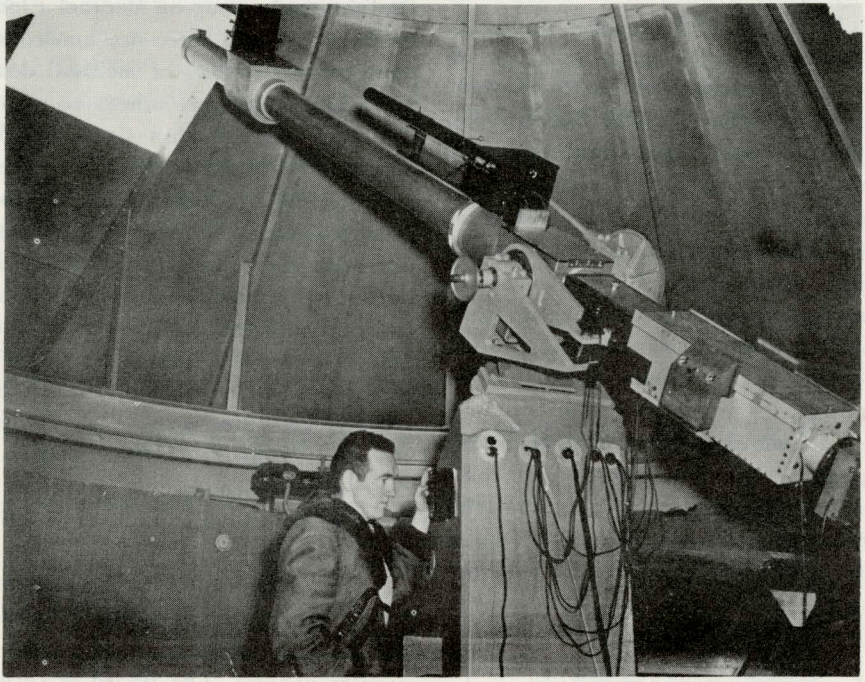
The Denver
DECIBEL

VOL. II, NO. 3 DENVER SECTION IRE SPRING 1957

Dr. Walter Roberts Speaks on Astrogeophysics



"The Sun and the Upper Atmosphere" was the subject of Dr. Walter Orr Roberts at the February meeting of the Denver Section in the Malcomb Wyer Auditorium in the new Denver Public Library.

Doctor Roberts is the director of the High Altitude Observitory of the University of Colorado. He has directed the operation of the coronograph station at Climax since its inception in 1940, and is a world recognized authority in his field.

His program included slides and movies showing several types at solar activity. In addition to the slides, he described some of the studies being made on the relation between solar activity and physical changes on earth.

A new field of science called "Astrogeophysics" to specialize in this work has been formed.

The IRE "Affiliate" Plan

A New Venture in Engineering Society Structure and Service

by W. R. G. Baker, Chairman
IRE Professional Groups Committee

On January 4, 1957 the IRE Board of Directors arrived at a decision which may in time prove to be one of the most far-reaching in its 45-year history. On that date the Board adopted a plan which will enable non-IRE members whose main professional interests lie outside the sphere of IRE activities to become affiliated with certain of the IRE Professional Groups *without* first having to join the IRE itself.

This plan is aimed at those specialists in other fields of science and technology whose work touches upon our own electronics and communications field only in specialized areas. In effect, the IRE is extending the specialized services of its Professional Groups to every field of science and engineering.

An outstanding example of where these services are needed may be found in the case of the medical and biological sciences. At the present time some 1400 IRE members enjoy the privileges of membership in the Professional Group on Medical Electronics. And yet there are hundreds, perhaps thousands, of medical doctors, biologists and others to whom the activities of this Group would be of interest and value. Both they and the Group would benefit from their participation. To require these persons, who have no interest in radio engineering, to join the IRE in order to join the Group is unreasonable, and probably futile as well. In fact, it was largely to provide an answer to this particular problem that the "Affiliate" Plan was first conceived, although it pertains to other fields as well, such as Computers, etc.

The "Affiliate" Plan is admittedly an experiment. So far as is known, no other society has ever tried a similar scheme. The Board of Directors feels strongly that the benefits afforded by the plan justify the risk that some persons who should join the IRE will instead become Affiliates. To minimize this risk, the plan has been carefully worked out along the following lines:

1. Participation in the Plan is at the option of each Professional Group. It is not expected that all Groups will adopt it; only those

(Continued on page 6)

THE DENVER DECIBEL

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DEADLINES FOR ISSUES

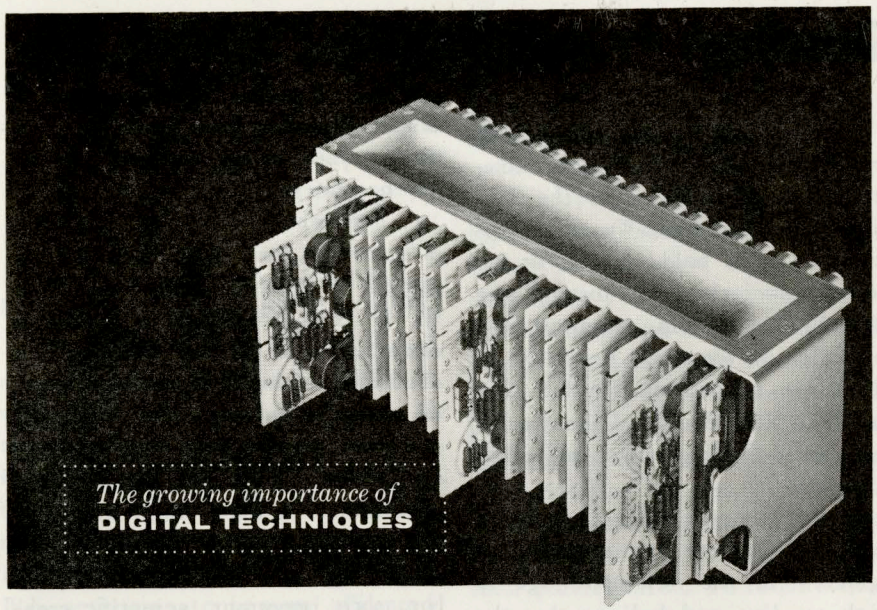
SPRING	MAR 15
SUMMER	JUNE 15
FALL	SEPT 15
WINTER	DEC 15

Engineering Notes & News

Encouraged by the success of the 1956 Science Fair, the joint committee is making plans for the Second Annual Colorado-Wyoming Science Fair to be held April 27 at the medical societies is joining the Colorado Engineering Council and the Colorado-Wyoming Academy of Science in sponsoring the fair this year. The NBS Boulder Laboratories are again providing space and other facilities.

These organizations recognize the need for more scientists and engineers in the scientific age in which we live and believe that the place to look for them and train them is in the Nation's schools. We feel also that a vigorous effort is necessary to stimulate more students to study science. One very practical way toward these ends is through science fairs.

A Science Fair is an exhibition of scientific work developed and displayed by students. More specifically, it is a collection of exhibits, each designed to show a biological, chemical, engineering, mathematical, or physical principle; a laboratory procedure; or an industrial development. These fairs afford students an apportunity to apply their scientific and mathematical knowledge in ways demanding not only craftsmanship but, more important, scientific creativeness. At the same time, they serve as a means of discovering and developing scientific ability.



As recently as ten years ago it was just becoming evident that digital techniques in electronics were destined to create a new and rapidly growing field. Today, incorporated in electronic computers and other equipment, they constitute one of the most significant developments in scientific computation, in electronic data processing for business and industry, and in electronic control systems for the military. In the near future they are expected to become a major new factor in industrial process control systems.

The digital computer for scientific computation is becoming commonplace in research and development laboratories. Such machines range from small specialized units costing a few thousand dollars, to large general purpose computers costing over a million dollars. One of these large computers is a part of the Ramo-Wooldridge Computing Center, and a second such unit will be installed the latter part of this year. The digital computer has not only lightened the computation load for scientists and engineers, but has made possible many calculations which previously were impracticable. Such computers have played a major role in the modern systems engineering approach to complex problems.

Electronic data processing for business and industry is now well under way, based on earlier developments in electronic computers. Data processors have much in common with computers, including the utilization of digital techniques. In this field, teams of Ramo-Wooldridge specialists are providing consulting services to a variety of clients on the application of data processing equipment to their problems.

The use of digital techniques in military control systems is an accomplished fact. Modern interceptor aircraft, for example, use digital fire control systems. A number of Ramo-Wooldridge scientists and engineers have pioneered in this field, and the photograph above shows a part of an R-W-developed airborne digital computer.

These, then, are some of the aspects of the rapid growth which is taking place in the field of digital techniques. Scientists and engineers with experience in this field are invited to explore openings at The Ramo-Wooldridge Corporation in:

Automation and Data Processing
Digital Computers and Control Systems
Airborne Electronic and Control Systems
Guided Missile Research and Development
Electronic Instrumentation and Test Equipment
Communication Systems

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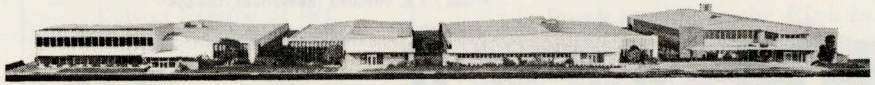


IRE & JOINTLY SPONSORED NATIONAL MEETINGS

1957 Date	Meeting	Place	Sponsored by	For Info. Regarding Exhibits	For Info. Regarding Publicity	For Info. Regarding Program
April 11-13	S. W. Regional Conf. & Elec. Show	Shamrock Hilton Hotel Houston, Texas	Region 6	Karl O. Heintz P. O. Box 2180 Houston, Texas	Marion A. Arthur P. O. Box 2180 Houston, Texas	Frank C. Smith, Jr. P. O. Box 13058 Houston, Texas
April 14-16	Nat'l Symp. on Telemetering	Phila., Pa. New Sheraton Hotel	PGTRC	L. P. Clark Tele-Dynamics Inc. 32 & Walnut Sts. Phila. 4, Pa.	Dayton Jones IRE Adv. Dept. 1475 Broadway New York 36, N.Y.	L. P. Clark Tele-Dynamics Inc. 32 & Walnut Sts. Phila. 4, Pa.
April 23-25	Symp. on Role of Solid State Devices in Electric Circuits	Eng. Soc. Bldg. N.Y.C.	PGCT; PGED; PIB Dept. of Defense	None	Jerome Fox Microwave Research Inst. 55 Johnson St. Bklyn 1, N.Y.	Dr. J. Griemsmann Microwave Research Inst. 55 Johnson St. Bklyn 1, N.Y.
April 24-26	7th Region Technical Conf. & Trade Show	San Diego, Calif. U.S. Grant Hotel	Region 7	Exhibits Donald E. Root 4686½ West Point Loma Blvd. San Diego, Calif.	Richard T. Silberman Kay Lab. 5725 Kearney Villa Rd. San Diego 12, Calif.	Robert E. Honer Convair - Bldg. 51 Pacific Highway San Diego 12, Calif.
April 26-27	11th Annual Spring TV Conf.	Eng. Soc. Bldg. Cinct. Ohio	Cinct. Sec. PGBTR PGBTS	Exhibits	Frank L. Wedig AVCO Mfg. Co. Cinct. 25, Ohio	Same
May 1-3	Electronic Components Conf.	Morrison Hotel Chicago, Ill.	PGGP; AIEE; RETMA; WCEMA	None	Victor D. Danilov Armour Res. Found. 35 W. 33rd St. Chicago 16, Ill.	Virgil H. Disney Armour Res. Foundation 10 W. 35th St. Chicago 16, Ill.
May 9-10	Symp. on Microwave Ferrites & Related Devices & Applications	Western Union Auditorium, N. Y.	PGMT&T	None	Tore M. Anderson 1539 Deer Park Mountainside, N.J.	Samuel Weisbaum Bell Telephone Labs. Murray Hill, N.J.
May 13-15	Nat'l Aero & Navigational Electronics Conference	Dayton, Ohio	PGANE; Dayton Section	Donald V. Meyers 6962 Miami Rd. Cinct. 27, Ohio	John E. Wilkinson 410 W. First St. Dayton 2, Ohio	Lowry Easley 3265 Zephyr St. Dayton, Ohio
June 6-7	1st Annual Conf. on Prod. Tech.	Willard Hotel Wash., D.C.	PGPT	S. Levine Melpar Inc. 649 Monticello Dr. Falls Church, Va.	H. F. S. Wolf Martin-Balto 3811 Oakford Ave. Baltimore 15, Md.	S. Levine Melpar Inc. 649 Monticello Dr. Falls Church, Va.
June 17-19	1st Nat'l Mtg. of PGMIL	Sheraton Pk Hotel Wash., D.C.	PGMIL	L. D. Whitelock Pitt Student Union Pittsburgh, Pa.	C. L. Engleman 2480 16th St. N.W. Wash. 9, D.C.	R. E. Frazier Physics Dept. Cornell Aeronautical La 4455 Genesee St. Buffalo 21, N.Y.

IRE Membership Grew More Than 8,000 In 1956

The membership of the Institute of Radio Engineers has increased by more than 8,000 due to effective promotional campaigns of the sections and professional group chapters during 1956, George W. Bailey, Executive Secretary, has announced.

As of December 31, 1956, IRE membership totaled 55,494 as compared with 47,388 in 1955, and Professional Group membership totaled 53,015 as compared with 36,562 in 1955, he said.

During 1956, 10 new Sections were established. The scoreboard now stands: Sections, 91; Professional Groups, 24; Sub-Sections, 26; Professional Group Chapters, 185; and Student Branches, 135.

IRE Affiliate Plan *(from page 2)*
which feel it serves a need in their particular field.

2. Each Group interested in initiating the "Affiliate" Plan must submit to the Chairman of the Professional Groups Committee a list of accredited organizations which has been selected and approved by its Administrative Committee, for official approval by the IRE Executive Committee.

3. To be an Affiliate of a Professional Group, a person must belong to an accredited organization approved by that Group and the IRE Executive Committee. Moreover, he shall not have been an IRE member during the five years prior to his application. He may affiliate with more than one Group, provided the accredited organization to which he belongs is recognized by the Group concerned.

4. The fee for Affiliates shall be the assessment fee of the Group, plus $4.50. The latter covers IRE subsidies to the Group, Professional Group overhead expenses borne by IRE Headquarters, and 50 cents which is to be rebated to IRE Sections for mailing and meeting costs.

5. An Affiliate will be entitled to receive the *Transactions* of his Group and that part of the *IRE National Convention Record* pertaining to his Group. He will be eligible for a Group award, and may attend local or nation meetings of the Group by

(Continued on page 11)

A Query From The Princton Section

For Squares

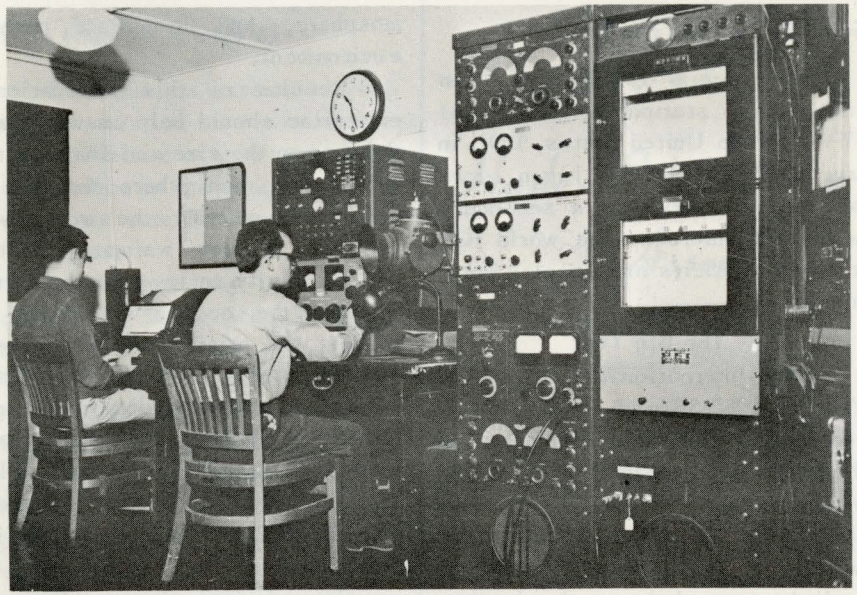
Poor Willy dropped his homework in a puddle and all but obliterated a longhand square root problem. All he can make out is the location of the digits in the problem which, when an *x* is subsituted for each digit, looks like this:

```
       x       x       x       x
  √ x  x    x  x    x  x    x  x
    x  x
    x  x    x  x
       x    x  x
               x  x  x  x  x
               x  x  x  x  x
```

He does, however, recall that the answer was an even number. Can he reconstruct the problem? If so, reconstruct it for him.

Solution to Query Published Last Issue Problem in Strategy

1. If A kills B, A's chance of surviving and killing C is 9.125.
2. If A kills C, A's chance of surviving and killing B is 0.166.
3. If A deliberately misses on his first shot, his chance of being the sole survivor is 0.458. This then is his best strategy.



GEOPHYSICS 1957-58

Control room of the IGY World Warning Agency at the National Bureau of Standards radio forecasting center, Fort Belvoir, Va., which is operated by the NBS Boulder Laboratories. Here, during recent trial runs, radio signals from the North Atlantic area were monitored for forecasting purposes, and teletype messages were received from and sent to all parts of the world. Incoming teletype messages bring data on disturbances on the sun or in the earth's atmosphere. Outgoing messages warn IGY scientists of expected increases in geophysical disturbances, Wilson E. Riggins (extreme left) is at the teletype while Lynn Sholar operates radio direction finding equipment. At right is equipment used to record the intensity of radio waves from distant broadcasts. *(Continued on page 10)*

Geophysics *(from page 9)*

The special radio propagation transmitting stations -- WWV and WWVH in the United States, LOL in Argentina, and JJD in Japan -- are expected to serve as a secondary method of informing the world IGY stations of Alerts and Special World Intervals.

The Big Year

The International Geophysical Year of 1957-58 will be a massive, coordinated assault by scientists of the world upon the mysteries of this planet. From July 1, 1957 through December 31, 1958, simultaneous world-wide observations will be made by several thousand scientists representing more than 50 nations. Measurements will be made of the earth's interior, crust, oceans, atmosphere, and immediate cosmic environment.

Results of this international enterprise should help answer questions as to the size and shape of the earth, how and where weather is generated, whether the world will continue to grow warmer, why the pull of gravity varies over the earth, whether the oceans are rising or falling, the origins of earthquakes, and the causes of radio black-outs. Increased understanding of earth physics will have both direct and long-range application in such fields as navigation, communication, weather prediction, and scientific instrumentation.

The United States National Committee for the IGY, organized by the National Academy of Sciences -

(Continued on page 11)

Affiliate Plan *(from page 6)*

payment of charges assessed Group members.

6. An Affiliate cannot serve in an elective office in the Group or Group Chapter, nor vote for candidates for these offices.

7. An Affiliate may hold an appointive office in the Group or Group Chapter.

8. An Affiliate may not receive any IRE benefits that are derived through IRE membership.

The "Affiliate" Plan is a bold and farsighted venture; one that recognizes and provides for the rapidly spreading influence of electronics in every walk of scientific and technological life, and one that enable the IRE to further its aims as a professional engineering society: the advancement of radio engineering and related fields of engineering and science.

Write to Editor for application blanks.

Geophysics *(from page 10)*

National Research Council, is planning and directing United States participation in the program. The National Science Foundation is responsible for the Government's fiscal sponsorship.

PGAP NEWS

No activities have been reported to the editor.

We Are Making A Survey: We need more time to think of an answer.

Note And Initial: Let's spread the responsibility for this.

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Changes In Membership Status

NEW MEMBERS

Wilbert H. Aldrich	S
Roland Schroder	S
George E. Schafer	S
Lillie C. Walters	S
Frances T. Daniel	M
James L. Viallet, Jr.	S
Peter R. Heid	S
Alvin C. Wilson	M
Kenneth N. Raymond	A
John H. Walter	M
Mohammed H. Zanboorie	M
Charles N. Rhodine	S
James B. Olson	S
Richard M. Braam	S
Robert D. Rhodus	S
Richard W. Herter	S
Robert L. Risher	S
Robert L. Spaulding	S
Cyril M. Kaloi	S
Robert L. Kern	S

HIGHER GRADE

Lloyd J. Spafford	M

MOVED IN

Charles H. Stewart	A
Frederick I. Moyer	A
Hugh T. Edwards	M
Lt. Robert G. Williams	A
Robert C. Mayberry	M
Donald R. Little	M

MEETING NOTICE

MAY 7—Dinner meeting at the Student Union, University of Colorado. Commander G. W. Hoover of ONR will speak on "Integrated Aircraft Instrumentation Systems".
This will be student paper night.

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