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## CALENDAR OF EVENTS

For reservations call the IEEE office at 236-4609 (unless otherwise indicated)

COPY DEADLINE: FIRST OF THE MONTH

|      |       |                                                         |                                                        |                                                             |                                                      |
|------|-------|---------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| OCT. | 3     | "Local Management Systems"                              | Fox Valley Sub. (j/w Vehicular Technol. Grp.)          | The Tally-Ho Rest. 27W103 North Ave. (Rt.64), West Chgo.    | Social 6:00 PM<br>Dinner 7:00 PM<br>Meeting 8:00 PM  |
|      | 8     | "Concerto for the Horn Antenna"                         | Antennas & Prop./ Microwave Theory & Techniques Soc.   | Louis' Place 351 E. Lake Addison                            | Social 5:30 PM<br>Dinner 6:30 PM<br>Meeting 7:30 PM  |
|      | 9     | Monthly Meeting - ALL WELCOME                           | IEEE Executive Cte.                                    | Brown & Root Offices 2001 Spring Rd. Oak Brook              | Meeting 7:30 PM                                      |
|      | 10    | "Energy Management in Process Industries"               | Indus. Appls. Soc. (j/w Power Engrng. Soc.)            | Nielsen's Village 7330 W. North Ave. Elmwood Park           | Social 5:30 PM<br>Dinner 6:15 PM<br>Meeting 7:15 PM  |
|      | 18    | Speaker: Dan McCracken (subject to be announced)        | Computer Soc. (Call Ralph Wallace, 647-9000)           | Standard Oil Bldg. 200 E. Randolph Dr. (Cafeteria), Chgo.   | Social 5:30 PM<br>Dinner 6:30 PM<br>Meeting 7:30 PM  |
|      | 24    | "Controll. Electrostatic Damage to Electronic Circuits" | Reliability Soc. (Call Ray Schirmer, 647-8800, x 2718) | Holiday Inn Algonquin Rd./Rt.53 Rolling Meadows             | Social 6:00 PM<br>Dinner 7:00 PM<br>Meeting 8:00 PM  |
|      | 27    | Seminar-"Power Electronic Appls. in Power Systems"      | Power Engrng. Soc.                                     | Fermilab Kirk Rd. & Pine Batavia                            | 8:30 AM--5:00 PM                                     |
|      | 29-31 | NCF-NEC/79 (see ad on pg. 5)                            | Natl. Engrng. Consortium, Inc. 325-5700                | Hyatt Regency O'Hare River Rd./Kennedy Expressway, Rosemont | 8:30 AM--4:30 PM                                     |
| NOV. | 5-8   | COMPSAC Computer Software & Appls. Conf.                | Computer Soc. (Call Martha Evens, 567-5156)            | The Palmer House State & Monroe Sts. Chicago                |                                                      |
|      | 6-8   | MIDCON/79 (see ad on back pg.)                          | Chicago & Dallas Sections, Regions 4 & 5               | Hyatt Regen. O'Hare O'Hare Expo. Center Rosemont            | 9:30 AM--6:00 PM (6th & 7th); 9:30-5:00 PM (8th)     |
|      | 12    | To be announced                                         | Antennas & Prop.Soc.                                   |                                                             |                                                      |
|      | 12-13 | Chicago Fall Conf. on Consumer Electronics              | Chgo. Sec., BCCE (Call Bob Rockwell, 391-7678)         | Ramada O'Hare Inn 6600 N. Mannheim Rd. Des Plaines          | 9:00 AM--                                            |
|      | 13    | Monthly Meeting - ALL WELCOME                           |                                                        | Brown & Root Offices Oak Brook                              | Meeting 7:30 PM                                      |
|      | 14    | "Train Operations Recorder TOR 2"                       | Northwest Sub. (j/w Vehic. Tech. Grp.)                 | To be announced                                             |                                                      |
|      | 14    | "Sub. Fluids for Askarel in Power Transformers"         | Power Engrng. Soc.                                     | Stouffer's Rest. 32 E. Randolph St. 2nd Fl., Chicago        | Social 11:15 AM<br>Lunch 11:45 AM<br>Program follows |
|      | 28    | "Bubble Memory Technology"                              | Reliability Soc. (j/w Computer Soc., Circuits & Sys.)  | Holiday Inn Algonquin Rd./Rt.53 Rolling Meadows             | Social 6:00 PM<br>Dinner 7:00 PM<br>Meeting 8:00 PM  |



INTERESTED IN A NEW ELECTRON DEVICES GROUP?

All Chicago Section members who are interested in forming an Electron Devices Group should contact J. Clifford Torbert, Jr. Mr. Torbert is Principal Engineer, Components and Standards, Commercial Division of Honeywell, Inc., 1500 West Dundee Road in Arlington Heights 60004. His home phone is 870-5365; office 394-4000. The group would be concerned with the theory, design and performance of electron devices, including electron tubes, solid-state devices, integrated electron devices, energy sources, power devices, displays and device reliability.

"CONCERTO FOR THE HORN ANTENNA" AT APS MEETING

Guest speaker at the Antennas & Propagation/Microwave Theory and Techniques Society meeting on Monday - October 8, 1979 will be A. W. Love of Rockwell International. His talk will trace a little history of the horn radiator including single and multiple mode versions and will emphasize development, in the last decade of hybrid modes in horns with anisotropic walls. Currently an Associate Editor of the Transactions on Antennas and Propagation, Mr. Love is also editor of two IEEE reprint books titled Electromagnetic Horn Antennas, and Reflector Antennas. Social hour will be 5:30 PM, dinner 6:30 PM and meeting 7:30 PM at Louis' Place, 351 East Lake in Addison.

TECHNICAL BONANZA COMING THIS SEASON

Chicago Section, its chapters and subsections have scheduled 57 meetings for the 1979-80 season. Included are 44 technical presentations, three tours, one seminar, five conferences, two professional meetings and two social events. Nearly half of the schedule consists of joint meetings. Last season, 45 sessions were held. The schedule of page three of this issue was put together by Program Committee Chairman, Bill Everson of Commonwealth Edison Company for your planning convenience. Call us with your suggestions for other programs.

LEARN MORE ABOUT POWER SYSTEM ELECTRONICS

Come to the Power Engineering Society's seminar on "Power Electronic Applications in Power Systems" on Saturday - October 27, 1979 at Fermilab in Batavia. In one day you will hear about thyristor rectifiers and inverters, direct ac voltage control, static control of voltage and vars, performance of thyristor-controlled static and var systems, high voltage dc transmission, typical rectifiers, inverters and switches, plus interfacing with the utility. Included is an inspection trip of power electronic applications. Registration: \$35 (members); \$15 (students); \$40 (non-members). For more information, call Hank McGreer at Harza Engineering Company, 855-7072.

CFC TO BE HELD IN EARLY NOVEMBER "BEFORE THE SNOW FLIES"

The 1979 Chicago Fall Conference on Consumer Electronics will be held November 12 and 13. This annual IEEE sponsored event will present the latest developments in consumer electronics, innovated products, new semiconductor and microcomputer applications, and improved production technology. Guest speaker at the noon luncheon on the 12th will be Maurice St. A. Eley, Director Plessey U.I. who will speak on Consumer Electronics in Europe. Ramada, The O'Hare Inn is Conference locale at 6600 Mannheim Road in Rosemont. Registration will take place at 9:00 AM. For further information, call Bob Rockwell, 1979 Conference Chairman at Zenith Radio Corporation, 391-7000.

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|               | M                                           | T                              | W                                                          | T                    | F                                                |  | M                                    | T                                      | W                                                        | T                       | F                                                 |
|---------------|---------------------------------------------|--------------------------------|------------------------------------------------------------|----------------------|--------------------------------------------------|--|--------------------------------------|----------------------------------------|----------------------------------------------------------|-------------------------|---------------------------------------------------|
| OCTOBER 1979  | OCT 1                                       | 2                              | 3<br>FVS, VTS<br>"Local<br>Mngt.Sys."                      | 4                    | 5                                                |  | FEB 4                                | 5<br>RS, CAS<br>"Failure<br>Mech. ..." | 6<br>IAS/IECI,<br>TBA - VTS<br>TBA - PES<br>"Deep..."    | 7<br>CS<br>TBA          | 8                                                 |
|               | YOM KIPPUR                                  |                                |                                                            |                      |                                                  |  | 10/11<br>/PES Val-<br>entine<br>Nite | 12<br>EXEC. CTE.                       | 13                                                       | 14<br>VALENTINES<br>DAY | 15                                                |
|               | 8<br>AP/MTTS<br>TBA                         | 9<br>EXEC. CTE.                | 10<br>IAS/IECI,<br>PES "Ener-<br>gy Mngt..."               | 11                   | 12<br>HOLM                                       |  |                                      |                                        |                                                          |                         |                                                   |
|               | COLUMBUS DAY                                |                                |                                                            |                      |                                                  |  |                                      |                                        |                                                          |                         |                                                   |
| NOVEMBER 1979 | 15                                          | 16                             | 17                                                         | 18<br>CS, ACM<br>TBA | 19                                               |  | 18<br>WASHINGTON'S<br>BIRTHDAY       | 19                                     | 20<br>ASH WED.                                           | 21                      | 22                                                |
|               | 22                                          | 23                             | 24<br>RS, CAS<br>"Controll.<br>Electro..."                 | 25                   | 26/27<br>/PES Sem.<br>"Power Elec-<br>tronic..." |  | 25                                   | 26                                     | 27                                                       | 28                      | MAR 1                                             |
|               | 29                                          | 30                             | 31                                                         | NOV 1                | 2                                                |  | 3                                    | 4                                      | 5<br>FVS, AP/<br>MTTS "Radio<br>Astronomy"               | 6                       | 7                                                 |
|               | 5                                           | 6<br>MIDCON                    | 7<br>MIDCON                                                | 8<br>MIDCON          | 9                                                |  | 10<br>COM<br>TBA                     | 11<br>EXEC. CTE.                       | 12<br>PES - TBA<br>VTS - TBA                             | 13                      | 14                                                |
| DECEMBER 1979 | 12<br>FALL CONF.<br>AP/MTTS<br>TBA          | 13<br>FALL CONF.<br>EXEC. CTE. | 14<br>NWS, VTS<br>"TOR 2"<br>PES "Sub-<br>Fluids..."       | 15                   | 16                                               |  | 17                                   | 18                                     | 19<br>NWS, CS<br>"Micro,<br>Applica."                    | 20                      | 21                                                |
|               | 19                                          | 20                             | 21                                                         | 22                   | 23                                               |  | 24                                   | 25                                     | 26                                                       | 27                      | 28                                                |
|               |                                             |                                |                                                            | THANKSGIVING         |                                                  |  | 31                                   | APR 1                                  | 2<br>FVS, CAS,<br>CS "Spider"<br>Circuit De-<br>sign..." | 3                       | 4                                                 |
|               | 26                                          | 27                             | 28<br>RS, CS, CAS<br>"Bubble<br>Memories"                  | 29                   | 30                                               |  |                                      | PASSOVER<br>1 - 8                      |                                                          |                         | GOOD FRI.                                         |
| JANUARY 1980  | DEC 3                                       | 4                              | 5<br>FVS<br>"Fusion<br>Research"                           | 6                    | 7                                                |  | 7<br>AP/MTTS<br>TBA                  | 8<br>EXEC. CTE.                        | 9<br>IAS/IECI<br>TBA                                     | 10                      | 11<br>PES, IAS/<br>IECI-Tour<br>Edison,<br>Joliet |
|               | 10<br>AP/MTTS,<br>COM "Satel-<br>lite Coms" | 11<br>EXEC. CTE.               | 12<br>IAS/IECI,<br>EMB - TBA<br>PES "vacuum<br>Switchgear" | 13<br>CS<br>TBA      | 14                                               |  | 14                                   | 15                                     | 16                                                       | 17                      | 18                                                |
|               | 17                                          | 18                             | 19                                                         | 20                   | 21                                               |  | 21                                   | 22                                     | 23<br>-AMERICAN POWER CONFERENCE-                        | 24                      | 25<br>CHGO. SEC.<br>Recognition<br>Dinner         |
|               | 24                                          | 25                             | 26                                                         | 27                   | 28                                               |  | 28                                   | 29                                     | 30                                                       | MAY 1                   | 2                                                 |
| FEBRUARY 1980 | 31                                          | CHRISTMAS<br>JAN 1980<br>1     | 2                                                          | 3                    | 4                                                |  | 5                                    | 6                                      | 7<br>FVS, ASSP<br>"Acoustic<br>Speaker<br>Design"        | 8<br>CS<br>TBA          | 9                                                 |
|               |                                             | NEW YR. DAY                    |                                                            |                      |                                                  |  |                                      |                                        |                                                          |                         |                                                   |
|               | 7<br>IAS/IECI,<br>ISA<br>TBA                | 8<br>EXEC. CTE.                | 9<br>PES,VTS,<br>WSE "Rr.<br>Electri."                     | 10                   | 11                                               |  | 12<br>COM - TBA<br>APS/MTTS<br>TBA   | 13<br>EXEC. CTE.                       | 14<br>PES "Gas<br>Insula.<br>Substa."                    | 15                      | 16                                                |
|               | 14                                          | 15                             | 16<br>NWS, COM,<br>VTS "AM<br>Stereo..."                   | 17<br>CS<br>TBA      | 18                                               |  | 19                                   | 20                                     | 21<br>NWS, EMB<br>"Medical<br>Elec'nics"                 | 22                      | 23/24<br>FVS<br>Taur<br>ITT Corp                  |
| MARCH 1980    | 21                                          | 22                             | 23                                                         | 24                   | 25                                               |  | 26                                   | 27                                     | 28                                                       | 29                      | 30                                                |
|               | 28                                          | 29                             | 30                                                         | 31                   | FEB. 1                                           |  | MEMORIAL DAY                         | JUNE 2                                 | 3                                                        | 4                       | 5                                                 |
|               |                                             |                                |                                                            |                      |                                                  |  |                                      |                                        |                                                          |                         |                                                   |
|               |                                             |                                |                                                            |                      |                                                  |  | 9<br>AP/MTTS<br>TBA                  | 10<br>EXEC. CTE.                       | 11<br>VTS - TBA<br>18-19<br>BCCE SPRING                  | 12                      | 13<br>ELEC'NCS CONFERENCE                         |

ABBREVIATIONS

ACM - Assn. for Computing Machinery  
AP/MTTS - Antennas & Propagation/Microwave Theory & Tech. Soc.  
ASSP - Acoustics, Speech & Signal Processing  
BCCE - Broadcast, Cable & Consumer Electronics  
CAS - Circuits & Systems  
CHGO. SEC. - IEEE Chicago Section  
COM - Communications Society  
CS - Computer Society  
EMB - Engineering in Medicine & Biology  
FVS - Fox Valley Subsection

IAS/IECI - Industry Applications Soc./Industrial  
Electronics & Control Instrumentation  
ISA - Instrument Society of America  
NWS - Northwest Subsection  
PES - Power Engineering Society  
RS - Reliability Society  
TBA - To be announced  
VTS - Vehicular Technology Society  
WSE - Western Society of Engineers



# RELIABILITY PRESENTING MEETING ON ANTISTATIC PLASTIC FILM

"Controlling Electrostatic Damage to Electronic Circuits - An Overall View" will be given by Dan C. Anderson, Vice President, Richmond Division of Dixico, Inc. of Redlands, California. His presentation will cover the history, variety and uses of static-preventive methods, techniques and materials in the fields of electronics, explosives, clean-room and medical fields with emphasis on newly-developed techniques for preventing damage to static-sensitive electronic components and assemblies during assembly, handling and shipping.

In 1966, Dan Anderson joined Richmond where he developed an antistatic transparent plastic film for use in clean rooms to prevent the attraction of dust and to prevent static ignition of electroexplosive devices. This was followed in '67 by antistatic nylon. Both films have been used as the drapes for every major spacecraft flown since their introduction. Today, Richmond's antistatic plastic film is becoming the favorite method of static-damage prevention in the electronics world where components in computers were being destroyed by the static generated by almost all plastic in ordinary handling.

The meeting will be held on Monday - October 24, 1979 at the Holiday Inn located at Algonquin Road/Route 53 in Rolling Meadows. Social hour is 6:00 PM, dinner 7:00 PM and meeting 8:00 PM. For reservations and information, call Ray Schirmer, Reliability Chairman at 647-8800, extension 2718.

## 1979 STUDENT SCHOLARSHIP

The Chicago Section recently participated in the Engineering College Honors Program at the University of Illinois Chicago Circle. A student scholarship program, approved by the Executive Committee provides awards of \$500.00 each to Electrical Engineering students who have demonstrated competence by grade average and performance.



Michael Hammer is 1979 recipient of the student scholarship. Mike had a 4.6 average out of a possible 5.0. He is a member of the James Scholar Program and has worked summers at Argonne National Laboratory. Mr. John Waters, Past Chairman of the Chicago Section and Michael Barnes, Student Activities Chairman, presented a framed certificate to Mike (the \$500.00 check had been given him at the recent Recognition Dinner). Northwestern University and the Illinois Institute of Technology also participate in this scholarship program. The awardees are selected by the deans of their schools.

Pictured (left to right), John Waters, Michael Barnes, Michael Hammer and Henry Setton, Assistant Dean of the College of Engineering UICC and former Chairman of the Chicago Section.



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-Adv-

NATIONAL COMMUNICATIONS FORUM NCF/79

NATIONAL ELECTRONICS CONFERENCE NEC/79

OCTOBER 29-31, 1979

HYATT REGENCY O'HARE CHICAGO

Plan now to attend NCF-NEC/79 and participate in an outstanding engineering education program. The educational program will include eighteen New Technology Seminars; and an integrated 100 Paper Program covering a wide range of electronics subjects.

## SEMINARS

Digital Switching  
Software Reliability  
Microcomputer Architecture  
Extreme Value Engineering Techniques  
Microprocessors Applications  
Development of Software  
Fiber Optics  
Digital Exchange Systems  
Computer Architecture  
Human Factors Considerations  
Minicomputers in Real-Time Systems  
Managing the Software Team  
Telecommunications Switching Systems  
Impact of New Technology on Outside Plant  
Digital Switching: Analog Interface Design  
Data Base Management Systems  
Computer Network Systems  
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## TECHNICAL PAPER SESSIONS

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-adv-

ATTEND USAB WORKSHOP AT



Strengthen your technical career. Participate in one of the two workshops sponsored by the IEEE U.S. Activities Board. Dr. James J. Rago, Jr. will lead both sessions on Thursday, November 8 in the Ambassador Room of the Hyatt Regency O'Hare. The first session will be held from 9:00 AM to 12 noon; the second from 1:00 PM to 4:00 PM.

The addition of 3,000 new parking spaces will provide attendees with easy traveling to and from the O'Hare Exposition Center where the high-technology convention and exposition will be held on November 6-8. There will be available 1,020 spaces in the Caravelle Inn parking lot (one block south of the Center) and 2,000 more spaces in the Horizon lot (adjacent to the Sheraton-O'Hare on Mannheim Road). The Convention Center lot has a capacity of approximately 1,000 vehicles, giving MIDCON the capability of handling 4,000 cars. All visitors will receive a detailed map of the area. The Center has facilitated parking access by the installation of new signs and directions to the Exposition. A continuous no-charge shuttle bus service provided by the Convention Center will serve all parking locations. (See ad on back page.)



# Midcon—the electronic touch in Chicago



Touch, study, and explore the products, systems and ideas that will influence all our lives in the 1980's. Midcon is really *four electronics shows* in one, offering *500 exhibits* in four distinct groupings:

1. Instrumentation and control systems
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O'Hare Exposition Center/Hyatt Regency O'Hare • Chicago • November 6-8, 1979



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------|----------|----------------------------|----------|--------------------------------------|----------|----------------------|----------|-----------------|----------|------------------------|----------|------------------|----------|-------------------|----------|--------------------|----------|----------|----------|------------------------------|----------|-----------|----------|----------------------|----------|------------------------------|----------|----------------------------|----------|------------|----------|-------------------------|----------|----------------------|----------|-----------------------|----------|--------------------------------|----------|---------------|----------|--------------------------|
| <b>PERSONS UNDER 18 YEARS OF AGE NOT ADMITTED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                      | <b>CIRCLE ONE LETTER IN EACH BLOCK</b><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td><b>A</b></td><td>Corporate/technical management</td></tr> <tr><td><b>B</b></td><td>Design/specifying engineer</td></tr> <tr><td><b>C</b></td><td>Engineering/manufacturing technician</td></tr> <tr><td><b>D</b></td><td>Engineering services</td></tr> <tr><td><b>E</b></td><td>Sales/Marketing</td></tr> <tr><td><b>F</b></td><td>Purchasing/Procurement</td></tr> <tr><td><b>G</b></td><td>Educator/Student</td></tr> <tr><td><b>H</b></td><td>Active components</td></tr> <tr><td><b>I</b></td><td>Passive components</td></tr> <tr><td><b>J</b></td><td>Hardware</td></tr> <tr><td><b>K</b></td><td>Tools &amp; production equipment</td></tr> <tr><td><b>L</b></td><td>Computers</td></tr> <tr><td><b>M</b></td><td>Computer peripherals</td></tr> <tr><td><b>N</b></td><td>Control systems &amp; components</td></tr> <tr><td><b>O</b></td><td>Electro-optical components</td></tr> <tr><td><b>P</b></td><td>Enclosures</td></tr> <tr><td><b>Q</b></td><td>Instruments, indicating</td></tr> <tr><td><b>R</b></td><td>Instruments, control</td></tr> <tr><td><b>S</b></td><td>Mechanical components</td></tr> <tr><td><b>T</b></td><td>Microwave components &amp; systems</td></tr> <tr><td><b>U</b></td><td>Power sources</td></tr> <tr><td><b>V</b></td><td>Wire, cable &amp; connectors</td></tr> </table> | <b>A</b> | Corporate/technical management | <b>B</b> | Design/specifying engineer | <b>C</b> | Engineering/manufacturing technician | <b>D</b> | Engineering services | <b>E</b> | Sales/Marketing | <b>F</b> | Purchasing/Procurement | <b>G</b> | Educator/Student | <b>H</b> | Active components | <b>I</b> | Passive components | <b>J</b> | Hardware | <b>K</b> | Tools & production equipment | <b>L</b> | Computers | <b>M</b> | Computer peripherals | <b>N</b> | Control systems & components | <b>O</b> | Electro-optical components | <b>P</b> | Enclosures | <b>Q</b> | Instruments, indicating | <b>R</b> | Instruments, control | <b>S</b> | Mechanical components | <b>T</b> | Microwave components & systems | <b>U</b> | Power sources | <b>V</b> | Wire, cable & connectors |
| <b>A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Corporate/technical management       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Design/specifying engineer           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Engineering/manufacturing technician |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>D</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Engineering services                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>E</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sales/Marketing                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>F</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Purchasing/Procurement               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>G</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Educator/Student                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>H</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Active components                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>I</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passive components                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>J</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Hardware                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>K</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Tools & production equipment         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>L</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Computers                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>M</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Computer peripherals                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>N</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Control systems & components         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>O</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Electro-optical components           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>P</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Enclosures                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>Q</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Instruments, indicating              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>R</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Instruments, control                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>S</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mechanical components                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>T</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Microwave components & systems       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>U</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Power sources                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>V</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Wire, cable & connectors             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| <b>ENCLOSE \$3 CHECK WITH THIS COUPON FOR PRE-REGISTRATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| Please PRINT as you want shown on badge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |
| Name _____<br><div style="display: flex; justify-content: space-between;"> <span>FIRST OR INITIALS</span> <span>LAST</span> </div> Position _____ Telephone (OPTIONAL) _____<br><div style="display: flex; justify-content: space-between;"> <span>AREA CODE</span> <span>NUMBER</span> </div> Company/Organization _____<br>Address: Bus. or Home _____<br>City, State, Zip Code _____<br><div style="display: flex; justify-content: space-between;"> <span>SF</span> <span>STATE</span> <span>ZIP CODE</span> </div> |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                                |          |                            |          |                                      |          |                      |          |                 |          |                        |          |                  |          |                   |          |                    |          |          |          |                              |          |           |          |                      |          |                              |          |                            |          |            |          |                         |          |                      |          |                       |          |                                |          |               |          |                          |