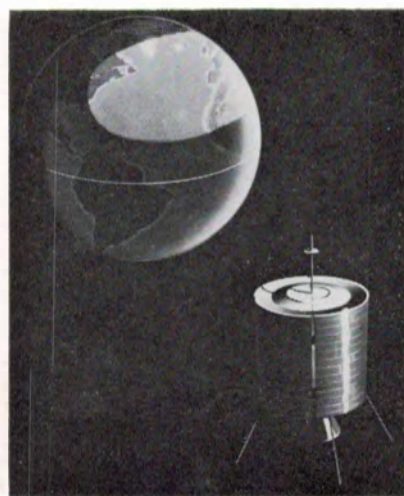
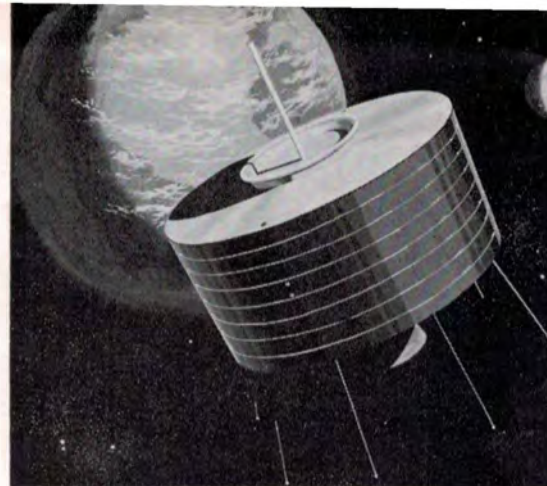


NORTH JERSEY ANNUAL DINNER



and presentation on

INTELSAT

The Global Approach to Satellite Communications
by Col. Edwin J. Istvan, Comsat



The IEEE

Newsletter

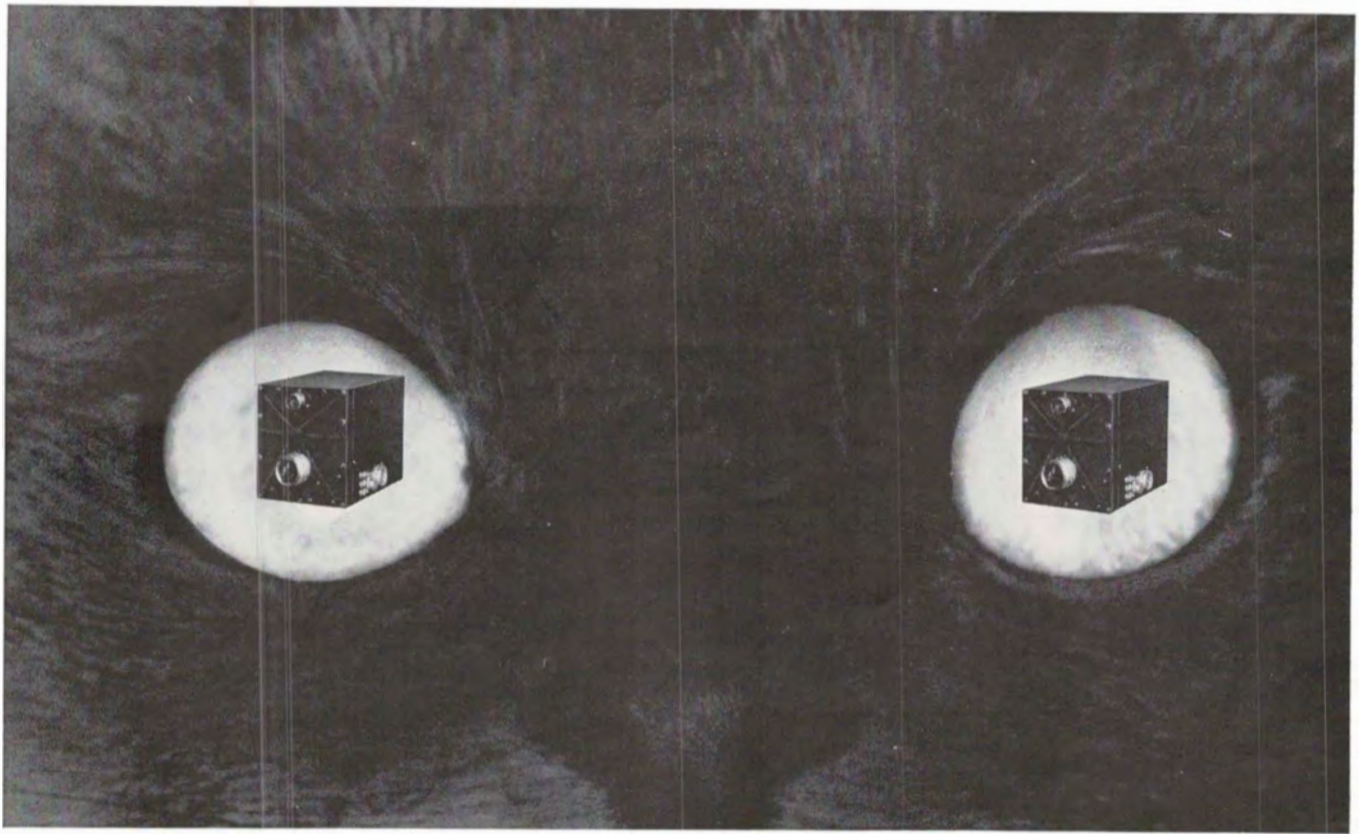
The Magazine of the North Jersey Section

ANNUAL DINNER and INTELSAT PRESENTATION
Wednesday, June 8 — Cocktail Hour 5:30 P.M.

ROBIN HOOD INN
Clifton, N. J.

For details, see page 4

Volume 12 / Number 10 JUNE 1966



IT WORKS IN THE DARK.

A fact our engineers sympathize with.

A Hazeltine low-light-level TV camera will soon be ready to snap pictures from Nimbus.

In developing this advanced camera, which operates on illumination as weak as starlight and as strong as sunlight, our engineers sometimes felt they were working over their heads . . . in areas of electronics where there were often no technological precedents.

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Advanced Communications Research

Synthesis and advanced development of ECCM communications, navigation and IFF, including AJ, secure and concealed systems. Strong theoretical background with substantial experience in analysis and/or synthesis required. Background in circuit design and hardware development desirable.

Radar Engineering

Senior openings in Radar and ECM Systems design. Intermediate and junior openings in RF and IF solid state circuit design. Junior openings in general solid state circuit design.

Signal Processing Research

Investigation of problems in advanced pulse compression wave-forms and signal processing, optimum filtering, multi-static radar data association. Both experimental and analytical backgrounds desirable.

Circuit Design

BS in EE (MS preferred) with 2 or more years experience in the design and development of solid state circuitry for military electronics systems. Assignments in diversified programs working from specification to prototype.

Reliability Engineering

BSEE, with 3 to 5 years experience in reliability programs for military electronics equipment, including design reviews, test procedures, parts failure analysis and reliability predictions.

RFI Engineering

Graduate EE with experience in RFI analysis and design. Must be familiar with Military RFI specifications, design practices, evaluation equipment and evaluation methods.

Electronic Imaging & Displays

Graduate EE with experience in the design of analog and digital circuits for camera tubes, scan converters and display devices, for military and space applications.

Write in confidence to Mr. W. Speer



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ABOUT ADDRESS CHANGES

REPORT ALL ADDRESS CHANGES TO:
INSTITUTE OF ELECTRICAL AND ELECTRONICS
ENGINEERS INC., 345 EAST 47th STREET
NEW YORK, N. Y. 10017

It is not necessary to inform the North Jersey Section when you change your mailing address. The NEWSLETTER and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.

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IEEE Group Editor: A. R. D'heedene
School Affairs Editor: Gene R. O'Brien
Associate Editor: David Wiener
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Executive Committee Meeting

at Verona Public Library — May 4

North Jersey Section IEEE Executive Committee

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Publicity Harry Raven
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Group Coordinator D. R. Campbell

Wednesday, June 8

NORTH JERSEY SECTION ANNUAL DINNER

5:30 P.M.—Cocktail and Social

6:30 P.M.—Dinner

"INTELSAT — The Global Approach to Satellite Communications"

6:30 P.M.—"INTELSAT—The Global Approach to Satellite Communications"
Col Edwin J. Istvan, COMSAT

Tuesday, June 14

N. Y. COMPUTER GROUP

7:30 P.M.—"Critical Review of Computer Year"

Dr. Howard Campaigne, Chief of Research National Security Agency
At—IBM Building, 590 Madison Avenue, N. Y. C.

Wednesday, June 15

NORTH JERSEY ENGINEERING WRITING AND SPEECH

8:00 P.M.—Program for coming year to be discussed

At—Communications Systems, Inc., South 60, Route 17, Paramus, N. J.

June 21, 22, 23

NEP/CON '66 — N. Y. COLISEUM

Wednesday, June 22

N. J. COAST COMTEC

8:00 P.M.—"Commercial Satellites of the Future"

Dr. Richard Guenther, RCA
At—Little Silver Fire House, Prospect Avenue, Little Silver, N. J.

NORTH JERSEY SECTION

IEEE GROUP COMMITTEE CHAIRMEN

If you require information on a North Jersey Section Group or wish to join one of these groups, please contact the chairman, whose name is listed below, of your field of interest.

Automatic Control — Robert G. Sokolski

Kay Electric Co.
Pine Brook, N. J.
226-4000 — Ext. 66

41 Taylor Ave.
Singac, N. J.
201 - 256-4206

Communications Technology — Alfred A. Roetken

Bell Telephone Labs.
Murray Hill, N. J.
201 - 582-3943

45 Prospect St.
Madison, N. J.
201 - 377-0347

Engineering Writing & Speech — Laverne Lees

Communications Systems, Inc.
South 60, Route 17
Paramus, N. J.
201 - 843-2400 — Ext. 4526

Microwave Theory & Techniques — Michael J. Thompson

Bell Telephone Labs.
Whippany, N. J.
201 - 887-1000 — Ext. 4127

100 Franklin St.
Morristown, N. J.
201 - JE 8-5169

Electronic Computers — Harry Clark

ITT Federal Labs.
500 Washington Ave.
Nutley, N. J. 07110
201 - 284-2537

97 Chestnut St.
Nutley, N.J.
201 - 667-6855

Power — Carl Torell

Federal Pacific Electric Co.
50 Paris St.
Newark, N. J. 07101
201 - 624-7500

9 Colony Court
Summit, N. J. 07901
201 - 273-2849

NORTH JERSEY SECTION

ANNUAL DINNER

June 8, 1966

The North Jersey Section dinner will be held at the Robin Hood Inn, 1129 Valley Road, Clifton, N. J. A "Dutch Treat" cocktail and social hour will begin at 5:30 P.M. A combination ham and chicken dinner will be served at 6:30.

Dinner tickets will cost \$4.00 each. Non-members are welcome — including wives.

PRESENTATION

By

Edwin J. Istvan — Guest Speaker
Director of International Development
Communications Satellite Corporation



"INTELSAT—The Global Approach to Satellite Communications"

Two international agreements were formulated in 1964 to implement the concept of jointly establishing a commercial communications satellite system for use by all nations. The agreements set forth certain basic political and economic principles and goals to which all of the countries signing the agreements are committed. They express the intent to create a single global system at the earliest practicable date, and they state the desire that all nations shall be permitted to use the system on a non-discriminatory basis.

The space segment of the system, that is to say, the satellites in orbit and the facilities required for their control, are being built, owned and operated by the participants in the joint enterprise, the signatories to the agreements. This partnership of the signatories has recently been named the International Telecommunications Satellite Consortium, now known as INTELSAT. The governments of 48 countries have become party to the agreements, since the agreements were formulated in 1964. Each government has designated a particular telecommunications entity to be its participant in the enterprise as part of this

unique international partnership which owns and operates the space segment. The 48 countries account for more than 90% of the potential international world telecommunications traffic that might be served by the global satellite system in the next few years.

Each of INTELSAT's members possesses the same juridical rights and obligations, differing only in quotas of ownership and number of votes in the ICSC. These rights include access to certain space communications technology, opportunities for local industries to provide equipment for the space segment, earnings on invested capital, and the possibility of obtaining membership on the Interim Committee.

An operating INTELSAT organization has already been put together and is functioning. Policy control of the international system is vested in the Interim Communications Satellite Committee (ICSC) which has been meeting regularly on a monthly basis since September of 1964. The Interim Committee comprises 15 members who directly represent 34 countries. The Interim Committee has a Secretariat and three Subcommittees for finance, technical matters, and contracts, respectively. Responsibility for the operation of the system under the policy direction of the Interim Committee has been assigned to the Communications Satellite Corporation which has been designated Manager of the System.

The Early Bird satellite (INTELSAT I) is owned in undivided shares by the 48 partners in this international consortium. The INTELSAT program, approved by the Interim Committee, calls for the launching of two additional synchronous satellites during the Summer of 1966. One of these satellites will be visible from the Eastern part of Southeast Asia to the Western part of the United States. The other will be positioned over the Atlantic Ocean where it will complement the coverage of the INTELSAT I satellite by enabling communications to take place between all of Europe, Africa and the Middle East, Latin America, and the Eastern shores of North America. These satellites, referred to as "INTELSAT II" satellites, will be capable of having numerous earth stations operating simultaneously through each satellite without significant reduction to their channel capacity. The anticipated lifetime of these satellites is twice that of the INTELSAT I.

The Interim Committee has formulated the "general standards" for earth stations intended to operate with the satellites of the system. These standards comprise certain minimum and recommended performance requirements which, if met, will assure technical approval for access of the earth station to use the satellites of the space segment. Already the requests for some 12 earth stations for access to use the satellites have been approved by the Interim Committee, and it can reasonably be expected that by 1968 some 20 to 30 earth stations will be in operation within the system throughout the world.

The program being followed by INTELSAT for the establishment of the single global commercial communications satellite system significantly accelerates the time table originally anticipated for successive phases leading to global coverage by communications satellites.

Biographical Data EDWIN J. ISTVAN

Education

B.S. Magna Cum Laude, Cleveland State University
M.S. Applied Physics, University of California

Prior Positions

Office of the Air Force Chief of Staff for Guided Missiles. 1957-1960

Deputy for Inter-Continental Ballistics Missiles

Department of Defense, Office of Space Systems. 1960-1963

Awarded Legion of Merit for contributions to the national space effort made while in this position.

Communications Satellite Corporation since April 1963.

Present Function

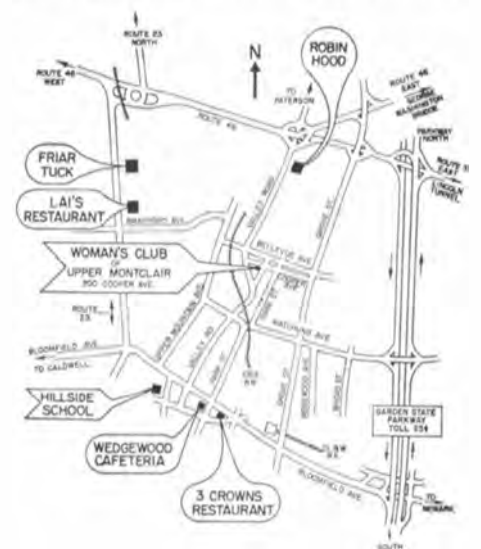
Director, International Development Division Communications Satellite Corporation
Responsible for developing plans and programs for achieving maximum participation in the communications satellite system on a global basis; providing information and decision-making assistance to foreign governments and telecommunications entities; assisting these foreign governments and entities in the development of their programs for the establishment of earth stations; and providing the principal point of contact with Government agencies regarding the Corporation's relationships with foreign governments, entities and international bodies.

COUPON COUPON COUPON

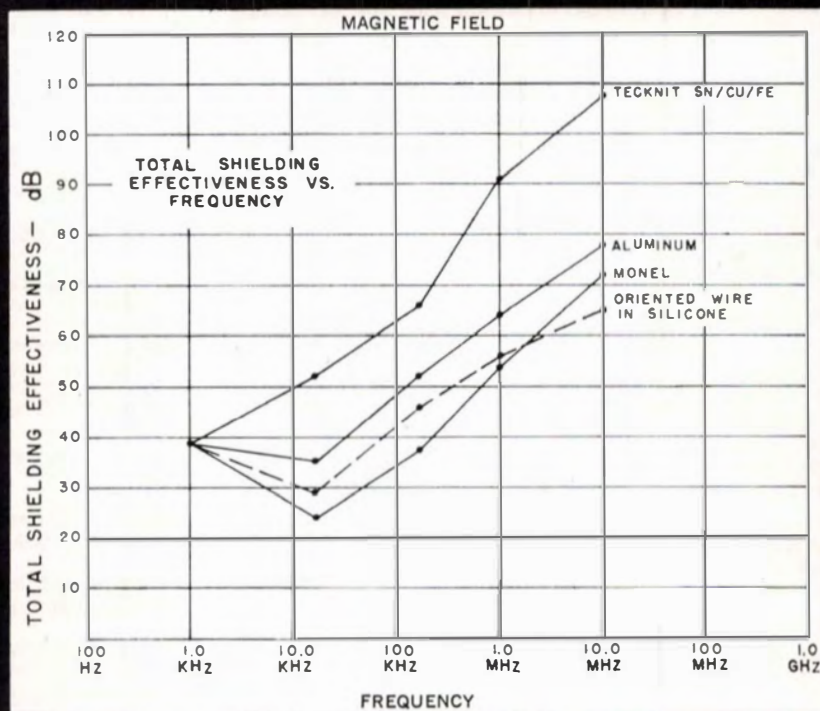
Yes! I want to attend the IEEE North Jersey Section's annual dinner meeting on Wednesday, June 8, at the Robin Hood Inn, Clifton, N. J. Enclosed is my check for \$ _____, representing payment for _____ dinner tickets at \$4 each. (Make checks payable to IEEE North Jersey Section.) I am enclosing a stamped, self-addressed envelope.

I understand that if I mail my check after June 1, my tickets will be waiting for me at the Robin Hood Inn.

Mail your check to the dinner committee chairman: Mr. M. M. Irvine, Bell Telephone Laboratories, Whippany, N. J., Room 3E127.



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CHAIRMAN'S CORNER REFLECTIONS

May 4, 1966

At the beginning of this year, the North Jersey Section established as its objectives: an active student program, a series of educational activities, several field trips and a social program. In the course of the year, all of these objectives have been fulfilled. There have been twenty-seven meetings and three lecture series. These meetings have included the Annual Banquet, at which over two hundred engineers and wives enjoyed a pleasant evening of good company and dancing. They also included two field trips, both of which were oversubscribed and required repetition.

The meeting programs were, in general, directed toward the new disciplines and technologies which are changing the nature of our profession. The subject matter ranged from electro-gas dynamics to quality control procedures. The presentations were uniformly good.

The student program featured the annual students nite at which industry representatives described current interview and hiring practices. The meeting was well attended and well received. Furthermore, during the year, a new Student Chapter was founded and another application initiated.

In summary, the objectives established have, in fact, been met. This accomplishment has come about because of considerable effort on the part of a large number of people who constitute the active committees which the Section has been fortunate to have this year. To these, and to all of those who contributed to making this a successful year, this Chairman says a sincere and humble "THANK YOU."

WALTER L. GLOMB
Chairman

NORTH JERSEY PGEWS

MEETING NOTICE

The North Jersey Chapter on Engineering Writing and Speech will hold a meeting on:
15 June 1966 — 8:00 P.M.

Communication Systems, Incorporated
South 60, Route 17, Paramus, New Jersey
(across from the Garden State Plaza)

Item of business will be the program for the coming year.

NORTH JERSEY SECTION

Information on IEEE Awards

As set forth in Operating Procedures of the North Jersey Section of the IEEE, the Awards Committee handles nominations of the Section for the Fellow Grade of Membership, for other National Awards, and for Section Awards. Nominations may originate within the Committee, or they may be sent in by individuals. In either case, an individual closely associated with the nominee can best fill out the necessary forms, sponsor blanks, etc. Nominations may be sent by individual Section members directly to the National Awards Committee; there is an element of added prestige if the Section Awards Committee approves and forwards the nominations. It is important that *every Section member consider the awards each year*, and suggest or sponsor appropriate candidates. Any member of the Awards Committee, listed below, will be glad to give counsel, and assist in the documentation procedures. The awards that are considered each year are attached.

Nomination forms may be obtained from the Staff Secretary of the Awards Board at IEEE Headquarters.

In order to properly consider nominations and submit them to the National Awards Committee on time, the Section Awards Committee should receive nominations and complete supporting material at least four (4) weeks before the deadline dates shown.

Awards Committee Members

R. D. Chipp, *Chairman*
R. T. Adams
J. T. Cimorelli
R. L. Dietzold
C. H. Hoffman
A. G. Kandoian
S. C. Leyland
R. M. Morris
J. H. Mulligan, Jr.
F. A. Polkinghorne
J. R. Poppele, Jr.
A. G. Richardson
P. C. Sandretto

NATIONAL AWARDS	NOMINATIONS DUE	FEATURES
IEEE Medal of Honor	1 June	Exceptional contribution to the field of science and technology encompassed by IEEE.
Edison Medal	1 June	Career of meritorious achievement in electrical engineering or electrical arts.
Founders Award	1 June	Major contributions in leadership, planning and administration of affairs of great value to the electrical and electronics engineering profession.
Lamme Medal Award	1 June	Meritorious achievement in development of electrical or electronic apparatus or systems.
IEEE Award in International Communication	1 March	Outstanding contributions in the field of international communication.
IEEE Education Medal	1 June	Excellence in teaching and ability to inspire students, and leadership in electrical engineering education through publication of textbooks and writings on engineering education.
Harry Diamond Award	1 April	Outstanding technical contribution in Government service.
Wm. M. Habirshaw Award	1 April	Outstanding contributions in field of electrical transmission and distribution.
Mervin J. Kelly Award	1 April	Outstanding contributions in the field of telecommunication.
Morris E. Leeds Award	1 April	Outstanding contributions in field of electrical measurement.
Morris N. Liebmann Award	1 April	Most important technical contribution to radio and allied arts recognized during the preceding three calendar years.
David Sarnoff Award	1 April	Outstanding contributions in field of electronics.
Vladimir K. Zworykin Award	1 April	Most important technical contribution in field of electronic television.
W. R. G. Baker Prize Award	15 September	Outstanding paper published in any of the IEEE Transactions during period July 1 through June 30.
Browder J. Thompson Memorial Prize Award	15 September	Best paper in any IEEE publication by author(s) under 30 years of age.
Fellow Grade	30 April	Unusual Professional Distinction.

STUDENT'S CORNER

Challenging summer programs for science- and management-oriented students, engineers, mathematicians, etc. are available at many universities. Listed, are some of the schools which offer pertinent courses.

Where:

Newark College of Engineering

What:

Fortran Language Programming

When:

Tues., Wed., Thurs. evenings; July 12-21

Fee:

\$40

Contact:

Paul A. Burns, Director of Conferences
Newark College of Engineering
323 High St.
Newark, N. J. 07102

Where:

Rutgers the State University

What:

Computer and Engineering Applications
Construction Contracts and Specifications

When:

Full Time, June 20-24

Fee:

\$150 per course

Contact:

Prof. Anthony J. Del Mastro, Director
Center for Continuing Engineering Studies
Rutgers, the State University
New Brunswick, N. J. 08903

Where:

University of Michigan

What:

Engineering Summer Conferences (About
35 courses in areas of engineering, science,
and computing)

When:

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Contact:

Raymond E. Carroll, Coordinator
Engineering Summer Conferences
University of Michigan
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Impedance 1 M Ω above 1 μ V; 5 M Ω above 0.1 mV; 10 M Ω above 0.1 V	Impedance < 10 k Ω above 1 nA; < 100 Ω above 10 μ A; < 1 Ω above 10 mA
Impedance Between Signal and Panel Grounds: R \geq 100 M Ω , C = 0.1 μ F, 500 V Peak Max Usable as DC Amplifier; 100 db max gain, 0.1 to 1 V output for each decade input range	

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N. J. COAST COMTEC

COMMERCIAL SATELLITES OF THE FUTURE

The trends in booster technology and power sources for use in satellites indicate the possibility of much larger and more powerful payloads in the future. Weights of 4,000 to 8,000 pounds and power up to 20 kw are indicated. This will permit multi-service satellites with more complex electronic equipment to be placed in orbit. This trend also offers substantial reduction in cost per pound payload and may open the way for a series of much more sophisticated satellites, such as repeaters with adaptive routing, TV broadcasting directly to the home, long distance mobile communication, etc. Some of the basic costs factors for such services and link computations will be presented in detail.

Speaker: Dr. Richard Guenther, RCA

Date: Wednesday, June 22, 1966

Time: 8:00 P.M.

Place: Little Silver Fire House
Prospect Avenue
Little Silver, New Jersey

Dr. Richard Guenther graduated from the Institute of Technology, Free City of Danzig (MEE-1934 and Ph.D. 1937). He is now Manager of all advanced communications technology activities for the RCA Defense Electronic Products Communications Systems Division. Among other projects his organization was responsible for the RCA part of 480-L, UNICOM, and the initial R and D phase of the Minuteman Project.

N. Y. COMPUTER GROUP

Critical Review of Computer Year Planned

Hardware developments of the 1965-66 computer year will be reviewed and assayed at the June 14 meeting of the New York Metropolitan chapter of the Computer Group.

The reviewer, Dr. Howard Campaigne, Chief of Research, National Security Agency, Ft. Meade, Md., will survey and comment on announced developments in circuits, subsystems and systems. The meeting is intended to be the first in an annual series of such reviews sponsored by the New York Chapter.

The meeting will be held at the IBM building, 590 Madison Ave., (57th St.) at 7:30 P.M. A no-reservations-needed, Dutch-treat premeeting dinner group will meet at 6:00 at Schrafft's, Madison Ave., and 58th Street.

The meeting will also be the occasion of the election of chapter officers for 1966-67. Nominated are: chairman, Alan Corneretto, Wathen/Walsh Assoc.; Phillip Rosenblatt, Western Union Co.; secretary, Prof. Ivan Flores, Stevens Institute of Technology.

NEP/CON '66

New York Coliseum
June 21, 22, 23, 1966

The National Electronic Packaging and Production Conference (called NEP/CON for short) will hold its fourth annual meeting at the New York Coliseum, June 21, 22, 23, 1966. An attendance of over 15,000 is expected to view the more than 250 booths. On display will be a wide range of components, materials, tools, and machines required in the production of electronic equipment.

In this year's meeting, over 125 panelists, speakers, and session chairmen, among them the leading experts from every branch of this industry, will participate in 12 technical sessions and eight specialized workshops, covering every facet of circuit packaging and production. In every technical session, and in every workshop, audience participation is strongly encouraged, a feature designed to facilitate the flow of ideas between the speakers and the men in the audience. NEP/CON is the working engineer's conference, where the everyday technology of building and producing electronic equipment is extensively discussed and analyzed.

ADVANCE INFORMATION

A University sponsored Short Course on the theme of "*Built-in Test Equipment for the Maintenance of Complex Electronic Systems*" will be conducted this summer in conjunction with the operations of PROJECT SETE. It is scheduled for the week of July 25, 1966 and will be held at the School of Engineering and Science.

The subject matter to be presented will emphasize new devices such as in-circuit, micro-circuit, non-destructive, and non-contact electronic and optical sensors; means for processing the sensor-derived data; and techniques for recording and display of the processed test data.

The course will be conducted in a manner similar to the "Design Course in Automatic Electronic Test Equipment" which was conducted in conjunction with PROJECT SETE activities in the summers of 1960 and 1961. The subject matter will be unclassified; tuition approximately \$225.

JOINT N. Y. ENGINEERING MANAGEMENT

At a meeting on April 21, 1966 the following slate of 1966-67 Officers of the Metropolitan Chapter were nominated:

Chairman L. Katz
(New York Telephone Co.)
Vice-Chairman H. Mullen
(Northern Radio Corp.)
Secretary J. E. Walsh
(Long Island Lighting Co.)
Treasurer R. Colen
(Hayden Publishing Co.)

Elections will be held at the Joint New York Section — Engineering Management Group meeting, May 19, 1966.

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Many years ago a Roman civil engineer, who was a high official in Alexandria, was approached by a young Arabian mathematician with an idea which the Easterner believed would be of much value to the Roman Government in its road-building, navigating, tax-collecting, and census-taking activities. As the Arab explained in his manuscript, he had discovered a new type of notation for number writing, which was inspired from some Hindu inscriptions.

The Roman official presumably studied this manuscript very carefully for several hours, then wrote this reply:

"Your courier brought your proposal at a time when my duties were light, so fortunately I have had the opportunity to study it carefully, and am glad to be able to submit these detailed comments.

"Your new notation may have a number of merits, as you claim, but it is doubtful whether it ever would be of any practical value to the Roman Empire. Even if authorized by the Emperor himself, as a proposal of this magnitude would have to be, it would be vigorously opposed by the populace, principally because those who had to use it would not sympathize with your radical ideas. Our scribes complain loudly that they have too many letters in the Roman Alphabet as it is, and now you propose these ten additional symbols of your number system, namely

1, 2, 3, 4, 5, 6, 7, 8, 9, and your 0.

"It is clear that your 1-mark has the same meaning as our mark-I but since this mark-I already is a well-established character why is there any need for yours?

"Then you explain that last circle-mark, like our letter O, as representing 'an empty column,' or meaning nothing. If it means nothing, what is the purpose of writing it? I cannot see that it is serving any useful purpose; but to make sure, I asked my assistant to read this section, and he drew the same conclusion.

You say the number 01 means the same as just 1. This is an intolerable ambiguity and could not be permitted in any legal Roman documents. Your notation has other ambiguities which seem even worse: You explain that the mark-I means ONE, yet on the very same page you show it to mean TEN and 10, and one HUNDRED in your 100. If my official duties had not been light while reading this, I would have stopped here; you must realize that examiners will not pay much attention to material containing such obvious errors.

"Further on, you claim that your system of enumeration is much simpler than with Roman Numerals. I regret to advise that I have examined this point very carefully and must conclude otherwise. For example, counting up to FIVE, you require five new symbols whereas we Romans accomplish this with just two old ones, the mark-I and

the mark-V. At first sight the combination IV (meaning ONE before FIVE) for four may seem less direct than the old IIII, but not that this alert representation involves LESS EFFORT, and that gain is the conquering principle of the Empire.

"Counting up to twenty (the commonest counting range among the populace), you require ten symbols whereas we now need but three; the I, V, and X. Note particularly the pictorial suggestiveness of the V as half of the X. Moreover, it is pictorially evident that XX means ten-and-ten, and this seems much preferred over your 20. These pictorial associations are very important to the lower classes, for as the African says, 'Picture tells thousand words.'

You claim that your numbers as a whole are briefer than the Roman Numerals, but this is not made evident in your proofs. Even if true, it is doubtful that this would mean much to the welfare of the Empire, since numbers account for only a small fraction of the written records; and in any case, there are plenty of slaves with plenty of time to do this work.

"When you attempt to show that you can manipulate these numbers much more readily than Roman Numerals, your explanations are particularly bad and obscure. For example, you show in one addition that 2 and 3 equal 5, yet in the case which you write as

79	
16	this indicates that 9
—	
95	

and 6 also equals 5. How can this be? While this is not clear, it is evident that the other part is in error, for 7 and 1 equal 8, not 9.

"Your so-called 'repeating and dividing' tables also require much more explanation, and possibly correction of errors. I can see that your 'Nine Times' Table gives sets which add up to nine, namely

18, 27, 36, 35, 54, 63, 72, 81 and 90 but I see no such useful correlation in the 'Seven Times' Table, for example. Since we have SEVEN, not nine, days in the Roman Week, it seems far more important we have a system that gives more sensible combinations in this table.

"All in all, I would advise you to forget this overly ambitious proposal, return to your sand piles, and leave the numbering reckoning to the official Census Takers and Tax Collectors. I am sure that they give these matters a great deal more thought than you or I can."

This apocryphal interchange could have happened. It appeared in "Simplified Chemical Coding for Automatic Sorting and Printing Machinery," is quite apropos in this day of new math, computers, minions, and metrics.

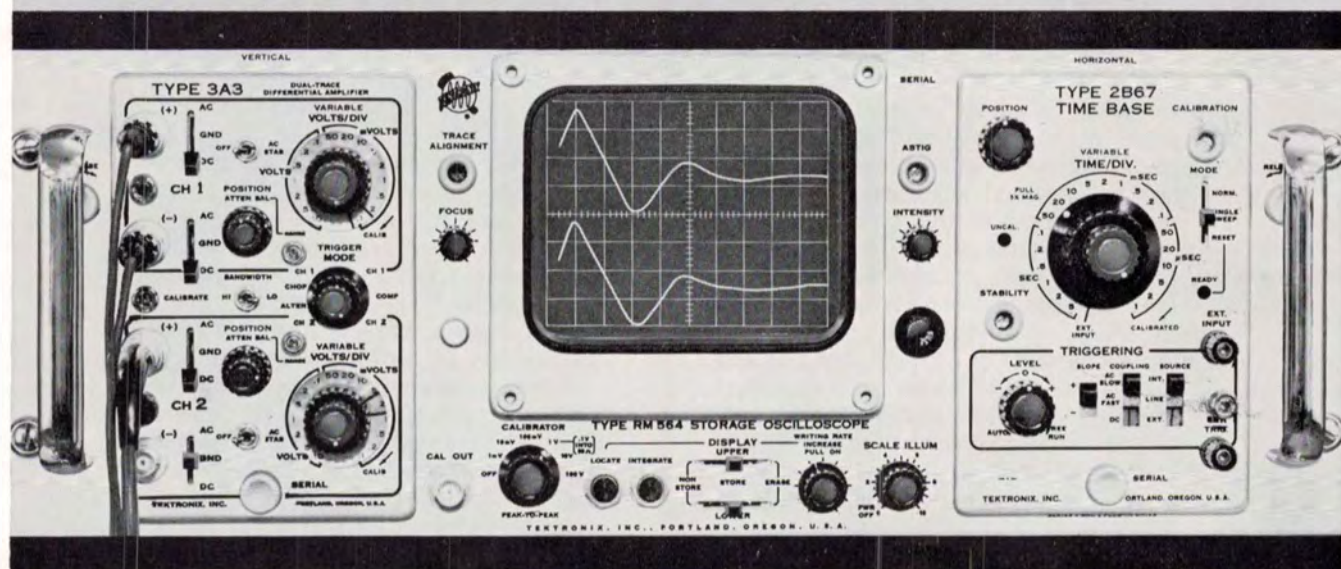
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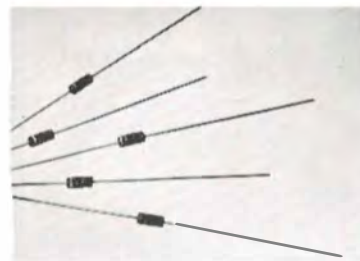
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