisurely day of flying rockets.




CEX-SIX FOOTER!


HORIZON


CAT BOY

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