

MARITIME REPORTER

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ENGINEERING NEWS



NAVIGATION/COMMUNICATIONS EQUIPMENT REVIEW

M.A.N.-GHH Sterkrade constructed drydock for Continental Maritime

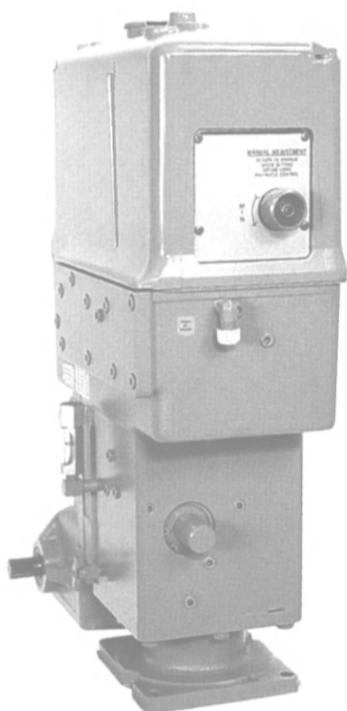
**New Drydock Constructed For
Continental Maritime By
M.A.N.-GHH Sterkrade**

(SEE PAGE 4)

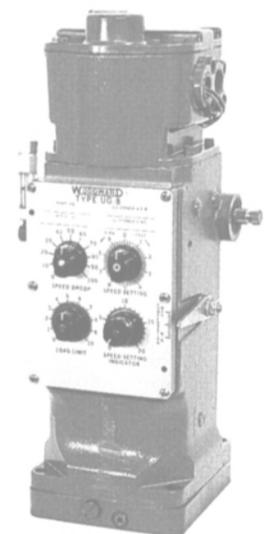
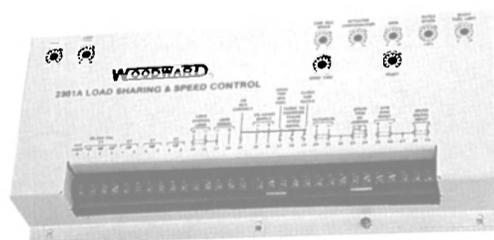
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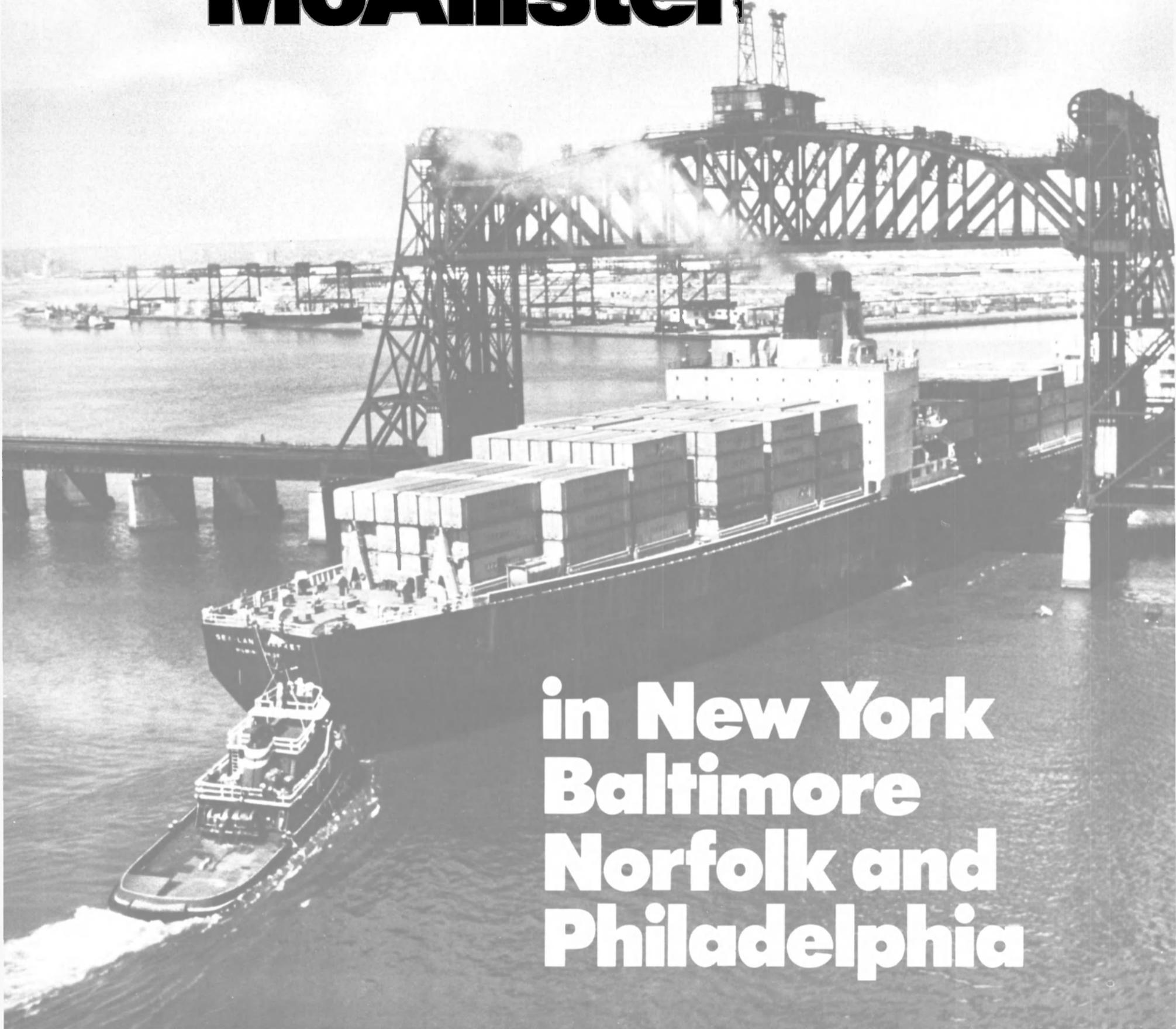
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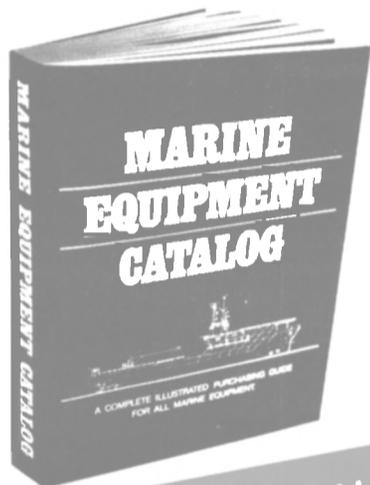
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ON THE COVER

New GHH-Constructed
Drydock For
Continental Maritime
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Communication
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Samsung Gets \$25-Million Contract From Caltex For Crude/Products Tanker

Samsung Shipbuilding and Heavy Industries Company, Ltd. of South Korea recently signed a contract valued at \$25 million for construction of a 95,000-dwt crude oil and petroleum products tanker for Caltex Company of Australia. To be built at Samsung's Kojse Shipyard, the carrier will have an overall length of 754.6 feet, beam of 151 feet, depth of 63 feet, and scantling draft of 44.6 feet. Main propulsion will be provided by a Korean-built B&W 5L80MCE diesel developing 15,950 bhp at 83 rpm. Cruising speed will be 15.4 knots.

The tanker will be classed by Lloyd's Register of Shipping and fly the Australian flag. Following delivery in July 1986, she will operate between Australia and the Middle East.

AMP Appoints Green Marketing Director For Transportation Group

Donald T. Green has recently been appointed associate marketing director for the Transportation Marketing Group of AMP Special Industries, Valley Forge, Pa.

In his new capacity, Mr. Green will have responsibility for the sales and marketing of AMP products to the following industries: railroads, mass transit signal and equipment manufacturers, shipbuilding, the United States Navy, General Aviation, the operating airlines, the FAA and truck and bus manufacturers. He will also be responsible for new business development in the North-eastern section of the U.S.

AMP Special Industries is the sales and marketing arm of AMP Inc., Harrisburg, Pa., the world's leading producer of electrical/electronic connection devices.

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REPORTER
AND
ENGINEERING NEWS**

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NEW YORK, N.Y. 10010

(212) 477-6700

Telex: MARINTI 424768

ESTABLISHED 1939

Maritime Reporter/Engineering News is published the 1st
and 15th of each month except monthly in April, June,
November and December by Maritime Activity Reports, Inc.
Mailed at Second Class Postage Rates at Waterbury, CT
06701 and additional mailing offices.

Postmaster send notification (Form 3579) regarding undeliverable
magazines to Maritime Reporter/Engineering News, 118 East 25th
Street, New York, NY 10010.

Member



Business Publications
Audit of Circulation, Inc.

No. 9

ISSN-0025-3448

Volume 47

ALL MATERIAL FOR EDITORIAL CONSIDERATION SHOULD BE ADDRESSED TO ROBERT WARE, EDITOR.

Scheidt Named Marketing And Sales Vice President For American Steamship



Michael M. Scheidt

Michael M. Scheidt has been promoted to vice president-marketing and sales of American Steamship Company (ASC), Buffalo, N.Y. The announcement was made by ASC's senior vice president, **Ned A. Smith**. Mr. **Scheidt** will be actively involved with the planning and development of long-term marketing strategies and policies; he will continue to be responsible for the sales function.

He began his career with ASC in 1967 as an administrative assistant for the grain brokerage and agency operations of Boland & Cornelius, a subsidiary of ASC. Other positions he has held include traffic dispatcher, assistant vice president-traffic, vice president-business development, and vice president-sales. He graduated from the University of Vermont with a BA degree in business administration.

Another change in ASC's marketing department announced by Mr. **Smith** was the promotion of **Russell W. Luther** to assistant vice president-sales. An account executive with ASC since 1981, he will remain in charge of his various Great Lakes accounts as well as ASC's marketing efforts off the Lakes.

Radio-Holland USA, B.V. Automates Coastal Station WLO's Radiotelex Service

Radio-Holland USA, B.V. recently announced that Mobile Marine Radio, Inc., owners/operators of Coastal Station WLO Radio, North America, has awarded Radio-Holland USA, B.V., in Houston, and Thrane & Thrane A/S in Denmark the contract to supply an automatic radiotelex system that will be used by WLO Radio, North America, for its automatic marine telex service.

The system initially includes a minimum of eight simultaneous radio-telex modem channels each equipped with automatic free signal generation and provision for later direct computer interface. The system includes channel processors for automatic forwarding of ship-to-shore messages into the international telex network.

The channel processors include features that will later permit direct

ship's dialing to domestic/international telex subscribers and automatic rerouting of messages to predetermined subscribers.

The initial phase should be installed mid-1985, and will be prepared for later upgrading with Model TT-1000 communications processors for store-and-forward telex handling in both shore-to-ship and ship-to-shore directions.

WLO Radio pioneered radiotelex

at sea 11 years ago and was the first United States coastal station to offer this service. The station was also the first to receive a Selcall number (No. 1090) issued by the FCC for coastal stations in the United States. The station at present is the largest provider of radio-telex communication and now will be the first coastal station in the USA offering completely automatic end-to-end telex-at-sea communications.

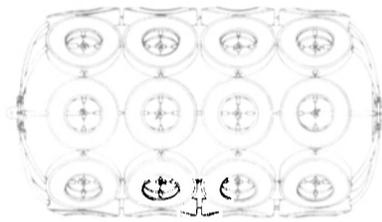
Worldwide, WLO Radio, North America, will join Singapore Radio, Scheveningen Radio, Lyngby Radio, and Burnham (Portishead) Radio, all of which are now operational with the Thrane & Thrane automatic channel processor radiotelex system.

For further literature containing full information,

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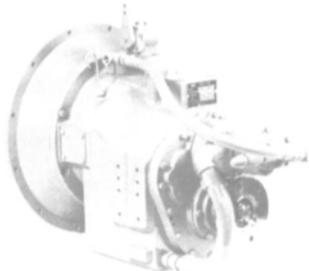
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Terry Announces New GLT Single-Stage Turbine —Literature Available

William L. Wathen, president of Terry Steam Turbine, Windsor, Conn., recently announced a small auxiliary turbine, the first new small turbine to be developed by the industry in 20 years.



The GLT solid-wheel, single-stage machines are designed to meet requirements of API 611 and are available in ratings to 200 hp. They feature total standardization, oil-free lubricating system, overhung design, innovative governor valve

and tight shut-off trip valve, true centerline support and low installation and maintenance cost.

The unit's high temperature ball bearings are sealed and grease packed with an L-10 life in excess of 50,000 hours, and require no lubrication oil. The governor drive gear design is oversized for ruggedness and uses non-metallic gears which eliminate the need for a coupling and lube oil.

Reduced maintenance/parts costs are realized with features that include a one-piece body for the governor and tight shut-off trip and throttle valves, elimination of both valve bonnet and joint, single stem penetration and a valve system design that permits the trip valve to be opened against full line pressure.

GLT installation simplicity is achieved with such features as absolute standardization of the basic envelope, uniform mounting dimensions and uniform steam connections for all sized machines. Some popular control options are available, a solenoid trip, electronic tachometer and hand valves. Also

available is a tungsten carbide-coated wheel for reduction of long-term maintenance costs where difficult wet steam conditions are encountered.

GLT turbines are available in ratings up to 200 hp. Inlet pressures and temperatures rating to 650 psig and 750 FFT-back pressure to 75 psig.

For complete information on Terry's GLT single-stage turbine,

Circle 21 on Reader Service Card

Bell Aerospace Wins \$59-Million Contract Modification From Navy

Bell Aerospace Textron, New Orleans, La., is being awarded a \$59,084,518 modification to a fixed-price-incentive contract for long lead time material for the Landing Craft Air Cushion (LCAC). Work will be performed in New Orleans, La., and is expected to be completed in July 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Navy Awards Tracor \$6.1-Million Contract For Engineering Services

Tracor Applied Sciences, Austin, Texas, is being awarded a \$6,121,476 cost-plus-fixed-fee contract for integration engineering services for nuclear-powered fleet ballistic missile submarine unique sonars. Work will be performed in Rockville, Md., and is expected to be completed in November 1986. At the end of the current fiscal year, \$5,869,316 of the contract funds would have expired. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Capitol Gears Introduces New Marine Transmission For Diesels Up To 485 HP —Literature Available

Capitol Gears, Incorporated, St. Paul, Minn., has added a new member to its marine transmission family—Model HE-11200, designed for high-speed diesel engines up to 485 hp.

Based on the long-established Capitol HE-10200 gear, the HE-11200 features greater clutch capacity and an improved hydraulic system. Typical applications for this compact unit include a wide range of pleasure craft and sport fishing boats.

The HE-11200 is available in anti-engine rotation output only but offers a choice of 1.04, 1.50, 1.75 or 2.00 to 1 reduction ratios. Total weight is a modest 405 pounds.

For further details,

Circle 12 on Reader Service Card

DeLuca Named Director Of Manufacturing For Fairbanks Morse



Michael J. DeLuca

T.V. O'Sullivan, president of the Fairbanks Morse Engine Division of Colt Industries in Beloit, Wisc., has announced the appointment of Michael J. DeLuca as director of manufacturing.

Mr. DeLuca has been with the Engine Division since 1980. He was manager of the foundry, and most recently, manufacturing manager for Fairbanks Morse engines. He came to Colt Industries from the Gleason Company in Rochester, N.Y., where he spent 15 years in various management positions. He has a BS degree in metallurgical engineering from Ohio State University, and an MBA from the University of Rochester.

Newport News Awarded \$38.2-Million Modification For Design Agent Services

Newport News Shipbuilding and Drydock Company, Newport News, Va., is being awarded a \$38,214,000 modification to a cost-plus-fixed-fee contract for additional Los Angeles (SSN-688) class submarine design agent services. Work will be performed in Newport News, and is expected to be completed in 1985. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Sperry Corporation Wins \$4.1-Million Contract For Replenishment Spares

Sperry Corporation, Defense Products Group, Great Neck, N.Y., is being awarded a \$4,156,000 firm-fixed-price contract for replenishment spares for the MK-53 Mod 1 control system Combined Antenna System (CAS) and MK-54 Mod 0 Separate Track Illuminating Radar (STIR) antenna. Work will be performed in Great Neck, and is expected to be completed in December 1985. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.



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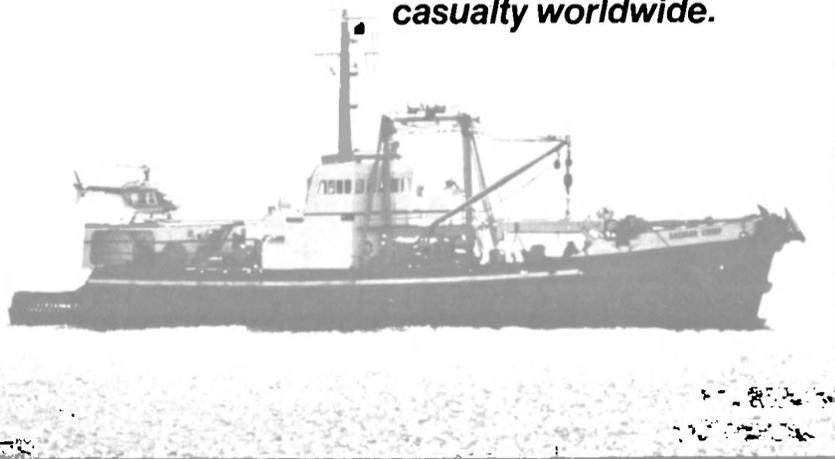
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New Manual Identifies Shipboard Equipment Approved By Coast Guard

A recently released U.S. Government publication identifies items approved or certified by the U.S. Coast Guard for use on commercial vessels and recreational boats. Published by the Department of Transportation, "Equipment Lists: Items Approved, Certified or Accepted under Marine Inspection and Navigation Laws," includes a listing of various items of lifesaving, firefighting, pollution-abatement, and miscellaneous equipment used aboard vessels. For each type of item, the name and address of the manufacturer and the complete model identification are provided.

The 212-page manual, stock number 050-012-00212-6, is available for \$6.00 (domestic) and \$7.50 (foreign). Send prepayment to Department 36-LB, Superintendent of Documents, Washington, D.C. 20402. To order with Master Card or VISA, telephone (202) 783-3238.

Free Brochure From Baldt Details Moor-Free™ Rapid Release System

Baldt Incorporated, Chester, Pa., has announced the availability of a six-page, full-color brochure, Bulletin 100, that details the Moor-Free Rapid Release System. This innovative computer-assisted system allows offshore rig operators to safely free a vessel from its moorings four times faster than previously possible.

The brochure provides detailed

technical information and specifications of all Moor-Free Rapid Release System components. The core of the system consists of Baldt's disconnect link. This unique link is armed when needed with a detonating bolt assembly containing an acoustic receiver. The link is fitted into the mooring system in a similar fashion to the standard Baldt chain connecting link. The disconnect link is then lowered below the water line and detonated by an acoustic signal. Once detonation occurs, the mooring is released.

The brochure also provides information on coaxial (hardwire) detonation for applications such as launching, towing, fleet mooring, and other situations where kinking and pinching of the cable cannot occur. It also details Baldt's worldwide training program, warranty, and inspection services agreement.

For a copy of Baldt's Bulletin 100,

Circle 35 on Reader Service Card

Waukesha Offers New Brochure On VHP Engine Components

Features and benefits of Waukesha VHP engine components are described in "How To Pick A Part For A Waukesha VHP Engine," a new brochure from Waukesha. The eight-page, full-color brochure explains and illustrates the design advantages of Waukesha replacement valves, valve guides, valve seat inserts, pistons, cylinder sleeves, air, lube oil and fuel oil filters.

For a copy of the brochure from Waukesha,

Circle 40 on Reader Service Card

ON THE COVER



NEW GHH-Constructed Drydock, Mission Bay, For Continental Maritime

In mid-March, Mighty Servant 3 began a 14,400-mile voyage from Bremen, West Germany to San Francisco, Calif. This heavy-lift ship, operated by Wijsmuller Transport B.V., Ijmuiden, Netherlands, transported the 25,000-ton-lift-capacity floating drydock Mission Bay to Continental Maritime of San Francisco, Inc.'s shipyard. The drydock was constructed at M.A.N.-GHH Sterkrade's dockyard in Blexen, West Germany. Delivery of the drydock will culminate a project that started in June 1983 with preliminary design discussions between Continental Maritime and M.A.N.-GHH. Design details were finalized in April 1984.

The drydock hull was designed and constructed in accordance with the regulations and under the supervision of the American Bureau of Shipping (ABS). After completion of commissioning trials at Continental Maritime's shipyard in San

Francisco, it will be classed +A1 floating drydock by ABS. In addition, it is designed and constructed to meet the U.S. Navy's drydock safety certification criteria published in Military Standard 1625 (B).

Plates for construction were ordered up to 3.75 meters in width and up to 15 meters in length (this limited the average waste for the entire dock to approximately 2.5 percent). These large-size plates were welded from one side with copper rail backing into panels by using automatic welding machines. The frames were welded by using semi-automatic welding machines and a special jig. Similar special-type jigs were used for welding of T girders which serve as web frames or bearers. The dock sections were constructed in a separate prefabrication shed before transfer to the assembly yard.

(continued on page 9)



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The dock was constructed on a horizontal level with the centerline bulkhead resting on the continuous tilting line which consisted of load-distributing concrete blocks with lowerable sand box equipment. The dock lay with its complete bottom surface on sleeper blocks which were in turn supported by concrete slabs and which could be vertically adjusted and readjusted by hydraulic jacks.

Weld shrinkage was allowed for and the dock is built with considerable hogging which is distributed over the length as a curve and which was maintained by continuously checking by leveling. The maintenance of the hogging along with the weld sequence of the longitudinal and transverse section joints was based on experience and provides the dock with a precisely horizontal keel line when afloat after launching in the "stress-relieved" position, an important factor in proper dock operation.

The complete dock construction yard, covering 138,000 square meters, was carefully laid out to permit the highest quality construction with low labor and overhead costs.

The launching took place on March 11, 1985. The sponsor, **Mrs. Constance Picchi**, wife of Continental Maritime's chairman and chief executive officer **Roger A. Picchi**, named the dock Mission Bay.

The order for the new dock was placed with the stipulation that it be delivered and ready for docking a ship as early as May 1985. The decision to use a heavy-lift ship was mainly dictated by this time factor. Traveling at a speed of 13-15 knots, the ship took the route around South America through the Strait of Magellan.

The dock was loaded on the heavy-lift ship *Mighty Servant 3* for

the trip to California on March 15, 1985. Prior to the arrival in California, Continental Maritime of San Francisco completed the final preparation to the berth for the dock at Mission Bay Pier 50.

The M.A.N.-GHH Sterkrade staff will commission the dock and perform a part of the tests required for the ABS classification. Keel blocks, bilge blocks, crane and other equipment will be unlash, placed in operating positions and tested.

Tests already completed at the shipyard in Germany include: tightness test of all tanks, test of the electrical connections and function tests of all machines and equipment. All other tests will be conducted in San Francisco according to a program developed by M.A.N.-GHH Sterkrade in consultation with Continental Maritime and ABS.

Innovative features of the drydock include an advanced system of adjustable keel and bilge blocks developed by M.A.N.-GHH and modified specifically for the docking of U.S. Navy ships with large deadrise. In addition, the dock has been outfitted with a sonar dome pit, 102 feet by 40 feet by 5 feet. The pit allows shipping or unshipping of the sonar dome rubber window of U.S. naval ships in a wide variety of docking positions. The dock is outfitted with steel portable transverse girders and heavy plates which are used to cover the pit when not in use. Keel blocks can be placed on this covering structure. The pit provides ample working area around the SQS-26 and SQS-53 sonars installed on U.S. naval combatants, up to and including CG 47 and DDG-51 classes.

The dock incorporates two dock arms which support working cars for personnel working on topsides or superstructure. Each arm travels on a rail system, located on the inner

side of either wing wall, and each dock arm is outfitted with an end-work platform. The dock arm position can be controlled from this platform. The working platform is automatically held in the horizontal position.

A high-pressure water blast system is located on the safety deck, port and starboard. Each system includes an electric-drive pump, a water supply tank (with both fresh and saltwater inlets), distribution piping, hose valves, hoses and nozzles. Water outlet pressure and flow will range up to 10,000 psi and 100 gpm. Pressure and flow characteristics are easily varied with interchangeable plunger conversion sets.

The new drydock is another step by Continental Maritime toward implementing the firm's decision to become a full-service shipyard. "We're primarily trying to attract Navy ship repair work," said Continental's president **D. Whitney**

Thornton II. He also stated the yard is in an ideal position to increase its West Coast commercial work through competitive pricing and quality workmanship.

This ship repair firm presently employs 520 people in its San Francisco yard and 430 people in its San Diego yard. The first scheduled drydocking for Mission Bay will be the *Ex-President Monroe* which Continental Maritime is converting into the *Gem State (TACS-2)*, an auxiliary crane ship.

For full details on the services offered by Continental Maritime,

Circle 25 on Reader Service Card

For complete detailed literature and full specifications on M.A.N.-GHH drydocks,

Circle 26 on Reader Service Card

MISSION BAY		
Main Dimensions		
Weight	Approx. 12,000 tons	
	Feet	Meters (approx.)
Overall length	664	202.390
Length over keel blocks	584	178.000
Width between inner side wing walls	142	43.282
Clear width between dock runways	138	42.062
Width between outer side wing walls below safety deck	168	51.206
Width between outer side wing walls above safety deck	190	57.912
Molded depth to upper deck	68	20.726
Height of caisson in dock center	15	4.724
Water depth above top of pontoon when the dock is immersed	40	12.344
Height of keel blocks	6	1.829
Camber of pontoon deck	3	0.102
Freeboard of upper deck when the dock is immersed	12	3.658
Freeboard of pontoon deck when the dock is in service	2	0.610
Frame spacing	2	0.610

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Korobov Elected Vice President-Finance For COMSAT TeleSystems—Mutnick Named Controller

COMSAT TeleSystems has announced that **Alan G. Korobov** has been elected vice president for finance, and **Myles Mutnick** has been promoted to the newly created position of controller. Mr. **Korobov** will oversee all of TeleSystems' financial and MIS activities, and Mr. **Mutnick** will direct the company's financial reporting, accounting, budgeting, and internal controls operations.

Prior to joining TeleSystems, Mr. **Korobov** held various managerial positions within COMSAT Technology Products, COMSAT General, and COMSAT corporate offices. He most recently served as vice president-finance for COMSAT Technology. He has also held positions with TRT Telecommunications, DeHart and Broide, and Riggs National Bank.

Mr. **Mutnick** previously served as director of accounting for TeleSystems. Prior to that he held a number of positions with Solarex, Arthur Anderson, and Deloitte Haskins & Sells. He received his MBA degree from Rutgers Graduate School in 1974, and became a CPA in 1976.

COMSAT TeleSystems, located in Fairfax, Va., designs, manufactures, markets, and provides worldwide service and support for a complete line of advanced analog and digital communications equipment and systems.

Bath Iron Awarded \$4.5-Million Navy Contract For Frigates

Bath Iron Works Corporation, Bath, Maine, is being awarded a \$4,500,000 cost-plus-fixed-fee contract under a basic ordering agreement for the post shakedown availability of the guided missile frigates USS Simpson (FFG-56), USS Samuel B. Roberts (FFG-58) and USS Kauffman (FFG-59). Work will be performed in Bath, Maine, and is expected to be completed in October 1987. Contract funds would have expired at the end of the current fiscal year. The Supervisor of Shipbuilding, Conversion and Repair, Bath, Maine, is the contracting activity.

Kollmorgen Awarded \$11.2-Million Contract For Periscope Sets

Kollmorgen Corporation, Electro-Optical Division, Northampton, Mass., is being awarded an \$11,200,000 firm-fixed-price contract for seven 18-B periscope sets for the Los Angeles class submarines SSN-753, SSN-754, SSN-755, SSN-756, SSN-757, SSN-758, and

SSN-759, plus associated technical data and reports. Work will be performed in Northampton and is expected to be completed in February 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

GE Awarded \$3.3-Million Modification To Contract For Transducer Elements

General Electric Company, Syracuse, N.Y., is being awarded a \$3,365,508 modification definitizing a previously awarded letter contract for TR203A/SQS-26BX transducer elements for surface ship sonars. Work will be performed in Syracuse, N.Y., and is expected to be completed June 1, 1986. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity. The suspension of General Electric Company does not affect this contract since the modification represents the definitization of a previously awarded letter contract.

Burrard Yarrows Awarded \$3-Million Contract For Repair Of USNS Spica

Burrard Yarrows Corporation, Vancouver, British Columbia, Canada, is being awarded a \$3,019,526 firm-fixed-price job order under a master ship repair agreement for the post ship availability of USNS Spica, a Military Sealift Command (MSC), United States-flag combat stores ship. The contract performance period is April 8, 1985, through June 15, 1985. Fourteen bids were solicited and six offers were received. Contract funds would not have expired at the end of the current fiscal year. The Military Sealift Command, Washington, D.C., is the contracting activity.

Tano Receives Additional Coast Guard Contract Valued At \$2.7 Million

Tano Corporation of New Orleans, a Rexnord company, has been awarded a \$2.7-million contract addition by the U.S. Coast Guard to manufacture electronic control systems for five cutters. With this follow-on award for five shipsets, added to a contract awarded in January this year for four other ship systems, Tano's contracts in this Coast Guard program now total \$5.1 million.

The contracts call for the company to supply an engine room console, pilothouse console, two bridge wing consoles, two local engine control panels, and a variety of components and sensors for retrofitting in

each of the 378-foot high-endurance cutters under the Coast Guard's Fleet Revitalization and Modernization Program.

Tano will deliver the systems to designated shipyards starting in early 1986 through the fall of 1988.

CDI Marine Awarded \$6.5-Million Navy Contract For SLEP Design Services

CDI Marine Company, headquartered in Jacksonville, Fla., has been awarded a \$6.5-million Navy contract to provide design and engineering services for the aircraft carrier USS Kitty Hawk (CV-63) Service Life Extension Program (SLEP) at the Philadelphia Naval Shipyard. The services will be provided through the CDI Jacksonville office, which has supported previous aircraft carrier SLEP on the USS Saratoga (CV-60), USS Forrestal (CV-59), and USS Independence (CV-62). Contracting activity is the Naval Regional Contracting Center in Philadelphia.

General Crane Awarded \$3-Million Navy Contract For Two Portal Cranes

General Crane and Hoist Inc. of Savannah, Ga., has been awarded a \$3,166,000 firm-fixed-price Navy contract for two electro-mechanical portal cranes for the large auxiliary floating drydock AFDB-7, plus spare parts and associated engineering services. Work will be performed in Savannah, and is expected to be completed in July 1986. Contract funds would not have expired at the end of the current fiscal year. Twenty-two bids were solicited and three offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-4147).

Daewoo Wins \$16.5-Million Contract To Build Offshore Vessel For India

The Oil and Natural Gas Commission of India has signed a contract for construction of a \$16.5-million well-stimulation vessel by Daewoo Shipbuilding and Heavy Machinery Ltd. of South Korea.

The 262¹/₂-foot ship will feature a dynamic positioning system, with two bow thrusters and two stern thrusters, the latter 360-degree rotatable, permitting it to remain stationary during well-stimulation operations with or without use of mooring lines. The vessel will also incorporate an anti-pollution control system, through which oil-dissolving chemicals are spread on the surface of the sea to combat oil spills.

The ship will be used in offshore

enhanced-recovery operations to help increase the volume of oil from older wells. Scheduled for delivery in 1986, it will be the first such vessel to be built at Daewoo's large and modern Okpo shipyard.

Jacksonville Yard Gets \$3-Million Navy Contract For Destroyer SRA Work

Jacksonville Shipyards Inc. of Jacksonville, Fla., has been awarded a \$3,092,000 firm-fixed-price Navy contract for the Selected Restricted Availability (SRA) of the guided-missile destroyer USS Luce (DDG-38). Work will be performed in Mayport, Fla., and is expected to be completed by June 14 this year. Two bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Mayport, Fla., is the contracting activity (N62670-70-C-0018).

Exclusive Rep For Danish Firm Introduces Radiotelephone System

M.E.M.A.C.-Dantronics Boca Raton, Fla., is the exclusive representative organization for the Danish Marine Communication A/S in the U.S. and Canada.

The new and second generation HF1200A radiotelephone system is said to be one of the most comprehensive long range radio telephone systems to be launched in the North American market in recent years. It has a new, completely redesigned transmitter (T-204A) solid state with 1,000-watt output. It is suitable for use on board large yachts, commercial vessels, offshore platforms, and is FCC type accepted. The HF1200A meets CEPT specifications, is MPT approved and complies with the latest SOLAS conventions, FCC, DOC and ITU radio rules.

The HF1200A is all solid state, has a fully synthesized transmitter and receiver, a built-in two tone alarm generator and electronic overload protection. It operates on 110, 220 or 380 ac or 24 VDC and contains a built-in antenna dummy load. All the international marine HF and MF bands are covered, there is a choice of exiter, the E204 which has 480 pre-programmed frequencies or the E205A which provides coverage of each marine bank in 100 Hz steps.

Optional extras include a built-in battery charger, remote controlled antenna tuner, extended frequency coverage from 1.6 to 30 MHz, both USB/LSB bands, and SITOR telex connections.

No warm-up period is required and it has low power consumption. The system is well suited for point-to-point communications or for any oil platform communication installation.

For further information on the Danmar HF1200A systems,

Circle 22 on Reader Service Card

Weerts Named Senior Program Manager For American Systems

Carl M. Albero, president and chief executive officer of American Systems Engineering Corporation (AmSEC), has announced the appointment of **Gary L. Weerts** to the position of senior program manager, in recognition of his contributions to the firm as a senior manager.



Gary L. Weerts

Mr. Weerts has been a program manager in AmSEC's Virginia Beach, Va., office since April 1983. He manages the firm's contracts with the U.S. Navy for support of weapons elevators, as well as support for the Navy's Service Life Extension Program (SLEP) for aircraft carriers.

AmSEC is an engineering services firm headquartered in Virginia Beach, with other major offices in Arlington, Va., Philadelphia, and San Diego, and field representatives throughout the country supporting both commercial and military customers. Since its inception in 1981 with 13 employees, AmSEC has become a fast-growing corporation with sales approaching \$10 million and a work force comprising more than 280 engineers, instructors, managers, and technicians.

ABS Developing New Computer Programs To Aid Ship Designers

The American Bureau of Shipping (ABS) has announced a new system of computer programs, called EAGLE, for use with the Hewlett Packard 9000, Series 200 computer recently installed in the ABS New York headquarters. A feature of the EAGLE system will be a program based on the "ABS Rules for Building and Classing Steel Vessels," the standards established for the design, construction, and periodic survey of merchant vessels.

According to Dr. Donald Liu, assistant vice president and head of the ABS Research and Development Division, "Currently, the Hull Structure sections of the Rules are being programmed for the computer. These sections are being tested and validated for release in July 1985. In addition to the the ABS Rules, the EAGLE system includes program modules to perform calculations for hull girder strength analysis, ship hydrostatics and stability,

structural element properties, and frame analysis, to name a few."

Additional programs relating to naval architecture and offshore engineering are being developed and will be made available as they are completed.

Benefits to users of the EAGLE program system will be the elimination of the duplication of effort by the designer and ABS, and a reduction of paper flow and delays for

plan review. These time and cost savings will be beneficial to designers and shipowners.

Ingersoll Rand Awarded \$3.2-Million Navy Contract For Centrifugal Pumps

Ingersoll Rand Company, Cameron Pump Division, Phillipsburg,

N.J. is being issued a \$3,249,840 order under a basic ordering agreement to furnish 66 centrifugal pumps in support of the FFG-7 program. Work will be performed in Phillipsburg and is expected to be completed by December 31, 1985. Contract funds would not have expired at the end of the current fiscal year. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity.

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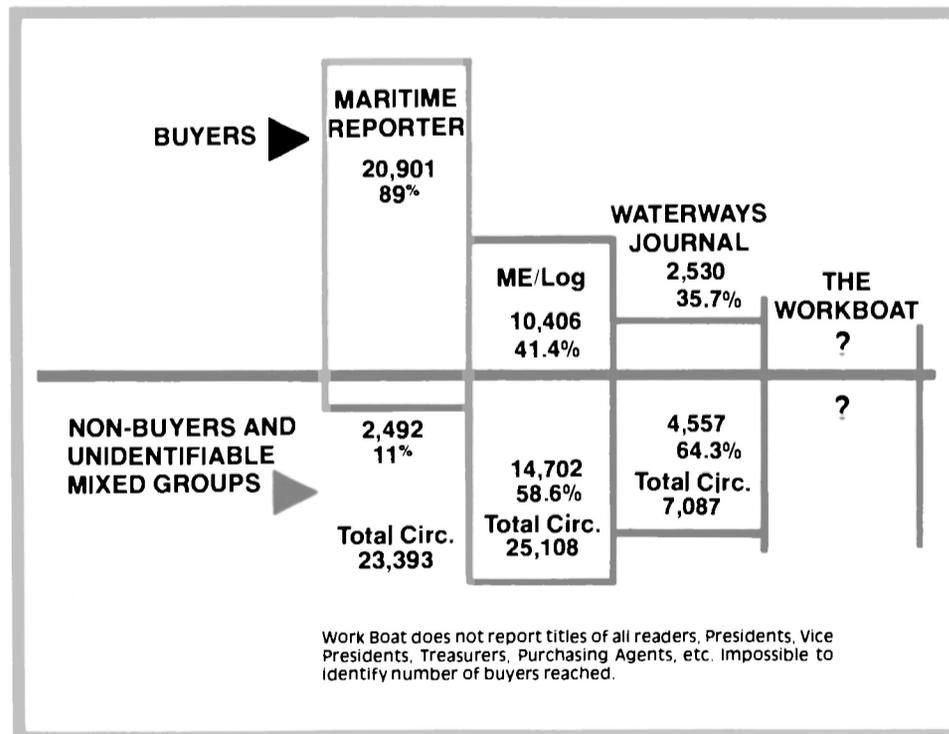
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In 1984, and for years, more media buyers placed more pages of advertising, for a larger number of advertisers, in MR than in No. 2 ME/Log.

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1,352
1,220
1,168

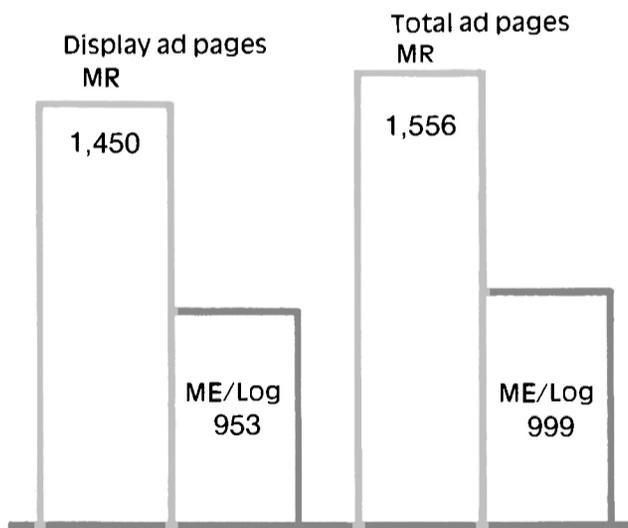
Navigation & Communications

773
663
623

Oily Water Separators

756
459
360

COMPARE 1984 ADVERTISING



Note — shows only magazine advertising 13 ME/Log issues — 24 MR issues . . . no catalogs, buyers guides, etc. Ad pages reported in 7" x 10" units for comparison.

MR clearly leads by a wide margin in advertiser acceptance.

ADVERTISING RESULTS IN '85

May 15, 1985

**MARITIME
REPORTER**
AND
ENGINEERING NEWS

Smith Appointed Senior Vice President For American Steamship



Ned A. Smith

Ned A. Smith has been promoted to senior vice president of American Steamship Company (ASC) of Buffalo, N.Y. The announcement was made by ASC's president and CEO, D. Ward Fuller.

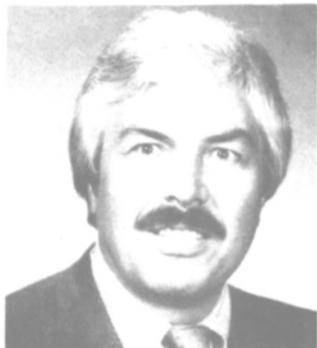
Mr. Smith will continue to be responsible for all marketing and sales department activities and the insurance matters of the company. In addition, he will now be responsible for all finance and accounting activities.

He began his career with ASC in 1975 as controller. Other positions he has held since then include vice president-finance and vice president-marketing. Prior to joining ASC, he spent five years with Price

Waterhouse & Company. He holds a BS degree in commerce and finance from Wilkes College and an MBA from Canisius College.

American Steamship, a subsidiary of GATX Corporation, is in its 78th year of operation. It owns and operates the largest fleet of self-unloaders on the Great Lakes, serving the steel, utility, chemical, cement, and construction industries.

Bohme Named Product Development Manager For Simpson Timber



Dr. Reinhard Bohme

Dr. Reinhard Bohme has been appointed product development manager-Northwest for Simpson Timber Company. He succeeds John Gould, who is leaving full-time employment.

Dr. Bohme comes to Simpson from Champion International, where he had been director of the

container technology, sales, and converting division in Minneapolis since 1976. A graduate of McGill University in Montreal, he earned his doctorate degree in physical chemistry.

The principal tasks of the Simpson Technical Center, where Dr. Bohme will be stationed, are to develop new products and to work with manufacturing and sales staffs on questions related to the manufacture and use of the existing line of overlaid plywood products.

Simpson is a leading U.S. manufacturer of overlaid plywood products that are used for concrete forming in a wide variety of marine, construction, and industrial applications.

For additional information on the Simpson product line,

Circle 55 on Reader Service Card

Joseph Joins COMSAT As Executive Vice President

Marcel P. Joseph has been elected executive vice president of Communications Satellite Corporation (COMSAT), Washington, D.C. He will report to COMSAT president Irving Goldstein, and will be responsible for the management and operations of all of COMSAT's business units.

Mr. Joseph comes to COMSAT after 24 years of experience with General Electric Company, serving most recently as corporate vice pres-

ident and general manager of the Transportation Products Division in Erie, Pa. In earlier assignments, he had held several general management positions with GE beginning in 1974 as general manager of its International Ventures Operation. In 1975, he was general manager in the Plastics Business Division, and in 1980 was named manager of GE's Specialty Motor Department.

New Tuf-Tred SkidGuard From Simpson Timber —Literature Available

Simpson Tuf-Tred SkidGuard offers a skid-resistant surface with a texture equivalent to 40 grit sandpaper. It is perfect for decks or docks as its skid resistance is exceptional when wet.

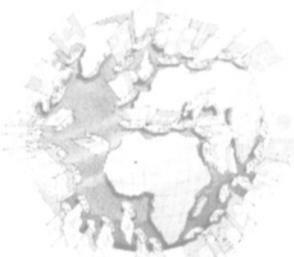
The exterior plywood panel has a heavy duty overlay surface with a gritty texture which is strong and durable enough to withstand normal foot traffic and direct weather exposure.

Tuf-Tred requires no sub-flooring, it can be applied directly over framing or existing decking. Available in gray or sand color, the 4- by 8-foot panels are 3/4-, 7/8- or 1-inch thick.

For a copy of the data sheet containing load span tables and application and finishing instructions,

Circle 46 on Reader Service Card

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It's commonly known that FISH EXPO is the world's largest commercial fishing show, but it is also the only major international show that combines the fishing industry with work boats, packaging and handling equipment and other commercial marine products.

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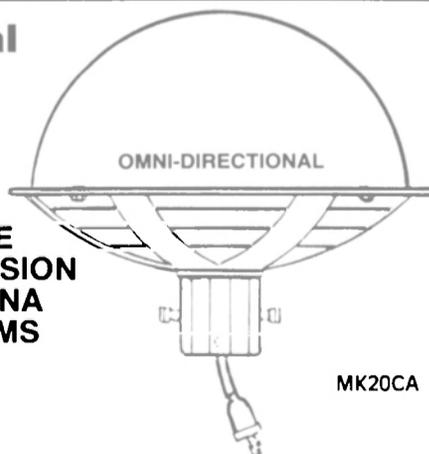
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Lundberg Reappointed Director General Of INMARSAT



Olof I. Lundberg

Olof I. Lundberg has been reappointed for a second six-year term as director general of the International Maritime Satellite Organization (INMARSAT), headquartered in London. He has been director general of INMARSAT since its creation in 1979. Prior to joining the Organization he was with the Swedish Telecommunications Administration in various capacities, and was actively involved in developing new telecommunications services.

INMARSAT provides satellite communications services to the world's shipping and offshore industries. It currently operates capacity on six satellites serving some 3,200 vessels; demand for some of its services is increasing at a rate of more than 60 percent a year.

INMARSAT is currently negotiating a contract to purchase from three to nine satellites, at a cost of up to \$400 million, for its second generation system.

Literature Available On Clemco Industries' 'Educt-O-Matic'

Clemco Industries, San Francisco, Calif., manufactures "Educt-O-Matic," a lightweight, portable abrasive blasting tool with an integral abrasive recovery system. Weighing only seven pounds, this hand-held tool vacuums and recycles abrasive during the blasting process.

It has a swivel blast head which turns 360° enabling an operator to blast in any direction without rotating the body. A master adaptor with four special boots permits cleaning inside and outside angles, 90° corners and rough or irregular surfaces.

The Educt-O-Matic need only be attached to a ½- or ¾-inch air line, requiring 90 cfm of air at 90 to 100 psi. It can hold one to four pounds of any standard 40-to-100 mesh blasting abrasive such as glass beads, steel grit or aluminum oxide. Because it is completely enclosed no special operator safety equipment or training is required.

For further information on Clemco's Educt-O-Matic,

Circle 26 on Reader Service Card

Hubbard Named To Newly Created Position At American President Lines

American President Lines of Oakland, Calif., has announced the appointment of **W.B. Hubbard** to the newly created position of senior vice president-operations strategy. Succeeding him as senior vice president-operations is **Lorenz P. Robinson**, who joined APL in 1979 and has served as vice president-North America since 1980.

Also announced was the appointment of **Michael Diaz** as vice president-North America, succeeding Mr. Robinson, and the promotion of **Barry A. Miller** to vice president-special services, succeeding Mr. Diaz. Mr. Miller previously served as regional director, Western region, based in Los Angeles.

Bruce Seaton, president of APL and its parent organization, American President Companies, Ltd., said Mr. Hubbard, in his new position, will be looking at near- and long-term strategy related to terminals, equipment, vessels, and other operating requirements of APL's international and domestic transportation operations. Mr. Hubbard, who joined APL in 1977, brings to his new position 30 years of experience in the development of containerization and intermodalism.

SNAME Introduces New Quarterly— The Journal Of Ship Production

The Society of Naval Architects and Marine Engineers, in conjunction with the National Shipbuilding Research Program is proud to present a new quarterly, the Journal of Ship Production. The first issue was published in February 1985.

The Journal will be dedicated to presenting the latest and best professional papers relating to the shipyard and the shipbuilding process. It is intended that articles will be solicited from every nation and that professional shipbuilders will benefit from the information and data found in each issue.

Editorial direction of the Journal has been vested in a SNAME editorial committee, under the chairmanship of **Howard M. Bunch**, who is also chairman of the education panel of the Society's ship production committee and Navsea professor of ship production at the University of Michigan.

SNAME members are invited to subscribe at a special introductory rate of \$12.50 for the first year. Non-member subscribers pay \$30 and Canadian and foreign nonmembers, \$34. This is a special price for the four issues of 1985 only; back issues will be forwarded to later subscribers as long as the supply lasts.

Magnavox Awarded \$24.6-Million Contract For Navigation Systems

Magnavox Advanced Products and Systems Company, Torrance, Calif., is being awarded a \$24,692,648 firm-fixed-price letter contract for materials for production of the AN/SSN-2 navigation system. Work will be performed in Torrance, Calif., and is expected to be completed in March 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Semerad Appointed Regional Marine Manager For Ameron Coatings

Jerry G. Semerad Jr. has been named south regional marine manager for the Ameron Protective



Jerry Semerad Jr.

Coatings Group. From offices in New Orleans, he will serve the southern U.S. and Gulf areas with Ameron's full line of high-performance marine coatings and antifoulants developed for deep-draft and riverine vessels, workboats and barges, and commercial fishing craft.

Before joining Ameron, Mr. Semerad spent 35 years with the Farboil Company, most recently as manager of the company's U.S. Gulf, West Coast, and Inland Waterways Division. Farboil is a manufacturer of marine and industrial finishes.

Cambridge Instruments Completes New Plant

Cambridge Instruments recently announced the completion of a new 50,000-square-foot manufacturing facility located in Monsey, N.Y.

The new facility, in addition to the present 250,000-square-foot structure, will house all manufacturing, quality control, shipping/receiving and storage facilities for the firm. It will provide a new, clean area for the manufacture of heat treating furnace control systems and high pressure boiler feed water analyzers, as well as bringing all

engineering, sales, marketing and manufacturing operations under one roof. The company moved its manufacturing operation from Ossining, N.Y. to Monsey last December.

Cambridge Instruments is one of the leading manufacturers of carburizing, neutral hardening and carbonitriding furnace control systems used in the heat treating industry and high pressure boiler feed water analyzers used in industrial and power generating facilities.

For further information on Cambridge Instruments' facilities or products,

Circle 57 on Reader Service Card

Navy Awards Metier \$5.6-Million For FASS Computer Series

Metier Management Systems Incorporated, Houston, Texas, is being awarded a \$5,624,322 firm-fixed-price contract for the Fundamental Automated Scheduling System (FASS) computer series used to schedule repairs and overhauls to vessels at naval shipyards. Work will be performed in Portsmouth, New Hampshire (13 percent), Pearl Harbor, Hawaii (12 percent), Long Beach, Calif. (11 percent), Philadelphia, Pa. (13 percent), Charleston, S.C. (11 percent), Puget Sound, Wash. (10 percent), Norfolk, Va. (11 percent), Mare Island, Calif. (11 percent) and the Naval Sea Systems Command Automated Data Systems Activity, Indian Head, Md. (8 percent), and is expected to be completed in August 1990. Contract funds would have expired at the end of the current fiscal year. Forty-three bids were solicited and five offers were received. The Naval Regional Contracting Center, Washington, D.C., is the contracting activity.

Fear Joins INMARSAT In Service Development Post At London Headquarters

Capt. **James Fear**, formerly with the U.S. Coast Guard, has accepted an appointment as service development officer of the London-based International Maritime Satellite Organization (INMARSAT).

Capt. Fear was, until recently, chief of staff for the Third Coast Guard District at Governors Island, N.Y. In addition to commanding several USCG vessels, he has been chief of Coast Guard telecommunications, and has served as technical adviser to the U.S. delegation to the INMARSAT Preparatory Committee, so he is fully familiar with the system and its potential.

He has also been closely involved with the International Maritime Organization (IMO), and the development of the Future Global Maritime Distress and Safety System, experience that will be invaluable in his new INMARSAT role.



NATURAL PROBLEM SOLVERS

Navigation and target detection at night or in poor visibility is always a problem, but, over the millennia, bats developed a natural solution. Bats have a built-in "radar" that is immensely efficient and enormously sophisticated. In flight, for example, some species can easily detect and avoid very fine suspended wires. Bats are able to accurately determine range and bearing, even discriminate between two closely spaced objects. In addition, bats can readily measure the relative velocity between themselves and a target by consecutive range measurements or by doppler frequency shift. The most amazing ability, however, is that bats not only can determine target size, but also shape and surface properties.

Furuno has a product line that solves navigation and target detection problems for commercial vessel operators: Our newest family of 12- and 16-inch radars. These systems are available in 25 kW X-band and 60 kW S-band versions, interswitched if desired, and offer dual VRM's, offcentering, "echo stretch," a variety of antenna lengths, and ten range scales to 120 miles plus a 12-mile true

motion scale. All units meet current IMO requirements for ocean-going vessels and provide features such as digital signal processing, continuously visible EBL, Furuno's exclusive hybrid microwave IC receiver circuitry for high sensitivity, and a log amplifier for better target detection at all ranges in any weather.

For complete information on the whole range of 12- and 16-inch radars, and their many options, contact Furuno today.

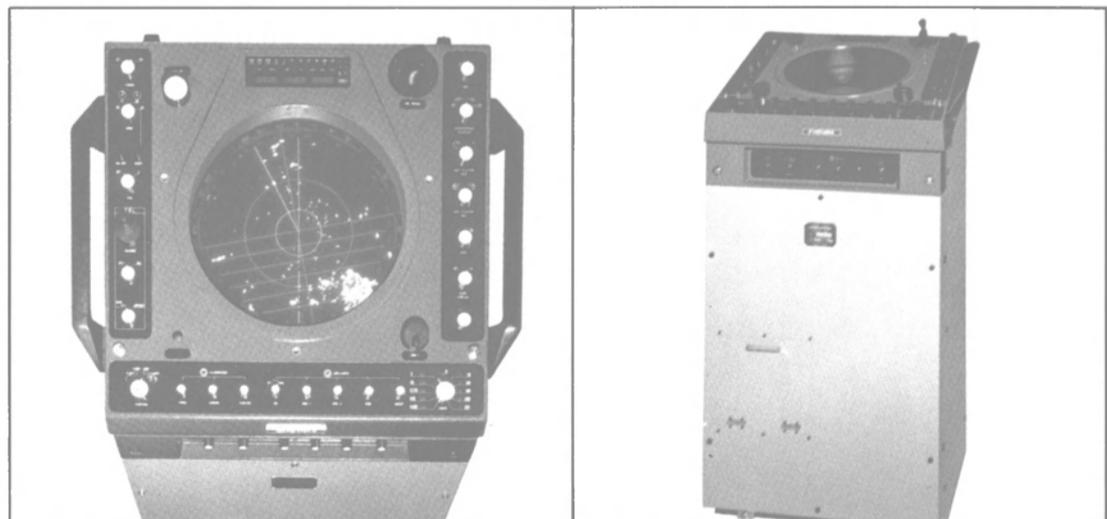
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Circle 13f on Reader Service Card

Navigation & Communications Equipment

—A Review—

Manufacturers of shipboard electronics equipment continue to improve their products in an effort to make navigation more precise and safer, and to provide easier, faster communications—both on a cost-effective basis.

The editors of MR/EN asked the manufacturers and suppliers of marine navigation and communications equipment and services to tell us about their latest products and marketing plans. The following review is based on the information we had received at press time.

FOR MORE INFORMATION

If you wish to receive additional information on any of the products described in the review, circle the appropriate reader service number(s) listed under each company's name, using the postage-paid card bound into the back of this issue.

ACR ELECTRONICS

ACR Electronics, Inc. of Hollywood, Fla., manufactures an Emergency Position Indicating Radio Beacon (EPIRB) that transmits a signal that radio direction finders can home in on, letting others know your rescue position. An EPIRB is required by American Power Boat Association regulations.

ACR offers Class A, B and C EPIRBs. The first two can be received by the Search & Rescue Satellite. The Class C incorporates a darkness-activated flashing light, and is monitored on Channels 15 and 16 VHF. Beacons range from 20 to 300 miles, depending on model. All are buoyant, rugged, reliable, and approved by the U.S. Coast Guard and/or the Federal Communications Commission.

The company also manufactures a full line of marine safety and rescue equipment, including lights, strobes, radiotelephones, RDFs, survival kits, and more.

Circle 81 on Reader Service Card

ALDEN

Alden Electronics, Inc. of Westboro, Mass., has announced the introduction of the Marinefax VI, a new, programmable, facsimile weather chart recorder with built-in synthesized receiver that features a self-prompting liquid crystal display.

The Marinefax VI incorporates a microprocessor-based feature that enables the user to program the recorder to automatically turn on and off and to automatically change frequencies as desired. As an aid to programming, the unit also features a self-prompting liquid crystal display that "prompts" the user as to when to enter the desired frequencies and time.

The display provides an "atlas" of transmitter sites by name. Programming the chart reception by schedule is of value not only when maps from different transmitters are needed but when single transmitter site reception requires different frequencies for day and night operation.



Marinefax VI also incorporates two memory functions. One function is permanent and is used to store all worldwide radiofax frequencies for easy, two-step recall; the other function is used as a local memory to store up to 10 frequencies for single-button recall. Any HF frequency in the world may also be manually entered into the receiver. The new unit is designed to meet International World Meteorological Organization recording speeds of 60, 90, and 120 scans per minute. It can operate at 12, 24, or 32 volts DC as well as 110 or 220 volts AC. An optional four-foot, all-wave antenna completes the package.

Weather charts received on Alden Marinefax recorders provide the user with surface analyses maps that show the current location of storms and weather fronts, as well as weather prognoses that show the indicated direction and speed of movement of these storms 12, 24, 36, and 49 hours ahead. Extended prognoses also forecast weather conditions up to five days into the future. Wave analyses and prognoses charts similarly indicate wave height and sea state conditions. Sea surface temperature and sea ice data are also transmitted, along with satellite cloud cover photographs.

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BOWDITCH

Bowditch Navigation Systems of Portsmouth, N.H., offers the MK-I Automatic Visual Positioning Aid (AVPA), a unique, integrated navigation with a viewing screen that gives the navigator a real-time display of current position projected onto a standard navigational chart.

The AVPA accepts inputs from all sources, including Loran C, Sat-Nav, Decca Navigator, and Omega, plus gyro or magnetic compass, visual bearings, radar ranges, and speed log. An integral Loran receiver is available as an option. Loran readings may be corrected for ASF errors to give extremely high position-fixing accuracy.

The navigational chart display is derived from a projection of an official Government nautical chart. This permits the navigator to view *all* of the information contained on the chart, including depth contours, soundings, shoreline, topographical features, and other essential information not typically available on "electronic charts."

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CMC COMMUNICATIONS (NAVAL SYSTEMS AB)

CMC Communications Inc. of Tampa, Fla., is the U.S. distributor for Naval Systems AB, a Swedish company located in Malmo that has many years of experience in manufacturing equipment for broadcast reception at sea. More than 15,000 Naval aerials and some 1,200 shipboard distribution systems have been installed worldwide. With a well-established network of representatives in 30 countries with 300 depots, the Swedish company can provide fast delivery and reliable service in most ports throughout the world.

The equipment manufactured by Naval Systems, including omnidirectional antenna systems that are best for TV reception at sea, is designed strictly for marine applications, and will withstand high winds, iceloading, salt water spray, and the shock and vibration that are present in the marine environment.

Naval Systems antennas are made of ABS plastic with circuitry and headamplifiers built into polyurethane foam. Mounting bases of seawater-proof special alloy, and bolts of acid-proof stainless steel insure long operational life. Special

wavetraps and arresters protect the amplifiers from HF overloading and breakdown due to static charge. The aerials are tested by Det norske Veritas for the same approval as for radar equipment, and by FFA for severe wind loads.

Circle 83 on Reader Service Card

COMSAT

COMSAT Maritime Services of Washington, D.C., provides telephone, telex, and data services to the international maritime market through the INMARSAT system. The firm's services are listed below.

Telephone. High-quality telephone service is fully interconnected with the worldwide telephone network. Service is fast, reliable, and private. Service features include direct-dial calling with one-minute minimum, station-to-station and person-to-person calls, collect calls, credit card calls, and conference calls.

Telex. Standard telex services (66 words per minute or 50 baud) are interconnected with the worldwide network through COMSAT's Telex Switching Center in Washington. Any office telex machine in the U.S. or abroad has a direct link to ships and offshore facilities with ship earth stations. Service features include store and forward, multiple address, departmental billing, and other options.

Facsimile. Using a telephone circuit, both analog and digital facsimiles of manifests, drawings, daily reports, weather maps, well logs, and other graphic materials can be exchanged between compatible telecopier machines on ship and ashore.

Voiceband Data Services. Using voice channels, data communications are available typically at data speeds of 300, 1,200 and 2,400 bits per second.

High-speed Data. Data at 56 kilobits per second is available in the ship-to-shore direction. A voice channel can be used for coordination purposes. Service is provided to COMSAT coast earth stations for interconnection with customer-arranged U.S. domestic links.

Circle 84 on Reader Service Card

FURUNO

The product line of Furuno U.S.A., Inc. of South San Francisco covers the full spectrum of naviga-

tion and communications equipment for every class of vessel, from harbor tugs to the largest oceangoing ships.

In radar, the company offers a full line of systems, including 12- and 16-inch X and S band units, the new FR-800D series of digital raster scan radars, 7- and 10-inch display standard analog radars, 14-inch CRT color radars, plus a 14-inch color radar interfaced with Loran or satnav that presents full-color radar and plotting information overlaid on the same CRT at the same scale.

Furuno also offers an extremely broad range of echosounders. Recorders are available with paper widths from four to eight inches at output power up to 1,000 watts. One unit, the FE-880, meets all current IMO standards for navigational sounders, and may be interfaced to optional depth alarm and remote digital display. A line of color video sounders is also available.

For the specialized needs of dredging, hydrographic survey, and general research, Furuno has the SL-27 side-looking sonar and CI-30 current indicator that displays speed and direction of the current at three different operator-selectable depths.

The company also has an extensive line of navigational equipment, including Loran, satnav, and Omega receivers, a variety of paper and video plotters, several ADFs, and completely automatic weatherfax receivers with either 10- or 14-inch paper widths. Furuno also offers both VHF and SSB communications systems.

Circle 62 on Reader Service Card

HARRIS

Harris RF Communications of Rochester, N.Y., offers a full line of HF/SSB radio products designed specifically for the marine industry.

The most recent additions to the product line are the RF-7100-05 adaptive communications system and the RF-3466 high-speed HF data modem. The former is a microprocessor-controlled HF radio set designed to provide automatic HF line establishment. It consists of the RF-711 adaptive controller (Autolink®) and the RF-230 transceiver. The Autolink system automatically tests and chooses the best propagating channel, resulting in automatic link establishment and reduced operator skill requirements. The RF-7100-05 system can be configured for a variety of HF communications applications, including point-to-point and computer-controlled frequency management systems.

The RF-3466 high-speed HF data modem is designed to combat the anomalies of ionospheric propagation that limit the rates at which data may be passed over on HF radio link.

Harris is a leader in advanced HF communications technology, pro-

viding customized HF computer-controlled systems for on-board management, drill rig daily reporting, and exploration data transfer. These systems are an economic alternative to fulfilling routine HF communications needs.

The RF-2331 series ARQ systems, for example, is an advanced, automatic error-correcting HF teletypewriter system, designed for easy

channelized marine telex and data operation. Simplex operation is provided by a high-speed antenna switch, permitting use of a single antenna for transmitting and receiving. The RF-536 scan control extends the capability of the RF-2331 ARQ system by providing channel scan for the RF-530 receiver. This system is especially advantageous aboard ships, as it allows a single

operator to monitor a large number of shore station frequencies, allowing fully automatic operation.

Harris also manufactures the RF-230 series HF/SSB transceivers for shipboard and limited coast shore applications. This series includes the RF-230M, 125-watt synthesized HF/SSB transceivers, and the RF-230RC/M(RC), 125-watt synthe-

(continued on page 20)

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Navigation/Communications Equipment — A Review

(continued)

sized/channelized transceiver. Also available is the RF-281, 150-watt automatic antenna coupler for use aboard ship or fixed plant with the RF-230M(AC).

Circle 63 on Reader Service Card

HENSCHEL

Henschel Corporation of Newburyport, Mass., a unit General Signal, is a leader in the design, development, and manufacture of ship control and interior communications equipment and systems for both commercial and naval ships. For more than 60 years, Henschel has supplied reliable equipment meeting the unique demands of the marine environment.

Recognized for decades as expert in synchro and servo engineering, the company now leads in the development of solid-state instrumentation for shipboard use. Its latest products use the special capabilities of microprocessors to full advantage.

Henschel's products include engine order telegraphs, sound-powered telephone systems, bell loggers, whistle timers, throttle control levers, engineer's alarm panels, shaft speed indicator systems, navigation light panels, fire alarm systems, audible signals, digital master clock systems, and rudder angle systems.

Circle 85 on Reader Service Card

JAPAN RADIO

The GPS/NAVSTAR (Global Positioning System/Navigation System with Timing and Ranging) offered by Japan Radio Company, Ltd. is a completely new system that will eventually use 18 satellites to pinpoint the position and speed of any object on the sea anywhere in the world in real time with extreme accuracy.

This system, now being developed in the U.S., can use seven satellites now in orbit. This will allow measurement of position for about three to five hours a day. Twenty-four hour service throughout the world will be available about 1987.

As the GPS navigator receives signals from four satellites to measure a position, four or five receiving channels would normally be required. However, the unique time-sharing system JRC has developed allows the unit to receive signals from all four satellites on a single channel for instant position fixing.

This GPS receiver determines not only latitude, longitude, elevation, speed, and bearing—the basic functions—but it can also indicate such navigational data in memory such as destination, bearing and distance to destination, required time to it, and off-course alarm.

Many optional units such as a color plotter for color track display, a hardcopy printer for printout of

various data, and a remote display unit for displaying the navigational data in a remote location can be connected to the GPS navigator.

Circle 86 on Reader Service Card

KING RADIO

King Radio Corporation of Olathe, Kansas, has introduced the KMC 95, said to be the first HF/SSB unit designed from the ground up to take advantage of the new technology that has come out of the microcomputer revolution. King's design team had two objectives: one, to create a user-friendly unit that would make the life of the HF radio operator easier; and two, to create a reliable unit that would work in an conceivable environment.

All 176 ITU radiotelephone channel frequencies are stored permanently in non-volatile memory. The memory also provides for storage of 99 user-programmable simplex and semi-duplex channels. Keyboard entry provides easy access to 280,000 frequencies in the 2 to 30 MHz range.

Extensive use of microcomputers means fewer moving parts and greater reliability. Top quality electronics are used throughout the KMC 95; a zinc diecast chassis provides durability and keeps the component parts from interfering with one another electrically.

Three optional remotes come in different sizes to suit any mounting requirement; the smallest remote has a front panel only 2¼ inches square. Private listening is available with an optional telephone headset.

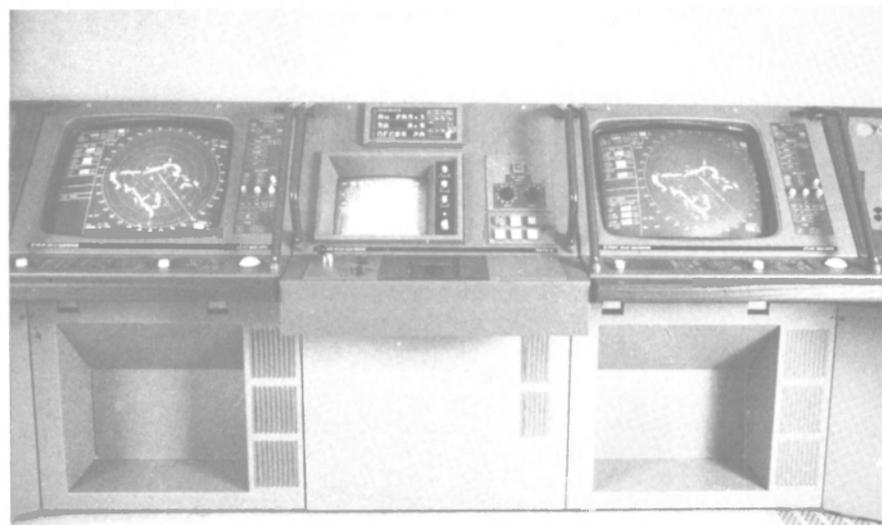
Circle 94 on Reader Service Card

KRUPP ATLAS

Newly developed navigational systems from Krupp Atlas Elektronik (KAE) of Bremen, West Germany, include the Atlas 7600/8600 series of rasterscan radars, said to be the first of their type to offer continuous, true daylight viewing on a 16-inch screen under all ambient conditions. Comprising RM, TM, and two ARPA models, all are designed to meet or exceed IMO and USCG specifications, and are FCC type-approved. KAE's U.S. operations are based in Rahway, N.J.

All four radar models provide true target trails for rapid orientation, while an advanced, centered display mode maintains own ship in a fixed position on the display, and also generates true trails of moving objects. Both the 7600 RM and TM systems allow manual acquisition of up to 10 targets, as well as semi-automatic plotting with target data readout, including CPA and TCPA. The 7600 ARPA also provides full automatic tracking functions.

The 8600 ARPA permits manual acquisition of up to 20 targets with automatic tracking and target data readout, including CPA and TCPA. The system also features automatic acquisition tracking of up to 40 targets with guard zones and limitation lines. Since their introduction last



Krupp Atlas new NACOS 20 bridge control and command system

year, more than 150 7600-8600 systems have been sold worldwide, and major U.S. orders are expected to be announced shortly.

Other new developments from KAE include the NACOS 20 series of integrated bridge control systems designed for one-man operation and precision navigation at reduced cost. Typically comprising two rasterscan radars, a doppler log, echo sounder, and an adaptive radar-controlled autopilot, the central control console also incorporates a full-color navigation information display, together with interfaces for other sensors and bridge equipment. By using a common data bus, integration of other ship's system such as those for administration, communications, engine control, and centralized monitoring is also possible.

Developed partly under sponsorship of the West German "Ship of the Future" project, three NACOS systems are currently being installed in the first three Norwegian "ships of the future" being built in South Korea for A/S Gill-Johannessen of Oslo. A further two systems have also been ordered recently for two containerships being constructed by Howaldswerke in Kiel for P. Dohle of Hamburg.

Circle 64 on Reader Service Card

MAGNAVOX

Since Inmarsat took over the global maritime communications satellite system from Marisat, the trend has been for manufacturers to concentrate on applications far beyond the straightforward use of telephone and telex. Magnavox Advanced Products and Systems Company of Torrance, Calif., is a leader in this trend.

Current examples of the technology now available as options of the Magnavox MX 211A SatCom involve several types of vessel monitoring systems (VMS). The most common VMS is the shore polling type, which allows the sensor data of a vessel to be monitored from shore without shipboard assistance. The ship's position, heading, speed, and fuel status can be retrieved from multiple off-site locations.

Other types of VMS available

from the Magnavox SatCom system include automatic vessel monitoring, which uses predetermined schedules for frequent updates of sensor data transmission by telex or voice channels, and multiple vessel sensor monitoring. The latter option can, for example, receive both navigation data and engine status independently, using a dual-port VMS system with separate polling and buffers capable of storing up to 2,000 characters each.

Circle 93 on Reader Service Card

MICROLOGIC

Micrologic of Chatsworth, Calif., has spent two years developing a navigation system that is easy to learn and simple to use. The result is the ML-7500 that, according to the company, the average user can master in a few hours.

This new Loran has 125 waypoints that can be called by name or number, a 26-point "SAVE" function, a backspace key for easy correction of keyboard inputs, and a submersion-proof case. Standard automatic features include: chain and secondary selection; acquisition of master and up to five secondaries; magnetic variation; ASF (land mass) correction; waypoint sequencing for 99 waypoints; route following for 99 route points; envelope calibration; and computer memory test.

In addition, the ML-7500 has LL to TD and TD to LL conversion; a yacht racing countdown timer; waypoint arrival, anchor watch, and cross track error alarms; six notch filters; range and bearing to 99 waypoints; cross track error/time-to-go; speed over the bottom/course made good; elapsed distance; and two-point range and bearing.

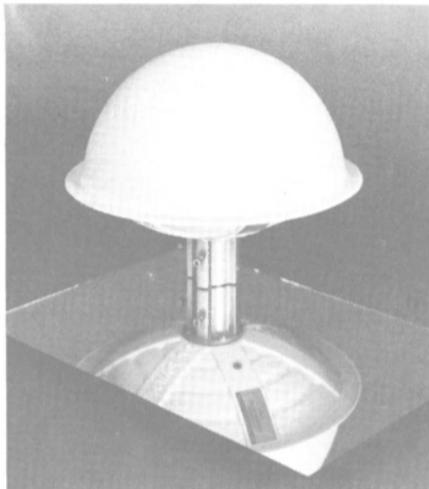
Made portable with an optional rechargeable battery pack, the ML-7500 can also be used on several vessels without permanent installation. The battery pack powers the unit for five hours of continuous operation. The basic Loran is six inches wide, six inches high, and three inches deep; weight is approximately four pounds.

Circle 65 on Reader Service Card

NAVAL

Naval Electronics, Inc. of Tampa, U.S. distributor for Naval Electronics A.B. of Sweden, features its MK 22 AM/FM TV antenna as part of a complete ship's entertainment antenna distribution system.

Free engineering and blueprinting services are offered to shipowners, naval architects, and shipyards. Naval's service and installation facilities now reach ports in more than 40 countries worldwide.



Naval's master TV antenna systems are omni-directional and do not need rotors as do conventional systems. This allows crew members to watch whichever station they desire without argument as to who controls the rotor. It also allows for superior reception while under way without continuous rotor adjustments to track the TV transmitter on shore. Naval's distribution system places antenna cords and outlets wherever required in messrooms, crew quarters, and other areas.

Naval also supplies a special TV receiver that can be used throughout the world when reception is not possible with a standard American system. This new receiver will operate from PAL, SECAM, and NTSC transmissions, making it truly an international TV set.

Circle 66 on Reader Service Card

NAV-COM

Busiship is an advanced, computer-based shipboard management information system developed by



NAV-COM Incorporated of Deer Park, N.Y., to provide improved operating efficiencies and reduced communications costs for commercial shipping companies.

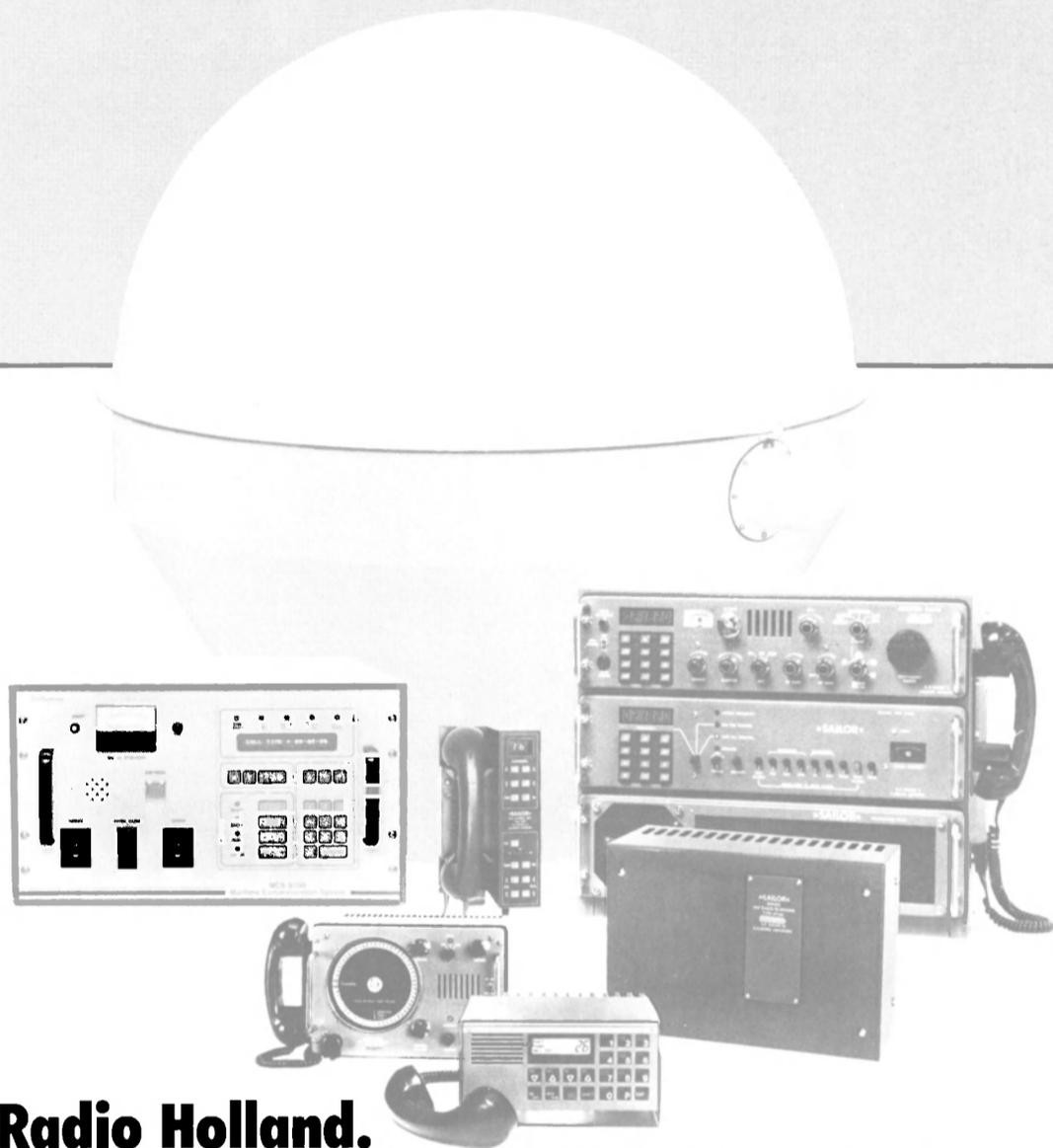
NAV-COM offers a full suite of applications software with the system, including new programs for on-board spares inventory, crew assignment/rotation, and vessel administration. Busiship incorporates a

complete package of data communications and electronic mail capabilities. The result is a system that encourages consistent and standardized reporting practices between ship and shore.

The Busiship system is built around an IBM PC/XT personal computer that has been "ruggedized" by NAV-COM for reliable performance in the shipboard environ-

ment. For ship/shore data exchange and electronic mail, the system uses a 2,400 bps modem and built-in error correction capabilities. It is fully compatible with most standard U.S. and European medium-speed data protocols, including CCITT V.22 bis.

NAV-COM offers a "turnkey" package that includes system de-
(continued on page 22)



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(continued)

sign, software development, training, and worldwide service. The company combines the full range of disciplines and technical skills to design, develop, implement, and support complex shipboard computer and communications installations.

Circle 67 on Reader Service Card

NAV-CONTROL

Nav-Control, Inc. of Halesite, N.Y., is a new firm formed to be the authorized U.S. agent for the navigation/instrumentation products manufactured by the Norcontrol Division of A/S Kongsberg Vaapenfabrikk in Norway. Nav-Control will also administer certain projects and in-process contracts on behalf of Norcontrol.

One of the major breakthroughs in modern navigation has been the development of the automatic radar plotting aid (ARPA). However, even though the microprocessor-controlled ARPA has landed navigators in the computer age, they still experience environmental pressure following the need for manual plotting and logging during stress situations.

Now, at the touch of a switch, an officer can insure accurate and automatic plotting and logging through the additional features provided for the Norcontrol DataBridge-7 radar navigation and ARPA system. The main innovation has focused on ex-

tending the system's unique radar map overlay functions by adding unlimited storage capacity, an X/Y track plotter, and datalogger.

Another optional feature allows radar maps to be stabilized with the aid of navigation data where fixed points for radar tracking are missing. The map function allows overlays to be constructed that show features not visible on the sea surface, such as wrecks, oil or gas pipelines, traffic separation zones, shallows, and international boundaries. Coast Guard vessels benefit from the capability of recording the position of target vessels including own ship in relation to fishing boundaries or other "invisible" lines.

Norcontrol's DataBridge-7 is a third-generation ARPA that acquires and tracks up to 50 radar targets and continuously displays collision-avoidance data on the most threatening 20. It will sound a collision warning alarm whenever any of these targets exceed user-specified values for closest point of approach and time to closest point of approach. As a collision-avoidance system, DataBridge-7 meets or exceeds IMO recommendations and U.S. Coast Guard and Maritime Administration standards.

Circle 98 on Reader Service Card

NAVIGATION SCIENCES

The Viewnav® master mariner electronic chart system from Navigation Sciences Inc. of Bethesda, Md., is being used increasingly by operators of pilot boats, ferries, tankers, and tugboats who want an extra edge to navigate more accu-



Racal — Decca ARPA 1690

ately in difficult harbor conditions. It is particularly valuable to ferryboat and other operators responsible for passenger safety, who must maintain precise schedules in all kinds of weather.

The Viewnav system combines differential Loran C with radar and NOS-quality, full-color digitized charts, and proprietary software to provide the most complete tactical navigation information possible. The system uses differential Loran position fixes of own vessel accurate to within five yards. Radar images are superimposed and displayed in water areas to show vessel traffic and other targets.

Buoys, nav aids, and channels are shown in actual chart colors. Own ship is a to-scale, vessel-shaped outline, and radar images appear in bright red. When a buoy is off station, the electronic chart shows where the buoy should be while the radar images show where the buoy actually is. The true-motion presentation is displayed in selectable ranges from one to 48 NM square, with automatic electronic chart advancement. Alphanumeric data appears on-screen, giving speed, course, time, distance, heading to the next waypoint, movable cursor position and more. Keyboard control consoles are available with a 14-, 20-, or 25-inch CRT color monitor.

Two new products, the Viewnav electronic chart offshore platform monitoring system for oil rig and pipeline traffic management, and the Viewnav harbor monitoring system, have been introduced to meet these stationary marine monitoring applications. To alert rig operators of potential collision danger, and to help them warn ships of potential collision or potential anchorage damage to pipelines, the platform monitoring system offers precise electronic charts of the entire platform and pipeline configuration. An automatic radar plotting aid (ARPA) replaces Loran C in this system, allowing up to 40 targets—ships, boats, even low-flying aircraft—to be simultaneously tracked, identified, and classified.

To airport authorities, pilots' groups, tug companies, and others who must know where vessel traffic is and help guide vessels into and out of harbors, the harbor monitoring system features detailed full-color charts and vessel radar returns, including anchorage grids for fast location, tracking, and identification of vessels. The data base can recall and display on-screen alphanumeric information such as arrival/departure times and pilot names.

When you go to sea, you need a lifeline you can always trust. Under all circumstances. With no exceptions.

That's why the Harris RF-230M HF-SSB synthesized transceiver belongs on your boat. It's built to the same exacting standards of quality and convenience that have made its military counterpart standard equipment for combat use. And its reputation for reliability is backed up by sales: more than 5,000 units sold worldwide for land and maritime use.

The quality starts with power: a full 125 watts, available through as many as 96 preset channels. Banded automatic servo tuning directs the output through the antenna coupler, and constantly adjusts to changing conditions. Whether you're one mile or one thousand miles from shore, you're never out of touch.

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Find out more about the RF-230M and its full line of accessories. Write or call us: HARRIS CORPORATION, RF Communications Group, 1680 University Avenue, Rochester, New York 14610 U.S.A., Tel: 716-244-5830. Telex: 978-464.



HARRIS

For your information, our name is Harris.

Circle 14C on Reader Service Card

Circle 68 on Reader Service Card

NEWMAR

NEWMAR of Newport Beach, Calif., offers the NAV-222, an automatic digital direction finder for easy and precise navigation. This compact unit utilizes a microprocessor in place of motors or other moving parts, and allows signals to be locked in from either the beacon or broadcast band by a lightweight delta loop antenna mounted permanently on the cabin top or mast.

Two digital LCD displays indicate station frequency to the nearest kHz and relative bearing of the station to the nearest degree. The circular LED display indicates the actual bearing in azimuth to the station. A rotating azimuth bezel allows relative bearings to be converted to true bearings for simple navigation or homing.

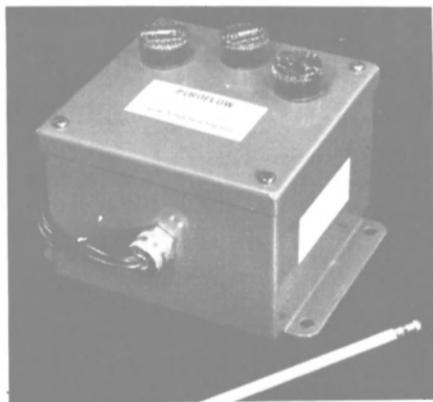
The speaker can be remotely located for maximum audibility, while the processor unit can be tabletop-, overhead-, or bulkhead-mounted.

Circle 92 on Reader Service Card

PUROFLOW MARINE

Puroflow Marine Corporation of Newport News, Va., manufactures power-line filters that provide essential protection for shipboard communications and navigation systems against harmful voltage surges and noise in ships' mains. Modern, solid-state electronics systems are extremely vulnerable to voltage transients and electromagnetic interference (EMI) that can cause these products to fail or malfunction without warning. It is estimated that voltage fluctuations may be responsible for as much as 60 percent of all service calls for marine electronics equipment.

Puroflow estimates that the average shipowner could save thousands of dollars annually by adding proper power-line protection aboard ship. The company offers an extensive selection of power-line protection devices, including voltage surge suppressors and EMI/RFI filters. These filters are designed to react within nanoseconds to shunt away harmful overvoltage surges and remove unwanted noise from ships' mains.



The bi-directional, multi-stage filters were originally developed by Puroflow to protect sensitive military electronics systems for the U.S. Navy. They meet all military specifications for power-line conditioning, including tests for vibration and

shock. Filters are available in a wide range of AC and DC voltage capacities.

Circle 69 on Reader Service Card

RACAL-DECCA

The Racal-Decca Master Radar series is a "building block" radar system that can be configured as a 16-inch relative motion radar and upgraded with modules to add anti-

collision true motion and automatic radar plotting aid (ARPA) capabilities.

This modular approach gives design and production economies and a wide range of usage applications. As a result, Master Radar systems meet or exceed IMO standards, but can cost less to buy, upgrade, and service. Purchase and maintenance economy are achieved without performance compromise.

Racal-Decca ARPA technology

has been extensively proven in operation around the world. Master Radar capabilities include automatic target tracking and collision-prediction alarms, pre-plotting of trail maneuvers, Cleanscan videoprocessing for best foul weather picture, bright recycled video, and easy-to-use "operator-proof" programming.

(continued on page 26)

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TO CONNECT TUBING TO SAE/MS STRAIGHT THREAD PORTS, USE:



Male SAE/MS Connector



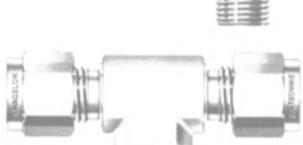
Long Male SAE/MS Connector



45° Male SAE/MS Elbow/Positionable



90° Male SAE/MS Elbow/Positionable



Male SAE/MS Branch Tee/Positionable



Male SAE/MS Run Tee/Positionable



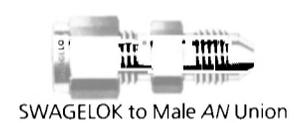
Reducer

TO REDUCE A SAE/MS PORT, USE:

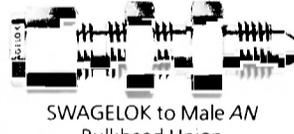


Reducer

TO CONNECT TWO TUBES OR TWO TUBE FITTINGS TOGETHER, USE:



SWAGELOK to Male AN Union



SWAGELOK to Male AN Bulkhead Union



SWAGELOK to Female AN Adapter

TO PLUG A SAE/MS PORT, USE:

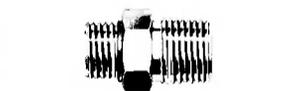


Hollow Hex Plug



Hex Head Plug

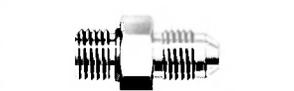
TO ADAPT SAE/MS TO NPT OR AN USE:



SAE/MS to Male NPT



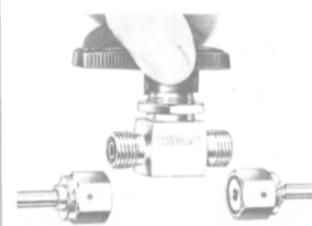
SAE/MS to Female NPT



SAE/MS to Male AN

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Zero Clearance Female Connector



Zero Clearance SWAGELOK Connector



Zero Clearance Straight Thread Connector



VCO Male Elbow

Patented



VCO Male Straight Thread Connector



VCO Male Straight Thread Elbow/Positionable



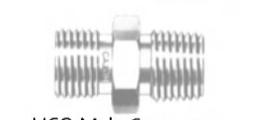
VCO SWAGELOK Connector



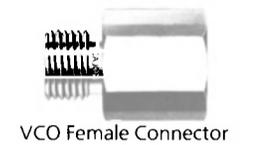
VCO SWAGELOK Bulkhead Connector



VCO SWAGELOK Elbow



VCO Male Connector



VCO Female Connector

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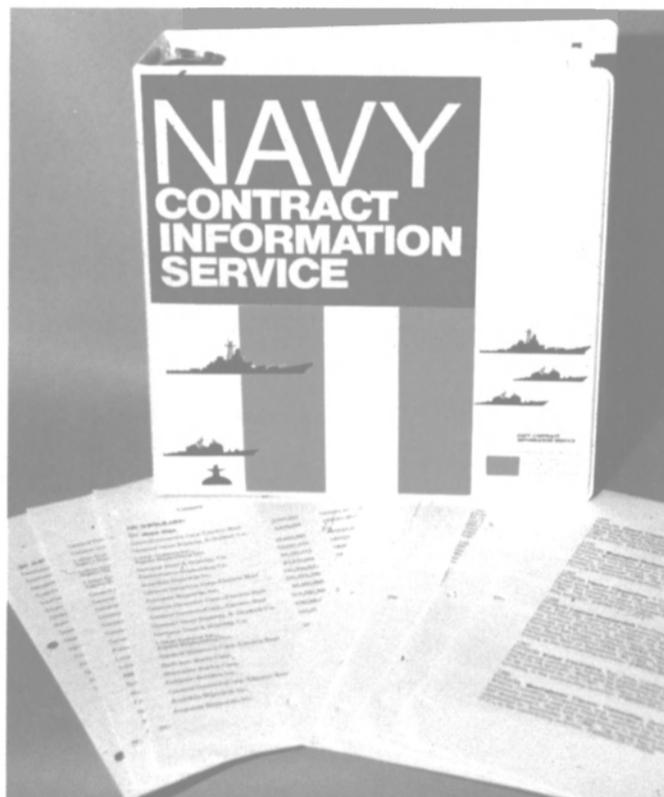
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Navigation/Communications Equipment — A Review

(continued)

To support global operations, Racal-Decca has more than 500 radar service locations worldwide.

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RADIO-HOLLAND

Radio-Holland USA, B.V., Distributor Products Division, Houston, is the exclusive distributor in the U.S. for many quality-oriented communications and navigation equipment suppliers. Sales and service are nationwide through an ex-

tensive network of nearly 200 marine dealers, and are also supported through the worldwide network of Radio-Holland B.V. of Amsterdam. Manufacturers and products represented include the following:

S.P. Radio Sailor of Aalborg, Denmark—the compact VHF 25-watt radio RT2047, with full duplex/simplex, 60 private channels, dual watch, and scanning; the 25-watt

VHF RT146, full duplex/simplex, 20 private channels, dual watch; the 25-watt VHF RT144AC, simplex/semi-duplex, five private channels, dual watch; the compact scrambler CRY2001, operates on any VHF/SSB, double scrambling, 16.8 million code combinations, group calling; the 1000 SSB 400-watt station with auto-tuned coupler, also available with fully automatic radiotelex station with scanning capabilities; and the 500 kHz main/reserve SOLAS station.

From Thrane and Thrane of Copenhagen—TT1600 integrated, automatic radio/telex system including TT1585C ARQ modem with 64K character text editing memory, keyboard processor, video display unit, and hard copy printer.

From Philips of the Netherlands—Pact 250 teleprinter with video display unit, basic electronic memory of 38K characters expandable to 166K characters.

From Kelvin Hughes of England—Series 500 complete X band radar package with peak output of 10 kilowatts available as two- or three-unit system; Series 1600 complete radar package for vessels over 1,600 gross tons, two- or three-unit system with 10 kw output or three-unit system with 25 kw output.

From COMSAT TeleSystems—TSI MCS 9100 maritime satellite communications system. From Odin, Inc.—the NCD-39 real-time electronic charting system. From Radio-Holland B.V. of Amsterdam—RH TR-4750 survival craft radio, RH 4316 VHF omnimeter, and RH 4312 video interface unit.

Circle 80 on Reader Service Card

RAYTHEON MARINE

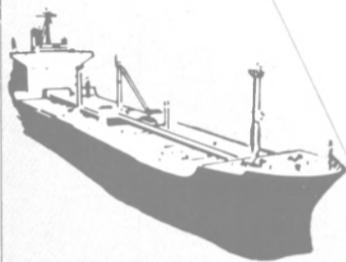
Raytheon Marine Company of Manchester, N.H., has introduced two new low-cost rasterscan radars so that all workboat operators can benefit from the new technology that has made radar more affordable. The 3604 and 3610 radars, with maximum ranges of 36 and 64 nautical miles, will also serve as backup units for oceangoing ships.

Using digital rasterscan technology, with high-resolution (512 lines), 12-inch-diagonal TV type displays, the new radars provide sharp, continuous 360-degree pictures that are easy to read from a distance. Standard features include electronic bearing line, variable range marker, SeaGuard intrusion alarm, interference rejection, selectable target expander, and on-screen tuning.

In addition to the new rasterscan radars, of major importance is Raytheon's introduction of a new DSL-150 doppler speed log that helps workboat and ship operators meet IMO requirements. The highly accurate DSL-150 interfaces with radar, ARPA, satellite navigators, and other equipment, and has a wide range of interfacing remote displays. The display has a three-digit, red LED readout indicating speed from zero to 30 knots in $\frac{1}{10}$ -knot increments. Distance run is indi-

Maritime Reporter/Engineering News

“SERIES 9000” AUTOMATIC DIAL TELEPHONE SYSTEM



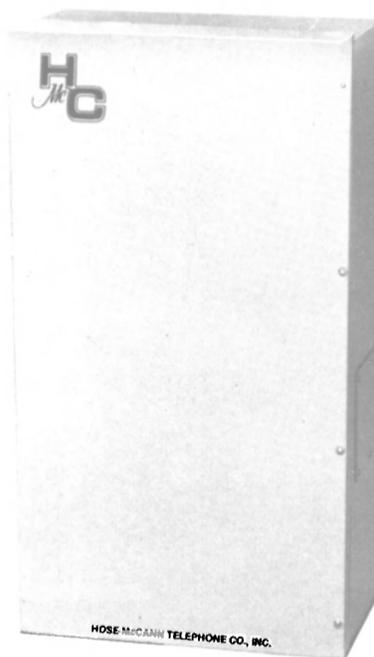
THE PAX-PABX DESIGNED EXCLUSIVELY FOR MARINE USE

After two years of technological and marketing research, the HOSE-McCANN TELEPHONE CO., INC., has developed a completely new automatic dial telephone system.

The new solid state telephone system, known as the “SERIES 9000”, was developed especially for use in the maritime industry, to meet the most demanding requirements for ships at sea. The primary objective was to build a marine communication system with the highest degree of reliability, flexibility and optimum performance.

Many features are included in the system as standard equipment, and some optional features are available for special requirements.

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- **CALL CONFERENCING** On any type of call (inside or outside source), any station can add other stations to conference.
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Circle 151 on Reader Service Card

cated by a six-digit counter, with manual reset on the front panel.

A new commercial, chart-recording echo sounder has also been introduced to meet IMO requirements for most ships. The RD-500 sounder records and prints depth in six ranges to 1,000 feet, meters, or fathoms, and prints time and event marks on the chart. Digital depth display and pre-settable, audible

depth alarm are provided. A 80-kHz transducer is standard.

Other new products from Raytheon include: the RAYAX-500 weather facsimile receiver/recorder; RAYSAT-200 satellite navigator; RAYNAV-750 MK II Loran C navigator; and the RAY-1285 SSB marine radiotelephone.

Circle 71 on Reader Service Card

RAYTHEON OCEAN

Raytheon Ocean Systems Company of East Providence, R.I., has introduced an inexpensive, micro-processor-based remote display designed for maximum compatibility with the company's established Fathometer® depth sounder and speed log product lines.

The ruggedized display is lightweight and compact for transportability. It features a splash-proof, corrosion-resistant case, and has an AC/DC option. The unit will ease operation and enhance the performance of Raytheon's DSF-6000 digital survey Fathometer and navigational speed log. The remote display will also perform well in conjunction (continued on page 28)

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Circle 25 on Reader Service Card

Navigation/Communications Equipment — A Review

(continued)

with other commercially available marine products featuring a compatible interface.

The new instrument has a large liquid crystal display that is clearly viewable in surroundings ranging from bright sunlight to completely darkened environments. Software customization is available, and a "daisy chain" capability for multiple display requirements is built in. A complete internal self-test is accomplished automatically each time it is turned on.

Remote installation can, under certain conditions, be as far away as 1,000 feet, with mounting on a bulkhead, tabletop, panel, or overhead. The product is engineered to military specifications for vibration, can withstand shock of 50 Gs for 11 mil-



liseconds, and can function in 100-

percent humidity with temperatures ranging from 0 to 70 C.

Circle 72 on Reader Service Card

RAYTHEON SERVICE

The Marine Department of Raytheon Service Company (RSC), headquartered in Glen Burnie, Md., provides sales, installation, service, and maintenance for a wide variety of marine navigational and communications equipment and systems, including radars, Fathometers, satellite communications, SOLAS radio stations, gyro/steering systems, and fuel management systems.

In addition to the head office, RSC operates at eight other locations around the country, in Los Angeles, San Diego, Houston, New Orleans, Norfolk, Baltimore, Philadelphia, and the New York/New Jersey area. The company maintains a million-dollar inventory of spare parts.

Circle 91 on Reader Service Card

RDI

RDI Radar Devices, Inc. of San Leandro, Calif., a leading manufacturer of guard zone warning equipment, offers several new navigation and communications products. These include the RDI ARPA I, M10 Collision Avoidance System, Star* Trac Satellite Navigator, and

Satcom I Inmarsat Satellite Communications System.

For shipowners having to comply with the mandatory International Maritime Organization (IMO) ARPA fitting, the RDI ARPA I, M10 represents the most economical solution.

The Amendments to the International Convention for the Safety of Life at Sea, SOLAS 1974, adopted by the Maritime Safety Committee in November 1981, state: "Automatic radar plotting aids fitted prior to September 1, 1984 which do not fully conform to the performance standards adopted by the Organization may, at the discretion of the Administration, be retained until January 1, 1991."

In simple terms, this statement provides an opportunity for a shipowner to fit an RDI ARPA I to a 12-inch radar and comply with the spirit of the IMO regulations until 1991.

In 1982, the U.S. Coast Guard permitted an add-on ARPA solution for existing 12-inch radars. These ARPA I/12-inch radar combinations may be retained until 1991 when the IMO ARPA specifications take full effect.

The Star* Trac satellite navigator, a commercial satnav at a competitive price, offers 64 navigation displays plus log/gyro interface for a list price of \$2,495.

The new RDI Satcom I features a

self-prompting keyboard to make operations simple. Designed for use with Inmarsat, the unit can be interfaced with the Star* Trac satnav to provide an automatic vessel monitoring system for less than \$33,000.

Circle 90 on Reader Service Card

REGENCY

Regency Electronics, Inc. of Indianapolis, Ind., recently introduced the Polaris MT6500, a synthesized marine band receiver. The unit operates on all U.S. and international channels, 10 weather channels, and has capacity to add up to 10 private channels. The scanning receiver section can be programmed to scan as few as two or as many as all of the marine channels.

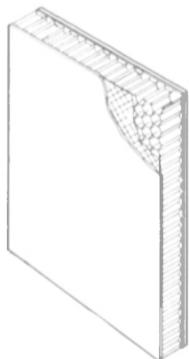
All information is entered into the microprocessor through the backlit, translucent rubber keyboard. Channel numbers and prompting information is displayed on the vacuum fluorescent display. A special feature of the MT6500 is a programmable, dual-priority capability that either automatically reverts to the priority channel when a call is received on beeps to let the operator know there is a call on the priority channel.

The American-made Polaris MT6500 also features a 25/1 watt selector, bright/dim panel light con-

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Circle 165 on Reader Service Card

Maritime Reporter/Engineering News

cated by a six-digit counter, with manual reset on the front panel.

A new commercial, chart-recording echo sounder has also been introduced to meet IMO requirements for most ships. The RD-500 sounder records and prints depth in six ranges to 1,000 feet, meters, or fathoms, and prints time and event marks on the chart. Digital depth display and pre-settable, audible

depth alarm are provided. A 80-kHz transducer is standard.

Other new products from Raytheon include: the RAYAX-500 weather facsimile receiver/recorder; RAYSAT-200 satellite navigator; RAYNAV-750 MK II Loran C navigator; and the RAY-1285 SSB marine radiotelephone.

Circle 71 on Reader Service Card

RAYTHEON OCEAN

Raytheon Ocean Systems Company of East Providence, R.I., has introduced an inexpensive, micro-processor-based remote display designed for maximum compatibility with the company's established Fathometer® depth sounder and speed log product lines.

The ruggedized display is lightweight and compact for transportability. It features a splash-proof, corrosion-resistant case, and has an AC/DC option. The unit will ease operation and enhance the performance of Raytheon's DSF-6000 digital survey Fathometer and navigational speed log. The remote display will also perform well in conjunction (continued on page 28)

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May 15, 1985

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With the SAILOR Short Wave Programme 1000/B it is possible to have a fully automatic shipboard radiotelex station,

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Circle 25 on Reader Service Card

Navigation/Communications Equipment — A Review

(continued)

with other commercially available marine products featuring a compatible interface.

The new instrument has a large liquid crystal display that is clearly viewable in surroundings ranging from bright sunlight to completely darkened environments. Software customization is available, and a "daisy chain" capability for multiple display requirements is built in. A complete internal self-test is accomplished automatically each time it is turned on.

Remote installation can, under certain conditions, be as far away as 1,000 feet, with mounting on a bulkhead, tabletop, panel, or overhead. The product is engineered to military specifications for vibration, can withstand shock of 50 Gs for 11 mil-



liseconds, and can function in 100-

percent humidity with temperatures ranging from 0 to 70 C.

Circle 72 on Reader Service Card

RAYTHEON SERVICE

The Marine Department of Raytheon Service Company (RSC), headquartered in Glen Burnie, Md., provides sales, installation, service, and maintenance for a wide variety of marine navigational and communications equipment and systems, including radars, Fathometers, satellite communications, SOLAS radio stations, gyro/steering systems, and fuel management systems.

In addition to the head office, RSC operates at eight other locations around the country, in Los Angeles, San Diego, Houston, New Orleans, Norfolk, Baltimore, Philadelphia, and the New York/New Jersey area. The company maintains a million-dollar inventory of spare parts.

Circle 91 on Reader Service Card

RDI

RDI Radar Devices, Inc. of San Leandro, Calif., a leading manufacturer of guard zone warning equipment, offers several new navigation and communications products. These include the RDI ARPA I, M10 Collision Avoidance System, Star* Trac Satellite Navigator, and

Satcom I Inmarsat Satellite Communications System.

For shipowners having to comply with the mandatory International Maritime Organization (IMO) ARPA fitting, the RDI ARPA I, M10 represents the most economical solution.

The Amendments to the International Convention for the Safety of Life at Sea, SOLAS 1974, adopted by the Maritime Safety Committee in November 1981, state: "Automatic radar plotting aids fitted prior to September 1, 1984 which do not fully conform to the performance standards adopted by the Organization may, at the discretion of the Administration, be retained until January 1, 1991."

In simple terms, this statement provides an opportunity for a shipowner to fit an RDI ARPA I to a 12-inch radar and comply with the spirit of the IMO regulations until 1991.

In 1982, the U.S. Coast Guard permitted an add-on ARPA solution for existing 12-inch radars. These ARPA I/12-inch radar combinations may be retained until 1991 when the IMO ARPA specifications take full effect.

The Star* Trac satellite navigator, a commercial satnav at a competitive price, offers 64 navigation displays plus log/gyro interface for a list price of \$2,495.

The new RDI Satcom I features a

self-prompting keyboard to make operations simple. Designed for use with Inmarsat, the unit can be interfaced with the Star* Trac satnav to provide an automatic vessel monitoring system for less than \$33,000.

Circle 90 on Reader Service Card

REGENCY

Regency Electronics, Inc. of Indianapolis, Ind., recently introduced the Polaris MT6500, a synthesized marine band receiver. The unit operates on all U.S. and international channels, 10 weather channels, and has capacity to add up to 10 private channels. The scanning receiver section can be programmed to scan as few as two or as many as all of the marine channels.

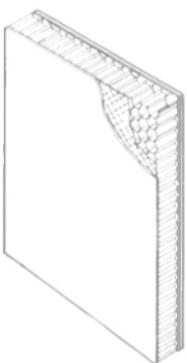
All information is entered into the microprocessor through the backlit, translucent rubber keyboard. Channel numbers and prompting information is displayed on the vacuum fluorescent display. A special feature of the MT6500 is a programmable, dual-priority capability that either automatically reverts to the priority channel when a call is received on beeps to let the operator know there is a call on the priority channel.

The American-made Polaris MT6500 also features a 25/1 watt selector, bright/dim panel light con-

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Circle 165 on Reader Service Card

Maritime Reporter/Engineering News



SELESMAR

Following an extensive research and development program, Selesmar S.p.A. of Italy is now marketing a high-resolution radar with digital scan converter and rasterscan presentation. While most other rasterscan systems utilize a resolution of 780 pixels, the new Selescan 1024 uses a high definition of 1,024 by

1,024 pixels in up to eight levels of intensity, provided on a standard monochrome display.

The 1024 is produced in all-version, relative motion, true motion, and ARPA models. In the latter case, basic radar and tracking controls have been designed according to the principle "one function-one control," whereas menu control via numeric keyboard has been chosen

for additional, non-urgent operation.

The 24-inch screen comprises two sections: a 350-mm diameter, high-resolution radar display; and a display presenting pre-selected navigational data. The latter section is also utilized as the interactive medium in menu operation.

Within the radar work station (continued on page 30)

trol, digital clock, and reversible mounting bracket.

Circle 73 on Reader Service Card

ROBERTSON/KONGSBERG

Based on extensive research into microprocessor technology, Robertson/Kongsberg North America Inc. of Hauppauge, N.Y., has introduced the AP-9 autopilot with adaptive rudder control system for medium to large vessels of all types.

The key feature of the AP-9 is predictive software that computes rudder response characteristics and completely replaces the dead-band principle. Combined with a totally new rudder feedback unit, this virtually eliminates rudder overshoot, resulting in more precise rudder positioning and extremely accurate steering.

The AP-9 uses LCDs to give course information and confirm the status of various control parameters. The use of touchbutton controls and the ability to take heading information from both magnetic and gyrocompass inputs makes this unit suitable for almost any vessel. It can take heading input from most popular brands of gyrocompasses, as well as from Robertson's highly accurate SKR-82 gyrocompass.

The AP-9 has a full range of remote controls and rudder angle indicators, as well as extensive self-test features. Optionally, a complete second steering station is available.

Robertson also announces a new member of its microprocessor-controlled autopilot family, the AP40. This pilot offers extremely simple yet highly accurate steering control for most commercial vessels and large yachts. The unit's design eliminates the need to individually set controls for rudder, counter rudder, etc., which can be a complex operation depending on vessel characteristics. Instead, a single pushbutton control selects one of the nine pre-programmed steering models that most accurately matches the vessel's characteristics.

The AP40, like all the Robertson autopilots, displays pertinent data on two large LCDs—one giving system status information, the other showing a digital course readout. The unit has built-in offcourse alarm and rate-of-turn control. It is said to be ideal for new vessel installations and for retrofits. Options include remote controls, watch alarm, and rudder angle indicators.

Circle 74 on Reader Service Card

May 15, 1985

THE TIME IS NOW. THE ADVANTAGE IS YOURS. THE VESSEL IS BLOUNT.

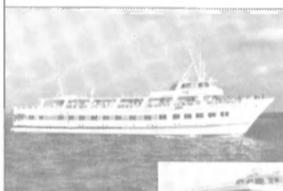
CRUISE SHIPS	DIVE BOATS	COMMUTER BOATS	WATER TAXIS	DINNER BOATS	THE YARD
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Now is the time to apply your 1985 Federal Investment Tax Credit toward the construction of new commercial watercraft designed and built to your specification. Blount Marine Corporation would be pleased to work with you in this matter, recommend the most suitable hull configuration to meet your needs, and provide estimates and delivery dates.

This is an excellent opportunity to obtain the kind of vessel you need and, at the same time, make use of your Investment Tax Credit Dollars. But the time is now

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The 150' x 28' x 7' M/V New Shoreham II Carries 100 passengers in 36 deluxe cabins on three decks. Equipped with bow landing ramp.



Maximum draft: 5'6" — can negotiate most canals and docks at quaint out-of-the-way places larger vessels cannot approach.

The 165' "Caribbean Prince" and her sister-ship, the "New Shoreham II," were built for inland waterway overnight cruising.

DIVE BOATS

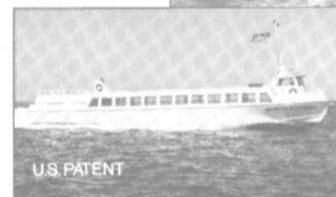
Aluminum superstructure mounts on Hitech unsinkable hull. Powered with a



370 HP Caterpillar 3208 turbo-charged diesel. Super-fast. Low wake. Propulsion by an Arneson surface piercing propeller. Speeds to 40 knots. Available in several configurations. Shipable by truck anywhere.

COMMUTER BOATS

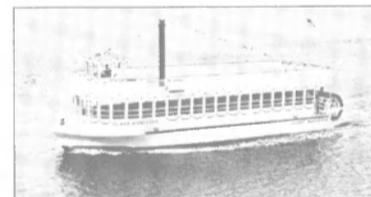
Choose from a variety of fast, light-weight, high speed commuter boats. Three 75' commuter ferries have been tested



at speeds up to 30 MPH. The 77' Hitech Express is unsinkable and carries 149 passengers at speeds to 30 MPH

WATER TAXIS

Choose from a wide range of passenger boat configurations. Blount offers you complete design flexibility and can provide almost any kind of hull custom-configured



to your needs. One of two 65-footers built for tours in the Thousand Island area of New York, the "Island Wanderer" is finished paddle-wheel style.

DINNER BOATS

A Blount specialty. The 145' Riveranda is powered by two 8V92 diesels. Carries



425 passengers. Seats 350 in two carpeted air-conditioned dining rooms.

The 150' "Star of Chicago" is considered to be one of the largest dinner boats in the world. Has passenger capacity of 600 and will seat 450 in two dining rooms.

The 134' "New Spirit" can carry 600 passengers.

Offers two completely enclosed and panelled decks plus a third open deck.

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The time is now to let Blount quote.

BLOUNT

MARINE CORPORATION

Circle 105 on Reader Service Card

Navigation/Communications Equipment — A Review

(continued)

console (designed by ergonomic specialists for either standing or sitting position), a separate microprocessor stores radar video and intelligently analyzes the scenario around a target. This innovation practically eliminates target swap and makes area surveillance possible.

A second product announced by Selesmar is the new Autotrack 2. Taking advantage of the technological progress and following wide field experience, the company's well-known Autotrack ARPA display has been improved for greater simplicity, while maintaining the outstanding quality and operational features, which largely exceed IMO regulations.

Circle 75 on Reader Service Card

SHIP ANALYTICS

The Seafarers International Union has just commissioned the world's first interactive, color day, night, and dusk visual shiphandling simulators, designed and built by Ship Analytics of North Stonington, Conn.

Located at the Harry Lundeberg School of Seamanship in Piney Point, Md., this facility contains a full bridge simulator and three radar bridge simulators. Ship Analytics utilized its modular Pilotship and Schoolship simulation technology, interfacing visual systems between the full bridge and the radar cubicles.

The Schoolship configuration provides basic shiphandling train-

ing capability within a radar cubicle at moderate cost and within a small space. It provides high resolution, color day, night, and dusk visual scenes up to 110 degrees horizontal field of vision, complementary bridge and navigation equipment, and hydrodynamic models interfaced with the radar simulator. The Schoolship configuration can be conveniently upgraded to the Pilotship configuration as training demands increase.

Ship Analytics utilized its Pilotship configuration to provide senior officer shiphandling training capability within the full bridge setting for collision avoidance, piloting, and navigation. Pilotship provides ultra high resolution, color day, night, and dusk visual scenes up to 230 degrees horizontal field including an aft view for tow operations.

Circle 89 on Reader Service Card

SIMRAD

Simrad, Inc. of Seattle markets the Simrad/Taiyo TD-C338HS automatic direction finder. This unit has a fully synthesized frequency range from 200 kHz to 17.999 MHz, with 100-frequency memory and 100-channel scanning. Frequency is selectable via keyboard or rotary encoder, in 0.1 kHz steps.

Frequency, channel, and signal strength are indicated by digital LED indicators. Bearings are displayed automatically by a CRT indicator, which includes auto-sense control.

The TD-C338HS unit is said to be one of the most advanced, state-of-the-art MF/HF automatic direction finders available.

Circle 88 on Reader Service Card

SI-TEX

Marine navigation data obtained by a conventional radar system can be displayed in six different colors on the CRM-1 color radar monitor from SI-TEX of Clearwater, Fla. The 360-degree presentation is continuous and never fades from view, and the color CRT allows exceptional daylight viewing, even without a hood.

The CRM-1 unit connects to most conventional radar systems, and converts system data into a six-color display depending on the strength of the returning echo. The strongest echoes are displayed in red, medium echoes are yellow, weak signals come in green, and the sea surface is displayed as blue. The variable bearing marker is displayed as a white dotted line, and the variable range marker appears as a white dotted circle. The plot line is black.

The plotting feature helps the operator determine relative bearing, course direction, and speed of moving targets around his vessel. Plotting time can be selected as 15 seconds (fast) or one minute (slow).

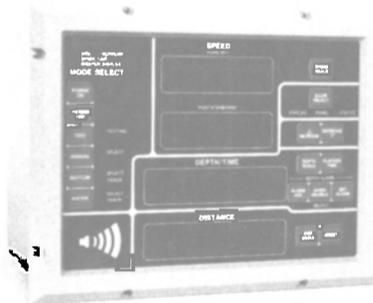
Range capability is from one-half to 64 nautical miles, depending on the capability of the master radar. The CRM-1 can be interfaced with most conventional radars, and can operate up to 50 feet away from the master radar.

An audible proximity alarm warns of a target's entry into a guard zone established by the operator. Five zones can be selected: full 360-degree radius, 180-degree on the bow, 90-degree on the bow, 180-degree on the port, and 180-degree on the starboard. Distance of range gates can be from one-half to 64 nautical miles from the vessel.

Circle 87 on Reader Service Card

SPERRY

To extend the capabilities of speed measurement for various shipboard needs, Sperry Corporation's Aerospace & Marine Group in Charlottesville, Va., now offers the SRD-421 two-axis, doppler speed log.



The new unit is designed to provide superior accuracy for display and transmission of speed, depth, and distance data, meeting the requirements of a wide range of vessels. It provides information to enhance efficient operations for the bridges of large oceangoing ships, as well as for special application such as dredges, ferries, hydrographic ships, and geophysical vessels.

The SRD-421 has two-axis speed

calculation that provides better speed data than a conventional speed log. It calculates distance traveled and depth under the hull with similar accuracy.

Three units comprise the SRD-421—the master display, the electronics unit, and the transducer.

The master display has touch-sensitive switches and easy-to-read LCD displays on its sectionally dimmed front panel. These simple controls allow the operator to select desired units for the three-digit fore/aft or port/starboard speed displays, four-digit depth or time display, three-digit depth alarm display (with audible alarm), and five-digit distance display.

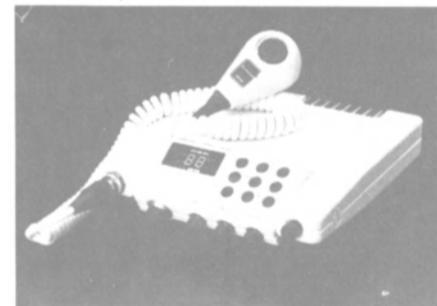
The electronics unit contains the transmit/receive circuitry and provides speed filters that automatically reduce response time needed to track rapid speed changes using another dedicated microprocessor.

The patented lens-type transducer is only eight inches in diameter. It uses a unique three-beam configuration, as opposed to four-beam transducers, making it more efficient and cost-effective.

Circle 76 on Reader Service Card

STANDARD

The latest marine VHF radio introduced by Standard Communications Corporation of Los Angeles features a totally new design. Called the Horizon Voyager, the new radio has a compact case measuring 7 by 7 by 1 inches, which houses a 25-watt, all-channel VHF radio, two-station intercom, and six-watt hailer.



The Voyager's innovative, tilting control panel conveniently places controls and the backlit LCD display at optimum viewing angle no matter where the radio is located—overhead, on, or under the console. Use of control seals, gasketing, and internal circuits sealed with Hemi-Seal®, protect microchips from the corrosive effects of salt water.

The new unit features all channels in each of the U.S., Canadian, and international frequency bands. Fifteen channels are assigned as auxiliary channels, for use as new frequencies are allocated by the FCC. The on-board microprocessor selects full 25-watt power, or lower 1-watt "in harbor" power automatically on channels 15 and 17. Programming of new frequencies can be handled in the field by Standard's network of authorized marine products dealers.

In addition to communications channels, six direct-select weather channels are provided. A marine priority scan feature permitting simultaneous monitoring of channel

NOW USE YOUR SATCOM TO SEND AND RECEIVE EXACT TELE-COPIES.

Alden's new FAX 340 III transceiver transmits and receives information that voice-link or telex cannot: engineering blueprints, financial and payroll information, diagrams, important documents and contracts, order forms, etc. Full pages sent in less than 30 seconds; perfect copies anywhere your satcom reaches.

For further information on our FAX 340 III group-3 high-speed digital transceiver, contact Alden Electronics, 125 Washington Street, Westborough, MA 01581, USA, or call (617) 366-8851.

ALDEN ELECTRONICS

Circle 172 on Reader Service Card

16 and other channels is programmed into the scan memory. An emergency override permits direct selection of channel 16 during emergencies.

The Voyager's memory with scan feature is controlled by the microprocessor, and permits monitoring of all active channels including auxiliary (future) channels. Backup power keeps the memory circuit alive when the main power switch is turned off. A two-station intercom and six-watt hailer may be selected at any time by pressing a single switch.

The unit's large numerical LCD display is a mini-information center in itself. The display shows channel in use, power level, and programs selected. A three-position dimmer enhances visibility in any lighting condition, including bright sunlight.

Circle 77 on Reader Service Card

TELEDYNE

Teledyne Hastings-Raydist of Hampton, Va., manufacturer of medium-range, precision radiopositioning systems, is currently conducting final testing on its revolutionary TRAK IV system.

Raydist TRAK IV is an improved version of the well-known Raydist DRS radiopositioning system utilizing "atomic clock" frequency standards and state-of-the-art technology to achieve practically unlimited user capability in the rho/rho mode on a single frequency allocation anywhere in the MF/HF band.

The new unit is particularly well suited to radiopositioning applications in which a relatively large number of simultaneous users must operate at ranges up to several hundred kilometers with a geodetic accuracy of a few meters. The rho/rho (circular) geometry makes the TRAK IV ideal for coastal applications, regardless of whether the coastline is concave, straight, or even convex. The comparatively broad lane widths (typically 100 meters or more) make lane recovery much easier than with other phase comparison systems.

The ability to track up to four LOPs continuously and simultaneously greatly increases system reliability. When used with the Raydist Director (microcomputer), interchecking is permitted between the redundant position data to achieve a statistically desired "best-fit" position solution and a "figure of merit" indication of probable accuracy. The Raydist Director also permits op-area initialization so

that the correct fractional values of the several LOPs can be established and/or verified in the actual area of operations.

Circle 78 on Reader Service Card

TEXAS INSTRUMENTS

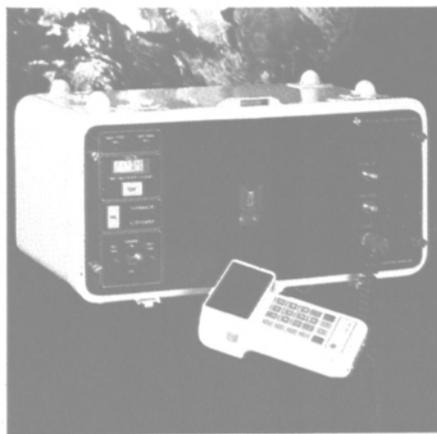
Texas Instruments of Dallas has announced a new addition to its TI 4100 Navstar navigator product line, an enhancement that makes the Global Positioning System (GPS) more productive as a navigation/positioning tool.

Called Satplan™, the new software product provides specific satellite visibility times and position dilution of precision (PDOP) information. It helps the operator select the best time at which the satellites are in a geometry that will produce a more accurate position.

Satplan selects the four best satellites available to the user, and provides information on precise GPS satellite rise and set times, satellite azimuth and elevation, satellite visibility, profile, and the recommended navigation mode.

The benefit to the user is said to be that Satplan displays and prints the information in tabular and graphic form so that a detailed schedule of satellite availability can be quickly prepared, including an analysis of the most efficient times for GPS use in each location and on each date desired.

Using the TI Color Professional or Portable Professional Computer, with 256K RAM and 8087 numerical co-processor, the easy-to-use Satplan complements the TI 4100 GPS receiver. Satplan almanac data can be taken directly from the receiver's display, or can be updated



from government or user sources. Almanac nomenclature is the same as that used by the TI 4100.

Circle 97 on Reader Service Card

TRACOR

The Bridgestar satellite navigator from Tracor Instruments of Austin, Texas, offers more value for 1985, with outstanding features and an economical price. In addition to all standard navigation functions, the Bridgestar calculates distance and bearing to 15 waypoints, with route planning between any two waypoints. Special software features provide the user with about 10 percent more usable satellite fixes than most other satnav receivers. In addition, a built-in speed and heading interface enables automatic dead reckoning between fixes.

The unit draws a maximum of 1.2 amperes at 12 volts DC. To conserve power, an innovative "Sleep Mode" allows the receiver to go into standby status between satfixes, and drops power usage to 0.2 amps. The

receiver will then "wake up" 20 minutes before the next satellite pass and be ready to calculate the next fix.

Continuous, accurate navigation data translates into time and fuel savings for an oceangoing vessel. Tracor's integrated Bridgestar satnav and Omega navigator, mounted on a single yoke, provide this essential information, with updates every 60 seconds. This compact, low-cost global navigation system combines the advantages of both satnav and Omega.

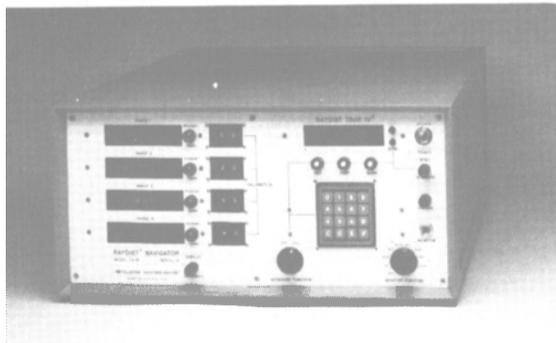
The greatest advantage of the Bridgestar is its very accurate position-fix capability. At each satellite fix, the Omega navigator is automatically updated by the satnav receiver. Between satellite fixes, the Omega receiver provides continuous navigation data as an invaluable aid to satnav dead reckoning. Because the system is comprised of two stand-alone units that can also operate independently, the user is assured of having a dependable navigation system available at all times.

Circle 79 on Reader Service Card

TRIMBLE

The Model 300 Loran computer offered by Trimble Navigation, Ltd. of Mountain View, Calif., is the Loran that continues navigating even where no Loran signals exist. The unit dead reckons position right through the signal interruptions that make other Lorans useless. It provides a constantly updated estimate of position even when the Trimble's normal Loran positioning capability is unavailable.

The Model 300 will stand alone as (continued on page 32)



May 15, 1985

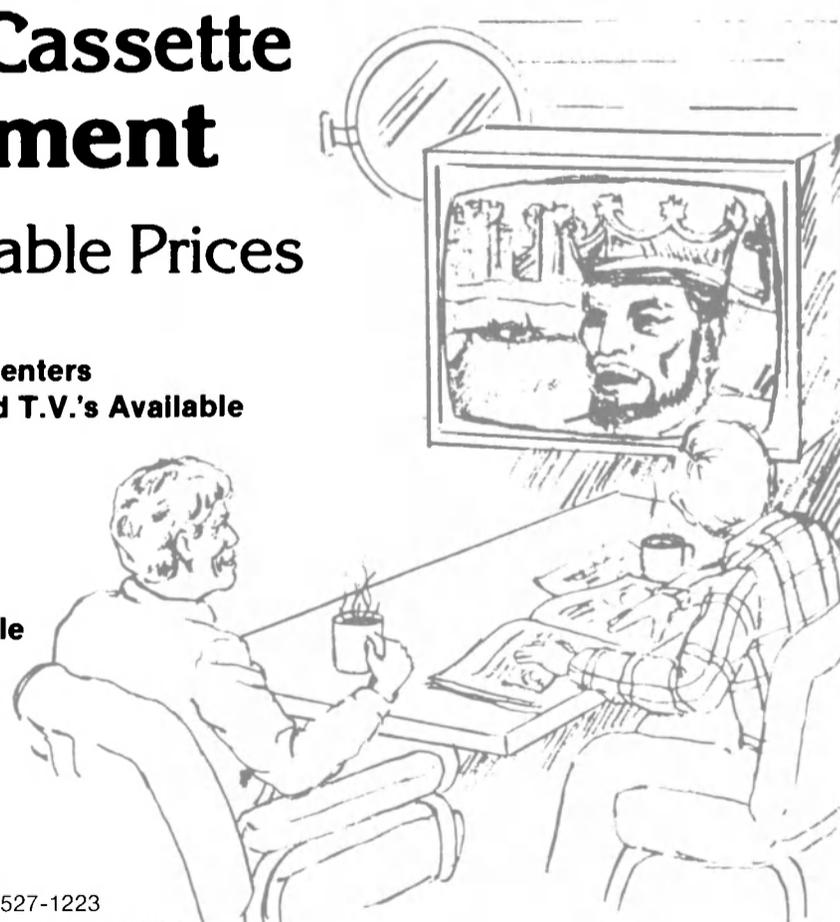
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Circle 131 on Reader Service Card

(continued)

a principal electronic aid to navigation or it may be the centerpiece of an integrated navigation system. Its dead-reckoning software package assumed the chore of recording estimated positions and calculates set and drift, utilizing external inputs of speed, heading, and time from a known position.

A track mode permits automatic tracking of the last nine Loran fixes at whatever time intervals required, and the last 10 satnav fixes with its corresponding Loran fix. This function may be invaluable in knowing a precise starting position for the dead-reckoning calculations or for retracing the course just traveled.

The Model 300 stand-alone package includes interface capabilities for satnav, wind and speed instruments, autopilots, CDI, plotters, RS 422 for computers, external alarms, external speed and heading transducers, and the Trimble full-function remote display. Also available is the optional Hewlett-Packard interface loop for handheld or personal computers. This interface is like having a handheld remote controller.

Circle 96 on Reader Service Card

II Morrow

II Morrow Inc. of Salem, Ore., is a leading manufacturer of marine navigation equipment, specializing in the production of Loran C receivers and XY track plotters.

The Avenger III Loran C receiver is the most recent addition to the company's product line. This unit is one of the smallest and more compact Loran C receivers, providing high accuracy and great repeatability. Features offered include current L/L, current LOP, 100 waypoints in L/L and LOPs, full navigation computer with bearing to destination in degrees, speed over bottom in knots, range in nautical miles, ground track in degrees, time to destination in minutes, cross track error, and point-to-point bearing and range between any two of the 100 waypoints.

The unit also offers anchor watch, arrival alert, SRN and ECD display, magnetic variation adjustment, ASF adjustment, and five-year, non-volatile memory. It also features a universal power supply operating on any dc input from 6.5 to 48 volts.

The Avenger III comes with a full two-year warranty, one of the best in the industry, and is priced at \$1,295.

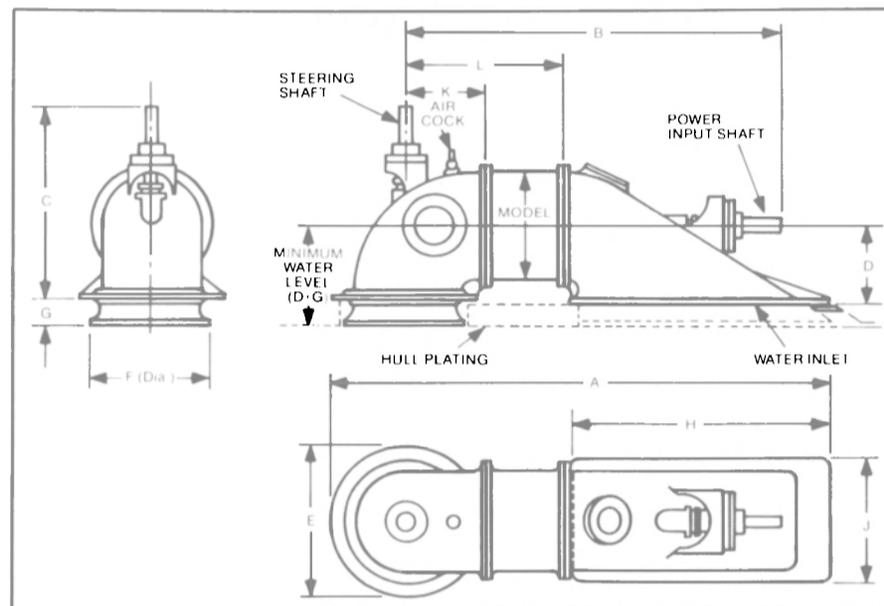
II Morrow also manufactures the Mariner M-33 track plotter, which provides a permanent hard-copy record of a vessel's track on any 8 1/2-by 11-inch sheet of paper or chart. This unit can even draw LOP grids on any scale to produce navigation charts.

Circle 95 on Reader Service Card

Elliott White Gill Thrusters Offer Unique Advantages

A main key to maneuverability in new ships is the special thrusters that enable her to keep on precise course or station and to "creep" at very low speeds, and demand for one such system, the Elliott White Gill™ thrust and propulsion unit, is said to be increasing because of its simplicity, versatility and ease of installation.

The Elliott White Gill thrust and propulsion unit is a low head, high volume axial pump capable of delivering thrusts of up to 38,000 pounds (17,000 kg) in every direction—forward, reverse, broadside, and any direction in between. It mounts flush with the hull, below the vessel's draft line, open to the water at both suction and discharge ports. Units are fitted in bow section, and/or stern, depending on application. Thrust is produced by drawing water through the intake, and discharging it on an almost horizontal plane through a deflector that rotates a full 360 degrees. No part of the system ever protrudes below the vessel's keel line and as a result it is extremely safe to use, for the thruster itself cannot be damaged by, or cause injury or damage to, lines,



Elliott horizontal shaft White Gill unit.

external structures, or personnel. It stays free of underwater hazards and cannot foul lines, cables or other submerged objects.

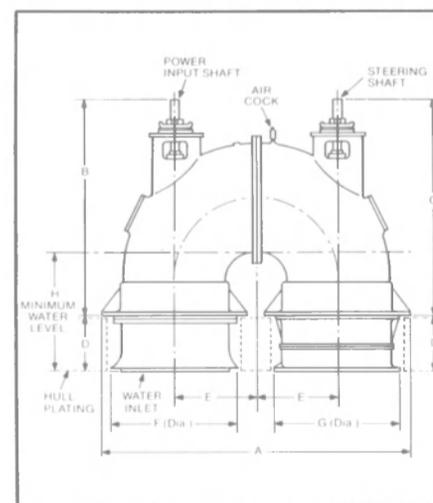
The inlet section of each White Gill unit is fitted with a sturdy metal grating to prevent large debris from being sucked into the pump

and possibly damaging rotor or discharge deflector. Smaller debris can pass through this "sieve" without harming the system.

The White Gill thruster can be powered direct or through gearing by any engine, or by any electric, diesel or hydraulic motor capable of meeting design requirements. The unique design does not require clutching mechanisms or reversing gears. Controls that are available vary from a simple joystick (lever switch) for control of thrust direction, with an option to control driver speed (magnitude of thrust) on the same joystick, up through complete dynamic positioning.

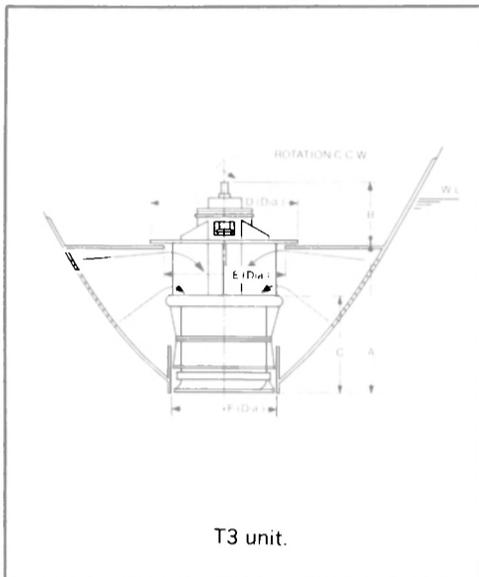


The White Gill bow thruster on the Royal Research Ship Charles Darwin (shown above) enables the vessel to heave-to in wind forces up to Beaufort 6 and has the added advantage of providing a "get-home" capability if main propulsion should fail.



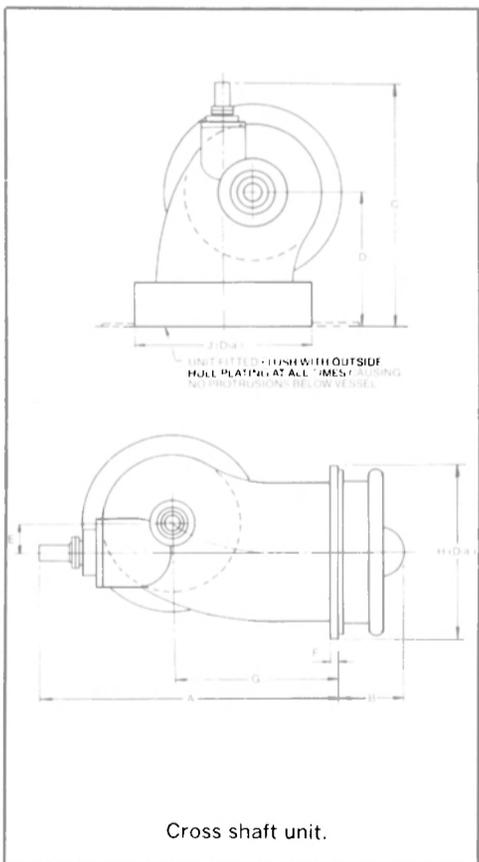
Vertical shaft unit.

A wide variety of designs and models is available to meet the specific requirements of every type vessel from tankers to tugs, service to salvage ships, barges, ferries, cable ships, research, survey and other craft plying offshore or inland waterways.



T3 unit.

Among notable installations, the new Royal Research Ship Charles Darwin, constructed at Appledore Shipbuilders for the National Environmental Research Council, is equipped with a White Gill bow thruster than can provide thrust in any direction and is capable of holding the ship in position up to Beaufort 6 wind force. Its 5.6 tons of static thrust can get the ship home in event of main propulsion troubles.



Cross shaft unit.

For further literature containing full information on Elliott White Gill thrust and propulsion units,

Circle 38 on Reader Service Card

Tompkins To Market BFGoodrich Bearings In Four Eastern States

Lucian Q. Moffitt, Inc., a subsidiary of BFGoodrich, has named **Guy Tompkins** as a manufacturer's representative for BFGoodrich Cutless® brand bearings. He will cover the commercial marine indus-

try in Maryland, Virginia, North Carolina, and South Carolina.

Mr. Tompkins' marine products group consists of four outside sales engineers with offices in Virginia Beach, Va., and Charleston, S.C. The group specializes in custom-engineered products for the marine industry.

"The addition of Mr. Tompkins to the marketing network of Lucian Q. Moffitt represents the company's commitment to increase its direct

presence in the commercial marine marketplace," said **Robert L. Gilson**, Moffitt marketing and sales manager.

Cutless brand bearings' resilient rubber lining and exclusive water wedge design have earned it a reputation for high quality and long-lasting performance in the marine industry.

For more information,

Circle 29 on Reader Service Card

THIS FINAL CONFERENCE PROGRAMME FEATURES SEVERAL IMPORTANT ADDITIONAL PRESENTATIONS *

CRUISE 85

International Conference & Exhibition
London Hilton on Park Lane 19-20 June 1985

— THE FUTURE —

Market-based Cruise Product Design

D. Tatzin, Arthur D. Little Inc., San Francisco, USA

Converting Concepts to Reality

K. Levander, Manager, Research and Development, Wartsila AB, Helsinki, Finland

The Way Ahead

R. Zeller, Chief Executive, Norwegian Caribbean Lines and Royal Viking Line, Miami, USA

Cruise Investment Strategy

R. Fain, Joint Managing Director, Gotaas-Larsen Ltd. and Director, Royal Caribbean Cruise Line and Eastern and Western Cruise Lines

A European View

B. Crisp, UK Director, Marketing and Operations, Cunard, London

The SS "United States" — preparing for 1987

Captain J. Cox, Senior Vice President, United States Cruises Inc., Brisbane, CA, USA

US incentive travel to Europe —

The Danube River Cruise Concept

I. Schneuing, President, D-Line, Deutsche Donau-Kreuzschiffahrts GmbH and The Incoming Tourist Service GmbH, Munich, West Germany

A strategy to increase Cruising in Egypt, the Red Sea and the Mediterranean

M. S. Lebeta, Chairman, Egyptian Chamber of Tourism and Travel Agencies, Cairo, Egypt

Cruise Marketing — Obtaining a better return?

K. Page, Director, Passenger Shipping Association, London

Sail Cruisers and Market Segmentation

J.-C. Potier, President, Windstar Sail Cruises Ltd., Miami

The often-ignored business opportunities of on-board services: designing innovative offerings and managing service quality

S. Buchin, Senior Vice President, Temple, Barker and Sloane Inc., Lexington, Massachusetts

At the centre of the cruise revolution — Miami today and tomorrow

C. J. Lunetta, Port Director, Port of Miami

— OPERATIONS —

Cruise Liner Berthing and Navigation in Restricted Waters — manoeuvring simulation study

O. Tersloev, Naval Architect, Danish Maritime Institute, Lyngby, Denmark

70 Shops on 28 Ships — different markets demand different approaches

E. Symes, Managing Director, Ocean Trading, Southampton, UK

Planning a catering system for maximum profitability — are turnkey systems the future?

S. Krouvila, Chief Designer, Oy Metos Marine, Kerava, Finland

On-line Viewdata Reservations and Accounting Systems for Cruise Lines

D. Hinkley, IBM and R. Gwynn, Marketing Director, Viewdata Information Processing Ltd., London

Maximising Shipboard Revenue on passenger overnight-cruise ferries

Speaker to be announced

A fresh look at vessel appearance — overcoming the operator's problem

C. Stevens, Marketing Manager, International Paint Marine Coatings, Felling, UK

— SHIP DESIGN —

Ship Design for the further development of the Cruise Market

This presentation will examine areas where designers could possibly stimulate the market. In particular, the environment aspects of cabins and public spaces
B. Hansen, Manager, Research and Development Dept., Aalborg Vaerft A/S, Aalborg, Denmark

Panel Discussion

The foregoing paper will be used as the basis for a panel discussion led by Mr. Hansen.

Panellists: B. Hansen, Aalborg Vaerft
R. Dussert-Vidalet, Chantiers du Nord et de la Mediterranee
V. Airaksinen, Wartsila AB
N. Eide, Cruise Ship Designer, Oslo project involvement includes: "Rotterdam", "Sagafjord", "Vistafjord", "Song of America" and "Royal Princess"
J. Victor, Managing Director, Technical Marine Planning Ltd., London Consultant for Carnival Cruise Line

The Cruise Ship and the Classification Society — precontract phase, the building period and the ship in service — new cost-conscious survey alternatives

J. Telle, Principal Surveyor, Det norske Veritas, Oslo, Norway

"Fairisky" (twin-screw turbine propulsion) and "Atlantic" (twin-screw diesel propulsion) — two similar sized large cruise liners but different in concept

This paper will discuss some of the main features including: hotel organisation — vibration and sound levels — electrical power distribution

R. Dussert-Vidalet
Chantiers du Nord et de la Mediterranee, Paris

REGISTRATION

We wish to make Conference Registration(s) for delegate(s) and enclose our cheque for made payable to BML Business Meetings Ltd.

Conference fee of £290 (US\$377) (includes UK VAT on taxable element), includes conference documentation, lunches, coffee breaks and invitations to the official buffet evening.

Delegate(s) who will attend please print:

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Title
Name
Title Telephone
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Complete this form and return with remittance to:-

Cruise Secretariat
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Herts WD3 1QP UK
Tel. Rickmansworth (0923) 776363
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MR



Principals at recent SNAME/ASNE joint meeting in Los Angeles included (L to R): **Paul Cromer**, papers chairman; **Len Thorell**, senior management representative; **Dr. Asinovsky**, author; **Robert Levine**, SNAME secretary-treasurer; **Mr. Ramsey**, author; **Gary Cash**, SNAME chairman; **John Marriner**, student programs; and **James Scholl**, SNAME vice chairman. Seated: **Capt. Nederman**, ASNE vice chairman; and **Magda Fodor**, ASNE secretary.

Los Angeles SNAME And ASNE Sections Meet In Joint Session

The Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers, in a recent joint meeting with the Long Beach-Greater Los Angeles Section of the American Society of Naval Engineers aboard the SS Princess Louise I, heard two presentations.

The first was entitled "Consideration of Maneuverability Characteristics in the Rudder Design Process," by **Dr. Volf Asinovsky**, senior naval architect in John J. McMullen Associates' Arlington, Va., office. The second, a student paper provided by ASNE, was entitled "A Short History of the Sea Explorer Ship Shipjack and Their Boats," by **Gregory K. Ramsey**, a student at the California State University in Long Beach.

Dr. Asinovsky's paper dis-

cussed the correlation between the kinematics of ship motion and the hydrodynamic force developed by the ship's rudder. The author amplified his presentation with mathematics and illustrations showing the relationship between movements of the ship's CG and those of the rudder, along with charts of rudder torques and other characteristics.

Mr. Ramsey's paper, which won the \$100 prize in the local ASNE/SNAME Student Paper Competition for 1985, dealt with a local group called a "ship" of Sea Explorers (formerly Sea Scouts), their various boats, and their activities through the years. This included the story of their overhaul, outfitting, and re-engining of a former Navy MSB-5 Class minesweeper in the mid-70s.

Literature Available On FIRE-PREP® 2012 From Nalco Chemical

The Transportation Chemicals Group of Nalco Chemical Company, Oak Brook, Ill., has announced their new diesel fuel additive, FIRE-PREP 2012. It is designed to control bacteria and fungi in marine diesel fuel storage tanks and also helps disperse existing sludge and controls formation of new sludge in the storage tank. The liquid product is added to the fuel as it is unloaded from tank car or truck into the diesel storage tank.

Control of microbial activity and sludge in the storage tank helps reduce filter plugging in fuel handling systems, thus preventing stall-

ing, poor acceleration and other diesel engine operating difficulties. It also helps reduce injector sticking, clogging of injector nozzles and fuel line plugging.

An ingredient in FIRE-PREP 2012 helps ensure more complete combustion of the diesel fuel, reducing sparking and smoking. It helps minimize deposits in the combustion chamber, on valves, pistons, rings and in exhaust manifold. A corrosion inhibitor in the product helps to protect system components from chemical attack, prolongs life and reduces maintenance. FIRE-PREP 2012 is available in 1-gallon containers, 5-gallon pails and 55-gallon drums.

For further information on FIRE-PREP 2012 from Nalco,

Circle 27 on Reader Service Card

Skantek Announces SK-401, An OCR Software Technology Breakthrough—Literature Available

After a year of intensive development, Skantek Corporation, Warren, N.J. has announced the SK-401, the first commercially available optical character recognition (OCR) software to decipher and reproduce hand-lettered characters on engineering drawings.

The first step in the development was to build a "knowledge base" of individual draftsmen's block lettering styles and machine printed characters. The SK-401 software refers to this knowledge base to identify hand lettering styles and common drafting typefaces.

The result was a cross section of more than 60 personal lettering styles. Combined with the two most common block lettering styles, Leroy[®] Modern and Varityper[®], a knowledge base was assembled that could correlate block machine lettering as well as standard drafting letter styles.

The next step was to speed up the three algorithms at the heart of the OCR software. Skantek engineers integrated the algorithms for locat-

ing and converting the text allowing the software to process 2,000 characters in 15 minutes. The result was the SK-401 OCR package which enables the SK-1010 automatic digitizing scanner to recognize and convert alphanumerics and many other symbols frequently used on engineering drawings.

The SK-401 OCR software classifies characters by assigning a unique code to each character or symbol. The receiving CAD/CAE system can then immediately recognize and handle the data. This automatic coding of characters by the scanner reduces the editing time required on each scanned drawing file transferred to the CAD/CAE system therefore operator productivity during the drawing conversion process is increased. In addition, the space required within the CAD/CAE system's memory for storage of text can be reduced.

For complete information on the SK-401 from Skantek,

Circle 36 on Reader Service Card

Navy Awards Sperry \$24.9-Million Contract

Sperry Corporation, Defense Products Group, Great Neck, N.Y., is being awarded a \$24,975,000 fixed-price-incentive contract for ordnance alteration kits for the AN/SPG-55B Terrier radar set. Work will be performed in Great Neck, N.Y. (45 percent); Clearwater, Fla. (35 percent); and Waterbury, Conn. (20 percent), and is expected to be completed February 28, 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

John Crane Offers Literature On Their Line Of Bellows Seals

Bellows seals have long been essential to sealing integrity in a wide range of industrial rotary shaft applications. Elastomer, metal and TFE bellows seals are universally accepted for the performance, safety and cost effectiveness they offer.

John Crane-Houdaille Inc. of Morton Grove, Ill. has available comprehensive and detailed literature on the types of bellows seals they carry. They offer three distinct types of seals which have exact recommendations for application. The elastomer bellows seals (John Crane types 1 and 2 series), metal bellows

(John Crane type 15 series) and the TFE Bellows (John Crane Type 20 series).

The elastomer bellows seals take extremes of temperature from -40°F to +550°F. They stand up to operational pressures as great as 1200 psi and static pressures up to 2000 psi. Because elastomers inherently retain their flexibility and are not subject to fatigue as the bellows perform their flexing functions, they are better performers in many situations.

Metal bellows seals satisfy other services that are beyond the range of elastomers, including cryogenics, heat transfer fluids, severe chemicals and corrosives at temperatures as great as 800°F. Recent improvements include a special design, low distortion front adapter assembly that ensures insert face flatness through the entire operating temperature range, special shrink fit for high temperature applications and thicker bellows for pressures up to 500 psi.

The TFE bellows seals are recommended for the most hostile environments where elastomer and metal bellows won't hold up to concentrations of acids and salts, strong oxidizing or reducing agents and organics.

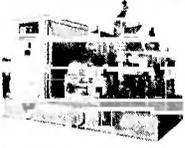
TFE bellows are the most corrosive resistant seals made. They won't erode like metal and temperature capabilities are to 250°F and pressure capabilities to 150 psi.

To receive further information on John Crane's bellows seals,

Circle 52 on Reader Service Card

MARINE EQUIPMENT FOR USE ASHORE OR AT SEA!

750 KW A.C. TURBO GENERATORS



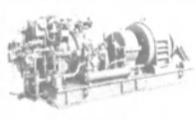
Ex-USN — GEI-16846 — type FN3-FN24 — seven stage 10033 RPM — typical serial # 49351 or 61718. Single helix reduction gear — 10033/1200 RPM — type S-187. GENERATOR: 750 KW — 6-pole 0.8 P.F. — 450/3/60/1200 EXCITER 10 KW — 120 volts. Steam inlet flange 24" — exhaust 17 1/2" X 25 1/2" rectangular. Overload 25% 2 hours. Units can be upgraded to 1250 KW for USN applications. Complete with throttles, etc. 8 Available

1500 KW TURBO GENERATOR SET



11-Stage turbine — FN4 — 8145 RPM — 3" steam — 525# — 825° TT. GEARS: 195-8145-1200 RPM. GENERATOR: 1500 KW — 450/3/60/1200 RPM — 2405 amps — 0.8 P.F. EXCITATION: 13.2 KW — 120 volts DC. Weight 36,000 lbs — exhaust flange 18" X 38"

L.P. 450KW A.C. TURBO GENERATORS



Suitable for waste heat turbo generators on motor ships 175 PSIG — D&S — 27 1/2" vacuum. GENERATOR, Westinghouse 450KW — 563KVA 450/3/60 — 1200 RPM. GEAR 6097/1200 RPM. TURBINE 175 lbs/D&S — 27 1/2" vacuum. Other pressures & temps: 250# @ 40 C — 27 1/2" vacuum. Turbine serial #7801-7802. OAL 13' 1-3/16" — OAH 5' — OAW 5 1/2". Total dry wt. 17,100 lbs. Plans on request

TURBINES/ROTORS REDUCTION GEARS

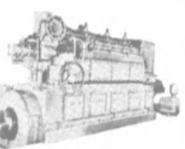
ROTORS: DRU-618M-73 — 700 KW — 10938/1200 RPM — GEI 90755 — 850°. DIAPHRAGMS, Labyrinth — bearings GEAR: S-432 — Form B — 10938/120. G.E. ROTORS: 600KW — 700KW — 618M — 6-stage — 10022 RPM — G.E.I. 34822. GEAR: S-277A — 10022/1200 RPM — MARAD units. G.E. ROTOR: DRU-318 — MRI non-condensing — 10938/1200 — 24 lbs. DeLAVAL TURBO GENERATOR SETS: ROTOR 7-stage class CD — 5910 RPM. REDUCTION GEAR type KD — 5910/1200 — double helical. Newport News hulls 499-504. Some Sparrows Point hulls. DeLAVAL 1000 KW TURBO GENERATOR SET ROTOR: 1442 HP — Class G.J.N. — 10009 RPM — 9-stage

300KW GM 8-268A 120/240 DC DIESEL GENERATOR SET



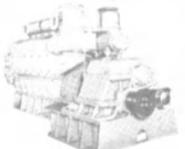
ENGINE: GM 8-268A — 6" x 7 — 1200 RPM. Heat exchanger cooled — equipped with heavy duty coolers. Just overhauled and can be seen running Good condition

NEW CLARK 500 BHP DIESEL



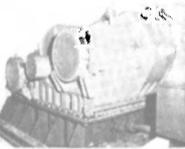
500 BHP @ 400 RPM. 4-Cylinder straight inline type — 12 1/2" X 16" — 2-stroke single acting — liquid cooled — direct reversible — CW rotation. With standard shaft-connected starting air compressor. WI 25,000 lbs — 228" long — 98" wide — 132" high. Designed for heavy duty, rugged use, its extreme simplicity will result in lower operating and maintenance costs.

MATCHED PAIR 900 HP GM 12-567A DIESELS W/ FALK REVERSE & REDUCTION GEARS



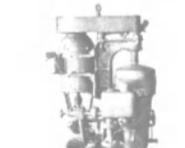
ENGINE: GM 12-567A 8" x 10 2-cycle V-type — 747 RPM — electric starting. GEAR, Falk Airflex reverse & reduction — 2.48:1 forward — 2.52:1 reverse. From USN LST.

UNUSED FARRELL-BIRMINGHAM MAIN PROPULSION REDUCTION GEAR



Single reduction 1.81:1. Will handle up to 3200 HP input at 402 RPM. Complete with hydraulic coupling. Port

SHARPLESS OIL PURIFIER



225 GPH — type M85-34-5-23-BY-44 — bowl speed 17,000 RPM — 2 HP — 440/3/60/3400 RPM. Reconditioned.

\$3950

ALMON JOHNSON CONSTANT TENSION LST STERN ANCHOR WINCHES WITH ALL CONTROLS



Drum capacity 900' of 1 1/2" wire. Gypsy performance 12,000 lbs or 125 FPM. OAL 12" — CAW 10" 1". Driven by 50 HP 230 VDC 181 amp motor. 2 Available with controls

PERFORMANCE

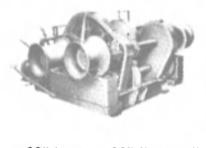
	Max. Control	Auto. Tension Control	
Line Speed	100,000 lbs	26,000 lbs	3000 lbs
Line Tension	10 FPM	Stall	400 FPM

50HP VARIABLE SPEED ELECTRO-HYDRAULIC CARGO WINCH



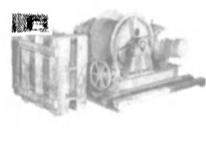
Made by Lakeshore. DUTY: 7400 lbs SLP — 220 FPM — drum size 24" diameter — 15" wide. Complete with ratchet & pawl. CAPACITY: 600' of wire. MOTOR: 50 HP — 440 volts — 66.3 amps — 3-phase 60 cycle — squirrel cage — 1200 RPM constant — Frame CC-445-N.

7X10 AH&D 10,000 LB CARGO WINCHES



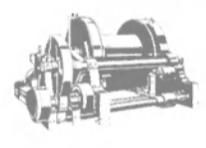
2-Speed single drum — reverse throttle operation. LINE PULL: low gear 10,000 lbs — high gear 5000 lbs. LINE SPEED: low gear 125 FPM based on 1st layer of 5/8" diameter rope — high gear 250 FPM based on 1st layer 3/4" diam. rope. DRUM: 26" diam. — 20" long — 26" flange diam. Rope capacity of drum: 5/8" diam. rope in 6 layers — 650' 3/4" diam. rope in 8 layers 1200'. Steam pressure at throttle 115 lbs. Operating weight 6450 lbs.

GENERAL PURPOSE WINCH 3500 LBS AT 200 FPM



New — Unused — Ex-USN A/C Motor drive — 25/12.5 HP — GE 440/3/60 — 40° C AB — 1750 RPM — Type KR — full load amps 32. Motor drives winch through Falk reduction gear. Has compression hand brake

LARGE STEAM TOWING ENGINE 9X10 TWIN ENGINE DRIVE



Air or Steam — 125/250 PSI Heavy duty Clyde with 36" diam. X 51" Face single drum. Flanges 68". CAPACITY: up to 2800' of 2" wire rope. Normal line pull 40,000 lbs @ 50 FPM. Steam or air pressure required 125 to 250 PSI. Can be adapted to electric drive or increased to a capacity of 82,000 lbs @ 20 FPM. Pawl holds 270,000 lb pull from any layer. Equipped with level wind device. Approx wt 30,000 lbs. DIMENSIONS: 12'6" wide — 6'6" high. Write for details. ALSO AVAILABLE: Large towing ring — 36" diameter.

12" X 14" STEAM MOORING WINCHES

Steam Or Air Driven with foot brake & declutchable gypsy head 20,000 LBS @ 100 FPM — FIRST LAYER ALSO HANDLES 16,000 LBS @ 150 FPM OR 50,000 LBS @ 8 FPM.



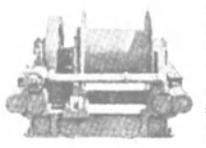
Drum will stow 1500' of 1 1/2" wire in 9 layers. Steam inlet 3 1/2" — 4" exhaust — 171 PSI working pressure. BASE DIMENSIONS: 6" X 6'3 1/2" — overall 8'4 1/2" wide X 9' long. Mfg by Friedrich Kocks — Bremen, Germany. Remover from ARCO "Challenger." ALSO IN STOCK — 12" X 14" Double gypsy unit. Can be demonstrated running.

UNUSED STEAM WINCH FOR MOORING & CARGO SERVICES



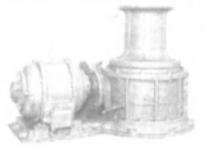
Lidgerwood 10X12 — with Morse controls. 10,000 lb. line pull — declutchable gypsy — hand compression brake.

SMALL 4 X 6 WINCH



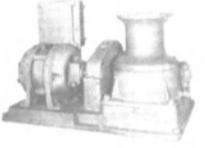
STEAM OR AIR DRUM: 20" Diameter X 23" width — 8" flange. Rated 2000#/90 FPM on 3rd layer of rope. 125# Steam or 3500 @ 90 FPM 150 PSI steam. 13,000 lb. static load. Fitted with ratchet & pawl so drum can be locked in off and on position.

HEAVY DUTY 2-SPEED DOCK CAPSTANS



For tugs docks, etc. Suitable for manila or wire rope because barrel is ridged. 40/40 HP — 1200/600 — 24,000# @ 30 FPM — 12,000# @ 60 FPM. Barrel size 22" diameter by 24" high — with controls.

DOCK CAPSTANS



Spool 10" diam. X 4" 15 HP — 220/440/3/60. 10,000 lbs @ 40 FPM. 48" Long — 32" wide — 28" high.

DEAN BROS. ALL-BRONZE STRIPPING PUMP BILGE & BALLAST 12 X 10 X 18



Max. pressure 730 GPM @ 200 lbs — steam end 250 lbs. Serial 67735. OA Dimensions: 43" wide — 39" deep — 104" high. Complete with spare unused bronze valve deck & spare liquid lines piston, steam end spares, rods, etc. This pump ready for immediate use — equal to new — little if any use.

WORTHINGTON 16" X 14" X 18" VERTICAL DUPLEX STRIPPING PUMP



1400 GPM @ 110PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction — 10" discharge — 2 1/2" steam — 4" exhaust. Overall width 6'8" — overall height 9'1 1/2" — depth 3'9 1/2". WI approx 10,000. Reconditioned 1980 ABS — ready to go.

HIGH PRESSURE HULL CLEANING PUMP



Mfg by Hypro — type L — 25 HP — 220/440/3/60 — Frame 284T. Pump capacity 25 GPM @ 500 PSI — 600 RPM

DEMING MOTOR DRIVEN RECIPROCATING PUMP



For sanitary and potable water use. 30 GPM @ 90 lbs. 190 RPM — 2" suction — 1 1/2" discharge. GE motor — 2 HP — 440/3/60/1735 RPM

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25000 CFM — A25A4W6 — 42" ID — 52" high — 25/14 HP — 440/3/60 — 1200/900 RPM — 36/24 amps. 4 Available. 3000 CFM — A3A4W6 — 21 1/2" ID — 29 1/2" high — 3 HP — 1150/1750 RPM. Mfg. by Joy. 4 Available. 5000 CFM — A5A4W6 — 23 1/2" ID — 29 1/2" high — 4 HP — 1150/1750 RPM. Mfg by Joy. 1 Available.

12000 CFM A12AX6 Explosion-proof — 29 1/2" ID — 37 1/2" high — 10/3 HP — 1800/1200 RPM — Frame 254U — group D Reliance motor

ALSO MARAD FANS

40665 CFM — size 43 AF — 60 HP

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Steel — with 12mm (1/2") cover and 19mm (3/4") flange. Gasket between top cover and flange. Mounting bolts are stainless steel

STYLE A STYLE B Style A has flush deck mounting flange with 24 3/4" diameter bolts. Style B has extended deck mounting flange with 20 1/2" diameter bolts

21" & 24" I.D. MAN-WAY 3-DOG HATCHES



18" Coaming. Available with T socket-wrench or removable handwheel (can be welded in place) for top opening. Spring-loaded lid w/inside handwheel. Coaming 12mm thick — top 11mm. Bosmet drawing #67/56

QUICK OPENING HATCH



Handwheel top & bottom. 4-Dogs 16" X 24" with 5" coaming. Drawing #60-40

4-DOG GENERAL PURPOSE 15" X 23" X 5" HATCH



QUICK-ACTING 4-DOG HATCHES

Heavily constructed. Handwheel operated. Handwheels top & bottom. Size A 27" X 21" w/12" coaming. SIZE B 31" X 31" w/12" coaming. For ocean-going barges, etc.

TANKER EXPANSION TRUNK



36" Diameter — 26" coaming — 7-dog drop-bolts. Drawing 36/26

20" ROUND HATCH



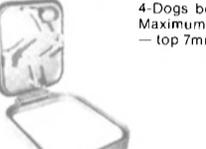
18" Coaming — 3 brass dog drop bolts. Coaming 12mm thick — top 11mm. Bosmet #68.

36" X 48" — 24" X 36" DECK HATCHES



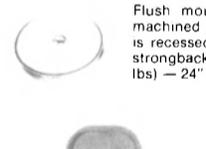
Has 10 brass dogs — 18" coaming. Coaming is 12mm — top is 11mm.

FLUSH HATCHES 24" X 30" 30" X 30"



4-Dogs bottom — T-key top opener. 4" Maximum coaming. Coaming 8mm thick — top 7mm

NEW 18" & 24" HATCH COVERS



Flush mounting watertight hatch with machined steel mounting ring. T-Handle is recessed and hand tightens against a strongback across mounting ring. 18" (60 lbs) — 24" (100 lbs)

NEW 3-DOG WEATHERTIGHT DOORS 26" X 78"



NEW QUICK-ACTING WHEEL OPERATED WATERTIGHT DOORS



6-DOG 5/16" Steel frame — 1/2" panel — 26" X 48" — 30" X 60" — 30" X 69" — 30" X 54"

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Clear opening 16" X 20" — 10" radius — 36 1/2" high — 40 1/2" long. For extra large tankers or heavy dredges where 1 1/2" wire or eye-spliced loop must pass through chock. VLCC type from 250,000 ton tankers.

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- **PLUS**—A wealth of current marine business and technical information first—weeks before the slower monthlies.

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SEPTEMBER 1, 1985

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AT&T Technologies Wins \$9.9-Million Modification To Equipment Contract

AT&T Technologies Incorporated, Greensboro, N.C., is being awarded a \$9,973,406 modification to a previously awarded cost-plus-incentive-fee contract for oceanographic equipment. Work will be performed in Greensboro, and is expected to be completed in March 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

Flakt Offers 20-Page Brochure On Facilities And Capabilities

Flakt AB, Marine Division of Gothenburg, Sweden, has published a new 20-page color brochure on the company and its facilities and capabilities as a leader in the field of air treatment and climate control.

Entitled "A chain can be no stronger than its weakest link," the preface points out that this is why such exacting standards have to be set for the safety of the equipment, as well as its reliability, mode of operation, quality, life expectancy and corrosion resistance.

After the preface, a page titled "Make use of our expert skills" mentions that with experience of ventilation technology since 1920, Flakt has amassed a solid fund of know-how that it is glad to share with customers.

"The resources you see are not the only ones you can count on," is the heading for the next chapter which states that what you usually see of the Flakt organization resembles the tip of an iceberg.

Flakt is a leader in the field of air treatment and the Flakt Group includes more than 80 companies that together with representatives operate in 50 countries.

Other sections deal with the stringent standards of safety necessary for tough environments, and the ventilation equipment necessary for high standards of safety and operation.

The last page of the brochure emphasizes that Flakt has, of course, complete systems for air treatment, ranging from central units to terminal units in cabins. However, it is not a mere supplier of equipment but also a consultant and partner in all matters relating to air treatment—a reassuring thought should unexpected problems occur in selecting a ventilation system.

The booklet, which is handsomely presented on high-quality stock, is illustrated throughout with excellent color photos.

For further literature containing full information,

Circle 20 on Reader Service Card

Maritime Reporter/Engineering News

CLASSIFIED AND EMPLOYMENT ADVERTISING

HOW TO PLACE CLASSIFIED ADVERTISING: Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of \$70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. MARITIME REPORTER is published the 1st and 15th of each month. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C. O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER and Engineering News, 118 East 25th Street, New York, NY 10010.



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Interested applicants should respond with a detailed resume to Professor J. A. Schetz, Head of AOE Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, telephone 703-961-6611.

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Telephone: (918) 561-4841

Clemco Pipe Cleaning Tools Blast-Clean Pipe Interior Without Rotating The Pipe

Clemco Industries of Burlingame, Calif., is offering a family of internal pipe cleaning tools—Spin-Blast, Hollo-Blast, and Hollo-Blast Junior—designed to blast clean the interior of pipe or tubing ranging in size from 1/4-inch to 36-inch I.D., without rotating the pipe.

Used in conjunction with standard abrasive blast machines, pipe cleaning tools simply replace conventional blast nozzles at the end of the hose. The Spin-Blast Tool incorporates a rotating head with two nozzles to propel abrasive to the surface. The Hollo-Blast Tool utilizes a deflection tip to direct abrasive to the surface, and the Hollo-Blast Junior utilizes a deflection tip like the Hollo-Blast, but with smaller proportions to accommodate pipe with inner diameters of 1/4-inch to 2 inches. Through this highly powered abrasive impact, precise surface profiles can be obtained, which will ensure proper adhesion for long life coatings.

Various Tungsten Carbide nozzle sizes are available to comply with the range of pipe diameters. Internal pipe surface preparation is said to be easier, faster and more economical with the Clemco Internal Pipe Cleaning Tools.

For more information on the Clemco Family of Internal Pipe Cleaning Tools,

Circle 59 on Reader Service Card

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Supply of new chain, including ten shots of 2 5/16" and twenty shots of 2 5/8"

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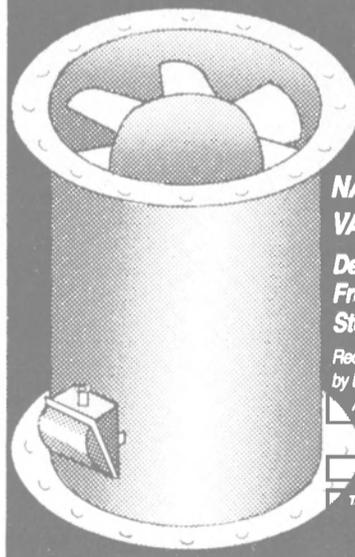
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Hitachi Delivers Jackup Rig Built For ONGC Of India

The cantilever type jackup drilling rig Sugar Ratna, ordered by the Oil & Natural Gas Commission (ONGC) of India, was completed recently at the Osaka Works (Sakai) of Hitachi Zosen Corporation. Immediately following delivery, the rig left under tow for India, where it will begin drilling offshore Bombay.

The new unit is the 21st jackup drilling rig built by Hitachi Zosen, and the third built for ONGC. The company's rig backlog includes four more jackups, five semisubmersibles, and one drillship.

Designed and built to American Bureau of Shipping class, the Sugar Ratna's platform is 216.5 feet long, 200 feet wide, and 23 feet deep, with a draft of 13.6 feet. The rig's three legs are 420 feet long, permitting drilling in water depths up to 300 feet, to a well depth of 20,000 feet. It is designed to withstand winds of about 120 mph and waves more than 60 feet high.

As the spud tank can be completely retracted inside the platform, there are no protrusions from the platform bottom, making it easy and safe to tow the rig in shallow waters or to transport it on a barge or heavy-lift ship. An on-board computer will facilitate efficient rig operation by performing stability and leg load calculations, as well as aiding with drilling, spares management, and equipment maintenance.

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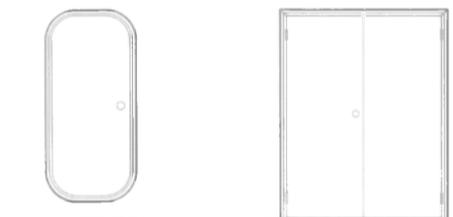
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Helac Introduces HR Series Rack & Pinion Rotary Actuators —Literature Available

Helac Corporation, Enumclaw, Wash., has available a new 12-page brochure that introduces the HR Series Hydraulic Rack & Pinion rotary actuator line. The publication provides descriptions of major features, application information, discussion of principles of operation, and complete specifications. Photos, drawings and cutaway illustrations are also included.

All models have standard adjustable rotation and are designed for 3,000-psi service. Torque ratings at 3,000 psi are from 2,000-in-lb to 4,000,000 in-lbs.

Models within this series can be tailored for special applications in robotic, mining, subsea and military operations. This completely application-engineered product line is available from authorized distributors throughout the country.

For a free copy of the brochure from Helac Corporation,

Circle 11 on Reader Service Card

Marine Gears Inc. Offers Literature On Clutch Drums, Clutches & Component Parts

Marine Gears Inc. (MGI) of Greenville, Miss., is offering free literature on the company's large inventory of clutch drums, clutches and component parts. MGI also maintains a complete stock of friction materials, shoes, rivets, air tubes, return springs, washers and miscellaneous fittings for all sizes of marine clutches.

Using the heading "Marine Clutch Capital of the World," the literature includes photos of the items, lists sizes and gives other pertinent information, as well as pointing out that MGI's total marine clutch inventory is available 24 hours a

day, with immediate hotshot delivery to any location.

For more information and a free copy of the literature from Marine Gears Inc.,

Circle 19 on Reader Service Card

Manitowoc Entering Offshore And Marine Crane Market

Ralph Helm, president of the Manitowoc Company, Inc., Manitowoc, Wisc., recently announced that the firm will enter the offshore and marine crane market. The company will organize a Texas corporation that will design, manufacture and sell hydraulic offshore cranes. Initial production will include a line of cranes having lifting capacities ranging from approximately 12 to 90 tons, and manufacturing is scheduled to be done in Texas and Mexico.

The company expects the product, which will be sold through an existing distributor network, to be on the market in the fall of 1985.

For further information,

Circle 14 on Reader Service Card

PRC Announces Availability Of New Family Of Mercaptan Functional Polymers

Products Research & Chemical Corporation (PRC) recently announced the availability of a new family of mercaptan functional polymers called Permapol P-3. The mercaptan-terminated Permapol polymers were introduced to complement the hydroxy materials offered by the company.

According to Herbert W. McNulty, vice president-market development, Permapol Polymers, Permapol P875 is the first mercaptan-ter-

minated polymer to join the growing family of Permapol P3 Polymers. This family now includes polyols used to make polyurethanes with resistance to hydrolysis and hydrocarbon fluids and P3 Polymers that do not have reactive end groups that are used as hydrocarbon-resistant plasticizers.

Mr. McNulty said that P875 is designed for use in room temperature curing high-performance sealants, adhesives and elastomers. As a component of epoxy-based flexibilized adhesives, the Permapol structure imparts low-temperature flexibility and hydrocarbon fluid resistance.

P875 is said to be particularly suited for formulations where resistance to cold-flow or compression-set and improved low-temperature flexibility plus adhesion to difficult substrates is desired.

PRC also announced that it is erecting a grass roots plant in the Mohave Desert, Calif., to manufacture commercial quantities of Permapols.

For further information on Permapol Polymers from Products Research & Chemical,

Circle 17 on Reader Service Card

Combustion Engineering Offers Free Steam Tables Booklet

The Power Systems Group of Combustion Engineering, Inc. is offering a new edition of its pocket-sized steam tables booklet to all interested parties.

The complimentary 36-page booklet, in its 13th printing, covers the properties of saturated and superheated steam, from 0.08865 to 15,500 lb per sq. in. absolute pressure. The values are reprinted from the American Society of Mechanical Engineers (ASME) steam tables.

A fold-out section covering the Mollier Diagram for steam is included in the back of the booklet. For a free copy of the booklet,

Circle 16 on Reader Service Card

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.

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Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

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Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Marlo Coil/Nuclear Cooling, Inc., P.O. Box 171, High Ridge, MO 63049
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrköping, Sweden

ANCHORS AND CHAIN

Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

ANODES—Cathodic Protection

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240

BALLASTS

Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031

BASKET STRAINERS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

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Grant Manufacturing & Alloying, Inc., 600 Schoolhouse Rd., Souderton, PA 18964

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6

Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BLASTING—Cleaning—Equipment

Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989

Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England

CLEMCO, P.O. Box 7680, San Francisco, CA 94120
E.I. DuPont de Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898

Key Houston Division of Jacksonville Shipyards, 13911 Atlantic Blvd., Jacksonville, FL 32225

BOILERS

Combustion Engineering, Inc., Windsor, CT 06095

BOILER CLEANING

Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645

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ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Mowbray's Tug & Barge, 21 West St., New York, NY 10006
Western Maritime, 701 B Street, San Diego, CA 92101

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Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

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MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

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Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

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Maritime Data Network, Ltd., 102 Hamilton Ave., Stamford, CT 06902
Military Contract Information Service, Inc. Dist. by Maritime Reporter/Engineering News, 118 East 25 St. N.Y. N.Y. 10010

TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

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ASEA, Inc., 4 New King St., White Plains, NY 10604
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2

Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Bowmar/ALI, Inc., 531 Main St., Acton, MA 01720
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205

Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6
Grumman Aerospace, 111 Stewart Ave., Bethpage, NY 11714
Indikon Corp., 26 New St., Cambridge, MA 02138
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Safe Electronics, 37 Staffern Drive, Concord, Ontario, Canada, L4K 2X2
Megsystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products, 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

COUPLINGS
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SKF Steel, 201 Tower Lane, P.O. Box 745, Avon, CT 06001

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Appleton Marine, P.O. Box 2339, Appleton, WI 54913
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CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202

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Murdock Engineering Company, P.O. Box 2278, Irving, TX 75061
Schoellhorn Albrecht, Div. of St. Louis Ship, 3460 So. Broadway, St. Louis, MO 63118

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International Grating, 7625 Parkhurst, Houston, TX 77028
Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143

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Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

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Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA

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ELECTRONIC SYSTEMS

Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327

EMULSIFICATION SYSTEMS

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S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
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Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

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Samson Ocean Systems, Inc., 99 High St., Boston, MA 02110
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, VA 22044

FINANCING—Leasing

Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Gulf Western Leasing Corp., 1500 City West Blvd., Suite 300, Houston, TX 77047
JMJ Marine Investors, P.O. Box 51509, New Orleans, LA 70151

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Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
MacGregor-Navire International, Box 8991, S-402 74 Göteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

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Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Seaward International, 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

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Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gaudio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

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Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

INSULATION—Cloth, Fiberglass

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Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE

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United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

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Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Masonite Commercial Division, Dover, OH 44622
Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOLERS

R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

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Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS

Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

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A-C Brake Co., 308 E. College St., Louisville, KY
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltsens, 160 Van Brunt St., Brooklyn, NY 11231
Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663

METALS

Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068

MINING

Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020

MOORING SYSTEMS

Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110

NAME PLATES—BRONZE—ALUMINUM

Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

ACB Industries, 3400 Camp Street Suite 100, New Orleans, LA 70130
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydramath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130

NAVIGATION

Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Bowmar/ALI, Inc., 531 Main St., Acton, MA 01720
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6
Grumman Aerospace, 111 Stewart Ave., Bethpage, NY 11714
Indikon Corp., 26 New St., Cambridge, MA 02138
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Safe Electronics, 37 Staffern Drive, Concord, Ontario, Canada, L4K 2X2
Megsystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products, 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209
 C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
 C.T. Marine, 18 Church Street, Georgetown, CT 06829
 Phillips Cartner & Co., Inc., 203 So. Union St., Alexandria, VA 22314
 Century Engineering, Inc., 32 West Rd., Towson, MD 21204
 Childs Engineering Corp., Box 333, Medfield, MA 02052
 Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
 Crane Consultants Inc., 15301 1st Ave., So. Seattle, WA 98148
 C.R. Cushing, 18 Vesey St., New York, NY 10007
 Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
 Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
 ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
 Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
 Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
 Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
 Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
 John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
 The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
 Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
 Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
 Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
 J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
 Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
 HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
 Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
 R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
 Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
 J.L. Konopasek & Associates, 3523 Scrimshaw Dr., Jacksonville, FL 32217
 James S. Krogen & Co., Inc., 3333 Rice St., Miami, FL 33133
 Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
 Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
 John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
 McLeary & Harris, Inc., 28 West 44 Street, New York, NY 10036
 Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
 Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
 Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
 Marine Power Associates, 4475 Mission Blvd., Suite 235, San Diego, CA 92109
 Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
 George E. Meese, 194 Acton Rd., Annapolis, MD 21403
 R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
 NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
 Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
 Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
 Northern Marine, P.O. Box 1169, Traverse City, MI 49685
 Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
 PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
 Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
 S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
 Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
 M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
 Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
 Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
 SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)
 STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
 Seaworthy Systems, Inc., 28 Main St., Essex Ct. 06426; 17 Battery Place, N.Y. N.Y. 10004, P.O. Box 205, Solomons, MD 20688
 Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
 George G. Sharp, Inc., 100 Church St., New York, NY 10007
 Simmons Associates, P.O. Box 760, Sarasota, FL 33578
 R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
 J.F. Stroschein Associates, 666 Old Country Rd., Garden City, NY 11530
 Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
 Thomas Caudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
 Timco, 622 Azalea Road, Mobile, AL 36609
 Tracor Hydraulics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
 Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT
 Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
 British Telecom International, The Holborn Centre, 120 Holborn, London EC1N 2TE
 CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
 COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
 A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
 Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
 General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
 Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
 Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
 Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
 ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
 Japan Radio Co., Ltd., Akasaka Twin Tower, 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, Japan U.S. Rep: 405 Park Ave., New York, NY 10022
 Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
 Kongsberg Vopenfabrik, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
 Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
 Micrologic, 20801 Dearborn, Chatsworth, CA 91311
 Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
 Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
 Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
 Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
 Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
 Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
 Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
 Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
 Robertson Autopilot, 400 Oser Ave., Hauppauge, NY 11738
 S.P. Radio A/S, DK 9200 Aalorg, Denmark
 Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107

Sperry Corporation, Great Neck, NY 11020
 Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
 Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
 Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067
 Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
 Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
 Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
 Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
 Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
 Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
 Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OIL/WATER SEPARATORS
 Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
 Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801
 Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
 Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
 Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
 Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
 Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
 Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
 Microphor, Inc., P.O. Box 490, Willits, CA 95490
 Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
 NALCO Chemical Co., 2901 Butterfield Road, Oak Brook, IL 60521
 Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323

PAINTS—COATINGS—CORROSION CONTROL
 American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
 Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
 CLEMMCO, P.O. Box 7680, San Francisco, CA 94120
 Dampney Company, Inc., 85 Paris St., Everett, MA 02149
 Devco Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
 Drew Ameroid Marine, One Drew Chemical Plaza, Boonton, NJ 07005
 E.I. DuPont de Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
 DuPont Co. MPS, Room X40750, Wilmington, DE 19898
 Esgard, Box 2698, Lafayette, LA 70502
 Farbol Company, 8200 Fischer Rd., Baltimore, MD 21222
 Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
 International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
 Jaegle Paint Company, Inc., 1012 Darby Road, Havertown, PA 19083
 Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
 Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
 Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
 Amermarine International, P.O. Box 9205, Dundalk, MD 21222
 Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
 Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
 Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
 Selkirk Metalbusts, Box 19000, Greensboro, NC 27419
 Tioga Pipe Supply Co. Inc., 2450 Wheatseaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications
 Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
 Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470

PLYWOOD
 Simpson Timber Co., Third and Franklin, Sheton, WA 98584

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
 Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
 Armo Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
 Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
 Bird-Johnson Company, 110 Norfolk St., Walpole, MA 02081
 Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
 Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
 Capitol Gears, 349 N. Hamline Ave., St. Paul, MN 55104
 Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629
 Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
 Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
 Combustion Engineering, Inc., Windsor, CT 06095
 Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
 Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
 Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
 Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
 George Engine Company, Inc., Lafayette, LA
 General Motors, Electro-Motive Division, LaGrange, IL 60525
 Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
 Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
 KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
 Lips Propellers, 3617 Koppers Way, Chesapeake, VA 23323
 M.A.N.-B&W Diesel, 2 Ostervej, DK 4960 Holeby, Denmark
 MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
 MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
 Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
 Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
 Mitsubishi Kakai Kaisha LTD, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
 National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
 North American Marine Jet P.O. Box 1232 Benton, AR 72015
 Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
 Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
 Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
 Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
 SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
 Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
 Skinner Engine Co., P.O. Box 1149, Erie PA 16512
 Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
 Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
 Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414

Transamerica Delaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
 Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
 Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
 Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
 J.M. Voith GmbH Dept. WErung, Postfach 1940 7920 Heidenheim/Brenz, West Germany
 Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
 Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
 WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
 Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
 Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives
 Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
 Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
 CMH Heleshaw, Inc., 201 Harrison St., Hoboken N.J. 07030
 Goltens, 160 Van Brunt St., Brooklyn, NY 11231
 Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
 Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
 Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
 Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
 Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
 Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
 Vita Motivator Company, 200 West 20th St., New York, NY 10011
 Warren Pumps Division, Bridges Avenue, Warren, MA 01083
 Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves
 Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
 United Technologies Carrier Transicold Div., Carrier Corp., P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers
 A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
 Allied Fibers, 1411 Broadway, New York, NY 10018
 American Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
 Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
 DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
 Sampson Ocean Systems, Inc., 99 High Street, Boston, MA 02110
 Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
 Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
 Vermeire N.V. Industriepark Zwaarveld, B-9160 Hamme, Belgium TX: 21687
 Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

SANITATION DEVICES—Pollution Control
 Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
 Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
 FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
 Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
 Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
 Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., NY 11696
 Marland Environmental Systems, P.O. Box 501, Great Falls, VA 22066
 National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

SCAFFOLDING EQUIPMENT—Work Platforms
 McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
 Trus-Joist Corp., P.O. Box 60, Boise, ID 83704

SCUTTLES/MANHOLES
 Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT
 Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
 Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734
 Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470

SHIPBREAKING—Salvage
 Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
 Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT
 Bardex Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
 Cockatoo Dockyard Pty. Ltd., P.O. Box 1139, North Sydney, NSW 2060, Australia TX: 72086
 M.A.N.—GHH Sterkrade Werksrabe 112 D-4100 Duisburg 18, West Germany
 Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
 Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
 Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, OS, Norway

SHIPBUILDING STEEL
 Armo Steel Corp., 703 Curtis St., Middletown, OH 45042
 Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
 United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport, PA 15132
 Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking
 Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland
 Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
 Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.
 Astilleros Unidos De Veracruz, S.A. San Juan Ulua S/N, Apdo. Postal 647 Veracruz, Ver Mexico
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
 Bardex Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
 Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
 Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
 Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
 Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
 Blount Marine Corp., P.O. Box 368, Warren, RI 02885
 Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
 Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
 Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
 Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801
 Conrad Industries, P.O. Box 790, Morgan City, LA 70380
 Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424
 Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10040
 Darby Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa
 Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates—U.S.A. Agents: Keppel Marine Agencies, Inc., 26 Broadway, New York, NY 10040, 6240 Richmond Ave., Houston, TX 77057

New Boiler Cleaning Technique Offers Savings For Vessel Owners —Literature Available

Infrasonik AB of Finspong, Sweden, is offering literature on a new boiler cleaning technique that offers savings for vessel owners.

The eight-page color brochure, entitled "Infrafone—the new approach to boiler cleaning," explains that the technique is based on maintaining a constant sound pressure in an enclosed space by generating infrasound—sound waves with a low frequency (approximately 20 Hz) and a long wavelength (17-30 m). The Infrafone equipment consists of a sound generator comprising an air feeder unit connected to a quarter-wave resonator in the form of a resonance tube. In simple terms, the equipment works like an organ pipe, and its only source of power is an air blower.

The company says that the technique is simple, and despite the fact that it is young it has already produced convincing proof of being vastly superior to conventional methods of sootblowing. Advantages listed are: appreciably more efficient cleaning; high efficiency—lower operating costs; wear is elimi-

nated—maintenance is minimized; the pay-off time is less than one year; installation is simple, involving a boiler stoppage of no more than one day; and since infrasound is non-directional, the equipment can be located virtually anywhere. The technique is said to perform excellently on boilers fired with most fuels—coal, oil, wood chips, bark, peat, municipal refuse, magnesium oxide and black liquor.

The publication is well illustrated with drawings, charts and color photos.

For a free copy of the brochure on Infrasonik's Infrafone,

Circle 60 on Reader Service Card

Gulfport Orders Second Paceco Container Crane —Literature Available

John R. Martin, president of Paceco, Inc. of Gulfport, Miss., has announced the receipt of an order for a new Paceco Portainer® crane from the Mississippi State Port Authority at Gulfport. The ship-to-shore, container-handling gantry will be capable of loading or unloading 20- and 40-foot containers weighing up to 30 long tons each at

an average rate of 30 boxes per hour.

The new crane will be installed on the Port Authority's West Pier alongside an Economy Portainer that has been operating there since 1979. The new crane will be faster than the older unit, and have an outreach of 115 feet versus 84 feet, and a lifting height of 80 feet against 60 feet for the smaller crane. With its greater capabilities, the new Portainer will enable Gulfport to service Panamax size containerships.

Since the introduction of the high-speed container-handling crane by Paceco in 1959, the company and its licensees have manufactured more than 300 units of this type, and in a recent report were credited with a 34-percent world market share.

For more information and free literature describing the Paceco cranes,

Circle 23 on Reader Service Card

Brochure Available On HF-SSB Radio Products From Harris Corporation

Harris Corporation, RF Communications Group, Long Range Radio

Division, has announced the availability of a new brochure on radio products for the marine industry. The six-page, full-color brochure describes Harris's full range of HF-SSB radio products and accessories.

The radio communication equipment and systems presented in the brochure are widely used for marine shipboard and limited coast shore applications.

The HF equipment featured includes the RF-230M 125-watt synthesized transceiver, RF-230MS 125-watt synthesized/channelized transceiver, the RF-104 1-kw linear power amplifier and the RF-798 remote control system.

The brochure also presents Harris's line of advanced HF communications systems providing customized HF computer control for on-board management, drill rig daily reporting and exploration data transfer.

Harris Corporation is a \$2 billion producer of state-of-the-art information processing communication and microelectronic products for the worldwide information technology market. The company operates 35 plants in the U.S. and abroad.

For a copy of the brochure and further information,

Circle 49 on Reader Service Card

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 Galten Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
 Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189
 Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
 Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
 Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
 Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji
 Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
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 Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
 Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
 Kone Corp., P.O. Box 6 SF-05801 Hyvinkaa, Finland
 Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel Friedrichsort, West Germany
 Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
 M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
 Main Iron Works, Inc., P.O. Box 1918, Houma, LA 70361
 Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208
 Marinette Maine Corporation, Marinette, WI 54143
 Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Tokyo, 100 Japan
 MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
 Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
 Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
 National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
 National Steel & Shipbuilding Corp., San Diego, CA 92112
 Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
 Neorion Shipyards Syros Ltd., Syros, Greece-U.S.A. Agents: Keppel Marine Agencies Inc., 26 Broadway, New York, NY 10004, 6420 Richmond Ave., Houston, TX 77057
 Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
 Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
 Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
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 Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
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 Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073
 M.A. Stream Associates, Inc., 400 Second Ave. W., Seattle, WA 98119

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 Butlerworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
 Butlerworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
 Gamlen Marine Division, 375 Allwood Rd., Clifton, NY 07013
 Gamajet Equipment Div., Sybron Chemicals Inc., 121 S. Maple Ave., So. San Francisco, CA 94080
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 Jan Erik Dyvi A/S, P.O. Box 454, Sentrum, Norway
 McAllister Bros., Inc., 17 Battery Pl., New York, NY 10004
 McDonough Marine Service, P.O. Box 26206, New Orleans, LA
 Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201
 Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, NY 10048
 National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144
 Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767; Walker Boat Yard, P.O. Box 729, Port Allen, LA
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 Jamesbury Corp., 640 Lincoln St., Worcester, MA 01605
 Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
 Nupro Co., 4800 E. 345th St., Willoughby, OH 44094
 Parker Hannifin Corp. Rotary Actuator Div., 9948 Rittman Rd., Wadsworth, OH 44281
 Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642
 Sno-Trik Co., 9760 Shepard Rd., Macedonia, OH 44056
 Stacey/Fetterolf Corporation, P.O. Box 103, Skippack, PA 19474
 Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202
 Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236
 Tate Temco, Inc. 1941 Lansdowne Road, Baltimore, MD 21227

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 Union Flonetics, P.O. Box 459, Clinton, PA 15026
 Robert H. Wager Co., Inc., Passaic Avenue, Chatham, NJ 07928
 Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186
 S.S. White Industrial Products, 151 Old New Brunswick Rd., Piscataway, NJ 08854
 Whitey Co., 318 Bishop Road, Highland Heights, OH 44143
 William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101
 Zidell Explorations, Inc. (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

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 Atlas-Danmark Marine & Offshore Baltorpej, 154 DK-2750 Ballerup, Copenhagen, Denmark, TX 35177 Atlas DK
 Drew Chemical Corporation, One Drew Chemical Plaza, Boonton, NJ 07005
 Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
 Marine Moisture Control, 60 Inip Dr., Inwood, NY 11696
 Marland Environmental Systems, P.O. Box 501, Great Falls, VA 22066
 MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130
 Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

WEATHER CHART RECORDERS
 Alden Electronics, 1145 Washington St., Westborough, MA 10581

WELDING
 KSM Fastening Systems Inc., 301 New Albany Rd., Moorestown, NJ 08057
 Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951
 Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912

WELDING EQUIPMENT
 Enerjee Ltd., 32 S. Lafayette Ave., Morrisville, PA 19067

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 Braden Winch Co., 800 East Dallas, Broken Arrow, OK 74012
 Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434
 Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
 McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, W. Biloxi, MS 39531
 Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
 Schoellhorn Albrecht, Div. of St. Louis Ship, 3460 So. Broadway, St. Louis, MO 63118
 Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

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 Kearfoot Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, NY 10550

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 AMP Special Industries, P.O. Box 1776, Southeastern, PA 19399
 Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, IL 60076
 Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008
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 Smith & McCroken, 153 Franklin St., New York, NY 10013

Halter Marine Awarded \$85-Million Navy Contract To Build Six T-AGOS Ships

Jack Edwards, president of Halter Marine, has announced the receipt of a contract from the U.S. Naval Sea Systems Command for the construction of six ocean surveillance ships (T-AGOS). Total contract value, including options, is said to be in excess of \$85 million.

The T-AGOS vessels, which have an overall length of 224 feet and a beam of 43 feet, will be operated by the Military Sealift Command and will have accommodations for 21 civilian crew and 12 technicians. The ships will be built to the requirements of the American Bureau of Shipping and the U.S. Coast Guard, under the inspection of the Navy's Supervisor of Shipbuilding offices at the building yards.

The contract authorizes Halter to proceed with the engineering for all six vessels and the construction of the first two. The remaining four vessels will be funded in fiscal years 86 and 87.

The vessels awarded to Halter have been designated T-AGOS-13 through 18, and are follow-ons to a 12-ship contract that was awarded to Tacoma Boatbuilding in 1980. The Halter vessels will have significant modifications to the earlier ships, including changes in accommodations, operation centers, tankage, and structural arrangements.

Murdock Gets \$3.7-Million Navy Order For Coupling Seal Assemblies

Murdock Engineering Company of Irving, Texas, has been awarded a \$3,672,000 order under a basic ordering agreement for 288 flexible coupling seal assemblies used on submarines. Work will be performed in Irving, and is expected to be completed by April 30, 1986. Contract funds would not have expired at the end of the current fiscal year. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-84-G-0244).

Bailey Joins Selkirk Metalbestos As Staff Engineer For Piping Line

Reed M. Bailey has joined Selkirk Metalbestos Commercial/Industrial Operations as staff engineer for the Model PS product line. He is working out of the company's Logan, Ohio, headquarters, according to a recent announcement by Daniel P. Jordan, vice president of marketing.

Mr. Bailey will be responsible for product stress analysis on specific projects, technical design support to existing engineering and research departments, as well as overseeing the design and specifications of the

new Model PS stack and exhaust program. A mechanical engineering graduate from Ohio State University, he has had extensive experience in stress analysis and manufacturing operations with Rockwell International and Toledo Scale.

Selkirk Metalbestos manufactures Model PS Pressure Piping Systems, primarily for engine exhausts, boiler stacks, and grease ducts, from plants in Logan and Nampa, Idaho.

Voigt Named General Service Manager For Johnson & Towers

Joseph G. Voigt has been appointed general service manager for Johnson & Towers (J & T) of Mount Laurel, N.J., diesel power specialists in marine, transportation, off-highway, and electrical power generation. The announcement was made by Albert Harris, vice president and general manager.

In his new post Mr. Voigt is responsible for all service work on engines and transmissions, as well as production of new power products manufactured by J & T, and supervision of all warranty work on products specifically warranted by the company.

With J & T for 15 years, he has been operations manager since September 1984. Prior to that he had served as production manager, dealer development manager, and training instructor; he started with the company as a mechanic. Before joining J & T, he had been with Camden Mack and Goodyear Tire & Rubber.

Zito Named Vice President-Marketing & Development Of COMSAT Technology

A. William Perigard, president of COMSAT Technology Products (CTP), has announced that Charles A. Zito has been elected to the newly created position of vice president-marketing and development. He will assume responsibility for the management of CTP's corporate marketing, strategic planning, and product development activities.

Mr. Zito comes to CTP from United Business Communications, where he served as vice president and general manager. He earlier was director of network operations for Satellite Business Systems, and previously held several senior product and program management positions during his 20-year career with IBM. He holds a BS degree in electrical engineering from Rensselaer Polytechnic Institute.

Located in Clarksburg, Md., CTP is the manufacturing arm of Communications Satellite Corporation, and is the parent organization for COMSAT TeleSystems, Amplica, Compact Software, and the Advanced Systems Group.

No Claims Yet On Cat's Over-The-Counter Parts Availability Guarantee

Caterpillar Engine Division's guarantee of over-the-counter parts availability, first announced in January 1984, helps demonstrate Cat's commitment to provide the marine industry with one of the better engine support efforts. To date, Caterpillar has not had a single claim.

The guarantee is offered to qualifying marine product users in the 48 contiguous states. It covers all new Caterpillar marine propulsion engines, transmissions, auxiliaries, and selected Twin Disc transmissions delivered to the user after February 1, 1984. New parts requirements for these products are covered for four years. The part ordered must be necessary to keep the marine system operating.

A very high percentage of needed parts is immediately available over-the-counter from the dealer's stock. In those cases when a part is not immediately available, the Marine Parts Availability Guarantee promises to provide the part at the counter where it was ordered in as short a time as possible. It will normally be available in a matter of hours, the same day, or overnight. If, however, the time is longer than 48 hours, the part will be provided to the customer at no charge.

For further information on the Cat parts guarantee,

Circle 48 on Reader Service Card

Racal Wins \$2.8-Million For Marine Simulators

Racal-SMS Ltd., Surrey, England, has announced that recent orders for the Marine Radar and Navigation Simulator Type 9000 have totaled over \$2.8-million. Orders have been received from Canada, Germany, the Middle East, Korea and China.

The MRNS 9000 is already in use in leading maritime training centers worldwide, including one system ordered by the International Maritime Organization (IMO) for Indonesia, the College of Maritime Studies at Warsash in Hampshire, U.K. and a mobile simulator for the Ministry of Transport and Communications of Spain.

The simulator enables exercises to be conducted in collision avoidance, navigation in confined waters, shipping lane discipline and high density traffic, blind pilotage and the use of navigational aids. It is type approved under the United Kingdom Department of Transport Specification for the Navigation Control Course and meets IMO recommendations for radar and Automatic Radar Plotting Aid training.

The MRNS 9000 is designed on a modular basis allowing for a high degree of flexibility to meet a wide range of specific training requirements and also for subsequent expansion. Ten types of high level

mathematical ship models are provided, the flexibility of the system enabling other vessels to be programmed. A military version of the MRNS 9000 is available which offers naval ship models, fixed and rotary wing aircraft targets, automatic plotting tables and anti-submarine warfare facilities.

For additional information and literature on the MRNS 9000,

Circle 32 on Reader Service Card

McTighe Offers Brochure On High-Flow & Low-Flow Oil/Water Separators

A four-fold brochure from McTighe Industries, Bohemia, N.Y. summarizes high-flow and low-flow oil water separators capable of removing oils and/or other volatile liquids and solids from wastewater, water draw-off systems and an EPA-approved biocide known as Karacide.

The separators, utilizing the parallel and corrugated plate theory together with the new Petro Pak[®], remove oil particles down to 20 microns in size and produce an effluent quality of less than 10 ppm of oil to meet the most stringent environmental regulations.

The water draw-off systems or Product Saver is the most effective method of removal of contaminated water bottoms from above or below ground oil storage tanks.

Karacide seeks out and destroys microbial contaminants in petroleum products, oil-water separators, marine ballast tanks, etc. and upon penetrating the oil-water interface/sludge bottom, 30 to 40 percent of this emulsification will return to pure product resulting in a clean water bottom and a completely sterilized vessel.

To obtain a copy of the brochure from McTighe Industries,

Circle 10 on Reader Service Card

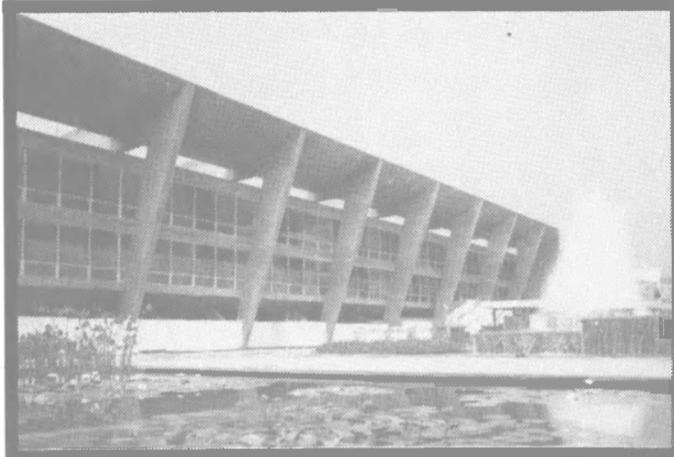
Helac Offers Brochure On Hydraulic Helical Rotary Actuators

Helac Corporation of Enumclaw, Wash., is offering a free 16-page brochure that explains the concept and lists performance data on the company's hydraulic helical rotary actuators. Cutaway illustrations, descriptions of major features, application information, discussion of principles of operation and complete specifications are provided.

For marine applications, Helac Corporation can furnish the body and all exposed surfaces made from stainless steel, and the shafts can be sealed against external pressures. This application-engineered product line is available from authorized distributors throughout the country.

For further information and a free copy of the brochure,

Circle 15 on Reader Service Card



**MUSEUM OF MODERN ART
CENTRE OF RIO DE JANEIRO · CENTRE FOR SHIPPING**

In October 1985, Expoship Riomar returns to the Museum of Modern Art as the venue for this important maritime business occasion. This is a move of enormous significance for it places the exhibition back at the heart of Rio's business centre and only a short distance from the city's international and domestic airports. A high attendance is thus expected.

Expoship Riomar 85 will be the fifth in the biennial cycle of this event and, as on previous occasions, the event will be linked to a Seatrade conference.

It's a week of opportunity – *the only week in two years* – when top business people from all over the continent will gather . . . to seek ideas and to see and hear what the world has to offer.

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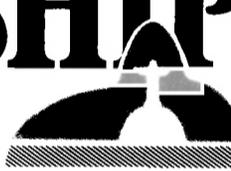
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I am interested in visiting the exhibition, please send information and free tickets when available

I would like to receive information about the conference as soon as it is available

Please send me information about the other Expoships in:
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New Rubber & Stainless Steel EXPANSION JOINTS, manufactured by Croll Reynolds: 30"—\$500; 24"—\$400; 20"—\$300; 18"—\$250
Also, 16" Copper EXPANSION JOINTS—\$200 ea.

Two (2) 44,000# Danforth-type Baldt anchors, new, for heavy-duty mooring. Price: \$19,000 each

(3) Reconditioned TOPPING WINCHES, 3000# at 30' per minute, 3HP 230V DC Motors. Price: \$500 each

Used MOORING CHAIN, from 1½" to 2½", in excellent condition. Price: \$10/lb.

SHAFTING—all types—from 8" to 30" diameter; lengths from 6' to 30'. Price: \$15/lb.

SMALL TURBINES

- (3) Westinghouse Type E125, 700 HP with reduction gear to 1800 RPM, close couple, 550# steam pressure, 20# exhaust, used, in excellent condition. Price: \$5,500 each.
 - (2) Direct drive E125 turbine, 150 HP at 400# 1800 RPM. Price: \$3,500 each.
 - (1) New Westinghouse E120 turbine, 150 HP at 4000 RPM 440#. Price: \$2,500.
 - (2) Coppus 100 HP at 3000 RPM, Type 18. Price: \$1,800
 - (2) 800 HP Skinner turbines, 500# steam pressure, Type S-26, with reduction gear to 1800 RPM. (one used and one unused). Price: \$5,500 each
- We have in stock dozens of small turbines from 1 HP to 1000 HP

WINCHES

Thirty (30) winches, almost new, American Hoist & Derrick. Twenty (20) 5-tons at 118'; ten (10) 30-tons at 30'. Can be used with DC, AC, hydraulic or diesel drive. Price: 5-ton, \$1,500 each, 30-ton, \$3,000 each

MOTORS

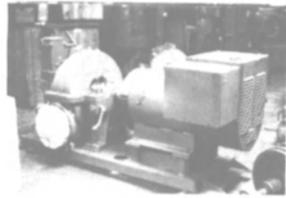
(Reconditioned, equal-to-new)

- (5) 50 HP, 1800 RPM, 440 V AC, General Electric. Price: \$1,200 each.
- (1) Two-speed, 50/20 HP General Electric 1780/1190 RPM, 440 V, 3-phase, 60-cycle, Frame: 504Z, totally enclosed. Price: \$1,400.
- (2) Reconditioned Vertical, 125 HP, 585 RPM, Frame: 6335, 440 V, reconditioned, equal-to-new. Price: \$3,500 each.
- (3) Unused, in excellent condition, General Electric 150 HP, 440 V AC, Vertical, explosion-proof motors, 1750 RPM. Price: \$3,500 each
- (2) 150 HP, 440 V, reduced voltage, General Electric starters. Price: \$1,500 each
- (3) 200 HP, 440 V, 3-phase, 60 cycle, General Electric, 1800 RPM, drip-proof motors, reconditioned, equal-to-new. Price: \$1,500 each

(100) BRAND NEW ECONOMISER ELEMENTS with 5½" cast iron gill rings and U-bends, manufactured 1982, with ABS Certificates, for Foster Wheeler boilers. Price: \$375 ea.

(2) Reconditioned equal-to-new, Waterous Model P1118 CARGO PUMPS. Price: \$2,250 each.

(4) New Diamond IK300 long vertical SOOT BLOWERS, brand new, completely automated with air motors, ready for operation. Price: \$1,500 each



FOR DIESEL SHIPS:

Low Pressure TURBOGENERATOR, 200 KW Skinner turbine, 125# steam pressure, 10# exhaust, driving 200KW Electric Machinery 440V, 3600 RPM generator, mounted on common base; will operate on steam conditions as low as 75#. New Cost: \$56,000. OUR PRICE: \$10,950, with switchboard

(1) 700 KW Cummins Model 2300 Diesel Gen Set, 440 V, 3-Phase, 60-cycle, 1800 RPM, heat-exchanger cooled, marine type with ABS certificate, equal-to-new, less than half manufacturer's price, built 1981. PRICE: \$25,000.

(1) Unused 40-50 ton-per-day Serck Model RX50-40 low pressure evaporator, complete with pumps, salinity indicators, dump valves, and spare parts, brand new, at less than 1/2 of original cost, in original boxes, built 1982

Approximately (50) 25# Galvanum Anodes, New. Priced at \$25 each.

(6) WINSLOW FILTER, 70 GPM for oil or any fuel, 48" tank. Price: \$1,500 each

ENTERPRISE DSG6 DIESEL ENGINES, 450 HP, 400 RPM with 250 KW Crocker Wheeler generators 230V DC. Price: \$5,000 each

(3) Crank cases with crankshafts, in excellent condition, for GENERAL MOTORS 16-278A diesel engines. Price: \$1,500 each. (This is cheaper than boring out the cylinders!)

(2) reconditioned HIGH PRESSURE DIESEL STARTING AIR COMPRESSORS, Ingersol Rand, 50 CFM at 400#, driven by 25 HP, 440V Westinghouse motor, in excellent condition. Price: \$2,900 each

(1) Completely rebuilt, like new, AIR COMPRESSOR, Worthington M40, 160 CFM at 150#, 7x6x5. Price: \$2,900.

(2) 350KW GENERAL ELECTRIC GENERATORS, 600 RPM, 440V, single bearing. Price: \$1,900 each

CATERPILLAR D398 PARTS, pistons, liners, filters and other parts. VERY LOW Prices.

(1) Complete set of Cylinders and Pistons for FAIRBANKS MORSE 32E14 DIESEL ENGINES, used, in excellent condition. Price: \$700 per cylinder.

(6) Cooper Bessemer 300 HP, 6-cylinder, type FS 900 RPM, 8" X 11 DIESEL ENGINES, Used, in good condition. Price: \$3,000 each

(3) Fairbanks Morse 1000 HP at 900 RPM Model 38D8 1/8, generator drive, used, in excellent condition. Price: \$7,900 ea

We have purchased the surplus spares for T-2, T-5, C4 from Exxon, Trinidad, Hess and others, which includes everything from gauge glasses to main turbine rotors: General Electric, Westinghouse, Worthington and Elliot.

(2) Reconditioned, equal-to-new, American Blower type Gyro-flow hydraulic COUPLINGS 250HP—1750 rpm maximum; can be used for any kind of pump drive with variable speeds required. Price: \$1,000 each

(2) Used, in excellent condition, WORTHINGTON 125-TON AIR CONDITIONING CHILLER UNITS, complete with 125HP Worthington turbine, 440#. New Cost of these units approximately \$125,000. Our Price: \$11,950 each

3" DOUBLE JOINTED EXPANSION JOINTS, ADSCO. Original cost: \$1,400 each. OUR Price: \$500 each

24" MODULAR IRON GATE VALVE, 150#. Price: \$800. *Hundreds of other valves in stock.

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(4) 2000 HP 2-pinion REDUCTION GEARS, 3.9-1, 950/250 RPM; can be used with single pinions, manufactured Farrel Birmingham, equal-to-new, with coolers. Price: \$4,900 each.

General Electric 1500 HP REDUCTION GEARS, 5000 RPM-1800 RPM. Price: \$4,500 each.

New Stal Laval HP LABYRINTH PACKING for 30,000 HP Stal Laval turbines. New Cost \$40,000. Our Price: \$7,500

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DP 120
DP 114

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- I. Introduction
 - A. Historical pattern of naval ship procurement
 - B. Market drivers—military needs, technical obsolescence, budget constraints, etc.
 - C. Impact of technology
 1. Unit ship cost has risen vastly since 1960
 2. Systems more important than platform
 3. Electronics systems particularly growing in sophistication
 4. Weapons are increasingly more lethal and accurate
 - D. Several important controversies
 1. Surface ship usefulness being questioned
 2. DOD trying to promote competition in procurement
 3. Insufficient work to support shipbuilding industry
 - II. Description of Current Players
 - A. Shipbuilders
 1. Major surface combatants—Bath, Ingalls, Todd-LA
 2. Submarines—Newport News, GD-Electric Boat
 3. Carriers—Newport News
 4. Amphibious ships—Lockheed, Ingalls, Avondale
 5. Auxiliaries—GD-Quincy, NASSCO, Avondale, Tampa, Beth Steel-Sparrows Pt., Pennship
 6. Small ships—Peterson, Marinette Marine, Bell-Halter, Todd Seattle, Tacoma, others
 7. Patrol boats, landing craft and service craft—Boeing, Swiftships, Atlantic Marine, others
 - B. Ship systems manufacturers
 1. Machinery—GE, Westinghouse, DeLaval, Colt
 2. Ordnance and Electronics—RCA, Litton, Sperry, GE Hughes, IBM, Raytheon, FMC, Honeywell, Rockwell, Gould, ITT, Interstate Electronics, Motorola, Sanders, Magnavox, Singer, GD-Pomona, Lockheed, Martin Marietta
 - C. Engineering services
 1. Naval architects—AME, Adtech, Arinc, CASDE, D&P, Geo. Sharp, Gibbs & Cox, JJ Henry, JJMA, M. Rosenblatt, NKF, RAM
 2. Systems integration—Vitro, BBN, Booz Allen, C Cubed, Calculon, Columbia Research, EG&G, Essex, Milcom, ORI, Syscom, TRW, Westinghouse
 - D. Summary of recent work distribution
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 2. Top 50 ship system awards
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 - C. NAVSEA's seven phase acquisition process
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 3. Makes early program entry important
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 4. AE, AG, AOE, AR—auxiliaries planned, maybe conversions
 5. TAO, TAGOS—follow flight to be completed
 6. MSH—opportunities for subcontractors, second source expected
 7. Service craft—lots of opportunities
 - C. Analysis of major ship systems now being procured or planned
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 2. Electronics—Aegis (RCA, Raytheon), control systems (Litton, GE), ASW systems (IBM, GE, EDO, Gould, Hazeltine, Raytheon, Honeywell), radar (Raytheon, ITT-Gilfillan, Sperry, Cardion Electronics), SUBACS (IBM), navigation systems (Rockwell, Litton, Racal Decca), integrated radio room (RCA)
 3. Ordnance—Vertical launch system (Martin Marietta, FMC), torpedoes (Gould, Hughes, Honeywell), ASW stand-off weapon (Boeing), close-in-weapons system (GD), missiles (GD, McDonnell Douglas, Lockheed, Raytheon)
 - D. Engineering services required in FY 1985
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C Detailed breakdown of 1985 Navy ship procurement, weapon procurement, other procurement, and research, development, test and evaluation budgets.

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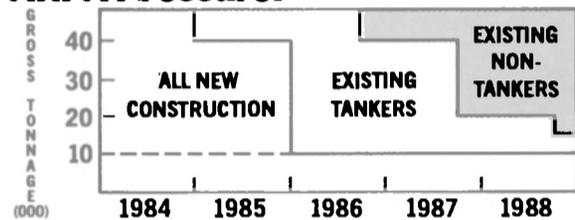
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