



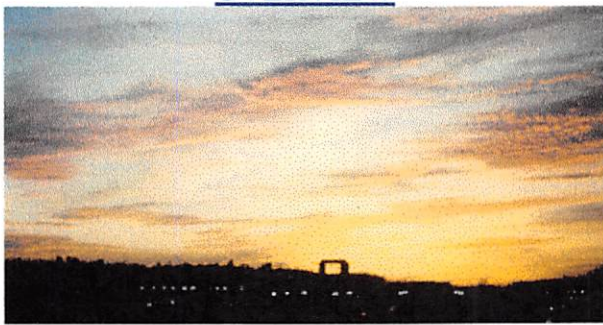
# ***AUTOMATIC RF TECHNIQUES GROUP***

## **CONFERENCE NEWSLETTER**

**FALL 2001**
**NUMBER 26**

### **The 58<sup>th</sup> Conference** *RF Measurements for a Wireless World*

#### OVERVIEW

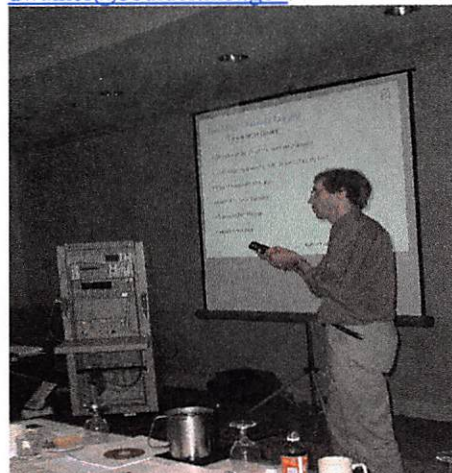


San Diego, California provided a very enjoyable setting for the 58<sup>th</sup> ARFTG conference, held on November 29<sup>th</sup> and 30<sup>th</sup>. This conference offered a two-day technical program and a demonstration of Bluetooth technology. A complete listing of the papers presented is available in the conference digest and also on the ARFTG website at [www.arftg.org](http://www.arftg.org). Conference Chair Brian Pugh and Technical Program Chair J. Stevenson Kenney put forth considerable effort to ensure an outstanding conference.

#### SHORT COURSE

The 8<sup>th</sup> annual NIST/ARFTG Microwave Measurements Short Course was given on November 27<sup>th</sup> and 28<sup>th</sup> at the Double Tree Hotel in San Diego, California. This one and a half day course offers an excellent introduction for those new to the field or review for those who wish to expand their knowledge on a wide variety of topics germane to high frequency measurements. The course material included: microwave measurements overview; circuit theory; vector network analyzer, interconnects, IC test fixtures, probing, and RF connectors, on-wafer measurements, power, noise temperature, phase noise, load pull, digital modulation, time domain, wideband radio link modeling, simulation, and

measurement. The course organizers and instructors put forth considerable effort in keeping the presentations up to date. The goal of the course is to keep the first day focused on RF and Microwave measurement basics, while tailoring the second day to be in-line with the conference theme. The author benefited greatly when he took the course several years ago. Additional short course information is available on our website at [www.arftg.org](http://www.arftg.org) or by contacting the ARFTG Short Course Director, David Walker, at [dwalker@boulder.nist.gov](mailto:dwalker@boulder.nist.gov).



#### NonLinear Measurement Workshop

The 1<sup>st</sup> NonLinear Measurement Workshop was also held at the Double Tree Hotel on the afternoon of November 28<sup>th</sup>. The workshop covered recent developments in Load-Pull measurements, nonlinear network analysis, and prediction of system parameters from nonlinear measurements. Workshop organizers Dominique Schruers, K.U. Leuven, and Paul Tasker did a great job and we all are looking forward to attending the next workshop in Fall 2002.



## TECHNICAL SESSIONS



The technical sessions were held November 29<sup>th</sup> and 30<sup>th</sup> at the Doubletree Hotel, San Diego. These sessions discussed the conference theme as well as a number of other diverse subjects of common interest. Technical Program Chair J. Stevenson Kenney and Conference Chair Brian Pugh assembled an interesting program consisting of 17 presented papers and 6 poster papers. Topics included: Model Verification, Test Accuracy, Calibration, Metrology, and Nonlinear Measurements.

Selected by the conference attendees as the Best Technical Paper was "Network Analyzer Overview", presented by Doug Rytting of Agilent Technologies. The Best Poster Session was "Wideband Frequency Domain Characterization of High Impedance Probes" by Uwe Arz, Howard C. Reader, Dylan Williams all of NIST and Pavel Akabos of the University of Stellenbosch, South Africa. The Best exhibitor was Agilent Technologies.

## EXHIBITS



The exhibits area at ARFTG Conferences provides attendees with the opportunity to view some newly

developed products and to have in depth discussions with the suppliers about their test and measurement problems and needs. For additional information please contact Exhibits Chair Leonard Hayden at [leonard@cmicro.com](mailto:leonard@cmicro.com)

## AWARDS



The awards banquet was held aboard a dinner cruise boat in scenic Mission Bay. The evening included sparkling conversation, good food, and a great view. President Robert Judish announced the awards for the 57<sup>th</sup> conference. The Best Technical Paper was "Separation of the Nonlinear Source-Pull from the Nonlinear System Behavior", presented by Yves Rolain and co-authored by Wendy Van Moer, P. Crama, and Johan Schoukens of Vrije Universiteit Brussels. President Judish awarded certificates of appreciation to those who organized the 58<sup>th</sup> conference chair Brian Pugh, technical program chair J. Stevenson Kenney, and short course coordinator David Walker.

## DIGESTS AND COURSE NOTES

Digests and course notes from this and previous conferences are available for purchase. For additional information, visit our website at [www.arftg.org](http://www.arftg.org) or contact Jim Taylor, the ARFTG Executive Secretary, at [jtaylor@blitz-it.net](mailto:jtaylor@blitz-it.net).

## MICROWAVE MEASUREMENT STUDENT FELLOWSHIP

ARFTG has an ongoing Microwave Measurement Student Fellowship Program. The purpose of this fellowship is to recognize and provide financial assistance to graduate students who show promise and interest in pursuing research related to improvement of radio frequency and microwave measurement techniques. One or more \$7500 awards may be granted each year, based on available funding and on the number and quality of applications received.



Applicants must have a bachelor's degree in engineering, physics or computer science and be enrolled as a full-time student in a graduate degree program at a suitably qualified institution of higher learning. Applicants must be carrying out research as part of the degree program, rather than just taking course work. The proposed research project must clearly involve RF/microwave measurements and be supervised by a full-time faculty member. The faculty advisor or supervisor must be an ARFTG member, or the proposal must be sponsored by an ARFTG member.

For more information visit our website at [www.arftg.org](http://www.arftg.org) or contact Jeff Jargon at [jargon@boulder.nist.gov](mailto:jargon@boulder.nist.gov).

### MEASUREMENT COMPARISON PROGRAM

The ARFTG Measurement Comparison Program allows participating laboratories to compare their measurements on the ARFTG standards kits to those obtained from other laboratories. Given the increasing emphasis on measurement assurance, this program provides a valuable, cost-effective method for validating the participant's measurement capability. This program is not intended to provide an uncertainty analysis but should give the participants more confidence in their measurement capability and assist in identifying measurement deficiencies. Data obtained from the participating labs are sent to NIST where the results are added to a database and a report is sent to the customer.

Connector	Contact
Type N	John Cable, Allied Signal
7 mm	Brian Lee, Agilent
3.5 mm	Phil Yates, JPL
Type K	Ron Guzman, Anritsu
2.92 mm	Ron Guzman, Anritsu
2.4 mm	Ken Wong, Agilent
7-16	Greg Burns, Northrop Grumman

#### **Calibration kits available in the Measurement Comparison Program**

For more information or to obtain a signup sheet visit our website at [www.arftg.org](http://www.arftg.org) or contact John Cable at [jcable@kcp.com](mailto:jcable@kcp.com).

### ANNUAL BUSINESS MEETING

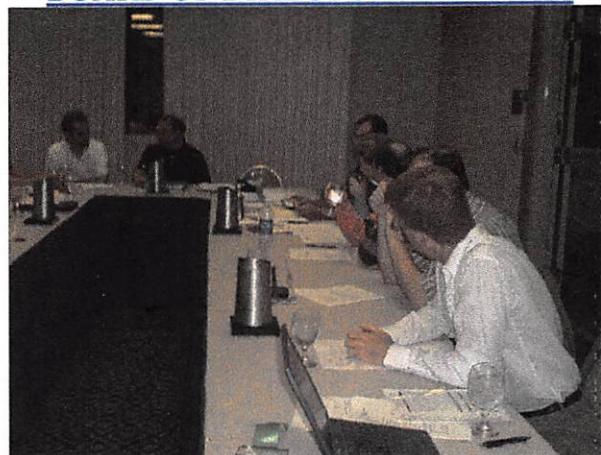
The annual business meeting, consisting of the membership present, was called to order by President Robert Judish.

An election was held for four members to serve on the Board of Directors. As currently constituted, the Board

of Directors is composed of twelve voting members each elected for a three year term. The six candidates were introduced to the membership. Biographies of the candidates were distributed with the conference materials and each member was asked to review them. The ballots were passed out, a vote requested and the ballots were collected. Brian Pugh, Greg Burns, Leonard Hayden, and Dylan Williams were each elected to terms expiring in Fall 2004.

John Cable was recognized to report on the ARFTG Measurement Comparison Program. Treasurer Ken Wong reported that the financial report of the organization is excellent and a balance sheet is available upon request. President Judish adjourned the meeting.

### BOARD OF DIRECTORS MEETING



The Board of Directors meets twice a year. During the Fall conference, the Board of Directors elects officers, as stipulated in the organization's bylaws. For the calendar year 2002: President Charles Wilker, Vice President Brian Pugh, Secretary J. Gregory Burns, and Treasurer Ken Wong. For a complete list of the ARFTG Board of Directors members and assignments, please visit our website: [www.arftg.org](http://www.arftg.org).

### FUTURE CONFERENCES

#### **59<sup>th</sup> ARFTG Conference**

The 59<sup>th</sup> ARFTG Conference will be held in conjunction with the MTT International Microwave Symposium (IMS). The ARFTG Conference will be held on Friday 7 June, 2002, at the Convention Center, in Seattle, Washington. The main conference theme is "*Test, Measurement, and Characterization of High Speed Digital Components and Systems*". Please contact either the Conference Chair Ed Godshalk of Maxxim Integrated products ([edg@mxim.com](mailto:edg@mxim.com) or (503)-641-3737 ext 1633) or the technical program chair Alfie Riddle of Macallan Consulting.



**9<sup>th</sup> NIST/ARFTG Short Course**

ARFTG in cooperation with NIST will offer its seventh annual Microwave Measurements Short Course in conjunction with the Fall 2002 ARFTG Conference to be held in Washington, DC. This popular two-day course provides both grounding in the fundamentals as well as the latest in measurement techniques taught by the experts. Basic measurement techniques are covered on Day 1, including: microwave measurement overview, circuit theory, vector network analyzers, test fixtures, on-wafer measurements, power, and noise. Additional in-depth topics are covered on Day 2, including: phase noise, load-pull, digital modulation, and time domain techniques. Several tutorials specifically related to the conference theme are also covered on Day 2. For more information, please visit our web site, [www.arftg.org](http://www.arftg.org), or contact the short course director, Dave Walker of NIST, ([dwalker@boulder.nist.gov](mailto:dwalker@boulder.nist.gov) or (303)-497-5490).

**60<sup>th</sup> ARFTG Conference**

The 60<sup>th</sup> ARFTG Conference will be held at the Madison Hotel, Washington, DC on 5 & 6 December, 2002. The main conference theme is "*Linear and Nonlinear Measurements and Instrumentation*". Please contact the Conference Chair Greg Burns of Northrop Grumman ([john\\_g\\_burns@mail.northgrum.com](mailto:john_g_burns@mail.northgrum.com) or (410)-765-7331).

**61<sup>st</sup> ARFTG Conference**

The 61<sup>st</sup> ARFTG Conference will be held in conjunction with the MTT International Microwave Symposium (IMS). The ARFTG Conference will be held on Friday 13 June, 2003 in Philadelphia, Pennsylvania. The Conference Chair is Charles Wilker of DuPont Superconductivity and the Technical Program Chair is John Cable of Honeywell FM&T.



Poster session is held in the breakroom

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National Institute of Standards and Technology