

the near-optimum ratio of inner to outer cable diameters (3.6:1) results in low losses, as shown by Fig. 2. The thin aluminum outer conductor is drawn over the plastic dielectric by ordinary tube manufacturing techniques.

The small amount of low-loss dielectric and the favorable (low-loss) ratio of diameters gives the five-spline cable an impedance of approximately 68 Ω . Highest power-carrying capacity in a cable is achieved when the cable impedance is about 50 Ω , and for that reason most common standard cables have that impedance. The favorable geom-

etry of the dielectric of the five-spline cable, however, permits it to transmit at least as much power as most conventional cables of equal size having a 50- Ω impedance.

To summarize, the new coaxial cable is reliable, has low losses, is pliable, and is comparatively inexpensive to manufacture. Its five splines are, relative to air, good conductors of heat and allow cooling of the center conductor. In conjunction with the new cable, simple, solderless, press-fit connectors were developed that are both air- and moisture-proof, and that do not cause any discontinuities.

PUBLICATIONS

The following list is a compilation of recently published books and technical articles written by APL staff members.

- G. L. Dugger, "Comments on High Performance Combustion Systems," *Proc. Twelfth International Astronautical Congress*, Academic Press, New York, 1963, 715-727.
- S. D. Bruck, "New Polyoxamidation Catalysts," *Ind. Eng. Chem.—Product and Research Development*, **2**, May-June 1963, 119-121.
- F. F. Hiltz, "Artificial Neuron," *Kybernetik*, Berlin, May 1963, 231-236.
- A. A. Westenberg and N. de Haas, "Gas Thermal Conductivity Studies at High Temperature," *Phys. Fluids*, **6**, May 1963, 617-620.
- Catherine Britton (APL) and I. F. Wagner (Minneapolis-Honeywell), "A Computer Program for Analysis of Variance for a Two-Level Factorial Design," *Commun. Assoc. Computing Machinery*, **6**, June 1963, 308-309.
- N. H. Choksy, "A New Analytic Stability Criterion for Use With Describing Functions," *Fourth Joint Automatic Control Conference*, University of Minnesota, June 1963, 481-484.
- R. H. Cantrell, "Gas Film Effects in the Linear Pyrolysis of Solids," *J. Am. Inst. of Aeronautics and Astronautics*, **1**, July 1963, 1544-1550.
- J. Dassoulas, "Transit/ANNA Flight-Test Operations," *Astronautics and Aerospace Engineering*, **1**, July 1963, 44-50.
- A. J. Zmuda, B. W. Shaw, and C. R. Haave, "VLF Disturbances Caused by the Nuclear Detonation of October 26, 1962," *J. Geophys. Res.*, **68**, July 1, 1963, 4105-4114.

PATENTS

Listed below are U. S. Government patents recently issued to Laboratory staff members for inventions produced in support of APL objectives.

- J. H. Walker—*Airplane*, Patent No. Des 194,445.
- R. O. Robinson, Jr.—*Radome Structure*, Patent No. 3,081,051.
- J. F. R. Floyd and R. H. Lapp—*Fire Extinguisher for a Rocket Motor*, Patent No. 3,084,506.
- E. Donato and R. E. Kemelhor—*Ohmmeter for Power Source Isolating Transducers for Testing Hazardous or Sensitive Circuits*, Patent No. 3,086,170.
- R. O. Robinson, Jr.—*Toroidal Coil Influence Oscillator*, Patent No. 3,089,421.
- R. H. Lapp and A. F. Hogrefe—*Inductive Link Infrared Fire Detection and Water Injection System*, Patent No. 3,090,197.
- J. H. Kuck and B. W. Bullock—*Transmitter for Radio-Sonde Battery Potential Indications*, Patent No. 3,090,917.
- J. H. Kuck—*Target Discriminator*, Patent No. 3,090,952.

HONORS

Maynard L. Hill, supervisor of the High Temperature Materials Project of the Bumblebee Flight Research Group, recently set a world altitude record for radio-controlled model airplanes. Nearly doubling the previous record held by Russia's V. Malenkov, the seven-pound *Skyrocket* reached 13,320 feet on its castor-oil-and-alcohol fuel. Mr. Hill is vice-president of the U. S. Academy of Model Aeronautics and current president of the Washington, D.C. Radio Control Club. *Dr. Walter A. Good*, whose "A Scientist and His Hobby" appeared in the January-February 1963 *Digest*, also surpassed the Russian record, with his radio-controlled model reaching an altitude of 10,080 feet.

ADDRESSES

Principal recent addresses made by APL staff members to groups and organizations outside the Laboratory.

- F. H. Esch, "Transit and ANNA Satellite Lubrication Problems," *American Society of Lubricating Engineers*, New York, May 3, 1963.
- F. T. McClure, "Acoustic Resonance in Combustion Systems," *Acoustical Society of America*, May 15-18, 1963. (continued)

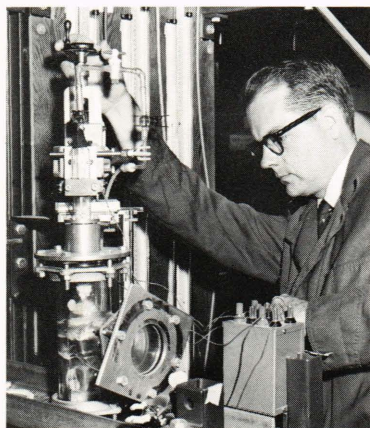
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- E. A. Bunt, "Development of the PRL Plasma Jet Facility," *American Institute of Aeronautics and Astronautics*, St. Louis, Mo., May 16, 1963.
- G. L. Dugger, "Ramjets—Past, Present and Future," *American Institute of Aeronautics and Astronautics*, Cumberland, Md., May 23, 1963.
- N. H. Choksy, "A New Analytic Stability Criterion for Use with Describing Functions," *I.E.E.E.* - *A.S.M.E.* - *I.S.A.* - *A.I.C.E. Joint Automatic Control Conference*, University of Minnesota, June 20, 1963.
- J. H. Martin and J. W. Teener (APL), and E. L. Ralph (Heliotek Division, Textron Electronics, Inc.), "Some Effects of Electron Irradiation and Temperature on Solar Cell Performance," *U. S. Army Electronics R and D Laboratories*, Atlantic City, N. J., May 21-23, 1963.
- M. A. Schreiber, "Construction and Launching of Artificial Satellites," *The Johns Hopkins University*, Navy Research Unit 5-4, June 6, 1963.
- H. D. Black, "Navigation by Satellite," *MELPAR, Inc.*, Falls Church, Va., June 10, 1963.
- F. J. Adrian and E. L. Cochran, "Relation Between Structure and ESR Spectra of HC = R Type Free Radicals," *Sixth International Symposium on Free Radicals*, Cambridge, England, July 2-5, 1963.
- E. L. Cochran, V. A. Bowers, and F. J. Adrian, "ESR Study of Ethyl and Vinyl Free Radicals," *Sixth International Symposium on Free Radicals*, Cambridge, England, July 2-5, 1963.

WITH THE AUTHORS

W. E. Wilson, Jr., a co-author of "Radicals in Flames," was born in El Dorado, Arkansas, and received his B.A. degree from Hendrix College. He received his Ph.D. degree in physical chemistry from Purdue University in 1957, and attended the Technische Hochschule, Munich, Germany, as a Fulbright Fellow in 1958. Dr. Wilson was a graduate assistant in chemistry at Purdue University, and an instructor in chemistry at Wisconsin State College at LaCrosse, Wisconsin. He came to APL in 1958 as a specialist in molecular spectroscopy and metal



carbonyl compounds. He is a member of the Chemical Physics Group of the Research Center at APL and is a member of the American Chemical Society and the American Institute of Aeronautics and Astronautics.



R. M. Fristrom, a co-author of "Radicals in Flames," was co-author of "Fundamental Processes and Laminar Flame Structure" in the January-February 1962 issue of the *Digest*. Born in Portland, Oregon, Dr. Fristrom received his B.A. degree in chemistry from Reed College, his M.A. degree from the University of Oregon, and, in 1948, his Ph.D. degree in chemistry from Stanford University. He was a Research Fellow at Harvard University and a Parsons Fellow from APL at The Johns Hopkins University. Dr. Fristrom came to APL in 1951 as a specialist in non-aqueous electrochemistry and microwave spectroscopy. Formerly a physical chemist in the Flight Research Group, he is now a member of the Chemical Physics Group of the Research Center. He is a member of the

American Physical Society and the American Chemical Society.

C. J. Nisson, author of "A Triode-Diode Function Generator," is a native of Sterling, Idaho. He received his B.E.E. degree from Catholic University and, in 1963, his M.S. degree in electrical engineering from the University of Maryland. Before coming to APL in 1954, Mr. Nisson was employed as an associate engineer in analog computing at RAND Corporation. At APL he is a specialist in electronic



analog computers and is Supervisor of the Simulator Operations Project in the Dynamics Group. He is a member of the Institute of Electrical and Electronic Engineers and of the Simulation Council.

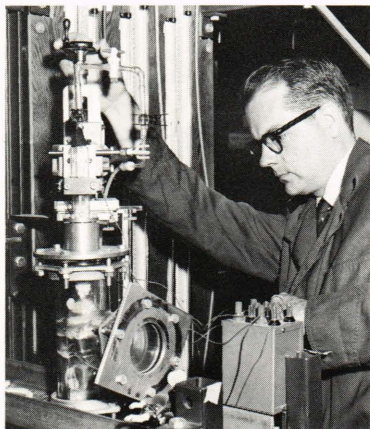
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