



NEC COMTECH SYMPOSIUM

1966 Communication Technology Symposium at NEC
McCormick Place, Chicago, Ill.
October 3-5, 1966

The 1966 Communication Technology Symposium at NEC has been planned by the technical committees of the IEEE Communication Technology Group to provide a forum where engineers active in the communications profession can meet and discuss their successes and perhaps their failures, their exciting new ideas and their visions of the future. Meetings such as this provide a unique opportunity to hear our colleagues describe their accomplishments and defend their ideas; they are a vital part of our constant effort to achieve an efficient and effective exchange of ideas between engineers active in communication technology.

A part of this Symposium which has become a popular tradition is the annual dinner for ComTech Group members and their guests. This is a very informal affair--no long speeches--just an opportunity to get together and meet each other. This year the dinner will be on Monday, October 3, at 6:30 p. m. at McCormick Place.

This Symposium at NEC is one of three such meetings held each year by the ComTech Group. The International Communications Conference, held annually in June, is sponsored by the ComTech Group with substantial support from other Groups having interests in communications. And the IEEE International Convention in New York each March is the third major meeting for communications engineers. Each of these meetings has its own special flavor. Together they help provide that personal contact with our colleagues which is vital to a dynamic profession.

W. B. Jones, Jr.
Chairman
ComTech Group

HIGHLIGHT SESSION DATA COMMUNICATION - 1976 VIEW

It has been stated that true social life is only possible through the existence of a communications system which provides the means to interchange thoughts. One can identify four fundamental breakthroughs in the history of communications, each of these enabling in its turn a fantastic improvement in the quantity, repeatability, and reliability of the interchange between human beings of experience, knowledge, and concepts. The first breakthrough was experienced about a 100,000 years ago when men - and women - learned to use speech and gesture to communicate thoughts to their neighbors. The second breakthrough about 10,000 years old, provided through the ability to record -- on rocks or other permanent substances -- human thoughts, and accumulated knowledge and experience which could thus be transmitted between successive generations without error or attenuation. The third breakthrough expanded this capability manyfold through the ability man acquired, about 500 years ago, to disseminate information in identical form, and in parallel to the rest of his fellows. The fourth breakthrough which one can justifiably identify as providing a fantastic improvement in mankind's communication capability, came to pass during the lifetime of everybody attending this session. The year - 1944, the place - the University of Pennsylvania, and the event - the firing up of the first logical information machine. It is interesting to note that these four breakthroughs are for all practical purposes equidistant on a logarithmic time scale, suggesting that we are to expect another communications breakthrough to take place in the year 1984 - more or less.

The purpose of this session to explore the directions in communications might take in mankind's search and achievement of these breakthroughs and in particular inquire into the situation which can be justifiably foreseen at the logarithmic midpoint between the fourth and fifth breakthroughs, only ten years from now, in 1976.

The direction which social life will take is to be explored by Professor William Gomberg. The practical outlook in the art of electrical communications with respect to the problems of planning in a large metropolitan area will be presented by Chris Hedge. Anticipations in the technology of transmission, switching, and the desires and fulfillments of the using public will be covered by R. A. Kelley, Dick Stiles, and Bob Francisco.

The views advanced by the above distinguished speakers will not fall on apathetic or unformed ears, for in addition to the distinguished members of the major audience there will be a sounding board of fast thinking skilled speakers. This sounding board includes among its members not only communicators, but also experts in banking, consumer needs, food distribution, or as the rhyme goes: "Tinker, Tailor, Soldier, Sailor, Rich Man, Poor Man, Beggarman, ...". In this manner it is hoped that the thoughts, concerns and points of view of the major audience will be fully represented and become the subject of clear and valid discussion.

For program details of this session see session No. 12.

COM TECH: DATA COMMUNICATIONS I

SESSION NO. 3

Monday, Oct. 3 - 9:30 A.M.
Room No. 9

Sponsor: Data Communication Committee
Chairman: R. M. Kall
Sperry Rand Corp.
Univac Division

19 CP 66-1333

EFFECTS OF PULSE SHAPING ON DIGITAL FM SPECTRA
H. J. vonBaeyer, Tjeng T. Tjhung, Inter Tel
Consultants Ltd.

19 CP 66-1334

DEMODULATION OF DIGITAL SIGNALS USING AN FM DISCRIMINATOR
Donald L. Schilling, Edwin Hoffman, Polytechnic
Institute of Brooklyn

19 CP 66-1335

A VESTIGIAL SIDEBAND FM MODEM
E. Hopner, R. W. Calfee, L. B. West, IBM

19 CP 66-1336

ADAPTIVE SATELLITE DATA TRANSMISSION SYSTEM
J. A. Buegler, USASCA
H. Blasbalg, J. Hayase, Hann Najjar, Renato D'Antonio,
IBM Federal Systems Division

19 CP 66-1337

INTERNATIONAL TELEX SERVICE THROUGH COMPUTERIZED LINE
SWITCHING
G. T. Fontain, P. J. Klein, Western Union Inter-
national, Inc.

COM TECH: WIRE COMMUNICATION I

SESSION NO. 4

Monday, Oct. 3 - 9:30 A.M.
Room No. 8

Sponsor: Wire Communication Committee
Chairman: William J. Roberts
Mountain States Tel. & Tel. Co.

19 CP 66-1322

MISSION CONTROL CENTER - HOUSTON (MCC-H) VOICE COMMUNI-
CATION SYSTEM

C. J. Kulesza, Philco-Communications & Electronics Div.
J. Meeting, North Electric Company
George Hayden, Philco-Houston Operations

19 CP 66-1323
SPACEPORT COMMUNICATIONS - PRESENT AND FUTURE
Dr. B. E. Keiser, Government Services, K.S.C. Communi-
cations Project

19 CP 66-1325
AN EDUCATIONAL TELEVISION NETWORK FOR THE STATE OF
DELAWARE
William K. Grauer, Bell Telephone Co. of Pa.

COM TECH: WIRE COMMUNICATION II

SESSION NO. 13 Sponsor: Wire Communication Committee
Monday, Oct. 3 - 2:30 P.M. Chairman: Bruce F. Robinson
Room No. 8 General Telephone Co. of Michigan

19 CP 66-1327
ENGINEERING ASPECTS OF OFFICE BALANCE
Richard J. Schindler, Ohio Bell Telephone Company

19 CP 66-1326
TIME DIVISION CONFERENCING OF 4-WIRE TELEPHONE CIRCUITS
R. C. Hoyler, Westinghouse Electric Corp.

19 CP 66-1328
DESIGN OF THE 46B CABLE CARRIER TERMINAL
Larry E. Getgen, Lenkurt Electric Co., Inc.

19 CP 66-1329
ENGINEERING AND APPLICATION FEATURES OF THE 46B CABLE
CARRIER SYSTEM
Philip R. Poling, Lenkurt Electric Co., Inc.

PANEL DISCUSSION

COM TECH: DATA COMMUNICATIONS - THE 1976 VIEW

SESSION NO. 12 Sponsor: Data Com-
Monday, Oct. 3 - 2:30 P.M. munication Committee
Lakeside Room Chairman: Claude A. R. Kagan
Western Electric Company

SPEAKERS

MORES, INFORMATION INNOVATION AND ECONOMICS IN 1976
Prof. W. Gomberg, Wharton School of Finance, University
of Pennsylvania

TOTAL COMMUNICATIONS
W. C. Hedge, A.T. & T. Co.

SWITCHING OUTLOOK
R. C. Stiles, Sylvania Electronic Systems

TRANSMISSION OUTLOOK
R. A. Kelly, Bell Telephone Labs.

THE USERS, THEIR WANTS, AND THEIR NEEDS
R. L. Francisco, Western Union Telegraph Co.

DISCUSSANTS

W.G. Vieth - W.U. Tlg. Co.
Evelyn Berezin - Digtronics
Peter James - Photo Mag. Sys.
William D. Rowe - Sylvania
Sam Levine - Bunker-Ramo
W.G. Dow - Univ. of Mich.
H. M. Boettinger - A.T. & T. Co.
D.A. Kerr - BTL
Harvey Mc.Mains - A.T.&T. Co.
Sam Harvey - Singer Co.
George J. Feeney - G.E. Co.
Mort Ashtrahan - IBM
Leon Davidson - Union Carbide
Ed De Laura - N.Y. S.E.

Milton Stone - Wakefern Foods
Marlin Miller - Dow Jones Res.
R.G. Mills - M.I.T.
Scott H. Cameron - I.I.T. Res.
Chuck Winston - Teletype Corp.
Morris Rubinoff - Univ. of Pa.
Jack Atkin - ITT World Com.
R.M. Kalb - UNIVAC
Herman Affel - Std. Comp. Inc.
R.S. Ledley - Nat'l. Biomed. Res.
Leo S. Packer - U.S. P.O. Dept.
M.M. Hubbard - Hubbard Assoc.
Sam Alexander - N.B.S.
Spencer Spaulding - RCA

COM TECH: COMMUNICATION SWITCHING III

SESSION NO. 47
Wednesday, Oct. 5 - 2:30 P.M.
Room No. 9

Sponsor: Communication
Switching Committee
Chairman: E. J. Glenner
Automatic Electric Labs., Inc.

19 CP 66-1309
A NEW SELF-CONTAINED PBX UTILIZING ELECTRONIC CONTROL AND
METALLIC CROSSPOINTS
V. R. DeStefano, H. A. Meise, Bell Telephone Labs.

19 CP 66-1310
CENTRAL OFFICE ARRANGEMENTS FOR AUTOMATIC IDENTIFICATION
FOR OUTWARD DIALING FROM PABX'S
W. Comella, G. A. Backman, R. F. Pina, Bell Telephone
Labs.

19 CP 66-1311
ANI ARRANGEMENTS IN PBX'S
H. P. Anderson, G. A. Scharg, Bell Telephone Labs.

19 CP 66-1312
ANI ARRANGEMENTS FOR CDO'S SMALL OFFICES
H. R. Moore, Bell Telephone Labs.

19 CP 66-1313
TRAFFIC ASPECTS OF SINGLE PARTY SERVICE IN RURAL AREAS
A. Marthens, R. E. A.

COM TECH: RADIO COMMUNICATIONS

SESSION NO. 21 Sponsor: Radio Communications Committee
Tuesday, Oct. 4 - 9:30 A.M. Chairman: R. M. Mattern
Room No. 9 Ohio Bell Telephone Company

19 CP 66-1329
BIT AND MESSAGE ERROR RATES IN ATMOSPHERIC NOISE WITH AND
WITHOUT PEAK LIMITING
W. B. Sisco, TRW - Space Technology Labs.

19 CP 66-1330
AIR-TO-AIR UHF PROPAGATION CHARACTERISTICS AT EXTREME
RANGES
T. D. Ellington, K. Kirk, Elect. Comm., Inc.

19 CP 66-1331
SELF-FOCUSING OF A LASER BEAM IN PLASMA
Dr. A. R. M. Rachad, Memphis State University

19 CP 66-1332
A GENERAL MODEL FOR A FREQUENCY-TIME SHIFT KEYED SIGNAL
FORMAT TROPOSPHERIC SCATTER
D. H. Lazarus, Martin Company

COM TECH: WIRE COMMUNICATION III

SESSION NO. 22 Sponsor: Wire Communication Committee
Tuesday, Oct. 4 - 9:30 A.M. Chairman: Dr. Peter Nicholls
Room No. 8 Northern Electric Co., Ltd.

19 CP 66-1314
CARRIER SYSTEM CHARACTERISTICS AND FREQUENCY ALLOCATIONS
James B. Eppes, Jr., J. M. Flanigan, A. H. Flores,
Rural Electrification Administration

19 CP 66-1315
CARRIER TRANSMISSION ON VOICE-LOADED LOOPS
M. J. Birck, Communications Apparatus Corporation

19 CP 66-1316
TRANSMISSION DESIGN FOR LONG LOOPS
Paul G. Lambidakis, R.E.A.

19 CP 66-1317
A NON INTERFERRING CABLE PAIR TRANSFER SYSTEM
DeMotte W. Gilbo, Michigan Bell Telephone Company

PANEL DISCUSSION

COM TECH: POWER SOURCES FOR SPACE COMMUNICATIONS

SESSION NO. 23

Tuesday, Oct. 4 - 9:30 A.M.
Room No. 2

Sponsor: Space Communication Committee
Chairman: Louis Pollack
I.T.T. Federal Laboratories

SPEAKERS

CHEMICAL BATTERIES

Dr. P. L. Howard, P. L. Howard Associates, Inc.

FUEL CELLS

R. S. Mushrush, General Electric Corp.

SOLAR CELLS

W. Luft, TRW Systems

THERMIONIC AND THERMAL SOURCES

P. Rouklove, Jet Propulsion Laboratories

NUCLEAR POWER SOURCES

W. J. Levedahl, Martin - Marietta

MAGNETOHYDRODYNAMICS

T. Brogan, AVCO Corp.

This panel discussion will include presentations and discussions covering the above-mentioned types of power sources for space communications. Each subject will be presented by an expert in that field, and will cover the present state-of-the-art, the advantages and disadvantages, and future possibilities. Following the presentations there will be a question and answer period including panelists and audience.

COM TECH: COMMUNICATION SWITCHING I

SESSION NO. 30

Tuesday, Oct. 4 - 2:30 P.M.
Room No. 9

Sponsor: Communication Switching Committee
Chairman: A. J. Leininger
Illinois Bell Telephone Company

19 CP 66-1301

ESK - RELAY AS CROSSPOINT COMPONENT
Dr. Fischer, Siemens & Halske

19 CP 66-1302

ESK - CROSSPOINT SWITCHING SYSTEM FOR LOCAL OFFICES
Hartmut Skawski, Siemens & Halske

19 CP 66-1303

CROSSPOINT SYSTEM FOR TELEX EXCHANGES
H. Dobermann, Siemens & Halske

19 CP 66-1304

AUTOMATIC MAIL SORTING USING CODE MARKS FOR DESTINATION
A. Kuhn, Siemens & Halske

COM TECH: WIRE COMMUNICATION IV

SESSION NO. 31

Tuesday, Oct. 4 - 2:30 P.M.
Room No. 8

Sponsor: Wire Communication Committee
Chairman: Frank E. Demaree
Illinois Bell Telephone Company

19 CP 66-1318

THE TYPE N2 REPEATERED LINE
E. H. Perkins, Bell Telephone Laboratories

19 CP 66-1319

COMPANDED DELTA MODULATION FOR TELEPHONE TRANSMISSION
Atushi Tomozawa, Hisashi Kaneko, Nippon Electric Co., Ltd.

19 CP 66-1320

SWEPT FREQUENCY MODULATION
E. K. Holland-Moritz, J. C. Dute, D. R. Brundage,
University of Michigan

19 CP 66-1321

A LOW-SPEED DATA-TRANSMISSION SYSTEM WITH R C - FILTERS
FOR USE IN VOICE FREQUENCY BANDS
K. G. Dieter, Siemens & Halske

COM TECH: COMMUNICATION SYSTEM DISCIPLINES I

SESSION NO. 32

Tuesday, Oct. 4 - 2:30 P.M.
Room No. 7

Sponsor: Communication System Disciplines Committee
Chairman: J. Schlaikjer
I.T.T.

19 CP 66-1339

ECONOMIC ANALYSIS OF COMMUNICATIONS II
R. Chipp, T. Cosgrove, Communications Systems, Inc.

19 CP 66-1340

ANALYTICAL AND STATISTICAL ANALYSIS GAG CHANNEL UTILIZATION IN THE ATC ENVIRONMENT
R. Podell, G. Scharff, Communications Systems, Inc.

19 CP 66-1341

DIGITAL SWITCHING AND CONTROL FOR THE AIR FORCE GLOBAL AIR NET
Melvin Fastow, Westrex Division, Litton Industries

19 CP 66-1342

A TROPOSPHERIC SCATTER TEST PROGRAM
O. Tagliaferri, Rome Air Development Center
John Kelly, Page Communications Engineers

19 CP 66-1343

DISCOSE - A NEW TOOL FOR DIGITAL COMMUNICATIONS STUDIES
Harold Crowley, Rome Air Development Center

COM TECH: COMMUNICATION SWITCHING II

SESSION NO. 38

Wednesday, Oct. 5 - 9:30 A.M.
Room No. 9

Sponsor: Communication Switching Committee
Chairman: J. G. Pearce
Stromberg-Carlson Corp.

19 CP 66-1305

SUBSCRIBER DIALING FOR INTERNATIONAL TRAFFIC IN EUROPE
J. Rosenblatt, Siemens & Halske

19 DP 66-1306

TELEPHONE NUMBERING PLANS KEEPING PACE WITH DOMESTIC AND GLOBAL SERVICE NEEDS
R. J. Keevers, Bell Telephone Laboratories

19 CP 66-1307

PROBLEMS OF PROGRAMMING FOR REAL TIME SHARED SYSTEM
L. S. Tuomenoska, W. Ulrich, Bell Telephone Laboratories

COM TECH: COMMUNICATION SYSTEM DISCIPLINES II

SESSION NO. 39

Wednesday, Oct. 5 - 9:30 A.M.
Room No. 7

Sponsor: Communication System Disciplines Committee
Chairman: R. Regis
Hazeltine Corporation

19 CP 66-1344

APPLICATION OF THE SUNDE MODEL TO AN AIR FORCE TROPO TRANSMISSION TEST
M. H. Bickelhaupt, Rome Air Development Center

19 CP 66-1345

MODELING OF PCM-TDM OVER A TROPO PATH
A. S. Kobos, Rome Air Development Center

19 CP 66-1346

MODELING OF PPM-FREQUENCY TIME HOPPING OVER A TROPO PATH
R. G. McLaughlin, Rome Air Development Center

19 CP 66-1347

MODELING OF DELTA MODULATION WITH FSK OVER A TROPO PATH
J. K. Wolf, Polytechnic Institute of Brooklyn

19 CP 66-1348

A METHOD OF OBTAINING ALL PHASES OF A PSEUDO RANDOM SEQUENCE
R. C. Curry, RCA Labs

PANEL DISCUSSION

COM TECH: NEW DIGITAL TECHNIQUES ON LONG TROPO PATHS

SESSION NO. 48
Wednesday, Oct. 5 - 2:30 P.M.
Room No. 7

Sponsor: Communication
System Disciplines Committee
Chairman: C. A. Strom, Jr.
Rome Air Development Center

SPEAKERS

- FUTURE NEEDS FOR TROPOSPHERIC SCATTER
R. Feik, Air Force Communication Service
- PCM-TDM OVER A VERY LONG TROPO PATH
J. Polyzou, I.T.T. Labs
- PPM FREQUENCY TIME HOPPING OVER A TROPO PATH
McDonald Wiggins, Martin Company
- DELTA MODULATION WITH FSK OVER A TROPO PATH
Lloyd Englebrecht, Motorola Inc.
- FREQUENCY DIVISION MULTIPLEX ON LONG TROPO PATHS
R. Heine, R. White, Lenkurt Electric

COM TECH ANNUAL DINNER

DATE: MONDAY, OCTOBER 3, 1966
TIME: 6:30 P.M.
PLACE: ROOM D - MCCORMICK PLACE
COST: \$6.50 PER PERSON

LAST CHANCE TO ORDER TICKETS

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

Send order and make check payable to:
A. J. Leininger
Illinois Bell Telephone Co.
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Chicago, Illinois 60606

I am enclosing \$_____ for _____ tickets for the Com Tech Dinner.

- Mail tickets to me.
- * Hold tickets for pickup at registration desk.

*All orders received after Sep. 26 will be held.



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