

with a large common data base can now be specified and designed with confidence. The principles used in the TAD portion of the VTS—manageable functional allocation, common I/O

system operations, a maximum of processing in the distributed units, and a minimum of data transfers—are those which will be used in future systems using minicomputers.

## PUBLICATIONS

Compilation of principal recently published books and technical articles written by APL staff members.

- A. G. Schulz, L. C. Kohlenstein, and L. G. Knowles, "Factors Affecting Recognition of Scintigraphic Abnormalities," *Seminars in Nuclear Med.* **3**, No. 4, Oct. 1973, 327-341.
- A. A. Westenberg and N. deHaas, "Rate of the Reaction  $\text{OH} + \text{H}_2\text{S} \rightarrow \text{SH} + \text{H}_2\text{O}$  Over an Extended Temperature Range," *J. Chem. Phys.* **59**, No. 12, Dec. 15, 1973, 6685-6686.
- A. A. Westenberg, "Gas Phase Reaction Kinetics," *Annual Rev. Phys. Chem.* **24**, 1973, 77-96.
- R. M. Fristrom (APL), A. R. Jones, M. J. R. Schwar (Paint Res. Assoc., Teddington), and R. J. Weinberg (Imperial Coll., London), "Particle Sizing by Interference Fringes and Signal Coherence in Doppler Velocimetry," *Faraday Symposia of The Chem. Soc.* No. 7, 1973, 183-197.
- L. Monchick, "Multiple Interactions and Macroscopic Differences in Ortho and Para Hydrogen," *Chem. Phys. Letters* **24**, No. 1, Jan. 1, 1974, 91-95.
- Space Dept. Staff (APL) and Guid. and Control Lab. Staff (Stanford Univ.), "A Satellite Freed of All But Gravitational Forces: 'TRIAD I,'" *AIAA 12th Aerospace Sci. Meeting, Washington, D.C.*, Jan. 30-Feb. 1, 1974, AIAA Paper No. 74-215, 1-11.
- J. F. Bird, "Noise Spectrum Analysis of a Markov Process vs Random Walk Computer Solutions Simulating 1/f Noise Spectra," *J. Appl. Phys.* **45**, No. 1, Jan. 1974, 499-500.
- J. Bohandy, B. F. Kim, and C. K. Jen, "Optical Spectra of Cu Porphin and VO Porphin in Single Crystal Triphenylene," *J. Molec. Spectroscopy* **49**, 1974, 365-376.
- P. P. Pandolfini (APL) and R. H. Page (Rutgers Univ.), "Resonance in a Piston-Driven Cavity," *Computer Methods in Appl. Mechanics and Engineering* **3**, 1974, 29-36.

## ADDRESSES

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

- V. O'Brien, "Against the M-Myth in Theoretical Bubble Dynamics," *The Case Institute of Technology, Cleveland*, January 11, 1974.
- W. Seamone, "Upper Limb Prosthetic Devices," *Langley Colloquium Series, Langley Research Center, Hampton, Virginia*, January 14, 1974.
- J. R. Kuttler, "Sloshing Frequencies by Finite Differences," *American Mathematical Society, San Francisco*, January 17, 1974.
- D. M. Silver (APL) and R. J. Bartlett (The Johns Hopkins University), "Correlation Energies with Many-Body Perturbation Theory," *International Symposium on Atomic, Molecular and Solid State Theory and Quantum Biology, Sanibel Island, Florida*, January 22, 1974.
- V. O'Brien, "Pulsatile Hemodynamic Model of the Aortic Bifurcation with Transient Separation," *The Johns Hopkins University Department of Mechanics and Material Sciences, Baltimore*, January 25, 1974.
- R. B. Kershner, "A Satellite Freed of All But Gravitational Forces: TRIAD I," *12th Annual Aerospace Sciences Meeting, Washington, D. C.*, January 30-February 1, 1974.
- J. L. Abita, "A Broadband Miniature Electric Field Probe," *New York Academy of Sciences, Conference on the Biological Effects of Electromagnetic Radiation, New York*, February 15, 1974.
- W. H. Avery, "Remarks on the Solar Seapower Plant," presented at the *Ocean Energy Systems Workshop, University of Miami, Miami, Florida*, February 25-26, 1974.
- W. H. Avery, "Evaluation of Alternative Plans for Baltimore Transportation," *Baltimore Engineering Societies, Baltimore*, February 28, 1974.
- C. H. Pollow, "Navigation Satellites," *Naval Reserve Officers School, Annapolis*, March 25, 1974.

## HONORS AND AWARDS

*D. A. Dods*, executive assistant in APL's ARPA Program Office, has been selected by the Parsons Fellowship Committee as the William S. Parsons Fellow for 1974-1975.

*L. Monchick*, a member of the Chemical Physics Group in the Research Center, has been named by

the Boston University College of Liberal Arts to its Collegium of Distinguished Alumni. This honor is accorded to alumni who have "achieved distinction in their chosen fields."

*J. B. Oakes*, Project Manager of

Clinical Engineering Health Care Delivery and Bioengineering Problems in the Biomedical Program Office, has been elected to the Institute of Electrical and Electronic Engineers Instrumentation and Measurement Group for a four-year term.

## APL COLLOQUIA

*Jan. 11*—"The Mathematics of Structured Programming or How to Cut the Gordian Knot," by H. D. Mills, IBM Systems Center.

*Jan. 18*—"Recent Developments in Laser Technology," by P. O. Clark, Advanced Research Projects Agency.

*Jan. 25*—"Can a Statistician Influence Policy in American Education?" by Dorothy M. Gilford, U.S. Office of Education.

*Feb. 1*—"Breaking Waves and Ocean White Caps," by O. M. Phillips, The Johns Hopkins University.

*Feb. 8*—"Pioneer 10 Encounters

Jupiter," by J. A. Van Allen, University of Iowa.

*Feb. 15*—"Energy Transport in Photosynthetic Units," by E. W. Montroll, University of Rochester.

*Feb. 22*—"Comet Kahoutek in Retrospect," by S. P. Maran, Goddard Space Flight Center.

*Mar. 1*—"A Modern Perspective on 18th and 19th Century Experiments in the Physics of Solids," by J. F. Bell, The Johns Hopkins University.

*Mar. 8*—"Hydrogen Energy Systems—Near and Long Term Prospects,"

by K. G. Hoffman, Brookhaven National Laboratory.

*Mar. 14*—A Panel Discussion on "Oil Resources and Energy Policy," by D. J. Rose, MIT; W. A. Roberts, Phillips Petroleum Corp.; J. W. Wilson, Consultant.

*Mar. 22*—"Three-Dimensional Structure of Human Immunoglobulin," by R. J. Poljak, The Johns Hopkins University.

*Mar. 29*—"Nuclear Theft—Risks and Safeguards," by T. B. Taylor, International Research and Tech. Corp.

## PATENTS

B. E. Tossman, F. F. Mobley, R. E. Fischell—*Variable Parameter Nutation Damper*, Patent No. 3,637,169.

R. L. Hickerson—*Infrared Horizon Sensor for Measuring Satellite Pitch and Roll*, Patent No. 3,638,021.

A. S. Polk—*Stowable Air Scoop*, Patent No. 3,659,424.

L. B. March—*Line Scan Television System Employing Spectrum Analysis*, Patent No. 3,660,594.

E. F. Osborne and L. J. Rueger—*Remote Drift Rate Compensator for Frequency Standards*, Patent No. 3,662,269.

R. E. Fischell—*Surface with Low Absorptivity to Emissivity Ratio*, Patent No. 3,671,286.

R. C. Masek—*Magnetron Rapid Frequency Changer*, Patent No. 3,671,801.

D. W. Rabenhorst and K. E. Darnell—*Rapid Deployment Corner Reflector*, Patent No. 3,671,965.

D. W. Rabenhorst—*Filament Rotor Structures*, Patent No. 3,672,241.

O. E. Gooding and A. E. Dixon—*Minimum Shift Keyed (MSK) Phase Measurement Device*, Patent No. 3,674,934.

R. A. Bailey and A. Michelson—*Coruscative Shaped Charge Hav-*

*ing Improved Jet Characteristics*, Patent No. 3,675,575.

C. J. Swet—*Optical Scanning Spacecraft System*, Patent No. 3,676,581.

D. W. Rabenhorst—*Magnetic Fluid Bearing*, Patent No. 3,682,518.

T. Wyatt—*Controllable Hysteresis Damping*, Patent No. 3,689,661.

E. L. Nooker and V. Dietz—*Continuous Rod Warhead (Improved)*, Patent No. 3,690,257.

D. W. Rabenhorst—*Radial Fluid Bearing*, Patent No. 3,694,042.

J. C. Loessi—*Feedback Switching Circuit for Eliminating Error Signals*, Patent No. 3,694,760.

J. H. Kuck—*Search System*, Patent No. 3,706,993.



The authors of the article on "The San Francisco Experimental Vessel Traffic System" are shown above. They are (left to right): A. C. Schultheis and A. J. Cote, Jr.

A. C. Schultheis contributed an earlier article to the *Digest* on "Experimental 3-D Radar Display" for the September-October 1962 issue. A native of Chicago, he received a B.S. degree in electrical engineering from the Fournier Institute of Technology. Employed by APL in 1953, he was first assigned to the Homing Group in which he tested cw semi-active homing missile guidance systems and did engineering redesign and evaluation of a homing system for a tactical missile. After returning from a three-year military leave of absence in 1958, Mr. Schultheis was involved in radar performance analysis and radar system design feasibility studies in the Guidance Systems Division. In 1966 he transferred to the Space Development Department as Project Engineer responsible for the development of Transit Satellite Navigation Receiver equipment. Until January 1972, he was supervisor of the Space System Applications Group where he was responsible for the design and development of hybrid satellite navigation systems, advanced satellite navigation system feasibility studies, and initiation of the development effort on the Vessel Traffic System. Mr. Schultheis is currently Project Engineer

in a NASA design definition study for an ocean monitoring satellite system called SEASAT-A.

A. J. Cote, Jr. was previously represented in the *Digest* as author of "The Frog and the Radar Display" published in the March-April 1962 issue. A native of Rhode Island, he received a B. S. in electrical engineering from the University of Maryland. Employed at APL in 1955, he is a specialist in active circuit theory and bionics, working until 1962 on development of transistor circuits and synthetic nerve networks. He was with the Naval Ordnance Laboratory between 1963 and 1965 as Chief of the Advanced Engineering Division. His writing interests have resulted in two books and employment for two years as Washington Editor for Industrial Research Inc. publications. Rejoining APL in 1968, he was concerned with satellite navigation system studies before becoming involved in systems engineering aspects of the Coast Guard Experimental Vessel Traffic system. He is a member of the Institute of Electrical and Electronics Engineers.

J. L. MacArthur contributed an earlier article to the *Digest* on "Digital Pulse Compression Radar Receiver" in the March-April 1967 issue. He was born in Columbus, Ohio, and received the B. E. E. degree from The Catholic University of America and the M. S. in electrical engineering from the University of Maryland. He joined APL in 1957 as a specialist in electronic circuit design and analysis and signal detection theory after working for Philco Corp., U. S. Electronic Corp., and Honeywell Regulator Co. Since joining APL, Mr. MacArthur has been involved primarily with various radar design and development activities directed toward improving performance of Navy search and tracking radars and implementing an automatic detection and track capability. Since 1971 he has been working on the design and implementation of automatic detection and tracking systems for the U. S. Coast Guard Vessel Traffic System.

J. M. Davis was born in New Hope, Pennsylvania. He has a B. S. degree in engineering physics and an M. E. in electrical engineering, both from Cornell University, and has taken graduate work in electrical engineering at The University of Delaware. He joined the Laboratory in 1967 as an Associate Engineer and was originally assigned to the Missile Radar Development Group. His major responsibility has been the design and testing of real-time programs for automatic detection and tracking systems. He worked on tracking systems for the Navy's SPS-48, SPS-39 radars and the FAA's ASR radars prior to working on the Vessel Traffic System. He is currently involved in the design, testing, and system integration of the AN/SYS-1 Detector/Tracker Set.

S. F. Oden, a native of Alabama, received his B. E. E. degree from the Georgia Institute of Technology. In 1962 he joined APL as Associate Engineer, working briefly on the prototype AN/SRN-9 receiver. After serving two years as a radio platoon leader in the U. S. Army, he returned



The authors of the article on "Automatic Detection and Tracking for the San Francisco Vessel Traffic System" are shown above. They are (left to right): J. M. Davis, J. L. MacArthur, and S. F. Oden.

to APL, where he participated in the design and development of the Geceiver geodetic satellite receiver. Mr. Oden has also been involved in the design and stability testing of ultra-stable crystal oscillators, and he designed the temperature-compensated crystal oscillators for the SAS-A and

SAS-B satellites. His digital design experience includes the Beam Steering Computer for AMFAR and, more recently, the Radar Video Preprocessor and interface portions of the Vessel Traffic System. Mr. Oden is presently a design engineer in the Space Digital Systems Group.

R. G. King, a native of California, received his B. S. E. E. degree from the California Institute of Technology and took graduate work at Cornell University and the University of Michigan. He joined the APL staff in 1953 as a specialist in transistor circuit design and digital computer design, and, among other assignments, he worked on the design of transistor circuits for missiles. From 1963 to 1965, Mr. King was at the Pennsylvania State University where he did research on underwater acoustics and underwater weapon systems at the Ordnance Research Laboratory. He returned to APL in 1965 and, until 1971, was assigned primarily to digital weapon system design and technique development. In 1971 he was assigned to the development of marine traffic systems and since 1972 he has been involved in the development of the San Fran-

cisco Vessel Traffic System. Mr. King is a member of the Institute of Electrical and Electronics Engineers.

F. S. Gregorski, a native of Jersey City, N. J. received a B. A. degree

in mathematics from Queens College in 1961, after which he joined the APL staff. A specialist in systems and task programming, Mr. Gregorski programmed the CP-327 computer for real-time satellite navigation, he programmed the Honeywell-20 computer for an earth survey, and worked on satellite field tests. Since 1969 he has been involved in real-time, radar track programming for ship traffic management in the VTS study. Mr. Gregorski is a member of the Association for Computing Machinery.

P. C. Marth, Jr. was born in Washington, D. C. and received the B. E. S. and M. E. S., both in electrical engineering, from The Johns Hopkins University. Employed by APL in 1961, he is a specialist in digital design. Until 1971 he worked on the AN/SRN-9 navigation receiver, the design of a data processor unit for the Geceiver AN/PRR-14 geodetic integrated doppler receiver, and the design of a computer interface unit for a hybrid aircraft navigation system incorporating Loran-C, Omega, and satellite navigation. Since 1971 Mr. Marth has been involved in development of the Coast Guard sponsored Vessel Traffic System, with emphasis on radar processing, vessel traffic hardware, and software development. He is a member of the Institute of Electrical and Electronics Engineers.



The authors of the article on "Traffic Analysis and Display for the San Francisco Vessel Traffic System" are shown above. They are (left to right): R. G. King, F. S. Gregorski, and P. C. Marth, Jr.