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The Pulse of Long Island

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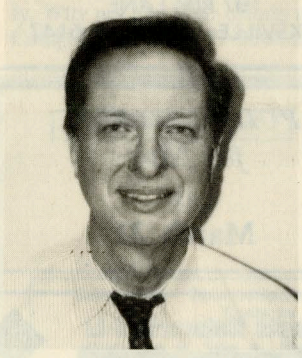
2921 SOUTH SIDNEY COURT
DENVER CO 80231

(USPS 450-540)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

MTT CHAPTER HOSTS TALK ON HIGH POWER MIXERS TO EXTEND DYNAMIC RANGE

The Long Island Microwave Theory and Techniques Chapter will sponsor a talk "*High Power Mixers Extend the Dynamic Range of Front-Ends With LNA's*" by Donald Neuf. The talk will be held at Polytechnic University, Route 110, Farmingdale Campus on Wednesday, March 13 at 6:30 PM in the auditorium.



Donald Neuf

Traditionally, low noise RF amplifiers (LNA's) are used to improve the minimum detectable signal level of any receiver front end, not limited by antenna noise. However, the increased RF gain often causes most existing second stage mixers to overload at high input signal levels, thus reducing dynamic range. More recently, MITEQ has developed MESFET double sideband and image rejection mixers that operate at the same local oscillator power as Schottky diode mixers, but provide typically 6dB higher input RF 1dB compression powers (P1dB). Furthermore, these passive mixers have low phase noise and third order intermodulation (IP3) products which are ideal quantities for "block downconversion" receiver architectures with high dynamic range IF digital signal processing (DSP).

The talk will describe designs for 1/4 to 1 watt input P1dB mixers from L to Ku Band with various RF bandwidths for communication, radar and EW applications. Furthermore, many of the designs used have termination independent IP3 performance and low RF and LO VSWR's. The required LO power for these mixers is from +10 to +30 dBm and is generally equal to the desired input P1dB.

Theoretical and practical MESFET mixer circuits will be reviewed and performance shown. In addition, recent harmonic and sampling mixer MESFET designs will be compared to similar designs using Schottky diodes.

Donald Neuf is the Department Head for the Special Mixer Products group at MITEQ Inc. He previously worked for AIL, General Microwave and JPL. He was also the Director of Engineering at RHG/M/A-COM. Mr. Neuf has published over 30 technical articles and has been granted 6 patents.

For further info and directions, call Michael Knox at (516) 872-4437 or Michael Hanczor at (516) 574-2607.

LONG ISLAND SECTION TO HOST AN INTERNET HOME PAGE WORKSHOP

This is a first announcement of a one day *Home, Home on the Web* workshop presented by Dr. Charles Rubenstein (Pratt Institute). Registration and continental breakfast will start at 8:30 AM with classes starting at 9:00 AM until 4:00 PM. Full detail of facilities and fee schedule will be announced in the April and May issues of *The Pulse*.

Abstract This workshop is designed to introduce participants to the Internet and the basics of HTML as applied to creating a simple World Wide Web home page. No prior internet experience is required, however, it is expected that the participants will have working knowledge of DOS and Windows 3.1. To be able to access the Internet, participants need to have use of, at the minimum: a 386 IBM PC-compatible computer operating with MS-DOS 5.0 and Microsoft Windows 3.1, with 4 megabytes of RAM and 4 megabytes of free hard disk space, and a 9600 baud modem.

Tentative Outline Brief history of the World Wide Web, Basic online setup and use of local (and/or Netcom) Internet provider services, Basic browser and e-mail capabilities, basic Netscape Navigator(R) download and setup techniques basic HTML language and web page examples, using an HTML editor, and live site visits and evaluation to illustrate home/web page construction techniques.

Home Page Wrangler Dr. Charles Rubenstein has a Ph.D. from the Polytechnic University and is currently an Associate Professor of Engineering and Information Science at Pratt Institute's School of Information and Library Science. As part of his Networks graduate course at Pratt Institute, he provides seminars and workshops on e-mail for a variety of organizations. He recently presented Internet seminars in Morocco, Africa, as part of a USIA Grant, and since 1994, he has been active in the IEEE as Region 1's (Northeastern United States) e-mail coordinator. He presented an overview of the Internet as a featured speaker at the Providence Section Annual Meeting. Last spring Dr. Rubenstein provided a successful seminar series on "*Multimedia Resources and Requirements for Electrical Engineers*" to members of the Long Island Section.

Information For further information or to provide comments, call Tom Campbell at (516) 757-3008.

CHAIRMAN'S MESSAGE

by Tom Campbell

1995 Activities Report

During the month of January, Section officers assembled the large amount of meeting and financial data to prepare annual reports for IEEE, Region 1, and METSAC. It is difficult to maintain our membership level in light of the lackluster economic environment on the Island. We lost approximately 12% of our membership in 1995 which has two impacts on the Section, it is difficult to maintain our programs and it reduces our financial base. Loss of membership reduces our IEEE dues rebate. Nevertheless, through employing several funding mechanisms, we continued to maintain a financially strong position.

The Section, through the dedication of committee and chapter chairmen, continued to provide a very active program for our members. Our program continues to provide a mix of technical, professional, educational and social activities. The section held more than 50 technical, professional, educational, administrative, and social meetings. Our major efforts were centered on 2 workshop series, two national and international symposia, and a tutorial.

The Section has eight active chapters and three chapters linked to other sections. The Long Island Section has 14 Societies with 50 or more members. Eight of these chapters; AES-10, AP-3, COMSOC-19, COMP-16, ECM-27, LEOS-36, MTT-17, and SP-1, have active programs on the Island. Three chapters (PES/IE, EMBS and VTS), are operated through other METSAC sections and their technical meetings are not held in Nassau or Suffolk Counties. Our eight active chapters held 30 technical meetings to provide members and non-members with opportunities to improve their technical skills or awareness in their fields of interest.

In addition to the technical programs, we have an extremely active Consultants Network organization, Employment Assistance Committee and an Economic Development Group.

1996 Goals

The Section and AIL have joined together to institute a Distinguished Lecturer Series. The first lecture will be presented by Dr. Ronald Fante of the MITRE Corporation on April 10th at AIL. The final details are being finalized and meeting publicity will appear in the next issue of *The Pulse*. These lectures will be presented in conjunction with our active chapters to augment their technical meetings. This is a very interesting activity to bring prestige to Long Island technical, industrial and academic communities.

Only seven of our societies have active chapters. Seven large societies have never had an active chapter to provide technical and educational programs. We would like to provide the same level of programs to these society members as are available to members in the eight societies with active chapters. We have identified four chapters: Circuits and Systems, Consumer Electronics, Control Systems and Engineering Management, as primary candidates to activate. Harvey Altstadter, Second Vice President, has been assigned the task of activating these chapters and stimulating and encouraging more programs be undertaken by our active chapters. This year provides us an opportunity and challenge to activate these chapters. We would like to get at least 2 of these society chapters activated.

We have a list of 23 technical colleges in Nassau and Suffolk Counties that have curricula supporting electrical engineering, computer sciences or electrical technology programs but are not associated with IEEE student activities. We would like to get at least two additional student chapters active this year.

We are developing several additional workshop series to be presented this year. The C/C++/GUI Seminar is an example of the educational programs. As other workshop plans mature, they will be publicized in *The Pulse*. We would appreciate suggestions for workshop from our members.

The Economic Development Group was initiated last year and has established a higher profile in our community. This program needs to be strengthened and expanded. The IEEE must focus on aggressively pursuing a program to influence the development, expansion or location of high technology companies on Long Island. Several new business activities areas have been identified to stimulate new business and have a greater influence in reducing the negative business environment.

An expanding program provides our members with several interesting challenges. To strengthen our program and achieve our 1996 goals requires members to become active. The engineering community is a reservoir of talent and expertise to assist local governments and other economic development organizations to build Long Island's economic future. If you are interested in improving the technical environment in which we work and live, the Section will provide you with plenty of opportunities to develop technical, leadership and networking skills. Please contact me at (516) 757-3008 to get involved in our future.

WANTED! ENGINEERS, SCIENTISTS, AND MANUFACTURING PROFESSIONALS

The Farmingdale High School Mathematics Research Group desperately needs you. We have 13 bright, enthusiastic honors students who need mentors to guide them in their research. If you are currently working on a project that includes some interesting problems that need to be solved and are willing to share them with someone, our people are just what you need. Our students are all enrolled in honors mathematics classes, up to and including calculus BC and some have experience in computer programming (BASIC and Pascal). They are superb problem solvers; many of them are on the "Mathletes" team which competes against other schools.

We need "real world" problems and interested professional problem solvers. We offer some of the nicest, brightest kids you'll ever meet. Please reach out to one of our students. It may well be one of the most rewarding things you'll ever do.

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PULSE Deadline
for **May**
is
March 31

30 YEARS AGO

by Rod Lowman, Historian

The Pulse printed a history of the Section's Professional Groups (forerunners of Societies) which included Automatic Controls, the Aerospace Electronic Systems Group (formed by the merger of Military Electronics, Aerospace and Navigation Electronics, Space Electronics and Telemetry, and Aerospace Support), Antennas and Propagation, Communications Technology, Microwave Theory and Techniques, and Electronic Computers. This increased the participation in the specialized groups.

Two of the groups (AO and MTT) sponsored a presentation on "*Optical and Semi-Optical Techniques at Millimeter Wavelengths*" by John Ramsey and Jesse Taub. John Ramsey described how the "quasi-optical" techniques developed by Hertz, Righi, Chunder, Bose, Zehnder, Garbasso, and Aschkinass, Cole, Hull, Lebedev, Lodge and others in the 1890s established a subject which was forgotten for over half a century. Jesse Taub described how "semi-optical" techniques contribute to a new generation of microwave components especially suited millimeter and submillimeter wave bands.

In reviewing the history of the Section, I am impressed at how durable many of the stalwarts of our membership are. Jesse, for example, for over 30 years has been extending the knowledge of micro and milli waves, developing filter theory, transmission line techniques, millimeter wave components and systems. He has inspired other aspiring engineers into the millimeter wave field where they too have become recognized experts. For years he headed the Central Research activities at AIL delving into the forefront of microwave electronics. And through all these years, he has continued to support the work of the Section and held major positions of responsibility in the national leadership of the MTT. Ever modest, Jesse continues to find and reward engineering excellence through his work with the Awards Committee for the Section.

It is ingenuity and persistence like this in our membership that has kept the Long Island Section in the forefront of IEEE activities nationally. Why not add your efforts to furthering the profession by calling Tom Campbell at (516) 757-3008 and telling him you would like to help.

DR. VICTOR LAWRENCE TO PRESENT KEYNOTE ADDRESS AT ELECTRO '96

Dr. Victor Lawrence, Director of AT&T Bell Laboratories' Advanced Communications Technology Center, will present the keynote address at the ELECTRO '96 conference on Tuesday, April 30 at 10 AM. Dr. Lawrence will discuss current developments in multimedia and digital signal processing environments. In his current position, Dr. Lawrence is involved with the exploratory development of multimedia products and services, including the processing, storage and transport of multimedia signals (data/video/audio/image) over wire and wireless networks.

The conference will update attendees on emerging technology issues in the fields of bio-medical systems, digital signal processing, electro-optics, telecommunications and wireless systems. The conference will also feature a new general interest track covering business issues and broad-based technology topics of interest to the show's audience of electrical and electronic design and manufacturing engineers as well as manufacturers' representatives, distributors, purchasing agents and general corporate management involved in the electronics market place.

Admission to the exhibit floor is $25.00. One day admission to the conference program is $150.00 ($95.00 IEEE and ERA member discount); and $275.00 for the three day program ($200.00 IEEE and ERA member discount) Early-bird registration discounts are also available.

The conference will be held at the Garden State Convention Center, Somerset, New Jersey, April 30th through May 2nd, 1996.

For information on attending or exhibiting, please contact Andrea Ericsson at (800) 322-9332.

REPLY TO AN ARTICLE IN JANUARY PULSE

by Robert Bruce, SM IEEE

I note in the January issue of Long Island *Pulse*, Irwin Weitman had an article with the sentiment that it's desirable to have universal registration. Universal registration means that all engineers who execute designs of products sold to the public, must have a P.E. license. Right now, there is an 'industry exemption' written into registration law, which permits companies producing products sold to the public to employ non-registered (non-P.E.) engineers to sign off their manufacturing drawings. On the other hand, only P.E.s can sign off drawings for construction projects, like bridges, dams, tunnels, etc. Therefore, except for companies turning out construction projects, there is no obligation to employ P.E.s, and employers are not likely to do so, if it raises costs. Ending the industry exemption is a prerequisite to universal licensure.

Since I am not a P.E., I hold no prejudice in favor of universal registration. Nevertheless I have to agree with Irwin Weitman. It would benefit the profession and the general public, if all engineers were registered. It would benefit the profession, because engineers would be accorded the respect that goes with licensure. Lawyers and nurses are all licensed, and the public acknowledges their expertise, as do their employers. Licensure is the hallmark of any profession. It would also benefit the profession, because it would act as a filter through which all entrants to the profession must pass. It might actually reduce the excessive number of engineers. We become aware of the surplus of engineers, when there are massive layoffs (like in the '90s), and the company continues to prosper without those laid off engineers.

Registration restrains the employer from compelling his staff to rush through designs and sign them off, without thorough checking. It empowers the engineer to act in the public interest, which, for a professional, is primary. A license implies that the holder is free to uphold the public interest.

It also benefits the public, in that it eliminates the employer's calling an unqualified employee an engineer. The profession would obtain control over the allocation of professional titles. Engineers would need a degree, and would have to have passed an entrance exam. Licensure elevates standards of entry. Can you imagine anyone defending a client in court or pulling a tooth, without a license to do so?

Note that licensure laws are statewide. Thus it would be necessary to change the law in 50 states, in order to have universal registration, which seems impractical. The only practical way would be to make a change in federal law that overrides 50 state laws. It is reasonable to expect massive resistance to such a change, from such organizations as National Association of Manufacturers, Electronic Industries Association, American Electronics Association, etc. The job to get federal law changed is difficult, but it seems worth the effort, if both the profession and the public benefit. What do you think?

AEROSPACE AND ELECTRONIC SYSTEMS CHAPTER TO HOST AN ELECTRICAL VEHICLES BATTERY MANAGEMENT PROGRAM

by Mr. Bob Drake and Joe Ambrosio

The LI AES Chapter will host a *BADICHEQ battery Management System* technical talk and component presentation by Mr. Bob Drake, President of Drake Associates and Mr. Joseph M. Ambrosio, President of Nescon Technologies, Inc. This meeting starts at 6:00 PM on Thursday March 21, 1996 at the Polytechnic University's Long Island Campus, Farmingdale. The speakers will display several battery management system components as well as battery installation photographs. Arrangements have also been made with Dr. Peter Voltz for an informal visit to Polytechnic's EV laboratory from 5:30 to 6:00 PM to discuss the KA1000.

Mr. Ambrosio will talk about near term, mid-term and long term battery technology. Mr. Drake will discuss battery technologies and battery management systems, particularly the BADICHEQ battery management system and the BADICHEQ battery management system and the integration in various vehicle platforms. It is a microcontroller based on-board unit which combines single battery measurement, including battery history monitoring and individual battery recharging by means of a small integrated charge. The patented hardware allows for high compactness and reliability. Using a charger with external current control capability, in combination with the patented charge procedure, yields a unique Cell Related Charging System (CRCS). The main charge current is controlled in such a way that none of the battery voltages rises above a specific limit, thus avoiding overcharging at high, nonrecombinable current. Incompletely charged cells are recharged individually by means of the BADICHEQ-integrated low power charger.

The BADICHEQ system is widely used in Europe and is installed in over 50 vehicles in the United States. It is the industry standard and many battery manufacturers extended their warranties when a BADICHEQ management system is installed in their pack.

Mr. Drake graduated with a BBA with a major in industrial management from Fairfield University, Fairfield Connecticut in 1963. He holds a patent #5,223,231 for Micro-Med Waste Treatment Process for hazardous, infectious and medical waste. He is Co-author ASTM paper 81-JPGC-PWR-13 on Power Station Condenser Cleaning Systems. He was a member of ARPA Consoreum Electrocore. Mr. Drake has extensive experience in business operations, management and sales/marketing. For over 16 years, he has specialized in developing U.S. market opportunities for European Industrial Corporation. He is involved in improving and developing U.S. market for a patented battery management system for the electric vehicle market. He is supporting the development of local EV workshop for installation and maintenance of EV components. He is working closely with research groups, battery manufacturers and automobile manufacturers to make EV a reality.

Mr. Ambrosio graduated with a B.S. degree in mechanical engineering from New York Institute of Technology in 1993. He is involved in EV conversions, ground up electrical vehicles, and hybrid EV systems with digital fuel management. He has developed new electric vehicle drive trains and new battery type installations and manipulations. He has been instrumental in developing thermal management systems for cold weather EV use and battery/EV safety equipment such as "Fault Finder", Current Leakage, and Hydrogen Sensing Systems.

The meeting is open and free of charge to the public. For information on this talk or to join the speakers for a post talk dinner, call Tom Campbell at (516) 757-3008.

IN MEMORY OF GEORGE MESSNER

Mr. George Messner had retired from the position of the Senior Scientist at PCK Technology, AMP-AKZO Corporation, Chadds Ford, PA in 1993. After graduation from New York City College with a BSEE degree, he joined Photocircuits in 1960 as Product Manager of the Multilayer Product Group and was responsible for establishing the first manufacturing facility for multilayer boards in the USA in 1961. From 1968 to 1971, Mr. Messner was Director of Process Research at Photocircuits, and later he became Manager of Technical Information at PCK Technology.

Mr. Messner authored over 150 technical papers and articles, presented and published internationally, covering electronic packaging trends and markets and printed board technology. He was co-editor of the first book on *Thin Film Multichip Modules*, published by ISHM in 1992. He was active in the IPC (Institute for Interconnecting and Packaging Electronic Circuits), where he chaired a number of Committees. In 1987, he received the IPC "Hall of Fame" Award and, in 1994, was awarded lifetime membership.

Mr. Messner was past Chairman of the Board of Directors, and past President of IEPS (International Electronic Packaging Society) and, in 1991, received the IEPS Achievement Award for his contributions to the field of Electronic Packaging.

Mr. Messner represented the United States as the Technical Advisor to the IEC/TC52 Committee on Printed Circuits, which set international standards and guidelines for these components.

He was a member of ISHM; the IEEE CHMT Society; the Packaging Committee of IEEE's Computer Society. He was a member of the Editorial Advisory Board of EP&P (Electronic Packaging and Production) magazine.

Mr. George Messner died on January 24, 1996 at his home in Sea Cliff, NY, at the age of 67.

PROFESSIONAL ACTIVITIES REPORT - March 1, 1996

by Irwin Weitman, P.E. **i.weitman@ieee.org**

The month's column applies to all engineers but recent graduates should pay special attention because you have a distinct advantage over your more experienced colleagues.

As you have all read in the press and in some of my previous reports the relationship between companies and employees has changed dramatically in the last five years. One of the results of "downsizing" has been the growth of "outsourcing." This is the process whereby a company purchases its manpower resources from another company. I read in a newspaper, several years ago, an extreme example of this. A large California defense company laid-off 7000 employees on one Friday afternoon. On the following Monday morning 3000 of them were back at their desks, but they no longer worked for the same company. They now worked for a job shop, for less salary and no benefits. I am sure there are many stories of similar situations that you have heard about. I recently heard of a company that was much more benevolent by not eliminating any jobs, improving the medical and retirement benefits and now all it's former employees (from the President on down) work for another corporate entity. I don't know what the long term implications of this process are, but "Times are different."

California is a strange place. Sometimes they are ahead of the rest of the country and other times ???? If you read my previous articles regarding professional registration and California you would know that in New York all professional registration is controlled by the New York State Board of Regents. In California it is controlled by the Consumer Protection Agency. All types of service providers must register, from Doctors to hair dressers to any kind of "Consultant." This has caused great turmoil for the last several years. An engineer who has an opportunity to work for a company as an independent consultant "May" or "May Not" have to be Registered. This battle is not yet settled. Many Engineers in California fear they may have to apply for a P.E. License and of course take the examination. I will let you fill in the rest of this story.

So how does this apply to you? Did you ever think of moving to California? Perhaps the same thing could happen here. Now we come to you recent graduates and those of you who still remember all the engineering basics you learned in college. Sign up for the "Engineer In Training" (EIT) Exam at your earliest opportunity. A minimum of study will be required to get that first part of the Exam behind you. There is no time limit on when you must take the second part. My youngest son was able to take the EIT in his senior year and is now signed up to take the second part in April of '96. (He must have a P.E. since he's a Structural Engineer.) Wouldn't it be nice if you could get your P.E. and have one less concern about your future? I assure you that having a P.E. makes you more attractive to any employer. If you want to become a consultant then the P.E. License gives you both professional and legal stature.

As far as other things you can do to secure your future in the world of outsourcing, keeping up to date and educating yourself is a plus. Unfortunately even the up to date engineers are not assured employment. As far as other things are concerned, your guess is as good as mine. If you have any suggestions you would like to share with me and your fellow engineers just send me an e-mail note and I will print it here.

If you are interested in the subject of outsourcing then go to Electro '96 on Wednesday, May 1, 1996. There is an afternoon seminar on "Outsourcing for Managers" that will prove useful to managers and employees alike. The speakers are members of the IEEE Consultants Network of Long Island.

The IEEE Long Island Consultants Network will meet on March 6th, 1996 at the LILCO Training Center at 131 Hoffman Lane in Hauppauge at 7:00 PM. The meeting will be entitled *"Visual BASIC (Release 4.0) and Add-ons"* and will be given by Dwight Pelzer.

EMBS TO PRESENT: "THE HYPERBARIC CHAMBER-CURRENT APPLICATIONS"

EMBS will present a talk on the current applications of the hyperbaric chamber on Thursday, March 21, 1996, at 7:15 PM at the Rockefeller University, room 305 Weiss (Tower), 1200 York Avenue in New York City.

Hyperbaric oxygen therapy has a number of distinct mechanisms of action. Due to its ability to improve tissue oxygenation it is an adjunctive therapeutic modality in a wide variety of clinical problems where local or systemic tissue anoxia contributes to the condition's pathophysiology. Hyperbaric oxygen therapy contributes to the mechanical compression of inert gas bubbles. Under specific conditions it may promote tissue healing by improving microvascular circulation. Hyperbaric oxygen is recognized as a primary treatment of choice for carbon monoxide poisoning, decompression sickness and air embolism. It may be beneficial in the treatment of osteoradionecrosis of the mandible and other radiation-related causes of tissue necrosis. It may have a role in the treatment of other intoxications including cyanide poisoning. It may also have an adjunctive role in the treatment of gas gangrene and refractory osteomyelitis.

A clinical review of the applications of hyperbaric oxygen therapy, its limitations and current use (and misuse) will be presented. Several areas of current clinical research will be reviewed.

The speaker will be Dr. Michael Touger. Dr. Touger received a M.D. degree from N.Y. Medical College in 1980. He is specialty board certified in Emergency Medicine and Family Practice and is an Assistant Professor in the Departments of Emergency Medicine, Family Practice, and Epidemiology & Social Medicine at the Albert Einstein College of Medicine in New York. He is the Associate Director of the Emergency Medicine Department at Jacobi Medical Center in the Bronx and Medical Director of its Hyperbaric Medicine Program. For more information please call Joel Levitt at (212) 479-7805 or Susan Baxt at (516) 678-6563.

MICROPROCESSORS AND SOFTWARE FOR THE NOVICE

The Long Island IEEE Section is presenting a five session (3 hours per session) training course "*Microprocessors and Software for the Novice*". It will be given at AIL Systems on Commack Road in Deer Park on five consecutive Thursday nights, from 6 to 9 PM beginning April 18, 1996.

This course is for engineers and managers who need a better understanding of the terminology, advantages, and pit-falls of today's microprocessor/software technology. It will also serve the needs of the entry level hardware or software engineer who can gain much practical knowledge based on the many years of experience of the engineer/instructor.

The instructor is Peter Buitenkant, MSEE, a software consultant and Chairman of the IEEE Consultants Network of Long Island. Mr. Buitenkant has been active in designing embedded microprocessor systems hardware and software since their introduction commercially in the early 1970's. He has designed systems based upon microprocessors developed by National, Motorola, Intel, Hitachi, Signetics and Intersil. He has shared his experience by teaching microprocessor courses since 1976 at Cardion, AIL, Litton Systems, Loral Systems, and Peterson Associates.

Content

I. Purpose of this course
   a. What you will learn: hardware / software
   b. Make or buy. Resist temptation to reinvent.
   c. What can the uP do?
      - Families
      - Abilities and constraints

II. Programming languages
   a. Comparison of strengths and weaknesses
   b. The software development process
   c. Software tools

III. Good programming practices
   a. Ego-less programming
   b. Defensive programming
   c. Test to make it fail, not to see if it works
   d. Multi-module, relocatable code
   e. Flowcharting - reference labels, language
   f. Comment why, not what; comment block

IV. Programming in assembler
   a. Write a program
   b. Assemble the program
   c. Link the modules
   d. Run the program in a simulator
   e. Time execution; examine size of object file

V. Programming in C.
   a. Write a program (same as the assembler)
   b. Compile the program
   c. Link the modules
   d. Run the program under DOS
   e. Time execution; examine size of object file

Development tools
   a. Simulators
   b. Logic analyzers
   c. In Circuit Emulators, demonstration.
   d. Conclusion - Q & A

Registration

Make checks payable to *IEEE Long Island Section* and mail to Babak Behesti, 101 Caffrey Ave., Bethpage, NY 11714; include your address, phone and fax numbers. For info call Don Grieco at (516) 488-8171. The fees for the training course are:

Payment date	IEEE member	Non-member	Student/retired/ unemployed
by April 12	$175	$250	$100
after	$225	$300	$150

WRI INTERNATIONAL SYMPOSIUM

on

DIRECTIONS FOR THE NEXT GENERATION OF MMIC DEVICES AND SYSTEMS

September 11-13, 1996, New York City

SECOND CALL FOR PAPERS

Microwave and millimeter-wave integrated circuits are becoming increasingly important in modern military and commercial communication systems. Current trends are towards low-cost, high-density, multilevel, and multifunctional integration, covering millimeter and submillimeter wave regions. The integration of diverse subfunctions, such as light-wave devices, superconductor circuits, digital circuits and ferrite devices, together with conventional microwave or millimeter-wave devices, circuits and antennas, would allow implementation of large systems on a single chip. Research on advanced device concepts, 3-D interconnects, high-performance packaging methods, advanced CAD-tools, measurement and testing techniques, as well as material and fabrication technologies, are being directed to meet the new challenges.

Continuing on our Weber Research Institute's series of symposia, we will host an international symposium on the recent developments and new research directions for the next generation of microwave and millimeter wave integrated circuits and systems. It will be organized as a 3-day symposium, running in a single-session format of regular papers, poster presentations and panel discussions. The symposium will be held in our CATT Auditorium located at the Metrotech Center, Brooklyn, New York. Hotel accommodations will be available in the Manhattan area, conveniently connected to the conference site by subways. The extended versions of the papers will be published as a bound volume by Plenum Press, New York.

The topics of interest cover various aspects of the following suggested areas:

- Components and Devices
- Novel Transmission Media
- Printed Antennas and Phased Arrays
- Multilevel Integration
- Interconnects and Packaging
- Multifunctional Integration
- Fabrication Technology
- Measuremet, Testing and Reliability
- Application Systems
- CAD Tools and Environment
- Analytical/Computational Techniques
- Guided Wave Effects and EM-Theory

TIME TABLE: • Final Call For Papers: **February 1995.** • Submission of One-page Summary: **March 30, 1996.** • Notification of Acceptance: **May 30, 1996.** • Extended Manuscript for Publication: At the Conference Registration.

Send two copies of one-page abstracts addressed to Prof. Nirod K. Das, Conference Co-Chair, 1996 WRI Symposium, Polytechnic University, Route 110, Farmingdale, NY 11735. For further information contact Tel: (516) 755-4228, Fax: (516) 755-4404, E-mail: ndas@prism.poly.edu.

Sponsor: Weber Research Institute, Polytechnic University, New York

Technical Co-sponsors: IEEE Microwave Theory and Techniques Society, IEEE Antennas and Propagation Society, in Cooperation with IEEE Long Island and New York Metropolitan Sections