

**MINUTES OF THE
SATELLITE DIVISION EXECUTIVE COMMITTEE MEETING
(September 24, 2004)**

Subject to the approval of the ION Satellite Division Executive Committee the following minutes are submitted. The Satellite Division Executive Committee Meeting was called to order on 24 September 2004 at King's Fish House, Long Beach, California at 6:30pm. Those present were:

VOTING COMMITTEE MEMBERS:

John Lavrakas	Chair
Elizabeth Cannon	Vice Chair
Pratap Misra	Secretary
Günter Hein	European Rep.
Hideyuki Torimoto	Asian Rep.

NON-VOTING MEMBERS:

Karen Van Dyke	GNSS '04 General
Chris Hegarty	GNSS '04 Program Chair
Susan Skone	GNSS '04 Track Chair
Peter Fyfe	GNSS '04 Track Chair
Chris Bartone	GNSS '05 Program Chair
A.J. Van Dierendonck	In-Coming Vice Chair
Angela Reichert-Dorsey	In-Coming Treasurer
Todd Walter	In-Coming Secretary
Jim Doherty	ION Exec. VP, Proxy for Penny Axelrad, ION President
Frank van Graas	Meetings Chair
John Raquet	Out Reach Chair
Mike Miller	Autonomous Lawnmower Competition Rep.
Carl Andren	Technical Director
Lisa Beaty	Director of Operations

AGENDA

1. Approve Minutes from September '03: J. Lavrakas
2. Ratify Decisions Made by Division Over Past Year: J. Lavrakas
 - a. Navtech as GNSS '04 & '05 Tutorial Vendor (Dec. 2003)
 - b. 2004-'06 Nominating Committee Membership (February 2004)
 - c. Rejection of VIGIL's Tutorial Proposal (March 2004)
 - d. Organization GNSS Program Chair Nominating Committee (August 2004)
3. Lessons Learned '04 & Recommendations for 2005: C. Hegarty
4. Approval of GNSS 2005 Program Chair, Dr. Chris Bartone: J. Lavrakas
5. Sponsored Student Program for 2005: L. Beaty
6. Sat. Div. Nominations Report/Election Results: J. Lavrakas for P. Axelrad
7. Parkinson Award Report: J. Lavrakas
8. NAA Sponsorship Completion Report: P. Ward
9. Outreach Activity Status, Autonomous Lawn Mower Competition: J. Raquet

Approve Minutes from September '03

Motion: Approve September '03 Satellite Division minutes as circulated. Motion made by John Lavrakas, seconded by Pratap Misra and passed by the committee.

Motions: Motion was made to ratify motions 1-4 listed below that were voted on and passed this past year via e-mail. Motion made by John Lavrakas, seconded by Pratap Misra and passed by the committee.

1. Navtech Seminars approved as a tutorial vendor for GNSS 2004 and GNSS 2005. *Motion passed December 2003.*
2. The following were approved to serve on the 2004-'06 Satellite Division Nominating Committee: Penny Axelrad (Chair), Per Enge & Gerard Lachappelle (Western Region) and Karen Van Dyke and Richard Greenspan (Eastern Region). *Motion passed February 2004.*
3. The proposal by VIGIL to present tutorials at GNSS 2004 was rejected. The reasons for rejection are in part that VIGIL had not demonstrated sufficient progress in remedying all of the concerns addressed in the March 7, 2003 letter sent by John Lavrakas, Satellite Division Chair, and in part because the low level of attendance at the courses does not justify the amount of ION resources required to support these tutorials. *Motion passed in March 2004.*
4. The Satellite Division Executive Committee organized a nominating committee to nominate the GNSS 2005 Program Chair. Committee consisted of John Lavrakas, Penny Axelrad and Chris Hegarty. *Motion passed August 2004.*

Lessons Learned GNSS 2004 & Recommendations for 2005

Chris Hegarty, GNSS 2004 Program Chair, led a discussion about the plenary session and expressed concern that the plenary session had been essentially the same for the last several years. It was suggested that the plenary be held on Wednesday morning. Concerns were expressed that this would reduce the total number of papers that could be presented in the technical program and that it would create a logistical challenge. It was suggested that the plenary return to a traditional Air Force/military update on the system. It was suggested that a plenary no longer be held unless there was a compelling reason. Chris Barton was directed that should he elect to organize a plenary session for 2005 that it needed to finish no later than 9pm.

Lisa Beaty reviewed some of the problems that had been experienced with the clearance process and meeting room capacity for the classified session. She recommended that in 2005 the session chairs for the classified session come from industry, the session should be open to US only and that a larger facility needed to be secured. Lisa reported that she had asked Boeing to consider hosting a Tuesday classified session in 2005.

It was suggested that due to the size of the Long Beach facility that the technical program be adjusted in 2005 to allow for more movement/relocation time between papers.

It was recommended that the session chairs be reminded at the speakers breakfast that photographs and video recordings of the sessions are not permitted and that this be announced at the beginning of each session.

Lisa reported that she would like to eliminate the purchase of photocopied papers in 2005 and offer a modified business center. Technical papers would be loaded onto the ION's web site live as they were submitted and all registered attendees would be able to download copies of papers until the proceedings were made available at which point this would revert to ION members only. The committee agreed.

Lisa suggested that view graph machines no longer be made available as part of the standard set-up as so few authors were using them. They would be available on an "as requested" basis. The committee agreed.

Lisa reported there were 1939 attendees this year, and that there was not an increase in local participation in Long Beach as had been hoped. She reported that there was much less abuse this year by exhibitors who used exhibit only badges to attend the conference. She reported that there were numerous complaints from local companies who wanted to get employees into the exhibit hall for free. To accommodate this it was reported that locals were permitted into the exhibits on Friday morning at no charge but in the end few locals actually elected to attend.

Approval of GNSS 2005 Program Chair

Motion: Chris Bartone is appointed and approved as the GNSS 2005 Program Chair.
Motion made by Elizabeth Cannon, seconded by Günter Hein and passed by the committee.

Sponsored Student Program for 2005

Lisa Beaty reported that of the twenty-eight students that had their travel sponsored, twenty of them involved travel problems, including trying to book personal travel in conjunction with their trip, trying to figure out a way to stay over extra days on the ION's nickel or incurring extra expense in their travel due to their inability to make arrangements in a timely manner. It was also reported that coordination of student travel, and dealing with individual student's problems, was excessively time consuming for National Office staff.

Lisa suggested that for 2005 each sponsored student receive a full complimentary registration and a flat travel allowance based on the continent in which their school was located. This allowance would be sent in advance directly to the university at the time of paper selection, in care of the sponsored student's academic advisor. The specifics of the student's travel could then be coordinated directly between the student and their academic advisor. Travel costs that exceed the published amount would be borne by the university. The university shall retain funds in excess of actual sponsored student's travel. Funds would be non-transferable and would need to be returned to the ION if for any reason the sponsored student was unable to attend. This would also help ensure that advisors were aware of mandatory events sponsored student are required to attend at the conference. It was also suggested that this would benefit the schools, as it would allow the universities to have students share rooms etc. and thus enable more students to attend the event.

The committee agreed that a flat rate of travel subsidy based on the country in which the sponsoring school was located was preferable.

Motion: 1) Student travel sponsorship provides a flat rate of travel subsidy based on the country in which the sponsoring school is located (not the country in which the student may reside). 2) Travel subsidy/sponsorship funds for the GNSS sponsored student program shall be remitted directly to the sponsored student's academic institution or professor at the time proof of visa/passport (if applicable) is provided. 3) Travel costs that exceed the published amount would be borne by the student. 4) The university shall retain funds in excess of actual sponsored student's travel. 5) Funds are not transferable and shall be returned to the ION if for any reason the sponsored student is unable to attend. Failure to do so would affect the acceptance of future paper submitted for consideration under the sponsored student program. 6) In extreme cases, special arrangements will be made for students who would be unable to participate should their school be unable/unwilling to administer travel arrangements directly. Motion made by Pratap Misra, seconded by Elizabeth Cannon and passed by the committee.

Action: Lisa Beaty to send Satellite Division Executive Committee proposal for approval with suggested travel-funding levels by continent for sponsored students.

Postscript: In October 2004 the Satellite Division approved the following sponsored student funding levels for GNSS 2005:

<i>U.S. Schools:</i>	<i>\$1,300</i>
<i>Canadian Schools:</i>	<i>\$1,500</i>
<i>U.K./Western European Schools:</i>	<i>\$2,000</i>
<i>Brazilian Schools:</i>	<i>\$2,200</i>
<i>Chinese/Korean/Japanese Schools</i>	<i>\$2,300</i>
<i>Australian Schools:</i>	<i>\$2,500</i>
<i>Other: qualify for special arrangements</i>	

There was also considerable discussion about whether or not a sponsored student paper should be allowed to be co-authored by a professor and still be eligible for travel sponsorship. It was noted that the current policy only allowed for student authors, or groups of student authors. It was suggested that the ION modify the policy to allow for professional/professor co-authors but still require the paper to be presented by the sponsored student. It was the consensus of the committee to leave the current program requirements for “student authors only” as they currently stand.

Sat. Div. Nominations Report/Election Results

John Lavrakas reported that the Satellite Division election had been held in this past summer and the following were elected:

Chair	Elizabeth Cannon
Vice Chair	A.J. Van Dierendonck
Treasure	Angela Reichert
Secretary	Todd Walter

It was reported that John Lavrakas would remain on the Satellite Division Exec. Committee as immediate past chair and that Elizabeth Cannon, In-Coming Chair, had appointed Günter Hein as the European Technical Advisor and Chris Rizos as the Pacific Rim Technical Advisor.

Parkinson Award Report

It was reported that the first Parkinson Award had been presented at the meeting. Five theses had been submitted and reviewed, and there had been no issues or concerns raised by the committee.

NAA Sponsorship Completion Report

John Lavrakas reported on behalf of Phil Ward that the flight recorder equipment sponsored by the Satellite Division for the NAA had been completed and tested. See attached files prepared by the NovAtel co-op student Trevor Brophy that demonstrate the outstanding success of the B1 Bomber 3 Km Record Attempt during extensive flight tests of the ION/NAA GPS Flight Recorder:

[B1_Timing_Data.pdf](#)
[B1_Course_Altitude_and_Width_Monitoring.pdf](#)
[B1_Flight_Altitude_Monitoring.pdf](#)
[B1_Flight_Data_Points.pdf](#)

It was reported that the tests were conducted at Edwards AFB. The attached official NAA data sheets (designed by Trevor) will tell the rest of the story. The GPS Flight Recorder equipment has now been delivered from Edwards AFB to the NAA National Office in Arlington, Virginia. Also delivered are the NAA GPS Flight Recorder Operator Manual, the Post Mission Software along with Trevor's ground test data from a car and a truck, as well as the B1 data. It was reported that in spite of numerous frustrations and time delays, this has been a very successful project. Phil Ward wished to extend his gratitude to the ION Satellite Division for their financial support and patience. It was reported that the NAA is well pleased with their new GPS instrumentation system.

Trevor found only one "bug" in the post mission software and this has been corrected. The baro altimeters were not connected to the DL-4 GPS receivers during the tests because the B1 cabin is pressurized and even if there had been a tube connecting the Baro pressure sensor to the outside of the B1, the air crew said that a Baro Altimeter would not work correctly at supersonic speeds. The absence of this Baro data tripped the "bug" in the post-mission program.

The "truth data" was provided by the Edwards AFB staff that performed post-mission processing of the average velocity between approximately 3 Km separated points. The independently recorded data came from an Ashtech kinematic GPS system and a Honeywell military GPS/IMU system, both field proven during previous B1 flight-testing at Edwards AFB. When Phil Ward asked Trevor about the "truth data" the following is a copy of his reply:

"Yes, there was "truth data" from Edwards. However, that truth data was only data points. The Edwards base people reviewed them and were impressed by the accuracy and tracking of the DL-4. There was no timing data to indicate how fast the aircraft was flying, so there was no way of checking if my software properly interpolated the times to cross the start and stop line. It was good, certainly, to find that bug that occurs when there is no barometer data. Aside from that, the software seems to run properly. Thanks again! It has been a pleasure! Trevor"

It was reported that Trevor did test the interpolation program using a ground vehicle at the NovAtel facility in Calgary, Canada. It was assumed that scaling this up to supersonic speeds would not alter the accuracy. Phil Ward has made a recommendation to the NAA that they test the GPS Flight Recorder against their original photographic system if and when the opportunity presents itself. The good news part of this particular 3 Km record attempt is that the B1 could not have been tested using the old photographic system. The land based operating crew would have sustained injuries since the B1 was breaking the sound barrier during the multiple passes low over the pre-surveyed desert runway at less than 500 meters above the old abandoned desert runway.

Outreach Activity Status, Autonomous Lawn Mower Competition

Mike Miller reported on the outcome of the first competition that was held in June 2004 in Dayton, Ohio. Mike reported that he hoped the competition would become more technically challenging each year.

See Attached File: [Autonomous_Lawn_Mower_Results.pdf](#)

Motion: The Satellite Division shall sponsor Autonomous Lawn Mower Competition for the next two years at a maximum of \$10,000 per year. At the end of that time period the Division shall evaluate its success in meeting the following goals: ability to obtain additional sponsorship and the likelihood of the contest being able to become self-sustaining in the future. Motion made by John Lavrakas, seconded by Pratap Misra and passed by the committee.

OTHER

Number of Signatures Required Satellite Division Checks

John Lavrakas stated that currently three signatures were required on Satellite Division checks and that the National Office recommended that this be changed to two signatures to avoid check delays caused by obtaining three signatures.

Motion: Two signatures are required on each Satellite Division check, with at least one of the two signatures coming from a Satellite Division officer. Motion made by John Lavrakas, seconded by Elizabeth Cannon and passed by the committee.

Satellite Division Bylaws Update

John Lavrakas noted that in the past year it was discovered that the way the Division operates does not always align with the policy in the Division's bylaws. He suggested that the bylaws be reviewed and amended this next year.

Action: Elizabeth Cannon accepted the action to have the bylaws reviewed/updated during the course of the next year.

The meeting was adjourned at 9:30pm.