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MOD Director Eugene Kranz says NASA got a bad rap in recent stories about software production. Story on Page 4.

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Road to STS-26 grows more familiar

'You can feel the excitement mounting,' says Crippen

By James Hartsfield

The pace is quickening, excitement is building and the road is steadily growing more familiar as launch preparations for STS-26 enter the home stretch.

Next week, *Discovery* should roll over to be mated to the external tank (ET) and solid rocket motors (SRMs), already together and bolted to the launch platform. In fact, STS-26 could begin its travels within two weeks, taking a 4.24-mile trek to Launch Pad 39-B.

"The feeling in the team here is that we're in the countdown to launch," Bob Siecke, launch director at Kennedy, said. "We very rapidly have been going through some significant milestones."

Momentum is building at Kennedy as each milestone is reached, especially since the completion of stacking the SRMs and their mating with the ET, Siecke said in a June 10 briefing.

The collective heartbeat of NASA has begun to quicken, Deputy Director of Shuttle Operations Robert Crippen added. "You can feel the excitement

mounting," Crippen said. "The whole Kennedy, NASA, aerospace team that supports the Space Shuttle is really seeing it out in front of us, seeing it getting close. We've got a lot left to do yet, but I think all of that is going to fall into place. You'll see it come together very smoothly."

Launch preparations are now on familiar ground, Siecke said, and his team is glad to be there. "The phase that we're entering right now is called our integrated flow, and the team always enjoys that part," he explained.

"It's not just because the Shuttle is all put together; it's because we use proven, standard procedures — as opposed to the period we've been in of extensive modifications and systems tests."

The "tried and true" procedures are more predictable and should lead to a strengthened schedule, Siecke said. "The target, an August launch, is optimistic, sure," he added. "But given where we are today, we've got a shot at it."

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Robert Crippen



JSC Photo

Jerry Elliott sits in the JSC Visitors Center with several of the children he hopes to bring together in his efforts to unify young people worldwide in the pursuit of peace.

'World Youth Day' shoots for Moon

By James Hartsfield

In some ways, Jerry Elliott's work to create a "World Youth Day" to honor and promote brotherhood among young people is his attempt to spread the spirit of teamwork and dedication he's seen in 22 years with NASA.

"When President Kennedy said we were going to the Moon, it was an idea; we just had to get started on it," said Elliott, JSC's technical manager of Flight and Orbital Support Equipment. "People-to-People, Heart-to-Heart is what got us to the Moon. We used teamwork. People came forward from all walks of life and we did it."

"World Youth Day" is a comparable effort to unify youths worldwide in the name of peace and mankind's common bonds, he said. "It's not technical in that way, but the people aspect is the same, the teamwork. NASA's demonstrated through teamwork that the sky's

no longer the limit. I think it's very realistic to try to explore ways by which youths can be recognized for their positive contributions to the world. You see too much in the news about the negative things a few youths have done. It's a poor reflection of the majority."

"People-to-People, Heart-to-Heart" is the theme of Elliott's event, planned to bring children from throughout the globe together on Oct. 18. He first developed the idea in August 1987, and has been working since then to make his dream into reality. Now, he has the help and support of the United Nations and the International Chamber of Commerce, the two organizations where charters for the day are being sought, and a host of other groups, companies and individuals worldwide.

"The underlying theme of the whole thing is that the future of the world is in the hands of our youths. I think this will be the first time in the history of the world

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Solid rocket test mimics stresses; looks successful

Preliminary observations show an A-plus performance by Qualification Motor-7 (QM-7) on Tuesday in the next to last major test firing of a redesigned solid rocket motor (SRM) before STS-26.

"And one more to go," SRM Project Manager Royce Mitchell said in post-test briefing. "All indications are that we had an excellent test. The motor performed very, very well. It's a good feeling to have everything looking so well at this stage of the game."

The QM-7 firing was the first to be performed on the new Large Motor Static Test Facility, a stand that simulates the stress put on SRMs during flight. By heating the SRM, QM-7 also simulated extreme summer weather conditions that may be encountered for STS-26.

"What we see right now looks excellent," Morton Thiokol Vice President for Engineering Allen McDonald said. "In our last test,

QM-6, everything looked good at first and even better after we tore it down. I hope that happens here, because it all looks great right now."

The results of QM-7 won't be fully determined until engineers disassemble the SRM and inspect its parts, probably in about two weeks. Tuesday's observations were from a review of "quick look" data from some of more than 500 sensors placed strategically throughout the rocket.

The new test stand simulated pressure put on the SRMs by the struts connecting them to the rest of the Shuttle stack. The stand's struts flexed the rocket with a force of about 330,000 pounds immediately after ignition, imitating the twisting forces generated by the Orbiter's main engines. About halfway through the two-minute firing, the struts mirrored the stress of maximum aerodynamic pressure (Max Q).



Employee Information Service makes telephone debut today

The JSC Employee Information Service makes its debut today, offering the center and its contractors another means of obtaining timely information with ease.

Operated by the Public Affairs Office, the service is a short recorded hotline of NASA news releases, JSC announcements, management instructions, NASA news summaries and meeting announcements. The system is able to handle up to 10 calls simultaneously.

Reports will be updated daily at 11:30 a.m. during non-mission periods. The schedule will be adjusted as mission requirements dictate.

"This system is part of a concerted effort to keep every employee at JSC informed," said Harold Stall, director of public affairs. "Communication helps build teamwork, and teamwork helps JSC do its jobs well."

To call the Employee News Service on-site, dial x36765. To call from off-site, dial 483-6765.

Survey picks Employee Assistance Program topics

A series of three lunch-time seminars planned by the Employee Assistance Program this year can help workers deal with stress in both their personal and professional lives, a topic chosen by a recent survey of almost 600 JSC employees.

The assistance program helps employees and their families work out mental or emotional problems that can hurt job performance. The office, staffed by two certified therapists in Bldg. 32, Rm. 132, offers private evaluations, counseling and, if needed, referrals to extensively researched mental health professionals in the area, said EAP Administrator Connie

Alexander.

"Some people think that to come here, they have to be crazy. But they don't. We work with just ordinary people experiencing day-to-day difficulties," explained Nellie Wegmann, an EAP counselor. "People don't see the way out, but they come to us and we see the way out. We know that people have problems and we're here to help them when they do. And it can make a difference in their lives."

The JSC employees who responded to EAP's January survey planning the lunch seminars ranked coping with stress far ahead of other topics as the one they would most like

to see addressed. Career changes, communication with co-workers, job burnout, financial problems and conflict were ranked respectively below stress as possible topics.

The first EAP seminar, slated July 14, will be "Stress on the Job" and will cover communication with co-workers and conflict resolution. The second seminar, planned for Sept. 15, will cover "Stress and Gender Issues" and the third, on Nov. 17, will cover "Stress and Aging Parents." All of the one-hour seminars will begin at noon, and their locations and speakers will be announced at a later date.

Stress can manifest itself in a variety

of ways, and its effects can be either constructive or detrimental. Good stress motivates while bad stress can create conflicts with co-workers, problems concentrating, and make what used to be exciting seem to be an obstacle, Alexander said.

"When we're not flying, people get stressed out very fast," she said. "Stress is not something to worry about; it's something to do something about."

Many times, a single visit with an EAP counselor is all that's needed to help an employee overcome their troubles. "We help them look at things from a fresh angle. Just having

someone to talk to makes a difference and they can move on," Wegmann said. The lunch-time seminar series is part of EAP's educational effort. The program also has a variety of brochures available on topics ranging from alcohol and drug abuse to coping with the pressures of financial, family and legal problems.

The upcoming seminars will be entertaining as well as informative, Alexander said, and, if they are well attended, may become more frequent in the future. For more information or an appointment with a counselor, EAP Administrative Assistant Judy Armstrong can be reached at x36130.

SPACE STATION PARTNERS

Tentative agreements clouded by nervous waiting over budget

By James Hartsfield

After two years of negotiations, tentative agreements were reached last week with NASA's international partners in Space Station, but the progress is clouded by continuing Congressional budget deliberations on the program's funding.

Associate Administrator for Space Station James Odom visited JSC for the first time June 9, the day after the agreements were reached, and warned that Congressional threats to cut the program's budget have the foreign partners concerned. Odom was at JSC to tour facilities, meet with Space Station Project Office personnel and attend a regular Space Station Management Council meeting.

In a briefing at JSC, Odom echoed NASA Administrator James C. Fletcher's warnings that inadequate funding in 1989 will kill the Space Station. "They (foreign partners) recognize that it's certainly our intent as a nation to go forward with it as a program, but they're obviously very nervous right now. And so am I," he said. "At this point, from a pure money standpoint, they've had more of an investment than us."

The combined international investment — from Canada, the 17-member European Space Agency (ESA) and Japan — so far has been about \$1 billion. The U.S. investment now totals about \$770 million, Odom explained.

According to the tentative agreement, the foreign partners will commit more than \$7 billion to Space Station development. ESA's share will amount to about \$4.2 billion; Japan's will be about \$2 billion; and Canada's share will be about \$1 billion. The foreign partners also will pay more than

25 percent of the station's operating costs during its 20-30 year life.

"That is a very sizeable investment on their part, and if our funding stretches out, then theirs will also," Odom said. "And that would be an unfortunate situation for both of us."

The participating governments are expected to sign final agreements in August, he said.

"I'm delighted with the completion of negotiations," Odom, who was named to his current post April 1, said. "They were really quite intense negotiations, and by intense I mean from the standpoint of what it means to us and our international partners."

The total U.S. commitment to Space Station development should be an estimated \$16 billion. NASA has requested at least \$900 million for Space Station for fiscal year 1989, but that figure has been threatened in Congress. "It's got to be at the \$900 million figure if you really want to make any progress in the program," Odom said. "Any lower and there would be no real growth; you can't bring on subcontractors and get into the long-lead procurements. That's a bad way to start a program."

Odom said NASA needs a multi-year funding plan from Congress to avoid the erratic cuts-versus-funding cycles of recent NASA budgets. "To me, it's almost imperative that we make multi-year commitments. It's almost germane to the President's space policy, which implies a long-term commitment," he added. "Now, it's slow them down, speed them up. That's a very inefficient way to run programs."

The Office of Management and Budget held \$225 million from this year's Space Station funding in escrow pending NASA's completion of a report on "Space Station Management." The agency submitted the report May 19, and the funds were made available June 1, just in time to pay the program's mounting bills.

In the last budget deliberations, NASA received only about 70 percent of what was requested. A \$900 million mark for Space Station would almost double the funding the program has had this year.

The Space Station Program has popular support, "but the problem is the rank and file people don't communicate to their congressmen what they really want and what they think ought to happen," Odom said. A nationwide December 1987 network poll that showed 84 percent of respondents in favor of spending \$15 billion on Space Station, said Tom Moser, station program director from the Level 2 Office in Reston, Va., also at JSC for the Management Council.

"The thing that's bothersome is not just the Space Station Program or the agency, it's really the tenor I'm afraid we're setting as a nation," Odom said. "It says we really do not want to be in space leadership, and that we're not that concerned about the technological race that's happening internationally." Funding of NASA is a barometer of the nation's commitment to technology development and to the future, he added.

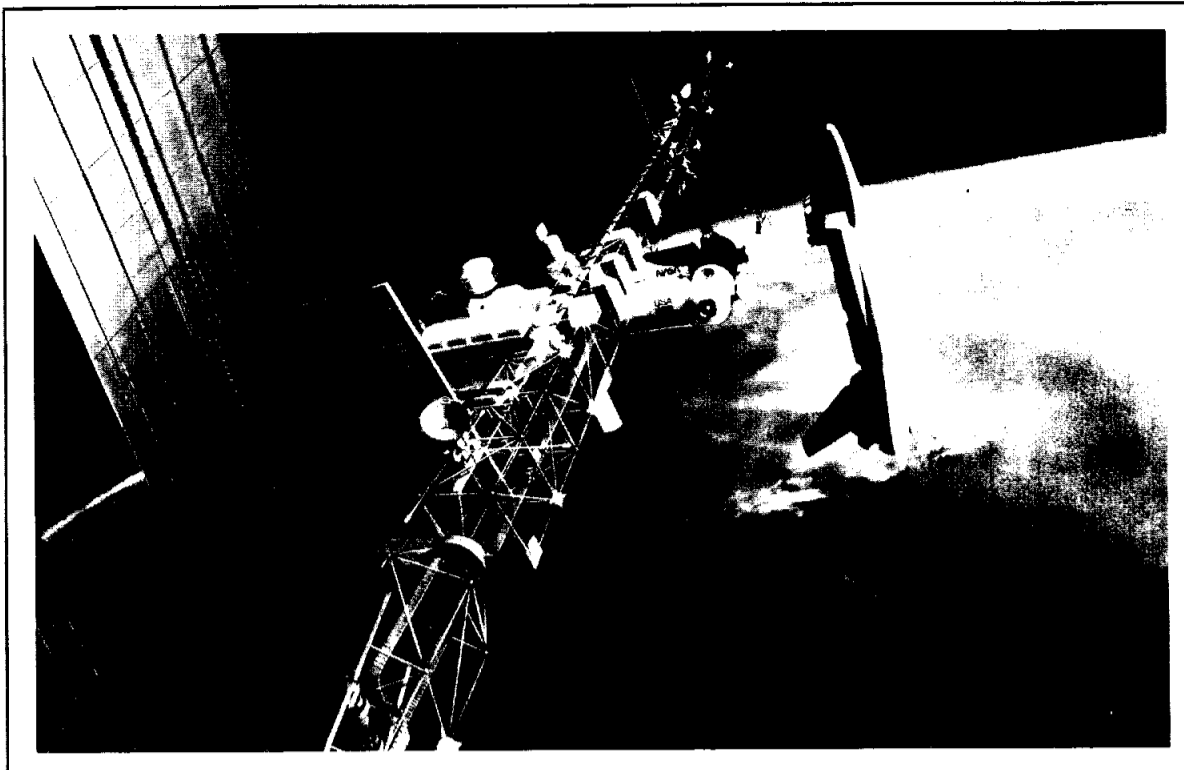
"It's bad enough to be a part of a generation that might drop the ball. I'm afraid we're laying it down on the ground and walking away from it," Odom said.

"I don't believe the benefits from a program like this can all be measured," Moser added. "The benefits of what it means to instill advancement in young people — that's the kind of thing that would be terrible to give up."

If the U.S. doesn't follow through on Space Station, ESA, Canada and Japan will, Odom said. "I'm convinced they will go ahead. It won't be the same program they want now, but they will have their program," he said. "All you've got to do is look at the rate at which they're launching, their scientific experiments, and the rate at which they're advancing their manned work, especially the Japanese."

The Space Station design already has been pared down as much as possible to cut costs, Odom added. "If you pare it down much from what it is, it really says that you just don't want a long-term manned presence in space. If we can't afford the Space Station we're talking about, then we just may have to go back to the drawing board."

For Space Station, agreements call for ESA to provide a pressurized laboratory module to be permanently attached to the manned base; an unmanned free-flying polar platform; and a man-tended free-flyer to be serviced by the station. Japan will provide the Japanese Experiment Module, a permanently attached, pressurized laboratory module that will include an exposed facility and logistics module. And Canada will provide a Mobile Servicing System to be used in conjunction with the assembly, maintenance and servicing of station elements.



Left: James Odom, NASA associate administrator for Space Station, and Tom Moser, Space Station program director, tour the mockups in Bldg. 15 with other program officials here for a Space Station Management Council meeting. Above: Odom discusses the status of international agreements and the Space Station budget with reporters.

Elliott strives for worldwide youth unity

(Continued from Page 1)

youths have had an opportunity to be formally recognized," Elliott explained.

"We should recognize that we're all people with hearts, one with each other, regardless of race, creed, color or anything. We really have our hearts linked together whether we choose to recognize it or not."

Several possible locations for the day's ceremonies are now being studied, including the United Nations building in New York; a "Circle of Unity" memorial site in Ecuador that Elliott designed and helped dedicate in 1986; Geneva, Switzerland; or one of many vacant past Olympic sites around the world. The ceremonies will include exchanges of different cultures and traditions between the many youth groups attending from various countries, he said.

But "World Youth Day" can be far more than just the day's ceremonies at whatever site, it should be a day observed by all adults wherever they are, Elliott added.

"It is a very touching, moving thing for adults to take time out to recognize the positive attributes of today's youths. It's not something celebrated in the streets, but rather in our hearts, our attitudes and perspectives," he said.

"It can hit the heart of every home; it can be celebrated just by parents honoring their children. Its success won't be measured by the quantity or number of people attending the ceremonies. It will be measured in people's awareness and recognition that we're all one. The moment they recognize that, we've been successful."

Elliott has worked closely with young people for more than 12 years, often speaking at schools and universities nationwide. A champion of world peace and unity, he is well known as a lecturer in the southwest.

Elliott, an Osage/Cherokee American Indian, began working toward "World Youth Day" because of a concern for youths and a desire to contribute.

"One time in your life, you realize that service to mankind is where we all end up. We need to give something back, it's our duty, our obligation as a human being."



OVER THE TOP — Astronaut James Bagian lowers himself from the top of one of the Shuttle mockups in Bldg. 9A during a recent post-landing over-the-top emergency egress test. Bagian is working with engineers evaluating egress using the new crew escape equipment that includes a parachute harness.

JSC Photo by Mark Sowa

Launch work enters integrated flow

(Continued from page 1)

When STS-26 emerges from the confines of the Vehicle Assembly Building to begin its less than 1 mile per hour march to the pad this month, it will be a sight for very sore eyes, Siecke said.

"Roll out is the most tangible evidence the workers and the team have that the big event, the target, is not far down the road. The team is motivated by making these intermediate milestones," he explained. "It's what they've been working for. The last solid rocket booster joint being put together, you didn't hear it, but in the VAB there was a cheer. More people are involved in each event as we go along, and the cheers are getting bigger."

Crippen, who said he plans to stay in his post for several years and put his astronaut days at least temporarily aside, outlined the management

milestones that remain for STS-26, the most important of which is the Flight Readiness Review (FRR) two weeks prior to launch. "That's the culmination of a lot of preparations and reviews at a lower tier. And it is the major one that says we think we're ready to go fly," he explained. Rear Adm. Richard Truly, associate administrator for space flight has the final responsibility for continuing the launch countdown at the FRR.

Two days prior to launch, the Mission Management Team (MMT), chaired by Crippen, convenes for a review of any changes that may have occurred since the FRR. The MMT will continue to monitor the countdown and any problems from that point on during planned holds, the last of which is a final MMT review at T-9 minutes.

"I'm going to make a commitment to a launch date at minus nine

minutes," Crippen said. "We're going to get this thing off when it's safe to go fly and the date is going to be when we can make it."

Although Crippen has the final responsibility for approving liftoff, he stressed that the decision is a team effort and, in many ways, he is only their voice. "I've seen some media articles regarding Crippen giving the final go or no go," he said. "It's really the total team that allows me to make that final decision. It is the launch team, the flight control team, the total project management team that, as we march forward, ends up giving me and all of us the final degree of confidence that we're ready to proceed or we're not ready to proceed."

"We still work as a team," he said. "It's just that somebody has to have the responsibility as we move past each point, and, in this case, the deputy director of Shuttle operations has that responsibility."

Pioneer 10, the most distant man-made object in existence, began its fifth year outside of the solar system Monday, still searching for the beginning of true interstellar space.

Scientists at NASA's Ames Research Center, including Pioneer investigators Drs. James Van Allen, Darrel Judge and John Anderson; Ames Project Manager Richard Fimmel; and Ames Project Scientist Dr. Palmer Dyal, celebrated the event with a review of Pioneer 10's accomplishments.

Almost 15 years since it completed its primary mission, the Pioneer explorer, now 4.17 billion miles from the Sun, continues to make discoveries about the Sun's influence in the local interstellar medium, called the heliosphere. Pioneer 10 also is searching for gravity waves predicted by Einstein and a possible 10th planet.

Radio signals, moving with the speed of light at 186,000 miles per second, now take 12 hours and 26 minutes to travel from Earth to the explorer spacecraft and back.

Launched in 1972, Pioneer 10 was the first spacecraft to cross the

Asteroid Belt by Jupiter and return pictures, chart Jupiter's intense radiation belts, measure the mass of its four planet-sized moons, locate the giant planet's magnetic field and discover that Jupiter is predominantly liquid.

Its primary mission was accomplished by December 1973. At that point, scientists reprogrammed Pioneer for an indefinite mission to explore the outer solar system and beyond.

Perhaps the most important finding about the outer solar system concerns the extent and characteristics of the heliosphere. Pioneer 10 still is measuring the "solar wind," a million-mile-per-hour flow of charged atomic particles boiling off the Sun's surface to form the Sun's tenuous atmosphere.

Pioneer has shown the Sun's sphere of influence to be nine times as distant as was originally believed by many scientists, and it is still looking for the end of the solar heliosphere. Many scientists now believe the boundary may be as far away as 9.3 billion miles.

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Kranz strongly rejects trade journal charges

By Brian Welch

Mission Operations Director Eugene F. Kranz has rejected claims about Shuttle software production published in a trade journal last week and sent a strongly worded letter to the magazine's editor.

The article, "Shuttle Security Lapse," published in the June 6 edition of Electronic Engineering Times, charged that an "accidental breach of software security" gave "unauthorized engineers and programmers access to raw code being prepared for the Space Shuttle Discovery's return to space."

Kranz said the charge is "totally incorrect." The article quoted Sylvia Robins, a former Rockwell Shuttle Operations Co. (RSOC) systems engineer who is now one of the plaintiffs in a \$5.2 million lawsuit brought last September against her employer. The lawsuit alleges that Robins and a co-worker, former Unisys data clerk Ria Solomon, were harassed and forced from their jobs for bringing safety violations to the attention of their superiors.

"I question why a highly respected technical journal would rely totally on the Robins and Solomon allegations to discredit the Shuttle software program," particularly when the reporter had wide-open access to a rich source of documents and personal interviews with people who are both knowledgeable and responsible for the program, Kranz wrote in his June 13 letter to Editor Steve Weitzner.

Kranz wrote Weitzner that the "safety of every astronaut crew and the success of every Shuttle mission from liftoff to landing rests on the shoulders of my NASA/contractor team. I cannot let an unwarranted attack on their integrity and professionalism go unchallenged."

The charges stem from an incident in June 1987, when access protection was inadvertently deleted from one module within a much larger software package known as Operational

Increment (OI) 8A. Other modules within OI-8A were not affected and were never threatened in any way, Kranz said.

The software that was affected was in the process of being delivered from IBM, suppliers of the basic code and tools, to RSOC, supplier of the flight-to-flight data reconfiguration. During this transfer, the software was correctly loaded into the Software Production Facility (SPF), one of the four major Shuttle avionics laboratories at JSC. Software residing on the SPF is protected by a program known as RACF — for Resource Access Control Facility. Each of the approximately 1,600 users of the SPF is allowed graduated levels of access to the software, depending on their RACF clearance.

A procedural error in June 1987, however, removed the RACF profiles from one of the OI-8A data sets — essentially a reference copy. This meant the software without RACF profiles was left unprotected from unauthorized modification. The error was discovered Friday, Nov. 20, 1987, by an authorized SPF user, an employee of IBM. NASA was notified immediately and the access protection was reinstated before the close of business that day.

Over the following weekend, an audit of the entire SPF data base — a bit-for-bit comparison — was performed. A formal report to the NASA Integrated Baseline Control Board was made on Nov. 23. Through the audit, 16 changes to the reference module were identified.

Subsequent evaluation, including a user survey, showed that all 16 changes were

inadvertent, and all were made by authorized users.

EE Times quoted one of the plaintiffs as saying the survey was a "shockingly inadequate" way to investigate the problem. In his response, Kranz said, "Far from being inadequate, this survey is evidence of the lengths that we go to trace every incident that occurs within the software processes at JSC. It was a final step taken after an exhaustive review of the procedures, processes, data base, log books and files."

As to the charge that the RACF incident threatened "flight software," Kranz said EE Times was "wrong on three counts."

In his letter, Kranz wrote, "(1) Even in the absence of the RACF, the ID and password gates were in place. Only authorized personnel have them. (2) Only a portion of OI-8A (Operational Increment) version was affected by the RACF error. (3) The OI-8A version was not destined for STS-26 or any other mission. OI-8B was already in the SPF in preparation for STS-26. OI-8A was being used only for early training."

EE Times also said Robins "steadfastly refutes" statements by RSOC President Robert Minor that changes to the OI-8A software were made by users in the browse mode of the computer program. "There is no such thing as a Browse mode for the software," the article quoted Robins as saying, "anyone who gets in there can effect changes. You can't edit in Browse as Minor said."

Kranz responded, "Wrong. System privileges

'I cannot let an unwarranted attack on ... integrity and professionalism go unchallenged.'
— Eugene Kranz