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## **RADAR 05 Final Report**

By all measures RADAR 05, held from May 9 through May 12, 2005 at the Marriott Crystal City Gateway Hotel, was the very best in the continuing series of the IEEE International RADAR Conferences held every 5 years in the Washington, DC area since 1975.

RADAR 05 had 537 attendees who took advantage of the 181 Technical Papers, 15 Tutorials, and 32 Exhibits. Tutorials were presented at entry level, intermediate, and advanced levels. Each Tutorial was given twice by leading experts. Continuing Education Credits (CEU's) were awarded upon completion. The 32 exhibits doubled the number of exhibitors in 2000. There were also planned tours to the new Smithsonian Air and Space Annex near Dulles Airport and the Historical RADAR Engineering Museum at the BWI Airport coupled with the National Cryptological Museum near Ft. Meade.

The attendees were split roughly equally between IEEE Members and Non Members and included 12 Life Members, 9 retired Members, and a record 53 Student Members. Thirty of the fifty-three Student members were International. Of the regular International Attendees there were 24 countries represented with the UK (27), Canada (12), China (11), Italy (11), Sweden (11), and Germany (10) having the most. Seven attendees took advantage of receiving a free Section of their choice by joining IEEE at RADAR 05.

The attendees were surprised at the Wednesday night Banquet by the reading of a Greeting from President George W. Bush welcoming all of the attendees to the IEEE International RADAR Conference. See Page 5.

RADAR 05 attracted the most number of students ever, with 53 students attending from 13 Countries. Many students submitted a paper for the Poster Session and there was a competition for the Best Student Paper which was won by Igal Bilak from Ben-Gurion University of the Negev, Israel. RADAR 05 was greatly indebted to the Army Research Office (ARO) and the Office of Naval Research (ONR) for providing Grant Funding to support Student's Travel and Living.

As in previous years, the IEEE Aerospace and Electronic Systems Society, the Northern Virginia Section, and the Washington Section hosted this conference along with the Institute of Electrical Engineers – UK as an Associate Sponsor.

Attendees also had the opportunity to avail themselves of vast research material in the Fred Nathanson Memorial Study Center. The Study Center, named after Fred Nathanson, our popular radar engineer, author, teacher and colleague (1933-1993), featured a library of radar books, along with a copier, comfortable reading chairs, and plenty of complimentary coffee. Fred was a Fellow of the IEEE and spent the early part of his radar career at Johns Hopkins University - Applied Physics Laboratory.

The Conference opened with a welcome by the Conference Chairman. The Chairman's remarks were followed by short videos of RADAR leaders from supporting countries around the world welcoming the attendees. Then, Dr. Taylor Lawrence of Northrop Grumman chaired an excellent Keynote Session and Panel discussion on "The Future Directions in Spaced Based Radar."

Technical sessions included radar systems, components integration, radar data and signal processing, phenomenology, adaptive processing, tracking, synthetic aperture radar (SAR), antenna technology, simulation, and emerging technologies. These papers featured leading research by world renowned and rising young researchers and practitioners in the radar field

Tutorials included Introduction to Radar, Radar Cross Section, Electronically Scanned Radar Systems, Tracking and Kalman Filtering, SAR, Bistatic Radar, Space-based Radar, Radar for Automotive Applications, Radar Waveform Design, Radar Performance Modeling, Space-Time Adaptive Modeling, and Clutter Modeling. Overall there were 208 attendees who took 475 Tutorials with a number of attendees taking 2 and 3 tutorials. A few attendees took as many as seven tutorials. Average Tutorial Attendance was 32 per Tutorial.

At the Wednesday evening banquet, Dr. Muralidhar Rangaswamy from AFRL, who is a Senior Member of the IEEE, was presented the 2005 Nathanson Young Engineer Award for his work in non-Gaussian clutter modeling and adaptive signal processing, his extensive publications on radar research, and his support of numerous IEEE activities, including the Transactions on Aerospace and Electronic Systems (See Fig 3). Mr. John Entzminger Jr. was presented the Warren D. White award for contributions to the art of RADAR engineering. Mr. Entzminger, a Fellow of the IEEE, received the award for "his distinguished thirty-eight year career and leadership in Defense research and development in the critical areas of intelligence, surveillance, reconnaissance and targeting sensors

Major General George Harrison, USAF ret from Georgia Tech Research Institute was the featured Banquet Speaker on the Topic "21st Century Radar – What Do Users Want?"

Four IEEE Members elected to receive their Fellow Awards at the RADAR 05 Banquet. These included:

- William Gerard Bath, Johns Hopkins Applied Physics Lab
- Mark Edward Davis, AFRL
- James H. Michaels, AFRL
- James Ward, MIT Lincoln Laboratory
- A fifth award to Joseph Guerci had been intended, but was regrettably neglected by an oversight.

Program 285 abstracts were received resulting in 181 Technical papers selected for the two main tracks and poster sessions. There were 12 volunteers on the Review Committee

Conference Funding In addition to seed money from AESS and the Northern VA and Washington DC Sections \$2500 Grants were received from AMS, ITT Gilfillan, Lockheed Martin Syracuse, Lockheed Martin Moorestown, Northrop Grumman, Telephonics, and Thales. Badge Holders and lanyards were provided by BAE Systems. Northrop Grumman provided the Conference Tote Bags

Conference Surplus At the time of this writing all bills are in except IEEE Headquarters for printing of the Proceedings. If we use the budget number for this printing we are projecting a SURPLUS of approximately \$ 95,000.00

Conference Statistics

Non Member Attendees	173
Advance	131
Door	42
Member	193
Advance	156
Door	37
IEEE Life Member	12
IEEE Retired Member	9
Students	53
Exhibitors	85
Gratis	7
One Day	4
Exhibits Only	1
 Total	 537

Attendees by Country

United States	377
United Kingdom	27
Canada	12
China	11
Italy	11
Sweden	11
Germany	10
Netherlands	9
Australia	8
France	8
Japan	7
Spain	7
Singapore	6
Israel	5
Norway	5

South Africa	5
Korea	4
Finland	3
Poland	3
Belgium	2
Turkey	2
Bulgaria	1
Chile	1
Iran	1
Kuwait	1
Total	537

Students by Country

United States	23
China	8
United Kingdom	7
Netherlands	3
Canada	2
France	2
Spain	2
Belgium	1
Bulgaria	1
Germany	1
Iran	1
Israel	1
Singapore	1
Total	53



THE WHITE HOUSE

WASHINGTON

May 2, 2005

I send greetings to those gathered for the International Radar Conference, hosted by the Institute of Electrical and Electronics Engineers.

Innovation continues to redefine the American workplace and is vital to our global economy. This event provides an opportunity for the world's leading specialists in radar systems and technology to share advances and opportunities in this important field. Through your work and commitment to excellence, IEEE members and all engineers expand the realm of the possible and contribute to global prosperity.

I appreciate IEEE members for supporting technological innovation in fields from computer engineering and biomedical technology to consumer electronics and aerospace engineering. By encouraging professional development and promoting high standards in engineering, you advance scientific endeavor and inspire the next generation of innovators.

Laura and I send our best wishes.

A large, stylized handwritten signature in black ink, which appears to be "George W. Bush".

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President Bush's Letter of Greeting

## **Committee Final Reports are as follows:**

### **Program Committee Report**

**(Dr. Mark Davis, AF Research Lab/ Dr. Iram Weinstein, SAIC)**

### **Technical Program**

The most important part of any conference is the Technical Program and its content. During the 2005 International Radar Conference, the topics advertised in the Call for Papers were:

**Radar Systems:** Advanced concepts in radar, imaging radar – high-resolution SAR, multi-function radar technology, airborne, shipborne, space-based radar, air traffic control, automotive and weather radar and counter-terrorism, counter-drug and law enforcement applications.

**Antenna Technology:** Multiple-beam antennas, conformal arrays, subarraying techniques, low-sidelobe design, multi-frequency, ultrawideband and dual-polarization designs as used in Radar systems.

**Radar Data and Signal Processing:** Digital beamforming, array processing techniques and STAP, waveform diversity, estimation techniques and superresolution, sidelobe control and false-alarm mitigation, multipath processing, improved ECCM techniques, sensor fusion, tracking, target classification and identification.

**Component Development:** Advanced signal processing components, new materials and manufacturing techniques, COTS processors and commercial components, low-cost T/R modules, power amplifiers and digital receivers.

**Phenomenology:** Propagation and polarization phenomena, target measurements and modeling, clutter measurements and modeling, terrain and building scattered interference.

**Radar Simulation:** System level simulation, clutter and propagation modeling, operational performance analysis, simulation validation with test data.

**Emerging Technologies:** Bistatic and multistatic radar, polarimetric radar, foliage- and ground-penetrating radar, ultra-wideband radar, interferometric SAR, MEMS applications, fiber-optic remoting.

This year's conference adopted an all electronic submission, review and publications approach. Authors were required to submit a 1,000-1,500 word paper summary with figures following the text. Electronic submission was required in either Microsoft Word or LaTeX file formats. Authors are permitted to indicate paper suitability for a poster format presentation. Student papers are strongly encouraged. The papers were sent electronically to the Technical Program Chairs at the web site [www.ieee.org/radar05](http://www.ieee.org/radar05), created and managed by Jim Hess of ISPG. The critical dates were:

- Deadline for submission of summaries was advertised as 30 September 2004, and extended to 30 October due to logistics demands.
- Authors were notified of acceptance by 15 December 2004, and received instructions and forms for publication at that time.
- Completed electronic papers (limited to 8 pages inclusive of text, figures, and tables) were be required by 30 January 2005, due to the long publications cycle of the printed Proceedings. This deadline was not met, and accommodations needed to be worked out between the Technical and Publications committees.
- Where applicable, government approval for publication as an unclassified, public-release paper was also required with the final paper submission. These approvals were all submitted electronically
- International Authors were notified that they should allow extra time for Visit VISA request, and should initiate the VISA process immediately after notification of paper acceptance in December 2004.
- All Papers and Presentation material were to be submitted electronically via the web site. This enabled electronic checking of the material to meet the new IEEE Publications requirements, as well as building the sessions prior to the Conference for better quality of papers.

The response was outstanding with 285 abstracts submitted, not including the Student papers. One area of significant response was the Radar Data and Signal Processing area. Due to the high volume of abstracts, it was necessary to split this into 4 different technical areas:

- Adaptive Processing
- Radar Data and Signal Processing.
- Synthetic Aperture Radar
- Tracking

The abstracts were from 26 different countries. Besides the USA, the largest numbers received were from China (98), Great Britain (20), Germany (9), Italy (9), France (7), and India (7).

Ninety (90) oral papers and ninety-one (91) poster papers were presented in these topic areas. Thus the acceptance rate was 70 percent, reasonably normal for past IEEE Radar Conferences. These oral and poster papers were from 23 different countries, making this a truly international program. The Technical Program was dual tracked with 20 sessions spread over the two and a half days of papers (first half day was Introductions and Plenary session). We decided during the paper selection process that any gaps in the oral program caused by no-shows would be filled with oral presentations drawn from the highest rated posters, to ensure continuity of the oral program. We selected two posters for potential oral presentation from each topic area and alerted these poster authors to be prepared to present their papers orally. Despite these precautions, there were still some no-shows for 4 papers.

The Paper Selection process was the most productive and efficient ever. Using the summary and diagnostic tools that Jim Hess developed on the web-based management,

the program results were completed, and the program constructed in less than 3 hours. This compared with 2 days in 1995 and 1.5 days in 2000.

Having the web based submission and the quality control checking insured the high quality of the printed proceedings. However, the interface to the electronic submission needs some work based on the number of exceptions and questions from our international community. This is especially true for the submission of the presentation viewgraphs in PowerPoint – a new concept for the IEEE Radar Conference. It insured the quality of the sessions, but several authors did not read the instructions and came to the conference asking to ‘plug in their computers to better represent their results’. This was tried once resulting in delays in the program, and required restart of the conference computer. In the future, the web instructions need to be more clear and forceful that no last minute changes or substitution of computers will be allowed..

The only negative aspect of the process was the large number of no-shows from China. According to Bob Hill only 3 of the 25 registrants were able to get their Visas, or actually made the trip. All but 2 of the missing oral presentations were from China (the others were Japan and Russia). Hopefully the Homeland Defense restrictions will be either better understood and publicized, or relaxed by the next Conference.

## **Lessons Learned**

Several last-minute problems arose during the conference. While all of these were resolved in a timely manner and were mostly invisible to attendees, they could have been avoided with more attention to coordination. For the most parts, the problems appeared at the interfaces between committees and individuals.

1. The printed program and session posters had a mysterious error in which the wrong authors were associated with many of the papers. The problem was discovered and corrected the night before the first session. Fortunately, this problem did not affect the Conference Proceedings. The cause of the problem is buried in the details of database programming, and at the interface between the web master and the publicity committee, who printed the program. The error could have been uncovered earlier if the Program Committee conducted a careful proofing of a galley copy of the program. [Were we offered the opportunity? I remember only proofing the advance program].
2. Many speakers did not show up for the Speakers Breakfasts. This led to some confusion as to whether the speakers would show for their sessions. Although this sort of thing is easily handled, we should make a point of emphasizing instructions about the breakfast in the final instructions to speakers.
3. Some Session Chairs did not make their sessions. This is not uncommon. We also did not provide the chairs with advance copies of the papers in their sessions and biographies of the authors. Both of these problems could be helped by creating a separate email group of the session chairs so that they can be informed of the details of their sessions.

- The Office of Naval Research generously provided \$6,000 of support;
- The Army Research Office generously provided \$6,000 of support; and,
- The conference General Chair, Mr. Tom Fagan, provided \$5,000 of conference funds.

In addition to the total \$17,000US available for stipends, fees for conference registration and one tutorial were waived for authors participating in the Student Paper Program.

The award selection committee included Dr. Rabinder Madan of the Office of Naval Research (ONR) and Dr. Dev Palmer of the Army Research Office (ARO), the two external program sponsors, as well as Dr. William Melvin of Georgia Tech and Dr. James Michels of Syracuse University. Criteria used to judge the papers included novelty, technical content, written quality, poster/oral presentation quality and applicability. All areas were equally weighted and scored from one to ten, with ten being the best score.

All student paper presentations were very well done. The general response to these technical presentations was very positive.

Based on specific requests and participation, sixteen students were given \$1000US stipends to cover travel and related expenses. Reimbursement was provided through the IEEE Development and Grants Office.

### ***Procedure***

The following steps were taken to execute the student paper program:

- A “call for papers” was issued in June of 2004. This CFP was sent to various IEEE student chapters and universities. It also was publicized on the conference website.
- Papers were reviewed and selected in the Fall of 2004.
- Program sponsors were sought, and eventually found, to financially support the program.
- Proposals were sent to ONR and ARO in December of 2004 through the IEEE Development and Grants Office.
- Funding awards were received in the March 2005 time frame.
- Evaluation criteria were established and sent to the pre-selected award selection committee prior to the conference.
- Student authors presented their papers at one of two sessions at the conference.
- The winning author was selected and presented results to the conference at the final luncheon.
- Final reports were sent to ONR and ARO in June 2005.

## **Recommendations**

The following recommendations are made:

- The Student Paper Chair should make it an immediate point to contact the IEEE Development and Grants Officer, Ms. Karen Galuchie, Phone 732 562 3860, [k.galuchie@ieee.org](mailto:k.galuchie@ieee.org), for general guidance. Ms. Galuchie provides valuable assistance in preparing grant proposals and is a point of continuity among conferences.
- It should be noted there were no restrictions on country of origin for receiving research funds. This has been a point of confusion and undue burden in the past (and proved the same this year).
- A website page or other document should be provided to all selected student authors participating in the program. Undue effort was expended repeatedly answering the same questions posed by the authors. Referring all questions to a single web page or document will be a big time saver in the future.
- A better mailing list for potential student authors is needed.

## **Exhibits Report (Dave Barber, SciTech Associates)**

Accomplished: Total of 31 paid exhibit spaces, plus RADAR Museum and IEEE booth in exhibits. Also, the Poster Papers were in the exhibit area.

Lessons: Having the Posters and Breaks in the exhibit area was a definite draw for attendees. The laptop giveaway was also popular with both attendees and exhibitors so recommend continuing.

Would like to see exhibits representation earlier in the hotel procurement and planning process to assure adequate space is allocated to the exhibit program as the exhibits should continue to grow.

## **Publicity Committee Report**

(Wande Soyombo, Northrop Grumman)

CALL FOR PAPERS “Call for Paper’s” postcards designed and sent to IEEE for printing and distribution. Postcards were mailed via distribution list provided by Jim Hess (the webmaster). Jim also sent electronic formats of the announcement via email distribution lists. In addition, web links connecting to the announcements were also sent to the AESS Panel member’s to distribute to their respective companies and universities to be posted on intranets

○ **GENERAL ANNOUNCEMENTS AND AD'S FOR THE CONFERENCE**

**Publicity via technical conferences.** Sending and distributing publicity material via committee member's attending technical conferences e.g. Iram and Mark attending the 2004 Radar Conference in France, and the IEE-sponsored Waveform Diversity and Design Conference in Scotland. Materials will continue to be distributed as members attend such technical conferences until May 9<sup>th</sup>.

**Publicity via company and university internets/intranets.** Same concept used in the "Call for Papers". The publicity committee will distribute to member's of the committee, the AESS panel and any other persons that may have an interest to promote the conference a web image that advertises the conference and directs them to the main IEEE Radar web page to get more information or to register.

**Publicity via technical journal, magazines and periodicals.** Locate 3-5 key journals/magazines/periodicals (e.g. Spectrum, Defense News) to place ¼, ½ page or full-page ads. In addition, locate several of these journals/magazines/periodicals that have frequently visited websites to solicit help in either adding a link from their site to the RADAR '05 site or the creation of pop-ads.

**COMMITTEE SCHEDULE**

- **June 17 – July 30, 2004:** Design and distribute "Call for Paper's" postcards.
- **August 18, 2004:** Distribute "Call for Paper's" via AESS panel members to company and university internets/intranets.
- **October 13, 2004:** Created power point slide to be used for publicity at the 2004 Radar Conference in France, and the IEE-sponsored Waveform Diversity and Design Conference in Scotland.
- **Oct 15, 2004 – Jan 31, 2005:** Designed publicity Ads (both graphics and web images) to announce conference and send out general meeting notices to magazines and websites
- **Feb 1, 2005:** Designed AD's go out to 4-5 key magazines, to run for March and April Issues. AD's will also appear on the websites RADAR-related companies and also sent to numerous mailing lists to drive registration.
- **March 1, 2005:** Reminders sent out again to mailing lists.
- **April 1, 2005:** Reminders sent out again to mailing lists.

**ACCOMPLISHMENTS**

- Created, Designed and Distributed the "Call for Papers" hardcopy to over 6577 physical addresses and delivered via internet to about 3000 emails. Over 270 abstracts were submitted. A big increase from the 2000 RADAR 05 conference

## **LESSONS LEARNED**

- Creating a master schedule and gathering information as related to Ad deadlines, and particularly sizes very early on. Initially we created 3 main sizes for Ad's – ½, ¼ and full page Ads. However, even with those sizes, each of the vendors had different dimensions for what a ¼ page meant, so each time we had to go and resize the prints. They also had different requirements for resolution. Knowing all these up front, might have helped us to be more efficient.
- Targeting potential sponsors early in the process. Our experience with AvWeek may have been successful had we targeted them as a sponsor very early on. They were very interested in being a sponsor and printing our ad's however, they felt they a year notice would have given them more time to get into their planning schedule, and the ability to budget and allocate their resources better. It was an unfortunate loss for Publicity because AvWeek was the most costly publication, with a very large following. However, Defense News was able to make up for that.
- Finding better ways to solicit feedback, so the AD designs don't have to go through numerous updates. It can sometimes be frustrating. Perhaps a process for review should be in place.

## **RECOMMENDATIONS FOR RADAR TWENTY TEN**

- Target potential sponsors for advertising very early on. Publications like AvWeek need about a year's notice to plan appropriately for it. If 3 main publications can be contacted as major sponsors, that can take care of the most advertising needed for publications. Most are willing to work out some kind of barter with enough notice.
- Using a bigger committee might make some of the processes more efficient and quick.
- Focus even more on reaching out to potential attendee's via emails and websites. People visit the web pages more than they will pick up magazines and journals. It's also more cost effective and is easier in reaching a younger audience.

### **Arrangements Committee Final Report (Jacki Hunter, IEEE N. VA Office Manager)**

Overall, the most persistent problems came in working with the hotel but other challenges included poor communication within the committee and some clumsiness in the registration process.

Although we followed the requirements set down by the hotel, they repeatedly lost paperwork and seemed ill informed on our needs. A change in personnel was blamed for this but several copies of the schedule we submitted were not filed apparently. Additionally, this error was not discovered until our event manager sold a whole day's space out from under us. After we documented our communication with her predecessor, our space was reinstated. In general though, we received grudging compliance with our

requests. The banquet service and audio-visual department were good but other areas of the hotel staff were slow to respond. The final mistake was on the last day of the conference. While we had events scheduled through 10 PM the hotel, without pointing it out to us, gave our office space and registration area away to the next conference coming in. A staff person arrived at 2 PM to tell us we had to be out by 3 PM. This caused no small disruption and resulted in loss of sales during the last few hours available. The hotel allowed us some financial compensation for this. The reservations department also proved to be a problem. Many people had trouble getting into the hotel, getting the correct rate and being credited to our account.

Miscommunication and lack of proofreading among members of the committee resulted in many misprinted signs, serious errors in the banquet program and delays in other materials. Tickets were not delivered when needed for registration packets. This caused unnecessary stress and wasted time at the point in the preparations when we least needed it. Information and supplies to make up the registration packets were also delayed, taking time away from other last minute finishing touches. The schedule for all these issues had been discussed at several prior committee meetings. Another miscommunication involved the timetable for the Study Center. It was scheduled to be open all day Tuesday through Thursday and I had scheduled volunteers to help work there. My volunteer showed up for the Thursday afternoon shift and I was told the study center was closing at noon.

Many things in the registration system were helpful but some fine-tuning would make the process more efficient for the registrant. We did not have the ability to print out receipts or nametags (at advance registration) for attendees, which meant they had to place a request and come back for them. We also did not have access to use the electronic credit card processors. Using them would have meant quicker turn around on receiving our money but would have been more expensive in having the hotel provide the access. In previous conferences, we did have this access and it worked well. Mostly, though, the most difficult thing was the late start in creating the registration packets. As late as Sunday afternoon, I was given over a hundred more to process. These were not late registrants, in general. They could easily have been processed earlier.

### **International Committee Final Report (Bob Hill – Consultant)**

I'm very pleased to participate in the "wrap-up" meeting of the conference committee by submitting this final report and lessons-learned account. In general, all should be pleased – particularly yourself – with the successes of the conference.

My report covers, first, the area of international liaison for which I was responsible, and second, some reflections on various other things about the conference.

#### **International Liaison**

**Sustaining international interest** It is very important that we keep reminding the entire worldwide community of the *series* of international conferences to which our

IRC belongs. At this time, we are still the "cornerstone" of that series, I think, the biggest in attendance, the one many will try hard to attend. The strongest partnership remains with the IEE of the UK (their next is in 2007), quite appropriate considering the origins of the series. However, the number of international conferences outside the series has increased *so much* since we began that a dilution of interest can easily take place. Some may fail to identify the Chinese (2006), the Australian (2008) and the French (2009) conferences with the "next big one in the USA". So it is important that we use *each* of these annual conferences as publicity opportunities. Even now, well before we form a 2010 committee, a potential "international liaison chairman" (or such) should:

- acquaint himself with the key persons organizing each of the overseas conferences,
- find out who among "us" is going to each, and enlisting those persons to take *something* indicative of the *whole series* scheme, within it the IEEE plans (handout, history page for the record of the overseas conference, platform announcement, etc.).

Many of the international community attend the annual IEEE "Radar Conference" (not held in the IRC years 'X0, 'X5); consequently it should be used the same way . . . just reminding those attendees that next IEEE international is something to anticipate enthusiastically. The Radar Systems Panel of the IEEE-AESS governs all the IEEE conferences, our international included. Our committee this year was well entwined with the panel membership, but it might not always be so inherent. The international-liaison chairman (and other committee members) must effect good communication with the panel; he should:

- acquaint himself with the current panel chairman (generally two-year terms involved),
- acquaint himself with those organizing the next "IEEE RadCon" and use it to draw attention to the international series and, specifically, the next IEEE IRC.

Sustaining international interest can come from personal and professional relationships outside the conferences. This chairman, in his own work or just in following up on interesting publications in the conference records or IEEE AES Transactions (*inter alia*), should cultivate a dozen or so of those abroad contributing to our literature, and promote conference participation through those acquaintances, reaching their larger community. Such acquaintances become an extension of our own organizing committee.

**Liaison with the Embassies** I was very late in Radar-2005 preparations to exploit this idea – we'd not done it before – and I doubt that we got much benefit. Nevertheless, I think this is a GOOD thing to do, and more AND EARLIER attention to it in 2010 should pay off. A simple email to the "Science and Technology Office" (or similar, depending on what is learned at each embassy's website about its organization) can call attention to the conference website. A few sentences in the email about the importance, the well-established history (numbers attending, number of nations) and multinational cooperation involved in organization of the conference should be included,

to generate some cooperation. Recommending the email be forwarded to appropriate national interests is important.

Now, the problem in getting started is this. I went to the site [www.state.gov](http://www.state.gov) ([www.state.gov/s/cpr/rls/dpl/c11653.htm](http://www.state.gov/s/cpr/rls/dpl/c11653.htm) had been given me – I don't think it came up that way when connected, however), and I clicked down to "Website and email addresses of embassies". However, this gave me website addresses mostly, very few emails; I then started the laborious process of visiting each site (I selected 28 nations: Australia, Belgium, Bulgaria, Canada, China, Finland, Germany, France, Georgia, India, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Poland, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and European Union – yes, E.U. has a "delegation" in Washington). Surprisingly only a few give an email address, generally just more website expansion, promotion of tourism, etc. I sent some eight emails after finding fourteen email addressees. . I had run out of time, having started too late. In summary, I think this is a good thing to do, but an earlier and more dedicated effort is required. Perhaps in 2010 this state-department service will be more consistent, helpful, and embassy invitation of email communication more universal. It may be well, too, that we send a regular mail flyer of some sort to selected embassies . . wouldn't hurt, and no mass mailing involved, 20-30 pieces, say. A piece of paper on some embassy desk might prompt some response, after the email file is closed.

In this embassy resource effort (and in other areas of early international promotion) it is essential, of course, that our own website be all that is implied when we refer people to it.

**The greeting videos** . Perhaps this feature of the opening session (Greetings from Around the World) will be repeated in 2010; I would recommend it – it's unique, none of the other conferences does this. Clearly getting a representative of each of the other four nations (United Kingdom, France, China, Australia) of the series is appropriate; then an additional greeting or two from "other" nations to represent the excellent contributions made by *all* nations (here I solicited both Germany and Italy) rounds it out. This year I solicited the four using these contacts:

Hugh Griffiths, United Kingdom  
Marc Lesturgie, France  
Zhou Mengqi (and others of the CIE), China  
Don Sinnott, Australia

and the two other nations:

Hermann Rohling, Germany  
Alfonso Farina, Italy.

I got immediate response from Hugh, Marc, Don and Alfonso. In China, it was harder to get this done. I visited the CIE in Beijing (Zhou Mengqi) in March, all was understood, another few weeks were asked for, then (as the reader may recall) they ended up not supplying a video; but rather Wu ShunJun (a very active contributor, good friend) came with a prepared few sentences that he recited in the session. I think it all worked out OK in the end, but I have no real explanation for why they couldn't get a video greeting

together, even after agreeing to do it. Hermann Rohling never responded at all to my emails, although he is himself an enthusiastic participant in ALL our conferences, and a good friend in activity liaison generally. Germany is going its own way in these activities (conference conduct) to large measure, and maybe this was more of a coalition than they wanted to show, I don't know.

The specification for the greeting was to this effect: 2-3 minutes duration; self-introduction of the (prestigious) speaker; own nation's industry, academic, radar-interest review (some stats, etc.) and challenges perceived; support for the present conference, the international series and the international "community" generally. The technical spec was supplied me by those who were to assemble the projected set of greetings (N-G in our case): (A) Format – Beta SP or DVCAM; (B) Standard – NTSC. We also asked for a letter of release; I don't know to what extent this is really required, nor whether we ended up getting such from each contributor.

We always ask our contact to solicit a high level official of his nation to provide this greeting. We have to be liberal on this, for expediency. We've had government sub-cabinet officials (Japan, the first time we did this; UK chief MOD scientist . . .), but we indicate a high position in industry or in academia (I prefer industry, actually) is welcome, too.

So, in 2010 it must be decided if we want to do this again. I simply note here, that before we began doing the videos from "high level persons back home", we had little five-minute greetings in person, during a 20 or 30-minute period of the opening session, from national representatives that were attending the conference. This, too, can be nicely done and impressive; some would have (vugraphs, then) visual aids, others not. I think it is *vital* for *our conference* particularly to do one or the other of these two – that is, to have these "greetings from abroad" (from the series-participating nations at a minimum) *either* in videos or in person, in the opening session. It further testifies to the leadership position we've established.

Incidentally, I think "thank you" letters are in order (Alfonso suggested it for his greeter, good suggestion), and I haven't done anything about it; I'll draft something, Tom, but suggest it should be on our conference stationery and from the General Chairman.

**The China problem** Today, China is our biggest U.S. visa problem . . . I'm sure it will require special attention in 2010 as well. My remarks here might, in five years, help in other nations as well, depending on the geo-political situation.

The main problem is in the time it takes for a Chinese to get a visa from the US embassy (or consulates in other than Beijing), particularly if the applicant has no history of previous visits to the US. By the time our letters of invitation went out (after the paper selection process) and the persons secured their passport clearance from their own government (yes, I learned, they still need to have this release of themselves, on a case basis, even if they're holding a passport – so the timing isn't *all* "our fault"), the applications to our embassy for visa were made. This was in February and March. Then,

our embassy *routinely* assigned interview dates *that were after our conference dates*, 20 May was one case among the several who corresponded with me in April. I've been to the embassy in Beijing and visited with visa officers (in the past, about helping other Chinese get to the US, for graduate study, etc.) and know the absolutely cavalier unsympathetic manner exercised there . . . I saw one official say to a Chinese (not my charge) "to hurry up (with a form) . . . *chop-chop*" . . . can you imagine the use of this phrase in such a setting? Anyway, with such interview dates assigned, I called the "China Desk" of our state department (Tom, you had had an earlier success in moving visas by this contact), dealt with a Melissa Lan (at 202-647-8775). She was on vacation until 18 April, and in phone conversation that day, she seemed very encouraging, very helpful, telling me exactly what personal data she needed on the identity of each of the persons I was trying to help (there were just two at this time: CHEN Liping from Beijing Institute of Technology; and HE Ruilong from Hefei, the chairman of Radar-2006): the name in pinyin as on the passport, the DOB, the passport number and date of issue, and the place and date of the scheduled interview. I had this in both cases, emailed the same (as instructed) to lanmj@state.gov . . . and never heard another word from her. A week later I called, left a "I'm not trying to hassle, but did I supply you all that you need" type call on her answering machine (that's all you get there these days, voice mail); called similarly once again before the conference. All futile, no response at all.

We should have a large delegation from China. In previous years, we've had ten or more in the delegation with some coordination by the CIE (eleven in 1995, I think; perhaps it was 1990), with some further coming NOT known to the CIE. China is a large (one fifth the world population) and vitally important country, emerging very strongly economically and technically. An "international" conference in such a field as radar with such a paltry participation by China is indeed disappointing. Professor He tried after the conference to continue his visa application, to come to confer with you, Tom, and myself and targeting our follow-up meeting of 29 June. My last indication (a week ago) was that his interview was held, and now his application has been sent to our State Dep. in the USA to see if "technologically sensitive" material is involved in his coming. I don't know if he will visit the USA and us this summer or not; more to the point, I have no idea what this portends for 2010.

The committee may wish to consider some alternatives:

- a year in advance, work on a group-arranged set of papers from China, solicited and coordinated by the IEEE China section, which is the same offices and persons as the Chinese Institute of Electronics, their professional society (Zhou Mengqi, the Deputy Secretary General at mqzhou@public.bta.net.cn)
- work with the China Desk of our State Department on the above strategy (the coordinated group participation) or, if that strategy is not used, on readying in *some* way the visa services for our applicants individually, and doing so perhaps SIX MONTHS before the conference
- if the year-early group idea is not used, there must be a spin-off early

of acceptance of papers AND ISSUING LETTERS OF INVITATION, say, six months in advance of the conference, minimum!

Clearly, our war on terrorism has had a slowing effect; this will affect the visa processes in middle-eastern countries, or countries by 2010 identified as having extremist threatening elements. The China situation is more caught up in our "partner or competitor" uncertainty with this giant country. Obviously, the international liaison chairman for 2010 must adapt our processes to the situation in those years, 2008+. In general, TIME is important, so the count-down schedule for Radar-2010 must make allowances for these extra and early efforts to have participation from visa-troubled countries.

### **Other Conference Matters**

This potpourri of items will conclude my too-lengthy report.

Duration Program duration of three-days is correct, should never be longer. Technical tours, tutorials and tourist activity extending beyond is OK, of course.

Posters I think we had too many. It's still a good (some prefer it) vehicle, having it in exhibit area I thought worked fine, benefits both (wasn't that so?). Poster presenters should be at their position for the full "half-day" period, with, of course, "be right back" signs permitted.

Number of papers I think we have too many. We should by all means stick to our maximum of two parallel sessions, and say eight or ten posters each for four half-day periods; 150 papers total. We ought to raise even higher our standards of acceptance. If accepting more papers is seen as a way to increase attendance, then we ought to work harder on suggesting people come to learn, and should come even if not presenting a paper. Accepted authors could be encouraged to bring colleagues, maybe this attendance strategy could be promoted more effectively at the VP or TD level of companies, institutes and laboratories.

The record I think (and many agree) we should continue producing the printed version (with CD, of course!). The panel is wrestling with this now, since surplus remains a problem, buy-back support having changed. Maybe, print to order for those indicating in registration they WANT a printed record is a way to go. Again, the panel will deal with this, the committee in 2010 should follow that panel guidance, of course. Also, I think the bio-sketches are a good part of the record . . . are they in the CD? I haven't looked . . . will we once again print bios in 2010?

The tutorials I think they are still a winner, our "university". Surely by 2010, this feature of conferences will not have become too stale. If we continue, then, I think the DOUBLE presentation with encouragement for registrants to pick "a curriculum" (sets of classes, choosing eased by the schedule flexibility of repeated presentation) remains a great feature, unique to our conference.

Sign and schedule coordination Tutorials brought this to mind: we had confusion on starting times; can't be allowed.

Study center I think this was successful, I saw it used by enough to make it worthwhile. I genuinely enjoy seeing people glance through a book or journal or such that I had loaned to this room. I hope we will do it again. We can see in 2010 if it still should be the Fred Nathanson Memorial . . probably still OK, in that the award made by the IEEE will still be that . . but I mention it only because time marches on and this association will one day end. On location, John Paul Berry's admonition (he the first and succeeding chairman of the study center) that a remote location is not good, while exaggerated, was basically right! I think its location needed to be same level (*somewhere*) as the sessions and other activity.

Exhibits I assume we did well on this this year. I've long since overcome my reluctance to even *having* exhibits – I offered protests years ago that we were not running a "trade show" like the boat show or such, beneath the dignity of a technical conference of a learned society. HOWEVER, pass the crowd. I think they're great, and a real contribution to the community, to link our engineers to these representatives (companies, labs, publishers), just great.

Hotel I think the Crystal Gateway Marriott is a very good choice. Location is vastly superior to the Seminary Road of 1995 and 2000. The facility is fine. I assume our business arrangement was satisfactory; Tom, you do such good negotiating, I'll be anxious to hear your appraisal of the hotel from that perspective.

Opening session, luncheon and banquet activity I think we have too much of a US military tone to the opening session. I am not ignorant of the dependence upon that sponsorship, but we need less provinciality in this international conference and a better balance of the military AND CIVIL uses of radar, and a not-so-US oriented display. Let's work harder on our opening session. As to luncheons, I think we ought to go back to NO program at each lunch with only a very limited announcement set, if necessary. As to the banquet, I think it went well, many awards (perhaps Fellows ought to have just a word or two of thanks, etc. at the microphone). Again, I think a distinct international tone is important for that speaker, or a subject of broad interest (space flight matters, all nations involved . . some astronomy or cosmological subject, personage). Well, these are just miscellaneous thoughts.

Totes I'll end my long report by this profound matter: I think plain canvas bags of a cheerful color and silk-screened logo, even without a zipper top, are vastly much better than the cumbersome dismal-black assembly of pockets, netting, plastic clasps and straps that we supplied. A pocket for one's own business card on the outside is a nice feature (avoids lost bags), but, you see, one's name can be penned easily on white canvas.

Well, Tom, at long last my report is over. I hope its inclusion in some sort of a notebook for the 2010 committee will be of some value. In many of the things I mentioned in the first part of this report, International Liaison, I will certainly be available to help with initial contacts abroad and the like. Obviously, I prefer that some other and younger person be named to this important responsibility, but I know my more than thirty-five years of cultivating overseas contacts will provide a resource for the "new" person. I'm pleased with the way the members of the Radar Systems Panel have contributed (so well!) to the committee, and that involvement should be exploited for its international aspects in 2010. The persons *other than myself* who are in a good position to either be the successor chairman or to assist him include Hugh Griffiths in London, Mark Davis in New York, some others no doubt. Both Hugh and Mark are very much on top of international activities generally and attend the "series" of conferences frequently. I regret that neither lives in the Washington, D.C. area (I strongly believe this conference should remain in the Washington area in its conduct), but that hasn't been too much of a hindrance. In the years leading to 2010, I will be particularly alert to others who, like Mark and Hugh, could well serve in that way.

My report would not be complete if I failed to mention that wonderful contribution given to our organization and conduct of the conferences these many years by Jackie Hunter. I've no idea if she will want to continue into 2010 – I hope that she would, what a wealth of experience she brings to us – but we should provide ringing endorsements of her participation to Jim Armitage and others of the prospective committee; Jackie's help has been just marvelous.

Now I add my personal congratulations and thanks to you, Tom, for the outstanding leadership you have brought to the conferences over these two decades. Your combination of talents toward the running of the conference itself and the dealing with all the necessary support structure – the hotel involved, other services we engage – is quite rare, I think, and we all personally and the IEEE, both in its academic purpose and in its financial interests, have profited greatly from your hard work. Thanks again, Tom, and sincere congratulations for your performance in our most successful enterprise.

## **STUDY CENTER COMMITTEE**

Matt Bechta, Chairman

We had a total of 122 visitors to the study center (39 - Tuesday, 52 - Wednesday, 31 - Thursday). The hours before lunch were busier than the evening. While several of the visitors did browse the books the majority of those that made the trek upstairs to the center did so in order to use the computer we had set up there to check their email accounts or do research. The DVD we featured was probably only viewed by 6 or 7 people but those that did enjoyed the presentation and wanted to know where they could get a copy.

Suggestions for next time would be to: 1) have the library closer to the actual conference, and 2) have at least one more computer available for attendees to use.

## Tutorial Committee Final Report (Vince Aungier, Consultant)

### **What Was Accomplished**

We presented 15 tutorials starting Monday afternoon 9 May 2005 through Thursday evening 12 May. By our count, 208 students took a total of 475 courses (475 student-courses). Foreign students accounted for 32% of the “student body” (67 of 208).

The organization of these tutorials followed in the notion of a “Radar University” that was introduced by the RADAR 2000 Tutorial Chairman R.T. Hill. We started the week with basic and “pre-requisite” courses, and we moved gradually to intermediate, advanced, and specialty courses.

The tutorials, tutors for each, and the level of instruction are listed below. A subsequent list shows the number of students per each tutorial.

Tutorial A: Introduction to Radar Systems (Basic)

Dr. Eric Evans – MIT/LL

Geordi Borsari – MIT/LL

Tutorial B: Principles of Ultra-Wideband Impulse Radar (Basic)

Professor Malek G. M. Hussain – Kuwait University

Tutorial C: Radar Cross Section (Basic)

Dr. John Shaeffer – Marietta Scientific, Inc.

Tutorial D: An Introduction to Electronically Scanned Radar Systems (Intermediate)

Professor Chris Baker – University College, London

Tutorial E: Tracking and Kalman Filtering Made Easy (Intermediate)

Dr. Eli Brookner – Raytheon Corporation

Tutorial F: Principles of SAR (Intermediate)

Marian Werner – DLR German Aerospace Center

Tutorial G: Smart FM/CW Radar Systems for Automotive Applications (Intermediate)

Professor Hermann Rohling – Technical University Hamburg-Harburg

Tutorial H: Radar Waveforms: Analysis and Design (Intermediate)

Dr. Nadav Levanon – Tel Aviv University

Tutorial I: Principles of Bistatic Radar (Intermediate)

Dr. Hugh D. Griffiths – University College, London

Tutorial J: Radar System Performance Modeling (Basic)

G. Richard Curry – SAIC, retired

Tutorial K: STAP Detection Theory (Intermediate)

Dr. J. Scott Goldstein – SAIC

Dr. Michael Picciolo – SAIC

Tutorial L: Space-Based Radar (Intermediate)

Dr. William Melvin – GTRI

Tutorial M: Radar Clutter Modeling (Advanced)

Dr. Pierfrancesco Lombardo – University of Rome “LaSapienza”

Dr. Maria Greco – University of Pisa, Italy

Dr. Alfonso Farina – Alenia Marconi Systems, Italy

Tutorial N: Applications of Synthetic Aperture Radar (Advanced)

Dr. Leslie Novak – ALPHATECH, Inc.

Tutorial O: Knowledge-Aided STAP: (Advanced)

Dr. Joe Guerci - DARPA

### Attendance

Tutorial	#students	1 <sup>st</sup> session	2 <sup>nd</sup> session
A	45		
B1,B2	24	14	10
C1,C2	15	11	4
D1,D2	35	23	12
E1,E2	43	27	16
F1,F2	40	25	15
G1,G2	17	11	6
H1,H2	54	34	20
I1,I2	25	14	11
J1,J2	42	33	9
K1,K2	30	21	9
L1,L2	24	14	10
M1,M2	35	18	17
N1,N2	21	13	8
O1,O2	27	21	6

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477 total (475 by separate count)

32 average

Tutorial A was a six (6) hour course presented in two three (3) hour parts. A light buffet was served to students at intermission. Tutorials B through O were three (3) hour courses, each presented twice to offer students some flexibility in scheduling. Tutorials B through O were offered four (4) at a time in parallel. In turn, tutorials were presented in parallel

with theater and poster paper sessions. Thus, we offered 29 presentations in eight (8) time slots over a period of five (5) days.

Northrop Grumman provided hard-copy tutorial notes and a master tutorial CD ROM. SAIC provided copies of the tutorial CD ROM, and we distributed both hard-copy notes and a CD ROM to each of our students. In deference to an MIT/LL policy that precludes an after-sale of their tutorial material, Tutorial A notes were **not** included on the tutorial ROM.

Committee member Bob Gregorits continues to coordinate with Sharon Strock of the IEEE for the award of CEU units. He has forwarded from our Webmaster to Sharon a list of students, the tutorial (s) taken by each, their addresses (both postal and E-mail), and their telephone numbers.

### **Problem Areas**

I suspect every International Radar Conference has a “surface” analogous to the ambiguity surface well known to waveform designers. The number of “glitches” in any conference cannot be reduced below some fixed constant.

For some reason unknown to the Committee, Tutorial I did not make the tutorial CD ROM. Tutorial H is twice presented, once following the cover page for Tutorial I. Tutorial I has been posted on our Website.

Three (3) sections of Tutorial A hard-copy notes were somehow not produced prior to the Conference. It necessitated a run to Kinkos, and copies were available to Tutorial A students at the Conference registration desk. Additionally, Professor Hussain requested, and we provided, some supplementary hard-copy tutorial material.

The undersigned 1<sup>st</sup> scheduled tutorials to coincide with theater paper presentations, and I provided these presentation times to the Chairman of Arrangements. She, in turn, arranged for the Tutorial Committee’s posters. The Program Committee subsequently changed the scheduled presentation times, and the undersigned failed to feed back to the Arrangements Chair. Thus we had posters with conflicting information relative to the tutorial schedule.

As a general observation, the Conference Committee relied more so than ever previously on electronic communications between committee members. The breakdowns occurred at the interfaces.

### **Lessons Learned**

The Tutorial Chairman needs to be certain to organize a list of “backup” tutors and tutorial material in the early planning stages. We experienced a couple of dropouts, and their replacement was somewhat a scramble.

## **Recommendations For RADAR 2010**

We could profitably employ a larger volunteer staff.

We should be certain to provide each tutor with a pointer (laser pointer preferred).

## **Appreciation**

The Tutorial Chairman extends thanks to R.T. Hill for assistance during the Conference and for counsel relative to potential tutorial topics, tutors, and other matters over the course of the planning stages.

Again for counsel in the early planning, I thank Mike Dorsett of the US Army SMDC who served as the Tutorial Chairman for the 2003 IEEE Radar Conference.

Beyond all, I'm indebted to Bob Gregorits for his assistance during the planning, his assistance during the Conference, and for the exacting attention he has given to our coordination with the IEEE relative to CEU awards

## **Summary of Key Lessons learned**

General Chairman's Note: Virtually all of the problems encountered by the Committees were transparent to the Attendees. Attendee feedback was very favorable and the problems solved by teamwork and cooperation.

- Establish the website at least one year out
- Drive potential attendees to website via post card mailings
- Utilize website for everything: paper selection, hotel reservations, conference registration, committee communications
- Proofread everything with at least three sets of eyes
- Multicolor complex logos drive up the cost when imprinting
- Publicity, the weakest area of the Conference, requires much up-front pre-planning.

As always, advance planning, attention to detail, and being fortunate to work with a first class Management Committee will lead to a successful conference.

Tom Fagan  
General Chairman  
RADAR 05