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EXPOSURE

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a newsletter for ocean technologists

Line Passing "Torpedo" For Use Under Sea Ice



FIGURE 1

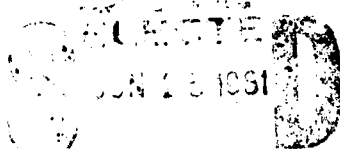
For a variety of deployment and recovery tasks, it is essential to pass ropes and wires under the Arctic sea ice. The technical staff of the Frozen Sea Research Group developed an under ice line passing "torpedo" which has, for the last two years, performed very well during winter field operations. Figure 1 shows the torpedo complete with launch pole being readied for deployment.

Description

The torpedo is 120 cm overall length, approximately 20 cm in diameter, and weighs 40 lb in air and 21 lb in water. A 30-cm-diameter hole is required through the ice to deploy the torpedo and subsurface float (see Figure 2). The torpedo is hung on a single rope approximately 2 meters below the float. This subsurface float bounces along the underside of the sea ice and, having about 15 to 20 lb excess buoyancy, supports

the torpedo. Attached to the rear steering bridle are two main power wires which are 35 m long. The electric drive motor was a 48 V dc, counter-rotating torpedo motor which was rewound for 12 V dc. Due to line loss, it is necessary to start with three 12-V, heavy duty lead acid batteries, in series on the surface, to get the required power to the motor. As the torpedo operates in a cold marine environment, heat dissipation is no problem.

May 1981



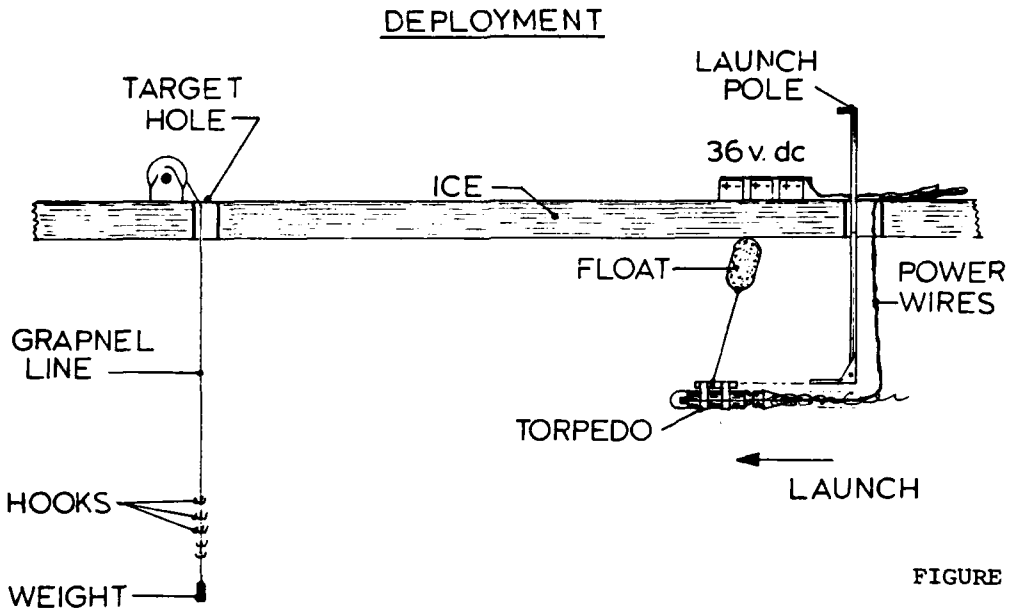


FIGURE 2

Operation

Before launching the torpedo, two 30-cm-diameter holes are drilled in the desired direction and distance apart. A 20-m grapnel line, having five or six treble 3-inch fish hooks, spaced approximately 30 cm apart and weighted with a 1-lb lead weight on its lower end, is deployed down the target hole. When aiming at the target hole, the torpedo is launched from its deployment hole at an azimuth angle of approximately 20° to the left of the desired target (Figure 3). When the torpedo reaches the length of the desired run, the power wires are tethered and the power to the motor is reversed. This reversing of electrical power does not affect the direction of the motor and so it continues to drive, maintaining tension on the tethered power wires. This reversal of current causes a diode-controlled solenoid on the front of the

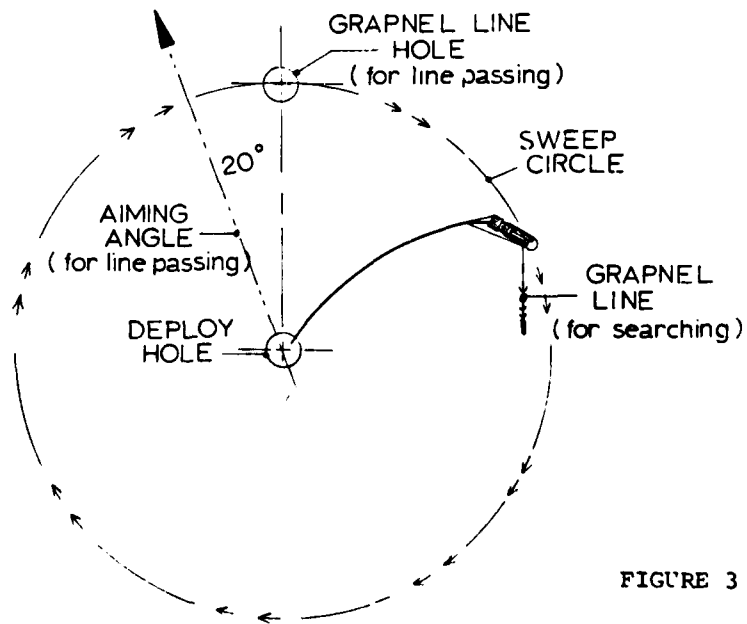


FIGURE 3

pressure case housing to trip, allowing the steering bridle to offset to the right of the case (see Figure 4). This offset, in conjunction with power still being applied to the propellers, allows the torpedo to sweep to the right in a large circle (see Figure 3). When the tether wires cross the grapnel line (previously deployed through the target hole), the power is shut off and the torpedo pulled back by its power wires to and through the

deployment hole, thus pulling the grapnel line with it (see Figure 5). Another hole is then drilled and the process repeated until the desired distance has been reached. Both ends of the rope are then joined together to form a continuous loop above and below the ice. This loop is then used to pass lines, etc., under the ice from hole to hole. The torpedo is removed, washed, and stored away. As local current speed and direction may play a significant role in the

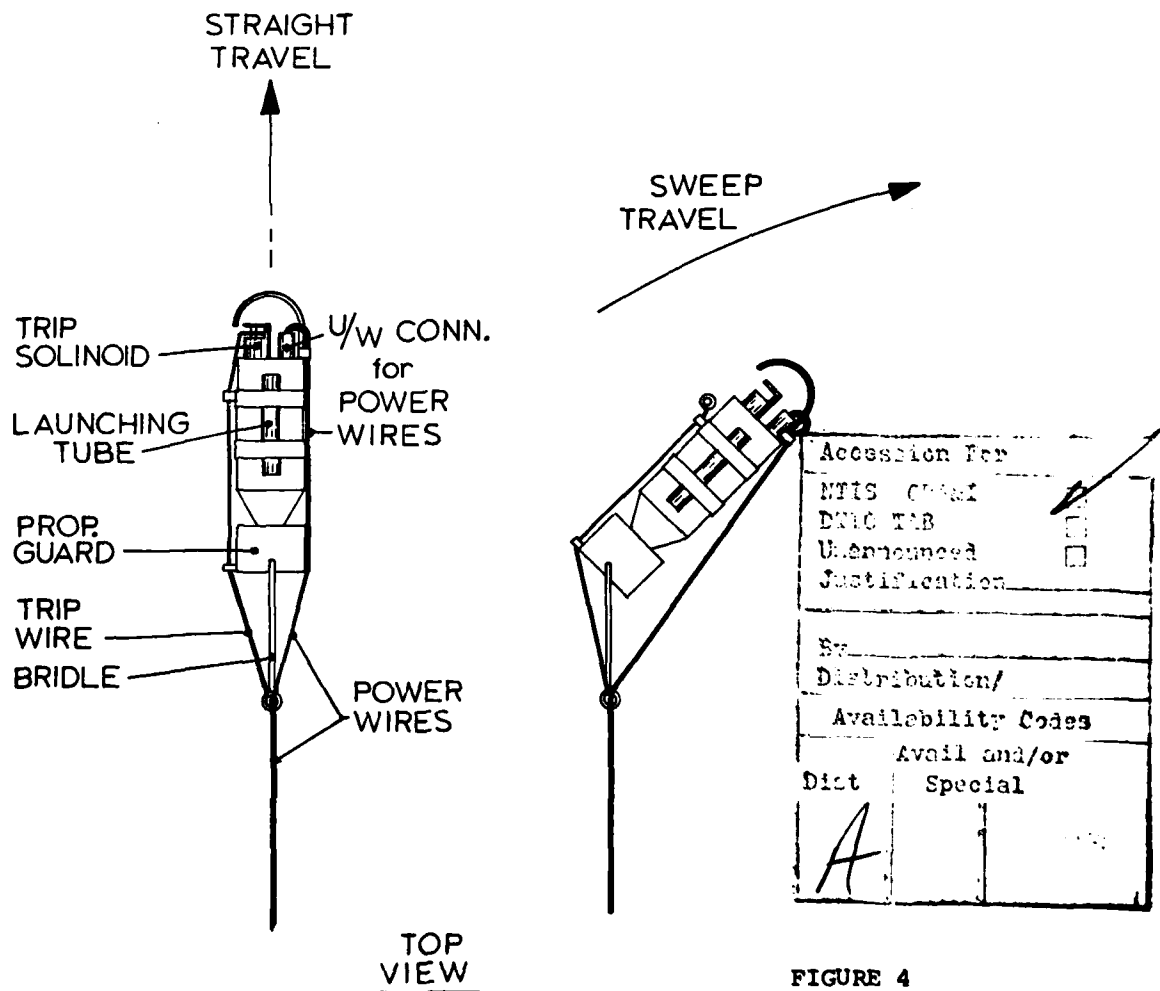
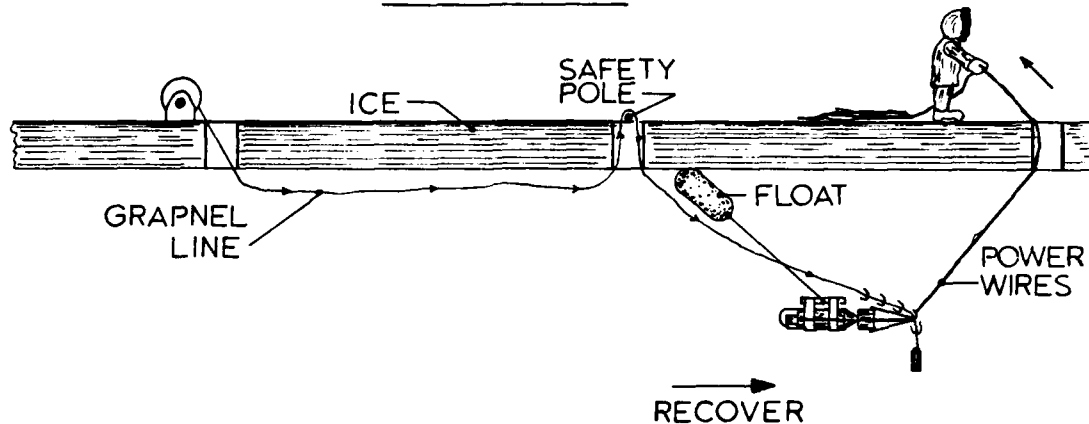


FIGURE 4

MULTI-HOLE LINE PASSING



successful deployment, aiming, sweeping, and recovery of the torpedo, it is desired to identify these parameters before launching and to use them to your advantage where possible.

Other Uses

The torpedo is useful for sampling under the ice or sweeping up to 70-m-diameter circles when searching for lost equipment. It can also be used to deploy drag lines.

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of electro/mechanical equipment for the group.

Dennis Richards has been a member of the Frozen Sea Research Group for the past 11 years, working primarily in the Canadian High Arctic. A machinist by trade, his primary function is the design and building

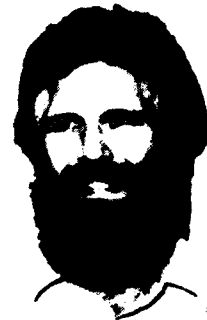


instrumented data collection systems.

Syd. Moorhouse is a senior logistics and design technologist with the Frozen Sea Research Group. He has spent 17 years in the Canadian High Arctic, involved with the designing, development, and installations of

Bibliography: Marine Electronics

The following is a list of recent books and reports for ocean technologists and instrumentation system designers. They cover the physics, sensor technology, amplifier design, data transmission, signal analysis, and computer programming necessary for marine instrumentation systems. They are more practical than theoretical. I have found the majority of these books to be the most useful ones in their fields. Items with an * are especially recommended.



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MARINE ELECTRONICS AND INSTRUMENTATION

- Marine Electronic Navigation. S. F. Appleyard 1980 Routledge
Electronic Surveying & Navigation. S. Lavrila 1976 Wiley (42.00)
Radio Direction-Finding and The Resolution of Multicomponent Wave-Fields P.J.D. Gething
1978 Peregrinus Ltd. (30.00)
Handbook of Marine Electronics. Safford 1978 TAB BOOKS
Designers Handbook of Pressure-sensing Devices. J. Lyons 1980 Van Nostrand
* Fundamentals of Temperature, Pressure and Flow Measurements. Robert Benedict 1977 Wiley
* Air-Sea Interaction: Instruments and Methods. ed. F. Dobson 1980 Plenum (800 pages)
Current Measurement: Proceedings of a Working Conference 1978 NOAA College of Marine Studies
Tech. Rept. DEL-SG-3-78 Univ. of Delaware Newark, DE 19711
Applied Fluid Flow Measurement. Cheremisinoff 1979 Dekker
Flowmeters. A.T.J. Hayward 1979 John Wiley & Sons (24.95)
Manual on the Use of Thermocouples in Temperature Measurement American Society for Testing
and Materials Special Tech. Pub. 470A 1974 1916 Race St., Philadelphia, PA 19103
* Transducer Interfacing Handbook. Ed. Daniel H. Sheingold 1980 Analog Devices, Inc. (14.50)
Analog Signal Processing and Instrumentation. Arbel 1980 Cambridge
Transducers for Biomedical Measurements: Principles and Applications Richard Cubbold 1974 Wiley
Geoscience Instrumentation. E. Wolff and E. Mercanti 1974 Wiley (59.50)
Microprocessor-controlled Digitization and Acquisition of Underwater Measurements of Conductivity,
Temperature, and Depth. 1980 207 p., Petroconsultants S. A., International Energy Services,
2 rue Vallin, Geneva, Switzerland. Contains good review of CTD techniques.
Directory of Defense Electronic Products & Services. U. S. Suppliers 1980 Information Clearing
House, Inc. \$40.00

E L E C T R O N I C S - O T H E R

- ** The Art of Electronics. P. Horowitz and Winfield Hill. 1980 Cambridge U. Press (excellent coverage of the entire electronics field)
- Electric Motor Handbook. Ed. E. H. Werninck 1978 McGraw-Hill
- Lead-Acid Batteries. Hans Bode 1977 Wiley
- Electronic Components Handbook. T. H. Jones 1979 Reston Publishing Company (7.95)
- A User's Guide to Selecting Electronic Components. G. L. Ginsberg 1981 (25.00) Wiley
- Crystal Oscillator Design and Temperature Compensation Marvin Frerking 1977 Van Nostrand
- Cooling Techniques for Electronic Equipment D. Steinberg 1980 Wiley (27.50)
- Optoelectronics Applications Manual Hewlett-Packard 1981
- Handbook of Electronic Tables & Formulas. Sams 1979
- Precis: Monthly review of such magazines as Computer Design, Datamation, Digital Design, EDN, Electronic Design, Electronic Products, Electronics, IEEE Spectrum, Mini-Micro Systems. By Technical Information Distribution Service. 40 West Ridgewood Ave., Ridgewood NJ 07450 (50.00/year)

S T R U C T U R E D P R O G R A M M I N G

- Managing the Structured Techniques. E. Yourdon 1979 Prentice-Hall (25.95)
- A Primer on Structured Program Design. G. L. Richardson, C. W. Buffer and J. D. Tomlinson 1980 Petrocelli Books, Inc. (14.95)
- The Practical Guide to Structured Systems Design. M. Page-Jones 1980 Yourdon Press (22.50)
- Structured Analysis V. Weinberg 1980 Yourdon

C O M P U T E R S

- The CP/M Handbook with MP/M R. Zaks 1980 Sybex, Inc. (14.95)
- Data Communications: A Users Guide K. Sherman 1981 Reston
- PET and the IEEE 488 Bus (GPIB). E. Fisher and C. W. Jensen 1980 OSBORNE/McGraw-Hill (15.00)
- The S-100 Bus Handbook. D. Burasky 1980 Hayden Book Company (12.95)
- The S-100 & Other Micro Buses. E. C. Poe & J. C. Goodwin 1979 Howard W. Sams & Co. (5.95)
- Interfacing small computers to the Real World. M. Sargent 1980 Addison-Wesley.
- Microcomputer Primer. M. Waite 1980 Sams (good for person with some digital hardware background)
- Microcomputer Interfacing J. Lipouski 1981 Lexington Books (25.00)
- 1981 APPLE II/III Software Director G. Vandiver Vital Information Inc., 350 Union Station, Kansas City MO 64108 (20.00) (Has good reviews and intercomparisons of software and some hardware.)

I N T E G R A T E D C I R C U I T S

- * The Master IC Cookbook. C. L. Hallmark 1980 TAB BOOKS (condensed data on many IC Families)
- IC Array Cookbook W. G. Jung 1980 Hayden Book Company (7.95)
- IC Converter Cookbook W. G. Jung 1978 Howard W. Sams & Co. (13.95)
- IC Timer Cookbook. W. G. Jung 1977 Howard W. Sams & Co.
- The 555 Timer Applications Sourcebook with Experiments. H. M. Berlin 1976 Howard W. Sams & Co.
- * CMOS Cookbook. D. Lancaster 1977 Howard W. Sams & Co.
- CMOS Databook. B. Hunter 1978 TAB BOOKS (6.95)
- TTL Cookbook. D. Lancaster 1979 Sams
- The PLL Synthesizer Cookbook. H. Kinley 1980 TAB BOOKS (7.95)
- Design of Phase-locked Loop Circuits. H. M. Berlin 1978 Howard W. Sams & Co.
- Phase-locked Loops A. Blanchard 1976 Wiley
- Phase-locked Loops & Their Application. Ed. W. C. Lindsey & M. K. Simon 1978 IEEE PRESS (reprints)
- Phase-lock Techniques. F. Gardner 1979 Wiley 2nd edition of classic reference.
- Counting and Counters R.M.M. Oberman 1981 Wiley (29.95)
- Charge Coupled Devices and Applications Beynon 1980 McGraw
- Master Handbook of 1001 More Practical Electronics Circuits. Ed. M.L. Fair 1979 TAB (\$13)
- How to Design and Build Audio Amplifiers. M. Horowitz 1980 TAB BOOKS (9.95)
- * IC Master 1981 United Technical Publications, 645 Stewart Ave., Garden City, NY 11530 (82.50)

O P E R A T I O N A L A M P L I F I E R S & F I L T E R S

- * Handbook of Operational Amplifier Circuit Design. D. F. Stout 1976 McGraw-Hill (31.50) detailed design equations.
- Operational Amplifiers and Linear Integrated Circuits R. F. Coughlin and F. F. Driscoll 1977 Prentice-Hall (18.95)
- Operational Amplifiers. George Clayton 1979 Butterworth
- * IC OP-Amp Cookbook Jung 1980 Howard W. Sams & Co.
- The Active Filter Handbook. F. P. Tedeschi: 1979 TAB BOOKS (7.95)
- * Electronic Filter Design Handbook. A. B. Williams 1981 McGraw-Hill (32.50)
- Introduction to the Theory and Design of Active Filters L. Huelsman and P. Allen 1981 McGraw Hill (28.50)

POWER ELECTRONICS

- Design of VMOS Circuits with Experiments. R. T. Stone & H. M. Berlin 1980 Sams (\$9)
Practical Transformer Design Handbook. E. Lowdon 1980 Howard W. Sams & Co. (21.95)
Ferromagnetic Core Design and Application Handbook. M. F. DeMaw 1981 Prentice-Hall
Transformer and Induction Design Handbook C. McLyman 1978 Marcel Dekker, Inc.
Principles and Applications of Inverters & Converters. I. M. Gottlieb 1977 Sams (\$8)
* Design of Solid-state Power Supplies. E. R. Hnatek 1981 Van Nostrand Reinhold Company (24.50)
Handbook of Audio Circuit Design D. Cameron 1978 Reston
Solid State Radio Engineering H. Kraus 1980 Wiley
Design of Microcomputer-based Medical Instrumentation. Ed. W. J. Tompkins & J. G. Webster. 1981
Prentice-Hall, Inc. (27.95)

NOISE

- Handbook of Electrical Noise: Measurement & Technology. C. A. Verqers 1979 TAB BOOKS (6.95)
(Basic treatment)
Handbook of Noise Measurement. Arnold Peterson 8th ed. 1978 General Radio (order direct)
* Noise Reduction Techniques in Electronic Systems. H. W. Ott 1976 John Wiley & Sons (24.50)
* Principles of Electromagnetic Compatibility B. Keise 1979 Artech (43.00)
Low Noise Electronic Design C. Motchenbacher 1973 Wiley (transistor design)

ELECTRONIC SYSTEM DESIGN

- Design of Continuous and Digital Electronic Systems. G.J.A. Bird 1980 McGraw-Hill
An Engineering Approach to Digital Design. W. I. Fletcher 1980 Prentice-Hall (28.00)
The Art of Digital Design. D. Winkel 1980 Prentice-Hall
Planning and Creating Successful Engineered Designs S. F. Love 1981 Van Nostrand Reinhold Co.
Digital Design with Standard MSI & LSI. Thomas Blakeslee. 2nd ed. 1979 Wiley (20.00)
Circuit Design for Electronic Instruments A&D Devices from Sensor to Display. Darold Wobschall
1979 McGraw

RELIABILITY

- Reliability & Maintainability of Electric Systems. Ed. J. E. Arsenault & J. A. Roberts 1980 Computer
Service Press
Computer System Reliability. R. Longbottom 1980 John Wiley & Sons (31.95)
Accelerated Testing Handbook. Technology Associates, 51 Hillbrook Drive, Portola Valley CA 94025 (\$50)
* Electrical Overstress/Electrostatic Discharge Symposium Proceedings (1979) Reliability Analysis Center
(Rome Air Development Center) 1980
* Electrical Overstress/Electrostatic Discharge Symposium Proceedings (1980) Reliability Analysis Center
(Rome Air Development Center) 1981 RADC/RBRAC Griffiss AFB NY 13441 (20.00 approx.)

MARINE ENGINEERING

- Seawater Corrosion Handbook. M. Schumacher 1979 Noyes (36.00)
Marine Corrosion F. LaQue 1975 Wiley
Corrosion, 2 volumes. 1976 Ed. L. L. Shreir Newnes-Butterworths, London
Corrosion Control by Coatings. Henry Leidheiser 1979 Science Press, Princeton.
Sound Noise and Vibration Control. L. Yerges 1978 Van Nostrand
Handbook of Oceanographic Engineering Materials. Stephen Dexter 1979 Wiley
Development of Supercorrodng Alloys for use as Timed Releases ... Civil Eng. Lab CEL TN 1550
Handbook of Pressure-Proof Connector and Cable Harness Design for Sonar Systems. November 1980
Naval Research Lab Memorandum Report - useful for description of thru hull connector techniques.
Dynamics of Marine Vehicles. Bhattacharyya 1978 Wiley
Ship Design and Construction 3rd ed. R. Taggart 1980 Soc. Naval Architects (52.00)
Remotely Operated Vehicles 1979 NOAA U.S. Dept. of Commerce Super. of Documents,
GPO #003-017-00-465-1
Submersibles and Their Use in Oceanography and Ocean Engineering. R. Geyer 1977 Elsevier
Underwater Handbook. Shilling 1976 Plenum

SIGNAL ANALYSIS

- Geophysical Signal Processing. Robinson, E. 1980 Prentice (36.00)
* Applied Time Series Analysis Otne 1978 Wiley
Signal Analysis. A Papoulis 1977 McGraw
Signal Processing: Discrete Spectral Analysis, Detection, and Estimation M. Schwartz 1975 McGraw
Digital and Kalman Filtering S.M. Bozic 1980 Halsted Press (23.95)
Fourier Transform and its Application R. Bracewell 2nd ed. 1978 McGraw
Fast Fourier Transform E.O. Brigham 1974 Prentice Hall
Programs for Digital Signal Processing 1979 IEEE/Wiley
* Applications of Correlation and Spectral Analysis J. Bendat, A. Piersol 1980 Wiley (\$30)

U N D E R W A T E R S O U N D

Mechanics of Underwater Noise Donald Ross 1976 Pergamon
 *Principles of Underwater Sound R. Urlick 2nd. ed. 1975 McGraw
 Sound Propagation in the Sea. R. Urlick 1979 Sup. of Documents #008-051-0071-2
 Acquisition, Reduction, and Analysis of Acoustical Data 1974 Naval Air Dev. Center NADC-AWG-SU
 Oceanic Sound Scattering Prediction. Niel Anderson 1977 Plenum
 Sound Transmission through a Fluctuating Ocean. Stanley Flatte' 1979 Cambridge
 Statistical Methods in Sonar. V. V. Ol'Shevskii 1978 Plenum (45.00)
 Animal Sonar Systems. Busnel 1979 Plenum
 Ocean Acoustics. J. DeSanto 1979 Springer (37.00)
 Fundamentals of Marine Acoustics Caruthers 1977 Elsevier (39.00)
 Sonar and Underwater Sound A. Cox 1975 Lexington
 Ultrasonics International 79 Conference Proceedings 1979 IPC Science and Technology Press
 The Physics of Sound in Marine Sediments. L. Hampton Plenum (45.00)
 Handbook of Array Design Technology 1976 AD-A038073 for Naval Electronics Systems Command
 Principles of Aperture and Array System Design B. Steinberg 1976 Wiley
 Introduction to Radar Systems M. Skolnik 1980 McGraw
 Coding and Information Theory R. W. Hamming 1980 Prentice Hall (21.95)
 Error-Control Coding and Applications D. Wiggert Artech House (28.50)
 Communication Systems. A. B. Carlson 2nd ed. 1975 McGraw (28.00)
 (good description of different types of modulations)

Periodical Guide for Computerists annual E. Berg Publications, 622 - 3rd, Kimball,
 Nebraska 69145 Index to computer articles in Computer Design, Creative Computing,
 Digital Design, Dr. Dobbs, EDN, Electronics, Electronic Design, Interface Age,
 Kilobaud, etc.

T A B L E O F C O N T E N T S

Page	Article	Author
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