

~~2643~~
~~III~~

P. 25/53

THE BELL SYSTEM

Technical Journal

DEVOTED TO THE SCIENTIFIC AND ENGINEERING
ASPECTS OF ELECTRICAL COMMUNICATION

ADVISORY BOARD

S. BRACKEN

F. R. KAPPEL

M. J. KELLY



EDITORIAL COMMITTEE

E. I. GREEN, *Chairman*

A. J. BUSCH

F. R. LACK

W. H. DOHERTY

W. H. NUNN

G. D. EDWARDS

H. I. ROMNES

J. B. FISK

H. V. SCHMIDT

R. K. HONAMAN

G. N. THAYER

EDITORIAL STAFF

J. D. TEBO, *Editor*

M. E. STRIEBY, *Managing Editor*

R. L. SHEPHERD, *Production Editor*

INDEX

VOLUME XXXII

1953

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
NEW YORK

LIST OF ISSUES IN VOLUME XXXII

No.	Month	Pages
1	January	1-264
"	March	265-522
"	May	523-778
"	July	779-1018
"	September	1019-1270
"	November	1271-1518

Index to Volume XXXII

A

- ADP *See* Ammonium dihydrogen phosphate
AIEE *See* American Institute of Electrical Engineers
AM *See* Amplitude modulation
AMA *See* Automatic message accounting
ABSTRACT(s) 255-60, 506-18, 767-74, 1007-14, 1257-65, 1507-13
"Acceleration Effects on Electron Tubes" (F. W. Stubner) 1203-29
"Acoustic Gyrorator" (W. E. Kock)
abstract 1261
Ahearn, A. J.
"Formative of Negative Ions of Sulfur Hexafluoride"
abstract 1007
"Ähnlichkeit zwischen Vokalformanten und Formanten von Musikinstrumenten" (W. E. Kock) 1261
"AIEE Progress" (D. A. Quarles)
abstract 1013
Alley, Reuben, E. J., Jr.
biographical material 1267
"Review of New Magnetic Phenomena" 1155-72
ALLOY(S)
copper, photometric determination of silicon 772
ferrous, silicon, photometric determination 772
magnetic properties 1155, 1258
Mishima, physical and magnetic structure 1262
nickel-carbon, reaction rates with barium oxide 771
silicon p-n junction diodes 512
zone-melting 513
Alsberg, D. A.
"Principles and Applications of Con-

verters for High-Frequency Measurements"
abstract 506

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Quarles address, Phoenix meeting 514
telephone invention 768

AMERICAN SOCIETY OF CIVIL ENGINEERS AND ARCHITECTS

centennial 768

professional engineering 514

AMMONIUM DIHYDROGEN PHOSPHATE

dielectric properties 510

elastic properties 510

piezoelectric properties 510

polymorphism 257

properties interpretation 510

AMPLIFIER(S)

L3 coaxial system 879-914

regenerative, for digital computers 508

transistor — cutoff frequency 516

traveling-wave-type, broad-band interdigital circuit for use in 256

vacuum tube electrometer 1261

AMPLITUDE MODULATION

land mobile service 62

ANALYSIS OF MEASUREMENTS ON MAGNETIC FERRITES

(C. D. Owens)
abstract 1012

ANDERSON, A. E.

"Transistors in Switching Circuits"
abstract 506-7

ANDERSON, F. B.

"Gain and Phase Angle Measuring Set"
abstract 1007

ANDERSON, J. R.

"Electrical Delay Lines for Digital Computer Applications"
abstract 1507

"Ferroelectric Storage Elements for

- Anderson, J. R.—*continued*:
- Digital Computers and Switching Systems”
 - abstract 506
- Anderson, P. W.
- “Concept of Spin-Lattice Relaxation in Ferromagnetic Materials” 767
 - “Exchange Narrowing in Paramagnetic Resonance”
 - abstract 1257-8
- Andrus, J.
- “Motion of Domain Walls in Ferrite Crystals” 1260
- ANGLO-AMERICAN COMMITTEE ON TECHNICAL TERMINOLOGY
- report 773
- “Anisotropic Elasticity with Applications to Dislocation Theory” (Eshelby, Read and Shockley)
- abstract 1509
- ANSWERING SERVICES See Telephone answering services
- ANTENNA(s)
- ground-plane, matching coax line 258
 - microwave relay stations 770
 - reflector problem, theoretical study 770
- ANTI-FERROMAGNETIC COBALT DISCILCIDE
- domain structure evidence 508
- ANTIMONY
- photometric determination in lead 1261
- “Application of Information Theory to Research in Experimental Phonetics” (G. E. Peterson)
- abstract 513
- “Approximating the Mode From Weighted Sample Values” (H. L. Jones)
- abstract 1010
- ARC, short, characteristics 1493-1506
- “Arcing of Electrical Contacts in Telephone Switching Circuits” (M. M. Atalla)
- Part I—Theory of the Initiation of the Short Arc 1231-44
 - Part II—Characteristics of the Short Arc 1493-1506
- “Arithmetic Processes for Digital Computers” (J. H. Felker)
- abstract 1009
- Armstrong, C. A.
- “Communications for Civil Defense”
- 1507
 - abstract 1007
- “Telephone Industry in National Defense”
- abstract 507
- Arnold, S. M.
- “Growth of Metal Whiskers” 1261
- “ASTM Standards—Their Effect on Plastics Technology” (R. Burns)
- abstract 255
- Atalla, M. M.
- “Arcing of Electrical Contacts in Telephone Switching Circuits”
 - Part I—“Theory of the Initiation of the Short Arc” 1231-44
 - Part II—“Characteristics of the Short Arc” 1493-1506
 - biographical material 1267
- ATOM(s)
- ionization, single, by electrons, threshold law 1512-13
 - magnetic resonance 74, 384
- “Attenuation Equalizers” (F. R. Bies)
- abstract 1258
- AUDIO FREQUENCY SIGNALS
- transmission, cold cathode tubes for 1371-91
- “Auditory Tests with Synthetic Vowels” (R. L. Miller)
- abstract 1011
- “Automatic Line Insulation Test Equipment for Local Crossbar Systems” (Burns and Dehn) 627-46
- AUTOMATIC MESSAGE ACCOUNTING
- tape-to-card conversion 1260
 - toll messages billing, 1264
- “Automatic Recognition of Spoken Digits” (Davis, Biddulph and Balashek)
- abstract 768-9
- “Automatic Switching for Nation-Wide Telephone Service” (Clark and Osborne)
- abstract 507

- "Automatic Toll Switching Systems" (F. F. Shipley) 514
- B
Babcock, Wallace C.
biographical material 261
"Intermodulation Interference in Radio Systems" 63-73
- BAKELITE (photoelastic)
connections, solderless, wrapped 557
- "Balanced Polar Mercury Contact Relay" (Brown and Pollard) 1393-1411
- Balashck, S.
"Automatic Recognition of Spoken Digits"
abstract 768-9
- BAND(s)
radio, mobile, frequency economy 42-62
- Bardeen, John
biographical material 261
"Surface Properties of Germanium" 1-41
- BARIUM OXIDE
nickel-carbon alloys, reaction rates 771
- BARIUM TITANATE
domain properties 511
- Barotta, P. J.
"Transistor Physics Simplified" 1510
- "Basic Physical Systems for Communication Between Two Individuals" (G. E. Peterson) 1511
- "Basic Theorems of Information Theory" (B. McMillan)
abstract 1510
- BATTERY(ies)
lead-acid, stationary 257
- Beach, A. L.
"Solubility and Diffusion Coefficient of Carbon in Nickel: Reaction Rates of Nickel-Carbon Alloys with Barium Oxide"
abstract 771
- Beck, A. C.
"Low-Loss Waveguide Transmission"
abstract 1011
- Becker, J. A.
- "Field Emission Microscope and Flash Filament Techniques for the Study of Structure and Adsorption on Metal Surfaces"
abstract 1008
- "Behavior of Magnetic Materials" (R. M. Bozorth)
abstract 1259
- BELL TELEPHONE LABORATORIES TRANSISTOR TEACHERS SUMMER SCHOOL 767
- BEND(s)
circular electric wave, transmission around 511
- Benedict, T. S.
"Microwave Observation of the Collision Frequency of Electrons in Germanium" 1258
- Bennett, A. F.
biographical material 775
"Improved Circuit for the Telephone Set" 611-26
- Bennett, William R.
biographical material 1267-8
"Correlatograph — A Machine for Continuous Display of Short Term Correlation" 1173-85
- Biddulph, R.
"Automatic Recognition of Spoken Digits"
abstract 768-9
- Bies, F. R.
"Attenuation Equalizers"
abstract 1258
- BIOASSAY TEST 152, 154
- Birdsall, H. A.
"Microstructure of Capacitor Paper" 1510
- Black, H. S.
"Experimental Verification of the Theory of Laminated Conductors"
abstract 255
- Blount, Frank E.
biographical material 1514
"Transistor Oscillator for Use in Multifrequency Pulsing Current Supply" 1313-31

- Bodle, D. W.
 "Lightning Protection for Mobile Radio Fixed Stations"
 abstract 257
- Bogert, B. P.
 "Band Width of Vowel Formants"
 abstract 1507-8
- BOLTZMANN EQUATION 170, 193
- "Bombardment Conductivity" (K. G. McKay) 1510
- BOOLEAN FUNCTIONS
 symmetry types, on n variables 1264
- Bozorth, R. M.
 "Behavior of Magnetic Materials"
 abstract 1259
- "Magnetic Crystal Anisotropy and Magnetostriction of Iron-Nickel Alloys"
 abstract 1008-9
- "Magnetic Study of Low Temperature Transformation in Magnetite" 1264
- "Measurement of Magnetostriction in Single Crystals"
 abstract 1008
- "Permalloy Problem"
 abstract 1258-9
- Brangaccio, D. J.
 "Factors Affecting Traveling Wave Tube Power Capacity" 1509
- Brattain, Walter H.
 biographical material 261
- "Electron Spin Resonance in a Silicon Semi-Conductor" 1511
- "Surface Properties of Germanium" 1-41
- Bridgman, D. C.
 "College Graduates and the Country's Telephone Industry" 767
- Briggs, H. B.
 "Infrared Absorption in High Purity Germanium"
 abstract 507
- "New Infrared Absorption Bands in p-Type Germanium"
 abstract 507
- "Broad-Band Interdigital Circuit for Use in Traveling-Wave-Type Amplifiers" (R. C. Fletcher)
 abstract 256
- "Broad-Band Matching with a Directional Coupler" (W. C. Jakes)
 abstract 509-10
- Brown, J. T. Lindsay
 biographical material 1514
- "Balanced Polar Mercury Contact Relay" 1393-1411
- Buehler, E.
 "Single-Crystal Germanium"
 abstract 257
- Bullington, Kenneth
 biographical material 262
- "Frequency Economy in Mobile Radio Bands" 42-62
- "Frequency Economy in Mobile Radio Bands," IRE Trans. 1508
- "Radio Transmission Beyond the Horizon in the 40- to 4,000-Mc Band"
 abstract 767-8
- Burns, R.
 "ASTM Standards — Their Effect on Plastics Technology"
 abstract 255
- Burns, R. M.
 "Science and Scientists in Telecommunications" 1259
- Burns, R. W.
 "Automatic Line Insulation Test Equipment for Local Crossbar Systems" 627-46
 biographical material 775
- C
- CABLE(S)
 Clogston 605 ft
 coaxial:
 Clogston Cable compared with 703-5
See also carrier: L3
 multi-conductor 1245
 polyethylene insulation 1245
- Calwick, C. J.
 "Microstructure of Capacitor Paper" 1510
- "Calibration of the Rolling Ball Viscometer" (H. W. Lewis) 1010
- CALL(S)

- delay curves for calls served at random, Riordan 100-19, 1266
delayed exponential, served in random order, working curves for, Wilkinson 360-83
queueing 367
CAMERA(s)
three-phase power from single-phase source 256
Campbell, R. D.
"Path Testing for Microwave Radio Routes" 1508
Campbell, W. E.
"Solid Lubricants" 1508
CAPACITOR DIELECTRICS 1264-5
CAPACITOR PAPER
microstructure 1510
CARBON
(in) nickel, solubility and diffusion coefficient 771
CARBON MONOXIDE
ions, drift velocity 1013
CARD TRANSLATOR *See* Translator
"Card Translator for Nationwide Dialing" (Hampton and Newsom) 1037-98
CARRIER(s), CARRIER SYSTEMS
L3:
amplifiers 879-914
equalization 833-878, 943
manufacture 969
quality control 943-967, 969
regulation 833-878
system design 779-832
television terminals 915-942
Type-N 1259
Type-O 1259
CAUSE (assignable)
type detection 512
CAVITATION
water, ultrasonically induced 1513
"Charge Transfer and the Mobility of Rare Gas Ions" (J. A. Hornbeck)
abstract 509
Ciccolella, D. F.
"High Frequency Crystal Units for Use in Selective Networks and Their Proposed Application in Filters
Suitable for Mobile Radio Channel Selection" 1508
CIRCUIT(s)
telephone set (500 type) 611-26
CIVIL DEFENSE
communication 1007, 1507
telephone system 258
Clark, A. B.
"Automatic Switching for Nation-Wide Telephone Service"
abstract 507
"Telephony Development in the United States"
abstract 768
Clarke, K. B.
"Western Electric's Service with Standards"
abstract 507
CLOGSTON TYPE CONDUCTORS *See* Conductor
Clos, Charles
biographical material 519
"Non-Blocking Switching Networks Study" 406-24
COAXIAL CARRIER SYSTEM L3 *See* Carrier
COBALT DISILICIDE
superconducting properties 1011
COBALT OXIDE (CoO)
domain structure evidence 508
magnetomechanical effects 1260
COBALT-SILICON SYSTEM
superconductivity 256
COLD
pressure connection 533
COLD-CATHODE STEPPING TUBE *See* Electron tube
"Cold Cathode Tubes for Transmission of Audio Frequency Signals" (Townsend and Depp) 1371-91
"College Graduates and the Country's Telephone Industry" (D. C. Bridgeman) 767
Colley, Reginald H.
biographical material 262
"Evaluation of Wood Preservatives" 120-69, 425-505
"Review of American Standard Fiber Stresses of Wood Poles" 1262

- COMMUNICATION**
- between two individuals, physical systems 1511
 - "Communications for Civil Defense" (C. A. Armstrong) 1507
 - abstract 1007
 - "Comparison of Mobile Radio Transmission at 150, 450, 900 and 3700 Mc" (W. R. Young) 1513
 - "Comparison of Recording Processes" (J. G. Frayne)
 - abstract 509
- COMPUTER(s)**
- binary, functions 769
 - digital:
 - delay lines for 1507
 - ferroelectric storage elements 506
 - regenerative amplifier 508
 - transistor, 255, 508, 769
 - historical development 772
 - "Computers — Past, Present, and Future" (W. H. MacWilliams, Jr.) abstract 772
- CONDUCTIVITY**
- bombardment 1510
 - electric fields, high, mobility in 768
- CONDUCTOR(s)**
- Clogston type, laminated, transmission properties 695-713
 - electroformed for drop wire 1099-1135
 - laminated 695
 - experimental verification of the theory of 255
- CONNECTION(s)**
- permanent, conditions for obtaining 551-91
 - pressure 525, 526
 - quality 532
 - solder 525
 - solderless, wrapped 523-610
 - "Connection Formulas Between the Solutions of Mathieu's Equation" (G. H. Wannier)
 - abstract 1014
- CONTACT(s)** See Electrical contacts
- CONTACT EROSION**
- switching circuits 1493
- "Controlled Gas Leak" (J. Morrison) 1262
- CONVERTER(s)**
- high-frequency measurements 506
 - transistor, negative-impedance 1510
- "Conveyorization Avoids Handling Headaches" (P. T. Mathy) 1262
- Conwell, Esther M.**
- "High Field Mobility in Germanium With Impurity Scattering Dominant"
 - abstract 1508
- "Mobility in High Electric Fields"
 - abstract 768
- "Mobility of Electrons in Germanium"
 - abstract 507
- "Properties of Silicon and Germanium"
 - abstract 507
- CoO** See Cobalt oxide
- COPPER ALLOYS**
- silicon, photometric determination 772
- "Copper as an Acceptor Element in Germanium" (Fuller and Struthers)
 - abstract 256
- COPPER OXIDE**
- varistors 514
- COPPER-STEEL WIRE** See Wire
- "Correlatograph — A Machine for Continuous Display of Short Term Correlation" (W. R. Bennett) 1173-85
- CORROSION**
- connections, solderless, wrapped 598
- COUNTER(s)**
- crystal conduction 1262
 - reversible binary 516
- "Coupled Resonator Reflex Klystron" (E. D. Reed) 715-66
- COUPLER (directional)**
- broad band matching 509
 - multi-element 258, 511
- Coy, J. A.**
- "Type-O Carrier Telephone"
 - abstract 1259
- CREOSOTE**
- as wood preservative 458, 461, 469, 473, 474, 479, 489-90
- CROSSBAR SYSTEM No. 1**
- automatic line insulation testing 627-46

- CROSSBAR SYSTEM No. 5
automatic line insulation testing 627-46
throwdown machine 292-359
traffic-carrying characteristics study 292-359
- CROSSTALK
interchannel 514
- CRYSTAL(S)
antiferroelectric 510
conduction counter 1262
dislocated, geometrical relations 1012
electrons, e/m values, interpretation 515
ferrites, motion of domain walls 1260
germanium: single, purification and segregations prevention 1012
solute distribution 1512
high-frequency units for primary frequency standards 260
high-frequency units for use in selective networks and proposed application in filters for mobile radio channel selection 1508
magnetic resonance 74
"Crystal Conduction Counter" (K. G. McKay)
abstract 1262
- Cutler, C. C.
"Factors Affecting Traveling Wave Tube Power Capacity" 1509
- D
- Dacey, G. C.
"Space-Charge Limited Hole Current in Germanium"
abstract 1509
- Dalton, A. G.
"Practice of Quality Control"
abstract 1009
- Darrow, Karl K.
biographical material 262, 519-20
"Magnetic Resonance of Electrons" 384-405
"Nuclear Magnetic Resonance" 74-99
- Davis, K. H.
"Automatic Recognition of Spoken Digits"
abstract 768-9
- "DC Field Distribution in a 'Swept Intrinsic' Semiconductor Configuration" (R. C. Prim) 665-94
- Debye, P. P.
"Mobility of Electrons in Germanium"
abstract 507
- DeCamp, R. T.
"Matching Coax Line to the Ground-Plane Antenna"
abstract 258
- DECIBEL 6
in search of the missing 512
- DEFENSE *See Civil defense*
- Dehn, J. W.
"Automatic Line Insulation Test Equipment for Local Crossbar Systems" 627-46
biographical material 775
- DELAY CALLS *See Call*
- "Delay Curves for Calls Served at Random" (John Riordan) 100-19
addendum to 1266
- DELAY FORMULA *See Erlang*
- DELAY LINES
digital computers 1507
storage capacity 1507
- Depp, Wallace A.
biographical material 1514-15
"Cold Cathode Tubes for Transmission of Audio Frequency Signals" 1371-91
- "Design Theory of Junction Transistors" (J. M. Early) 1271-1312
- "Development and Manufacture of Electroformed Conductor for Telephone Drop Wire" (Gray and Murray) 1099-1135
- DIAL TELEPHONE, DIALING
card translator for nationwide 1037
exchanges, traffic engineering design 257, 516
numbering system, nation-wide, need for 512
- Dickinson, Frank R.
biographical material 1015
"L3 Coaxial System — Amplifiers" 879-914

- Dickten, E.
 "High-Frequency Transistor Tetrode"
 abstract 774
 "Junction Transistor Tetrode for High-Frequency Use"
 abstract 517
- Dielectric(s)**
 capacitor 1264-5
 $\text{ND}_4\text{D}_2\text{PO}_4$, properties 510
- "Diffusion of Lithium Into Germanium and Silicon" (Fuller and Ditzenberger) 1509
- Digit(s)**
 register 508-9
 spoken, automatic recognition 768-9
- Digital Computers** *See Computer*
- Dimensional Resonance** *See Resonance*
- Diode(s)**
 semiconductor gates 1137-54
 silicon p-n junction alloy 512
- Directional Coupler** *See Coupler*
- Dislocation Theory**
 anisotropic elasticity 1509
- Ditzenberger, J. A.
 "Diffusion of Lithium Into Germanium and Silicon" 1509
- Dodge, H. F.
 biographical material 1015
 "L3 Coaxial System—Quality Control Requirements" 943-67
- "Domain Properties in BaTiO_3 " (W. J. Merz)
 abstract 511
- Domain Structure**
 anti-ferromagnetic CoO 508
- Domain Walls**
 ferrite crystals 1260
 motion 1162, 1260
- "Dominant Wave Transmission Characteristics of a Multimode Round Waveguide" (A. P. King)
 abstract 256
- "Drift Velocities of Ions in Krypton and Xenon" (R. N. Varney)
 abstract 517
- "Drift Velocity of Ions in Oxygen, Nitro-
- gen, and Carbon Monoxide" (R. N. Varney)
 abstract 1013
- Drop Wire** *See Wire*
- Drvostep, J. J.
 "Standardization of Rigid Coaxial Transmission Lines" 1009
- "Dual Photomagnetic Intermediate Studio Recording" (Frayne and Livadary)
 abstract 769
- "Dynamic Measurements on Electromagnetic Devices" (M. A. Logan) 1413-67
- "Dynamic Program for Conversion" (J. R. Townsend) 1512
- "Dynamic Spectrograms of Speech" (Kock and Miller) 771
- "Dynamics of Transistor Negative-Resistance Circuits" (B. G. Farley)
 abstract 508

E

- Ear Canal**
 sound pressure 512
- Early, James M.
 biographical material 1515
 "Design Theory of Junction Transistors" 1271-1312
 "Effects of Space-Charge Layer Widening in Junction Transistors"
 abstract 507-8
- Ebers, J. J.
 "Four-Terminal p-n-p-n Transistors"
 abstract 508
- ECASS** *See Electronically controlled automatic switching system*
- Echo(es)**
 television transmission 1511
- "Economics of High-Speed Photography" (A. C. Keller)
 abstract 771
- "Effect of Electrode Spacing on the Equivalent Base Resistance of Point-Contact Transistors" (L. B. Valdes)
 abstract 516
- "Effects of Space-Charge Layer Widening"

- ing in Junction Transistors" (J. M. Early)
abstract 507-8
- Ehrbar, R. D.
biographical material 1015
"L3 Coaxial System — System Design" 781-832
- ELASTICITY
anisotropic, applications to dislocation theory 1509
antiferromagnetic CoO, evidence of domain structure, measurements for 508
 $ND_4D_2PO_4$, properties 510
"Elasticity and Thermal Expansion of Germanium between -195 and 275° C" (M. E. Fine)
abstract 1260
- ELECTRIC FIELDS (high)
mobility 768
- ELECTRIC WAVE
circular, transmitting around bends 511
- ELECTRICAL CONTACTS
switching circuits, arcing of 1493-1506
- "Electrical Delay Lines for Digital Computer Applications" (J. R. Anderson)
abstract 1507
- ELECTRICAL STABILITY
connections, solderless, wrapped 591
- ELECTRODE SPACING
equivalent base resistance of 516
transistors, point-contact 516
- "Electroformed Copper-steel Wire Development" (A. N. Gray)
abstract 1260
- ELECTROLYSIS SWITCH
improved 259
- ELECTROMAGNETIC DEVICES
dynamic measurements 1413-67
- ELECTROMETER AMPLIFIER
vacuum tube 1261
- ELECTRON(s)
crystals, e/m values, interpretation 515
ejection from Mo by He^+ , He^{++} , and He_2^+ 769
electric fields, high, mobility in 768
germanium:
 collision frequency, microwave observation 1258
 mobility in 507
magnetic resonance 74, 384-405
mean free paths in evaporated metal films 514
microscopy, of solids 770
mobility in high electric fields 1511-12
recombination statistics 259
resonance, See Electron — magnetic resonance
spin resonance in a silicon semi-conductor 1511
streams, microwave noise calculation 773
threshold law for single ionization of atoms or ions 1512-13
- ELECTRON(s) AND HOLES
diffusion constant and mobility 767
mobility in high electric fields 1511-12
recombination statistics 259
"Electron Ejection from Mo by He^+ , He^{++} , and He_2^{++} " (H. D. Hagstrum)
abstract 769-70
- "Electron Spin Resonance in a Silicon Semi-Conductor" (Portis, Kip, Kittel and Brattain) 1511
- ELECTRON TUBE(s)
acceleration effects 1203-29
cold cathode, for transmission of audio frequency signals 1371-91
computer designs 769
electrometer amplifier 1261
shock measurement 1203, 1215, 1219-21
stepping, cold-cathode, 10-stage 773
traveling wave 1510
 factors affecting power capacity 1509
- ELECTRONICALLY CONTROLLED AUTOMATIC SWITCHING SYSTEM 406
- ELECTRONICS
solid state physics 257
- Elmendorf, C. H.
biographical material 1016
"L3 Coaxial System — System Design" 781-832

- ENCODER**
optical position 508
- ENGINEERING PROFESSION**
organization 514
- EQUALIZER(s)**
attenuation 1258
- EQUATION(s)**
transistor 1013
- Erlang, A. K. 100
- ERLANG FORMULA** 100, 1266
- EROSION** *See* Contact Erosion
- Eshelby, J. D.
"Anisotropic Elasticity with Applications to Dislocation Theory"
abstract 1509
- "Evaluation of Wood Preservatives" (Reginald H. Colley) 120-69, 425-505
- "Evidence for Domain Structure in Antiferromagnetic CoO From Elasticity Measurements" (M. E. Fine)
abstract 508
- "Exchange Narrowing in Paramagnetic Resonance" (Anderson and Weiss)
abstract 1257-8
- "Experimental Verification of the Relationship Between Diffusion Constant and Mobility of Electrons and Holes" 767
abstract
- "Experimental Verification of the Theory of Laminated Conductors" (Black, Mallinckrodt and Morgan)
abstract 255
- F**
- FM *See* Frequency modulation
- "Factors Affecting Traveling Wave Tube Power Capacity" (Cutler and Brancaccio) 1509
- FADING**
radio signals, super-high frequency 1187-1202
- FARADAY EFFECT**
ferromagnetic 1260, 1333
microwave 1166
- Farley, B. G.
"Dynamics of Transistor Negative-Resistance Circuits"
abstract 508
- Felker, J. H.
"Arithmetic Processes for Digital Computers"
abstract 1009
- "Regenerative Amplifier for Digital Computer Applications"
abstract 508
- "Typical Block Diagrams for a Transistor Digital Computer"
abstract 255, 769
- FEMF (foreign e.m.f.) TEST** 636
- FERRITE(s)**
crystals, motion of domain walls 1260
description 1156
gyrator 1261
inductor cores 265-91
initial permeability and related losses 256
magnetic, measurements analysis 1012
magnetic phenomena 1155 *f*
waveguide medium, new non-reciprocal 1512
- "Ferrite Core Inductors" (H. A. Stone, Jr.) 265-91
- "Ferrites in Microwave Applications" (J. H. Rowen) 1333-69
- "Ferroelectric Storage Elements for Digital Computers and Switching Systems" (J. R. Anderson)
abstract 506
- FERROMAGNET**
spherical model 510
- FERROMAGNETIC ALLOYS**
silicon, photometric determination 772
- "Ferromagnetic Faraday Effect at Microwave Frequencies and Its Applications" (C. L. Hogan) 1260
- FERROMAGNETIC RESONANCE** 1164-6
- FERROMAGNETIC SUBSTANCES**
magnetic resonance 74, 398
relaxation, spin-lattice 767
- FERROUS ALLOYS**
silicon, photometric determination 772
- FIELDS** *See* Electric Fields; Magnetic Field
"Field Emission Microscope and Flash

- Filament Techniques for the Study of Structure and Adsorption on Metal Surfaces" (Becker and Hartman)
abstract 1008
- FILAMENTARY TRANSISTORS** *See* Transistor
- FILM(s)**, metal, evaporated
electron mean free paths 514
- FILM PULLING MECHANISMS**
three-phase power from single-phase source 256
- FILTER(s)**
mobile radio channel selection, high frequency crystal units 1508
- Finch, Tudor R.**
biographical material 1016
"L3 Coaxial System — Equalization and Regulation" 833-78
- Fine, M. E.**
"Elasticity and Thermal Expansion of Germanium between -195 and 275°C"
abstract 1260
- "Evidence for Domain Structure in Antiferromagnetic CoO From Elasticity Measurements"
abstract 508
- "Magnetomechanical Effects in an Antiferromagnet, CoO" 1260
- Fletcher, R. C.**
"Broad-Band Interdigital Circuit for Use in Traveling-Wave-Type Amplifiers"
abstract 256
- "New Infrared Absorption Bands in *p*-Type Germanium"
abstract 507
- Follingstad, H. G.**
"Optical Position Encoder and Digit Register"
abstract 508-9
- "Formative of Negative Ions of Sulfur Hexafluoride" (Ahearn and Hannay)
abstract 1007
- "Four-Terminal p-n-p-n Transistors" (J. J. Ebers)
abstract 508
- Fox, A. G.**
- "Magnetic Double Refraction at Microwave Frequencies" 517
- Frayne, J. G.**
"Comparison of Recording Processes"
abstract 509
- "Dual Photomagnetic Intermediate Studio Recording"
abstract 769
- "Frequency Economy in Mobile Radio Bands" (Kenneth Bullington) 42-62, 1508
- FREQUENCY MODULATION**
land mobile service 62
- "Frequency Response and Stability of Point-Contact Transistors" (B. N. Slade)
abstract 515
- Frost, George R.**
biographical material 520
"Throwdown Machine for Telephone Traffic Studies" 292-359
- Fuller, C. S.**
"Copper as an Acceptor Element in Germanium"
abstract 256
- "Diffusion of Lithium Into Germanium and Silicon" 1509
- "Properties of Thermally Produced Acceptors in Germanium"
abstract 256
- G**
- "Gain and Phase Angle Measuring Set" (Anderson)
abstract 1007
- Galt, J. K.**
"Initial Permeability and Related Losses in Ferrites"
abstract 256
- "Motion of Domain Walls in Ferrite Crystals" 1260
- Garrett, Robert F.**
biographical material 1016
"L3 Coaxial System — Application of Quality Control Requirements in the Manufacture of Components" 969-1005
- Gas(es), rare**

- Gas(es)—*continued*:
 ion charge transfer and mobility 509
 ion-atom collisions 509
- GAS LEAK
 controlled 1262
- GASEOUS IONS
 motion in strong electric fields 170—
 254, 259
- GASEOUS KINETICS
 charged particles moving through a
 gas under the influence of a static,
 uniform electric field 170
 equations 178
 glossary 178
- Gentile, S. P.
 “Transistor Physics Simplified” 1510
- “Geometrical Relations in Dislocated
 Crystals” (J. F. Nye)
 abstract 1012
- GERMANIUM
 acceptors, thermally produced, proper-
 ties 256
 carrier density and mobility 507
 copper as an acceptor element 256
 crystals:
 single 257
 solute distribution 1512
 uses for the Hall effect 1010
 elasticity 1260
 electrical properties 507
 electron mobility 507
 electrons, collision frequency, micro-
 wave observation 1258
 electrons and holes:
 diffusion constant and mobility, re-
 lationship 767
 field dependence of mobility 1511
 filament, theory of magnetic effects on
 the noise in a 647–64
 high field mobility in, with impurity
 scattering dominant 1508
 high purity, infrared absorption 507
 infrared absorption 507
 lithium diffusion 1509
 minority carrier lifetime, measurement
 517
 phototransistors 1263
 properties 507
- p-type, infrared absorption bands 507
space-charge limited hole current 1509
surface properties 1–41
temporary traps 1260
thermal conversion, impurity effects
 257
thermal expansion 1260
varistors 514
- Goucher, F. S.
 “Interpretation of α -values in p-n
 Junction Transistors”
 abstract 1009
- Graham, R. Shiels
biographical material 1016
“L3 Coaxial System—Television
 Terminals” 915–42
- Gramels, Joseph
biographical material 1515
“Selenium Rectifiers—Factors in
 Their Application” 1469–92
- Gray, A. N.
biographical material 1268
“Development and Manufacture of
 Electroformed Conductor for Tele-
 phone Drop Wire” 1099–1135
“Development of Electroformed Cop-
 per-Steel Wire”
 abstract 1260
- Green, E. I.
biographical material 1016–17
“L3 Coaxial System—Foreword”
 779–80
- GREENSALT
evaluation 487
- Grossman, Alexander J.
biographical material 1017
“L3 Coaxial System—System De-
 sign” 781–832
- Groth, W. B.
“Principles of Tape-to-Card Conver-
 sion in the AMA System” 1260
- “Growth of Metal Whiskers” (Koonee
 and Arnold) 1261
- GYRATOR(s)
 acoustic waves 1261
 employing magnetic field independent
 orientations in germanium 1010
 ferrite 1261

H

Hagstrum, H. D.

"Electron Ejection from Mo by He⁺, He₂⁺⁺, and He₃⁺⁺"
abstract 769-70

"Hall Effect Modulators and 'Gyrators' Employing Magnetic Field Independent Orientations in Germanium" (Mason, Hewitt, and Wick)
abstract 1010

Hamming, R. W.

"Measurement of Magnetostriction in Single Crystals"
abstract 1008

Hampton, L. N.

biographical material 1268
"Card Translator for Nationwide Dialing" 1037-98

Hannay, H. B.

"Formative of Negative Ions of Sulfur Hexafluoride"
abstract 1007

"Hard Rubber" (H. Peters)

abstract 513

Harris, J. R.

"Transistor Shift Register and Serial Adder"
abstract 509

Hartman, C. D.

"Field Emission Microscope and Flash Filament Techniques for the Study of Structure and Adsorption on Metal Surfaces"
abstract 1008

Haynes, J. R.

"Temporary Traps in Silicon and Germanium" 1260

HEAT

pressure connection 533
wood sterilization 456

Heidenreich, R. D.

"Methods in Electron Microscopy of Solids"
abstract 770

"Physical and Magnetic Structure of the Mishima Alloys" 1262

HELIUM ISOTOPES

vapor pressures 772

Hewitt, W. H.

"Hall Effect Modulators and 'Gyrators' Employing Magnetic Field Independent Orientations in Germanium"
abstract 1010

"High Field Mobility in Germanium With Impurity Scattering Dominant" (E. M. Conwell)
abstract 1508

HIGH-FREQUENCY

measurements, converters for 506

"High-Frequency Crystal Units for Primary Frequency Standards" (A. W. Warner)
abstract 260

"High-Frequency Crystal Units for Use in Selective Networks and Their Proposed Application in Filters Suitable for Mobile Radio Channel Selection" (Ciccolella and Labrie)
1508

"High-Frequency Transistor Tetrode" (Wallace, Schimpf and Dickten)
abstract 774

HIGH-SPEED PHOTOGRAPHY *See Photography*

"Higher Frequencies for Ground-Air Communications" (S. B. Wright)
1265

Hines, M. E.

"Traveling-Wave Tube" 1510

Hogan, C. L.

"Ferromagnetic Faraday Effect at Microwave Frequencies and Its Applications" 1260

Holecomb, A. L.

"Three-Phase Power From Single-Phase Source"
abstract 256

HOLE(S) AND ELECTRONS *See Electron(s) and holes*

Hopper, A. L.

"Nonsynchronous Time Division with Holding and with Random Sampling"
abstract 258, 513

- Hopper, H. G.
 "Motion of Domain Walls in Ferrite Crystals" 1260
 abstract 509
- Hornbeck, J. A.
 "Charge Transfer and the Mobility of Rare Gas Ions"
 abstract 509
 "Temporary Traps in Silicon and Germanium" 1260
- "How to Conceal Telephone Wires, Keep Desks Neat" (A. R. Hutchinson) 770
- "How To Detect the Type of an Assignable Cause" (P. S. Olmstead)
 abstract 512
- Hughes, W. T.
 "Vacuum Tube Electrometer Amplifier" 1261
- Hulm, J. K.
 "Superconducting Properties of Cobalt Disilicide"
 abstract 1011
- HUMIDITY**
 connections, solderless, wrapped 598
- Huntley, H. R.
 biographical material 1268
 "Transmission Design of Intertoll Telephone Trunks" 1019-36
- Hussey, Luther W.
 biographical material 1269
 "Semiconductor Diode Gates" 1137-54
- Hutchinson, A. R.
 "How to Conceal Telephone Wires, Keep Desks Neat" 770
- HYPFINE STRUCTURE OF ELECTRON RESONANCE** 396, 405
- I
- "Improved Circuit for the Telephone Set" (A. F. Bennett) 611-26
 "Improved Electrolysis Switch" (V. B. Pike)
 abstract 259
 "Impurity Effects in the Thermal Conversion of Germanium" (Slichter and Kolb)
 abstract 257
- "In Search of the Missing 6 Db" Munson and Wiener)
 abstract 512
- INDIUM ANTIMONY** (InSb), magneto-resistance effect in 1263
- INDUCTOR(s)**
 ferrite materials as cores 265-91
 "Influence of Echoes on Television Transmission" (P. Mertz) 1511
- INFORMATION THEORY**
 basic theorems 1510
 "Information-Bearing Elements of Speech" (G. E. Peterson)
 abstract 773
 "Infrared Absorption in High Purity Germanium" (H. B. Briggs)
 abstract 507
- "Initial Permeability and Related Losses in Ferrites" (J. K. Galt)
 abstract 256
- InSb** See Indium antimony
- INSULATION**
 crossbar systems, local, automatic line test equipment 627-46
 leakage paths 627, 628
 moisture 627
 polyethylene 1245-56
 stress relaxation 517-18
 subscribers' lines 627
- "Interesting Property of Certain Conductive Rubbers" (L. G. Kersta) 1261
- INTERFERENCE**
 co-channel 42, 45
 intermodulation 63-73
 "Nonsynchronous Time Division with Holding and with Random Sampling" (Pierce and Hopper)
 abstract 258, 513
 "Intermodulation Interference in Radio Systems" (Wallace C. Babcock) 63-73
 "Interpretation of α -values in p-n Junction Transistors" (Goucher and Prince)
 abstract 1009
 "Interpretation of e/m Values for Electrons in Crystals" (W. Shockley) 515

ION(s)

- carbon monoxide, drift velocity 1013
 gaseous, motion in strong electric fields 259, 170-254
 gases, rare, charge transfer and mobility 509
 ionization, single, by electrons, threshold law 1512-13
 krypton, drift velocity 517
 nitrogen, drift velocity 1013
 oxygen, drift velocity 1013
 sulfur hexafluoride, negative 1007
 xenon, drift velocities 517

IRON-NICKEL ALLOYS

- magnetic properties 1258

J

Jakes, W. C., Jr.

- "Broad Band Matching with a Directional Coupler"
 abstract 509-10
 "Theoretical Study of an Antenna-Reflector Problem"
 abstract 770

JOINING METHODS *See* Connection

Jones, H. L.

- "Approximating the Mode From Weighted Sample Values"
 abstract 1010

JUNCTION TRANSISTOR(s) *See* Transistor"Junction Transistor" (M. Sparks)
 abstract 516"Junction Transistor Tetrode for High-Frequency Use" (Wallace, Schimpf and Dickten)
 abstract 517

K

Kaplan, E. L.

- "Tensor Notation and the Sampling Cumulants of k -Statistics"
 abstract 770

Kaylor, Robert L.

- biographical material 1269
 "Statistical Study of Selective Fading of Super-High Frequency Radio Signals" 1187-1202

Keister, William

- biographical material 520
 "Throwdown Machine for Telephone Traffic Studies" 292-359

Keller, A. C.

- "Economics of High-Speed Photography"
 abstract 771
 "New General-Purpose Relay for Telephone Switching Systems"
 abstract 510

Kern, H. E.

- "Solubility and Diffusion Coefficient of Carbon in Nickel: Reaction Rates of Nickel-Carbon Alloys with Barium Oxide"
 abstract 771

Kersta, L. G.

- "Interesting Property of Certain Conductive Rubbers" 1261

Ketchledge, R. W.

- biographical material 1017
 "L3 Coaxial System — Equalization and Regulation" 833-78

KINETIC ENERGY

- electrons 769

KINETICS *See* Gaseous kinetics

King, A. P.

- "Dominant Wave Transmission Characteristics of a Multimode Round Waveguide"
 abstract 256

Kinsburg, Boris J.

- biographical material 1017
 "L3 Coaxial System — Quality Control Requirements" 943-67

Kip, A. F.

- "Electron Spin Resonance in a Silicon Semi-Conductor" 1511

Kittel, C.

- "Electron Spin Resonance in a Silicon Semi-Conductor" 1511

Klie, Robert H.

- biographical material 1017
 "L3 Coaxial System — System Design" 781-832

KLYSTRON

- reflex, coupled resonator (tube) 715-66



- Kock, W. E.
 "Acoustic Gyrator"
 abstract 1261
 "Ähnlichkeit zwischen Vokalformanten und Formanten von Musikinstrumenten" 1261
 "Dynamic Spectrograms of Speech" 771
 "Selective Voice Control Problems"
 abstract 771
 "Similarity Between Vowel Formants and the Formants of Musical Instruments" 1261
- Kohman, G. T.
 "Polyethylene Terephthalate — Its Use as a Capacitor Dielectric"
 abstract 1264-5
- Kolb, E. D.
 "Impurity Effects in the Thermal Conversion of Germanium"
 abstract 257
 "Solute Distribution in Germanium Crystals" 1512
- Koonce, Miss S. E.
 "Growth of Metal Whiskers" 1261
- Kruger, M. K.
 biographical material 1017-18
 "L3 Coaxial System — Quality Control Requirements" 943-67
- KRYPTON
 ions, drift velocity 517
- k*-STATISTICS
 tensor notation and sampling cumulants 770
- L
- Labrie, L. J.
 "High Frequency Crystal Units for Use in Selective Networks and Their Proposed Application in Filters Suitable for Mobile Radio Channel Selection" 1508
- LAMINATED CONDUCTORS *See* Conductor
- Lander, J. J.
 "Solubility and Diffusion Coefficient of Carbon in Nickel: Reaction Rates of Nickel-Carbon Alloys with Barium Oxide"
 abstract 771
- "Vacuum Tube Electrometer Amplifier" 1261
 "Large Current Amplifications in Filamentary Transistors" (W. Van Roosbroeck) 774
 "LARMOR FREQUENCY" 85
 "LARMOR PRECESSION" 85
 LATEX EBONITE 513
 "Lead-Acid Stationary Batteries" (U. B. Thomas)
 abstract 257
- Lebert, A. W.
 "Standardization of Rigid Coaxial Transmission Lines" 1009
- LENTINUS LEPIDEUS
 Mad. 534 (test fungus) 154
- LENZITES TRABEA
 Mad. 617 (test fungus) 155
- Lewis, H. W.
 "Calibration of the Rolling Ball Viscometer" 1010
 "Multiple Meson Production in Nucleon-Nucleon Collisions" 771
 "Spherical Model of a Ferromagnet"
 abstract 510
 "Lightning Protection for Mobile Radio Fixed Stations" (D. W. Bodle)
 abstract 257
- LINE INSULATION *See* Automatic Line Insulation Test
- Linvill, J. G.
 "Transistor Negative-Impedance Converters" 1510
- LIQUID(s)
 magnetic resonance 384
- LITHIUM
 diffusion into germanium and silicon 1509
- Livadary, J. P.
 "Dual Photomagnetic Intermediate Studio Recording"
 abstract 769
- Logan, Mason A.
 biographical material 1515
 "Dynamic Measurements on Electromagnetic Devices" 1413-67
- Lovell, G. H.
 biographical material 1018
 "L13 Coaxial System — Amplifiers" 879-914

- "Low-Drain Transistor Audio Oscillator" (D. E. Thomas)
abstract 516
- "Low-Loss Waveguide Transmission" (Miller and Beck)
abstract 1011
- L3 COAXIAL SYSTEM**
- Amplifiers (Morris, Lovell and Dickinson) 879-914
- Application of Quality Control Requirements in the Manufacture of Components (Garrett, Tuffnall and Waddell) 969-1005
- Equalization and Regulation (Ketchledge and Finch) 833-78
- Foreword (E. I. Green) 779-80
- Quality Control Requirements (Dodge, Kinsburg and Kruger) 943-67
- System Design (Elmendorf, Ehrbar, Klie and Grossman) 781-832
- Television Terminals (Rieke and Graham) 915-42
- LUBRICANT(s)**
- solid 1508
- Luke, C. L.**
- "Photometric Determination of Antimony in Lead Using the Rhodamine B Method" 1261
- "Photometric Determination of Silicon in Ferrous, Ferromagnetic, Nickel, and Copper Alloys — A Molybdenum Blue Method"
abstract 772
- Lumsden, G. Q.**
- "Quarter Century of Evaluating Pole Preservatives" 772
- "Review of American Standard Fiber Stresses of Wood Poles" 1262
- M**
- McKay, K. G.**
- "Bombardment Conductivity" 1510
- "Crystal Conduction Counter"
abstract 1262
- McLean, D. A.**
- "Microstructure of Capacitor Paper" 1510
- McMahon, W.**
- "Polyethylene Terephthalate — Its Use as a Capacitor Dielectric"
abstract 1264-5
- McMillan, B.**
- "Basic Theorems of Information Theory"
abstract 1510
- McRae, J. W.**
- biographical material 776
- "Solderless Wrapped Connections — Introduction" 523-4
- "Transistors in Our Civilian Economy"
abstract 510
- MacWilliams, W. H., Jr.**
- "Computers — Past, Present, and Future"
abstract 772
- MAGNETIC ALLOYS** 1155, 1258, 1262
- "Magnetic Crystal Anisotropy and Magnetostriiction of Iron-Nickel Alloys" (Bozorth and Walker)
abstract 1008-9
- "Magnetic Double Refraction at Microwave Frequencies" (Weiss and Fox) 517
- MAGNETIC FIELD**
- noise in a germanium filament 647
- MAGNETIC MATERIALS**
- behavior 1259
- classical concepts 1155
- phenomena, new 1155-72
- MAGNETIC RESONANCE**
- discovery and importance 74
- equation, general 80
- nuclear 74-99
- practical value 74
- "Magnetic Resonance of Electrons" (Karl K. Darrow) 384-405
- MAGNETIC STRUCTURE**
- Mishima alloys 1262
- "Magnetic Study of Low Temperature Transformation in Magnetite" (Williams and Bozorth) 1264
- MAGNETITE**
- low temperature transformation, magnetic study 1264
- "Magnetomechanical Effects in an Anti-ferromagnet CoO" (M. E. Fine) 1260

- "Magnetoresistance Effect in InSb" (Pearson and Tanenbaum) 1263
- Mallina, R. F.
biographical material 775-6
"Solderless Wrapped Connections — Part I — Structure and Tools" 525-55
- Mallinckrodt, C. O.
"Experimental Verification of the Theory of Laminated Conductors" abstract 255
- Mapes, C. M.
"Telephone System in National Defense" abstract 258
- Mason, W. P.
biographical material 776
"Hall Effect Modulators and 'Gyrators' Employing Magnetic Field Independent Orientations in Germanium" abstract 1010
- "Piezoelectric, Dielectric, and Elastic Properties of $ND_4D_2PO_4$ " abstract 510
- "Rotational Relaxation in Nickel at High Frequencies" abstract 1262
- "Solderless Wrapped Connections — Part II — Necessary Conditions for Obtaining a Permanent Connection" 557-90
- "Matching Coaxial Line to the Ground-Plane Antenna" (R. T. DeCamp) abstract 258
- MATHIEU'S EQUATION**
connection formulas between the solutions of 1014
- Mathy, P. T.
"Conveyorization Avoids Handling Headaches" 1262
- Matthias, B. T.
"Piezoelectric, Dielectric, and Elastic Properties of $ND_4D_2PO_4$ " abstract 510
"Polymorphism of $ND_4D_2PO_4$ " abstract 257
- "Superconducting Properties of Cobalt Disilicide" abstract 1011
- "Superconductivity in the Cobalt-Silicon System" abstract 256
- May, A. S.
"Microwave System Test Equipment" 1510
- "Mean Free Paths of Electrons in Evaporated Metal Films" (Reynolds and Stilwell) 514
- "Measurement of Magnetostriction in Single Crystals" (Bozorth and Hammink) abstract 1008
- "Measurement of Minority Carrier Lifetime in Germanium" (L. B. Valdes) abstract 517
- MECHANICAL STABILITY**
connections, solderless, wrapped 591
- "Mechanized Billing of AMA Toll Messages" (F. D. Slade) 1264
- MELLOR APPROXIMATION** 100, 111-13
- Mertz, P.
"Influence of Echoes on Television Transmission" 1511
- Merz, W. J.
"Domain Properties in $BaTiO_3$ " abstract 511
"Polymorphism of $ND_4D_2PO_4$ " abstract 257
- MESON PRODUCTION**
in nucleon-nucleon collisions 771
- MESSAGE ACCOUNTING** See Automatic Message Accounting
- METAL**
whiskers, growth 1261
zone-melting 513
- METALLURGY**
solid state physics 257
"Methods in Electron Microscopy of Solids" (R. D. Heidenreich) abstract 770
- MICROSCOPY**
electron, of solids, methods 770
"Microstructure of Capacitor Paper" (McLean, Birdsall and Calbick) 1510

MICROWAVE FREQUENCIES

- ferrites 1333-69
- ferromagnetic Faraday effect 1260
- magnetic double refraction 517

MICROWAVE NOISE

- in electron streams, calculation 773
- "Microwave Observation of the Collision Frequency of Electrons in Germanium" (Benedict and Shockley) 1258

MICROWAVE RADIO

- routes, path testing 1508

MICROWAVE RELAY STATIONS

- antenna 770

"Microwave System Test Equipment"
(A. S. May) 1510**"Microwaves from Coast-to-Coast"** (J. R. Rae) 1013

Miller, E. S.

- "Notes on Methods of Transmitting the Circular Electric Wave Around Bends"

abstract 511

Miller, R. L.

- "Auditory Tests with Synthetic Vowels"

abstract 1011

- "Dynamic Spectrograms of Speech"

771

Miller, S. E.

- "Low-Loss Waveguide Transmission"

abstract 1011

- "Multi-Element Directional Couplers"

abstract 258

MISHIMA ALLOYS 1262

MOBILE RADIO *See Radio*

"Mobility in High Electric Fields" (E. M. Conwell)

- abstract 768

"Mobility of Electrons in Germanium"
(Debye and Conwell)

- abstract 507

"Mobility of Holes and Electrons in High Electric Fields" (E. J. Ryder)

- abstract 1511-12

MODULATOR(S)

- employing magnetic field independent orientations in germanium 1010

MOISTURE

- insulation of subscriber lines 627

MOLYBDENUM BLUE METHOD 772

Montgomery, H. C.

"Transistor Noise in Circuit Applications"

abstract 511-12

Morgan, S. P.

"Experimental Verification of the Theory of Laminated Conductors"

abstract 255

Morris, Lester H.

biographical material 1018

"L3 Coaxial System — Amplifiers"
879-914

Morrison, J.

"Controlled Gas Leak" 1262**"Motion of Domain Walls in Ferrite Crystals"** (Galt, Andrus and Hopper) 1260**"Motion of Gaseous Ions in Strong Electronic Fields"** (Gregory H. Wannier) 170-254

abstract 259

MOTION PICTURES

- three-phase power from single-phase source 256

"Multi-Element Directional Couplers"
(Miller and Mumford)

abstract 258, 511

"Multiple Meson Production in Nucleon-Nucleon Collisions" (H. W. Lewis) 771

Mumford, W. W.

"Multi-Element Directional Couplers"

abstract 258, 511

"Optimum Piston Position for Wide-Band Coaxial-to-Waveguide Transducers"

abstract 772

Munson, W. A.

"In Search of the Missing 6 Db"

abstract 512

Murray, G. E.

biographical material 1269

"Development and Manufacture of Electro-formed Conductor for Telephone Drop Wire" 1099-1135

N

- NATIONAL DEFENSE *See Civil defense*
- NATIONAL POLITICAL CONVENTIONS (Chicago)
television coverage 1263
- "Nation-Wide Numbering Plan" (W. H. Nunn)
abstract 512
- "Nature of Solids" (G. H. Wannier)
abstract 517
- $\text{ND}_3\text{D}_2\text{PO}_4$ *See Ammonium dihydrogen phosphate*
- Nelson, R. A.
"Vapor Pressure of He^3 & He^4 Mixtures" 772
- Nesbitt, E. A.
"Physical and Magnetic Structure of the Mishima Alloys" 1262
- "New General-Purpose Relay for Telephone Switching Systems" (A. C. Keller)
abstract 510
- "New Infrared Absorption Bands in *p*-Type Germanium" (Briggs and Fletcher)
abstract 507
- "New Method of Calculating Microwave Noise in Electron Streams" (J. R. Pierce)
abstract 773
- "New Non-Reciprocal Waveguide Medium Using Ferrites" (E. H. Turner) 1512
- Newsom, James B.
biographical material 1269-70
"Card Translator for Nationwide Dialing" 1037-98
- NICKEL
carbon in, solubility and diffusion coefficient 771
rotational relaxation at high frequencies 1262
- NICKEL ALLOYS
silicon, photometric determination 772
- NICKEL-CARBON ALLOYS
barium oxide, reaction rates with 771
- NITROGEN
ions, drift velocity 1013

NOISE

- germanium filament, theory of magnetic effect on 647-64
in a temperature-limited electron beam in a drift space 773
microwave, in electron streams, calculation 773
oscillatory 1371
- "Non-Blocking Switching Networks Study" (Charles Clos) 406-24
- "Nonsynchronous Time Division with Holding and with Random Sampling" (Pierce and Hopper)
abstract 258, 513
- "Notes on Methods of Transmitting the Circular Electric Wave Around Bends" (E. S. Miller)
abstract 511
- N-P-N JUNCTION PHOTOTRANSISTORS
See Phototransistor
- NUCLEAR MAGNETIC RESONANCE
discovery 99
"Nuclear Magnetic Resonance" (Karl K. Darrow) 74-99
- NUCLEON-NUCLEON COLLISIONS
multiple Meson production 771
- NUCLEUS, nuclei
magnetic moments 74
- NUMBER(s), numbering *See Telephone numbers*
- Nunn, W. H.
"Nation-Wide Numbering Plan"
abstract 512
- Nye, J. F.
"Geometrical Relations in Dislocated Crystals"
abstract 1012

O

- O'Connor, S. F.
"Plating Room Waste Water Disposal" 1012
- OIL-TYPE PRESERVATIVES 160
- Olmstead, P. S.
"How to Detect the Type of an Assignable Cause"
abstract 512
- Olsen, K. M.
"Purification and Prevention of Segre-

- gation in Single Crystals of Germanium" 1012
- "On the Band Width of Vowel Formants" (B. P. Bogert)
abstract 1507-8
- "On the Number of Symmetry Types of Boolean Functions on n Variables" (D. Slepian) 1264
- "Optical Position Encoder and Digit Register" (Follingstad, Shive and Yaeger)
abstract 508-9
- "Optimum Piston Position for Wide-Band Coaxial-to-Waveguide Transducers" (W. W. Mumford)
abstract 772
- "Organization of the Engineering Profession" (D. A. Quarles)
abstract 514
- Osborne, H. S.
"Automatic Switching for Nation-Wide Telephone Service"
abstract 507
"Rose by Any Other Name" 773
- Oscillator**
low-drain transistor audio 516
transistor, use in multifrequency pulsing current supply 1313-31
- Osmer, T. F.
biographical material 776
"Solderless Wrapped Connections—Part II—Necessary Conditions for Obtaining a Permanent Connection" 557-90
- OVERSEAS TELEPHONY**
single-sideband system 514
- Owens, C. D.
"Analysis of Measurements on Magnetic Ferrites"
abstract 1012
- OXYGEN**
ions, drift velocity 1013
- P**
- PARAMAGNETIC RESONANCE**
exchange narrowing 1257
- PARAMAGNETIC SALTS**
magnetic resonance 74
- PARAMAGNETIC SOLIDS**
electron resonance 393
- "Path Testing for Microwave Radio Routes" (R. D. Campbell) 1508
- Pearson, G. L.
"Magnetoresistance Effect in InSb" 1263
- "Silicon p-n Junction Alloy Diodes"
abstract 512-13
- Peek, D. S.
"Ten-Stage Cold-Cathode Stepping Tube"
abstract 773
- PENTACHLOROPHENOL**
evaluation 488
- "Permalloy Problem" (R. M. Bozorth)
abstract 1258-9
- Peters, H.
"Hard Rubber"
abstract 513
- Peterson, G. E.
"Application of Information Theory to Research in Experimental Phonetics"
abstract 513
- "Basic Physical Systems for Communication Between Two Individuals" 1511
- "Information-Bearing Elements of Speech"
abstract 773
- Pfann, W. G.
"Principles of Zone-Melting"
abstract 513
- "Purification and Prevention of Segregation in Single Crystals of Germanium" 1012
- "Segregation of Two Solutes, with Particular Reference to Semiconductors"
abstract 258
- PHONETICS**
information theory application 513
- PHOTOCELL(S)**
germanium, single-crystal 257
M-1740 p-n junction 514
- PHOTOGRAPHY**
high-speed, economics 771

- PHOTOMAGNETIC INTERMEDIATE STUDIO RECORDING 769
- "Photometric Determination of Antimony in Lead Using the Rhodamine B Method" (C. L. Luke) 1261
- "Photometric Determination of Silicon in Ferrous, Ferromagnetic, Nickel, and Copper Alloys—A Molybdenum Blue Method" (C. L. Luke) abstract 772
- PHOTOTRANSISTOR(s)
- germanium 1263
 - n-p-n junction multiplier 1263
 - p-n junction 1263
 - point contact 1263
 - See also* Transistor
- "Physical and Magnetic Structure of the Mishima Alloys" (Nesbitt and Heidenreich) 1262
- Pierce, J. R.
- "New Method of Calculating Micro-wave Noise in Electron Streams" abstract 773
 - "Nonsynchronous Time Division with Holding and with Random Sampling" abstract 258, 513
 - "Transistors" 1511
- "Piezoelectric, Dielectric, and Elastic Properties of $ND_4D_2PO_4$ " (Mason and Matthias) abstract 510
- Pike, V. B.
- "Improved Electrolysis Switch" abstract 259
- Pilliod, J. J.
- "Fundamental Plans for Toll Telephone Plant" 513
- PINE (wood) *See* Southern pine
- PISTON
- transducers, wide-band coaxial-to-waveguide, optimum position 772
- PLANE WAVE THEORY 1333
- "Plans for Toll Telephone Plant, Fundamental" (J. J. Pilliod) 513
- PLASTICS
- stress relation 517-18
- "Plating Room Waste Water Disposal" (S. F. O'Connor) 1012
- P-N JUNCTION PHOTOTRANSISTORS *See* Phototransistor
- P-N JUNCTION SILICON DIODE 512
- P-N-P-N TRANSISTORS *See* Transistor
- POINT CONTACT PHOTOTRANSISTORS *See* Phototransistor
- POLE(s) *See* Telephone poles
- Pollard, C. E., Jr.
- "Balanced Polar Mercury Contact Relay" 1393-1411
 - biographical material 1516
- POLYETHYLENE
- connections, solderless, wrapped 557
 - "Polyethylene Insulated Telephone Cable" (A. S. Windeler) 1245-56
 - "Polyethylene Terephthalate—Its Use as a Capacitor Dielectric" (Wooley, Kohman and McMahon) abstract 1264-5
 - "Polymorphism of $ND_4D_2PO_4$ " (Wood, Merz and Matthias) abstract 257
- Portis, A. M.
- "Electron Spin Resonance in a Silicon Semi-Conductor" 1511
- "Practice of Quality Control" (A. G. Dalton)
- abstract 1009
- PRECESSION 84
- Prim, R. C.
- biographical material 776-7
 - "DC Field Distribution in a 'Swept Intrinsic' Semiconductor Configuration" 665-94
 - "Space-Charge Limited Emission in Semi-Conductors" abstract 1512
- Prince, M. B.
- "Interpretation of α -values in p-n Junction Transistors" abstract 1009
- "Principles and Applications of Converters for High-Frequency Measurements" (D. A. Alsberg) abstract 506
- "Principles of Tape-to-Card Conversion in the AMA System" (W. B. Groth) 1260

- "Principles of Zone-Melting" (W. G. Pfann)
abstract 513
- "Progress and Problems" (D. A. Quarles) 1511
- "Properties of Germanium Phototransistors" (J. N. Shive)
abstract 1263
- "Properties of Junction Transistors (K. D. Smith) 774
- "Properties of M-1740 p-n Junction Photocells" (J. N. Shive)
abstract 514
- "Properties of Silicon and Germanium" (Esther M. Conwell)
abstract 507
- "Properties of Thermally Produced Acceptors in Germanium" (Fuller, Theuerer and Van Roosbroeck)
abstract 256
- PROTON RESONANCE ABSORPTION** 75
- Pugh, S. G.
"Southern Bell Switches to Chemical Brush Control"
abstract 1263
- "Purification and Prevention of Segregation in Single Crystals of Germanium" (Pfann and Olsen) 1012
- Q**
- QUALITY CONTROL**
L3 coaxial system 943, 969
- Quarles, Donald A.
"AIEE Progress"
abstract 1013
"Organization of the Engineering Profession"
abstract 514
"Progress and Problems" 1511
"Report to the Membership" 1511
"We Begin a New Institute Year"
abstract 514
- "Quarter Century of Evaluating Pole Preservatives" (G. Q. Lumsden) 772
- R**
- RADIATION**
out-of-band 514
- RADIO(s)**
- connections, solderless, wrapped 525 *f*
field strength fluctuations far beyond the horizon 773
frequency spectrum, use 42
lightning protection 257
microwave, routes, path testing 1508
mobile:
bands, frequency economy 42-62, 1508
channel selection, filters suitable for 1508
channels usability 42-62
fixed stations, lightning protection 257
intermodulation interference 63-73
path loss between antennas 43
transmission, comparison at 150, 450, 900 and 3700 Mc 1513
super-high frequency, signal fading, study 1187-1202
- "Radio Transmission Beyond the Horizon in the 40- to 4,000-Mc Band" (K. Bullington)
abstract 767-8
- Rae, J. B.
"Microwaves from Coast-to-Coast" 1013
- Ralston, R. W.
"Television Coverage of the National Political Conventions"
abstract 1263
- RANDOM SERVICE**
calls, delayed exponential, working curves 360-83
delay curves 100-19
- RAPID LINE INSULATION TESTING**
switching systems 627, 631-3
- Read, W. T.
"Anisotropic Elasticity with Applications to Dislocation Theory"
abstract 1509
"Statistics of the Recombinations of Holes and Electrons"
abstract 259
- RECORDING** *See Sound recording*
- RECTIFIER(s)**
germanium, single-crystal 257
selenium 1469-92

- Reed, E. D.
 biographical material 777
 "Coupled Resonator Reflex Klystron" 715-66
- REFLECTOR
 plane, antenna used with 770
- REGENERATIVE AMPLIFIER *See* Amplifier
 "Regenerative Amplifier for Digital Computer Applications" (J. H. Felker)
 abstract 508
- RELAXATION
 electric fields, high, mobility in 768
 ferromagnetic materials 767
 nickel at high frequencies, rotational 1262
 nuclear magnetic resonance 92-9
- RELAY
 AF type 510
 AG 510
 AJ 510
 electromagnetic, general purpose 510
 mercury contact, balanced polar 1393-1411
 "Report to the Membership" (D. A. Quarles) 1511
- RESONANCE 83
 dimensional 1163-4
 electron spin, in a silicon semi-conductor 1511
 ferromagnetic 1164-6
See also Magnetic resonance; Nuclear magnetic resonance; Paramagnetic resonance
- RESONATOR
 coupled reflex klystron 715-66
- "Review of American Standard Fiber Stresses of Wood Poles" (Lumsden and Colley) 1262
- "Review of New Magnetic Phenomena" (R. E. Alley, Jr.) 1155-72
- Reynolds, F. W.
 "Mean Free Paths of Electrons in Evaporated Metal Films" 514
- RHODAMINE B METHOD
 photometric determination of antimony in lead 1261
- Rice, S. O.
- "Statistical Fluctuations of Radio Field Strength Far Beyond the Horizon" abstract 773
- Rieke, John W.
 biographical material 1018
 "L3 Coaxial System — Television Terminals" 915-42
- Riordan, John
 biographical material 263
 "Delay Curves for Calls Served at Random" 100-19
 addendum 1266
- Ritchie, Alistair E.
 biographical material 520-1
 "Throwdown Machine for Telephone Traffic Studies" 292-359
- "Rose by Any Other Name" (H. S. Osborne) 773
- "Rotational Relaxation in Nickel at High Frequencies" (W. P. Mason) abstract 1262
- Rowen, John H.
 biographical material 1516
 "Ferrites in Microwave Applications" 1333-69
- RUBBER(s)
 conductive 1261
 hard 513
 synthetic 513
- Rudisill, J. A., Jr.
 "Simple Phase-Angle Measurement Technique" abstract 257
- Ryder, E. J.
 "Mobility of Holes and Electrons in High Electric Fields" abstract 1511-12
- S
- SALT (paramagnetic)
 magnetic resonance 74
- Sawyer, B.
 "Silicon p-n Junction Alloy Diodes" abstract 512-13
- Schimpf, L. G.
 "High-frequency Transistor Tetrode" abstract 774

- "Junction Transistor Tetrode for High-Frequency Use"
abstract 517
- Schlaak, N. F.
"Single-Sideband System for Overseas Telephony"
abstract 514
- "Science and Scientists in Telecommunications" (R. M. Burns) 1259
- "Segregation of Two Solutes, with Particular Reference to Semiconductors" (W. G. Pfann)
abstract 258
- "Selective Voice Control Problems" (W. E. Kock)
abstract 771
- "Selenium Rectifiers — Factors in Their Application" (J. Gramels) 1469-92
- SEMICONDUCTOR(s)**
DC field in a "swept intrinsic" 665-94
diode gates 1137-54
silicon, electron spin resonance 1511
solute segregation 258
space-charge limited emission 1512
statistics of the recombination of holes and electrons 259
"swept intrinsic" configuration, DC field distribution in 665-94
- "Semiconductor Diode Gates" (Luther W. Hussey) 1137-54
- SERIAL ADDER**
transistor 509
- SHIFT REGISTER**
transistor 509
- Shipley, F. F.
"Automatic Toll Switching Systems" 514
- Shive, J. N.
"Optical Position Encoder and Digit Register"
abstract 508-9
- "Properties of Germanium Phototransistors"
abstract 1263
- "Properties of M-1740 p-n Junction Photocells"
abstract 514
- Shockley, William
- "Anisotropic Elasticity with Applications to Dislocation Theory"
abstract 1509
- "Interpretation of e/m Values for Electrons in Crystals" 515
- "Microwave Observation of the Collision Frequency of Electrons in Germanium" 1258
- "Solid State Physics in Electronics and in Metallurgy"
abstract 257
- "Space-Charge Limited Emission in Semi-Conductors"
abstract 1512
- "Statistics of the Recombinations of Holes and Electrons"
abstract 259
- "Transistor Electronics: Imperfections, Unipolar and Analog Transistors"
abstract 515
- "Unipolar 'Field-Effect' Transistor"
abstract 515
- SHORT ARC**
characteristics 1493-1506
- SILICON**
carrier density and mobility 507
electrical properties 507
electrons and holes, field dependence of mobility 1511
lithium diffusion 1509
p-n junction alloy diodes 512-13
properties 507
semi-conductor, electron spin resonance 1511
temporary traps 1260
varistors 514
- "Silicon p-n Junction Alloy Diodes" (Pearson and Sawyer)
abstract 512-13
- "Similarity Between Vowel Formants and the Formants of Musical Instruments" (W. E. Kock) 1261
- "Simple Attachment for Low Temperature Use of an X-Ray Diffraction Camera" (E. A. Wood) 1264
- "Simple Phase-Angle Measurement Technique" (J. A. Rudisill, Jr.)
abstract 257

- "Single-Crystal Germanium" (Teal, Sparks and Buehler)
abstract 257
- SINGLE-PHASE 115-VOLT POWER**
conversion to three-phase 230-volt form 256
- "Single-Sideband System for Overseas Telephony" (N. F. Schlaak)
abstract 514
- Slade, F. D.
"Mechanized Billing of AMA Toll Messages" 1264
- Slepian, D.
"On the Number of Symmetry Types of Boolean Functions on n Variables" 1264
- Slichter, W. P.
"Impurity Effects in the Thermal Conversion of Germanium"
abstract 257
"Solute Distribution in Germanium Crystals" 1512
- Smith, K. D.
"Properties of Junction Transistors" 774
- SOIL-BLOCK TESTS**
creosotes, residual, characteristics of weathered blocks 479-87
evaluation 132-60
- SOLDER JOINT** 525
- SOLDERLESS WRAPPED CONNECTIONS** 523-610
"Solderless Wrapped Connections"
Introduction (J. W. McRae) 523-4
Part I — Structure and Tools (R. F. Mallina) 525-55
Part II — Necessary Conditions for Obtaining a Permanent Connection (Mason and Osmer) 557-90
Part III — Evaluation and Performance Tests (R. H. Van Horn) 591-610
- SOLID(s)**
magnetic resonance 384
nature of 517
paramagnetic, electron resonance 393
"Solid Lubricants" (W. E. Campbell)
· 1508
- "Solid State Physics in Electronics and in Metallurgy" (W. Shockley)
abstract 257
- "Solubility and Diffusion Coefficient of Carbon in Nickel: Reaction Rates of Nickel-Carbon Alloys with Barium Oxide" (Lander, Kern and Beach)
abstract 771
- SOLUTE(s)**
germanium crystals, distribution 1512
segregation during directional solidification of an ingot 258
- "Solute Distribution in Germanium Crystals" (Slichter and Kolb) 1512
- SOUND PRESSURE**
ear canal 512
- SOUND RECORDING**
dial photomagnetic intermediate studio recording 769
magnetic 509
mechanical 509
photographic 509
processes comparison 509
re-recording 769
three-phase power from single-phase source 256
- "Southern Bell Switches to Chemical Brush Control" (S. G. Pugh)
abstract 1263
- SOUTHERN PINE SAPWOOD**
stakes, testing 427
- "Space-Charge Limited Emission in Semi-Conductors" (Shockley and Prim)
abstract 1512
- "Space-Charge Limited Hole Current in Germanium" (G. C. Dacey)
abstract 1509
- Sparks, M.
"Junction Transistor"
abstract 516
"Single-Crystal Germanium"
abstract 257
- SPECTROGRAM(s)**
speech 771
- SPEECH**
information-bearing elements 773
phonetic content 771
spectrograms 771

- "Spherical Model of a Ferromagnet" (Lewis and Wannier)
abstract 510
- SPIN-LATTICE RELAXATION** *See* Relaxation
- "Standardization of Rigid Coaxial Transmission Lines" (Drvostep and Lebert) 1009
- Stang, L. R.
"Telephone Answering Services" 516
- Stansel, F. R.
"Transistor Equations"
abstract 1013
- "Statistical Fluctuations of Radio Field Strength Far Beyond the Horizon" (S. O. Rice)
abstract 773
- "Statistical Study of Selective Fading of Super-High Frequency Radio Signals" (R. L. Kaylor) 1187-1202
- "Statistics of the Recombinations of Holes and Electrons" (Shockley and Read)
abstract 250
- STERILIZATION**
wood preservation 152
- Stewart, J. A.
"Traffic Engineering Design of Dial Telephone Exchanges" 516
abstract 257
- Stilwell, G. R.
"Mean Free Paths of Electrons in Evaporated Metal Films" 514
- Stone, H. A., Jr.
biographical material 521
"Ferrite Core Inductors" 265-91
- STRAIN(s)**
solderless wrapped connections 557
- STRESS(es)**
solderless wrapped connections 557
- "Stress Relaxation in Plastics and Insulating Materials" (E. E. Wright)
abstract 517-18
- Struthers, J. D.
"Copper as an Acceptor Element in Germanium"
abstract 256
- Stubner, F. W.
- "Acceleration Effects on Electron Tubes" 1203-29
biographical material 1270
- Suhl, Harry
biographical material 777
- "Theory of Magnetic Effects on the Noise in a Germanium Filament" 647-64
- SULFUR HEXAFLUORIDE**
ions, negative, formative of 1007
- "Superconducting Properties of Cobalt Disilicide" (Matthias and Hulm)
abstract 1011
- "Superconductivity in the Cobalt-Silicon System" (B. T. Matthias)
abstract 256
- "Surface Properties of Germanium" (Brattain and Bardeen) 1-41
- SWEDISH CREOSOTE EVALUATION TESTS**
489-90
- SWITCHES**
dynamic measurements of reciprocating phenomena 1413
electrolysis, improved 259
- SWITCHING CIRCUITS**
arcing of electrical contacts 1231-44, 1493-1506
contact erosion 1493
- SWITCHING SYSTEMS**
AF-type relay 510
automatic 507, 514
balanced polar mercury contact relay 1393
calls delay 100
cold cathode gas filled tubes 1371
counting, reversible binary 516
crossbar No. 5, traffic study 292-359
crossnet array 406
crosspoints 406, 419
ferroelectric storage elements 506
nation-wide telephone service 507, 1019-36
non-blocking networks 406-24
rapid line insulation testing 627, 631-3
toll 514, 1019-36
transistors 506
voice frequency signals 1371

T

Tanenbaum, M.

"Magnetoresistance Effect in InSb"
1263TAPE-TO-CARD CONVERSION
in the AMA system 1260Teal, G. K.
"Single-Crystal Germanium"
abstract 257Tebo, Julian D.
appointed editor *opp* 523

TELECOMMUNICATION(s)

sciencee and scientists in 1259
"Telephone Answering Services" (L. R. Stang) 516TELEPHONE CALLS *See* Call(s)"Telephone Industry in National Defense" (C. A. Armstrong)
abstract 507

TELEPHONE NUMBERS

nation-wide plan 512

TELEPHONE POLES, Posts
fiber stresses 1262
preservatives, evaluation 772
testing 425-505TELEPHONE SET (500 type)
circuit, improved 611-26"Telephone System in National Defense" (C. M. Mapes)
abstract 258

TELEPHONE TRAFFIC

delay formula 100
throwdown machine 292-359"Telephony Development in the United States" (A. B. Clark)
abstract 768

TELEVISION

connections, solderless, wrapped
525 *ff*political conventions, Chicago 1263
terminals, L3 coaxial system 915-42
transmission, influence of echoes 1511"Television Coverage of the National Political Conventions" (Ralston and Wickline)
abstract 1263"Temporary Traps in Silicon and Germanium" (Haynes and Hornbeck)
1260"Tensor Notation and the Sampling Cumulants of *k*-Statistics" (E. L. Kaplan)

abstract 770

"Ten-Stage Cold-Cathode Stepping Tube" (D. S. Peck)

abstract 773

TERMINAL(s)

connections, solderless, wrapped 523-610

TETRAGONAL CRYSTAL ND₄D₂PO₄

properties 510

TETRODE(s)

transistor, high-frequency 774

transistor, junction, for high-frequency use 517

"Theoretical Study of an Antenna-Reflector Problem" (W. C. Jakes, Jr.)
abstract 770

"Theory of Magnetic Effects on the Noise in a Germanium Filament" (Harry Suhl) 647-64

Theuerer, H. C.

"Properties of Thermally Produced Acceptors in Germanium"
abstract 256

Thomas, D. E.

"Low-Drain Transistor Audio Oscillator"
abstract 516"Transistor Amplifier - Cutoff Frequency"
abstract 516

Thomas, U. B.

"Lead-Acid Stationary Batteries"
abstract 257"Three-Phase Power From Single-Phase Source" (A. L. Holecomb)
abstract 256"Threshold Law for Single Ionization of Atoms or Ions by Electrons" (G. H. Wannier)
abstract 1512-13

"Throwdown Machine for Telephone Traffic Studies" (Frost, Keister and Ritchie) 292-359

THROWDOWN TESTS

call delays 360

TIMBER PRESERVATION *See* Wood preservatives

- TIP AND RING GROUND TEST** 636
- TOLL MESSAGES**
billing, mechanized 1264
- TOLL SWITCHING**
nationwide 1019
- TOLL TELEPHONE PLANT**
plans 513
- TOLUENE**
as a diluent for creosote treating solutions 455
- Townsend, J. R.**
"Dynamic Program for Conversion" 1512
"What We Have Learned in 1952" 774
- Townsend, Mark A.**
biographical material 1516
"Cold Cathode Tubes for Transmission of Audio Frequency Signals" 1371-91
- TRAFFIC** *See* Telephone traffic
- "Traffic Engineering Design of Dial Telephone Exchanges" (J. A. Stewart) 516
abstract 257
- TRANSDUCER(S)**
wide-band coaxial-to-waveguide, optimum piston position 772
- TRANSISTOR(S)**
amplifier 516
analog 515
audio-oscillator 516
circuit application noise 511
circuit cutoff frequency 516
circuits, negative-resistance 508
civilian economy 510
computer, digital, block diagrams 255, 508, 769
converters, negative-impedance 1510
counter, reversible binary 516
digital computer, block diagrams 255, 769
electronics 515
equations 1013
field effect type 515
filamentary, large current amplifications 774
germanium, single-crystal 257
imperfections 515
junction:
design theory 1271-1312
- principles and development 516
properties 774
small signal ac transmission characteristics of 1271
space-charge layer widening 507
tetrode for high-frequency use 517
- negative-resistance circuits 508
noise behavior 511
oscillator, multifrequency pulsing current supply 1313-31
phototransistor *See* Phototransistor
Pierce, J. R., article 1511
p-n-p-n, four terminal 508
point-contact:
audio oscillator 516
electrode spacing effect on equivalent base resistance 516
frequency response control 515
negative-resistance properties 508
stability 515
serial adder 509
shift register 509
tetrode, high-frequency 774
unipolar 515
- "Transistor Amplifier — Cutoff Frequency" (D. E. Thomas)
abstract 516
- "Transistor Electronics: Imperfections, Unipolar and Analog Transistors" (W. Shockley)
abstract 515
- "Transistor Equations" (F. R. Stansel)
abstract 1013
- "Transistor Negative-Impedance Converters" (J. G. Linvill) 1510
- "Transistor Noise in Circuit Applications" (H. C. Montgomery)
abstract 511-12
- "Transistor Oscillator for Use in Multi-frequency Pulsing Current Supply" (F. E. Blount) 1313-31
- "Transistor Physics Simplified" (Gentile and Barotta) 1510
- "Transistor Reversible Binary Counter" (R. L. Trent)
abstract 516
- "Transistor Shift Register and Serial Adder" (J. R. Harris)
abstract 509
- "Transistors" (J. R. Pierce) 1511

- "Transistors in Our Civilian Economy"
 (J. W. McRae)
 abstract 510
- "Transistors in Switching Circuits" (A. E. Anderson)
 abstract 506-7
- TRANSLATOR(s)**
 card, for nationwide dialing 1037
- TRANSMISSION**
 audio frequency signals, cold cathode tubes for 1371-91
 Clogston type conductors, laminated 695-713
 coaxial system L3 *See Carrier: L3*
 electric waves, around bends 511
 intertoll telephone trunks, design 1019-36
 radio, beyond horizon in the 40- to 4,000-Mc band 767-8
 radio, mobile, comparison at 150, 450, 900 and 3700 Mc 1513
 television, influence of echoes 1511
 waveguide, low-loss 1011
- "Transmission Design of Intertoll Telephone Trunks" (H. R. Huntley) 1019-36
- "Transmission Properties of Laminated Clogston Type Conductors" (E. F. Vaage) 695-713
- TRANSMITTER(s)**
 "Nonsynchronous Time Division with Holding and with Random Sampling" (Pierce and Hopper)
 abstract 258, 513
 single-sideband 514
 sinusoidal radio wave 773
- "Traveling-Wave Tube" (M. E. Hines) 1510
- TRAVELING WAVE TUBE POWER CAPACITY 1509
- Trent, R. L.
 "Transistor Reversible Binary Counter"
 abstract 516
- TRUNK(s)**
 intertoll, transmission design 1019-36
- Tuffnell, T. L.
 biographical material 1018
 "L3 Coaxial System — Application of Quality Control Requirements in the Manufacture of Components" 969-1005
- Turner, E. H.
 "New Non-Reciprocal Waveguide Medium Using Ferrites" 1512
 "Type-O Carrier Telephone" (E. K. Van Tassel)
 abstract 1259
- "Typical Block Diagrams for a Transistor Digital Computer" (J. H. Felker)
 abstract 255, 769
- U
- "Ultrasonically Induced Cavitation in Water: A Step-by-Step Process" (G. W. Willard)
 abstract 1513
- "Unipolar 'Field-Effect' Transistor" (W. Shockley)
 abstract 515
- V
- Vaage, E. F.
 biographical material 777
 "Transmission Properties of Laminated Clogston Type Conductors" 695-713
- VACUUM TUBE *See Electron tube*
 "Vacuum Tube Electrometer Amplifier" (Hughes and Lander) 1261
- Valdes, L. B.
 "Effect of Electrode Spacing on the Equivalent Base Resistance of Point-Contact Transistors"
 abstract 516
- "Measurement of Minority Carrier Lifetime in Germanium"
 abstract 517
- Van Horn, R. H.
 biographical material 777
 "Solderless Wrapped Connections — Part III — Evaluation and Performance Tests" 591-610
- Van Roosbroeck, W.
 "Large Current Amplifications in Filamentary Transistors" 774

- "Properties of Thermally Produced Acceptors in Germanium"
abstract 256
- Van Sielen, H. E.
"What We Did to Cut Costs of Finishing Telephone Woodwork" 1264
- Van Tassel, E. K.
"Type-O Carrier Telephone"
abstract 1259
- "Vapor Pressure of He³ and He⁴ Mixtures" (R. A. Nelson) 772
- VARISTOR(s)**
copper-oxide 514
germanium 514
- Varney, R. N.
"Drift Velocities of Ions in Krypton and Xenon"
abstract 517
- "Drift Velocity of Ions in Oxygen, Nitrogen, and Carbon Monoxide"
abstract 1013
- VISCOMETER**
rolling ball, calibration of 1010
- VOICE CONTROL**
selective 771
- VOICE FREQUENCY SIGNALS**
switching 1371
- VOWELS(s)**
formants, and the formants of musical instruments 1261
formants, band width 1507-8
synthetic, auditory tests 1011
- W**
- Waddell, R. A.
biographical material 1018
- "L3 Coaxial System — Application of Quality Control Requirements in the Manufacture of Components" 969-1005
- Walker, J. G.
"Magnetic Crystal Anisotropy and Magnetostriction of Iron-Nickel Alloys"
abstract 1008-9
- Wallace, R. L., Jr.
"High-Frequency Transistor Tetrode"
abstract 774
- "Junction Transistor Tetrode for High-Frequency Use"
abstract 517
- Wannier, Gregory H.
biographical material 263
- "Connection Formulas Between the Solutions of Mathieu's Equation"
abstract 1014
- "Motion of Gaseous Ions in Strong Electric Fields" 170-254
abstract 259
- "Nature of Solids"
abstract 517
- "Spherical Model of a Ferromagnet"
abstract 510
- "Threshold Law for Single Ionization of Atoms or Ions by Electrons"
abstract 1512-13
- Warner, A. W.
"High-Frequency Crystal Units for Primary Frequency Standards"
abstract 260
- WATER**
cavitation, ultrasonically induced 1513
plating room waste disposal 1012
- WAVE** See Electric wave
- WAVEGUIDE(s)**
directional coupler 510
multimode round, dominant wave transmission 256
non-reciprocal medium, using ferrites 1512
transmission, low-loss 1011
- "We Begin a New Institute Year" (D. A. Quarles)
abstract 514
- WEATHERING**
creosote and creosoted wood 457
line insulation resistance 629
wood preservatives 150
- WEIGHTED SAMPLE VALUES**
approximating the mode 1010
- Weiss, M. T.
"Magnetic Double Refraction at Microwave Frequencies" 517
- Weiss, P. R.

- Weiss, P. R.—*continued*:
- “Exchange Narrowing in Paramagnetic Resonance”
 - abstract 1257-8
 - “Western Electric’s Service with Standards” (K. B. Clarke)
 - abstract 507
 - “What We Did to Cut Costs of Finishing Telephone Woodwork” (H. E. Van Sielen) 1264
 - “What We Have Learned in 1952” (J. R. Townsend) 774
 - Wick, R. F.
 - “Hall Effect Modulators and ‘Gyrators’ Employing Magnetic Field Independent Orientations in Germanium”
 - abstract 1010 - Wickline, B. D.
 - “Television Coverage of the National Political Conventions”
 - abstract 1263 - Wiener, F. M.
 - “In Search of the Missing 6 Db”
 - abstract 512 - Wilkinson, Roger I.
 - biographical material 521
 - “Working Curves for Delayed Exponential Calls Served in Random Order” 360-83 - Willard, G. W.
 - “Ultrasonically Induced Cavitation in Water: A Step-by-Step Process”
 - abstract 1513 - Williams, H. J.
 - “Magnetic Study of Low Temperature Transformation in Magnetite” 1264 - Windeler, A. S.
 - biographical material 777, 1270
 - “Polyethylene Insulated Telephone Cable” 1245-56 - WIRE(s)
 - concealment 770
 - connections, solderless, wrapped 523-610
 - copper-steel, electroformed, development 1260
 - drop, electroformed conductor for 1099
 - polyethylene insulation 1245
- Wood, E. A.
- “Polymorphism of ND₄D₂PO₄”
 - abstract 257
 - “Simple Attachment for Low Temperature Use of an X-Ray Diffraction Camera” 1264
- WOOD POLES
- fiber stresses 1262
- WOOD PRESERVATIVES
- evaluation 120-69
- WOODWORK FINISHING
- cost cutting 1264
- Wooley, M. C.
- “Polyethylene Terephthalate — Its Use as a Capacitor Dielectric”
 - abstract 1264-5
 - “Working Curves for Delayed Exponential Calls Served in Random Order” (Roger I. Wilkinson) 360-83
- WRAPPING
- connections 543-5, 551
- Wright, E. E.
- “Stress Relaxation in Plastics and Insulating Materials”
 - abstract 517-18
- Wright, S. B.
- “Higher Frequencies for Ground-Air Communications” 1265
- X
- X-RAY DIFFRACTION CAMERA
- attachment for low temperature use 1264
- Y
- Xenon
- ions, drift velocity 517
- Z
- Yaeger, R. E.
- “Optical Position Encoder and Digit Register”
 - abstract 508-9
- Young, W. R.
- “Comparison of Mobile Radio Transmission at 150, 450, 900 and 3700 Mc” 1513
- ZONE-MELTING PRINCIPLES 513



BIBLIOTEKA GŁÓWNA
Politechniki Śląskiej

P

25/53