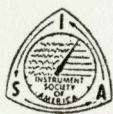
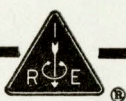


PROGRAM



12th ANNUAL CONFERENCE on

ELECTRICAL TECHNIQUES in

MEDICINE and BIOLOGY

HOTEL SHERATON, PHILADELPHIA 3, PA.

NOV. 10-12, 1959

CONFERENCE SCOPE

THE INTERACTION of non-ionizing forms of radiation with biological matter and advancements in electrical techniques in medicine and biology will be covered during the 11-session three-day program of the 12th Annual Conference on Electrical Techniques in Medicine and Biology. More than 40 papers will be presented in special sessions concerned with ultraviolet, infrared, microwaves and ultrasound. More than 20 additional papers will be concerned with cardiovascular techniques and instrument advances in the field of biomedical electronics.

ADDITIONAL COPIES of the *Digest of Technical Papers*, priced at \$4.00 per copy, may be obtained from H. G. Sparks, the Moore School of Electrical Engineering, University of Pennsylvania, 200 South 33d St., Philadelphia 4, Pa. Remittance should be made out to the order of: 12th Annual Conference, Electrical Techniques, Medicine and Biology.

ALL TECHNICAL SESSIONS will start promptly at designated hours.

EXHIBITS

AN EXHIBITION AND DEMONSTRATION of the latest electro-medical equipment and accessories are featured in the East Ballroom of the Hotel Sheraton.* Among those exhibiting are: Bell Telephone Manufacturing Company, Minneapolis-Honeywell Regulator Company (Heiland Division), Sanborn Company, Lester A. Dine Company, American Electronic Laboratories, Inc., Baltimore Instrument Company, Inc., Yellow Springs Instrument Company, Inc., Arthur H. Thomas Company, The Decker Corporation, Biophysical Electronics, Inc., American Edelstaal, Inc., Keithley Instruments, Inc., Veterans Administration, Electromedical Division—Moore School of Electrical Engineering—University of Pennsylvania, National Heart Institute-National Institutes of Health.

SHOW HOURS ARE:

Tuesday, Nov. 10—12:00 Noon—9:00 P.M.

Wednesday, Nov. 11—12:00 Noon—9:00 P.M.

Thursday, Nov. 12— 9:00 A.M.—12:00 Noon

REGISTRATION . . . TOURS

CONFERENCE FEES ARE:

Registration (General)	\$6.00
(Students)	2.00
Cocktail-Buffer (Nov. 11)	2.00

TOURS:

Tuesday P.M. (Nov. 10)		
Air Crew Equipment Lab.....		\$1.00
Wednesday P.M. (Nov. 11)		
Institute for Cancer Research.....		1.00
Thursday P. M. (Nov. 12)		
Electromedical Lab.—Johnson Foundation for Medical Physics, University of Pennsylvania		1.00
Friday—All Day (Nov. 13)		
RCA Labs—Princeton University, Princeton, N. J.....		2.00
Friday—All Day (Nov. 13)		
Naval Air Devel. Center, Johnsville.....		2.00

CONFERENCE COMMITTEE

Chairman: Dr. Herman P. Schwan, University of Penna.
Secretary: Dr. Duncan A. Holaday, University of Chicago
Treasurer: George Barnes, Barnes Development Company
Program: L. E. Flory, RCA Laboratories
Publicity-Exhibits: Carl Berkley, Rockefeller Institute
Local Publicity: Joseph Fisher, Philco Corporation
Local Arrangements: John Reid, H. G. Sparks and Prof.
 O. Salati, University of Pennsylvania
Registration: Matthew Conrad, Consultant
 Elizabeth Brown, Decker Corporation
Exhibits-Publication Manager: Lewis Winner, Consultant

JOINT EXECUTIVE COMMITTEE

Chairman: Dr. H. P. Schwan, IRE-AIEE
Vice-Chairman: Dr. R. L. Bowman, ISA
Secretary: Dr. D. A. Holaday, ISA
Members: Dr. Otto H. Schmitt, IRE L. E. Flory, IRE
 Carl Berkley, IRE L. G. Cumming, IRE
 R. S. Gardner, AIEE G. C. Riggle, AIEE
 H. S. Kindler, ISA

The Joint Executive Committee acknowledges with pleasure the support of the Conference by the Rome Air Development Center of the Air Research Development Command, U.S. Air Force.

*Presence of displays or products on Exhibit Floor does not constitute an endorsement by the Joint Executive Committee.

TUESDAY, NOVEMBER 10, 1959

9:30 A.M. Opening Addresses—**H. P. Schwan,**
 Conference Chairman
J. H. Foote,
 President, AIEE

SESSION I: Ultraviolet Radiation I

West Ballroom

Chairman: J. Schultz,

The Institute for Cancer Research, Phila., Pa.

- 10:00 A.M. 1.1: **General Problems of Absorption Measurements in the Cell**
 B. Thorell, Karolinska Institutet, Stockholm, Sweden
- 10:45 A.M. 1.2: **The Application of Ultraviolet Absorbance Measurement to Problems in Cell Biology**
 George Rudkin, The Institute for Cancer Research, Philadelphia, Pa.
- 11:35 A.M. 1.3: **Evaluation of Radiation Change in the Ultraviolet Microscopy of Living Cells**
 Jerome J. Freed and James L. Engle, The Institute for Cancer Research, Philadelphia, Pa.

SESSION II: Cardiovascular I

Independence-Constitution Rooms

Chairman: Robert L. Bowman,

National Heart Institute, Bethesda, Md.

- 10:00 A.M. 2.1: **Phase Space Display of Vectorially-Resolved Electrocardiograms**
 Otto Schmitt, University of Minnesota, Minneapolis
- 10:25 A.M. 2.2: **A Comparison of the Arrival in the Cerebral Hemispheres of Intravenously Injected Radioisotope**
 W. H. Oldendorf, Veterans Administration Center, Los Angeles, California
- 10:45 A.M. 2.3: **Blood Flowmeter Utilizing Nuclear Magnetic Resonance**
 Robert L. Bowman and Vsevolod Kudravcev, Laboratory of Technical Development, National Heart Institute, Bethesda, Md.
- 11:15 A.M. 2.4: **Application of Magnetic Resonance Phenomena to Biological Problems Including Measurement of Blood Flow**
 J. R. Singer, Division of Electrical Engineering, University of California, Berkeley, Calif.
- 11:35 A.M. 2.5: **A Square-Wave Electromagnetic Flowmeter of High Sensitivity Suitable for the Measurement of Low Flows of Blood in Unopened Vessels**
 William M. Chardack, University of Buffalo School of Medicine and Veterans Adm. Hospital, and F. A. Giori, Cornell Aeronautical Labs, Buffalo, N. Y.
- 11:55 A.M. 2.6: **Electromagnetic Waves and Arterial Pulsations**
 Harry Lobel, Omaha, Neb.

SESSION III: Ultraviolet Radiation II

West Ballroom

Chairman: George Z. Williams,
National Institutes of Health, Bethesda, Md.

- 2:00 P.M. 3.1: **Biological Effects of Ultraviolet Radiation**
Max R. Zelle, Division of Biology and Medicine,
Atomic Energy Commission, Washington, D. C.
- 2:45 P.M. 3.2: **The Use of Television and Scanning Techniques
for Ultraviolet Irradiation Studies of Living Cells**
P. O'B. Montgomery, University of Texas South-
western Medical School, Dallas, Texas
- 3:05 P.M. 3.3: **Flying-Spot Techniques in Microscopy**
L. L. Hundley, University of Texas Southwest-
ern Medical School, Dallas, Texas.
- 3:35 P.M. 3.4: **Measurements of Reaction Rates in Living
Cells by Time-Lapse Ultraviolet Television
Microscopy and Oscilloscopy**
G. Z. Williams and G. C. Vurek, National In-
stitutes of Health, Bethesda, Md., and R. G.
Neuhauser, RCA, Lancaster, Pa.
- 3:55 P.M. 3.5: **Television Spectroscopy of Biological Fluores-
cence**
S. S. West and C. N. Loeser, Department of
Anatomy, School of Medicine, Western Reserve
University, Cleveland, O.

SESSION IV: General I

Independence-Constitution Rooms

Chairman: O. H. Schmitt,
University of Minnesota, Minneapolis

- 2:00 P.M. 4.1: **A Transistorized Portable Electronic Hematocrit**
Robert H. Okada and Herman P. Schwan, Elec-
tromedical Division, The Moore School of Elec-
trical Engineering, University of Pennsylvania,
Philadelphia, Pa.
- 2:20 P.M. 4.2: **In-Vivo Miniature Glass Dosimetry**
S. J. Malsky, C. Amato, B. Roswit, S. M. Unger,
C. B. Reid, C. Spreckels and M. Villazon, Vet-
erans Administration Hospital, Bronx, N. Y.
- 2:40 P.M. 4.3: **Measurements of Pathologically Significant
Primary Cosmic Particles**
dePaul J. Corkhill, Aeromedical Field Labora-
tory, Air Force Missile Development Center,
Holloman Air Force Base, New Mexico
- 3:10 P.M. 4.4: **Remote Open-Chamber Method for Breathing
Measurements in Hibernation Utilizing Ther-
mistors**
Samuel P. Battista, A. D. Little Co., Cambridge,
Mass., and Albert R. Dawe, Office of Naval
Research, Chicago, Illinois
- 3:30 P.M. 4.5: **Radio Telemetry of Whole Nerve Action
Potentials**
Roger M. Morrell, Montreal Neurological Insti-
tute, Montreal, Canada

Tour:*

2:00-5:00 P.M. Air Crew Equipment Laboratory

WEDNESDAY, NOVEMBER 11, 1959

SESSION V: Microwave Radiation I

West Ballroom

Chairman: George M. Knaut, USAF (MC),
Patrick Air Force Base, Fla.

- 9:00 A.M. 5.1: **Biological Effects of Microwave Radiation: A
Research Progress Report**
George M. Knaut, USAF, Cocoa Beach, Fla.
- 9:45 A.M. 5.2: **Review of Some Recent Research on the Whole
Body Effects of Microwaves**
Thomas S. Ely, Division of Biology and Medi-
cine, Atomic Energy Commission, Washington,
D. C.
- 10:35 A.M. 5.3: **Physical and Electrical Characteristics of a
Microwave Hazard**
Joseph H. Vogelman, Research and Develop-
ment, Dynamic Electronics-New York, Inc.,
Richmond Hill, N. Y.
- 10:55 A.M. 5.4: **Some Observations Regarding Temperature
Sensations Due to Microwave Irradiation**
E. Hendler, Air Crew Equipment Laboratory,
Naval Air Materiel Center, Philadelphia, Pa.,
and J. D. Hardy, Physiology Dept., School of
Medicine, University of Pennsylvania.
- 11:15 A.M. 5.5: **Characterization of the Thermal Response
Among Animals Exposed to Microwaves or In-
creased Environmental Temperature**
Sol M. Michaelson, Roderick A. E. Thomson and
Joe W. Howland, Department of Radiation
Biology, University of Rochester School of Medi-
cine and Dentistry, Rochester, N. Y.
- 11:35 A.M. 5.6: **Biological Effects of Pulsed Electromagnetic
(2880 MC) Irradiation**
Joe W. Howland and Sol M. Michaelson, De-
partment of Radiation Biology, University of
Rochester School of Medicine and Biology,
Rochester, N. Y.
- 11:55 A.M. 5.7: **Studies on the Behavior of Phantoms in Elec-
tromagnetic (Radar) Fields**
H. Mermagen, University of Rochester Atomic
Energy Project, Rochester, N. Y.

SESSION VI: Ultrasonic Radiation I

Independence-Constitution Rooms

Chairman: William J. Fry,
Biophysical Research Laboratory, University
of Illinois, Urbana, Ill.

- 9:00 A.M. 6.1: **The Absorption of Ultrasound in Biological
Materials**
Edwin L. Carstensen, U. S. Army Chemical
Corps, Fort Detrick, Frederick, Md.

9:45 A.M. 6.2: **Effects of Ultrasonic Irradiation on Hemoglobin**
Alfred Weissler, Laboratory of Technical Development, National Heart Institute, Bethesda, Md.

10:05 A.M. 6.3: **Ultrasonically-Induced Movements in Cells and Cell Models**
Hubert J. Dyer (Botany Dept.) and Wesley L. Nyborg (Physics Dept.), Brown University, Providence, R. I.

10:35 A.M. 6.4: **Method to Study Cell Suspensions—An Application of Colloidal Vibration Potentials**
Karl Sittel, Franklin Institute Laboratories for Research and Development, Philadelphia, Pa.

10:55 A.M. 6.5: **Ultrasonic Resonances of Simple Biological Cells**
Eugene Ackerman, Biophysics Laboratories, Pennsylvania State University, University Park, Pa.

SESSION VII: Microwave Radiation II

West Ballroom

Chairman: Herman P. Schwan,
Electromedical Div., The Moore School of Electrical Engineering,
University of Pennsylvania

2:00 P.M. 7.1: **Opacities in the Lens of the Eye Experimentally Induced by Exposure to Microwave Radiation**
Russel L. Carpenter, Department of Biology, Tufts University, Medford, Mass.

2:45 P.M. 7.2: **Analytical and Experimental Investigation of Unicellular Organisms Under Microwave Irradiation**
C. Susskind and P. O. Vogelhut, University of California, Berkeley, Calif.

3:05 P.M. 7.3: **Dielectric Constant and Conductivity of the Interior Erythrocytes and Pearl Chain Formation in Blood**
Herman P. Schwan and H. Pauly, Electromedical Division, The Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pa.

3:35 P.M. 7.4: **Relaxation Parameters of a Suspension of Membrane Covered Ellipsoids**
D. W. C. Shen and H. P. Schwan, Electromedical Division, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pa.

3:55 P.M. 7.5: **The Effect of Electromagnetic Fields on Unicellular Organisms**
John H. Heller, New England Institute for Medical Research, Ridgefield, Conn.

4:15 P.M. 7.6: **Bionegative Actions of Microwaves**
Victor T. Tomberg, Biophysical Research Laboratory, Elmhurst, N. Y.

4:35 P.M. 7.7: **Pearl Chain Formation**
J. F. Herrick, Rochester, Minn.

SESSION VIII: Ultrasonic Radiation II

Independence-Constitution Rooms

Chairman: Edwin L. Carstensen,
U. S. Army Chemical Corps, Fort Detrick, Frederick, Md.

2:00 P.M. 8.1: **Instrumentation, Techniques, and Mechanism of Action of High-Intensity Ultrasound in Fundamental Neurological Investigations and in Human Neurosurgery**

F. J. Fry, Biophysical Research Laboratory, Department of Electrical Engineering, University of Illinois, Urbana, Ill.

2:45 P.M. 8.2: **Techniques Used in the Ultrasonic Visualization of Soft Tissue Structures**

Douglass H. Howry and Joseph H. Holmes, Departments of Radiology and Clinical Medicine, University of Colorado Medical Center, Denver, Colo.

3:35 P.M. 8.3: **Ultrasonic Visualization of the Eye**
Gilbert Baum, Department of Ophthalmology, New York University Post-Graduate Medical School, New York City, N. Y., and Ivan Greenwood, New York University and General Precision Laboratories, Pleasantville, N. Y.

3:55 P.M. 8.4: **Gas Chromatograph Detector Based on Measurement of Sound Velocity**

Frank W. Noble, Laboratory of Technical Development, National Heart Institute, Bethesda, Md.

Tour:*

2:00-5:00 P.M. Institute for Cancer Research

THURSDAY, NOVEMBER 12, 1959

SESSION IX: Infrared Radiation I

West Ballroom

Chairman: E. Hendler,
Air Crew Equipment Laboratory, Naval Air Materiel Center, Philadelphia, Pa.

9:00 A.M. 9.1: **The U. S. Army Quartermaster Solar Furnace**
Eugene S. Cotton, U.S. Army Quartermaster Research and Engineering Center, Natick, Mass.

9:45 A.M. 9.2: **Radiant Heat Sources Employed in Thermal Burn Studies**
J. A. Carter, W. L. Derksen and T. I. Monahan, Naval Materiel Laboratory, N. Y. Naval Shipyard, Brooklyn, N. Y.

10:05 A.M. 9.3: **Measurement of Temperatures in Thermal Burn Studies**
T. I. Monahan, W. L. Derksen and G. P. delHery, Naval Materiel Laboratory, N. Y. Naval Shipyard, Brooklyn, N. Y.

- 10:35 A.M. 9.4: **Radiometric Technique in Skin Temperature Measurement**
E. Hendler, Air Crew Equipment Laboratory, Naval Air Materiel Center, Philadelphia, Pa., and J. D. Hardy, Physiology Department, School of Medicine, University of Pennsylvania
- 10:55 A.M. 9.5: **Penetration of Corneal Opacities With Infrared Electronics**
Joel Friedman, Brooklyn, N. Y.
- 11:15 A.M. 9.6: **Temperature Control in a Bio-Satellite**
K. L. Cappel, The Franklin Institute Laboratories for Research and Development, Philadelphia, Pa.

SESSION X: General II

Independence-Constitution Rooms

Chairman: L. E. Flory,

RCA Laboratories, Princeton, N. J.

- 9:00 A.M. 10.1: **Lighting Regimen and Experimental Method: Light-Synchronized Periodicity Analysis**
Franz Halberg, University of Minnesota Medical School, Minneapolis, Minn., and Cambridge State School and Hospital, Cambridge, Minn.
- 9:25 A.M. 10.2: **Control of Information Input by the Television Eye Marker**
E. Llewellyn-Thomas and N. H. Mackworth, Defense Research Medical Laboratories, Toronto, Canada
- 9:45 A.M. 10.3: **A Fully Automatic Primate Test Apparatus with Response-Contingent Stimuli**
D. G. McConnell, D. R. Meyer and J. E. Alt, Laboratory of Comparative and Physiological Psychology, Ohio State University, Columbus, Ohio
- 10:05 A.M. 10.4: **The Use of Punched Paper Tape in Animal Behavioral Testing**
Murray E. Jarvik, Department of Pharmacology, Albert Einstein College of Medicine, Yeshiva University, New York, N. Y.
- 10:35 A.M. 10.5: **A Simplified Analog Storage and Averaging System for Electroencephalographic Responses**
John F. Davis and W. R. D. Ross, Allan Memorial Institute of Psychiatry, McGill University, Montreal, Canada and H. A. Ferris, Sigma Technical Associates, St. Lambert, Quebec.
- 10:55 A.M. 10.6: **A Transistorized Bio-Tachometer**
Harve M. Hanish, Litton Industries, Los Angeles, Calif.

SESSION XI: Infrared Radiation II

West Ballroom

Chairman: J. D. Hardy,
School of Medicine,
University of Pennsylvania

- 2:00 P.M. 11.1: **The Predictability of Thermally-Induced Epidermal Injury**
F. C. Henriques, Technical Operations, Inc., Burlington, Mass.
- 2:45 P.M. 11.2: **The Temperature Response of Skin Exposed to Penetrating and Non-Penetrating Radiation**
Thomas P. Davis, Department of Radiation Biology, University of Rochester School of Medicine and Dentistry, Rochester, N. Y.
- 3:05 P.M. 11.3: **Some Thermal and Optical Properties of Rat Skin**
G. P. deLhery, W. L. Derksen and T. I. Monahan, Naval Material Laboratory, N. Y. Naval Shipyard, Brooklyn, N. Y.
- 3:35 P.M. 11.4: **Skin Simulants Employed in Thermal Burn Studies**
W. L. Derksen, G. P. deLhery, T. I. Monahan, Naval Material Laboratory, New York Naval Shipyard, Brooklyn, N. Y.
- 3:55 P.M. 11.5: **The Effect of Intense Thermal Radiation upon Textile Materials**
A. J. McQuade, U.S. Army Quartermaster Research and Engineering Center, Natick, Mass.
- 4:15 P.M. 11.6: **The Use of an Inanimate Skin Simulant in Evaluating Thermal Energy Transfer through Cloth to Skin**
Nai-Yuen Chen, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.
- Tour:*
- 2:00-5:00 P.M. **Electromedical Laboratory and Johnson Foundation for Medical Physics, University of Pennsylvania**

FRIDAY, NOVEMBER 13, 1959

Tours:*

- 9:00 A.M.-3:00 P.M. **Aviation-Medical Acceleration Lab, Naval Air Development Center, Johnsville, Pa.**
- 9:00 A.M.-5:00 P.M. **RCA Labs and Princeton University, Princeton, N. J.**

*See last page of this program booklet for highlights of these tours.

SPECIAL TOURS

12th ANNUAL CONFERENCE on ELECTRICAL TECHNIQUES in MEDICINE and BIOLOGY

1: Tuesday, Nov. 10, 2:00-5:00 P.M.

Air Crew Equipment Laboratory, Naval Air Materiel Center, Philadelphia, Pa.

THE LABORATORY is concerned with the design, research, and development of specialized protective equipment worn or used by pilots and space travelers. Present space research programs are concerned with studies of prolonged confinement, utilization of space suits under space flight conditions, and environmental training of *Project Mercury Astronauts*.

2: Wednesday, Nov. 11, 2:00-5:00 P.M.

The Institute for Cancer Research, 7701 Burholme Blvd., Philadelphia, Pa.

THE INSTITUTE does fundamental biological research. Demonstrations of the *vidicon* and flying-spot ultraviolet microscopes and an electron microscope, as used in cell studies, will be given.

3: Thursday, Nov. 12, 2:00-5:00 P.M.

The Electromedical Laboratory, University of Pennsylvania

THE ELECTROMEDICAL LABORATORY conducts electromedical and biophysical research. It specializes in the areas of linear electrical and acoustical properties of biological systems, and pertinent applications to biology and medicine. Current programs include structural analysis of biological systems by alternating current spectroscopy, biological effects of microwave irradiation, vector electrocardiography and ultrasonic visualization of heart wall movement.

Thursday, Nov. 12, 2:00-5:00 P.M.

**Johnson Foundation for Medical Physics,
University of Pennsylvania**

RESEARCH PROJECTS of particular interest at the Johnson Foundation are microspectrophotometry and microfluorimetry of respiratory enzymes localized within single living cells. There will be demonstrations of other techniques for the study of intracellular enzyme systems in a larger scale, which include low-temperature recording spectrophotometers, electron-spin resonance methods, temperature jump methods, and polarographic methods. Analog and digital computer representations of enzyme reactions will be demonstrated. The representation of ascites tumor metabolism will be demonstrated at the University Computer Center between 4:00 and 5:00 p.m.

4: Friday, Nov. 13, 9:00 A.M.-3:00 P.M.

**The Aviation-Medical Acceleration Laboratory,
Naval Air Development Center, Johnsville, Pa.**

THIS LABORATORY deals with the effects of acceleration on the human, and conducts supportive research in biology and physiology. The largest centrifuge in the U.S. is located here. Control of the centrifuge can be programmed on an analog computer to simulate space vehicle flight and problems on vehicle control can be presented to the "pilot" on the centrifuge.

5: Friday, Nov. 13, 9:00 A.M.-5:00 P.M.

David Sarnoff Research Center, Radio Corporation of America and Princeton University, Princeton, N. J.

DEMONSTRATIONS at the David Sarnoff Research Center will cover work of particular interest to the conference. They will feature a combined ultraviolet and visible light television microscope using a new $\frac{3}{4}$ -inch *vidicon* tube, the *radio pill*, developments in light amplifiers, and work in thermoelectrics. Following lunch, courtesy of RCA, the group will tour the historic old campus of Princeton University.

GENERAL INFORMATION: All transportation will be by chartered busses, which will leave promptly at times indicated from the Sheraton Hotel and return to the hotel. Tickets, which will be sold at the registration desk, should be purchased as early as possible, since attendance will be limited on some tours.

	Mon., Nov. 9	Tues., Nov. 10	Wed., Nov. 11	Thur., Nov. 12	Fri., Nov. 13	
Morning		<p>Registration: 8:00 A.M.-4:00 P.M.</p> <p>9:30 A.M. Opening Addresses</p> <p>Session I: Ultraviolet I 10:00 A.M.-12:00 Noon West Ballroom</p> <p>Session II: Cardiovascular I 10:00 A.M.-12:20 P.M. Indep.-Const. Rooms</p> <p>Exhibits: 12:00 Noon-9:00 P.M. East Ballroom</p> <p>Session III: Ultraviolet II 2:00 P.M.-4:20 P.M. West Ballroom</p> <p>Session IV: General I 2:00 P.M.-4:00 P.M. Indep.-Const. Rooms</p> <p>Tour: 2:00 P.M.-5:00 P.M. Air Crew Equip. Lab.</p>	<p>Registration: 8:00 A.M.-4:00 P.M.</p> <p>Session V: Microwave I 9:00 A.M.-12:20 P.M. West Ballroom</p> <p>Session VI: Ultrasonic I 9:00 A.M.-11:30 A.M. Indep.-Const. Rooms</p> <p>Exhibits: 12:00 Noon-9:00 P.M. East Ballroom</p> <p>Session VII: Microwave II 2:00 P.M.-5:00 P.M. West Ballroom</p> <p>Session VIII: Ultrasonic II 2:00 P.M.-4:30 P.M. Indep.-Const. Rooms</p> <p>Tour: 2:00-5:00 P.M. Inst. for Cancer Res.</p> <p>Cocktails 6:00 P.M.-9:00 P.M. Pennsylvania Room</p>	<p>Registration: 8:00 A.M.-12:00 Noon</p> <p>Exhibits: 9:00 A.M.-1:00 P.M. East Ballroom</p> <p>Session IX: Infrared I 9:00 A.M.-12:00 Noon West Ballroom</p> <p>Session X: General II 9:00 A.M.-11:30 A.M. Indep.-Const. Rooms</p> <p>Session XI: Infrared II 2:00 P.M.-4:45 P.M. West Ballroom</p> <p>Tours: 2:00 P.M.-5:00 P.M. Electromedical Lab. U. of P. Johnson Found. Med. Phy. U. of P.</p>	<p>Tours: 9:00 A.M.-3:00 P.M. Aviation-Med. Accel. Lab. Johnsville, Pa.</p> <p>9:00 A.M.-5:00 P.M. RCA Labs. Princeton Univ. Princeton, N. J.</p>	
Afternoon						
Evening	<p>Registration: 6:00-8:00 P.M.</p>					