

Southeastern Space Supporter

Newsletter of HAL5 – the Huntsville Alabama L5 Society chapter of the National Space Society

Volume 7, Number 4 — July–August 1998

SPECIAL COLLECTOR'S EDITION

FIRST WORD

The First SL-2 Attempt

(by Ronnie Lajoie, SSS Editor)

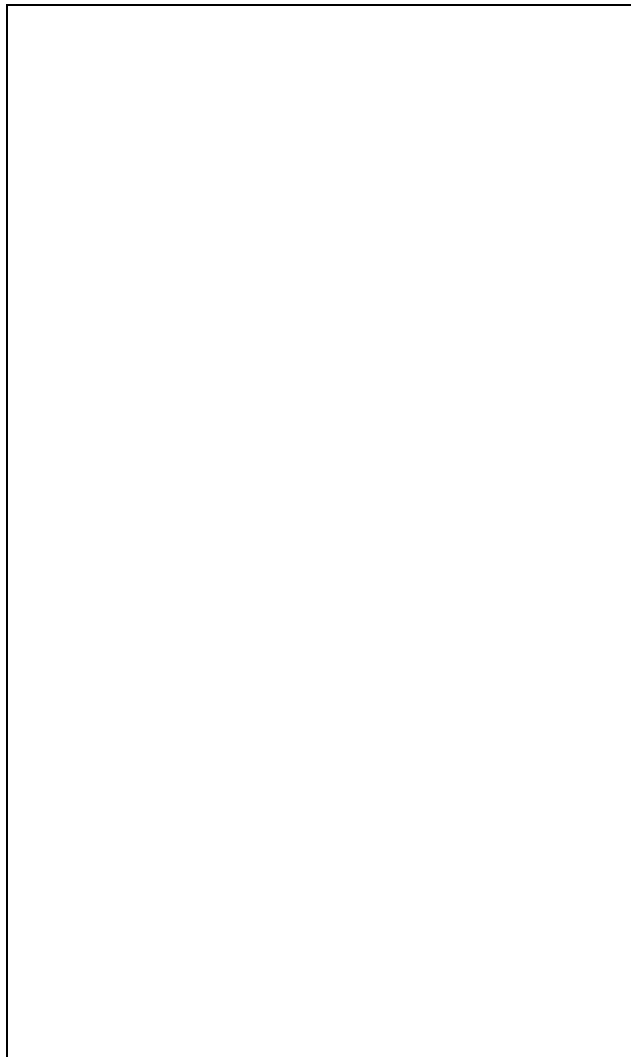
This special edition of the *Southeastern Space Supporter* is dedicated to the hardworking members of the Project HALO team, who endured many trials and tribulations in an heroic effort to prepare for and execute the first attempt of the HALO Sky Launch 2 (SL-2) rocket mission.

Following an unsatisfactory static test firing of the original SL-2 motor in November of last year, the motor and much of the rocket was redesigned. Both the HALO Rocket and Electronics teams worked hard, giving up most of their after work hours to the SL-2 effort, from January to June of 1998.

Meanwhile, Greg Allison led a team of engineers to prepare the analysis data and paper work required to satisfy NASA Safety personnel, and then to coordinate the multiple sites. The logistics planning side of the SL-2 effort was just as difficult as the hardware side.

But time had finally run out, and a date of June 20 was firmly set in concrete. The HALO team worked exponentially harder during the last three weeks leading up to the mission. It was a whirlwind of activity, right up to the moment of launch. In the pages that follow, you too will come to acknowledge that SL-2 was a heroic effort. ☆

A HEROIC EFFORT



An Awesome Adventure: Tales of the First Launch Attempt of HALO SL-2

(by Greg Allison, Program Manager)

Anyone who knows engineers is aware that the conventional attitude which is prevalent in the profession is that any job can be done on short order. Schedules are based on everyone knowing exactly what to do, when to do it and everything working perfectly the first time.

This highly overused technique is known as “success driven scheduling.” But then there is this little thing called “reality.” Reality is ruled by a lawgiver named Murphy. As we all well know, The Honorable Mr. Murphy is anything but kind.

The Time Challenge

The HALO SL-2 crew had been working day and night for months to prepare for the first amateur launch into space. NASA was going to give us a boat ride into the Gulf of Mexico to make it all possible. It turns out that the funding

(see HALO SL-2 on page 3)

HAL5 August Program Night

Wednesday, August 26, 1998, 7:00 p.m. to 8:30 p.m. (with social afterwards)
Huntsville Public Library Auditorium, 915 Monroe Avenue, Huntsville

“Space Tethers: Power and Propulsion from a String!”

Speaker will be Mr. Les Johnson, NASA Marshall Space Flight Center space physicist. All HAL5 and NSS members are encouraged to attend, and to bring interested friends and co-workers. The program is open to the public. Free admission and parking.

Huntsville Alabama L5 Society

President — Greg Allison
 Day: 544-4440, Eve: 859-5538
 Vice-President — Gladys Young
 Day: 852-0561, Eve: 852-0561
 Treasurer — Ronnie Lajoie
 Day: 971-3055, Eve: 721-1083
 Secretary — Clay Sawyer
 Day: 971-6408, Eve: 539-3889
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 Day: 971-9362, Eve: 726-0056

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The *Southeastern Space Supporter* is a bimonthly publication of the Huntsville Alabama L5 Society (HAL5), a not-for-profit 501(c)(3) organization devoted to the goal of seeing everyday people living in thriving communities beyond the Earth.

Any opinions expressed in this newsletter are those of the authors or of the Editor, and, unless expressly so stated, are not necessarily those of HAL5 or the NSS.

Visit the HAL5 Web Page on Internet via:
<http://advicom.net/~hal5/>

HAL5 encourages its members to speak out on space-related issues, and welcome submissions of both fact and opinion articles of interest to HAL5 members.

Submit letters or articles to: Ronnie Lajoie
 162 Kirby Lane, Madison, AL 35757
 Day phone/message: 205-971-3055
 Night/Weekend phone: 205-721-1083
 FAX number: 205-971-3333
 Electronic mail address: hal5@advicom.net

Deadline for submittal is the last day of the following months: February, April, June, August, October, and December.

Preferred format for plain text is ASCII (text with graphics is *MS Word* or *WordPerfect*) either sent by E-mail or on a PC diskette. Also acceptable are letters and articles sent by mail or faxed; however, the more retyping required, the less likely the acceptance. HAL5 is not responsible for receipt of mailed submissions; none will be returned unless sent with a SASE. Hand-delivered diskettes will be hand-returned. No compensation is paid for submissions.

A Tale of Two Signs

(by Ronnie Lajoie, HALO member)

Every now and then I get the urge to do something creative — though it usually happens before midnight! In this case, I wanted to do something nice for the HALO team about to embark on their historic journey to the Gulf of Mexico.

The HALO team had just spent weeks of frantic activity getting the rocket ready to fly. Finally, on Tuesday, June 16, all the rocket parts (with the exception of the electronics and payload), balloons, and all the required ground support equipment were put into large wooden crates in preparation for a pickup by a NASA truck the next morning. After that, there was no turning back.

After making my last drop of ground support equipment at Tim's around midnight, I started thinking how it would be nice if a crowd of well-wishers were there in the morning to see them off.

I came up with the next best thing in the form of a large sign made using 3 rows and 4 columns of 8-1/2 x 11 sheets of paper laid over poster board, and reinforced with wood stakes.

The message "**GOOD LUCK HALO**" was made using ClarisDraw that allowed me to expand the words and our HALO logo over the 12 sheets of white paper. After printing them, I touched up the edges with magic marker, taped them together and then taped the entire large sheet to the poster board sign. That, actually, was the easy part.

It was now 2 AM, and the hardest part turned out to be figuring out where to put the sign and how to prop it up. I knew that some of the HALO team were driving their own vehicles down to Louisiana, which meant putting up the sign at Tim's house would not allow the whole barge team to

see it. I finally opted for a stretch of the Interstate 565 freeway outside Huntsville halfway to Greenbrier.

I had not counted on the roadside grass to be compacted practically into stone. After several failed attempts to find soft ground, I did my best to hammer the sign into the hardened dirt. It held up to the wind of passing trucks and was easily visible. Great! It was now 3 AM. The next morning, after not hearing



The HALO "Good Luck" sign on I-565.

from the barge team, I ventured back to the site, only to find the sign removed from its spot and laid to rest nearby. Disappointed, but not defeated, I remade the top words of the sign to be "**WELCOME TO**" and brought the sign to the HALO site on Dauphin Island. ☆



Gladys Young and Judy Wells pose with the now HALO "Welcome" sign on Dauphin Island.

(HALO SL-2, continued from page 1)
 which NASA was using to support this mission came out of the special low cost launch program project. The NASA Administrator, Dan Goldin, was briefed that the rockoon had many cost saving aspects that made it a lead contender for this project. Unfortunately Mr. Goldin ruled that he was not interested in any "air-launch gimmicks". Our NASA lead, Vance Houston then presented us, the HALO Team, the option of dropping the mission. If we were to continue we had to launch no later than the 20th of June or the program was dead!

Given the rule of Mr. Murphy and the challenges of a club-based space shot, the decision to continue was brought before the HALO team and the HAL5 Executive Committee. The task before us was simply impossible! Or so one might think given the tasks to be accomplished in just a few weeks. But then this is the most determined HALO team. Put to the question, each voted launch! The game was on!

The entire team snapped into a grand

marathon. Everyone worked day and night into the wee hours. The week before launch sleep was almost outlawed. Crew members took leave from their day jobs to push the mission.

One of my favorite stories relates to Clay Sawyer working into the wee hours at Gene Young's electronics shop. Worn out, he struggled his way to his car to head home to catch a minute of sleep. When he got to his car he discovered he was too tired to drive. The next morning Gladys Young wanted to know why he did not come back into the house to sleep on one of their fine spare beds. The answer was that Clay just did not have enough energy to make it out of the car back to the house. So he had the luxury of sleeping a whole two hours in his car before he had to hit it again. Unfortunately that was the norm for the group as we frantically prepared for this mission.

Avionics Crisis

Just days before we were to launch the backplane for our avionics boards totally failed in the manufacturing process. This meant that the job would require a long laborious hand wiring process.

We were also having problems with integrating software for two of the other avionics boards. Two guys were removed from other important tasks to do parallel development of simpler boards which could still meet mission

requirements. This last minute hardware and associated software passed initial preliminary tests and was baselined as core flight systems. Not because they were better, but because they were simpler and were expected to present us with less integration problems. Everything was going down to the wire.

Parts were still being built. Systems were still under integration. No one had slept over the past week more than a few hours per night. The crew would not yield. We packed all the loose parts and headed to the barge that was to carry us into the Gulf of Mexico. The team had bet that we could complete systems integration on the barge before launch. No one would say uncle!

We departed on Wednesday, 17 June. The trip to the NASA Michoud facility took several hours.

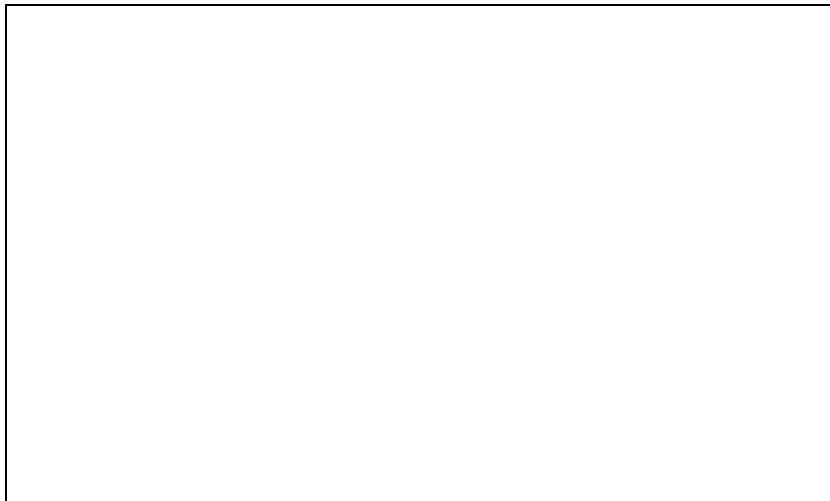
Into the Midst of History

The NASA barges used to transport large hardware for the space agency are huge relics from World War II. Originally built to off-load cargo ships for Pacific Islands which had no harbors they were latter refurbished to serve NASA. Inside, these ships look like a set from a World War II naval movie.

There were two barges at the dock when we arrived, the *Orion* and the *Pearl River*. The *Pearl River* barge was the vessel destined to ferry us on this grand



The completed rocket avionics module.



The barges *Orion* (left) and *Pearl River* (right) via wide-angle lens.

adventure. The *Orion* is one of two covered barges used to transport Space Shuttle External Tanks from the NASA Michoud facility to the Kennedy Space Center (KSC). Prior to that, the *Orion* had served to transport the first stage of the Saturn V moon rocket to Cape Canaveral (as KSC was known then). The *Pearl River* barge had an open deck. Both barges were large ships. They are not what one would typically think of as a barge. Each had upper decks with a wheel house, galleys and crew quarters (including a shower).

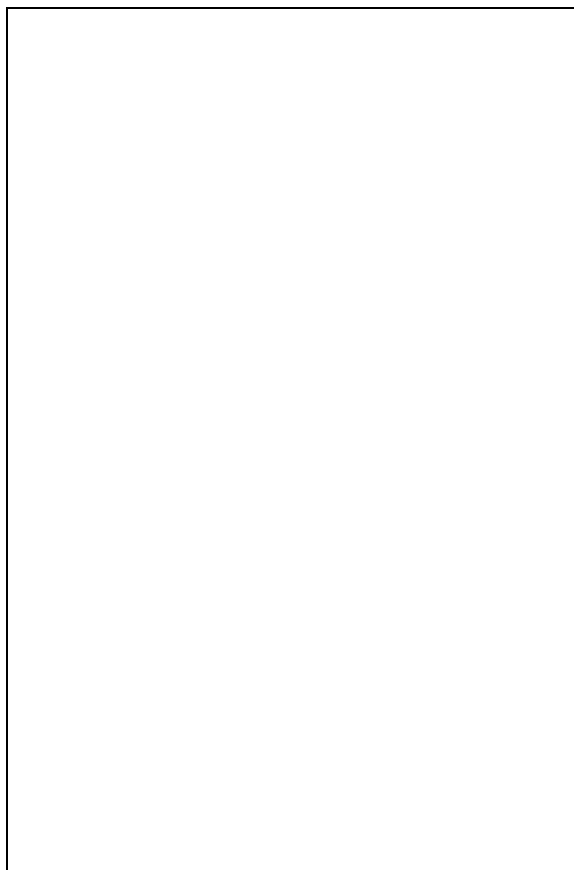
The *Orion* had several two man crew quarters which together with the galley were air conditioned. The *Pearl River* crew quarters only had bunks for four. The crew quarters and the wheel-house were the only air-conditioned rooms on board. Two of those four bunks were spoken for by the NASA guys, one went to the captain, one for Gene Young (who never slept except for when we got hit by the squall line storm). Guess where the rest of us slept? Mostly on the deck (when it wasn't raining). Some managed to squeeze in on the floor in the crew cabin. For the most part we were camping out at sea. Fortunately most of us didn't have time for sleep anyway.

Into the Belly of the Beast

Luckily most of the crew got to sleep on the *Orion* Wednesday and Thursday night before our early Friday morning departure. The *Orion* was awesome! The covered deck had a Quonset hut (a building that looks like the upper half of a giant corrugated aluminum drainage pipe) type roof which resulted in a facility which looked like a hangar for a large blimp. The roof was about 70-80 feet above the deck, far higher than the Saturn V first stage required (even with a trailer underneath). If you yelled inside the echo would resonate for several seconds.

The side railing on the *Orion* was a wall about 8-10 foot high. In the walls on

each side were hatches exactly like those on the ship in the latest James Bond movie which was going to launch a missile at the U.S. to provoke war with China. To sleep in the quarters of such a magnificent piece of history, which is still transporting external tanks to the launch site, was quite frankly a real thrill. While the bunks reminded me of my stint in the Army, the doors and hatches were strait out of the World War II navy! Yes, that was cool!



The Belly of the Beast. Inside the barge *Orion*.

Setup Aboard the *Pearl River*

Thursday was devoted to setup. The transport truck was off-loaded to the barge. Equipment was stowed. Tim Pickens, Steve Mustaikis, Al Wright, Glen May and several other crew members erected the canopy for the rocket assembly area. Then they assured that the launch gantry was assembled. The helium and nitrous-oxide bottles were brought on-board and fixed into position.

We made last minute runs to Radio Shack for electronics parts, and to grocery and hardware stores. Gene Young set up the avionics assembly and checkout station in the wheel-house. Clay Sawyer, Ben Frink, and Bill Brown set up the mission control station on the upper deck next to the wheel-house. Quite a busy day indeed!

Off to Sea!

On the morning of Friday 19 June, we rose with the sun and prepared to set off. The Tug *Edwin N. Bisso* had arrived and tied on to the side of the *Pearl River* to pull us from dock. Once we got into the channel the tug left the side of the *Pearl River* and connected a tow line at the bow. Unlike river barges which push their payload, we were towed through the channel and into the Gulf.

As we headed out the long trip down the channel, the HALO team began initial launch preparations for the rocket and avionics. I was busy on my cell phone fruitlessly trying to make contact with the recovery boat, the *Sand Dollar*, our ground station on Dauphin Island, the recovery plane, and the HAM network in Mobile which had set-up to support this mission. Quite a bit of coordination was required for these aspects of the mission. Unfortunately this became a real problem at sea. On that Friday, the HAM team was in the field setting up, and Captain Dean Scarborough of the *Sand Dollar* was making preparations for his trip. The HALO Press Site Team was obviously not yet in place. Unfortunately, the communications problem were only beginning. At least at this point roaming services were available! At sea, it is a different matter!

Communications Problems

Once out to sea, cell phone roaming services were not available. There was a cell phone network set up for the oil rigs,

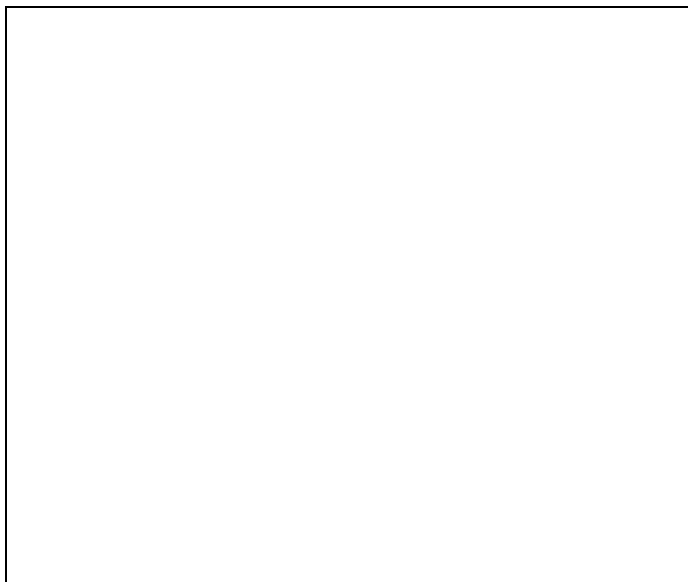
however. I tired in vain to use this network to establish essential mission communications. You had to call the network operator, enter who you were trying to call, credit card information and such.

Unfortunately signal interruptions would always block part of this information. Then you would be disapproved. Upon getting the standard disapproval due to poor signal quality you could then to call an operator and apply verbally. Again due to poor signal quality the operator could not hear you properly and would subsequently punch in the wrong numbers. Of course you would get disapproved again. Then you try to get the same operator back on-line and talk them through it again.

Usually somewhere in this long process the signal would drop-out, again due to poor signal quality, and you would have to start over. As it turned out, it would take 45 minutes or longer to attempt a single phone call at great cost. The result, busy signals or no answer. I once got the hotel clerk were our Press Site team was staying. She put me on hold and guess what, thanks to the poor signal quality the signal dropped out and the call was terminated!

I had talked NASA into putting a satellite phone on the boat for communicating with the FAA and launch ranges, but they did not want to let us use it for anything else due to high usage fees. After I presented the on-board NASA representatives with the problems we were facing with communications, and the mission criticality of these communications, they relented to allow me to use the satellite phone.

When you use a geosynchronous satellite for phone conversations, the speed of light starts becoming a problem. There is a definite time delay between what each party says and the time the other party hears it. This is not like regular



The tugboat *Edwin N. Bisso* towing the barge *Pearl River*.

telephone conversations. Old fashioned World War II type radio protocol is required. Unfortunately, the general lay person you are trying to contact has a hard time understanding this! Though it was possible to get through, this was at best a most difficult mode of communications.

Squall Line on the High Seas!

The plan was to launch SL-2 in the early morning hours of Saturday, 20 June at about 7 AM. This might have worked if Mother Nature didn't have other plans! As with SL-1 we had planned to start the final launch preparations at about 3 AM. The crew got up and started preparations. We then got a report from the weather service of a squall line to our

north. The Tug took us to the south in the hope that we might avoid it.

Unfortunately the squall line was intent on paying us a little visit. 20 minutes before it hit we got the notice. There was no way we could avoid it. Rocket parts and the entire mission control center lay exposed. We had to rush to secure our equipment! Frantically the rocket systems were boxed up. Unfortunately, in the rush many critical parts went into boxes and places unknown. Clay Sawyer used his naval experience in wrapping up the mission control center. That

canopy which would have blown away was used to overwrap and directly support all the mission equipment.

The squall line hit! The winds were intense! Ocean spray flew over the bow of the barge onto the lower deck. The waves were crashing! Lighting was flashing. Al Wright and Tim Pickens lead a rescue mission to secure the rocket assembly canopy and equipment boxes by adding lines to the deck (via deck mounted D-rings) and railing. The legs of the canopy were jumping and popping around as we attempted to secure them. Canopy struts blew apart but were pulled back together tied with lines and secured with duct tape. We did all that we could. It was risky working



Clay used his Navy experiences to secure the ground station during the storm.

where metal struts were whipping around frantically in the air.

Then the wind got really rough, howling with near hurricane force! I am NOT exaggerating — we have the video to prove it! We sought shelter underneath the overhang of the upper deck and watched as the winds struggled do undo all our handiwork. The winds blew and tore at the canopy. Lines broke loose. Soon the tent and its pole looked like a mule kicking at the deck as the aft poles broke loose and fluttered in the wind bouncing between the sky and the deck. The canopy tore and the poles blew apart. We figured we would lose it all but fortunately all the major parts remained on the large deck of the barge.

Eventually the squall line blew through. In its wake we were several hours behind schedule with equipment scattered every where! Putting this mission back together was going to be a real mess!

Launch Preparations

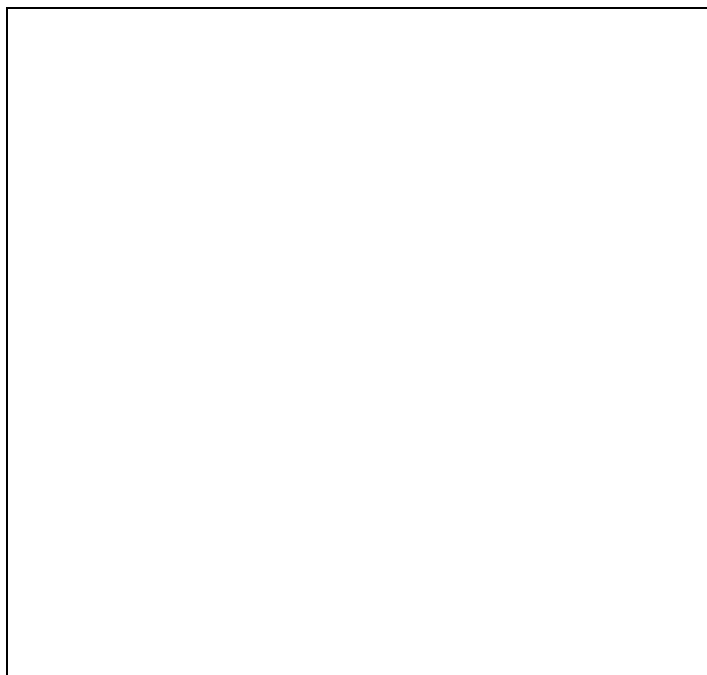
The crew began to pull out all the equipment again. There was of course many problems finding critical components which slowed our process. We discovered we had some questions about the balloon. We needed to talk to Mike Smith, Chief Engineer at Raven Industries. Fortunately, due to some extra mission requirements at Raven, a receptionist was on-hand who could give us Mr. Smith's phone number. We woke Mike Smith up on Saturday morning, the first "free day" he had in many weeks after an intensive proposal effort. He was very helpful in talking us through



Three Men and Their Baby. Electronics Team members Clay Sawyer, Gene Young, and John Price, with payload.

everything we had to do. Unfortunately, we would soon find out we did not have time to take all those steps.

Ben Frink was busy assembling an antenna which we had received with no instructions. Bill Brown and I were discussing inflating a tethered pilot balloon to guide the tugboat in matching wind velocity. At 8 AM, Bill contacted



Alfred Wright, Tim Pickens, and John Price race to assemble the rocket before their deadline is up.

Dauphin Island and told the Press Site team that, due to the storm, there would be a 2-1/2 hour launch delay.

I started making the required satellite phone calls to the federal agencies which controlled the range and air space. As it was a Saturday in which the military agencies had no training exercises planned, no one was available at any of their offices. The FAA is, of course, always there. They informed us of a little point of which we had previously known nothing. Our mission had to be over and back in the water no later than 1 PM! This meant we had to launch by 11 AM. And it was already 10 AM!

The Race to Launch on Time

Haste was in order! I talked to each team lead. We had to cut to the chase, drop assembly of the other antenna, and begin filling the balloon as final electronics and rocket assembly was still underway. This was a high stakes schedule. We didn't have enough time to inflate a tethered balloon to help the tugboat captain manage our wind velocity. We would just have to wing it!

The rocket team reported that the time required to assemble the rocket exceeded the time required to launch. I told them to give it their best shot!

We began balloon inflation. The tugboat struck out a course to give us a straight run matching the wind. The balloon began to rise above the deck. Then the rocket team came through. They heroically pulled their systems together ahead of schedule. Then the avionics were assembled and checked

out. The rocket was assembled and placed on the launch gantry as we continued with the balloon inflation.

As we didn't have time to inflate a tethered balloon to guide the tug before we inflated the main balloon, we had to deal with wind gusts across the deck of the barge as we began the initial inflation of the flight balloon. This meant several crew members had to physically hold the balloon down during the initial inflation process. Imagine holding a balloon with over a hundred pound of lift when the deck temperature exceeded 100 deg-F.

John Price was exerting all his effort to hold the balloon down. He was as red as a beet and sweating bullets. He quite understandably begged to swap place with me. Having once held onto a similar balloon myself my sympathy poured out to him, but he did not know the mission requirements and could not maintain contact with the FAA and the rest of the launch crew. I had to tell him to hold on as he cursed my soul.

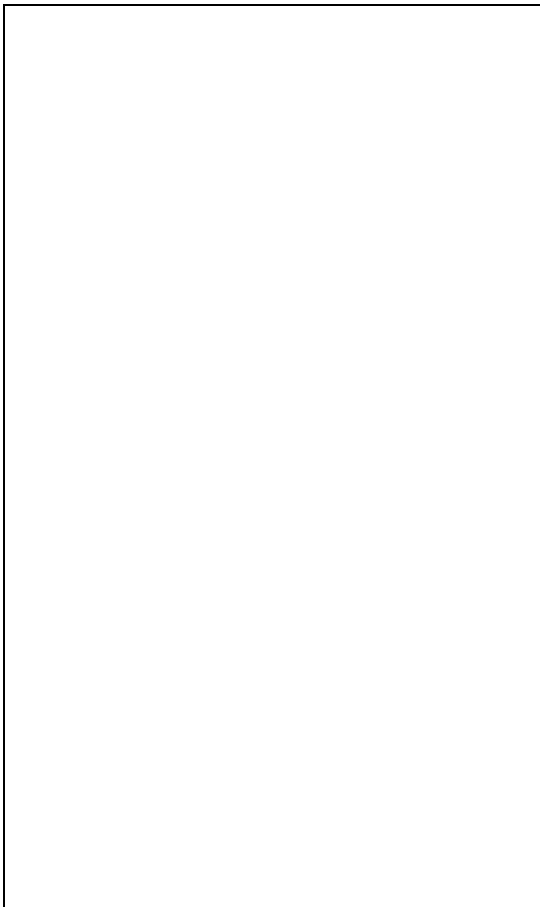
It is not easy being at the top at times. Sometimes it breaks your heart, but you have to make those tough decisions. I commanded the photographer from *Shift* magazine to remove his camera gear and assist the balloon team. He didn't like it but mission assistance was the criteria by which he was permitted to be on the barge. He pitched in and did his part. The heat was searing the crew on the

deck. Andy Welch went around the deck with a gallon jug full of cold water giving everyone a drink. I ask him to pour my part over my head. That felt like deliverance! It was like cold fire!

Later, when I looked at Bill Brown, I saw that he was turning from red to purple! He was almost speechless as he held tight to the fill tube to prevent it from twisting. I told Penn Stallard to get him some water. She said, "No! I already tried. He nearly bit my head off!" I said "Give him a drink and make him drink it!" "No", she replied, "he won't do it." I said, "Bill you take that water from Penn or else! Penn, give him the water now and don't take no for an answer!" She gave him the water, and he took it without any trouble. I was afraid he might get heat stroke.

Helium Tank Difficulties

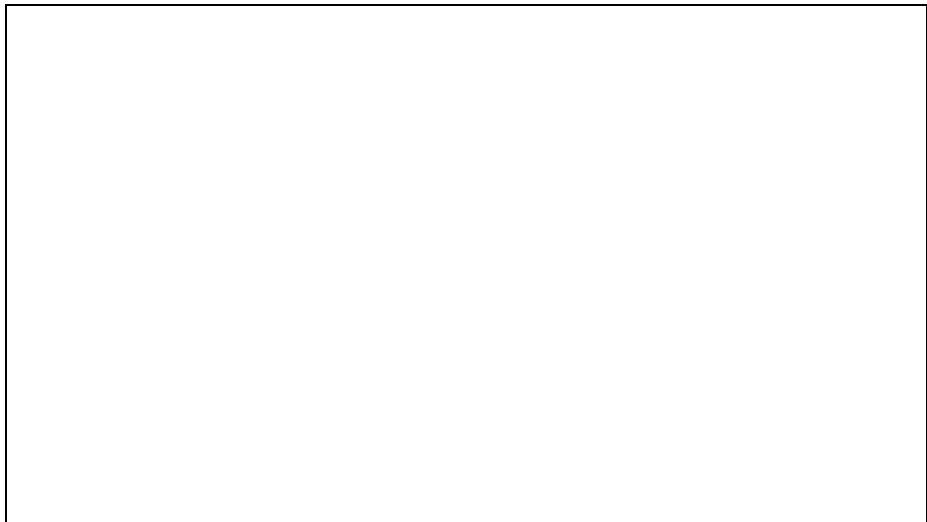
Our NASA team lead, Vance Houston was in charge of the fill manifold and the helium bottles. After filling with the first 10 bottles on the starboard (right) side of the barge, he and much of the crew wanted to continue to fill the balloon from the helium tanks on the starboard side. Unfortunately, the rest of those tanks were the reserve tanks



HALO members struggle to hold the balloon.

that HAL5 had set aside to use with the spare balloon in-case of a failure with the primary inflation. Use of those tanks would have obligated HAL5 for \$438 — money that we did not have. Launch time was pressing us. Over the popular objections of several crew members, I insisted that we use the tanks on the port side which were paid for by NASA.

The launch clock was ticking as we attempted to switch the fill manifold to the port side helium tanks. Unfortunately, those tanks were not lined up with their nozzles pointing in similar directions. We tried to twist the bottles around but they would not budge. This made it impossible to connect the fill manifold as it was designed. Cries went out from the crew to go back to the starboard helium bottles. The launch clock was about to run out. I refused to swap sides and called in Tim Pickens to assist Vance Houston and to solve this problem on the port side. With much difficulty we managed to find a way to



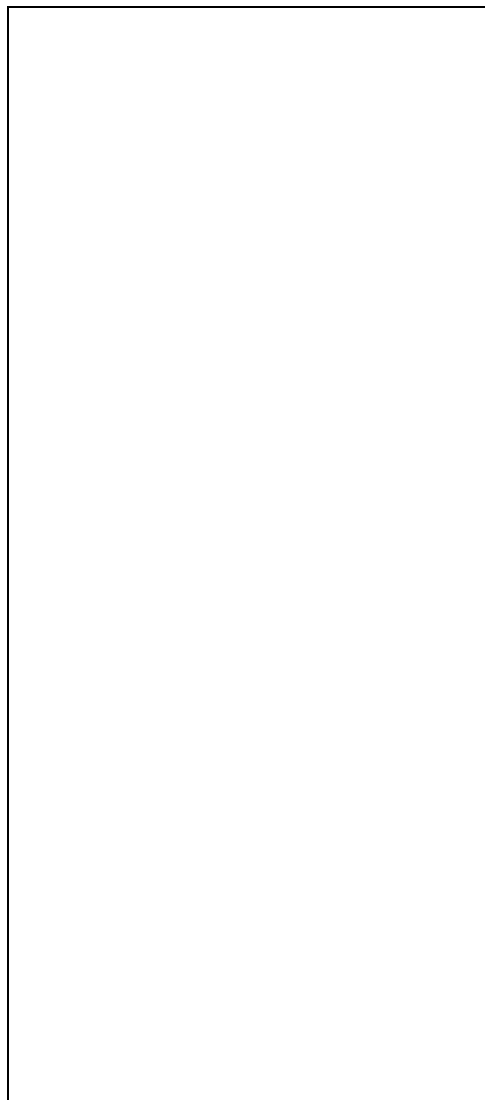
All Hands on Deck! Balloon launch operations required every crew member.

connect five fill nipples between 10 bottles to continue the inflation.

Final Balloon Fill

We calculated the final fill require for the balloon. Bill Brown and I got into an argument relative to the required balloon fill. After heated discussions I temporarily yielded to Bill Brown. Then Al Wright jumped me on exactly the same matter a bit latter. I went back to Bill and we had quite an argument! It turned out that our problem was terms and definitions. At that point I realized that the balloon was already slightly over-filled. Filling stopped and launch procedures were enacted.

The load cell on the balloon indicated that we had more than enough lift



The SL-2 high altitude balloon is ready.

available. It was connected to a cable tied between two D-rings on the deck of the boat. This system enabled me to pull the flight train tight before we launched the balloon.

The Balloon Launch

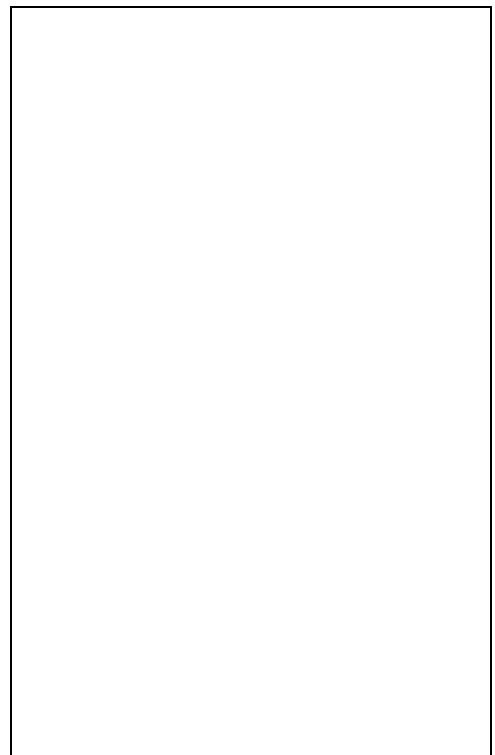
I radioed Andy Welch, the NASA transportation officer, to speed up the tugboat to create an aft-blowing wind to lean the balloon back. The balloon shifted back a bit (but not enough). Steve Mustaikis declared that we were back well enough. I looked up. It was leaning back some. If it were leaning back too far it would have jerked real hard on the rocket. I took the cue and ordered launch of the balloon.

I held the flight train taught as Glen May cut the cord which launched the balloon. At first all looked well. The balloon was drifting back toward the aft end as we had

planned for it to pick the rocket from the launch gantry. Then something went wrong. As I went to reach for my camera, I saw our rocket leaving the launch platform and coming at us. The balloon did not go over the aft end of the barge the way we envisioned it! Instead it started to ascend straight up just forward of the rocket launch gantry!

The rocket was dragged over the gantry. All might have ended well if the uplink avionics module had not snagged on a new piece added to the launch gantry for stiffness when crew members were on the ladder servicing the rocket. If we had one more inch of clearance we might have reached space!

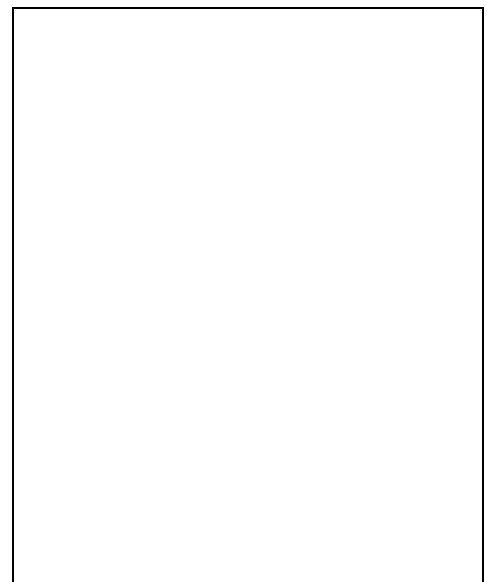
Like a bow and arrow, the 210 pounds of lift of the balloon pulled hard against the snag. When the uplink avionics module finally released, it, along with the gondola pole and the rocket shot forward. Despite the shock, the rockoon still held together. All may have ended well had not then the last piece of the rockoon train, the gondola video package, also snagged on the



The HALO SL-2 hybrid rocket is ready.

launcher. The shock temporarily stopped the gondola, but not the rocket. The 120-lb rocket sailed right off its launch pin and down to the barge deck!

Seeing this mishap in progress, I yelled "Hit the deck! No! Run! Run! Run! Run!" We all ran into the galley area to mitigate any further problems. The electronics package was still working perfectly after falling 25 feet onto the steel deck of the barge. The rocket video



The SL-2 rocket falls to the barge deck!

and GPS package were essentially transmitting “Hey guys! Here I am!”.

Al Wright heroically went out and safed the pressure tank. The rocket was then disassembled.

Meanwhile, Back on the Balloon

The balloon drifted up to 100,000 feet where the overpressure of the extra helium fill burst it. We had finally established communications with the recovery team. The boat was in place at the right coordinates to recover the balloon and gondola. Of course, Judge Murphy was still in charge. Upon announcement of failure to launch the rockoon, a Mobile HAM operator told our recovery boat to go back home.

Upon learning of this, Bill Brown tried to countermand that order, as we wanted to recover the gondola electronics. The recovery boat had been positioned at the drop zone. Unfortunately, after he departed, the HAM operator on-board the recovery boat turned his radio off immediately. We couldn’t get through to tell them to return to the point.

Strangely enough the gondola splashed down within a mile of a tug operated by the same company as the tug *Edwin N. Bisso*, the Canal Barge Company. They already knew what it was so they picked it up for us. Unfortunately, it would now take us several days to recover it from them. By this time, the salt water had wiped out all the electronics.

After the mission was over, we spent a little time policing up and talking among ourselves about the whole thing. Then many of us just started dropping dead from shear exhaustion and over heating.

I had bought a bunch of hamburger meat and had the usual duty of cooking for the crew. The evening was ripe so I forced myself back into the world of the awakened with the dreadful idea of fighting a headache and exhaustion to cook as I knew I should.

Well, fortunately our Captain was both a Cajun who knew how to cook, and quite a fisherman. Early in the morning before our launch he caught a large King Mackerel. He cooked it on a gas grill which Al Wright had bought for the mission. He also prepared Cajun Rice.

So I stumbled out to the deck and was greeted with the most wonderful aroma. There was plenty for everyone. Not only was I relieved to not have to cook, but I was treated to the absolutely best meal I ever ate in my life! That added quite a high point to the mission!

Conclusion

We didn’t get to launch our rocket into space; but we successfully demonstrated a free-standing inflation of a large balloon from the deck of a sea vessel and launched that to the edge-of-space. That was really the main thing that NASA wanted to see.

The rocket, well, it was string-launched to about 25 feet over the deck. Fortunately, it was recovered. There are still strong prospects for flying this rocket within a year. It is mostly a matter of raising about \$14,000 dollars to pay for the mission costs as HAL5 will be on its own for the reflight.

The main lesson to be recognized here is one we all know well: the learning is in the doing. As any bird would attest (if it could talk to us) you have to fall out of the nest a few times before you can fly. That happened with us before we flew

SL-1. And now before too long we shall fly SL-2!

Of course, there was some disappointment over not launching the SL-2 rocket into space, but that disappointment is well-tempered with the sense of the adventure we embarked on. Here we were a club, a chapter of the National Space Society, riding out to sea on a World War II ocean barge, towed by a tug, to brave adverse conditions, face an impossible schedule, fraught with unforeseen obstacles, poised to launch a balloon to the edge of space, and a rocket into space. Despite all the obstacles, everything came through except for the mere clearance of an inch.

It was a true odyssey, a sea space odyssey — quite an adventure for a club project. While some people are watching stories about people living their lives on TV, we are busy living ours! The memories of our experiences are rich! It was like competing in the Olympics. This first SL-2 mission was absolutely an awesome launch attempt! It was so darn rough, I just can’t wait to do it again! The adventure continues. We need not sit around and talk about going into space — let’s fly! Join us in our odyssey into space.

Acknowledgments

On behalf of HAL5, I would like to thank the many players that made this attempt possible. To the Rocket Team of Tim Pickens, Steve Mustaikis, and Al Wright — I salute you. You, and your

Holy Mackerel, Batman! Captain catches King Mackerel for the HALO team.

support personnel who could not attend pulled off an amazing feat in getting the rocket ready on time.

To the Electronics Team of Gene Young, Clay Sawyer, John Price, and Bill Brown — I express a heart-felt “Thank you!” I am amazed and awed by the number of hours you put in to get all this equipment working, from the antennas on top of the rocket, to the transmitter on the bottom of the gondola video package. Not to mention the ground support equipment. Wow!

To the barge launch support staff of Ben Frink, David Hewitt, Johnny Jones, and Glen May — Thank you for your three days of intense effort (not to mention all of your pre-mission support). We could not have gotten this far without you.

To Press members Felix Vikhman, Taras Kovaliv, and our own Penn Stallard — Thank you for going above and beyond the call of duty to help out.

To our remote support team of Captain Dean Scarborough, Pilot Jim Jeninski, Danny Carpenter and his GCATS volunteers, and the entire HALO Press Site team — Thanks for your hard work, patience, and understanding during this initial experiment. We will definitely do better next time!

To our NASA support team of Vance Houston, Andy Welsh, the captains of the barge *Pearl River*, tugboat *Edwin N. Bisso*, and crewboat *C. D. White*; plus the folk at NASA Marshall and Michoud — Thank you very much for your generosity and hospitality. It is clear to say that this first attempt for SL-2 could not have been done without your support, both financial and otherwise.

And, last but not least, to you and our many other moral supporters — Thank you for five years of moral and financial support. Project HALO would not have been possible without it. Ad Astra! ☆



SL-2 FIGHT SONG

(sung to the tune of the theme from “Gilligan’s Island”)

Just sit right back and you’ll hear a tale, a tale of a fateful trip;
That started from the Louisiana shore aboard a tug-drawn ship.
The crew was tattered and tired for they had gotten no sleep;
Sitting up many nights preparing for a launch from the ocean deep.
As the boat pulled out from shore the crew was still building the rocket;
As we all know today the fate of this mission was not set firmly in pocket.
They worked all day and they toiled all night to prepare for launch to space;
Working diligently to meet a schedule they knew not what they would face.
As the crew prepped the rocket all night for a launch in the early morn;
They got a surprise visitor in the form of a big violent storm.
The wind did blow and waves crashed high, the big barge was tossed;
If not for the courage of the tiny crew the mission would have been lost.
The mission would have been lost.

The crew went out and braved the storm to put the equipment in store;
The squall line still ripped the boat until the canopy got tore.
That next morning we started again but we were now running late;
We had to get the Rockoon in the air before the FAA shut the gate.
The rush was on the whole crew was in a dead-long run;
All this while we were all roasted by the sun, roasted by the sun.
We started filling the balloon as the rocket was still being built
Everyone on the barge was running at full tilt, running at full tilt.
The balloon was inflated on the deck, The rocket placed on its tower;
In spite of all the challenges it came together in the last hour.
It came together in the last hour.

The tug speeded up to make the balloon lay back toward the aft;
This strategy was to make the balloon pick the rocket off the raft.
Then the balloon was launched but it didn’t have enough air drag;
It rose to much forward on the deck causing the rocket launcher to snag.
Like a bow and arrow the rocket was flung into the steamy sky;
We reacted very quickly because we didn’t want to die, didn’t want to die.
I shouted out very loud “Hit the deck! No! Run Run Run Run!”;
I herded everyone into the galley, we were not having fun.
The rocket hit the deck, the balloon soared into the stratosphere;
As the avionics lay on the deck they said “Hey guys I’m right here!”
Al Wright safed the rocket, expressing no fear, expressing no fear.
The captain had caught King Mackerel and cooked it on the grill;
The dinner we had on that eve was our biggest thrill, was our biggest thrill.
Next time you go out and look in that milky blue sky;
Consider this, SL-2 will yet fly, SL-2 will yet fly.

— Greg Allison, 16 August 1998

HAL5 CALENDAR OF MEETINGS AND EVENTS

August 1998

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---------------------------------------|---------------------------------|--|--|---|---------------------------------------|---------------------------------------|
| 16 | 17 Phobos discovered 1877 | 18 Project HALO Tech. Meeting Noon at Ponds | 19 | 20 HAL5 Executive Comm. Meeting Noon at Ponds | 21 Solar eclipse 9:03 PM | 22 |
| 23 | 24 Voyager 2 at Neptune 1989 | 25 Project HALO Tech. Meeting Noon at Ponds | 26 HAL5 Program "Space Tethers" 7 pm at Library | 27 HAL5 Executive Comm. Meeting Noon at Ponds | 28 "Galileo" the Play 8 PM showing | 29 "Galileo" the Play 8 PM showing |
| 30 "Galileo" the Play 2 PM matinee | 31 | HAL5 August Program Night "Space Tethers: Power and Propulsion from a String!" by Les Johnson of NASA MSFC 7-9 PM, Wed., August 26, at Huntsville Library | | World Premiere Event Theatre `Round the Corner presents the play "Galileo" starring Roy Henderson 8 PM, 214 Holmes Avenue, \$10-17 | | |

September 1998

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------------------------------|---------------------|--|--|--|--------|----------|
| | | 1 Project HALO Tech. Meeting Noon at Ponds | 2 | 3 HAL5 Executive Comm. Meeting Noon at Ponds | 4 | 5 |
| 6 Lunar eclipse 6:21 AM | 7 Labor Day | 8 Project HALO Tech. Meeting Noon at Ponds | 9 | 10 HAL5 Executive Comm. Meeting Noon at Ponds | 11 | 12 |
| 13 Luna 2 impacts moon 1959 | 14 | 15 Project HALO Tech. Meeting Noon at Ponds | 16 | 17 HAL5 Executive Comm. Meeting Noon at Ponds | 18 | 19 |
| 20 | 21 Rosh Hashanah | 22 Project HALO Tech. Meeting Noon at Ponds | 23 HAL5 Program "Asteroids" 7 pm at Library | 24 HAL5 Executive Comm. Meeting Noon at Ponds | 25 | 26 |
| 27 | 28 | 29 Project HALO Tech. Meeting Noon at Ponds | 30 Yom Kippur | HAL5 & WFS Joint September Program Night "Asteroids: Friends or Foes?" by Greg Allison, HAL5 President, and Les Johnson, NASA Space Physicist 7-9 PM, Wed., September 23, at Huntsville Library | | |

October 1998

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--|--------------------|--|-----------|--|--|--|
| Con†Stellation XVII: Hydra Science Fiction Convention featuring award-winning authors Mike Resnick and Timothy Powers, and featuring award-winning space artists Bob Eggleton and David O. Miller, \$30 until Sept. 11, then \$35; at the Airport Sheraton Hotel, Huntsville | | | | 1 HAL5 Executive Comm. Meeting Noon at Ponds | 2 | 3 |
| 4 Sputnik 1 launched 1957 | 5 | 6 Project HALO Tech. Meeting Noon at Ponds | 7 | 8 HAL5 Executive Comm. Meeting Noon at Ponds | 9 Con†Stellation XVII: Hydra 5-11p at Airport | 10 Con†Stellation XVII: Hydra 9a-11p at Airport |
| 11 Con†Stellation XVII: Hydra 9a-1p at Airport | 12 Columbus Day | 13 Project HALO Tech. Meeting Noon at Ponds | 14 | 15 HAL5 Executive Comm. Meeting Noon at Ponds | 16 | 17 |

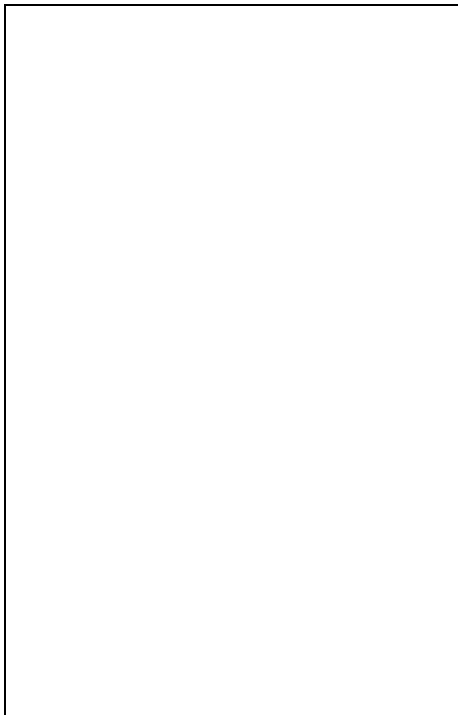
The HALO SL-2 Avionics

(by Gene Young, SL-2 Electronics Lead)

Two electronic subsystems were built to support the HALO SL-2 launch and flight. These are described as follows:

Uplink Avionics Module

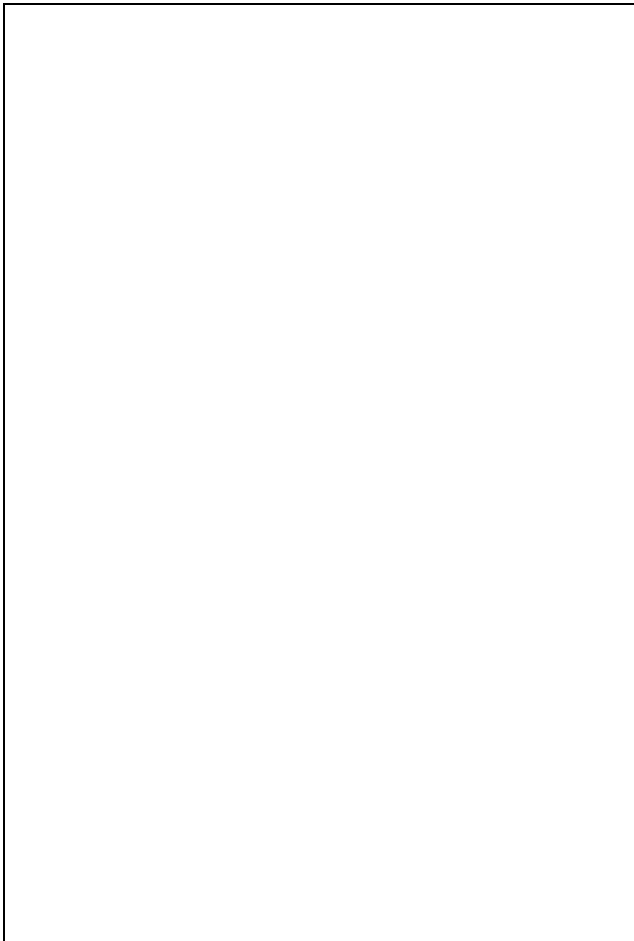
The Uplink Avionics Module contained electronics to ignite the SL-2 motor and provide power to the nitrous oxide tank heaters. It contained redundant command receivers, decoder and control boards and lithium batteries. It was contained in an aluminum cylinder, 12 inches in diameter, 12 inches long and weighed 16 pound. Although the motor ignition circuitry did not get the opportunity to do its job, commands were sent while the balloon was in flight to cut the gondola loose from the balloon and pull the tear-out panel from the balloon. The commands were sent when the balloon was still in sight and



The Rocket Avionics Module.

estimated to be above 20,000 feet.

These commands provided no visible results as the balloon floated farther and farther away. It was not known until after the balloon burst and was recovered from the Gulf that the uplink commands had fired the pyros in the rope cutters, resulting in the ropes being cut partially through. Without the weight of the rocket on the ropes, the partially cut ropes were strong enough to support the remaining weight. To the left is a picture of the Uplink Avionics Module before the flight. The short time that the module was in the salt waters of the Gulf, and not being able to right-away wash the corrosive salt away rendered the module useless for later use.



Tim watches Gene work on Uplink Avionics Module.

Rocket Avionics Module

The Rocket Avionics Module was designed to provide down-linked TV, accelerometer and GPS data, and deployment of parachutes after flight trajectory apogee. A color TV camera looked out the side of the 7 inch by 18 inch aluminum canister that contained the flight electronics. A 1.255 GHz transmitter was employed to send the space TV images to the ground.

Accelerometer and GPS data were fed through a MIM chip, 1200 baud modem and a 432 MHz transmitter for transmission to the ground station. A Video Overlay board also was used to impose the GPS and accelerometer data onto the transmitted video signal, providing redundancy to down-linked data. Lithium batteries provided the power for all the electronics. Inverted F antennas for the 432 MHz and 1.255 GHz antennas were located on the outside surface of the canister. A picture of the Rocket Avionics Module removed from its storage canister is shown above.

It was a terrible disappointment that the rocket did not fly to demonstrate the capability of the module but it was somewhat comforting to observe that it was still sending out data after a fall from about 20 feet to the steel surface of the barge. The module could easily be repaired, tested and made ready to fly by the next day. ☆

Photograph Credits

| <u>Photographer</u> | <u>Page(s)</u> |
|---------------------|-----------------|
| Bill Brown | 8 |
| Johnny Jones | 3, 5, 6, 7, 8 |
| Ronnie Lajoie | 2, 4, 12, 15-20 |
| Penn Stallard | 1, 3, 4, 9 |
| Alfred Wright | 4, 8, 12, 14 |

On the Cover

Alfred Wright and Steve Mustaikis perform final checkout of the HALO SL-2 rocket on its wooden launcher.

My HALO SL-2 Experiences

(by Tim Pickens, Rocket Systems Lead)

Greg had gotten the final word from NASA and it didn't look good, "Launch is imminent on this date, June 20, or there will be no launch!" I didn't want to hear this, nor did any one else. I began to run through a mental check list and decided that at our current pace, we might be ready in 4 months but not one!

The last thing that I wanted to see is our all-volunteer team get in a hurry and not have the opportunity to do thorough checkouts and a full-up system integration. Without enough time, we would all really have a tense month and we could all end up looking real amateur instead of just amateur.

A Long "To Do" List

There was so much to do. The carbon tank had not been finished yet, nor any of the upper sections which housed the parachutes, electronics, etc. There was no ground support equipment to manage the rocket or the balloon. I had a lot of ideas of how to do these things, but they were not on paper.

There was no time to discuss these ideas with the other team members. I did not like the idea of have the monkey on my back not only for responsibility reasons, but also because the other team members needed to know what was going on in case I got sick. There was no time to produce formal procedures for balloon inflation, rigging, nitrous filling of the rocket, etc. It was everything that we could do to get the rocket built.

The Hectic Month Before Launch

Along the way there were many unexpected set backs. For instance, we built a heater from a piece of stove pipe that we were going to cure our carbon fiber tan in. It looked nice but had about a 100 degree thermal gradient from one end to the other. We manage to use it but it was not an ideal environment for our curing cycle. We also attempted to strengthen our wooden fins with pre-impregnated Kevlar. They would have

to undergo a vacuum bagging process and then be placed into the oven at approximately 350 deg. They did not survive the environment without becoming warped. We had to scrap them and purchase some carbon fins from HARC, which was also in the process of building a large hybrid.

Another biggie was the need to build a large launch cradle to both elevate the rocket several feet above the barge deck and support the weight of the vehicle during fill. This project ended up taking lots of our time to build. The rocket would not get to see a final fit check with this until we were on the barge the morning of the launch.

This cradle was built in order to allow a totally remote nitrous fill as well as a hands off balloon launch. These were just a few of the problems we experienced those last four months and I think you can get the jest of what I am saying. It was insane!

At the NASA Michoud Facility

We are now arriving in Michoud and boy was the security tight. No one would leave or go without a NASA escort. We would stay in our immediate area, go no where and talk to know one. Welcome to boot camp.

We ended up spending the first night on a nice old boat that was used to carry the external tanks from the space shuttle. It was built in the 60's and named *Orion*. It was a real cool piece of floating history because it also carried the first stages on the Saturn V moon rockets. It was old but very nice and could accommodate a crew of over 12.

We all spent most of the night working on wiring harnesses and electronics while we had a nice air conditioned room, which in our case was the kitchen (galley for you boat people).

Aboard the Barge *Pearl River*

Fate would not allow the comforts of home to last. We were ask to load up on another older boat called the *Pearl River*

after our one night stay on the *Orion*. It was kinda like being fed your last meal before you were instructed to walk the plank. This boat could sleep only four persons with air conditioning in the bunk room. It was absolutely miserable anywhere else on the barge. I could not believe the humidity level that accompanied the heat.

We would set sail in just a few hours and it was time to take my motion sickness medicine. I would be a basket case with out it. I was really getting sick and worried because the helium fill manifold that Raven had loaned us was in route and presumably lost in receiving somewhere in lots of red tape. It did finally get located just hours before we shoved off. It was very stressful, wondering had I covered all bases and did we have everything we needed for this mission. Unlike the other balloon flights, there was no turning back or going to the store on this mission.

The tug arrived early that morning and connected to our barge. It was time to shove off and get it over with one way or another. I was determined to get that rocket off that barge one way or another because I was sick of looking at it after the last month of hell! We all were ready to get this monkey off our back so we could get on with our lives. This project had really consumed all of us for many months and we wanted to see it go if we had to push it off the boat.

It was time to go now and the barge began to move. I really hated the idea of going out with no chance of getting off this boat. It seemed so confined and permanent. I am not the adventurous type. My head was already swimming and we were only in the river at this point. It would be 12 hours of this calmness and then the real deal would begin to rock the boat.

During this part of the cruise, it was a good time to help the electronics guys and put stuff together. It would be a long night because the next morning we would have to launch the balloon. I was really spacing out and panicking about everything. I was feeling sick and it was

time to pass along the master plan to the other guys because I was going down. There were a lot of details of the operation that never made it to paper, so I talked to key people on the team who could take the ball and run with it.

The Squall Line Attacks!

I would end up spending a lot of my time in the crew quarters sleeping, which is the only refuge I had from the swaying barge. I would awakened by a beating sound under the hull which turned out to be the waves bashing the barge. I jumped up and ran out side to see lightning all around us and we were running around trying to miss the storms. I was really getting nervous because all our stuff was out on deck.

Gail force winds began to cross the deck and beat our tent/tarp, which was the only refuge from the beating sun during the day. Several of us ran out on deck with our life vests on as the boat swayed and wind blew stuff around on the deck. It was really scary out there in the middle of the night with the water spraying over the sides of the barge. We were running around like crazy trying to cover and secure anything outside. The winds were over 35 knots at this time and the captain told us to come in and not return to the deck. The winds picked up even more as we watched the storm approaching.

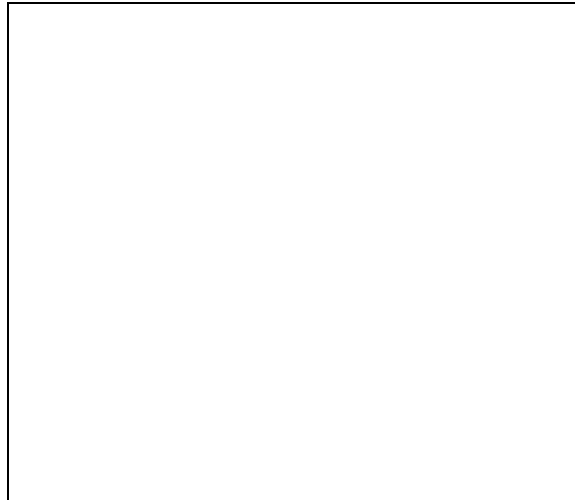
It was pointed out that our motor and fin box were not tied down. I immediately put on a life vest as did others and committed mutiny by running out there during the high winds to save our rocket and mission. We weren't getting paid by NASA to do this mission, so we would still have a job tomorrow.

It looked as if tomorrow's launch would have to be scrubbed because of this storm. I was really mental at this point. I really enjoy designing, planning, coordinating, and building, but I hate launches, especially balloon launches.

The Morning After

It finally calmed down after the storm and turned out to be perfect weather for a launch. But there was only one problem: our systems were not fitted and ready to fly. When we finally got the electronics payload in hand, we still needed another 2-3 hours of final assembly. During this assembly nightmare, the balloon team began to fill the balloon.

We were having all sorts of problems with orientation of connectors, hoses, and antenna on the rocket relative to the launch cradle. This was really going to be a crazy launch being hands off. There were too many untested systems. We needed 5-6 persons on the rocket but could not produce them because the balloon team was having their problems and needed lots of help. It was nuts in the hot sun. Many of the guys that were holding the balloon down were about to pass out in the 95 degree heat. I was



Tim and Steve work on the SL-2 rocket.

playing water boy and dumping water on our teams heads to cool them down. We were having to rotate positions in order to keep from passing out in the heat. It was the most miserable I had ever been in my life. I just wanted it to end.

The nitrous was put into the rocket remotely and the umbilical was finally disconnected. The balloon was directly over head, but no one could take pictures of it because there was not a sole on that

barge including the captain that was not tied up. Greg was yelling about the FAA window closing and were freaking with the final wiring of the pyro cutters and igniters.

It was finally time to speed the barge up so the balloon would lean toward the back of the boat and, when released, would pull the rocket off the back of the barge as it ascended — or at least that's the way it worked on paper. The signal to speed the boat up was given and the barge began to respond. The balloon leaned back and the release rope was severed as planned. The balloon didn't go toward the back of the boat. It was going straight up. It must have been only a local gust which was giving us the false sense that the barge speed was increasing.

The balloon ascended straight up and dragged our rocket over the front of the cradle and finally releasing it, but the gondola video package hung up on the cradle. It stretched out the ropes and finally released them which sling shot the rocket up and off the hook which it was secured by. The rocket was free of the balloon and falling back to the deck. I ran down into the hull of the barge and never came out again. I did find out through others that all was OK and no one was hurt. I was sick about the whole situation. I went back too sleep so I could escape from everything.

When I awoke 6 hours later, the good team that we have had already cleaned up the mess and all was packed up. We were going home. It was indeed the best part of the trip. I was no longer sick and was relieved. I was ready to go home and see my wife and daughter and forget rockets forever (no such luck there).

We did not get to make history this time but we gave it all we had. It was the most interesting adventure I have ever been apart of. I think its time for new blood to pick up the ball and run with it. The hardware is in Ronnie's garage. ☆

Fun on Dauphin Island

(by Ron Lajoie, SL-2 Press Site Manager)

With limited room on the barge, many of the HALO team, as well as most members of the Press and visitors, could not be present to witness the SL-2 flight. Months before the mission, we began looking for a suitable "shore site" in which to place a backup ground station and to serve as the Press Site.

The Alabama School of Science and Mathematics, located in downtown Mobile, offered use of their facilities for our site, and loaned us a student experiment as well. Problems of radio interference however, forced us to find another site.

The Gulf Coast Amateur Television Society (GCATS), part of the Mobile Amateur Radio Club (MARC), came to our rescue. GCATS President Danny Carpenter and member Gerry Regan, arranged for us to use a classroom at the Sea Lab on Dauphin Island, just off the Alabama coast.

Danny and I (plus Greg and Bill Brown) exchanged many email messages to coordinate the site and to make sure it would serve our needs. It sounded ideal. A good view of the beach, air-conditioning, phone lines, electricity, tables, chairs, and especially rest rooms. It sounded so good that the Barge Team (who knew no such accommodations were on the barge) started to give me friendly grief.

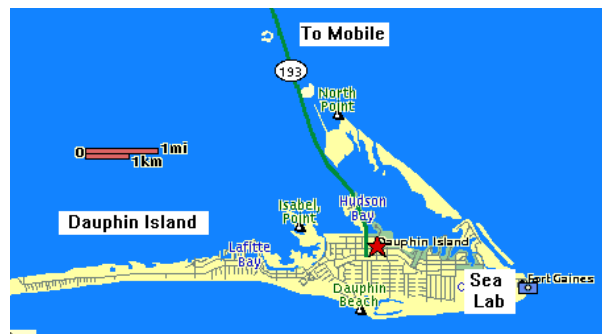
Once the Barge Team was on its way, I could finally focus on getting the HALO SL-2 press kit designed and printed, and on sending out information to the waiting Press. Bill Axenroth telephoned and asked if he could help, and in the next half hour he volunteered to carry all the Press Site supplies in his van and do the driving. That gave me Thursday night to get the press kits copied and get some sleep.

Friday Setup at Sea Lab

Bill and I arrived in Mobile about 1 PM. We stopped at the Day's Inn in Tillman's Corner, south of Mobile, to check in and drop off our suitcases. We then picked at Gladys Young and headed for Dauphin Island.

It was a beautiful travel day (just hot), and it was great to look out over the blue water towards Dauphin Island. I had never been south of Birmingham by car before, so seeing the Gulf of Mexico was a real treat for me. I was amazed by the line of telephone poles sticking up through the shallow waters to bring power and telephone service to the island.

The three of us approached the Sea Lab about 1:30 PM, only a half hour behind schedule. The GCATS volunteers were



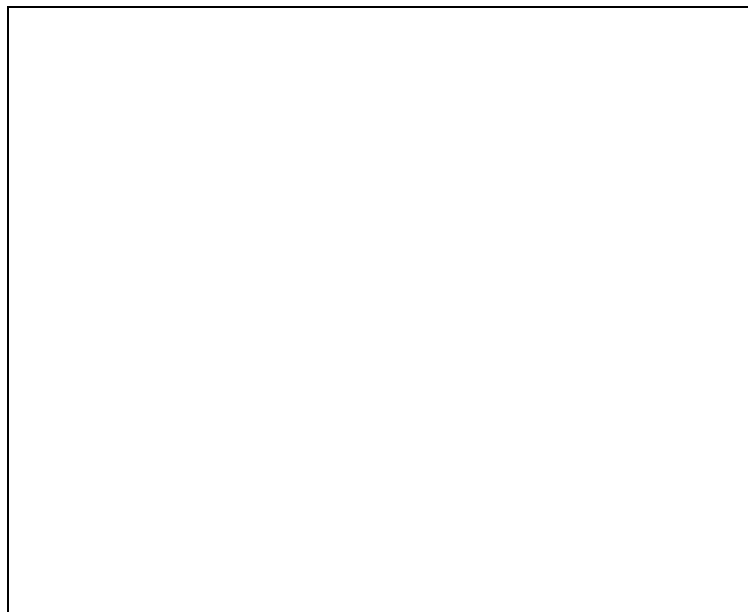
The Sea Lab on Dauphin Island, Alabama

Ron and Wade had already scoped the room, and we quickly came up with a layout that would satisfy the needs of both the ground station and the Press Site (see photo on page TBD). We placed a row of the narrow tables along the window-side wall for the amateur radio equipment, televisions, and VCRs; that way all the wiring would be behind the tables and out of reach of feet.

Another table was placed near the room entrance, so that members of the Press and other visitors could pick up a copy of the HALO press kit as they walked in. Bill and Ron Creel assembled the paper part of the press kits, while Garrett prepared the photo insert part for the VIP versions of the HALO press kits.

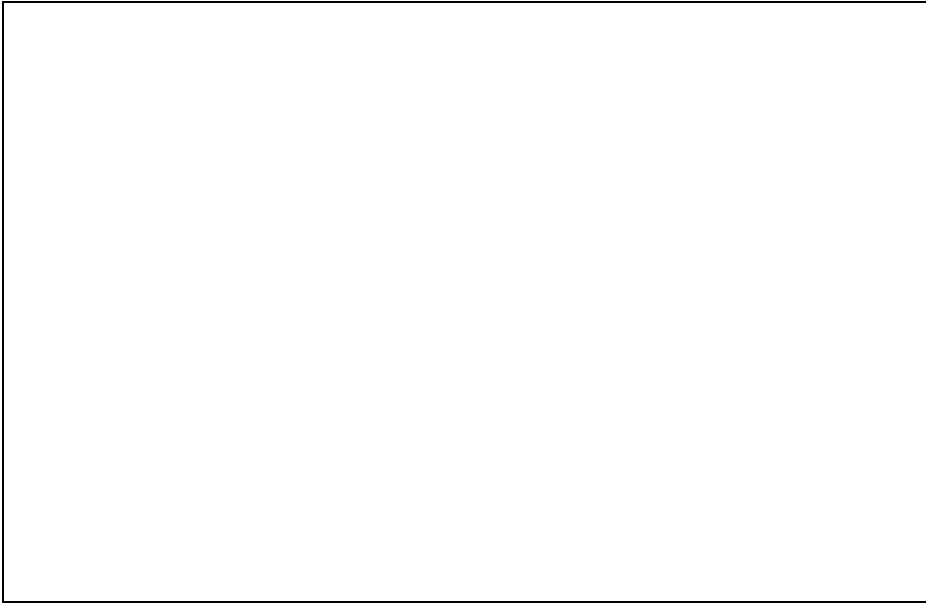
Because the tables were narrow, we needed to double many up. Two double-tables were allocated for the HALO exhibit, which was setup in the corner so that visitors would spot it as they walked into the room. In addition to the exhibit itself, we placed sample HALO hardware, the photo albums, and other past HALO material on the tables.

One double-table was used for HAL5 materials, including to-be-sold HALO T-shirts and *Ad Astra* magazines, as well as the new HAL5 brochure designed by



Supplies for the HALO SL-2 Press Site ready for loading.

already there and starting to setup their equipment. Wade Dorland and Ron Creel (who we had not seen since the SL-1 mission) were there as well. Philomena Grodzka and Garrett Roberts, and Mark and Judy Wells, arrived soon afterwards. After the ritual of greetings and introductions, we got down to work.



The HALO Press Site and Shore Station. Danny Carpenter (far left) leads nine GCATS volunteers to contact the barge and record data while the Press Site team keep the Press and visitors informed of events as they unfold.

Philomena. Since attendance was light, no products were sold, but some were given away to volunteers. The table was also used to display STEDTRAIN brochures brought by Philomena.

Another double-table was set aside to be used for serving refreshments the next morning. Those would include coffee and doughnuts, plus tea and cookies. Soft drinks were available from a nearby vending machine.

One larger table we found in the closet was used to setup my computer and printer. We set that up at the door-end of the window-side wall, so it would be out of the way of visitor traffic.

Since it was a classroom, that left a lot of chairs. Most of them were placed in a long row in the center of room, faced so that Press and visitors could watch the monitors showing live video from the balloon gondola and rocket. The rest were put against the back wall.

With so many helpers, setup went very quickly and was an enjoyable experience — as I had hoped. One of the promises I gave to my team was that, if we had enough volunteers, we could relax and enjoy ourselves — something we all deserved after the last 3 frantic weeks.

Friday Night Lightning Show

With setup complete, the Press Site team was ready for dinner. The GCATS crew were still setting up and told us to go on ahead. They recommended a restaurant called Rousso's in downtown Mobile. Ron Creel opted to stay on the island for the night, and said he would eat locally.

The rest of us first headed back to our hotels in Tillman's Corner, then headed for Rousso's. The food was as delicious as promised, and as pricy as foretold.

In the cooler air of night, we all took time to look up at the night sky. A barrage of lightning (but no thunder) filled the skies to the east. We looked with concern to the southwest, towards our comrades out on a barge in the Gulf, but saw no sign of stormy weather. We all prayed that it would avoid them.

After shopping for refreshments for the morning, we went to bed so that we could get up early the next morning. During the night, I was surprised to get a cell phone call Greg Allison on the barge, who was mad as hell that he could not reach any of us until then. I apologized and told him that our planned two phone line system at Sea Lab had gone down to just one — and no

phone. I checked the phone in the hotel, but the phone line was bolted into the phone. No way to borrow this one.

Greg told me that the barge was heading south to avoid the storms, and that this maneuver might delay the start of launch operations. He was very concerned that he did not know the location of the recovery boat, or even it had set sail. Gladys had been getting similar calls from Greg, and had talked with Danny Carpenter. Between the three of us, we got Greg the information he needed.

Live from Dauphin Island!

The next morning, we woke early so that we could get to Dauphin Island by 5:30 and open the doors by 6:00 AM. That would give us one hour before the planned launch time of 7:00 AM. The Day's Inn had been kind enough to set out breakfast early for us. We arrived a little after 6:00 AM, but still in plenty of time to prepare for the launch. The honorable GCATS crew were already there checking out their equipment.

Local Mobile CBS-TV affiliate WKRG showed up around 6:30 AM, including reporter Angela Poe and cameraman Tim Williams. Angela told us we would be featured live — yes, live! — as part of their Saturday news morning show. We did several 5-minute spots, and I was interviewed several times. I spoke about the purpose of Project HALO and the goals of this mission. We all hoped to see live video from the balloon any minute.

In between interviews, I set updates to the HALO SL-2 Web site. The first report, at 7:13 AM, said only "Standing by for balloon launch. All systems are go!". By 7:38, I was still saying "Still standing by for balloon launch." By now, both the crew and the Press were getting antsy, wondering when we would see signs of activity on the monitors.

At 8:07 AM, an hour after planned launch time, we received word from Bill Brown that the barge had encountered a squall the night before, and that balloon operations were delayed. The estimated

launch time was now around 10:30 AM. CBS-TV had to leave, and we thanked them for their visit. Some people decided to go get breakfast.

The Long Wait

During the wait, I asked Garrett to call the local TV stations and newspaper and get more members of the Press out here. Meanwhile I was recruited to help estimate the flight path of the balloon and thus the coordinates for the recovery boat. With the stormy weather last night, the midnight wind data on the Web was useless, and I had a hard time finding wind data I could trust.

10:30 AM came and went. By 11:02, I was back to posting "Still standing by for balloon launch" on the Web site. By 11:32 AM, I was adding "No news from the barge (hopefully no news is GOOD news)." What was happening???

Meanwhile, Garrett had been successful in getting newspaper reporter Dan Cusick from the *Mobile Register*, and TV reporter Chris Hatch from NBC-TV affiliate WPMI-15 and his cameraman Lloyd Heard. During the long wait, both Dan and Chris got their fill of news and background pieces for their reports. The cameras and VCRs were ready, the crowd was waiting. Let's GO!

What's Wrong with the Video Signal?

At 11:36 AM, we started to see signs of activity on the gondola video monitor. Something was happening, but the signal was so fuzzy we could not tell what. We wonder aloud if our reception is so good that we are actually picking up faint signals from the barge prior to liftoff.

By 11:45 AM, with a snowy image of a balloon swaying back and forth on the monitor, we convince ourselves that the balloon has been launched. We report as much and attempt to make out the images, while the GCATS crew adjusts the antennas in an attempt to improve the reception. (Little did we know that the gondola antenna had been severely damaged, and that we actually had better reception than the Barge Team!)

By 12:20 PM, the reception was getting clearer, and we could make out the gondola canister and pole hanging below the balloon. Since it was high noon, the sun was directly overhead, which added to the poor reception. What we could not tell for sure was whether or not the rocket was attached to the pole or not. It did not appear to be there, but it was possible that it was just hidden in the snowy transmission.

At 12:36 PM, someone said they spotted sunlight glinting off the three fins, and I went ahead and reported that the rocket was on board. We were getting no signal at all — not even snow, from the rocket however. This was certainly not the show we had been promised. We began to wonder if the nearby trees were blocking the signal.

By 12:50 PM, the gondola video started getting worse, and came in sporadically from then on until 1:10 PM.

At 1:18 PM, we finally received news from the barge. Bill Brown reported that the balloon had already popped and the gondola had splashed down in the Gulf of Mexico. He also reported that the barge was circling the gondola, from which we wrongly deduced that the barge would retrieve it. We thus sent a radio message to recovery boat Captain Scarborough to head back to shore.

Bill also reported the embarrassing news that the rocket was still on board the barge, having fallen off its hook during launch operations. The good news was that the rocket never touched water and looked repairable. My last Web update for the day started with "Embarrassing, but not disaster!" which would end up in an AP wire report.

After a few final interviews with the Press, the last of reporters and visitors left. By 1:30 PM, the show was over.

Taking Down the Show

With the event clearly over, the GCATS volunteers were eager to take down the equipment and go home. Meanwhile, the Press Site team was hungry and long

past ready for lunch. I asked Danny to leave me an active phone line so that I could finish updating the HALO Web site upon my return from lunch. He agreed.

The Press Site team had lunch at the restaurant Delchamps on the island. Just as we were arriving, we caught Philomena, Garrett, and Bill on their way back from a late breakfast. They turned around and joined us for lunch. I had a delicious crab-cake sandwich.

Upon our return to the Sea Lab, we found the room empty except for the HALO Press Site supplies, neatly packed away by a dedicated Wade Dorland, and just my computer left active — but with no phone line! After fretting for a few minutes, my colleges helped to convince me that I could hook it up back at the hotel. The group wanted to leave.

We said our good-byes to Ron Creel and to Gerald Regan, the GCATS volunteer who worked at Sea Lab and arranged for our loan of one of the buildings. Then we returned back to Tillman's Corner.

I remembered from the morning that the phone itself was hardwired into the phone line. So instead I looked behind the bed to unplug the phone line from the wall outlet. No wall outlet. Just a hole in the wall for the phone line to pass through. Obviously an anti-theft measure. Now what was I going to do?

I had left the readers of the SL-2 Web page hanging literally in mid-sentence, because I was in the middle of revising a copied paragraph when the local NBC affiliate needed to conduct a post-mission interview. (I later got home to find frantic messages from readers who did not know what happened, including one from Tim Pickens' father Herman, who did not know if he son was okay or not — neither did we at the Press site. Bill Brown's earlier message implied, though, that no one had been injured.)

All I could do was wait until I got back to Huntsville to update the Web site — which meant a 24-hour delay.

Saturday Night on the Town

Mark, Judy, Philomena, Garrett, Gladys, Bill, and I went to the Italian restaurant Ronaldos for dinner. After the struggles of the day, it was good to just sit back and enjoy a good meal. Following that, Bill, Philomena, Garrett, and I went to the local dog track. Bill and Philomena bet on some dog races, and Philomena won a few dollars. She said it was the first time she had ever won anything!

An Unexpected Sunday Surprise

The next morning, on my way to fill my ice chest, I saw Gene Young and Johnny Jones with Gladys as she was preparing to check out. How did they get here?

Gene and Johnny said that the barge had docked back in Michoud at 6 AM, and they then loaded up their truck and drove the two hours back to Mobile to pick up Gladys. They also said that the NASA van was already on its way back to Huntsville, which meant the Barge team would make it back before the Press team. (So much for my idea of changing the HALO sign once again, to read **“WELCOME BACK HALO”**.)

They also mentioned that Greg was going to travel back with Bill Brown and videographer Penn Stallard. Greg and Bill were going to visit E. N. Bisso & Son in New Orleans to discuss the recovery of the balloon gondola. They were also going to visit Captain Dean Scarborough of the recovery ship *Sand Dollar*, at his home in Mississippi. Then they would meet up with Danny Carpenter to retrieve Bill’s loaned amateur radio equipment.

Gene and Johnny also gave me my first real facts about what happened on the barge. Gene said that the payload canister popped off the rocket when it hit the barge deck, and shot forward due to the parachute spring and slid up the deck towards the cabin. Amazingly, the rocket electronics were unfazed by the whole incident and kept operating. Gene said “It was like a Timex watch, it took a licking and kept on ticking!”

Johnny Jones said that the balloon and gondola shot straight up and was visible throughout its flight. He said he even saw the balloon pop when the white dot he was watching suddenly winked out. Despite the accident, both were in good spirits. Both raved about the delicious fresh King Mackerel they had for dinner the previous night.

Bill Axenroth and I had breakfast with Mark and Judy Wells, then headed back to Huntsville. We stopped back at the Turkey Restaurant for another open faced sandwich, but otherwise the trip was uneventful. I would like to thank Bill for providing his large van and for driving both ways.

Acknowledgments

This was quite a feat for an NSS chapter! On behalf of HAL5, I would like to thank the members of my HALO Press Site team, for their dedication, patience, and smiles throughout the weekend. Thank you Bill Axenroth, Ron Creel, Wade Dorland, Philomena Grodzka, Garrett Roberts, Judy Wells, Mark Wells, and Gladys Young. It was a pleasure serving with you and I look forward to the next SL-2 launch attempt.

HAL5 owes a debt of gratitude to the hard-working members of GCATS. Thank you Rick Lightcapp (KD4IYH), Red McDonald (KF4MH), Donny Newberry (W4EGF), Jeff Pecock

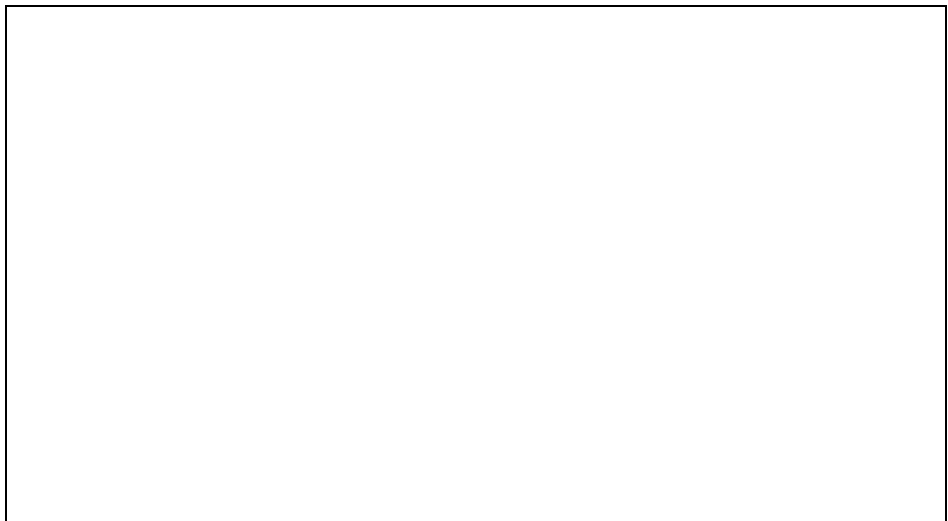
(KD4GOE), Craig Warnol (KB5UEJ), and Andrew York (KF4FFN) for setting up and manning the Dauphin Island Sea Lab ground station.

Thank you Tom Curry (KD4KMW) for sailing with Captain Dean Scarborough aboard the recovery ship *Sand Dollar*. Thank you Rob Mills (KC4MQU) for flying with Pilot Jim Jeninski aboard his search plane.

Thank you, especially, Gerald Regan (WA4CZC) for arranging for an air-conditioned classroom building at the Dauphin Island Sea Lab to be made available to HALO, to serve as both the ground station and Press Site, and for inviting us back.

And thank you, especially, Danny Carpenter (N4UXY) for providing the above 9 volunteers, for coordinating the entire amateur-radio support operation, for keeping in constant email and phone contact with the HALO team in the frantic weeks before the mission, for being the tour guide to the entire Press Site team (providing driving directions, recommending lodging and restaurants), and especially for inviting us back down to try again at a later date.

You and your team showed us the best Southern Hospitality and it was very much appreciated. We look forward to working with you and the GCATS again in the future. Ad Astra! ☆



The HALO SL-2 Press Site Team. Picture L-R: Ronnie Lajoie, Bill Axenroth, Wade Dorland, Gladys Young, Mark Wells, Judy Wells, and Ron Creel.

Operation: Gondola Rescue

(by Ronnie Lajoie, HALO member)

Like almost every aspect of the first attempt of the SL-2 rockoon mission, the recovery of the balloon gondola was no less an adventure than the mission itself.

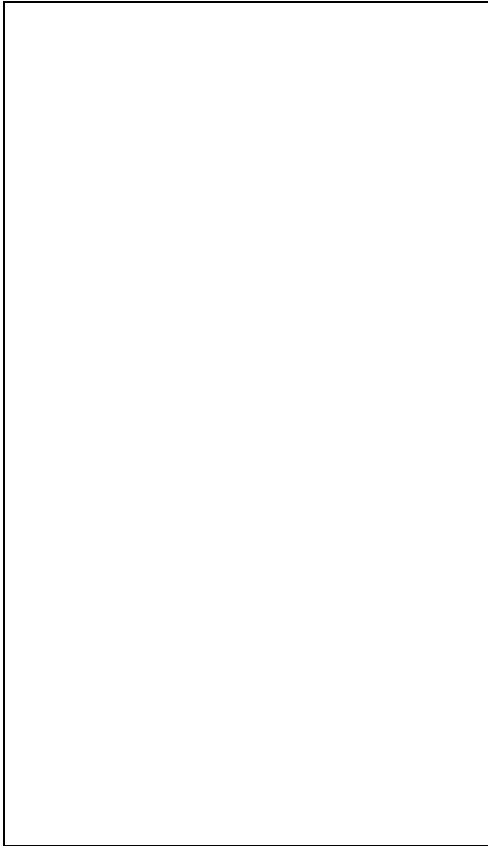
After the balloon popped, the gondola and the remains of the balloon fell back to Earth. A parachute had been strategically located between the balloon and gondola so that it would automatically open upon descending. Alas, live video from the gondola package showed that the parachute was not fully deployed. Because of this, the descent of the balloon gondola was faster than planned and it splashed down harder than desired.

The entire balloon gondola system had a mass under 30 pounds. The uplink avionics module (UAM) canister, a 12-inch diameter by 12-inch long cylinder, was sealed to provide the required buoyancy, about 50 pounds. Thus the HALO team was not worried that it would sink — unless the impact with the ocean broke open the canister.

Salt water and live electronics is a nasty combination that results in almost instant corrosion (i.e., rust). If any salt water leaked into the canister, the over a \$1,000 dollars worth of UAM electronics would be doomed unless they were flushed soon afterwards with pure distilled water. The race was on.

The balloon gondola splashed down in the vicinity of the barge, but alas, the tug and barge combination was not very maneuverable. Due to some poor radio communication, our hired recovery boat had been told to head back to shore. Instead, the tug radioed a nearby “crewboat,” the *C. D. White*, which was able to recover the valuable property. Unfortunately, the crewboat was on its way to the other side of the Louisiana delta, and then on to Texas. How were we going to get the package?

The company that owned both the tug and the crewboat was E. N. Bisso & Son.



Greg Allison poses with balloon gondola.

Back on shore, Greg Allison called Bisso owner George Flannigan and tried to convince him of the urgency to bring the gondola to shore. The owner told Greg that the earliest the crewboat would dock would be on Tuesday. He agreed to ask Captain Malon Dawsey to have the gondola brought to shore.



Gene Young sadly removes the crusty remains of the UAM electronics.

It was then Sunday. Tuesday was too late for the HALO team to sit and wait. Now we needed to find someone in New Orleans who could fetch the gondola from E. N. Bisso & Son, and ship it back to Huntsville. Bob Spawn, a New Orleans HAM operator, was the most likely candidate. Despite calls all week long, we could not reach Bob.

On Friday, I began making plans to go to New Orleans to fetch the gondola. The next morning, I reached member Bruce Cunningham, who owns a small airplane. He agreed to fly us down to New Orleans. Pop-up thunderstorms were all around the Gulf that day, and we had to dodge a few mean-looking clouds and endure some rough wind.

Meanwhile, Bill Brown finally reached Bob Spawn, who picked up the gondola just hours before Bruce and I landed in New Orleans. We drove to Bob Spawn’s home and picked up the UAM canister, which looked okay. Alas, Bill’s package was lost at sea.

Upon return to Huntsville, we quickly drove over to Gene Young’s home. Gene quickly opened the canister. Too late — the insides looked like a scene from the wreck of the Titanic. The canister had clearly gone underwater. Every component was corroded. DOA. The UAM will have to be rebuilt. ☆

HAL5 Membership Report

The following is a list of additions to the current paid membership of HAL5, which includes 37 renewals and 14 new members, for a total of 51. Last year's membership peaked at 82, a record for the society. Welcome to all our new and renewed members!

| | | |
|---------|----------|-------|
| Gene | Anderson | (N) |
| Donald | Clowers | (N,D) |
| Vincent | Dauro | (N,D) |
| Timothy | Pickens | (R) |

(N) - New Member
 (R) - Renewed Member
 (D) - Included a Donation

Gene Anderson is an NSS member in Tucson, Arizona. Currently, 35 (69%) of HAL5 members are NSS members. HAL5 encourages all of its members to join the National Space Society as well.

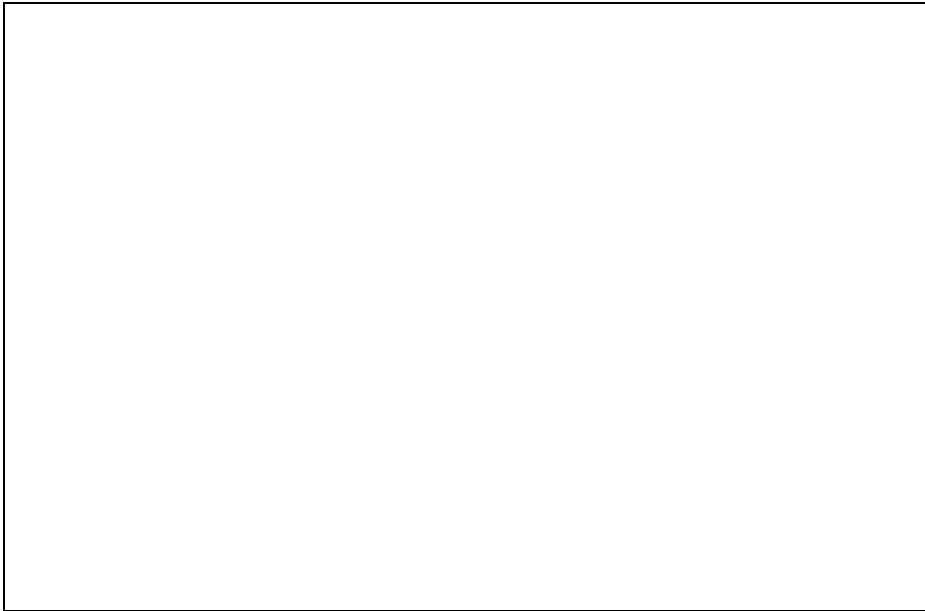
Donald Clowers lives in Colorado Springs, and gave a very generous donation to Project HALO. Thank you very much! Currently, 17 (one-third) of HAL5 members live outside Alabama, including two members from Tennessee who are within driving distance.

Vincent Dauro lives here in Huntsville, but his name came to us in an email from Karen Mermel of Chicago. Vince and HAL5 exchanged a few email messages and we invited him to our July program. He joined that very night — and gave a donation to Project HALO as well. Thanks, Vincent!

Tim Pickens, of course, is our dedicated rocketman, without whom our Project HALO could never have achieved so much so quickly. Thank you, Tim! ☆

Upcoming Events of Interest to HAL5 Members

- Wed., Aug. 26 — **HAL5 Program** on “**Space Tethers**” by Les Johnson, Space Physicist at NASA Marshall Space Flight Center, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 971-3055
7:00 - 8:30 PM
- Fri. Aug. 28 to Sun. Aug. 30 World premiere of play “**Galileo**”, at the **Theatre `Round the Corner**, 214 Holmes Ave.; \$10-17; for tickets call: 539-PLAY
- September 17-18 **STEDTRAIN**, at Calhoun College; free; questions: 837-4287
- Wed., Sep. 23 — **HAL5 Program** on “**Asteroids — Friends or Foes?**” by Les Johnson (of NASA) and Greg Allison (of HAL5), at Huntsville Public Library, 915 Monroe Ave.; free; questions: 971-3055
7:00 - 8:30 PM
- Tue., Sep. 29 — **ASA Program** on “**Solar Rockets**” by TBD, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 971-3055
7:00 - 8:30 PM
- Fri. Oct. 9 to Sun. Oct. 11 **ConStellation** science fiction convention, at Airport Sheraton hotel; \$30-35; for info and tickets call Marie at: 880-8210
- Wed., Oct. 28 — **HAL5 Program** on “**The Artemis Moon Project**” by Boise Pearson, President of the Artemis Society, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 971-3055
7:00 - 8:30 PM



200th member Bruce Cunningham (with airplane) holds his HAL5 gifts, plus the HALO SL-2 uplink avionics module he helped rescue.

Special Announcement

HAL5 August Program Night on

“Space Tethers: Power and Propulsion from a String!”

Wednesday, August 26, 7–9 pm

Huntsville Alabama L5 Society
 1019-A Old Monrovia Rd, Suite 168
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