NEWARK AIRPORT INSPECTION TRIP

SATURDAY, NOVEMBER 20, 1965
10:00 - 12:00 A.M.

Advance Registration is Required

Further Details on Page 3
3-c to 1.5-Mc Frequency Meter and Discriminator for only $565 in U.S.A.

If 0.2% accuracy is adequate for your frequency-measuring needs, you will benefit in several ways by using this handy little instrument instead of a more costly counter. The dollar saving alone, of course, is substantial. And, if you want a permanent record of frequency drift or change, just connect a recorder to the instrument's output terminals and you have your data. As a bonus, you have an instrument that is also a highly linear, low-noise, pulse-count discriminator for incidental-fm or fm-deviation measurements. With a wave analyzer, you can measure individual components of incidental fm.

The usable frequency range, particularly for frequency-drift and incidental-fm measurements, can be extended upwards to thousands of megacycles per second if the unknown frequency is heterodyned against a stable frequency. This gives a proportionate increase in resolution. At 100 Mc/s, frequency drift and incidental fm can be measured to at least one part in $10^9$.

The reason you get 0.2% accuracy in an instrument with a meter is because the first one or two digits of a measurement are transferred to a calibrated switch while the meter interpolates to establish the last two significant figures. Thus, the meter scale is effectively expanded by a factor of 10.

**SPECIFICATIONS**

**Type 1142-A Frequency Meter and Discriminator**

- **Frequency Range** — 3 c/s to 1.5 Mc/s in five decade ranges.
- **Input Sensitivity** — 20 mV from 20 c/s to 150 kc/s, rising to 200 mV at 3 c/s and 1.5 Mc/s (except for very short pulses).
- **Impedance** — 100 kΩ, dropping to a minimum of 5 kΩ above 500 kc/s.
- **As a Frequency Meter** — Logarithmic meter maintains constant accuracy; calibrated interpolator effectively expands meter scale by a factor of 10.
- **As a Discriminator** — Output is 15V, full scale. Low noise; residual fm is down more than 100 dB.
- **Accuracy** — In the "direct" mode, 1% of reading. In the "interpolate" mode, 0.2% of full scale.
- **Recorder Outputs** — Adjustable from 1-mA to 5-mA; interpolator output for high-Z recorders. Voltage is proportional to frequency deviation.

Write for Complete Information
NORTH JERSEY SECTION
NEWARK AIRPORT INSPECTION TRIP
Saturday Morning, November 20, 1965
10:00 - 12:00 A.M.

The North Jersey Section IEEE has arranged with the Port of New York Authority to conduct an inspection trip of the facilities of Newark Airport on Saturday morning, November 20, 1965. The trip will include an inspection of the control tower, communication facilities, radar installation, runway lighting installations, and a tour of a hangar and a jet airliner. Guides and engineering personnel will be made available by the Port Authority to conduct the tour and answer our questions — so COME ON OUT!

For tickets and further information, write:
A. P. ZIMMERMAN
Room 3B - 220A
Bell Telephone Labs, Inc.
Whippany, N. J.

Please send me tickets at $0.75 each for the Newark Airport Inspection Trip.

Name
Address

I will meet the tour bus at:
[ ] Pine Street, Newark
[ ] Airport Passenger Terminal

Registration Deadline — NOVEMBER 12, 1965

Please enclose stamped, self-addressed envelope for a prompt return of your tickets.

MTT GROUP
NEW SOLID-STATE MICROWAVE AMPLIFIERS AND OSCILLATORS
by
R. S. Engelbrecht
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey

Increasingly, active semiconductor devices are replacing vacuum tubes in critical microwave system applications. Two recent advances in this field will be discussed in this talk:

1) Wideband transistor amplifiers have been developed for frequencies up to about 4 Gc.

2) Direct generation of microwave power has recently been accomplished with bulk semiconductors utilizing transit-time phenomena such as the "Gunn Effect."

The talk is to be given at 8:00 P.M. on Wednesday, November 17, 1965 at Bell Telephone Laboratories' Arnold Auditorium. There will be a pre-meeting dinner at 6:30 P.M. at Wally's Tavern on the Hill. See October issue for map.
Ballantine Linear AC to DC Converter

Model 710A
Price: Rack Version, $530 / Portable Version, $510

New!
Supplement your dc DVM or Recorder... measure a wide range of ac voltages

Ballantine's new Model 710A is used to convert ac voltages to dc voltages for readout on a dc DVM, Recorder, or Potentiometric device. Its outstanding characteristic is its unusually high level of 1 V to 10 V dc output over each decade of ac input. This results in (1) the significant use of one more digit on the DVM than would be possible with a converter supplying a maximum of only 1 V dc, and (2) fuller use of the built-in accuracy and stability of Model 710A, whether it is used with a DVM, a Recorder, or a Potentiometric device.

The Model 710A may be used to supplement any of the many fine dc DVM's on the market.

PARTIAL SPECIFICATIONS

Voltage Range .......... 1 mV to 1000 V
Frequency Range .......... 30 Hz to 250 kHz
Power Requirements .......... 115/230 V,
50 to 420 Hz, 39 W

DC Output 1 V to 10 V for each decade of ac input
Accuracy .1%, 1 mV to 250 V, 50 Hz to
10 kHz (% of actual value, not of full scale)

Write for complete specifications

STUDENT AFFAIRS
NCE Student Chapter
Begins Active Year

With a central theme to link its programs and a new slate of officers to guide it, the Student Chapter at Newark College of Engineering has entered the 1965-66 academic year.

The engineer's relationship with the industrial world will flavor the majority of the chapter's speaking programs during the coming meetings. Coordinating these programs will be the new officers: Ron Poinsett has been elected as chairman; his vice-chairman will be William Hnat; and serving as secretary and treasurer will be Albert Nawy and Richard Salkie, respectively.

The first meeting of the chapter on September 24th was highlighted by an address from Mr. Walter Glomb, the chairman of the North Jersey Section Engineer Glomb initiated the students to the work ahead by discussing the engineer and the IEEE. His talk was well received.

The October eighth program included an address by a spokesman from the National Aeronautics and Space Administration. At this meeting the students heard about the engineer’s role in industry.

ANNUAL STUDENTS’ NIGHT
FRIDAY, DECEMBER 3rd
7:30 P.M.
FAIRLEIGH DICKINSON UNIVERSITY GYMNASIUM
TEANECK

On the program:
Recruiter — Roadblock or Booster?

The Newsletter, November 1965
EXECUTIVE COMMITTEE COLUMN

HOW MUCH DO YOU KNOW ABOUT THE NORTH JERSEY SECTION OF IEEE?

Here is a quiz just for fun. No prizes are being offered. And after you’ve completed the quiz you won’t have to rate yourself as “genius” or “nincompoop.” The intent of the quiz is to give members a better understanding of the Section.

1. The North Jersey Section membership is approximately
   a) 3,000 b) 5,000 c) 7,500 d) 15,000

2. The Section has how many technical Group Chapters?
   a) 4 b) 6 c) 8 d) 10

3. The Section has how many Standing Committees?
   a) 4 b) 6 c) 8 d) 10

4. The Section has how many engineering college Student Chapters?
   a) 4 b) 6 c) 10 d) 12

5. Approximately how many events, including lectures, study programs, inspection trips, dinners and student meetings, were sponsored by the Section last year?
   a) 40 b) 50 c) 60 d) 75

6. The Section’s Executive Committee consists of how many members?
   a) 3 b) 8 c) 15 d) 22

7. How many issues of the Section’s publication, the Newsletter, were sent to you last year?
   a) 3 b) 6 c) 10 d) 12

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**ANSWERS TO QUIZ**

Question | Correct Answer
---|---
1. | b) The Section has approximately 5,000 members.
2. | b) The Section has six group chapters, as listed below:
   - Automatic Control
   - Communication Technology
   - Computer
   - Engineering Writing and Speech
   - Microwave Theory and Technique
   - Power

   In addition to these, the Section also sponsors a number of joint Metropolitan Group Chapters with nearby Sections in New York and New Jersey. Chapter meetings are announced in the Newsletter and on bulletin boards. If you are interested in participating more fully in the activities of any chapter, contact any member of the Executive Committee.

3. | c) The Section has eight Standing Committees:
   - Awards
   - Education
   - History and Procedures
   - Membership
   - Nominations
   - Program
   - Publications
   - Student Affairs

   If you are interested in participating in the work of any of these committees, you should contact a member of the Executive Committee.

4. | a) The Section has four Student Chapters, as listed below:
   - Fairleigh Dickinson University
   - Newark College of Engineering (Day)
   - Newark College of Engineering (Evening)
   - Stevens Institute of Technology

5. | c) Last year the Section sponsored approximately 60 events. These included lectures on dozens of technical subjects, three study courses, inspection trips to Newark Airport and Shea Stadium, a Fellow Recognition Banquet and a Student Night.

6. | d) The Executive Committee has 22 members. It consists of 7 elected officers, the chairmen of the 8 Standing Committees and the 6 Group Chapters and a Group Coordinator. The names of the Executive Committee members are listed near the front of the Newsletter. These are the people to blame if you are not satisfied with Section performance.

7. | c) You should have received 10 issues of the Newsletter from September to June last year. The Section’s year begins on July 1.

**POWER GROUP**

**Industrial Ground Relaying Can Be More Sensitive**

**Speakers:** Eustace C. Soures
Consulting Engineer
Industrial Engineering Service
Jersey City

John J. Stamato
Assistant System Relay Engineer
Jersey Central - New Jersey
Power and Light Company
Morristown

Richard Smithley
Manager of Consulting Engineering
Federal Pacific Electric Company
Newark

**Date:** Thursday, November 18, 1965
**Time:** 7:30 P.M.
**Place:** Punch Bowl Room
Jersey Central - New Jersey
Power and Light Company
Madison Avenue at
Punch Bowl Road
Morristown, New Jersey

**COMTEC GROUP**

**Defense Communication Satellite Systems**

**Speaker:** Fred J. Altman

**Place:** ITT Federal Laboratories
Auditorium
Nutley, New Jersey

**Date:** Tuesday, November 16, 1965
**Time:** 8:00 P.M.

The planning for both the Interim and the Advanced Defense Communication Satellite Program (DCPS) will be reviewed briefly. Detailed discussion will center on system aspects such as the following:

- Satellite deployment, replenishment, visibility, bunching, conjunctions, and scheduling, stressing results of computer simulations.
- Power budgets and statistical variations, adapted performance.
- Problems of multiple access to a wideband hard-limiting heterodyne repeater.

Mr. Frederick J. Altman is director of the Systems Technology Division of System Sciences Corporation, Falls Church, Virginia, formerly ITT Intelscom and still affiliated with Communication Systems Inc. of Paramus. Previous to his present work on the Defense Communication Satellite Program and other space-oriented projects he spent 16 years with ITT Federal Laboratories working chiefly on Doppler radar and tropospheric scatter projects. He has an M.S. degree from M.I.T. and has participated in several international conferences of the International Telecommunications Union.
A convenient table of capacitance/loss formulas relating such quantities as Q, dissipation factor, conductance, parallel resistance, series resistance, and power factor... nomographs for determining Q from capacitance and inductance measurements... available free on request. Write...

N. Y. COMTEC

THE STATUS OF SOLID-STATE DEVICE TECHNIQUES IN RADIO RELAY SYSTEMS

SPEAKER:
L. G. Abraham, Director, Transmission Engineering Planning Center, Bell Telephone Laboratories.

The meeting will be held at 7:00 P.M. on Wednesday, November 17, 1965 at the Willkie Memorial Building, 20 West 40 Street, New York City and admission is free.

ELECTRON DEVICES GROUP

Recent Developments in Solid-State Microwave Generators

Presented: Dr. Bernard C. DeLoach
By: Bell Telephone Laboratories

Date: November 18, 1965
Time: 8:00 P.M.
Place: General Telephone and Electronics Labs. 208-20 Willets Point Boulevard, Bayside, Long Island

Pre-Meeting Dinner: Kam Fong Restaurant (6:00 P.M.)

19-11 Francis Lewis Boulevard (near Willow Point Boulevard) Whitestone, Long Island

We've reserved a copy for you...

TECHNIPOWER'S 1965 REFERENCE CATALOG containing over 4,000 power supply modules including the new Laboratory Modules Series with twice the output ratings of comparable units.

N. Y. POWER & INDUSTRIAL DIVISION

Two round table meetings are planned by the Power & Industrial Division of the IEEE. The meetings will be held at 6:30 P.M. on Tuesday, November 23, 1965 at Con Edison Co., 4 Irving Place, New York City. Refreshments will be served at 6:00 P.M. The program for that evening will be as follows:

Meeting No. 1
Grounding Practices on 277/480 Volt Systems
Meeting No. 2
New Concepts in Urban Underground Distribution

For further information, please call Ralph Droste at: 212-CH 4-8000, ext. 694.
Type RM564 general-purpose oscilloscope with added feature of STORAGE

SPLIT-SCREEN permits simultaneous operation as a storage oscilloscope and as a conventional oscilloscope

- presents stored or conventional displays—The Type RM 564 presents full-screen stored displays or full-screen conventional displays. Or—with the split-screen—stored displays can be presented on either the upper or lower half of the CRT with conventional displays on the other half.

- saves film—The Type RM564 permits detailed waveform analysis and simplified waveform comparisons, in many instances, without resorting to photography. Just store and analyze—for periods up to one hour, with quick erase in less than one-fourth second.

- trace photography is easier and can cost less—Stored displays can be recorded at one's convenience, without the need for high-speed lens or film.

- accepts combinations of 20 plug-in units—The Type RM564 adapts easily to such applications as multi-trace, low level differential, sampling, spectrum analysis, others—including matched X-Y displays using the same type amplifier units in both the amplifier and time-base channels. Plug-in units offer capabilities from 100μV/cm sensitivity (3A3) and 10MHz passband (3A1, 3A6), to 0.5 μsec/cm sweep rate (3B1, 3B3) and sweep-delay applications (3B1, 3B2, 3B3).

- saves space—The Type RM564 occupies only 7 inches of standard rack height, yet has a full 8-cm by 10-cm display area.

- operates simply and reliably—Although capable of many sophisticated measurements, the Type RM564 retains the operating convenience of a conventional oscilloscope.

Display shows ability of the Type RM564 to store single-shot events. Waveforms represent displacement of leaf springs due to imparted shocks given them during test. Split-Screen Facility—with independent storage and erase of upper and lower half of the CRT—permits easy comparison of test waveforms to a reference display.

Type RM564 Oscilloscope ................................. $1035
Type 3A3 Dual-Trace Differential Amplifier Unit ........................................ 790
Type 2B67 Time-Base Unit .................. 210
18 other plug-in units available.
Type 564 Cabinet Model also available with same performance specifications ........ 950

Tektronix, Inc.

FOR A DEMONSTRATION, PLEASE CALL YOUR TEKTRONIX FIELD ENGINEER

The Newsletter, November 1965
HEWLETT-PACKARD OFFERS A LOW-COST, GENERAL PURPOSE COUNTER

Model 3734A is a compact new solid-state 2-mc electronic counter which makes a wide variety of measurements. With a built-in crystal time reference it measures frequency, makes period observations, calculates the average of multiple periods up to 100,000, and measures time intervals.

The 3734A indicates the ratio of two frequencies, or multiples of ratios. It will totalize random events over long or short periods, by local or remote control. Readout storage provides continuous display of the most recent measurement, even while the instrument is making a new measurement.

The high sensitivity and high input impedance of the HP Model 3734A Electronic Counter enable it to make accurate measurements of signals as low as 100 millivolts.

The compact form factor and light weight of Model 3734A make it especially suitable for experimental use. Seven inches high, it is only 11" deep and less than 8" wide. Model 3734A weighs 12½ pounds and costs $1075.

SANBORN MODEL 8875A FEATURES AMPLIFICATION OF LOW LEVEL SIGNALS

As a differential wideband, dc amplifier, the 8875A is used with modern data acquisition systems employing such devices as digital voltmeters, digital printers, analog digital converters, magnetic data recorders, oscillographs, and other readout instrumentation. The 8875A is packaged for use as a single-channel amplifier as well as for multi-channel use in 19-inch wide 10-unit banks.

Design characteristics of the Model 8875A make it particularly suitable for amplifying very low level signals such as those derived from thermocouples, dc excited strain gages, dc excited vibration sensors, and similar transducers.

The Model 8875A is a completely solid-state amplifier. It offers high gain (1-1000) with vernier control for variable settings between fixed steps, high rejection of common mode signals, and extremely accurate amplification of low level signals in the presence of noise. Since no chopper is used, complete freedom is obtained from intermodulation distortion caused by signals having harmonics in the vicinity of the chopper frequency.

Each 8875A Amplifier includes an integral power supply and measures only 4-3/4" high by 1-9/16" wide by 15" deep. The 8875A is priced at $495.00. And for complete details call or write your RMC Field Engineer.