



THE NORTHERN NEW JERSEY

Newsletter

Institute of Radio Engineers

Volume 7

NOVEMBER 1960

Number 3

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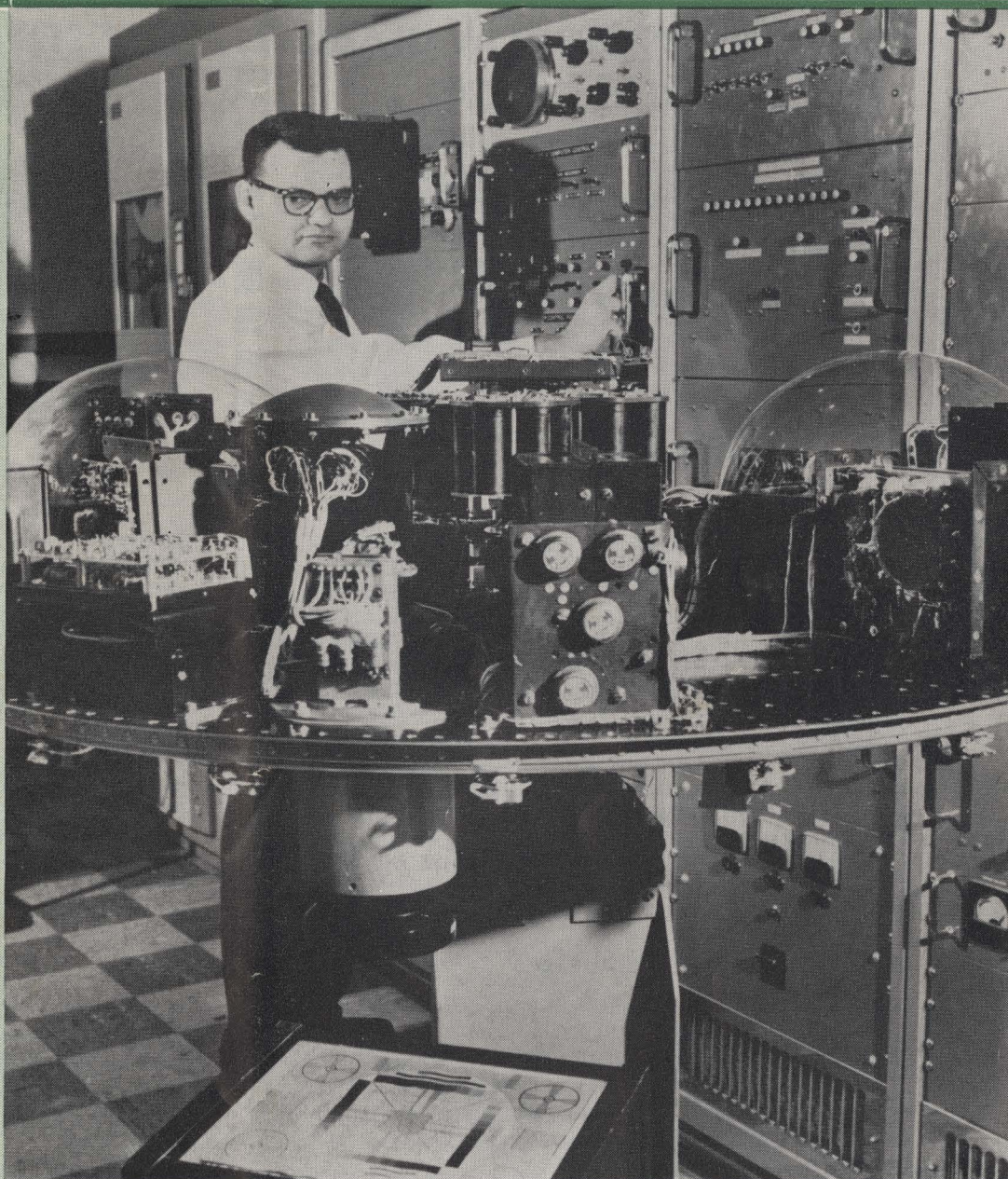
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For Full Coverage

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November Meeting (Students Night)

SUBJECT: Tiros Weather Satellite
SPEAKER: Maury Staton
PLACE: Newark College of Engineering
TIME: 8:00 P. M. O'clock
DATE: November 9, 1960
NCE Cafeteria open until 6:45 P. M.

NEW INSTRUMENTS

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A NEW DIGITAL CLOCK HAS BEEN DESIGNED EXPRESSLY FOR THE LEFT-HAND PANEL OF YOUR HEWLETT-PACKARD PRINTER. THESE CLOCKS CAN EITHER BE FACTORY INSTALLED IN NEW PRINTERS, OR CAN BE ADDED TO UNITS ALREADY IN THE FIELD. THE TIME OF DAY (IN SIX DIGITS) IS DISPLAYED ON THE NEW ULTRA LONG LIFE BURROUGHS NIXIE® INDICATOR TUBES AND IS ALSO FED IN DIGITAL FORM TO THE PRINTER. THIS MEANS YOU CAN NOW RECORD YOUR TEST RESULTS ALONG WITH TIME INFORMATION AT A MAXIMUM RATE OF 5 LINES PER SECOND. SUITABLE INTERLOCKS ARE PROVIDED TO PREVENT THE CLOCK FROM CHANGING NUMBERS WHILE A PRINT IS BEING MADE. RMC FIELD ENGINEERS ARE QUITE FAMILIAR WITH THIS NEW DEVICE AND CAN SHOW YOU HOW TO APPLY IT TO YOUR PARTICULAR DIGITAL PROBLEM.

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EDITORIAL NOTES

New Jersey Electronics Conference

As a section, what are we doing to promote New Jersey industry, New Jersey educational institutions, and New Jersey professional societies to the public and to the future generations of engineers in elementary and high schools? We suggest that the professional societies in New Jersey such as IRE, AIEE and the educational institutions such as Newark College of Engineering, Fairleigh Dickinson University, Rutgers University, Stevens Institute of Technology, and Princeton discuss the establishment of an annual New Jersey Electronic Conference. The benefits of such a conference could be far reaching not only for the professional societies and the educational institutions involved, but also for all industry in New Jersey. We should always strive to maintain our state's position as a leader in electronic development, manufacture and education.

A New Jersey Electronic Conference would go a long way toward promoting our state and our region as a major center for the electronics industry.

Edward J. Byrum

From the Mailbox

To the Editor
NNJ NEWSLETTER:

I enjoyed your editorial (Here We Go Again, September 1960) and was delighted to know I have been enervated and exhorted. If I did not look these two words up in the dictionary, I still would not be aware of what you did to me.

Since we are, as you mention, monsters, I would like to suggest you start the clean, crisp and new editorial season with smaller words. Although many of us are very impressive looking—don't be fooled. We are really just average material in the scheme of life.

Fraternally yours,
Oscar R. Sommermeyer
Clifton, N. J.

Thus chided, we withdraw the 'monster' appellation, but remain adamant on the big words. We have a penchant for polysyllabic expression, as you might have noticed . . . Ed.

THE FRONT COVER—The Tiros weather satellite, one of the most complex electronic systems yet sent into space by the United States, is shown in pre-flight testing at the Space Center of the RCA Astro-Electronic Products Division, Princeton, N. J., where the satellite and its associated ground system were designed and built for the National Aeronautics and Space Administration under U. S. Army technical direction.



The Northern New Jersey

Newsletter

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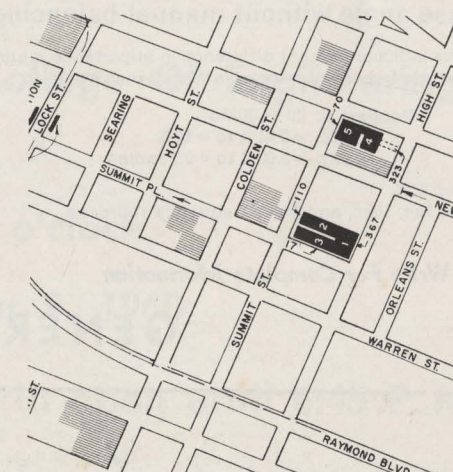
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1960-1961 Meeting Schedule

Section Meetings	Exec. Comm. Meetings
November 9, 1960	No Meeting
December—No Meeting	December 7, 1960
January 11, 1961	January 25, 1961
February 8, 1961	March 1, 1961
March 8, 1961	March 29, 1961
April 12, 1961	April 26, 1961
May 10, 1961	May 24, 1961
Field Trip	June 28, 1961

Student Night Parking Guide



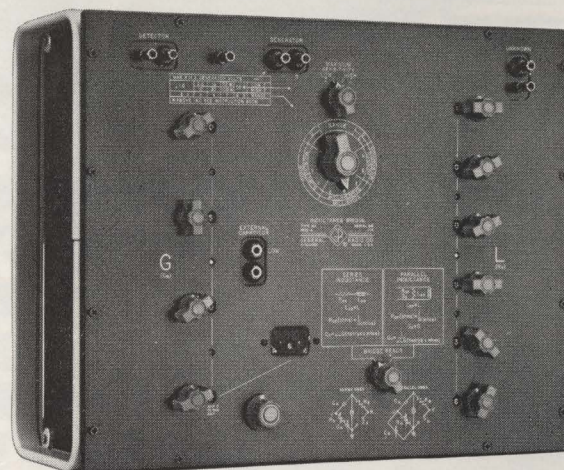
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Ranges: R: 1 mΩ to 10 MΩ
L: 1 μh to 1000 h
C: 1 pf to 1000 μf
D: 0.01 to 50 (at 1kc)
Q: 0.02 to 1000 (at 1kc)

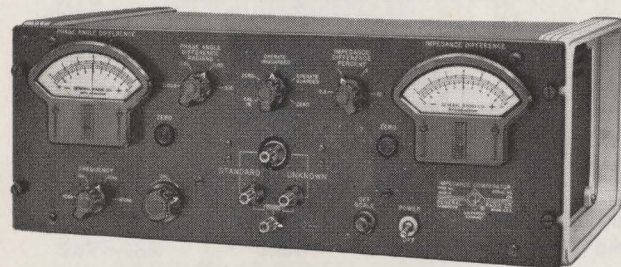
Basic ±1% accuracy
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For precise measurement of inductance

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(minimum indication is 0.0001 μh)
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Basic ±0.1% accuracy. Inductors having nearly equal values can be compared to an accuracy of 1 part in 10⁵
Designed for 1-kc measurements. Can be used to at least 10kc with slight decrease in accuracy.



Type 1605-A Impedance Comparator . . . \$800

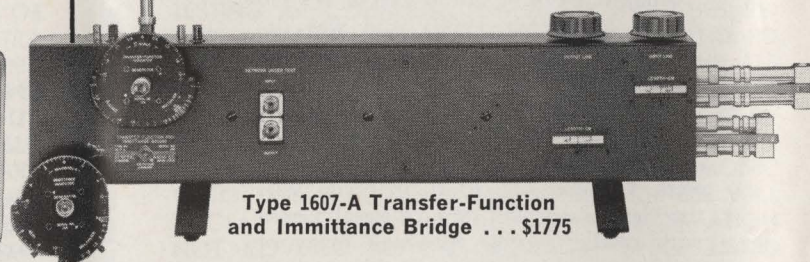
For rapid measurements of impedance and phase angle without manual balancing

Panel meters indicate percent difference in impedance magnitude and phase angle between unknown and external standard

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ΔZ: ±0.01% to ±10%
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Transadmittance (Y_{21})	0-600 mmhos	$2.5 (1 + \sqrt{\frac{Y_{21}}{20}})\% + 0.5$ mmho
Impedance (Z_{11})	0-1000 ohms	$2.0 (1 + \sqrt{\frac{Z_{11}}{50}})\% + 1.0$ ohm
Admittance (Y_{11})	0-400 mmhos	$2.0 (1 + \sqrt{\frac{Y_{11}}{50}})\% + 0.4$ mmho

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Mr. Maury Staton

Staton is RCA Veteran; Holds Legion of Merit

Maury Staton was born in Portland, Oregon, in 1913 and graduated from Oregon State College in 1935. From 1936 to 1942 he worked for the West Coast Telephone Company where he was concerned primarily with the conversion of telephone exchanges to dial operation. During World War II he was assigned to the Plant Engineering Agency of the Chief Signal Office, Army Signal Corps. He was awarded the Legion of Merit for installing the radio network supporting the B29 attack upon Japan.

At the close of the war, Mr. Staton joined the Engineering Department of the old RCA Victor Division where he supervised the installation of the first major microwave system connecting Western Union facilities in New York, Pittsburgh, Philadelphia and Washington.

In 1948 Mr. Staton transferred to the Sales Department of RCA Engineering Products Division, where he became Manager of Communications Product Planning. He was involved in the early conception and planning of a number of product developments such as micro-miniaturized radio equipment and broadband point-to-point microwave radio relay equipment.

In March, 1958, Mr. Staton was assigned to a group which became the Astro-Electronics Division of RCA. In mid-1960 this Division became part of RCA Defense Electronic Products and Mr. Staton, who had been Manager of Planning, became Manager of Market Development, his present assignment.

RCA's Staton To Tell Tiros Story At Students Night Meeting

by Jim Holahan

Maury Staton, Manager of Market Development for the Astro-Electronics Division of RCA, will speak on the Tiros weather satellite at the annual NNJ Section Students Night. The meeting is scheduled to be held at Newark College of Engineering on Wednesday, November 9 at 8:00 P.M. Dining facilities will be available at N.C.E.'s cafeteria until 6:45. As is the custom, all students attending will receive souvenirs of the meeting.

Long-Range Forecasting

Ever since Tiros I was blasted into space in the nose cone of a Thor-Able rocket, cloud pictures taken by the satellite have been interpreted by analysis and by comparison with known weather conditions, to reveal weather patterns in hitherto inaccessible areas.

One important result of these large-scale observations is that major storms and hurricanes can now be followed closely over tremendous distances. Even more vital, however, are the advantages of accurate long-range forecasts for agricultural and industrial planning. Mr. Staton will elaborate on these as well as other aspects of the satellites performance.

In addition to his talk, Mr. Staton will show a color film covering Tiros' development from drawing board to orbit.



Picture of earth transmitted by TIROS shows Red Sea, Nile and Mediterranean. Cloud bands in foreground indicate jet stream fifty to seventy-five miles toward top of picture.

NOVEMBER MEETING

Subject:

Tiros Weather Satellite

Speaker:

Maury Staton

Place:

Newark College Of Engineering

Time:

8:00 P. M. o'clock

Date: November 9, 1960

NCE Cafeteria open until 6:45 P. M.



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"TEAM"

By MARSHALL PEASE, *Stanford Research Institute*

One of the magic words in these days of massive engineering projects is "team." Every management functionary worries about this concept—whether or not his department functions as a team; if not, why not; whether he can convince the upper management that his team is effective. In recent years, we have begun to hear even of teams of companies.

All this leads us to wonder if there is really an agreed and useful meaning to the word. Do different people mean essentially the same thing when they use the word "team"? What does this word really mean? What else does it imply that might be overlooked in its use in everyday business jargon? What are the implications as well as the connotation?

Danger, of course, exists in the very fashionableness of the word. In the present day climate, not one dares argue against the value of building a group into a team. It is one of those things that has become universally accepted as being desirable.

None the less, we wonder. We wonder and are somewhat suspicious, particularly because this team concept is so universally accepted. We are cynical enough to have noticed that most of the popular single word concepts that are accepted as good are either so vague as to be meaningless, or that they imply a specific frame of reference that is never stated, and sometimes forgotten. In either case, they often carry with them implied attitudes that may be quite inappropriate in a given application.

It is not necessarily bad that a word be general, or that it imply specific conditions. We can usefully discuss freedom of the individual without being unduly concerned about the line between freedom and anarchy. We can talk about education without continually reminding ourselves that we are not approving education in crime. We know, ourselves, what we mean; and we should have reason to hope that what we say will mean much the same thing to our listeners.

What Is a Team?

It seems worthwhile, then, to consider for a bit what a team is, and what it is not.

Let us start with the dictionary. The basic modern definition (Oxford Universal Dictionary, 3rd Ed.) is as follows: "A set of draft animals; two or more oxen, horses, dogs, etc., harnessed to draw together. This is not a very good start! What engineer would accept a comparison to a draft animal? Let us quietly pass on.

Next we see that a team is "a number

of persons associated in some joint action; now especially a definite number of persons forming a side in a match..." This is better; in fact it more or less fits the picture.

If we think a little more on this, however, we begin to wonder. For one thing, it implies a competition. Where the term is used in industry, there is sometimes competition. Companies combining in a team for the sake of a bid are, in fact, competing against other such associations. An engineering department which may or may not have the "team spirit" is, in a sense, competing against its counterparts in other companies. But it should be noted that the word is used more generally than in the competitive sense. It implies, if we read it correctly, a working together that transcends any immediate competition.

This is, maybe, a trivial objection. Let us look further.

Stars As Team Members

It is a truism of athletics that, to call an athlete a star, does not necessarily infer that he possesses much or any team spirit. The individual performer, if he is good enough to be called a "star," probably has, in that very fact, an extra handicap to overcome to become a good team member. He is, in the first place, absorbed in his own performance. Secondly, his teammates would be other than human if they did not view him as something of a threat to their own self-esteem.

Some degree of mediocrity, then, is of considerable help in achieving good team spirit.

A more respectable name for this state of affairs is "conformity." Some degree of conformance in an engineering organization is, of course, necessary; but if the organization is to accomplish anything out of the ordinary, it must have in it some people who are able to think in non-conforming ways.

Invention is a lonely business. No team thinks up a new engineering principle. No committee generates, as a group, a new idea. It can, at best, put coordinated effort into exploiting an idea that is the brainchild of some single individual.

This aspect of engineering, then, is completely submerged when we talk of the team. The two areas of organizational accomplishment — the group area epitomized by the word "team," and the individual area of creativity — are not mutually exclusive. Both types of activities do go forward in the same organization; but they are totally different aspect. While

considering the one, we should not lose sight of the other.

This is a limitation on the "team concept" — it is not an objection. But there are other ways in which the team concept may actually mislead us in the aspect which it purports to describe.

When we speak of "team," we think perhaps of college football. One of the key factors in the activities of such teams is the fact that all of the plays are called by one single individual on the team. If the season happens to be spring, we may think, instead, of professional baseball. In this case, the key decisions are not made by any member of the team at all, but by the manager in the dugout. Or, if we are types to whom such active examples tend to be exhausting, we may think of the game of bridge, where there is no line of authority at all, but where there is an elaborate and ritualistic method of, ideally, reaching a proper joint decision.

Teams As Decision-Makers

So, as soon as we start thinking of teams, we come to the question of how the team, if it is to be a team, will handle the question of decisions.

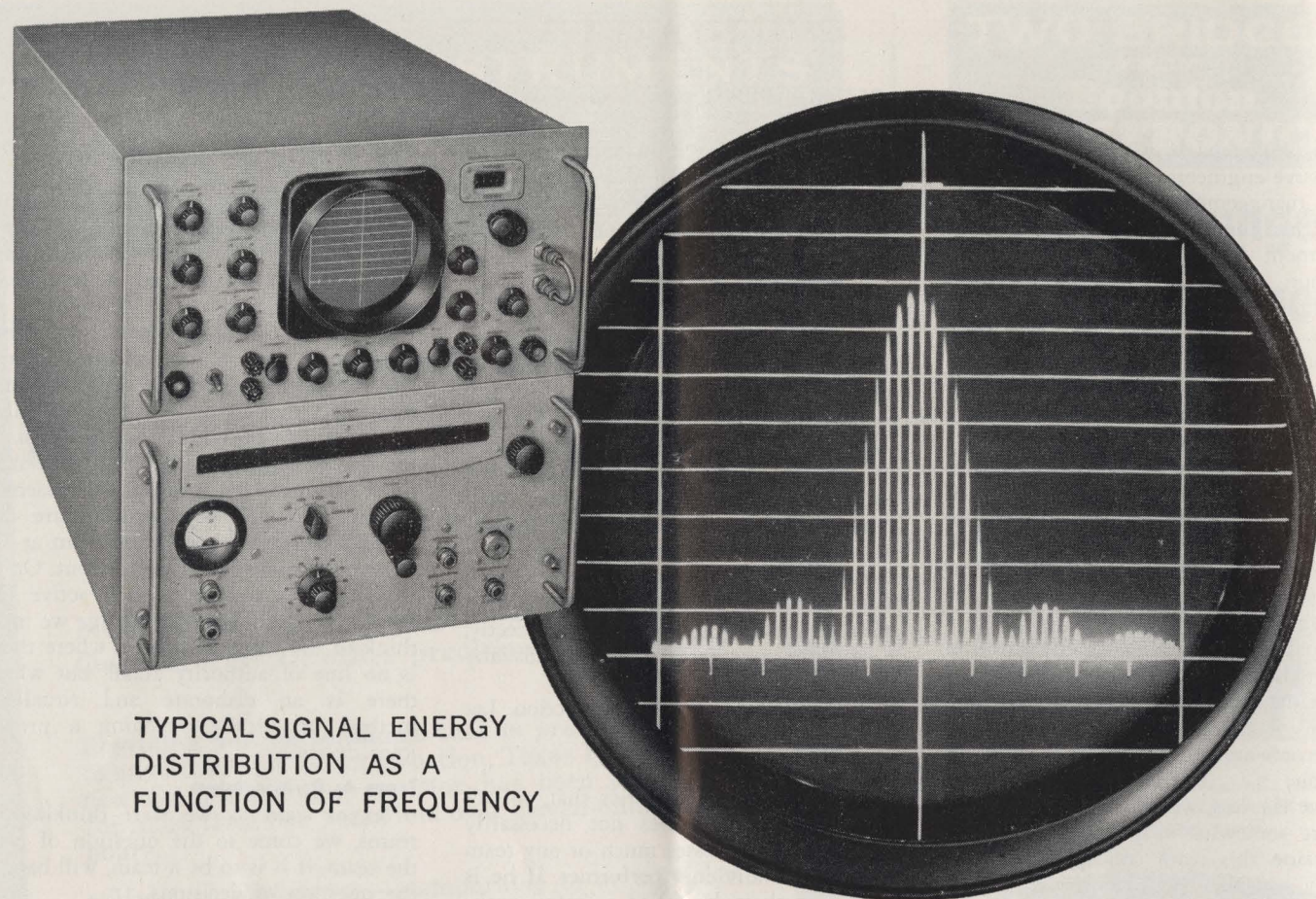
Here, we have something that is very far from being trivial. It appears, rather, to be the very essence of what is meant by the word "team." To say, "They are a good team," means, it seems to us, that they have solved the question of authority in such a manner that they do constitute an effective organization. Conversely, when a group is not an effective team, we can always describe the failure as a lack of agreement on decisions.

It may be argued that ineffectiveness can be the consequence of bad decisions fully agreed upon. This, however, is simple stupidity or ignorance, not a failure to function as a team. It may, in fact, represent the ultimate manifestation of hyperactive team spirit. We shall, for present purposes, ignore this unfortunate possibility.

In stating that team failure is a consequence of a failure to agree on decisions, we find ourselves face to face with the problems of what is a decision, and what constitutes agreement. If the question is one of choosing between a finite number of distinctive and definite possibilities, there is no problem. Somehow a selection is made, and everybody conforms to that choice or gets fired — all very simple.

Most important decisions, however, are not made that way — which, perhaps, is why they are important. Usually the choices available are vague and undefined, representing an attitude rather

(Continued on page 15)



TYPICAL SIGNAL ENERGY
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FUNCTION OF FREQUENCY



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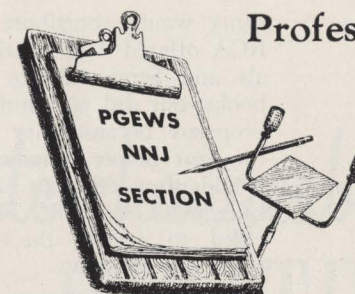
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Professional Group on Engineering Writing and Speech

Use Of Mental Miltown To Be Described At November PGEWS Meeting

Chester W. Sall, Technical Reports Coordinator at RCA's David Sarnoff Research Labs in Princeton, has agreed to divulge some professional secrets to NNJ PGEWS members at the November chapter meeting. The subject of Mr. Sall's talk will be "Taking the Pain Out of Technical Report Writing," or "Judicious Application of Academic and Psychological Novocaine Eases Engineer Pain During Reportectomy."

The meeting will be held at the RCA Auditorium in Harrison, N. J. on Wednesday, November 16 at 8:00 P.M. The pre-meeting dinner is scheduled for 6:15 P.M. at Carbone's Restaurant, 515 Harrison Ave., Harrison.

When questioned about the text to accompany such a bizarre title, Mr. Sall explained: "Report writing still continues to be one of the most painful and distasteful chores performed by the engineer. In this 'Paper Age' the vast number of required reports—monthly, interim, final, annual, trip, progress, special, and yet more—is enough to dismay and appall anyone, especially the working engineer whose joy is in his research and development, not in pushing a pencil to describe the fruits of his effort. Thus, any analgesic that eases the travail of this necessary, albeit repulsive, job is welcome."

"Several such remedies have been suggested; a few have been helpful to some degree. A few large companies resort to technical writers to relieve the engineer of the burden. Others give 'in-service' writing courses. Still others urge the engineer to attend technical writing courses sponsored by local educational institutions.

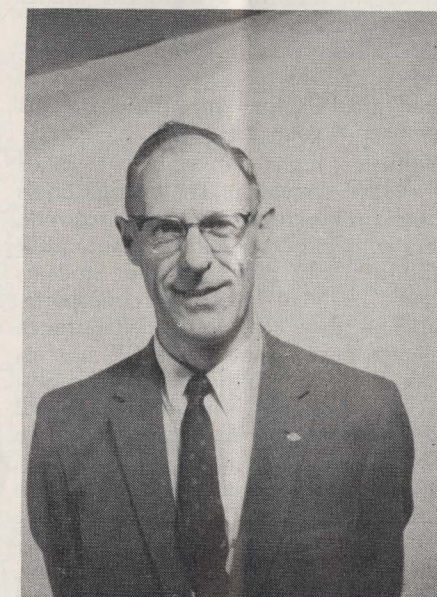
"In practically all organizations the technical papers administrator (or editor, publications engineer, or other such title) rides herd on the engineers, cajoling, coercing, encouraging, threatening, assisting, spoon-feeding, flattering — and despairing of!

"At RCA we've tried various combinations of these approaches to better report writing. Classroom instruction, from 'Outlining to Final Printing' in ten easy lessons is one method. The technical-editor method is another. I shall give a brief account of my personal experiences during the past 18 years trying to help

the engineers suffer less as they spawn their 'deathless technical prose.'"

About the Speaker

Mr. Sall received the A.B. degree from De Pauw University in 1935, and the A.M. degree from New York State College for Teachers in 1942. Between 1936 and 1943 he taught high school science at Saugerties and Baldwin, N. Y., com-



Mr. Chester W. Sall

ming to the RCA Industry Service Lab as a Technical Editor in 1943. Mr. Sall transferred to RCA's Industrial Electronic Products Division in Camden in 1958 to assume the duties of Manager of Technical Publications. In February 1960, he was appointed to his present position at the Princeton Laboratories.

Mr. Sall is a Senior Member of the IRE, and holds a national office in the Professional Group on Engineering Writing and Speech.

PGEWS EXCHANGE

This month, as last month, the material for PGEWS Exchange was taken from an article entitled "How to Edit Your Own Writing" by Eleanor M. McElwee of Radio Corporation of America. Miss McElwee has prepared a convenient guide to punctuation which includes a few of those "sticky" points which pop up from time to time in technical reports.

Period

- 1) At end of sentence.
- 2) After most abbreviations.
- 3) Use three periods (...) to show omission (ellipsis).

Colon

- 1) To show that something is to follow: a list, a series of examples, a long quotation.
- 2) After the salutation of a formal letter.

Semicolon

- 1) Between two independent clauses not connected by a conjunction.
- 2) Between members of a series if one or more contain commas

Comma

- 1) Between independent clauses connected by a conjunction.
- 2) After introductory adverbial phrases or clauses.
- 3) Around nonrestrictive phrases or elements.
- 4) Around parenthetical, interrupting, or displaced expressions.
- 5) After all but the last item of a series.
- 6) Between contrasting sentence elements.
- 7) To separate quotations from the rest of a sentence.
- 8) Whenever necessary to make the meaning of the sentence more obvious.

Quotation Marks

- 1) Before and after direct quotations.
- 2) Around the name of a magazine article.
- 3) To enclose technical words or words used in unusual senses.

Apostrophe

- 1) To show possessive case.
- 2) To show contraction.
- 3) To form plural of letters, figures, etc.

Parentheses or Brackets

- 1) To enclose material loosely connected with main thought.
- 2) To set off numerals or letters indicating items of a series.
- 3) Around an interpolation added to quoted material.

Hyphen

- 1) Between all compound adjectives.
- 2) Between compound nouns if meaning is made more obvious.



By D. Shombert

The Program Committee is undoubtedly the most important factor in the success of our Section. The regular monthly meetings are the bond which ties all of the members together and maintains their interest in the IRE, and the Program Committee has as its main goal the preparation of a general program of topics and speakers which will appeal to all of the Section members.

At the first meeting of this year's committee, Chairman Morris Levine stated the goals and responsibilities of the committee as follows:

1. Set up a program for each Section meeting from September, 1960 through November, 1961—including a dinner and a field trip.
2. Select topics and speakers for meetings of broad interest to attract maximum attendance.
3. Provide publicity information to NEWSLETTER staff.
4. Advise Facilities Chairman of program needs (slide projector, etc.)
5. Cooperate with the NNJ Chapters of Professional Groups on joint meetings with the Section.

Meetings Planned Far Ahead

You would be surprised at how far in advance it is necessary to plan the Section meetings. I attended a session of the Program Committee in August, and found that they were already planning the spring meetings for 1961. This is not surprising when you consider that a speaker must be approached, given time to consider and accept, and yet have time to prepare his talk before-hand; if the first speaker who is approached does not accept, there must be sufficient time for the second choice to go through the same procedure. The September 14 meeting was planned on June 21.

The program committee acts as the clearing-house for all IRE activities in the area, in addition to their program responsibilities. Meetings of Professional Groups must be reported in advance to the program committee, to be certain that no conflict occurs with Section meetings, other PG meetings, or Lecture Series meetings. Because of this, the chairman of each PG Chapter is a member of the Program Committee.

A Typical Session

The Program Committee meets once a month, on the third Tuesday, with a recess at Christmas and July. The August meeting would be typical of an evening's work for this group, and I would like to report it.

The September meeting was first discussed and cleared up. Bell Telephone Labs' auditorium was definitely decided upon as the place. NEWSLETTER publicity was taken care of by Ed Byrum, and the projection equipment for the demonstrations was assigned to Larry Hohmann.

The October Section meeting is a dinner meeting. Prices of meals were discussed and the contribution of the Section to each member attending was considered. The Section generally pays about half of the cost of a member's dinner (dinner cost: \$4.60, member cost: \$2.50). This seems to me to be an excellent incentive for Section members to attend the October meeting: you get back part of your dues.

Student's night, November 9, called for a lot of discussion. The George Ennis School in Montclair had been reserved, but the committee felt that the NCE auditorium was more suitable. Students are not likely to have ready transportation, and they can get to NCE much easier than to Montclair; NCE has offered their fine auditorium to the Section any time we want it. The school auditorium reservation was changed to a spring meeting. Subject for the meeting was to be either "Electroluminescence" or "Tiros." Three speakers were available on electroluminescence; the speaker on Tiros, on the other hand, knew first-hand of the heart-breaks and adventure that went into its success, having been at Canaveral. A panel discussion on electroluminescence was also considered. Tiros won the decision; students would be apt to find it more glamorous, in the committee's opinion, and the attendance would be greater.

Choosing Souvenirs

Next came the subject of what sort of souvenir gift to give the students. Each member of the committee had asked the public-relations department of his company for some suggestions. Syl-

vania would contribute Tube Manuals. RCA offered Transmitting Tube Manuals and Semiconductor Devices Handbooks, but did not think they were appropriate because they had been given the year before. Engineering Publishers would provide copies of books on reliability, and so forth. The chairman decided to review the possibilities and make the selection.

The spring meetings were then considered. The electroluminescence talk was re-scheduled for January, and the speakers will be approached. A joint meeting with the PGEWS Chapter was proposed for February. Fellow's night, in March, was scheduled as a dinner, presentation of Fellows, and dance evening for members and wives. A topic for this meeting must appeal to the wives as well as to the members; the possibility of excluding a talk altogether was brought up. The May and June meetings were started on: suggestions for topics were made by all members of the committee. Examples are: Anti-Submarine Warfare, Nuclear Rocket Propulsion, DEW Line, Project Echo, Space Photography, Thermoelectric Conversion, Underseas Communication. Committee members were assigned to explore the availability of speakers on some of these.

How does the program committee decide on the subject of a meeting? I would like to give an example of the chairman's reasoning in one case. The subject of Modern or Automated Techniques in Electronics (Western Electric) was mentioned: the chairman vetoed this because it is closer to mechanics than to radio engineering, which is, after all, the purpose of our society. Other topics were rejected because they were too similar to recent talks.

Chairman Is Morris Levine

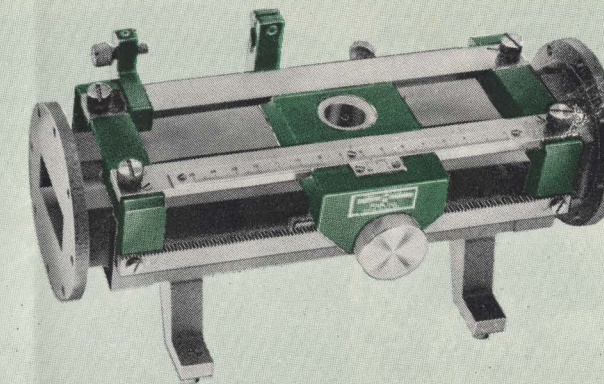
The guiding hand of our Program Committee this year belongs to Morris E. Levine of Staten Island. Mr. Levine got his B.S. in E.E. from CCNY in 1934, and his M.S. from Columbia in 1936. He joined the Applications Department of Tung-Sol in 1936 and is now manager of Applications Engineering.

Mr. Levine has been active in the affairs of the I.R.E. He has served on the membership committees for the New York Section and the North Jersey Section. He has also served on several industrial committees on mechanical tests radio and TV ratings, cathode-ray tube phosphors, etc. He is a member of Tau Beta Pi.

The other members of the committee are: Charles A. Meyer (secretary), J. Soukup, Edward J. Byrum, George W. Sideris, Don Dworkin, Charles Gorse, Morry M. Irvine, Rod Foley, and Harold R. Whaley.

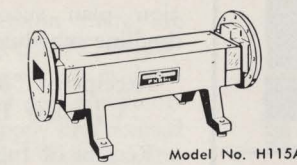
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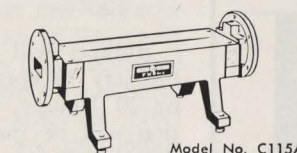


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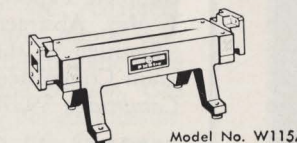
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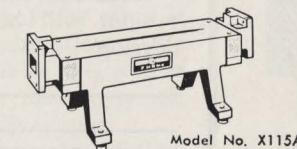
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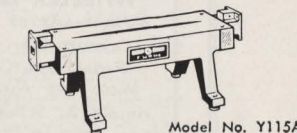
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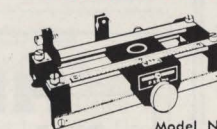


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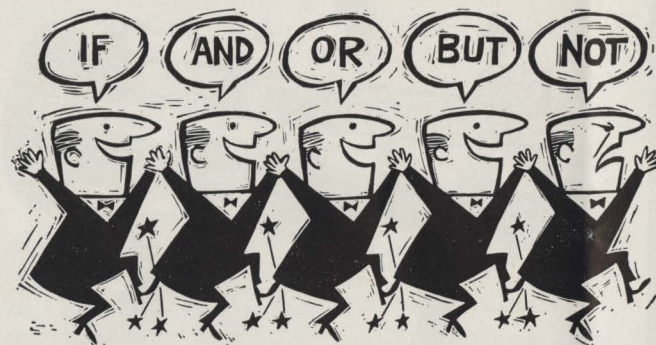


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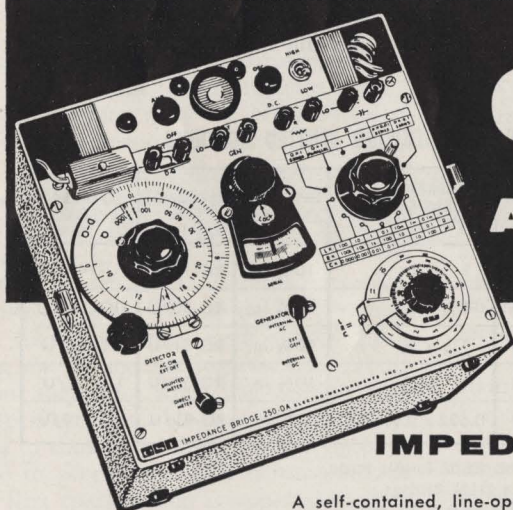


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Information Theory Group Calls For Papers

The PGIT, in cooperation with the Center of Communication Sciences, Research Laboratory of Electronics, M.I.T., is planning to hold an International Symposium on the Transmission and Processing of Information on September 6-8, 1961 at M.I.T.

The purpose of the Symposium will be to provide an outstanding occasion for the presentation of significant new research contributions, of either a theoretical or experimental nature. As in the case of similar symposia in 1954 and 1956, no tutorial papers will appear; the program will be planned specifically for active specialists in the field. In order to provide opportunity for creative and thorough discussion, the Symposium TRANSACTIONS will be distributed at least two weeks prior to the meetings.

Submission of papers is hereby invited. In order to carry out the publication plan successfully, the following deadline schedule is necessary.

Receipt of 500-1000 word Abstracts:
1 January 1961

Receipt of full length Papers: 1 April 1961

Authors will be notified of the preliminary acceptance of their Abstracts by 20 January; the final program selection will be made on the basis of the complete Papers, and authors notified by 1 May. Abstracts and Papers should be submitted to the Chairman of the Program Committee, *Peter Elias, RLE, MIT, Cambridge 39, Massachusetts.*

Additional information about the Symposium will be disseminated as plans develop.

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Dr. G. M. Anderson



Those of you who attended the September meeting witnessed first hand the excellent planning of the Program Committee. Mr. McCamy of the National Bureau of Standards was entertaining as well as informative. It is gratifying to be able to report that the turnout was of record proportions and worthy of the occasion.

Although it has been repeated many times, I wonder how many realize that Professional Group Chapter meetings are Section meetings and that all Section members are privileged to attend. The PG chapters are supported by the Section.

Within the NNJ Section there are two PG chapters. The PGMTT chapter formed several years ago, has had an active and noteworthy career. Newly arrived is the PGEWS chapter, Professional Group on Engineering Writing and Speech, for which we have great expectations. As these chapters are in the family you will find their events duly publicized in the NEWSLETTER. There are additional PG chapter activities enjoying NNJ Section support. These are the jointly sponsored metropolitan area chapters. These chapters are supported jointly with the New York Section and in some cases also with the Long Island Section. Gus Karger, our hardworking PG coordinator, listed these chapters in the September issue of the NEWSLETTER. Every effort is made to give advance publication to the meetings of these chapters as well, so that the Section membership may enjoy the programs which they help support.

Those recommendations for Fellow grade should be sent to Harry Hauck at the Measurements Corporation as soon as possible. This particularly applies to the smaller companies, where people are more likely to remain unnoticed by the Committee in its survey.

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NCE Now Offering Doctorates in Engineering

The trustees of Newark College of Engineering announced recently that the State Board of Education has granted the college authority to confer the degree of Doctor of Engineering Science in addition to the B.S. and M.S. degrees the college now offers in Chemical, Civil, Electrical, Industrial, Management and Mechanical engineering. The new doctoral program will be offered at first only in the fields of Chemical and Electrical engineering.

The State Board's authorization, dated September 7, was transmitted to the trustees in the form of a four part resolution commending NCE for the quality of its facilities and faculty which, it said, "assures a rich program of advanced study culminating in the doctoral degree."

"Newark College of Engineering," the resolution continued, "has distinguished itself in undergraduate and graduate study, having conferred more than 1,000 Master's Degrees since 1949 and having received from time to time explicit approval and commendation of accrediting agencies."

The resolution, the result of a formal application by the college and of a recommendation for its approval by State Education Commissioner Frederick M. Raubinger, noted that NCE "serves an industrial complex requiring a high concentration of professional staff with advanced technical and scientific training."

Trade Journal Editors Air Needs to Philly PGEWS

A panel discussion by staff editors from three leading national technical magazines highlighted the September meeting of the Philadelphia Chapter of PGEWS. The participants in the discussion included Peter Kaprielyan, Technical Editor of AIRCRAFT AND MISSILES; Joseph McLean of ELECTRONICS NEWS; and Samuel Weber, Senior Associate Editor of ELECTRONICS and Editor of the NNJ NEWSLETTER.

Each member of the panel outlined his magazine's requirements and standards for submitted technical manuscripts. Particular attention was paid to such aspects of technical papers as subject, length, illustrations, and style.

(Continued from page 7)

than an action. The response to a number of available choices in much more than a simple "yea" or "nay." There are all sorts of responses possible — from an enthusiastic leap onto the bandwagon down through all the intermediate attitudes to a conscious determination to go along with only the "letter of the law." While the extremes are easy to spot, it becomes tricky in the intermediate cases to decide just what degree of concurrence has been obtained. This is particularly so when it is often impossible to state explicitly just what the decision itself was!

Under these circumstances, then, one wonders just what is the significance of the team concept. Certainly it is an intangible. More than that, it is an intangible that is based on intangibles.

Causes of Team Breakdown

Furthermore, it may lead one to look in wrong directions for the reasons for breakdown in team effectiveness. Usually if a team is not effective there is at least a strong implication that the solution lies in a change of heart in the team members — or a change of team members. The quarterback or manager may be criticized for failing to inspire the proper loyalty in the team, but never for acting as a quarterback or manager. Yet the root problem involved in the failure of an engineering group to function as a team may, in fact, be in the decision making procedure itself. The failure may be the result of the quarterback quarterbacking in areas where he should not.

It is a truism that engineering is an authoritative field. Given an engineering problem, there are many answers that will not work, and only one or a few that will. No matter how overwhelming the majority that favors a given answer, if it is not going to work—it won't. Nature is singularly unimpressed by majority votes. This fact puts tremendous emphasis on the judgment of those who, by virtue of having had applicable experience, should be in a position to make the best guess.

This is in contradistinction to what we might call managerial-type problems. Rarely does a wrong decision on such problems lead to disaster. The accumulation of many such wrong decisions may lead to bankruptcy, but no single such error is likely to do more than splash a little red ink around. Often enough it is not even clear whether or not the decision was wrong. But there is very little arguing with a process that does not work, or a design that does something else than what was intended.

Who Shall Decide?

The significant aspects here are the truths — and they are clearly true — that first, engineering decisions must be made by individuals, and second, the proper

choice of the individual who is to make the decision depends on the problem. A young engineer fresh out of school may have more specific and applicable experience for a given problem than his boss's boss. If the organization is to function effectively, that engineer should make that decision, and those upward in the hierarchy should be content to allow him to do so.

Where this is not done — and it is also a tricky problem to know whether this kind of delegation is or is not being properly done — then there must be a failure of the team spirit. If the young engineer has the best answer, only to have his seniors decree a different one, then his attitude toward the team, will certainly be affected.

He does not deserve to be called an engineer who will go along happily with an engineering decision that his superior has made and which he believes to be wrong. An organization of people worthy of being called engineers will most certainly fail to be a team if the structure of authority and decision does not adjust itself to the realities of the experience and talent within the group.

Yet it seems to us that to call such a situation a lack of team spirit is to dodge the actual problem. So diagnosed, the obvious remedy seems to be in the ways by which those in authority can evoke better loyalty. In such a case, the lack of team spirit is a symptom, not a cause. If the symptom be treated while ignoring the cause, then, certainly, the results will be less than desired.

Where does this leave us? We do not suggest that the word "team" is invariably a bad one. We must concede that it is a useful word in describing certain aspects of the functioning of an organization; but we also maintain that it describes only some of the aspects, not all. Particularly and most importantly, it does not describe the aspect of creativity. We can suggest that to some extent, the aspects it includes are anti-pathetic to creativity. We suspect that, where the ideal engineering team actually put together, it would be a singularly unimaginative group.

We also suggest that there is danger in the label "team" in that it describes a symptom to the possible confusion of the cause. If the label is used with the full awareness of this possibility, the difficulties will be minimal. If, instead, it is used as a bit of jargon, as a tag that replaces true thought, the concept can be very dangerous.

"Team" is a useful word; but precisely because it has become so fashionable, it is one that should be used with some caution.

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Open Letter to Future Members of PGEWS

Dear IRE Member:

The Northern New Jersey Chapter of the Professional Group on Engineering Writing and Speech extends to you an invitation as an IRE member, to join the local PGEWS Chapter.

Why A PGEWS?

Perhaps the question comes into your mind, "Why should I join PGEWS? I am not interested in writing and speaking, above all speaking in front of a group of engineers, and furthermore my company employs professional writers to patch up the few papers I am required to write." This perhaps in the pre-atomic era was a good reason but we found that when the chips were down and we had to communicate ideas to other engineers, we had lost the fine art of communicating by the written word. The IRE recognizing the need for better communication between the individual engineer and his fellow engineers established the Professional Group on Engineering Writing and Speech to help the IRE member become more adept in his use of the skills and techniques of written and oral communications.

Field of Interest

Naturally you want to ask what is the Field of Interest in this Professional Group? Like most groups we have long-range plans and the long-range PGEWS program includes the study, development, improvement, and promotion of all appropriate means for communicating information in the electronics and related fields. The techniques involved are those that will help you collect, organize, write,

process, illustrate, edit, and disseminate information. The group will both initiate and support development and promulgation of acceptable standards pertinent to its work.

Who Belongs to the PGEWS?

When you become a member of the local Group Chapter you will find that PGEWS is composed of people whose interest in writing and speaking is merely an adjunct to other engineering activities, as well as those whose major occupation is the communication of engineering information.

The interests of PGEWS extend beyond the technical disciplines of each of the other IRE Professional Groups to encompass areas that are of major concern to all of them.

If you are engaged in any of the many phases of electronics and are required to write, if only a monthly report, we can help you. So while you are thinking about it, clip out the coupon, attach your two dollars (\$2.00) and send it in.

Are You Planning To Attend The Next Section Meeting?

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- I am a member of IRE and hereby apply for membership in PGEWS. My assessment* is enclosed.
 - I am interested in joining IRE and the PGEWS. Please send information.
 - I belong to and wish to join the PGEWS as an affiliate.
- *Assessment: \$2.00 for IRE members of all grades except Student. Student assessment is \$1.00 if PGEWS is first Professional Group selected.

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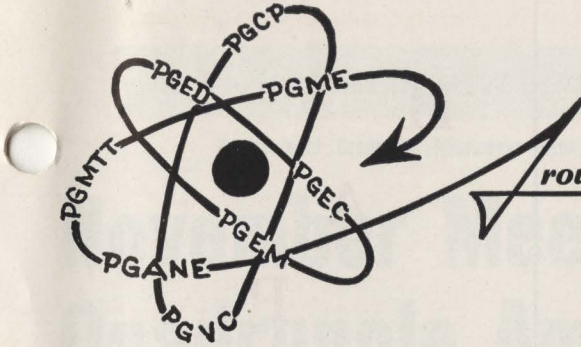
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round the PG Circuit

By GUNTHER "GUS" KARGER

CAPE CANAVERAL CALLS

Our regular Professional Groups Editor, "Gus" Karger, has been called from his ITTL post to an on-the-spot assignment at Cape Canaveral as part of the Courier Satellite Program, now in full orbit around the earth. Courier, an active satellite communications system, is slated to become a forerunner of systems which will in the near future provide dial telephone, teleprinter, facsimile, and live television on a worldwide scale. Pinch-hitting for "Gus" is yours truly, Brian Eden, latest addition to the hard-working NNJ NEWSLETTER staff. Like Gunther Karger, the writer is also with ITT Laboratories (Communications) and would like to take this opportunity to voice a hearty "hello" to all Northern New Jersey - Metropolitan New York - Long Island PG Chapter members.

ELECTRONICS AIDS MEDICINE

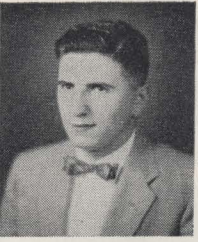
Mr. H. P. Mansberg, Publicity Chairman of the local chapter of the Professional Group on Bio-Medical Electronics (PGBME), reports that the program for the fall season is in full swing with the next meeting scheduled for November 17th at the Rockefeller Institute. Following a pre-dinner meeting at the Sutton Restaurant, PGBME members will hear Mr. Joseph Rogoss discuss "Problems in Electro-Diagnostic Instrumentation." Mr. Rogoss is Chief of the Physical Medicine and Rehabilitation Center of the Jewish Chronic Diseases Hospital of New York. The November talk by Mr. Rogoss is the second in a series of fall and winter presentations which will envelop such areas as Electromyography, Muscle Structure Investigative Techniques, Entelemetry, Oxiometry, Nuclear Instrumentation, Body Pressure Measurement, Instruments for the Blind, and Ultrasonics.

AIR TRAFFIC CONTROL: MAN OR MACHINE

The important area of Air Traffic Control will be in the spotlight at the

November 10th meeting of the Professional Group on Aeronautical & Navigational Electronics. Messrs. Thompson J. Simpson, Head, Radar System Engineering Section, and Karl F. Bierach, Acting Chief of Systems Modernization and Integration Section, both part of the Bureau of Research and Development, Federal Aviation Agency will speak on "A Third Dimension in Air Traffic Control."

The speakers will review the efforts underway to improve the traffic-handling capabilities and safety of the U.S. Air Traffic Control System via automation of certain functions of the air traffic controller. In the transfer of certain responsibilities from the human to a machine, there arises the problem of maintaining within the machine the all-important relationship of aircraft position with that of aircraft identity. In pointing out the problem generated in the transition from man to machine, the speakers will show how the introduction of height is expected to relieve this particular situation. The experimental air height surveillance radar (AHSR-1), which is now being constructed at the National Aviation Facility Experimental Center (NAFEC),



will be described as a source of the height data. Details of the meeting time and place can be found in the Calendar of Events.

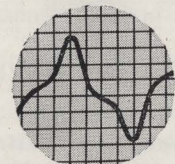
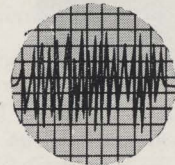
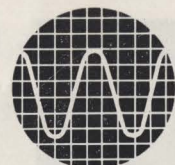
ROBOTS ON THE MOVE - PGEC

The New York Chapter of the Professional Group on Electronic Computers will meet on Tuesday, November 22, at the International Business Machines office, 578 Madison Avenue (Manhattan). The meeting will begin at 8:00 p.m. in the second-floor auditorium (Rooms D and E). A paper entitled "A Digitally Controlled Robot" will be presented by Mr. Maury Dunne of the Consolidated Controls Company, Bethel, Connecticut. PGEC Vice-Chairman Philip Rosenblatt reports that plans for the remainder of the New York Chapter season include the following meetings:

- Thursday, January 5 — "Features of the Packard-Bell PB-250 Computer"
 - Thursday, February 2 — "A Security System for Military Installations"
 - Thursday, February 28 — "Pulse Transformer Design by Use of a Digital Computer"
- Additional meetings are scheduled for the dates of April 20 and May 25.

CALENDAR OF EVENTS

- November 10 —A THIRD DIMENSION IN AIR TRAFFIC CONTROL PGANE Members will be notified of time and place of meeting
- November 17 —PROBLEMS IN ELECTRO-DIAGNOSTIC INSTRUMENTATION Pre-Meeting Dinner 6:15 P.M. Talk 8:00 P.M. PGBME Sutton Restaurant 1053 First Avenue New York Rockefeller Institute—Welch Hall 67th Street and York Avenue, N. Y.
- November 22 —A DIGITALLY CONTROLLED ROBOT 8:00 P.M. PGEC International Business Machines Office 578 Madison Avenue Manhattan



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POWER SUPPLY: 105-125 volts; 50-420 cps, 75 watt. Provision for 210-250 volt operation

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regardless of waveform

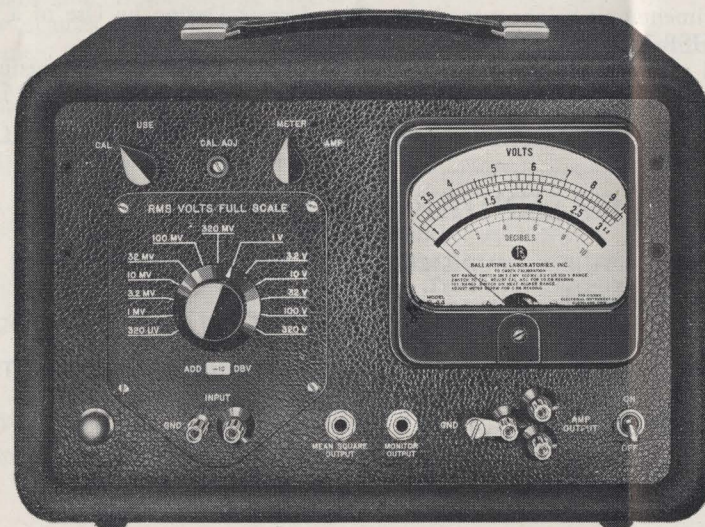
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NORTHERN NEW JERSEY IRE

Professional Group on Microwave Theory & Techniques

P.G.M.T.T.

November Meet Features Quadrupole Amplifiers

At the November 16th meeting of the PGMTT, Dr. E. I. Gordon of Bell Telephone Laboratories, will discuss quadrupole amplifiers. The meeting, scheduled for 8:00 p.m. at the Arnold Auditorium of Bell Telephone Laboratories, Murray Hill, will be preceded by a dinner. This pre-meeting dinner is to be held at the Old Heidelberg restaurant in Scotch Plains with a starting time of 6:00 p.m.

Quadrupole amplifiers such as the Adler tube can amplify microwave frequencies at X-band and higher with very low noise figures. These amplifiers are relatively easy to manufacture. The heat dissipation ability of the coupler used is much greater than that of a helix or that of the re-entry cavity of a klystron since no fine structures are present.

Dr. Gordon will discuss in detail several topics dealing with this method of amplification.

Physical Description

A physical description of various interactions that occur in quadrupole pump fields will be given. These interactions include:

1. Active coupling of cyclotron waves in both high frequency and d-c pumps for amplification,
2. Passive coupling of cyclotron and synchronous waves for beam cooling and slow wave noise stripping,
3. Coupling of transverse waves and space-charge waves, and
4. The influence of space-charge on the amplification process.

PGMTT NOVEMBER MEETING NOTICE

Subject:
QUADRUPOLE AMPLIFIERS

Speaker:
DR. E. I. GORDON,
Bell Telephone Laboratories

Place:
ARNOLD AUDITORIUM, Bell Telephone Laboratories,
Murray Hill, N. J.

Time:
Wed., November 16
8:00 P.M.

Dinner:
PRE-DINNER MEETING
at Old Heidelberg,
Scotch Plains, 6:00 P.M.



From 1952 to 1957 he did graduate work at MIT where he was awarded a Ph.D. in Physics.

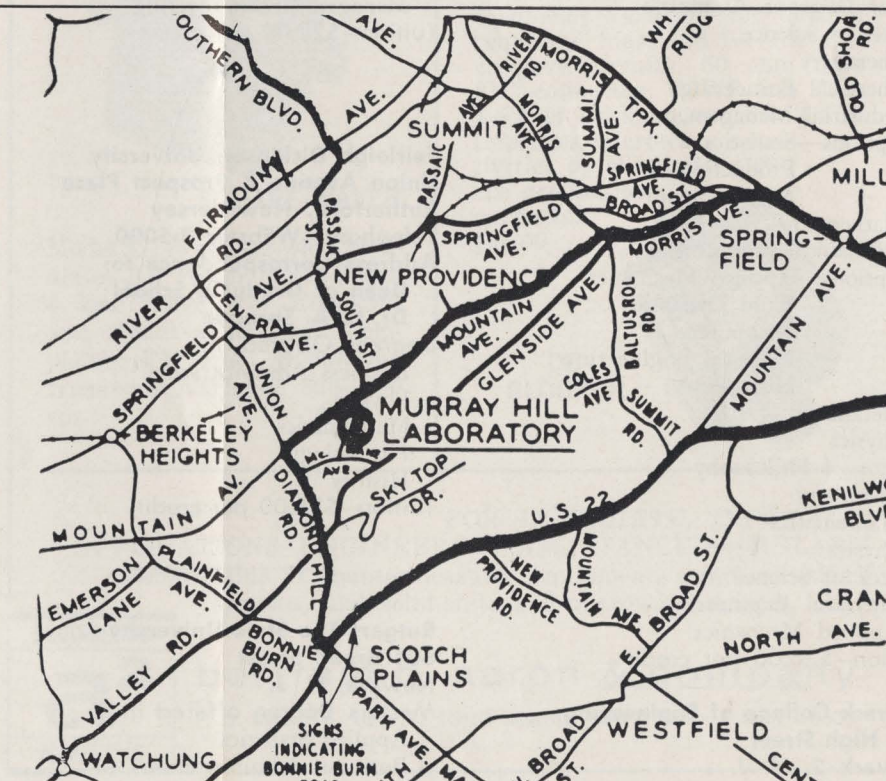
MIT Associate

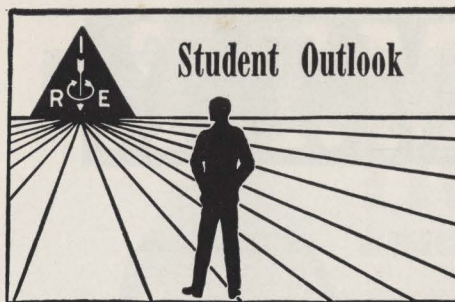
From January 1957 to October 1957 he served as a Research Associate at MIT. During this period Dr. Gordon conducted research dealing with plasma physics.

Since November 1957 he has been a member of the Technical Staff at Bell Telephone Laboratories and is presently a supervisor in a group studying cyclotron wave amplifiers and low-noise traveling wave tubes.

About the Speaker . . .

Dr. Eugene I. Gordon is a native of New York City having been born in the Bronx in 1930. His undergraduate work was at the City College of New York where he received a B. Sc. in Physics in 1952, graduating Magna Cum Laude.





BY BOB BROWN

The NEWSLETTER plans to devote an entire page to student activity news in each issue this season. To facilitate this plan, this editor proposes to utilize the space to provide several services never before presented by the section to its members. There are several categories of

students hitherto ignored in this column that represent a sizeable portion of the membership. So beginning with this issue and in one issue every year, we will publicize advanced study opportunities in NNJ and surrounding areas for the benefit of graduate students.

There are two colleges in the NNJ section, NCE and Stevens, that offer graduate training and degrees in electrical engineering. Stevens also offers a doctorate and masters degree in physics. Business Administration, Industrial Management, and various engineering curricula are also available in the area. A condensed list of pertinent facts follows this article for the prospective student's use;

LIST OF AVAILABLE COURSES

Stevens Institute of Technology
Castle Point Station
Hoboken, New Jersey
Telephone N. Y.—RE 2-8237
Telephone N. J.—OL 9-7700
Address Correspondence to:
Director of Admissions
Dean of Graduate Studies
Dr. J. H. Potter
 Degrees Available in EE
 Master of Science in Electrical Eng.
 General curricula in electronics some courses in computer technology and switching. Semiconductors emphasized.
 Other Degrees Available
 Master of Science
 Chemistry
 Chemical Engineering
 Industrial Management
 Options—Statistics
 Production Management
 Mathematics
 Mechanical Engineering
 Options—Applied Mechanics
 Fluid Dynamics
 Computers
 Nautical Engineering
 Heat Power
 Metallurgy
 Physics
 Doctor of Philosophy
 Chemistry
 Mathematics
 Physics
 Doctor of Science
 Chemical Engineering
 Applied Mechanics
 Tuition—\$36.00 per credit

Newark College of Engineering
323 High Street
Newark 2, N. J.

Telephone—MA 4-2424
Address Correspondence to:
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Chairman of Graduate School
Dr. I. P. Orens
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 Masters Degree in Electrical Eng.
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 Civil Engineering
 Electrical Engineering
 Mechanical Engineering
 Management Engineering
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Fairleigh Dickinson University
Union Avenue & Prospect Place
Rutherford, New Jersey
Telephone—WEBster 3-5000
Address Correspondence to:
Dean of Graduate School
Dr. H. A. Sprague
 Degrees Offered in:
 Business Administration
 Physics
 Mathematics
 Psychology
 History
 Tuition—\$25.00 per credit

Rutgers The State University
601 Broad Street
Newark, N. J.
 Masters Degree offered in:
 Applied Statistics
 Business Administration

STEVENS DRIVE FOR MEMBERS

Stevens Institute of Technology inaugurated their program for the year at a meeting on October 5th. Membership applications were distributed and a membership drive was initiated. Mr. Gary Fitton will report news from this chapter during the year.

STUDENTS' NIGHT

Students' Night is upon us this month. It is the sincere wish of this editor that the entire memberships of all chapters attend. The topic (Tiro) is one of vital interest and should draw an equally large percentage of graduate members as well as undergraduate. A booklet titled "Proceedings of the second symposium on Applied Reliability" will be made available to all students in attendance.

Mathematics
 Chemistry
 Tuition—\$13.50 per credit

Seton Hall University
South Orange, N. J.

Address Correspondence to:
"Office of University Admissions"

Dean of Graduate Studies
Dr. R. H. Morrison
 Masters Degrees in Chemistry &
 Business Admissions
 Tuition—\$20.00, \$25.00 (Chemistry) per credit

Engineering Degrees are offered at many colleges in New York City. Some addresses follow for further information:

New York University
 Washington Square
 New York 3, New York
 Columbia University
 New York 27, New York

Address—"Admissions" or "Requests for Bulletins"

Polytechnic Institute of Brooklyn
 333 Jay Street
 Brooklyn, New York

Address—Admissions Office
 Fordham University
 441 East Fordham Road
 New York 58, N. Y.

Address—Office of Admissions

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 Range: 70 db. Input attenuator provides six 10 db steps. Accuracy 0.1 db/step
 Meter Scales:
 SWR 1-4, 3-10; expanded SWR 1-1.3; db 0-10; expanded db 0-2; bolometer current 0-10 ma.
 Gain Control: Approximately 30 db range
 Input Connector: BNC female
 Input Positions:
 High Bolo—8.4 ma, 200 ohms
 Low Bolo—4.3 ma, 200 ohms
 200—200 ohms for crystal
 Hi-Z—high impedance for crystal
 Outputs:
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 Power: 115/230 volts, 50/60 cps
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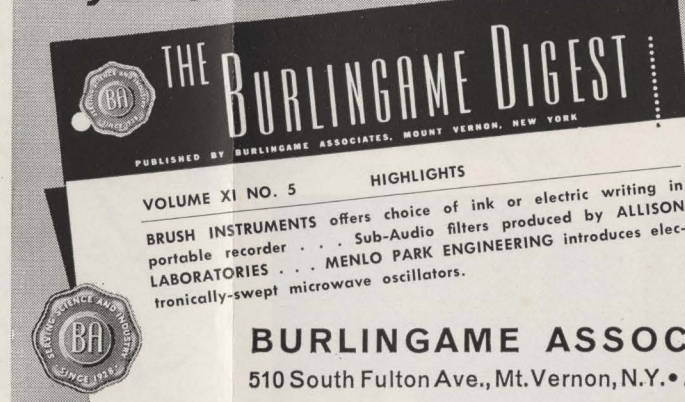
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Nov. 1—Amplification by Tubes and Transistors

Nov. 15—Parametric Devices and Tunnel Diodes

Nov. 22—Amplification in Space

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Mr. James Van Duyne, Membership Chairman hands Mr. C. S. McCamy his admission card. Looking on is Dr. G. M. Anderson.



Members and guests signing the register at the Bell Telephone Labs Auditorium.



Mr. C. S. McCamy answering a question from a member. In front of Mr. McCamy are the three projectors used in the demonstration.

Near-Record Turnout At September Section Meeting

By Jim Holahan
(Photos by Ed Byrum)

Almost 350 NNJ IRE members were alternately bewitched, bemused, and (at times) bamboozled by the National Bureau of Standard's Calvin S. McCamy during his surpassingly fine demonstration of abridged color systems at the September Section Meeting held at Bell Labs in Murray Hill. Manipulating projectors and filters like a magician performing slight of hand, Mr. McCamy added colors, subtracted colors, mixed colors, and switched colors to produce some highly unexpected results.

Complementing his demonstration with an excellent technical explanation of color phenomena, Mr. McCamy placed particular emphasis on the subjective nature of color perception with a neat bit of photographic deception which had his audience reporting blue, yellow, and brown in a black and white slide. He also discussed (quite seriously) the advantages and drawbacks of two-color television and photographic systems.



Section Chairman Anderson congratulates Tore Anderson on receiving the plaque in recognition of exceptional service to the Section.



The Air Force Missile Family...Scions of Space Technology

Science and technology, especially as they relate to missile art, have advanced further in the last six years than in the preceding six centuries. Any review of the many milestones successfully attained since 1954 reveals an epic of hard work, inventiveness, accomplishment, and singleness of objective. This single objective—the achievement of operational weapon capability at the earliest possible date—is being realized.

The Air Force missile family including Atlas, Thor, Titan, and Minuteman, has achieved progress beyond expectation in a program unmatched for magnitude and complexity.

Space Technology Laboratories has had the responsibility since 1954 for the over-all systems engineering and technical direction of these programs. STL's scientific and technical management capabilities have not only helped to hasten the day of operational capability for Air Force ballistic missiles, but have also been applied in carrying out related space probe and satellite projects.

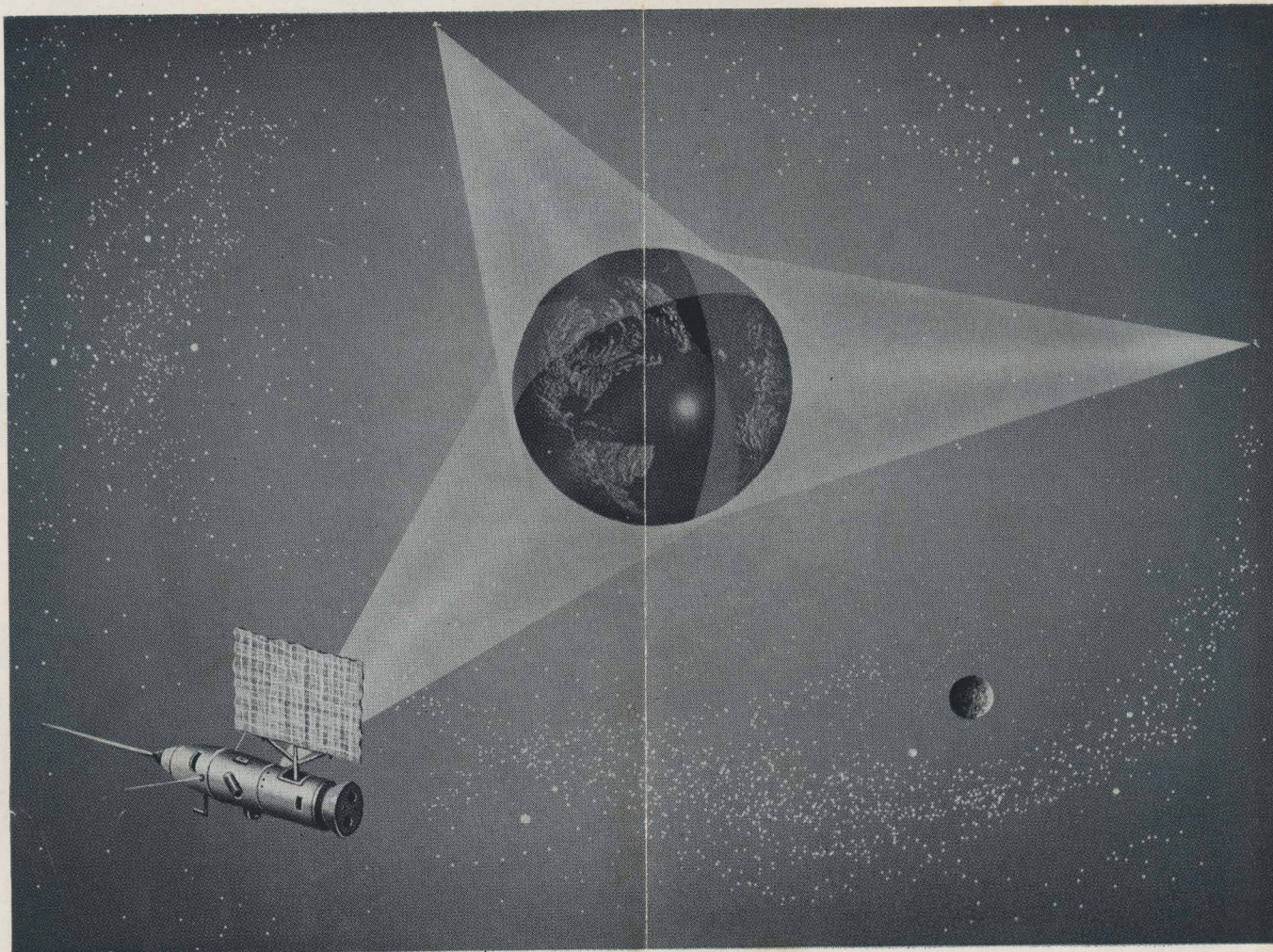
Scientists and engineers with outstanding qualifications find unusual opportunities for their skills and disciplines at STL. Positions on STL's technical staff are now available for those who wish to add a new dimension to their careers. Resumes and inquiries are invited.

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THE FAR REACHES OF MAN'S KNOWLEDGE

Over the years ITT Laboratories has made significant contribution to advancing the state of the art in electronics. Today highly evolutionary progress is moving apace in such areas as broadband communications systems, low-noise parametric amplifiers, atomic clocks, inertial navigation systems, high density storage tubes, and space guidance, navigation and flight control. Major achievements are resulting in stored program digital computers and digital communications.

While engineers and scientists at ITT Labs meet the urgencies of today, they are simultaneously exploring the far reaches of man's knowledge, accepting small failures, making small successes, to unlock

the doors to revolutionary achievements in electronics.

Communications, as essential to civilization as food and shelter, is an area of unlimited challenge which constantly occupies our efforts. To find more room within the radio spectrum for electronic communications — from direct current to the cosmic rays — is a major goal. Revolutionary ways to extend communications is another. We foresee early success with single satellite systems of the delayed-transponder type, and possibly passive reflector satellites. In only a few years ITT's "Earth Net" communication system may be a reality, providing global communications via three satellites. Within a generation, world-wide television may be a commonplace.

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