

# MARITIME REPORTER AND ENGINEERING NEWS



American Mariner

**Bay Shipbuilding Delivers  
GM-Powered "American Mariner"  
To American Steamship**

(SEE PAGE 12)

**MAY 15, 1980**

**B&W****NEW**

# How to save up to 500,000 US dollars à Year

## Simply by Converting your B&W Auxiliary Engine

B&W Marine Service has great news for shipowners who are worried about the fact that the price of diesel oil has tripled during the last two years... But at the same time the price of intermediate fuel oil has »only« doubled.

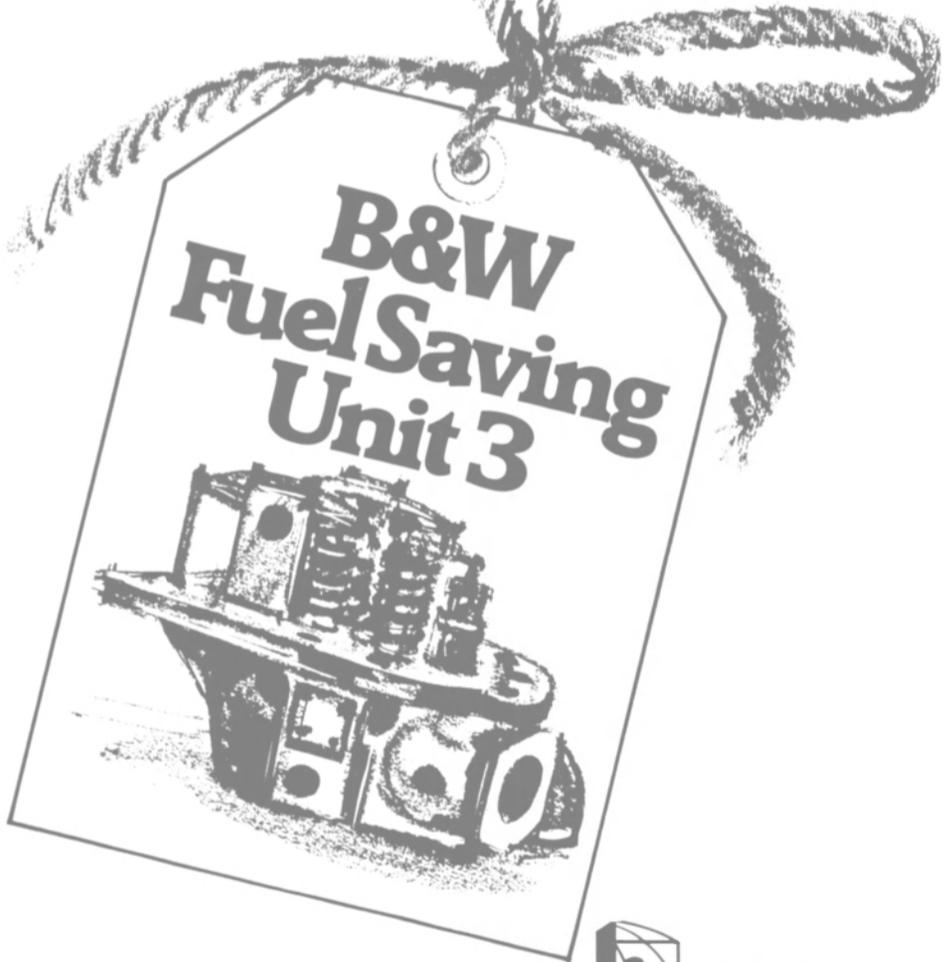
B&W research department has drawn the conclusions from this - and has developed an actual novelty. The B&W Saving Unit 3 programme.

Thereby your B&W auxiliary engines can be rebuilt to run on intermediate fuel oil - and this change means at once a lot of money saved, with the present oil prices up to ½ mill. US\$ per year - dependent on running hours and output.

This modernization of B&W auxiliary engines has a pay-back time of 8-12 months dependent on engine type.

The B&W Saving Unit 3 can be installed on all B&W auxiliary engines of the type 26MTBH, T/V23L(2 valves), U28L(2 valves) and U28L(4 valves).

Contact B&W Marine Service and let us tell you more about our fuel-saving units and how much you can save.



## B&W Marine Service

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DIVISION OF B&W DIESEL AS

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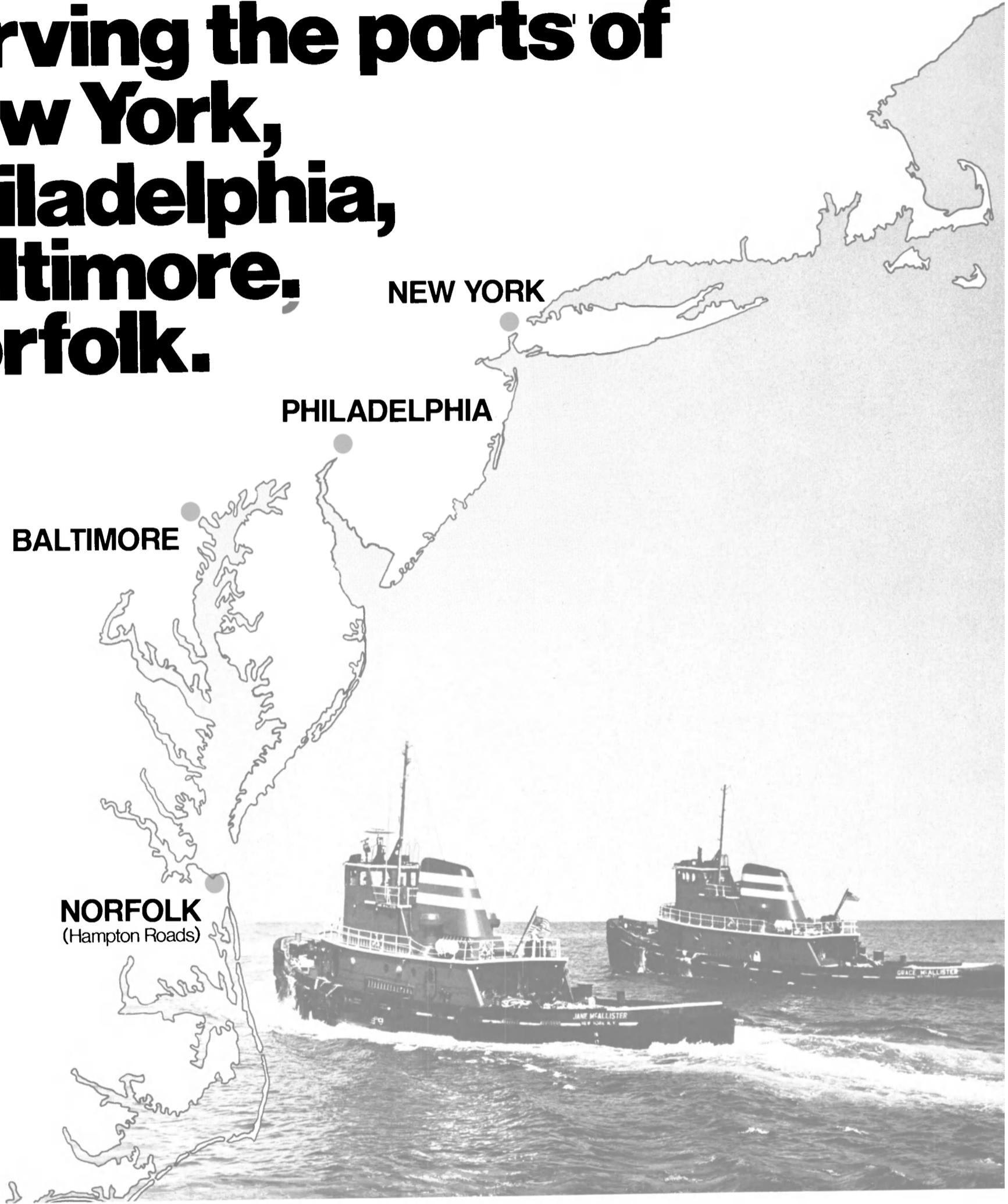
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# How A&A sees container shipping



Longshoremen loading a container ship in Staten Island, New York.

For warehouse-to-warehouse protection, Alexander & Alexander starts paying attention long before the containers come aboard. We watch through the truck driver's rearview mirror. We track progress with the trainman's timetable. From inland depot to dock, from deck to destination.

It's not the way you're used to seeing ships. Unless, of course, you are one of the shippers on A&A's client manifest.

## Risk management

But these insider vantage points give A&A the best view of the risks that beset containers, cargoes and vessels. They form a frame of reference that helps us design programs to minimize losses and to compensate for those that do occur. They enable our specialists to simplify

the complexities of marine insurance—barges to bumbershoots, crews to claims, charters to captives, rigs to rivers, property to price.

Every business is unique. Each has different needs. For insurance, for risk management, for human resources management, for financial services. That's why A&A works from a client's point of view. Only by working as partners, by solving business problems together, can we be sure a company gets the most comprehensive, cost-efficient programs possible.

We think our dedication to forming a close alliance with our clients is a big reason A&A has become one of the biggest and most trusted insurance brokers world-

wide. Each of our 120 offices here and overseas has the facilities, expertise and strength to meet the needs of any company, large or small, in any industry. Because we work the same way with every client. From the client's point of view.

# Alexander & Alexander

## From the client's point of view.

## Joeckel Appointed Fleet Manager For Ashland Petroleum

John W. Joeckel has been named fleet manager, ocean tanker operations, for Ashland Petroleum Company, Ashland, Ky., according to Robert T. McCowan, president.

In his new position, Mr. Joeckel directs the operation and performance of the company's ocean tanker fleet. He also makes recommendations to management relative to tanker design and new construction, and serves as an engineering/maintenance consultant to Cleveland Tankers, Inc. He reports to Carl H. Stuber, manager, tanker operations.

Mr. Joeckel joined Cleveland Tankers, an Ashland subsidiary, in 1972 as a cadet on the Great Lakes. He became assistant to the marine superintendent in 1974, and was named marine superintendent in 1977. He will relocate to the Ashland, Ky., area to assume his new position.

## Kormarine Will Have International Exhibits

Exhibitors from 11 countries—Canada, Finland, Holland, Italy, Japan, Norway, Singapore, Sweden, U.K., U.S.A., and West Germany—have already booked for Kormarine '80, the International Shipbuilding, Marine Equipment, Ports and Harbors Exhibition which will be held in KOEX, the new exhibition center in Seoul, Republic of Korea, July 28-August 4, 1980. The exhibition will also have a significant Korean participation.

Kormarine '80 will provide a first-time opportunity for worldwide manufacturers of equipment for ships and ports to show their products in the fastest-growing shipbuilding nation in the world. The Republic of Korea is set upon a course of modernization and expansion, with a particularly vast shipbuilding program and massive expenditure proposed on its ports. The demand for modern equipment from Europe and the West for such programs is forecast to increase.

The largest national participation will be from Norway, with 20 companies and organizations represented on the Norwegian pavilion.

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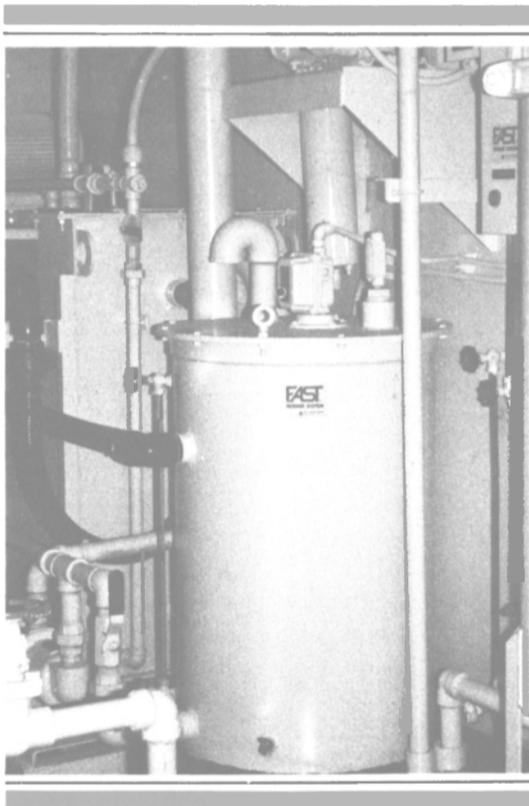
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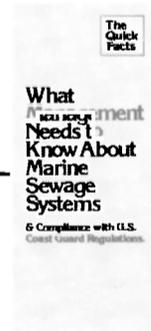
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MR & EN 5/15/80

**Schmidt Requests  
Title XI For Barge  
To Cost \$1.55 Million**

O.L. Schmidt Barge Lines, Inc. of Lemont, Ill. has applied to the Maritime Administration for a Title XI mortgage loan guarantee to aid in financing the construction of a double-skin tank barge. The applicant has indicated that

the 275-foot by 54-foot by 17-foot vessel will be operated on the Great Lakes and/or inland rivers of the U.S.

Port Brownsville Shipyard, Inc., Brownsville, Texas, is the proposed builder, with delivery scheduled for September 1980. If approved, the guarantee would be for \$1,356,250, which is 87½ percent of the estimated cost of \$1,550,000.

# Remember the Super Servant 1?



## You saw it first in Maritime Reporter

The only marine magazine published twice each month...MARITIME REPORTER delivers the most important marine information first...weeks before the slower monthlies.

MR is the best read marine magazine because it's the only current marine magazine. As a result, MR is requested, in writing, by thousands more buying influence readers than any other marine publication in the entire world.

Because MARITIME REPORTER is number 1 with marine people who specify and buy...it is number 1 with the world's leading marine advertisers.

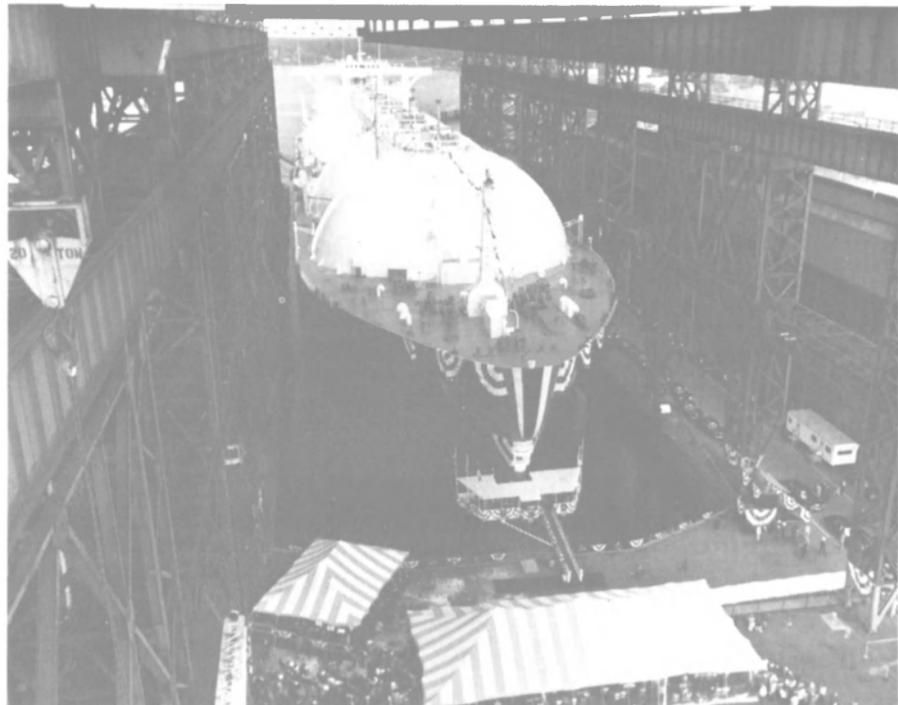
In 1979 MARITIME REPORTER carried more pages of advertising than number 2, ME/Log. MARITIME REPORTER carried 1866 pages (7x10) of advertising. Number 2, ME/Log carried less advertising for the third consecutive year...down to 1298 pages in '79.

Send for complete information showing how MARITIME REPORTER can put real power behind your marine advertising to produce more sales for you in 1980.

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LNG tanker Lake Charles almost fills dock at General Dynamics' Quincy shipyard just prior to recent christening. Vessel is first gas tanker built at Quincy that will transport LNG to the United States.

### General Dynamics Christens Its First LNG Carrier Built For U.S. Trade

The Lake Charles, first liquefied natural gas tanker built by General Dynamics to transport LNG to the United States, was christened recently at the corporation's Quincy, Mass. shipyard. When she goes into service, Lake Charles will carry LNG from Algeria to the U.S. Gulf Coast. All previous LNG tankers built at Quincy are delivering natural gas from Indonesia to Japan.

The Lake Charles, a 125,000-cubic-meter tanker, was built for Lachmar, a partnership of subsidiaries representing Panhandle Eastern Pipe Line Company, Houston; Moore McCormack Bulk Transport Company, Stamford,

Conn.; and General Dynamics, St. Louis.

The ship was christened by Mrs. Richard L. O'Shields, wife of the chairman and chief executive officer of Panhandle Eastern. Panhandle has a gas purchase contract with Sonatrach, the national oil and gas company of Algeria. The vessel will be operated by a subsidiary of Moore McCormack.

The other LNG tankers built at the Quincy yard have made 213 round trips and transported more than 25 million cubic meters of LNG. A sister ship of the Lake Charles, the Louisiana, will be completed at Quincy later this year.



Participants at recent christening were (left to right): Mrs. Carolyn J. Turney, sponsor's daughter; Richard L. O'Shields, chairman and chief executive officer of Panhandle Eastern Pipe Line Company of Houston; Mrs. O'Shields, the sponsor; Mrs. Stanley R. Boles, sponsor's daughter; and David F. Lewis, board chairman of General Dynamics Corporation.

# You can pay a little more now, or a lot more later.

Jeffboat refuses to compromise on quality. Because we don't, the initial cost of a Jeffboat barge may sometimes be slightly higher.

But the true cost of ownership is over the life of a vessel, not the initial investment. And no one can match the added service Jeffboat quality builds into our vessels.

A Jeffboat-built barge offers superior fitting, joining, sizing

and plate preparation. No detail goes overlooked. After a weld, for example, we eliminate the slag residue to be sure the weld is true and strong.

When you build a barge this way it may cost you slightly more initially. But on the true bottom line—many extra years of dependable performance with minimal maintenance problems—it's actually going to cost a good deal less.

And we'd be happy to help you compare your barge specifications against ours so you can see for yourself the reason for these savings.

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## Literature Available On Marine And Offshore Hydraulic Equipment

Paul-Munroe Hydraulics, Inc., Orange, Calif., has available a new brochure describing the capabilities of its Marine & Offshore Division. The 8-page bulletin features a wide range of specialized hydraulic equipment available to

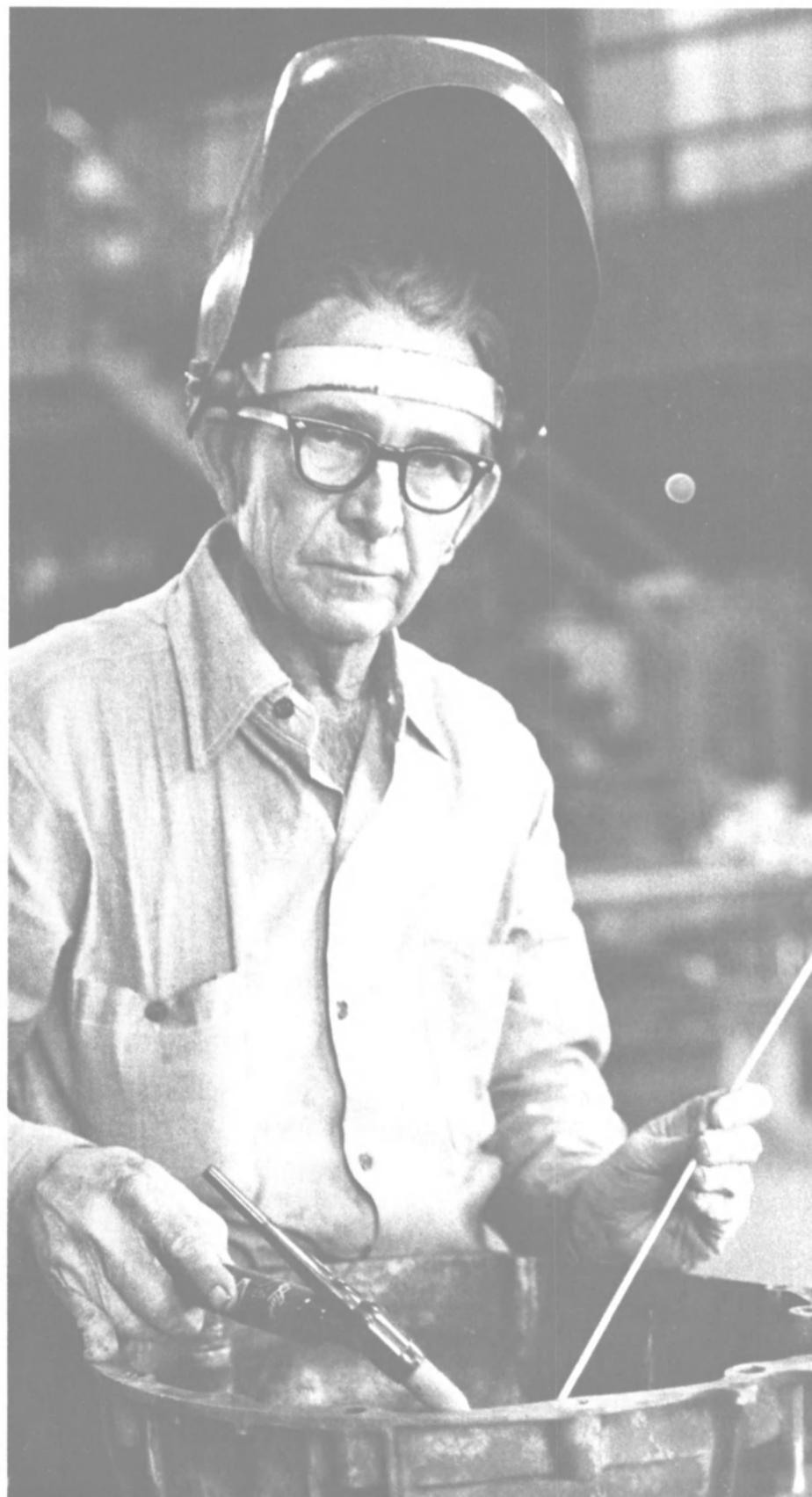
the offshore and marine industries. Also emphasized is the company's ability to custom-engineer products to meet each individual customer's requirements. Another section of the brochure describes the around-the-clock and around-the-world field service capabilities of Paul-Munroe.

Paul-Munroe is a southern California firm that has been provid-

ing engineering, manufacturing, and servicing of hydraulic equipment to worldwide markets for more than 30 years.

Additional information or a free copy of the brochure may be obtained by writing to **Peter Carter**, Paul-Munroe Hydraulics, Inc., Marine & Offshore Division, 1701 West Sequoia Avenue, Orange, Calif. 92668.

## "The great Coppersmith" is not extinct. You'll find him in Savannah.



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Bill is an artist with metals. He can do creative and amazing things with galvanized, stainless, and copper.

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## Efren Sanchez Promoted At Matson Navigation

Matson Navigation Company, San Francisco, has promoted **Efren Sanchez** to general manager, freight operations, it was announced by **C. Bradley Mulholland**, vice president, freight division. Mr. Sanchez, who joined Matson in 1955, formerly was manager, planning at San Francisco headquarters.

Other Matson changes: **Barry G. Miller**, formerly manager, freight operations, has been appointed manager, sales, northern California; **Walter D. Brewer**, formerly manager, sales, northern California, has been named manager, freight operations.

## AWO Names Patricia Yoder VP-Public Affairs

**Patricia D. Yoder** has been named to the newly created position of vice president-public affairs of The American Waterways Operators, Inc., Washington, D.C. The announcement was made by AWO president **Anthony L. Kucera**.

**Ms. Yoder** was an officer of Mellon Bank in Pittsburgh and served as assistant manager, public and corporate communications, before returning to the Washington, D.C., area to join the staff of the American Bankers Association as assistant director of public relations. She also served as press aide for former Secretary of Transportation **Brock Adams** while he was on Capitol Hill, and as director of public information for the Mayor and City of Fort Wayne, Ind.

## Sifco Provides Onboard Plating—Literature Available

Sifco Metachemical-Dalic, Cleveland, Ohio, a division of Sifco Industries, has available literature describing their Dalic Maritime Contract Plating Services.

Dalic plating equipment is brought to the ship by trained Dalic technicians who do the work onboard. Any repair requiring metal deposits up to 0.015 inch to 0.020 inch is common. The Dalic process is an approved U.S. Navy repair under Navships 0900-038-6010.

The ability of Dalic to come right onboard to do the job eliminates costly downtime in dismantling equipment, cutting holes in hulls, and transporting parts to job shops.

Details of actual jobs are described in the literature. Typically, shafts, cylinders, bearings, gears, turbine casings, and bores are application areas.

To receive the literature, write to **Carter Graff**, Sifco Metachemical-Dalic, 5708 Schaaf Road, Cleveland, Ohio 44131.



## Introducing the new TI 9900 from Texas Instruments. A fully automatic, computer controlled Loran C Navigator, at an affordable price. Only \$3495.

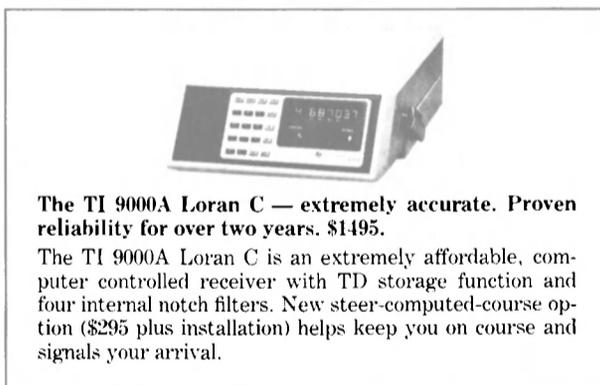
Finding a navigator that costs more is easy. Finding one that'll *do* more is hard.

The new TI 9900 not only tells you where you are, but also how to get where you're going.

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The TI 9900 also provides you with a wealth of other information. Range and bearing to your next waypoint, for instance. Your average speed-over-the-bottom, cross-track error, course-made-good and time-and-distance-to-go are instantly available.

A built-in steering indicator tells you when you're off course.



The TI 9900A Loran C — extremely accurate. Proven reliability for over two years. \$1495.

The TI 9900A Loran C is an extremely affordable, computer controlled receiver with TD storage function and four internal notch filters. New steer-computed-course option (\$295 plus installation) helps keep you on course and signals your arrival.

You can enter up to 10 course waypoints, and the TI 9900 will signal when you arrive, then display the range and bearing to the next waypoint. A special Constant Memory™ feature retains stored waypoints and other information — even after the TI 9900 is switched off.

It's affordable, versatile and compact, yet simple to use, and it draws only 16 watts.

See your nearest Texas Instruments dealer for a demonstration. He is factory-supported to provide you with installation, operating assistance and service. Ask for a detailed brochure, or write: Texas Instruments Incorporated, Marine Products, P.O. Box 226080, M/S 3107, Dept. MR, Dallas, Texas 75266.



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**OHIO:** Ashtabula, Loran Electronics, See Jefferson, La. Listing. Grand River, Holbrook Industries, (216) 352-2411. Holland, Loran Electronics, See Jefferson, La. Listing. Lorain, Loran Electronics, See Jefferson, La. Listing. Milbury, Loran Electronics, See Jefferson, La. Listing. Practorville (Huntington, W. Va.), La Fon Electronics, (614) 886-6863. Sandusky, Monroe Service, Inc., (419) 625-5215. Toledo, Loran Electronics, See Jefferson, La. Listing.

**OREGON:** Astoria, Jensen Communications, Inc., (503) 325-5917. Charleston, George's Marine Electronics, (503) 888-5209. Newport, Radio Center, Inc., (503) 265-2731. Portland, Rodgers Marine Electronics, (503) 287-1101.  
**PENNSYLVANIA:** Darby, Mantum Electronics Co., Inc., (215) 532-9236. Erie, Holbrook Industries, (814) 833-8159. Large, Specialized Electronics, See Memphis, Tennessee Listing. Pittsburgh, We-Do Electronics, (412) 767-5553.  
**RHODE ISLAND:** Davisville, Harbor Electronics, (401) 295-0657. East Greenwich, Merram Instruments, Inc., (401) 884-1710. Narragansett, Nav-Tech, Inc., (401) 789-1004. Point Judith, Merram Instruments, (401) 783-7335.  
**SOUTH CAROLINA:** Charleston, Marcom Electronics, Inc., (803) 766-3856. Georgetown, Parker Electronics, (803) 546-9351.  
**TENNESSEE:** Memphis, Specialized Electronics, (800) 238-5916. Tergh Communications, (901) 942-5711.  
**TEXAS:** Aransas Pass, Gulf Radiotelephone & Electronics, (512) 758-2021. Brownsville, Dubose Marine, (512) 831-4249. Dickinson (Galveston), Gulf Radiotelephone & Electronics, (713) 744-0150. Freeport, Gulf Radiotelephone & Electronics, (713) 233-8911. Houston (Pasadena), Gulf Radiotelephone & Electronics, (713) 944-6000. Houston, Bibbins & Rice, (713) 641-5023. Sabine (Port Arthur), Gulf Radiotelephone & Electronics, (713) 962-8465.  
**VIRGINIA:** Chincoteague, Maritime Electronics, (804) 336-5335. Falls Church, Television Workshop, (703) 532-2990. Hampton, Central Electronics, (804) 723-7889. Gulf Radiotelephone & Electronics, (804) 247-0277. Harfield, Marine Electronics, Inc., (804) 776-9500. Norfolk, Sea Port Electronics, (804) 545-4631.  
**WASHINGTON:** Anacortes, Whatcom Marine Electronics, (206) 293-6100. Beltingham, Whatcom Marine Electronics, (206) 676-1990. Blaine, Whatcom Marine Electronics, (206) 332-6323. Ilwaco, Whatcom Marine Electronics, (206) 642-2650. Port Angeles, Pride Electronics, (206) 452-2922. Seattle, Collins Marine, (206) 284-7473. Northern Marine Electronics, (206) 782-3780. Sound Marine Electronics, (206) 784-7444. Whatcom Marine Electronics, (206) 285-2740.  
**WEST VIRGINIA:** Huntington, Specialized Electronics, See Memphis, Tennessee Listing.  
**WISCONSIN:** Green Bay, Wilson Electronics, (414) 499-0490. Port Washington, Lakeshore Electronics, (414) 284-6061. Sturgeon Bay, Bay Electronics, (414) 743-9693.  
**CANADA:** British Columbia, Vancouver, Spitsbury & Tindall Ltd., (604) 684-4131. Telex 04-55482. Cable 'SPILTIN'. Nova Scotia, Halifax, Gabriel Aero-Marine Instruments Ltd., (902) 423-6627.



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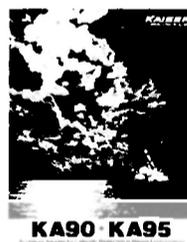
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CHEMICALS

## Heyl & Patterson Gets \$4.75-Million Contract

Heyl and Patterson, Incorporated, Pittsburgh, Pa., has been awarded a \$4,752,086 modification to a fixed-price contract for repairs required to several large cranes at the Norfolk Naval Shipyard, Portsmouth, Va. The Naval Facilities Engineering Command, Atlantic Division, is the contracting activity. (N62470-79-C-2536)

## Willamette Tug Names New Vice President



R. Kirk Roberts

R. Kirk Roberts has been named vice president of Willamette Tug & Barge Company, an operating division of Riedel International, Inc., both headquartered in Portland, Ore. Announcement was made by Whit Olson, president of Willamette Tug.

Mr. Roberts, a 28-year veteran of the tug and barge industry on the West Coast, retains his responsibilities as general manager of Willamette Tug & Barge. The firm operates in the Columbia and Willamette River basins, including the Ports of Portland and Vancouver, and along the Pacific Rim.

## Literature Available On New Decca Loran C Unit

ITT Decca Marine, Palm Coast, Fla. has introduced the new 1024 Loran C. Unveiled at the recent Miami Boat Show, this unit has a watertight, touch-tone-activated front panel, and can work with any Loran C chain in the world. The user will have two adjustable notch filters and a display to see the precise frequency setting and signal strength his filters are set to.

The 1024 features dual LOP readouts, tracks four LOPs simultaneously, and can monitor and display incoming signal quality. The user can also be alerted to erroneous LOP readings. Designed for universal mounting, the 1024 can accept any standard voltage and whip antenna. As an option, the new unit can be interfaced to Decca's new 10350 track plotter to provide a high-performance navigation package.

For literature containing more information on the 1024, write to Alan D. Thompson, Dept. MR, ITT Decca Marine, Inc., P.O. Box "G", Palm Coast, Fla. 32037.

## Guidance Notes For Coal-Burning Ships Available From Lloyd's

In view of the interest now being shown in using coal as a cheaper alternative to oil for fueling ships, Lloyd's Register of Shipping has produced a new booklet, "Guidance Notes for the Burning of Coal in Ships' Boilers."

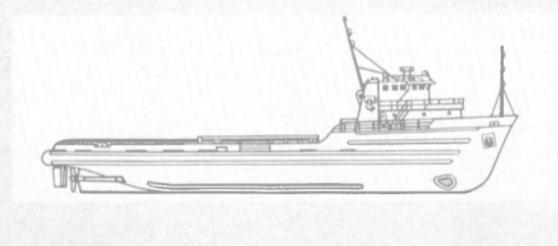
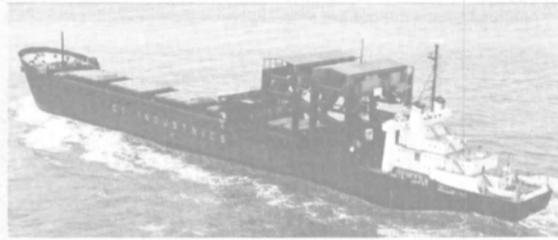
The Notes explain the statu-

tory and classification aspects of using coal as a fuel at sea as a primary source of heat for the generation of steam for main and essential auxiliary services.

It has been assumed throughout that no manual handling of coal will be used, and that boiler firing will be by some form of automated grate—this being the most likely system to be adopted in the near future. However, this

does not rule out other forms of firing, such as pulverized fuel, slurries of coal/oil/water mixtures, or fluidized bed firing, and Lloyd's Register will consider such systems if submitted for approval.

For a free copy of the booklet, write to The Secretary (Ref. TSG/AGC), Lloyd's Register of Shipping, 71 Fenchurch Street, London EC3M 4BS, England.



# Avondale... 40 years of diversified shipbuilding and offshore construction

## Proven Performance

Since 1938, Avondale has constructed over 2,300 vessels. In the period from 1967 to 1977 alone, 95 major ships were delivered. And in 1978, the Avondale Offshore Division has built 33 offshore drilling rigs, 20 jackets and 19 decks.

## Diverse Interests

Avondale never limits its interest in ship construction by type, size or quantity. Our design capability has been developed as a service to the industry for the development of new ship designs, and to review existing designs for possible improvements. We can meet all of your requirements. Similar diversification has been developed for the offshore industry.

## Unique Capabilities

Avondale's facilities are among the most modern in the United States. We are extremely proud of the fact that many unique construction techniques have been developed in response to challenges from the industry for certain types of vessels and rigs. But... the real reason for Avondale's capabilities is its people and their dedication to being the nation's best shipbuilders.

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## Avondale Shipyards, Inc.

A Subsidiary of Ogden Corporation  
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LNG/LPG SHIPS - Immense vessels to serve inter-continental trade routes.  
CONVERSIONS - Our massive drydock enables us to add new midbodies.  
WORKBOATS - Now on order, the workboats of the future.



Bulk carrier American Mariner is latest self-unloader to join the Great Lakes fleet of the American Steamship Company.

## Self-Unloading Bulk Carrier Delivered To ASC By Bay Shipbuilding

The newest addition to the American Steamship Company's Great Lakes fleet, a \$30-million, 728-foot bulk carrier, was christened and went into service recently. The new self-unloader is named the American Mariner in honor of the officers and men who dedicate their lives to the sea.

**Samuel B. Nemirow**, Assistant Secretary of Commerce for Maritime Affairs, Maritime Administration, was the principal speaker at the christening ceremony held in Sturgeon Bay, Wis., in the yard of Bay Shipbuilding Corporation, a subsidiary of The Manitowoc Company, Inc.

**Frank Drozak**, executive vice president of the Seafarers International Union, and **Raymond T. McKay**, president, District 2, Marine Engineers Beneficial Association-Associated Maritime Officers, delivered remarks at the ceremony. **Mrs. Samuel B. Nemirow** was the ship's sponsor.

The American Mariner's flexible design will enable her to carry iron ore pellets, coal, and other



Mrs. Samuel B. Nemirow smashes champagne across the bow of the 728-foot Great Lakes vessel American Mariner. Her husband, right, the Assistant Secretary for Maritime Affairs, Department of Commerce, and **Arthur J. Zuehlke**, president, Bay Shipbuilding Corporation, watch the traditional ceremony.

bulk commodities. The vessel has a 78-foot beam and a midsummer draft of 30 feet 10 inches. She has an unloading rate of 6,000 long tons of iron ore pellets per hour, and a capacity of 31,600 long tons of iron ore pellets. Her two diesel engines will provide a total of 7,000 bhp, and will give her a full-load speed of 15 miles per hour.

The ship is the ninth new carrier to enter service since 1973 in American Steamship's current building program. This has added more than 325,000 long tons in new capacity to the ASC fleet, which now totals 20 vessels.

American Steamship Company, a GATX subsidiary, has been headquartered in Buffalo, N.Y., since 1907, and operates the largest fleet of self-unloading vessels

on the Great Lakes, serving the steel, utility, chemical, cement, and construction industries. Commodities typically shipped include limestone, coal, iron ore, salt, gypsum, and sand.

### Hillman Changes Name To HBC Barge, Inc.

Hillman Barge & Construction Company has changed its name to HBC Barge, Incorporated to better identify its role as a major inland barge builder. The company specializes in custom-designed barges built to customer specifications. Company ownership, management, craftsmen, and support staff all will remain unchanged, as will the company's location in Brownsville, Pa., on the Monongahela River.

**Robert Kenny**, president of HBC Barge, stated the reason for the name change is to gain better identity with the barge industry and barge users. "We wanted our name to be an easy and direct reflection of our dedication to barge building," Mr. Kenny said, "which is the majority of our business. Although our old, full name did say 'Barge and Construction,' most people knew of us only as 'Hillman' and often confused us with the other Hillman companies. The 'Construction' in the old name led to other confusion, we'd often get calls about building port facilities, schools and highways.

"With the new name, HBC Barge, people will more easily recognize us for our barges," Mr. Kenny added, "This identity is particularly important to potential new customers who are looking for a barge builder."

HBC Barge, Inc. began building barges as Hillman Barge & Construction Company in 1939. Since then, the company's plant facilities have grown steadily, along with its capabilities. The current facilities have been laid out for maximum flexibility, permitting the simultaneous construction of many different barges of various types and sizes, and of differing design requirements. This type of layout has proven necessary due to the custom design of the company's barges.

According to Mr. Kenny, each barge the company produces is designed to meet the customer's specifications and design requirements. "This adaptability to design is particularly important with the liquid cargo and chemical barges we build," Mr. Kenny said. He added, "The variety of products our customers transport have very crucial, and widely differing, handling requirements. We design and build each barge for the customer, accordingly."

In addition to liquid cargo and chemical barges, HBC Barge builds coal, grain, cement, sand,

gravel and general commodity barges, in standard, jumbo, stubbo and specialty sizes. Although the company concentrates its efforts on barges, it still retains the capabilities for building other types of specialty marine equipment.

### Honeywell-ELAC Names Reimann As Consultant

Honeywell-ELAC of Kiel, West Germany has appointed **Manfred Reimann** as consultant for the North American market. He will be responsible for increasing the presence of the company in the U.S. and Canada.



Manfred Reimann

A member of the Honeywell family of companies, Honeywell-ELAC has a long history in the design and production of echosounder systems for navigation, fishing, oceanography, and hydrographic survey. The combined technology of Honeywell Inc. and its German subsidiary will ensure that exceptional products will be provided for the marine industry.

Mr. Reimann will cooperate closely with ITT-Decca Marine, Palm Coast, Fla. and Decca Marine, Toronto, Canada — Honeywell-ELAC's exclusive distributors for navigation and fishing equipment in North America. His previous assignment was general manager of Krupp Atlas Elektronik Division, Houston. Mr. Reimann will be working out of the Marine Systems Center of Honeywell Inc., Seattle, Wash.

Honeywell-ELAC offers a comprehensive product line, from fish detection sounders, fish scopes, long-range and high-definition sonars to hydrographic survey sounders with digitizer, and vessel berthing systems.

### Dikeos Named Acting Director For Farrell

**James P. Horn**, president of Farrell Lines Incorporated, New York City, announced the appointment of Capt. **Andreas Dikeos** as Farrell Lines' acting director for Greece, Yugoslavia, and Bulgaria.

He will be headquartered in Farrell's Piraeus office, and will replace Capt. **P.A. Adams**, who is returning to the United States for reassignment. Captain Dikeos will report to **A.P. Ferroni**, Farrell Lines' vice president-Mediterranean Area, in Genoa.

#### American Mariner

(2) 20 Cylinder GM EMD Model 20-645-E7 diesel engines. Each are 3,600 bhp at 900 engine rpm.

(1) Falk Model 2527 MA1 Marine reduction gear.

(4) Kato ships service generators each 670 kw — each powered by a Caterpillar D-398-TA diesel engine.

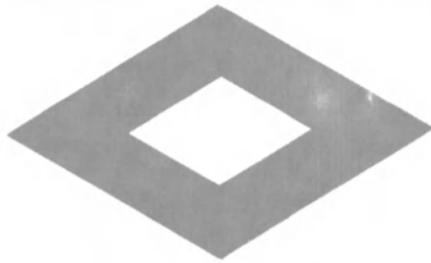
(1) Propeller — Bird-Johnson Ka-MeWa. 17 ft. 6 in. diameter. Controllable pitch with stainless-steel blades.

(2) Bow and stern thruster — CP Bird-Johnson. Each with 79-inch-diameter tunnel.

FAST Sewage Treatment System. Steering gear — Jered Industries.

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- ◇ The largest and most powerful fleet of tugs.
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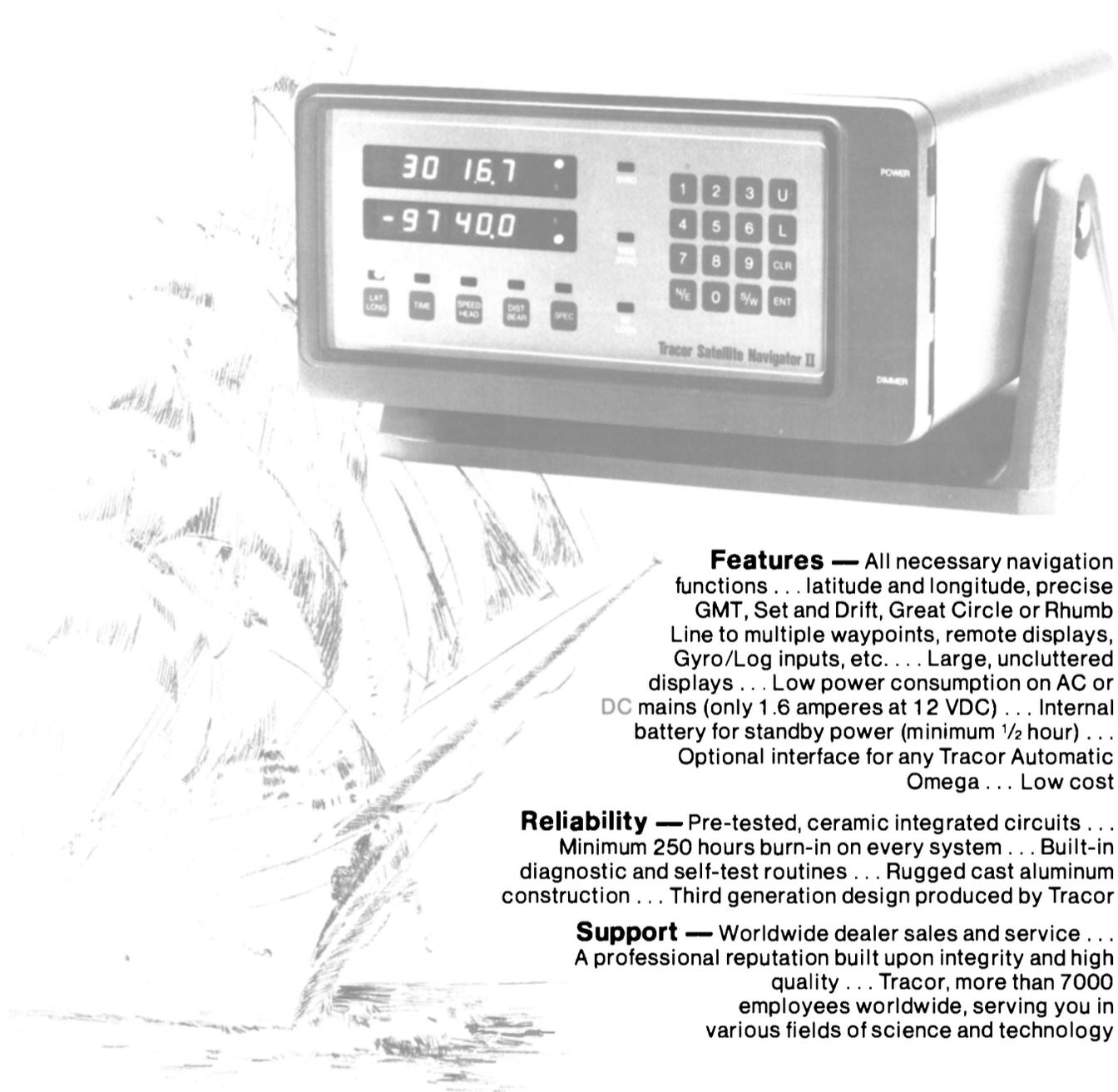
- ◇ Eight twin-screw tugs of more than 3000 hp.
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Tugs CAPE HENLOPEN 3300 hp and  
FELLS POINT 2400 hp docking STONEWALL JACKSON.

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**Features** — All necessary navigation functions . . . latitude and longitude, precise GMT, Set and Drift, Great Circle or Rhumb Line to multiple waypoints, remote displays, Gyro/Log inputs, etc. . . . Large, uncluttered displays . . . Low power consumption on AC or DC mains (only 1.6 amperes at 12 VDC) . . . Internal battery for standby power (minimum 1/2 hour) . . . Optional interface for any Tracor Automatic Omega . . . Low cost

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## \$5-Million-Plus Contracts Awarded To Louis Allis

Contracts exceeding \$5 million for eight more auxiliary propulsion systems for the U.S. Navy's new guided missile frigates, the FFG-7 class, have been awarded to Louis Allis Division of Litton Industries.

The Milwaukee, Wis.-based manufacturer of special motors said three systems are to be delivered to Bath Iron Works, Bath, Maine; three to Todd Pacific in San Pedro, Calif., and two to Todd Pacific in Seattle, Wash. Deliveries will begin in October 1980.

## George K. Geiger Joins Bay Shipbuilding Corp.

Bay Shipbuilding Corporation, Sturgeon Bay, Wis., has announced that **George K. Geiger** will assume the position of vice president and general manager and will report directly to **A.J. Zuehlke**, president.



George K. Geiger

Mr. Geiger was employed by Bethlehem Steel Corporation in 1970. He was a member of a team that organized and staffed the Bethlehem yard in the Republic of Singapore, Malaysia. Once the shipyard was in operation, Mr. Geiger was in charge of production operations, equipment procurement, and operational budgets. In 1965, he returned to the United States where he was assigned as assistant to the general manager at the Key Highway ship repair yard.

In 1966, Mr. Geiger was employed by Litton Industries and was first assigned to the Beverly Hills, Calif. FDL program participating in the development of the new Pascagoula, Miss., shipyard. In 1967, he became president and general manager of Erie Marine in Erie, Pa. There, Mr. Geiger established a new shipyard and shipbuilding company at which the first 1,000-foot Great Lakes bulk carrier, the M/V Stewart J. Cort, was built for Bethlehem Steel. He has also held key positions at Todd Shipyards at Los Angeles, and Puget Sound Naval Shipyard in Washington.

## Delaval Will Test Use Of Coal-Derived Fuel

In a new phase of the Government's multi-billion-dollar synthetic fuels program, the Department of Energy has awarded

Transamerica Delaval Inc. a contract to test the performance characteristics of coal-derived liquid in operating heavy-duty diesel engines.

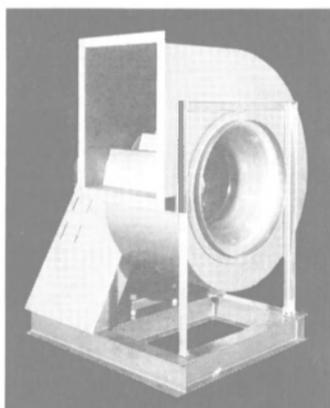
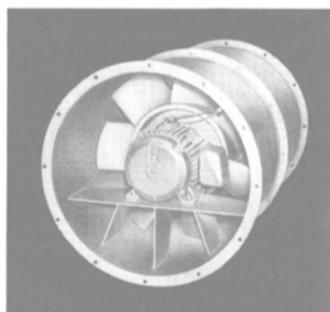
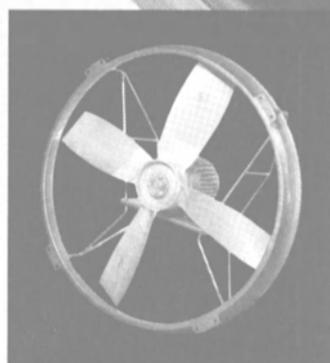
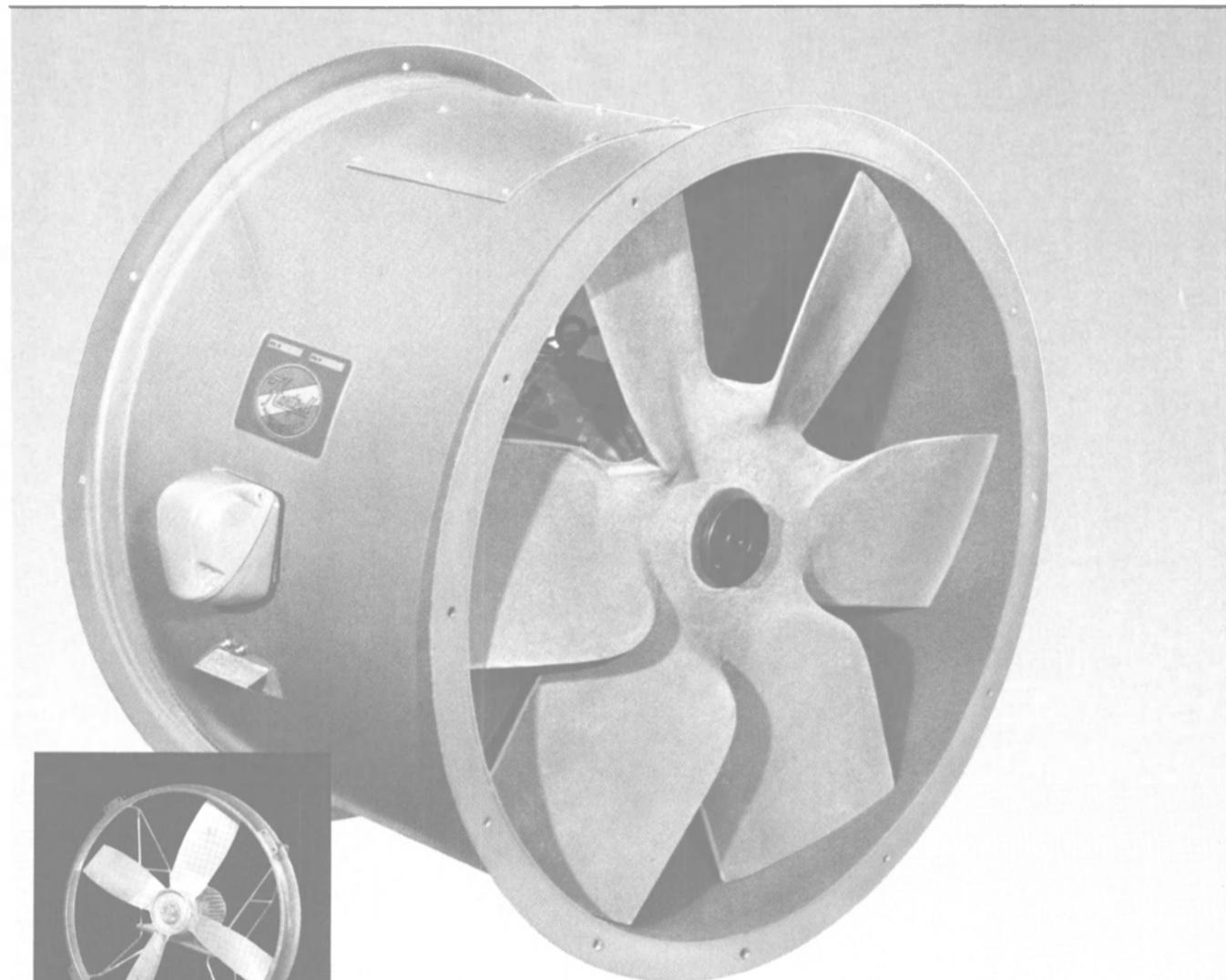
Details of the \$475,000, 16-month program were announced by **Douglas Martini**, vice president and general manager of Transamerica Delaval's Engine and Compressor Division, which manufactures diesel engines in the

3,000 to 13,500-bhp range at its Oakland, Calif., plant. The division will use its 3,656-bhp DSR-46 engine in the DOE tests.

Mr. Martini said the test engine contains the same basic technology as the other medium-speed diesel built by Transamerica Delaval for ship propulsion and for generating electrical power. The DSR-46 is also easily modifiable for the tests, and economical in

terms of fuel consumption per test hour.

According to the Department of Energy, the feasibility studies "anticipate the time when synthetic fuels from coal could provide substantial amounts of energy in the U.S." In addition to testing with synthetic fuel from coal, the program is expected to include a later phase using shale oil.



## Select the only seagoing fans with Hartzell quality

Hartzell has been a leading manufacturer of high quality air moving equipment for well over 50 years. And now we're out to conquer the seas with a full line of fans designed specifically for shipboard ventilation.

We offer a variety of models, including ring fans, axial flow and vaneaxial duct-type fans, and centrifugal units. And our application engineers are available to help you select the right fans for your needs.

Hartzell marine fans meet MarAd specifications S38-1-101, S38-1-102, and S38-1-103. Motors are available for above and below deck operation to meet IEEE45, U.S.C.G., and A.B.S. regulations. And in addition to complying with all official marine requirements, we make our fans even more seaworthy with hot dip galvanizing and special corrosive resistant coatings.

Many marine models are on our loading dock, ready for immediate delivery. So call your local Hartzell representative today. We're ready to put 50 years of ventilation know-how to work for you.

# HARTZELL



Hartzell Propeller Fan Company, Piqua, Ohio 45356

## Edmond Easter Named Navidyne Vice President



Edmond Easter

Navidyne Corporation, Newport News, Va. announces the promotion of **Edmond Easter** to the newly created position of vice president, marketing. He will assume responsibility for worldwide sales of Navidyne's product line of marine electronics equipment.

Mr. Easter has served as Navidyne's marketing manager for North America since joining the company in 1976. He has also held marketing positions with the Hastings-Raydist Division of Teledyne, Inc., and with Texas Electronics.

According to **A. Clifford Barker**, president of Navidyne, Mr. Easter has played a leading role in establishing the company as a leading producer of satellite navigation receivers.

### Catalog Available From Milwaukee Tool

A 16-page catalog describing the company's complete line of vices, jacks, braces, wrenches, pipe cutters and other tools and equipment for use in shipyards and shops is being offered by Milwaukee Tool & Equipment Company. The brochure gives complete specifications on a wide range of products, particularly vices.

For a free copy of this catalog, write to **Dick Berger**, sales manager, Milwaukee Tool & Equipment Company, 2773 South 29th Street, Milwaukee, Wis. 53215.

### Navy Contracts Totaling \$203 Million Awarded To Todd Shipyards—Backlog Is \$1.5 Billion

**John T. Gilbride**, chairman and chief executive officer of Todd Shipyards Corporation, has announced that the company's West Coast subsidiary, Todd Pacific Shipyards Corporation, has been awarded additional contracts to build, under the Navy's fiscal 1980 program, two more FFG-7 class guided missile frigates for the U.S. Navy, and one additional FFG-7 class ship for the Royal Australian Navy.

The base price is approximately \$203 million, with provision for upward adjustment for labor, material, and overhead escalation in

accordance with contract terms. With 20 ships of the same class still under construction, as a result of contracts previously awarded to Todd in fiscal years 1975-79, this award gives the company a Naval shipbuilding backlog of \$1.5 billion for the 23 ships now under contracts.

The first Todd-built FFG, the USS Wadsworth (FFG-9), constructed at the Los Angeles Di-

vision, joined the fleet early in April this year. The second, the Duncan (FFG-10), having successfully completed acceptance trials, will be delivered by the Seattle Division in May. Of the remaining ships, nine have been launched and 11 are on the building ways or in the construction process. Of the total of 25 ships awarded to Todd thus far, 21 are for the U.S. Navy and four are

for the Royal Australian Navy. One of the ships of the current order will be built at the Los Angeles Division and two at the Seattle Division.

Mr. Gilbride stated that, based on current administration planning, at least 15 more of these frigates are proposed for construction. Todd expects to be awarded a fair portion of these during the next four years.

# Crude Oil Washing problems come in many shapes and sizes. So do BUTTERWORTH® tank cleaning machines.

### The Right System Reduces Turn-around Time... Increases Profits.

Because tank washing problems can be simple or complex there is no one machine that is right for every tank or task. But with this wide range of equipment Butterworth Systems can help you select precisely the right machine or combinations of machines for your vessel, so you get the optimum cleaning system at minimum cost.

With the IMCO deadline approaching, there couldn't be a better time to let Butterworth Systems solve your tank cleaning problems.

### The Industry Leader Yesterday, Today and Tomorrow

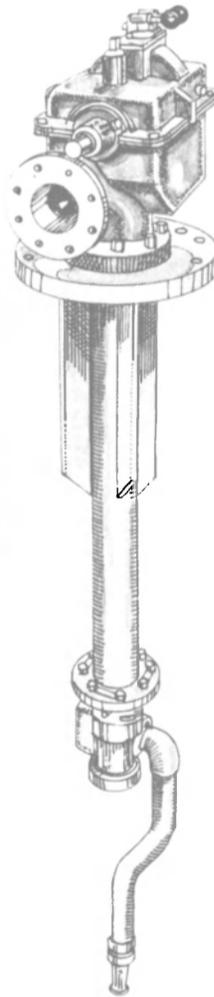
For over fifty years Butterworth Systems has been the world leader in tank cleaning equipment. Our complete line of

tank washing machines offer thoroughly proven performance and the highest reliability. Each BUTTERWORTH® tank cleaning machine has its own unique cleaning capabilities and advantages which can provide a tailor-made system for your specific crude oil washing needs.

## 1.

### The LAVOMATIC® SA Machine. For Fastest Cleaning of Large Tanks.

The deck mounted LAVOMATIC® SA tank cleaning machine has a capacity of 90-150 tons per hour and a Selective Arc feature for single or multi-stage crude oil washing. It is the only tank cleaning machine in the world which has a patented programed speed feature which concentrates cleaning effectiveness wherever sludge buildup is normally heavy. The LAVOMATIC® SA unit automatically slows



down when washing critical areas and then speeds up over less critical areas. This speed programming feature can result in up to 60% reduced cleaning time.

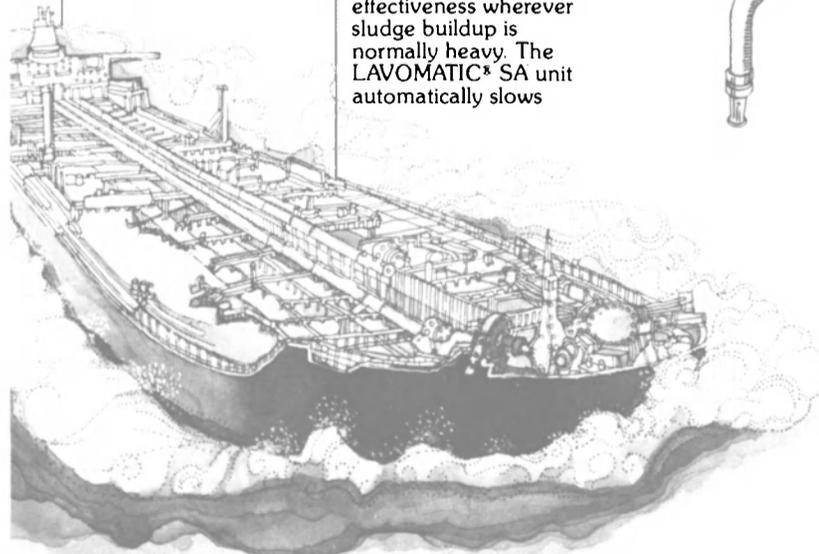
The LAVOMATIC® SA advantage: the fastest economical cleaning of even the largest tanks plus a long history of superb performance and reliability.

## 2. Introducing the BUTTERWORTH® P-60 Machine. Making Multi-stage Crude Oil Washing More Economical.

The latest addition to the Butterworth Systems family of tank cleaning machines, the P-60 is a single nozzle, deck mounted machine functionally similar to the LAVOMATIC® SA machine. The capacity of the P-60 ranges from 90 to 150 tons per hour. It features a permanently mounted control box/power source, preset speed and full-flow turbine.

Three preset selectable arcs are available to the tanker crew for a full wash, side wash or bottom wash. The bottom wash setting features a closer wash pattern to provide the greater cleaning power required there.

The P-60 advantage: provides multi-stage washing and proven Butterworth Systems reliability while reducing initial cost.



### First Of 60-Barge Order Delivered By NABRICO

The first of 60 grain barges has been delivered to the American River Transportation Company (ARTCO) by the Nashville Bridge Company (NABRICO). The barges are 195-foot rake hopper and 200-foot box hopper barges being constructed at the NABRICO Ashland City, Tenn., facility.

Previously, NABRICO constructed five 10,500-barrel chemical tank barges and five 195-foot bulk flour barges for ARTCO.

Founded in 1970, ARTCO is a wholly owned subsidiary of the Archer Daniels Midland Corporation of Decatur, Ill. A major carrier on the Mississippi, Illinois, Missouri, and Ohio Rivers, ARTCO has a fleet of more than 500

barges carrying a variety of agricultural products, including grain, flour, and vegetable oils.

NABRICO is a wholly owned subsidiary of the American Ship Building Company, Cleveland, Ohio. Headquartered in Nashville, Tenn., NABRICO has been in the marine field for more than 60 years and is primarily concerned with the design, engineering, and construction of barges.

### R.A. Lambert Joins Envirovac As Marine Sales Manager

Richard A. Lambert has joined Envirovac, Rockford, Ill., as sales manager, marine systems, as announced by Frank Eubank, executive vice president and general manager of the company.



Richard A. Lambert

Mr. Lambert has been in the marine field since 1957. As international sales manager for AMF International, he was responsible for the marketing activities for all marine and land-based seawater desalination systems. More recently, he was international area manager responsible for the entire marketing program in Asia for RF Communications.

Envirovac manufactures sewage systems for the marine and a wide variety of other industries.

### Garlock Introduces Expandable Packing—Literature Available

A four-page, illustrated Bulletin 135, just issued by Garlock Inc., presents a new style 9000 expandable valve stem packing (EVSP) set designed to prevent the escape of gases or liquids from within the system, and to reduce packing inventory requirements.

Expanded views of standard and miniature designs show that the EVSP set construction incorporates three major chemically inert components—aluminum spacer rings, carbon fiber wiper/sealing rings, and pure graphite sealing rings having a unique selective compressibility.

A detailed drawing shows how EVSP elements expand radially on gland tightening to make a tight seal against both stuffing box I.D. and valve stem O.D. This characteristic is said to compensate for dimensional variations caused by valve wear or maintenance machining. It also permits use of one set to cover a multitude of valve sizes. The 48 nominal set sizes listed in the bulletin are claimed to work in virtually hundreds of different valves.

A free copy of Bulletin 135-MR may be obtained by writing to James E. Heffron, manager-sales and marketing, Garlock Inc., 1666 Division Street, Palmyra, N.Y. 14522.

# 3.

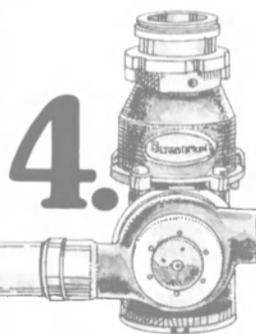
**The BUTTERWORTH® MP Machine. Cleans Hard-to-reach Areas From Any Angle.**

The multi-position, very high-capacity BUTTERWORTH® MP machine is designed to clean hard-to-reach areas in complex tank structures. Self-powered



and featuring simple design, the MP provides the very high reliability required for within-tank mounting. This single nozzle tank cleaning machine weighs 178 lbs and can be fixed-in-place in any location, at any angle, and is specifically designed to allow installation on tank bottoms under the cargo.

*The MP advantage:* cleans large areas which cannot be reached by conventional deck-mounted equipment and provides unbeatable Butterworth Systems performance.



**The BUTTERWORTH® SSK Machine. For Small Areas or Medium Size Tanks.**

The BUTTERWORTH® SSK two-nozzle machine combines throughput

and range to clean medium sized tanks or hidden areas in large tanks. The SSK machine can be fixed-in-place at any angle, weighs 55 lbs and has a throughput capacity of 80 tons per hour and an effective cleaning range of approximately 100 feet.

*The SSK advantage:* low cost cleaning of moderate size tanks with famous Butterworth Systems technology.

# 5.

**The BUTTERWORTH® SK Machine. Cleans Hidden Areas or Smaller Tanks.**

Fixed-in-place at any angle, the SK machine has a twelve year track record of dependable, effective cleaning. It features Butterworth Systems' exclusive

"ball of twine" spray pattern that crisscrosses and overlaps for thorough cleaning. The SK machine weighs 55 pounds and has a throughput of 30-60 tons per hour and a range of 70 feet.

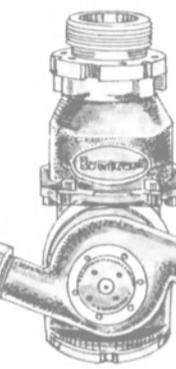
*The Super K advantage:* low cost cleaning of hard-to-reach areas plus Butterworth Systems reliability.

# 6.

**The BUTTERWORTH® K Machine For Small Tanks, Fixed-in-place at Any Location.**

Over 20,000 BUTTERWORTH® K machines have made it the industry favorite for every kind of tank cleaning for twenty-three years. Now the K machine provides valuable COW service.

It weighs less than fifty pounds, has a cleaning range of 30 feet and up to 30 tons per hour throughput.



Fixed-in-place, the K machine is ideal for cleaning smaller tanks or small hard-to-clean areas in large tanks. Its twin nozzles rotate while the entire unit revolves, thereby producing Butterworth Systems' "ball of twine" pattern which ensures that every inch of surface is completely covered.

*The K advantage:* small size, lightweight, low cost and the most proven Butterworth Systems technology.

**For any capacity range or tank location Butterworth Systems has proven equipment to meet your needs.**

| Unit              | Capacity Tons Per Hour | Weight  | Location     | Attitude |
|-------------------|------------------------|---------|--------------|----------|
| LAVOMATIC® SA     | 90-150 TPH             | 820 lbs | Deck Mounted | Vertical |
| BUTTERWORTH® P-60 | 90-150 TPH             | 690 lbs | Deck Mounted | Vertical |
| BUTTERWORTH® MP   | 70-150 TPH             | 178 lbs | Any          | Any      |
| BUTTERWORTH® SSK  | 60-80 TPH              | 55 lbs  | Any          | Any      |
| BUTTERWORTH® SK   | 30-60 TPH              | 55 lbs  | Any          | Any      |
| BUTTERWORTH® K    | 20-30 TPH              | 48 lbs  | Any          | Any      |



## Butterworth Systems

For more information contact **Butterworth Systems Inc.**  
224 Park Avenue, Box 352, Florham Park, N.J. 07932 USA  
Telephone: (201) 765-1549 Telex: 136434

**Butterworth Systems (UK) Ltd.**  
445 Brighton Road, South Croydon, Surrey CR2 6EU, England  
Telephone: 01-668-6211 Telex: 946524



Supply vessel Boh Tide is one of three built for Tidewater Marine Service by Halter Marine's Moss Point, Miss., yard.

## Four Supply Vessels Of New Class Delivered To Tidewater Marine

Tidewater Marine Service, Inc. of New Orleans, a subsidiary of Tidewater Inc., recently took delivery of four new 180-foot supply vessels. Three of the new vessels—the Boh Tide, Bolling Tide, and Toby Tide—were constructed at the Moss Point, Miss., yard of Halter Marine; the Munson Tide was built at McDermott's New Iberia, La., yard. These boats are the first four of 10 new units, and an altogether new class of supply vessel that will serve the offshore oil and gas industry.

William E. Bright, president of Tidewater Marine, said the new vessels are particularly suited for jackup drilling operations and other relatively shallow-water exploration and development programs.

"Towing/supply and supply boats in the medium horsepower range form the focal point of the company's \$60-million fleet expansion program, which is about midway to completion and will add a total of 25 vessels by October 1981," Mr. Bright said. Tidewater

owns and operates the world's largest offshore fleet of some 400 vessels that are now in service worldwide.

The latest four vessels are equipped with an improved pumping system designed by Tidewater's engineering staff, which provides liquid mud and other chemicals in addition to fuel and water to offshore drilling rigs.

Vessels in this class are powered by twin Caterpillar D-399 diesel engines driving through Reintjes reduction gears, giving 2,250 continuous horsepower and a speed of 12 knots. They are equipped with the latest communications and navigation devices, including Decca radar, Drake VHF and emergency radios, RF Communications SSB radio, and Texas Instruments Loran. Electrical power is supplied by GM/Delco diesel generator sets.

These vessels have air-conditioned and heated quarters for 20 persons. Deck storage area is 114 by 34 feet; below-deck storage can accommodate 4,000 cubic feet of bulk cargo.

### Triple 'A' South Awarded \$6.4-Million Navy Job

The San Diego shipyard Triple 'A' South has been awarded a \$6,391,352 fixed-price contract for the regularly scheduled overhaul and drydocking of the amphibious assault ship USS Tripoli (LPH-10). Contracting activity was the Supervisor of Shipbuilding, Conversion and Repair, USN, San Diego. (N62791-74-C-0030)

### NACE Philadelphia Section Will Sponsor Northeast Regional Meeting

A three-day conference on various corrosion control procedures, sponsored by the Philadelphia Section of the National Associa-

tion of Corrosion Engineers, will be held at the Marriott Hotel in Philadelphia September 29 to October 1.

The program for this 1980 Northeast Regional Meeting of NACE will include a marine conference, and sessions on the principles of corrosion, protective coatings and linings, and water treatment. Among the topics that will be discussed at the marine conference are generic coatings, water treatment techniques, national and international regulations, cathodic protection systems, tank linings, and construction techniques for shipbuilders.

For further information write to Jay Keldsen, Matcor, Inc., P.O. Box 687, Doylestown, Pa. or Vincent Giorno, P.S.G., Inc., 110 Essex Building, Narberth, Pa.



Latest Crandall railway drydock to become operational is located in the Port of Zeebrugge, Belgium. It is the fourth Crandall dock in service in that country.

## Fourth Crandall Drydock For Belgium Placed In Service

The Port of Zeebrugge, Belgium, which is presently undergoing considerable expansion, recently inaugurated a new 1,200-ton Crandall railway drydock, with a side transfer system to enable as many as four vessels to be docked simultaneously. The construction was undertaken by the Entreprises Maurice Delens of Brussels, using the general and detail design of Crandall Dry Dock Engineers, Inc. of Dedham, Mass.

This facility, the first of its kind in Zeebrugge, will permit the substantial fishing fleet of the area, as well as other harbor craft, to be drydocked in its home port rather than having to go to Ostend or Antwerp. It also will encourage a shipbuilding industry to develop in the Prinsfilip dock area where the drydock is located.

Sitting in a wet dock behind locks assures a constant water level within a range of 20 centimeters, permitting 24-hour docking. The brackish water is too salty to freeze readily but not salty enough to support marine borer life.

The railway has foundation and underwater ways of azobe timber from Cameroon, and the inshore portion is of reinforced concrete. A curved track causes the cradle to be rotated from its inclined attitude submerged to a horizontal position full up that permits easy side transfer.

A standard Crandall low-friction roller system is used for both hauling (with a single 2¾-inch chain) and transfer. There is a cradle 72 meters long by 16 meters wide, with drafts over blocks of 3 meters inshore and 6 meters offshore. It has a capacity for concentrated loads of up to 35

tons per meter, with transfer limited to 24 tons per meter.

Because the outshore section can operate independently, there are forward latches to secure the bow cradle, and there is a wire rope bridle to keep the roller system in position.

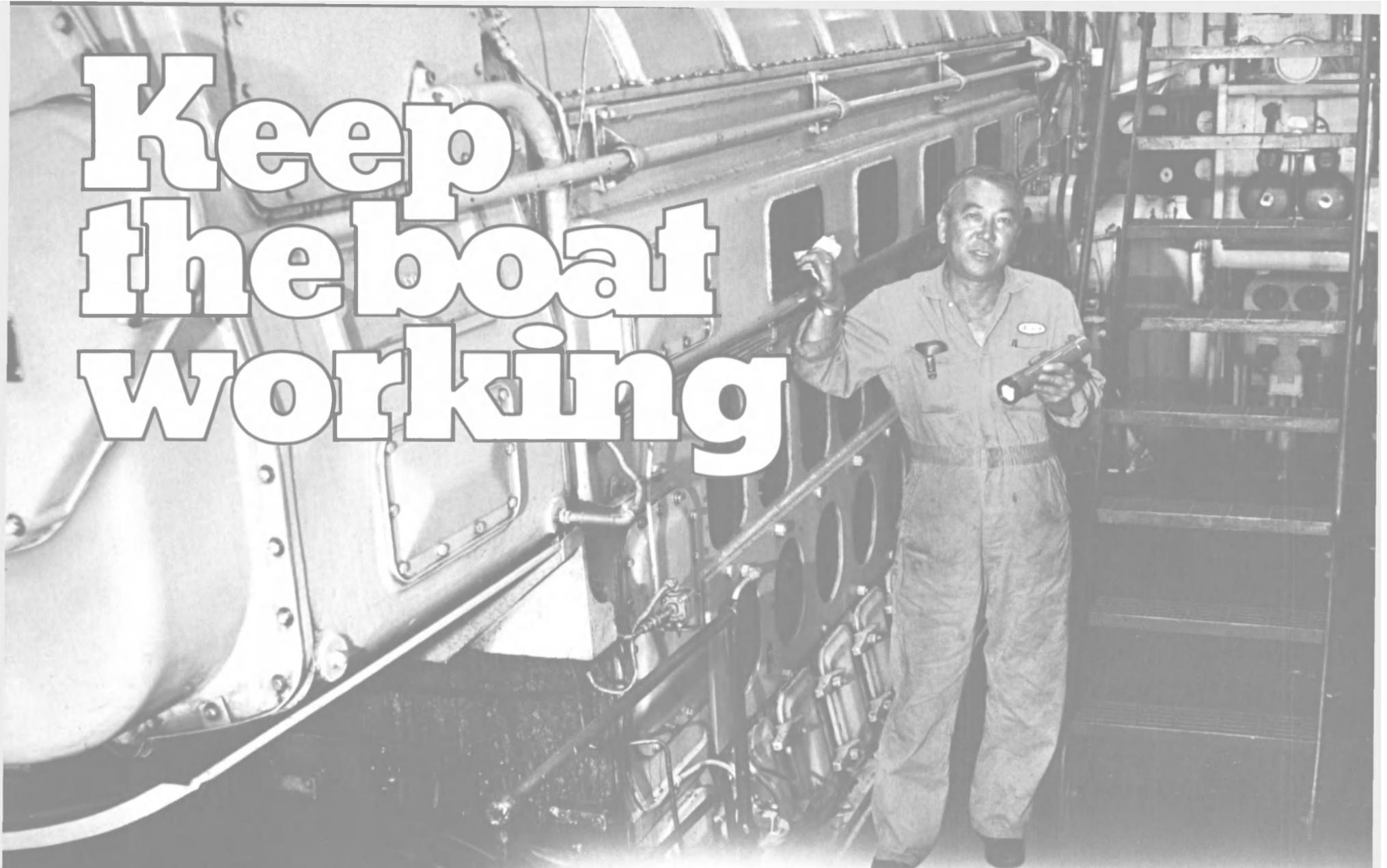
A unique system for bilge block operation on the transfer cars is capable of reconnection so as to work directly on the main cradle. This latest improvement, never used previously, has proved very successful and saves considerable time and labor in the transfer of vessels.

A vessel to be transferred sits on up to nine separate cars. It is propelled sideways by two independent hydraulic-powered drums, using 22-millimeter wire rope with 3-part tackle, attached at two points to the vessel itself. For security against wind forces, the transfer cars are provided with holding clamps on both the cradle and the transfer berths.

The project was financed by the national government of Belgium for the city of Brugge through the Department of Public Works (Service de la Cote), and managed by Ir. Kerckaert, director, under the overall control of Ir. Simoen, Inspector General.

Fabrication of structural steel was done by Victor Buyck of Eeklo; the hauling machine with all its electrical controls was manufactured by de Pecker of Gent, using certain elements supplied Crandall, while all civil works were carried out by Delens. Underwater work, particularly pile cutting and track installation, was subcontracted to Benelux Divers, Inc. of Antwerp.

# Keep the boat working



Intake  
100% open



Exhaust  
90% open

M.S. Mikioi



Intake  
100% open



Exhaust  
90% open

M.S. Mikiona

## Dillingham does. Saving over \$20,000 a year in each Fairbanks Morse engine with Shell's Caprinus® R Oil.

The "Mikioi", powered with twin Mdl 38D8 - 1/8 6-cylinder engines, and the "Mikiona", powered with twin Mdl 38D8 - 1/8 10-cylinder engines, have logged over 13,600 hours each since their last overhaul. In both boats, *Caprinus*® R has been the engine lubricant for more than 3,000 hours — preceded by Shell's *Caprinus* T Oil.

Since Dillingham switched to Shell's *Caprinus* R oil the boats have logged over 5,000 hours each without a single day of downtime to clean engine ports.

M. Kent Whitman, Vice President and Manager of Dillingham Tug and Barge Corporation in Hawaii, estimates *downtime costs* for each of Dillingham's ocean-going tugs at \$4,000 per day. Shunsaku Hirano, Assistant Maintenance Supervisor, estimated that with the engine lube previously used, an HVI base oil, each of the two boats required a three-day downtime period every 1,500 hours (about three times a year) for cleaning of intake and exhaust ports due to excessive power-robbing deposits. *Labor costs* for the cleaning totaled about \$1,900 each time the boats were down.

With the previous oil — each boat averaged 9 days downtime a year, at \$4,000 per day, plus 3 cleanings a year at \$1,900 each — or about \$41,700 every year for each boat.

Look at the pictures (left). They show intake and exhaust ports from the engines of the *Mikioi* and the *Mikiona*. Ports are clear. That's because *Caprinus* R with Shell's premium MVI base oil

doesn't form hard deposits. It helps keep exhaust port deposits soft and friable. As power output varies, these deposits slough (break) off keeping the ports open and improving air scavenging efficiency.

Whitman stated, "...we looked for an oil that could help us reduce unscheduled downtime and *Caprinus* R has proved it can do it." And, Hirano added, "...with *Caprinus* R there has been a vast improvement over the HVI base oil we did use in keeping the engines clean and ports clear...wear rates are down and the boats run longer between service intervals. *Caprinus* R does the job for us."

Dillingham Tug & Barge has found out what *Caprinus* R can do in Fairbanks Morse engines and in its EMDs too. The high alkalinity, high dispersancy additives, in a premium MVI base oil provide the right combination for the protection the big medium-speed diesels need. Keep them clean, wear rates low and deposits at a minimum.

What could you save with *Caprinus* R Oil? Try it in ALCO, EMD and Fairbanks Morse and you'll know. Write us for more information.

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Manager, Commercial  
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Houston, TX 77002

\*Caprinus is a trademark and is used as such in this writing.

Come to   
Shell for answers

### Bird-Johnson Names East Coast Manager

Robin H. Booth was recently named East Coast regional manager for Bird-Johnson Company.

He is responsible for directing East Coast sales activities, providing technical and sales support for all area marine customers. He is based at the company's cor-

porate headquarters in Walpole, Mass.

Mr. Booth has been employed with the company as an applications engineer for two years. Additional marine industry experience includes two years' employment as a test engineer for General Dynamics' Electric Boat Division, and three years' employment as an applications engineer for Sperry Vickers.

### Falcon Seeks Title XI Covering Four Tankers To Cost \$108 Million

Falcon World Shipping Corporation, a subsidiary of Falcon Carriers of Houston, Texas, has applied to the Maritime Administration for a Title XI mortgage loan guarantee to aid in construction of four 37,000-dwt tankers.

If approved, Title XI financing would be for \$81 million or 75 percent of the actual total cost of \$108 million.

The diesel-propelled, 13,680-bhp vessels will be used in worldwide trade. Ingalls Shipbuilding division of Litton Industries, Pascagoula, Miss., is the proposed builder, but no delivery dates have been scheduled.

### Uniflite Awarded \$535,000 Navy Contract

The U.S. Naval Sea Systems Command has awarded a contract valued at \$535,000 to Uniflite, Inc., Bellingham, Wash., to build seven 33-foot utility boats, according to James J. Doud Jr., Uniflite president.

The boats are an advanced version of similar utilities previously built for the Navy. Delivery of the 45-passenger fiberglass utility boats will be made to Naval facilities at Portsmouth, Va., and San Diego, Calif. They are used to transport personnel and cargo to and from tenders for destroyers and submarines.

The boats are 33 feet 9 inches length overall, with a beam of 10 feet 11 inches, and are powered with single 100-bhp 4-53 Detroit Diesel engines.

### Sarex Oil/Water Separators Approved By U.S. Coast Guard —Literature Available

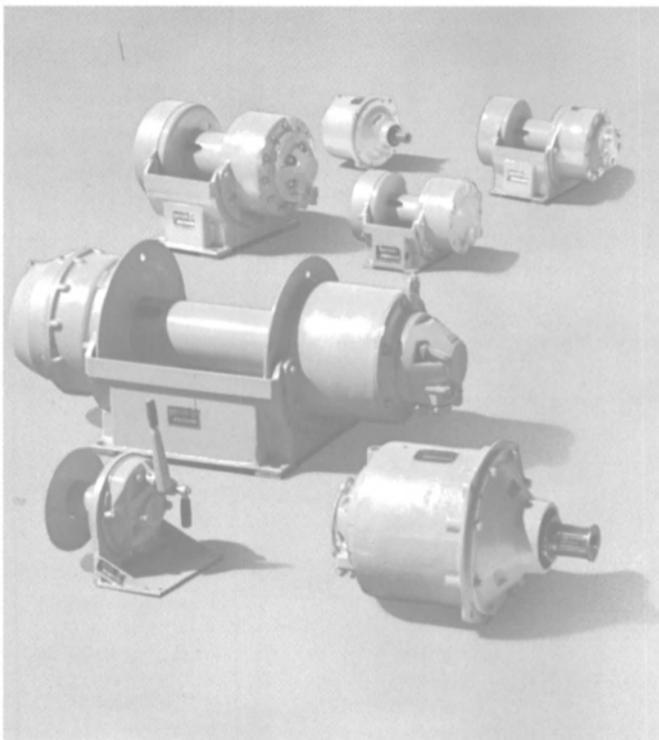
The U.S. Coast Guard has approved Sarex oil/water separators to control polluted waters being discharged from shipboard bilges and shoreside stations. Said to be the first such certification issued by the Coast Guard for oil/water separators, it was granted to Separation and Recovery Systems, Inc. of Irvine, Calif.

Joseph De Franco, president of the company, stated that "the certification was based upon stringent specifications and test requirements for oil/water separators and bilge monitors that were published in the *Federal Register* in September 1979, and Sarex systems are specifically designed to process dirty water from tankers and other vessels."

The U.S. Coast Guard regulations are based on international design and test specifications that have been adopted recently by the Inter-Governmental Maritime Consultative Organization of the United Nations, of which 102 nations are signatories.

For further technical information on Sarex oil/water separators, all other Sarex products, and the complete line of anti-pollution systems, write to Eric Nietsch, manager, Pollution Control Division, Argo Marine Systems, 140 Franklin Street, New York, N.Y. 10013.

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jumbo; hopper, tank and deck barges; semi-integrated, double-square-end and double rake barges; plus, we have the capabilities to provide floats and other marine specialty equipment.

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HBC Barge, Inc. Brownsville, Pennsylvania 15417 Phone: (412) 785-6100

Formerly named Hillman Barge & Construction Company.

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The most comprehensive and reliable engine monitoring control and analysis system in the world today is Megasystems' Seamatic. And it's the simplest to operate, too.

Fuel savings alone make Seamatic the definitive system of the 80's and fuel savings are just one of a host of Seamatic benefits.

Megasystems' Seamatic II is now in place and operating brilliantly in fleets of several major companies and a number of total automation and control systems have been specified for ships currently under construction.

Most flattering of all, the Seamatic is being re-ordered—and re-ordered in multiples—by most of the sizable shippers

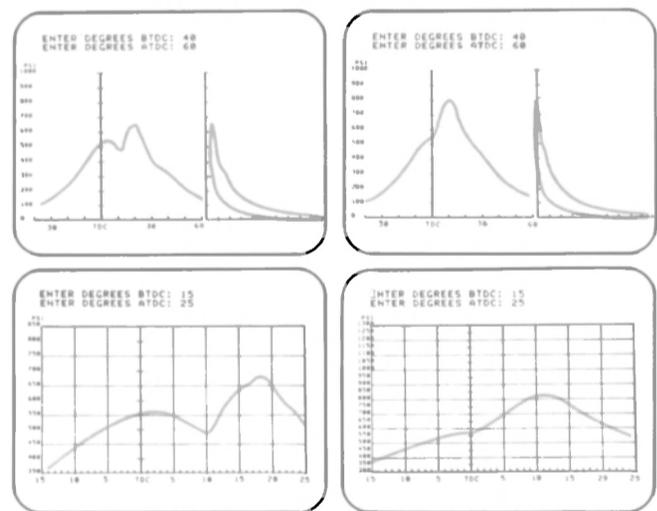
who have use-tested it under the most difficult and demanding conditions.

So unique that it's patented, the state-of-the-art Seamatic engine monitoring and control system is so sophisticated and so dependable that it will save you money year after year. In fact, with Seamatic, fuel savings of five per cent or more are commonplace.

Pay-back time, of course, varies depending on use. But, in all cases, Megasystems' Seamatic pays for itself in a remarkably short time.

If you'd like to improve your ship's performance . . . and cut your fuel costs . . . talk with us. We'll show you how to do it!

## BEFORE AND AFTER



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### W.H. Corbett Promoted To VP At Everpure, Inc.

William H. Corbett has been named vice president-engineering and production for Everpure, Inc., Westmont, Ill. He joined the company in 1965 as manager of manufacturing engineering and quality assurance. He was promoted to manager of product engineering as well in 1974. Mr. Corbett has been director of engineering and production since 1977.

Everpure is a manufacturer of water filtration products and purification systems for the marine and offshore industries.

### J.W. Chandler Named To Shipbuilders Council Posts



John W. Chandler

John W. Chandler, director of the Marine, Military and Government Department of the York division of Borg-Warner, has been appointed to the board of directors of the Shipbuilders Council of America and elected chairman of its Allied Industries Committee.

Mr. Chandler supervises the sale of all York's marine, military, and government products in domestic and international markets, and heads the division's government relations activities in Washington, D.C.

He joined the York division in 1944 and has served the air-conditioning and refrigeration equipment manufacturer in several capacities, including sales engineer and district manager for the Washington, Maryland, and Virginia area.

### APL And Encinal To Develop Container Terminal In Alameda

American President Lines, Ltd. (APL) of Oakland, Calif., and Encinal Terminals of Alameda, recently announced agreement to develop a 23-acre full-service berth and container facility in the island city of Alameda. Target date for completion of the initial phase, to be capitalized at \$3.5 million, is October 1, 1980.

The new venture was announced by W.B. Hubbard, senior vice president (operations) of APL, and president of Eagle Marine Services, Ltd., the wholly owned subsidiary which will operate the facility; and Chengben (Peter) Wang, president of Encinal Terminals, Alameda.

Mr. Hubbard said the project

has been launched to help meet massive expected demand, on the part of vessel operators and the shipping public, for container facilities in the San Francisco Bay Area over the next decade and beyond.

The new terminal is to include a berth for oceangoing container vessels, two modern gantry cranes, facilities for 1,000 dry and refrigerated containers, and an innovative receiving and delivery system for trucks. To be located at the Encinal Terminals' Berth 5 complex, it will be Alameda's only full-service container-handling operation.

erators as prospective tenants. He said the facility will be fully operational upon completion of "phase one," but that additional development on the site is projected.

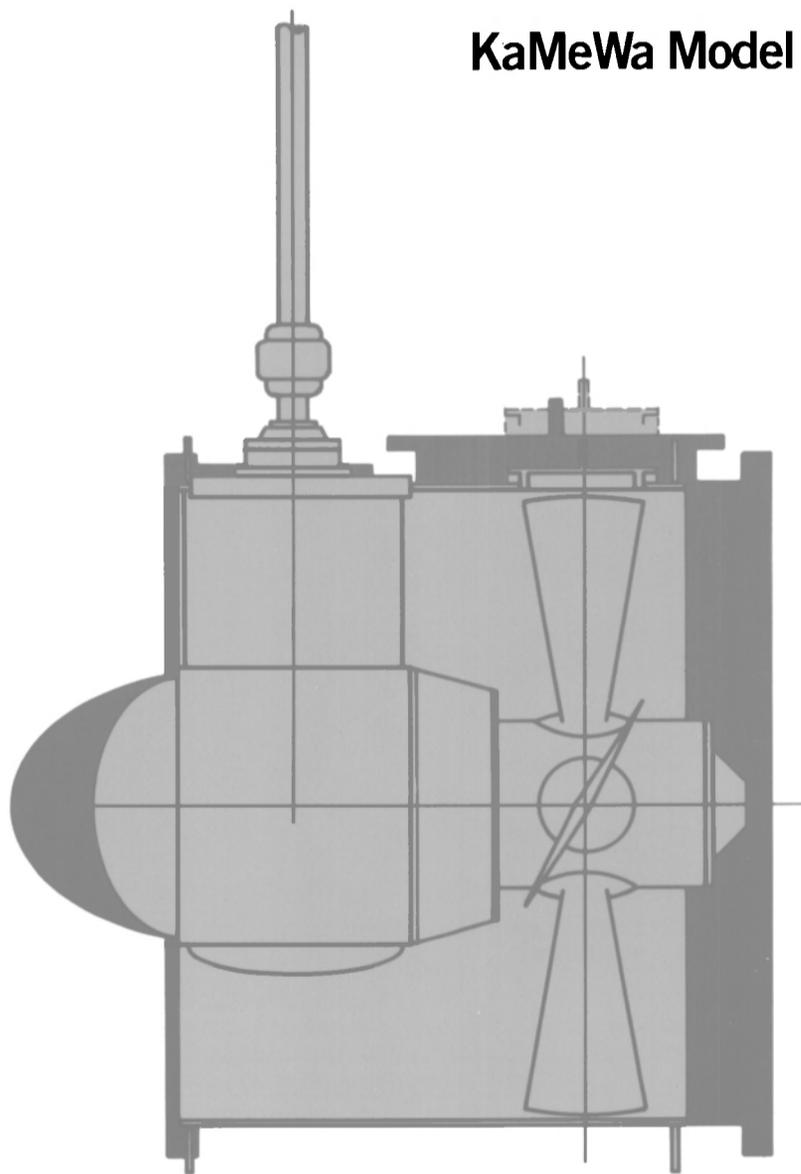
Eagle Marine is a comprehensive container stevedoring contractor, providing services in Los Angeles, Oakland, and the Pacific Northwest for APL and other vessel operators.

Raymond L. Cunan, vice president and general manager of Eagle Marine, said the developers of the project are currently negotiating with several vessel op-

erators as prospective tenants. He said the facility will be fully operational upon completion of "phase one," but that additional development on the site is projected.

# MORE POWER TO YOU

## KaMeWa Model 200 CP Thruster



Power makes the difference. And size. The Model 200 is now in production. We capitalized on the latest technology without sacrificing the qualities which made our 1000 HP Model 80 the most successful thruster in the world.

Propeller diameter and input pinion speed are identical in both models. But the KaMeWa 200 accepts input horsepowers up to 1500!

We reduced overall tunnel length. Reduced the hatch removal clearance. Result: a thruster that's smaller. Streamlined. With greater flexibility for location in restricted spaces.

For even more power we also produce the Model 240 (to 2200 HP) and the Model 250 (to 3000 HP). Contact Gary Dayton for additional information.

## BIRD-JOHNSON COMPANY MARINE DIVISION

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# The Shipbuilding Market In The USA

H.I. Freinberg, D.M. Mack-Forlist and R.W. Thorpe Jr.\*

During most of the 20th century there has been a debate in the United States about the operation of and the need for shipping and shipbuilding. The debate was interrupted by two world wars and has been intensified during the past 30 years.

During the same period, the political and economic interdependence of nations has been growing. The exchange of materials, foodstuffs and manufactures is becoming more and more imperative. In spite of technological advances, the bulk of this exchange moves by sea and will continue to do so in the foreseeable future.

Against this background, it is important to examine the U.S. shipyard, its product, its market and the conditions under which it works. It is the authors' thesis that:

1. Shipbuilding is a very complex operation, demanding a wide range of sophisticated knowledge, in design, production and management;

2. The technology of construction is complex because of the great number and diversity of materials, components and processes even though shipyards do not manufacture the high-technology components;

3. Ship and shipbuilding technology have changed greatly since World War II and the changes are continuing;

4. During that time there have been significant increases in shipyard productivity;

5. Both the international and U.S. shipbuilding markets are largely government controlled;

6. This is caused by the economic and military mission of the ship;

7. As a result, the shipyards' operating conditions are basically different from other industries;

8. Many of these conditions are worldwide, but some are different and more restrictive in the United States;

9. This accounts for the special characteristics of the operation of U.S. shipyards, and

10. Productivity and cost comparisons are not meaningful unless the differences in conditions and operating practices are recognized and evaluated.

The merchant and military vessels built by major U.S. shipyards are identified in Tables 1 and 2.

The U.S. shipbuilding industry has built and continues to build a variety of merchant and military vessels. The numbers of vessels built in the different decades have not varied greatly. For merchant construction, however, the types of vessels have changed dramatically. The passenger and breakbulk cargo vessels are no longer built, other ves-

sel types having replaced them, such as container, roll-on/roll-off, barge carrier and liquefied natural gas ships. Naval vessels have experienced changes within classes rather than changes in basic mission.

## Commercial Market

The shipbuilding market differs from the markets for other industries in that the product can be built, maintained and operated anywhere, regardless of its origin or ownership, without causing a significant additional cost or any additional cost at all. The potential competition is, therefore, worldwide. The product—the ship—has a vital part in supplying its country's economic needs, and in case of war in helping maintain its defense. Almost without exception, therefore, governments intervene in shipping and shipbuilding to help their domestic industries and to protect broader national interests.

The commercial shipbuilding business can be divided into three basic markets. The ship-buying customers in each shipbuilding market serve fundamentally different shipping markets and specify different technical,

regulatory and special-approval requirements. These markets are: U.S. foreign commerce trade, including U.S.-flag subsidized and unsubsidized ships; U.S. domestic trade Jones Act, and foreign sales ships.

During times of high demand in the international market, U.S. shipyards build ships for sale to foreign-flag shipowners. The current worldwide oversupply of ships and severe depression in the international shipbuilding industry is not now conducive to U.S. shipyards selling to foreign owners. However, the cost of foreign labor has been rising in each country's currency. When this cost increase is combined with the decreasing value of the dollar against foreign currencies, the opportunities for foreign sales may develop in the 1980s when the international demand for ships firms up. To illustrate how labor rates compared in 1977, Table 3 summarizes the average net earnings of all wage earners less all government deductions, not including fringes other than family allowances, and converted to U.S. dollars.

Table 1 — Merchant Vessels Delivered By Major Shipyards

|   | 1950-59 | 1960-69 | 1970-78 |
|---|---------|---------|---------|
| General liners                                    |         |         |         |
| Passenger/cargo-passenger                         | 7       | 5       | —       |
| Breakbulk   | 63      | 136     | —       |
| Container   | —       | 11      | 16      |
| Ro/Ro   | 1       | 5       | 15      |
| Barge carriers                                    | —       | —       | 23      |
| Ocean barges                                      | —       | —       | —       |
| Irregular dry cargo                               |         |         |         |
| Dry bulk  | 12      | —       | 11      |
| NEO bulk  | 13      | —       | 4       |
| Heavy lift  | —       | —       | 1       |
| Ocean barges                                      | —       | —       | 2       |
| Liquid cargo                                      |         |         |         |
| Product carriers                                  | 160     | 44      | 77      |
| VLCC  | —       | —       | 5       |
| ULCC  | —       | —       | 0       |
| LNG/LPF   | —       | —       | 7       |
| Chemical carriers                                 | —       | —       | 3       |
| Ocean barges                                      | —       | —       | —       |
| Miscellaneous                                     | 15      | 11      | 19      |
| Dredges, drill ships, ferries, survey ships, etc. |         |         |         |

SOURCE: Shipbuilders Council of America

Table 2 — Naval Vessels Delivered By Major Shipyards

|   | 1962-69 | 1970-78 |
|---|---------|---------|
| Combatants                              |         |         |
| Aircraft carriers                       | 2       | 2       |
| Air capable                             | 1       | 3       |
| Cruisers                                | —       | 3       |
| Attack submarines                       | 25      | 29      |
| Ballistic missile submarines            | 26      | —       |
| Destroyers                              | 19      | 14      |
| Frigates and escorts                    | 36      | 40      |
| Support ships                           | 24      | 39      |
| Miscellaneous                           |         |         |
| Surveillance, rescue, icebreakers, etc. | 17      | 6       |

SOURCE: Shipbuilders Council of America

Table 3 — Average Shipyard Wage Comparison

|              | Dollars/hour           |                              |
|--------------|------------------------|------------------------------|
|              | At 1977 Exchange Rates | At Early 1979 Exchange Rates |
| Sweden       | 6.20                   | 6.70                         |
| Japan        | 4.75                   | 6.15                         |
| West Germany | 4.80                   | 6.00                         |
| USA          | 5.63                   | 5.63                         |
| Spain        | 1.70                   | 2.00                         |
| Korea        | N.A.                   | under 1.00                   |

At the 1979 exchange rates, the cost of labor for Japanese and West German as well as Swedish shipyards would be greater than in American yards. U.S. costs are higher due to ship design and shipyard operating requirements by at least \$5 to \$6 million and quite possibly more.

The world shipbuilding market is a mix of international economy, price competition and politics. The overriding factor is government support and control. Government policy is becoming increasingly important each year. In foreign countries ship prices are often completely determined by the need to support national industry, create jobs, reduce unemployment payments and earn hard currency. In the United States, government support is primarily limited by law to highly visible direct subsidy support to the shipyards and shipowners.

In the United States, ship prices are determined in the long run by adding a profit to the estimated cost which will yield a return on the shipyard's invested capital equal to or greater than other alternative investment opportunities to the shipyard owner. In effect, international shipyards do not compete against each other; instead, shipbuilding countries compete against other shipbuilding countries.

This market environment with its many swings in the balance between supply and demand of ships and heavy influence of international politics and government policy has created a very cyclical market. This is illustrated by Figure 1, showing the total number

\*Mr. Freinberg, assistant to vice president-ship building, Bethlehem Steel Corporation; Mr. Mack-Forlist, consulting engineer, and Mr. Thorpe, marine marketing manager, Bath Iron Works, presented a paper at the Society on Naval Architects and Marine Engineers' Annual Meeting entitled "Characteristics and Constraints of Shipbuilding in the United States." Part of this paper is reproduced here in a condensed form. The full paper may be obtained from the Society, One World Trade Center, Suite 1369, New York, N.Y. 10048.

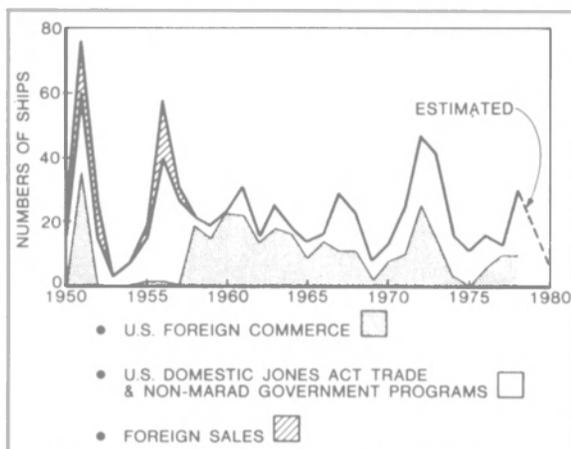


Figure 1 — Merchant vessels of 1,000 gt and over contracted for with private U.S. shipyards, net of cancellations, showing distribution between three markets.

of ships contracted to be built in the United States each year.

A review of Figure 1 shows that the total market in ships over 1,000 gross tons contracted for, net of cancellations, varied from highs of 76, 57 and 48 in 1951, 1956 and 1972 to lows of 3, 7 and 8 in 1953, 1954 and 1969, respectively. The long-term five-year moving average has been about 20 ships/year. Within the total market the three basic markets varied even more, showing the danger of specializing in one market. The total market has a fairly regular average cycle period of between five and six years, although there is no one type of economic phenomenon which controls this timing.

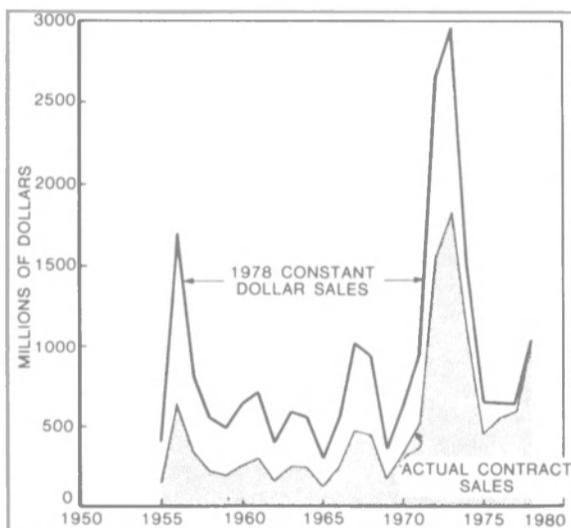


Figure 2 — Sales dollars of merchant vessels 1,000 gt and over contracted with private U.S. shipyards, net of cancellations.

Numbers of ships are not a totally accurate measure of shipbuilding sales activity because ships vary so much in size and type. Figure 2 illustrates how commercial ship sales dollars have varied between 1955 and 1978. In addition to total sales each year, the value of sales at 1978 constant dollars is also plotted. These 1978 constant dollars were determined by weighting the Material Index for Steel Vessels and the Bureau of Labor Statistics Selected U.S. Shipyard Labor Index by the proportion of material and labor plus overhead in ships. No matter what measure is used, they all demonstrate that the shipbuilding business is very cyclical and has a regular cycle period of between five and six years.

In addition to the cyclical nature of the U.S. shipbuilding market, the steady production of ships in a single yard has been rare. With the general exception of the Bethlehem Steel 28,000/29,000-dwt tanker series and the LASH ships built at Avondale, production runs of commercial ships have been limited to a dozen at most and often as small as one, two, or three ships.

The second-to-last item to discuss in the

commercial U.S. shipbuilding market is the method of contracting for new ships. Several procurement methods have been used. In the 1950s the owner usually negotiated with the shipyard to buy a ship designed by the yard. This was usually done in the foreign sales market and was often used to buy Jones Act ships.

Formal advertised bidding by several shipyards on a set of contract plans and specifications prepared by the owner's naval architect under close government supervision was used by the MarAd for the general-cargo ship fleet replacement and modernization program started in the late 1950s, and continued until the 1970 Merchant Marine Act. A provision in this act wisely allowed shipyards to prepare and market designs for subsidized ships. Nearly all contracts placed in the 1970s have

been by negotiated procurement, using either shipyard- or owner-prepared contract designs. In this way, both the shipyard and the owner gain a better understanding of the contract provisions and the shipbuilding process applied to the ship being negotiated.

The final point, which should be emphasized, is that the existence of the U.S. commercial shipbuilding industry in the past has depended on the existence and implementation of a national maritime policy. Government aid in some major foreign shipbuilding centers has increased in recent years. In Great Britain and Sweden, it has been carried to the point of nationalization or government ownership of controlling blocks of stock.

This intervention by governments domi-  
(continued on page 26)

## HOSE McCANN Rotating Beacon Light

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## U.S. Shipbuilding Market

(continued from page 25)

notes the market. Effective operation in this market requires a clear understanding of the national maritime policy. In the United States the policy is represented by the Merchant Marine Act of 1936 as amended in 1970, the 1916 Shipping Act, The Jones Act for Domestic Ships, the Public Law 664 which provides government-impelled cargo preference, and other legislation. In the absence of clear policy direction and implementation of responsive maritime laws by all the Government departments involved, the United States does not have an effective maritime policy at this time.

Various new provisions are being proposed by the maritime industry, including bilateral trade agreements or other cargo-sharing agreements, tax incentives, and less restric-

tion on the operations of U.S. ships in worldwide and domestic trading. In terms of planning and organizing the industry's operations, reasonable foreknowledge of the Government's position is almost more important than the exact form which the assistance may take.

### Military Market

The U.S. military shipbuilding market can be divided into four basic markets: U.S. Navy; U.S. Coast Guard; U.S. Army, and foreign military sales.

Most major U.S. yards have maintained a naval shipbuilding capability to support their workforce during periods of low demand for commercial ships. In fact many U.S. yards rely heavily on the military shipbuilding market. About 70 percent of the dollar value of major U.S. shipbuilding is naval construction.

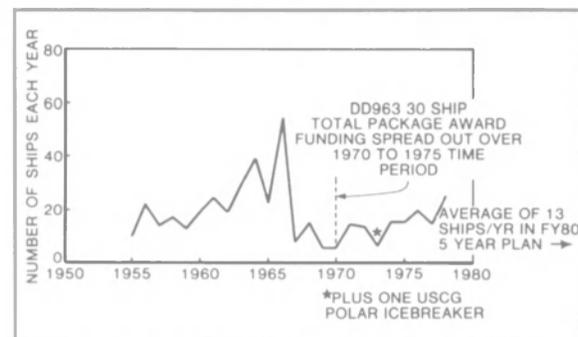


Figure 3 — Naval ships of 1,000 light displacement tons and over contracted with private U.S. shipyards.



Figure 4 — Total dollar sales of military ships, 1955-1978.

Like the commercial shipbuilding market, the U.S. military shipbuilding market has been cyclical. However, the cycles are long—about 12 years. Figures 3 and 4 show a fairly steady buildup from 1955 to 1966 in both the number of ships contracted with the military services and the dollar sales, if year-to-year fluctuations are smoothed. This buildup peaked with the destroyer escort and landing-ship procurements which were packaged into large lot sizes in 1964 and 1966. Contracting activity dropped to an average of about 10 ships per year during the 1967 through 1973 time period. The new high of orders after 1966 was for 25 military ships in 1978, caused primarily by follow-up procurements of nine FFG7 Class frigates plus four DD993 Class destroyers and four medium-endurance cutters for the Coast Guard.

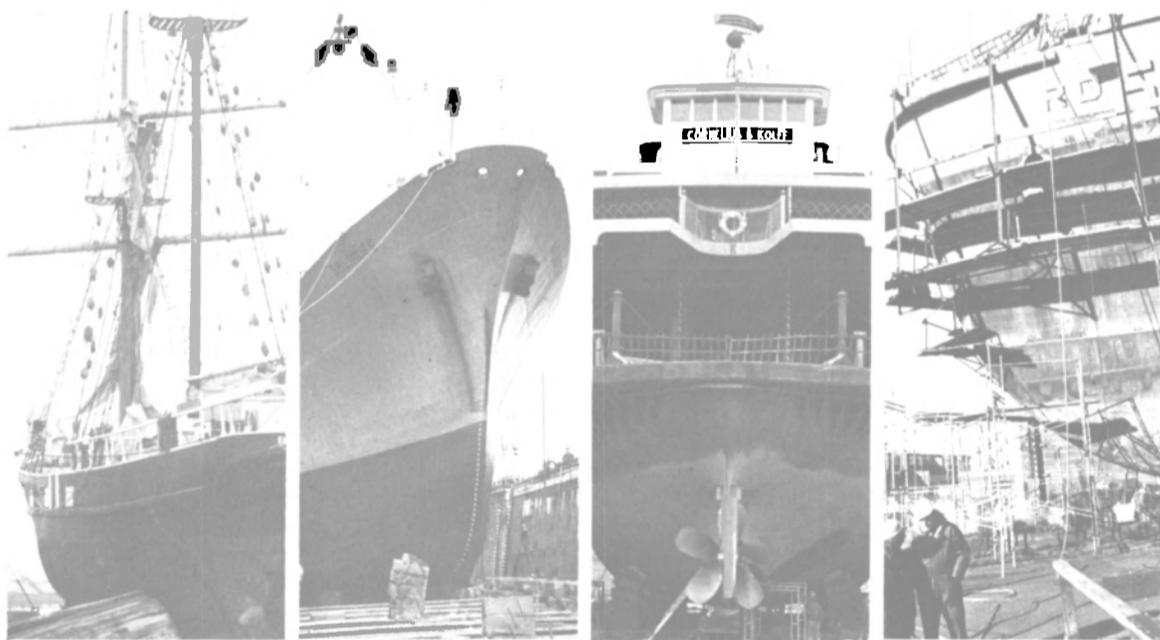
Looking forward to anticipated awards for military ships through 1984, based on the Navy Fiscal Year 1980 Five Year Plan, the industry will see a drop in the number of ships to be awarded from the 1978 high to an average of 13 Navy ships plus whatever USCG cutters, Army dredges and other ships may be awarded during the time period.

A review of Figure 4 shows that over the 24-year period from 1955 to 1978, the Navy market averaged about \$1.4 billion per year in shipyard sales. These sales are measured in 1978 constant dollars. The sales trend in 1978 constant dollars is slightly up, at the rate of about \$20 million more dollars each year, over the 24-year period. Actual final billings for Navy ships have been and will be greater than shown in Figure 4 due to the escalation recovery of inflationary cost increases and normal change-order growth.

In summary, the large variety of market segments and commercial and naval ship types combined with the limited number of units in a production run and rapidly changing ship procurement methods makes U.S. shipbuilding different from foreign shipbuilding. Investing in specialized facilities for efficient construction of one type of ship does not offer the same benefits in the United States as abroad. Diversification in several shipbuilding market segments appears to lead to a more stable operation, although unit costs will be higher and construction time longer than in a shipyard organized to concentrate on one type of ship.

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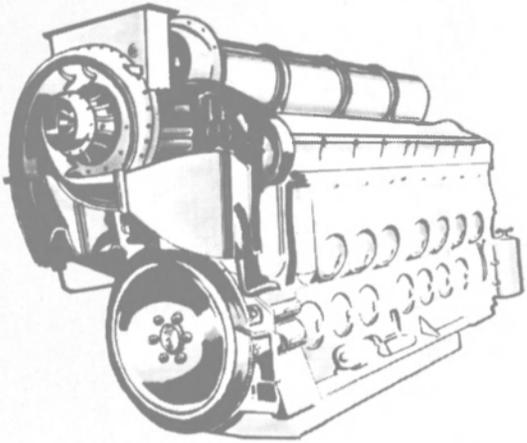
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## Texas Shipbuilding Gets Big Drilling Barge Contract

Texas Shipbuilding Company, Houston, has been awarded a contract by Atlantic Pacific Marine Corporation for construction of two inland, posted drilling barges.

The drilling barges will have a rated drilling depth of 20,000 feet with a maximum water depth of 20 feet. Delivery of the first unit will be in the first quarter of 1981, and delivery of the second unit will be July 1981.

Texas Shipbuilding's yard is located near Jacintoport on the Houston Ship Channel. The facility, acquired by the present owners in 1979, has the capability for marine repairs and construction of jackup drilling units and drilling barges, service vessels, tugs, and oil and deck barges.

## Literature Available On Bomar Deck Hatches

A new brochure describing the company's line of flush deck hatches is available from Bomar, Inc. These hatches feature a heavy cast aluminum top with reinforcing ribs and a 1/2-inch-thick base ring. Deck openings of 20-inch diameter and 15 by 24-inch are available, and inside or outside opening is standard.

All cast-aluminum parts are made of high-strength, highly corrosion-resistant Almag-35; all hardware is stainless steel.

The Bomar design prevents any metal-to-metal contact between top and base when closed. Parts are isolated by a neoprene gasket and nylon friction pads. This prevents freeze-up in highly corrosive environments. The hatch cover is also available with a mild steel base for welding to steel decks.

These hatches have been used on passenger-carrying vessels, and are approved by the U.S. Coast Guard for emergency escape purposes.

For a free copy of the brochure, which also contains specifications on the company's offshore windows and portlights, write to **John C. Zurich**, product manager, Bomar, Inc., P.O. Box 314, Charlestown, N.H. 03603.

## Joint Venture Formed By Taylor And Hydrospace

Taylor Diving & Salvage Company, Inc. Belle Chasse, La., has entered into a joint venture with a Newfoundland-based diving company to establish the firm of Hydrospace Marine Services.

Taylor Diving president **Ken Wallace** joined with **Bill Lukeman** and **Max Ruelokke**, partners in Hydrospace Engineering of St. Johns, in announcing formation of the new company, which is geared

to provide a complete range of diving services for the rapidly expanding offshore industry in Canada's Maritime Provinces.

Hydrospace Engineering, the Canadian joint venture partner, has been a major factor in marine engineering and diving in Newfoundland/Labrador since 1974, while Taylor's position as

a leader in diving technology and techniques is well-known to companies and contractors worldwide.

At present, Taylor is providing training for Hydrospace divers at its headquarters in Belle Chasse and various offshore locations. In addition, the joint venture will have access to Taylor's large inventory of saturation diving, RCV,

and hyperbaric welding equipment.

In a joint statement, Messrs. **Lukeman, Ruelokke, and Wallace** said: "By drawing on the strengths and resources of the joint venture partners, Hydrospace can successfully complete projects of varying magnitude and complexity."

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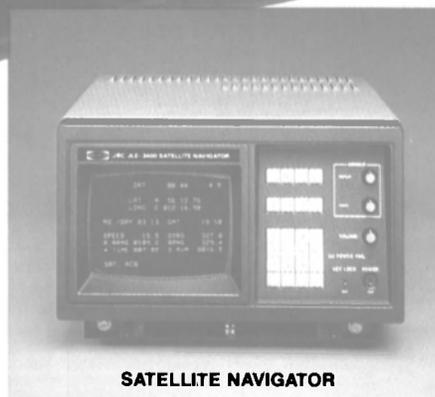
**Satellite Navigator gives worldwide fixes accurate within 100 yards every 30 to 90 minutes.**

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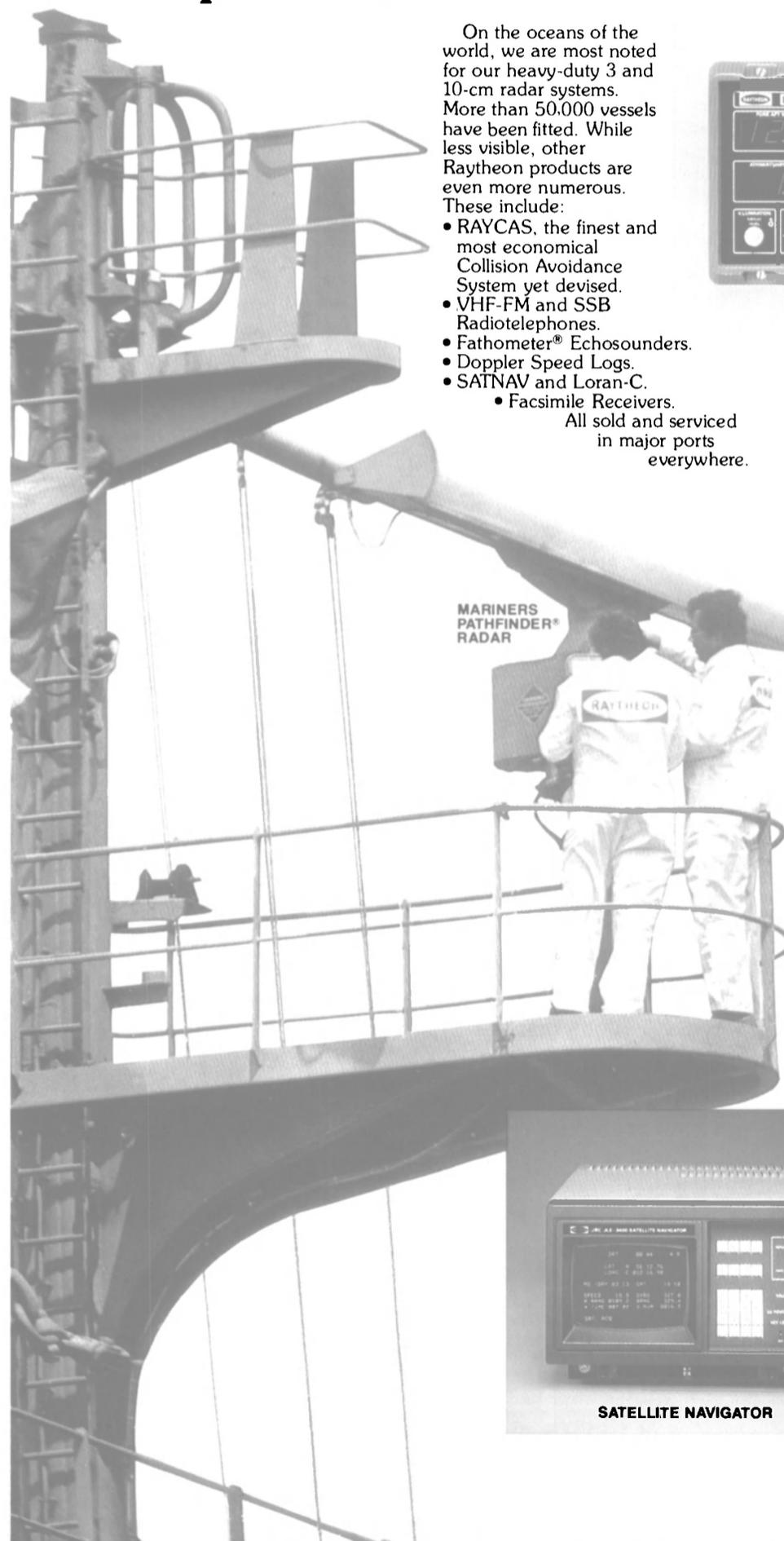
Featuring a large 9-inch CRT, the JLE-3400 will also display such important data as:

- Date and GMT.
- Time since last satellite fix.
- Time and angle of next satellite fix.
- Ship's speed and course.
- Data from up to ten way-points including: course-to-steer for Rhumb or Great Circle tracks, distance run, ETA's etc.

A printer for displayed data and a remote CRT display are available as options.



SATELLITE NAVIGATOR



## Literature Available From Elliott Co. On High-Speed Gears

A bulletin describing high-speed gears for pump, compressor, and fan manufacturers has been published by Elliott Company, a divi-

sion of Carrier Corporation, Jeannette, Pa. The bulletin is entitled "Elliott High-Speed Gears," and outlines 13 design features of the gear case. These include compact design, double-helical gear and pinion, liner-type bearings, dynamically balanced gear and pinion, increased efficiency of driven and driving equipment, rated per-

AGMA 421.06, quiet operation and a vibration guarantee of 2 mils below 4,500 r/min, and 1.5 mils above 4,500 r/min.

A chart includes material specifications for gear case, gear wheel assembly, pinion/shaft, and bearings. A section discusses primary parts, including precision hobbled gears and pinions, liner-

type sleeve bearings, and cast iron gear case.

A table outlines the eight available frame sizes and nine pre-engineered standard ratios, and lists options available, including special ratios, vibration detectors, Kingsbury-type thrust bearings, and API 613. Performance charts for the eight gear sizes are also included, with instructions for selecting the desired gear size.

For more information on Elliott high-speed gears, request Bulletin H-41 from **J. William D. Wright**, Elliott Company, Jeannette, Pa. 15644.

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The RAYFAX 300 Recorder is available separately for vessels equipped with a suitable wide-band receiver.



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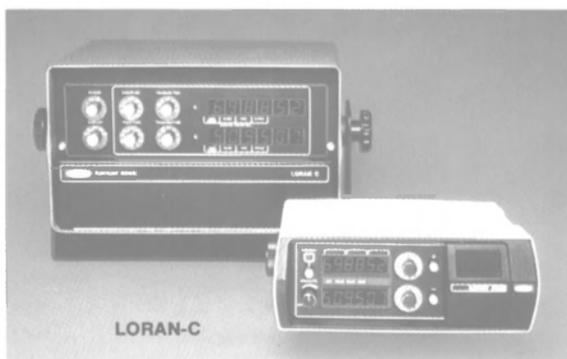
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The R-8220 is completely self-contained except for hull-mounted transducer.

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- 1% sounding accuracy.
- Bottom alarm adjustable in 1-foot or 1-fathom increments down to 299 feet or 240 fathoms.

Designed for console or bulkhead mounting, the DE-740 is supplied with a remote equipment cabinet and a hull-mounted transducer.



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Telephone: 01-623-4451/2  
Telex: 8954198



## B.F. Mandella Promoted At Dravo Corporation



Bruce F. Mandella

Bruce F. Mandella has been appointed senior project manager for Dravo Corporation's Engineering Works Division. He will oversee all project managers, project coordinators, and field personnel who are responsible for the division's materials-handling contracts.

Mr. Mandella has served in various project managing/design engineering positions since joining Dravo in 1968.

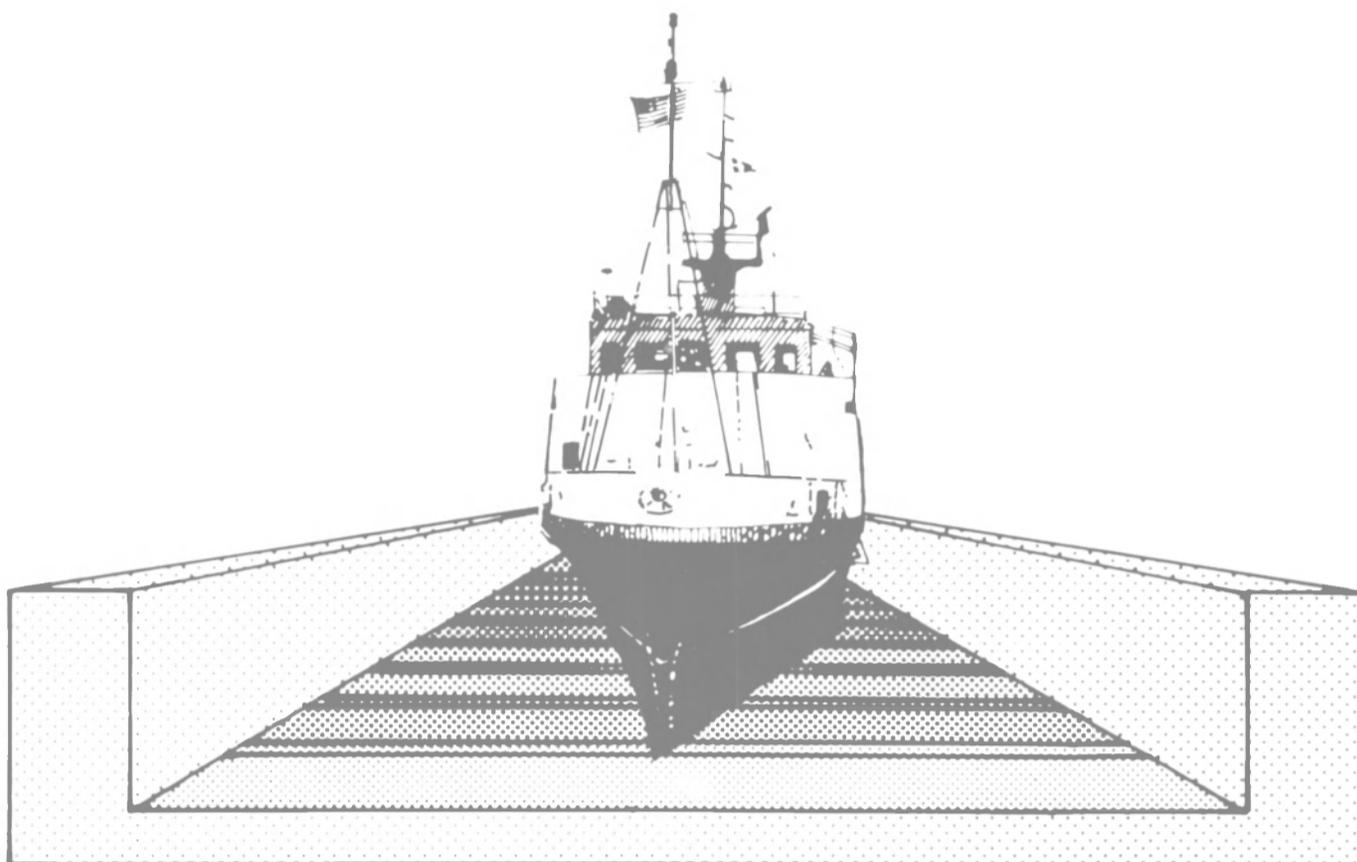
Dravo's Engineering Works Division provides a broad range of products and services including towboats and barges, bulk materials handling systems and equipment, as well as specialized heavy-duty process equipment and machinery.

## Two New Appointments At Foss Alaska Line

Lael Prock has been named operations manager, and Theo McCulloch sales manager for Foss Alaska Line (FAL), a division of Dillingham Maritime. The announcement was made by T.V. Van Dawark, FAL vice president and general manager.

Mr. Prock will assume overall operational responsibility for FAL's services to southeast Alaska, Alaska Peninsula/Aleutian Islands, and western Alaska. Prior to his recent appointment, he served as FAL manager of sales. With Dillingham Maritime for 14 years, he has spent the past eight years with FAL in Seattle.

As sales manager, Mr. McCulloch will have overall direction of sales efforts in all areas served by FAL.



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### **Santa Fe International And Acres Consulting Form Joint Venture**

Santa Fe International Corporation and Acres Consulting Services Ltd. have formed a joint venture to provide design and engineering services for offshore oil and gas operations in Canada.

The new organization, headquartered in Calgary, Alberta, will be incorporated as a jointly owned company, Acres-Santa Fe Inc. It will offer design, consulting, and engineering management services for offshore drilling and production platforms, pipelines, terminals, loading buoys, and other installations required for the development of oil and gas fields in Canadian waters. Services also will include economic, environmental, and engineering studies for projects in the early planning stages.

Acres Consulting Services, of Calgary, is one of Canada's largest civil engineering companies. Santa Fe International, of Orange, Calif., is a leading engineering, drilling, and construction contractor to the international petroleum industry.

### **New Rust Inhibitor Introduced By Farboil —Literature Available**

A new, rust-preventive marine ballast tank coating that is said to provide economical and long-lasting protection to ferrous metals in a saltwater environment has been introduced by Farboil Company of Baltimore.

The new coating, named Ballastite 400®, is non-toxic and does not contaminate ballast water. It is semipermanent and can be applied by spray to ballast tanks and voids during new ship construction or drydock periods. The coating adheres to millscale and is thermally stable, fire resistant, electrically insulating, and self-healing. It does not interfere with welding.

Tanks coated with Ballastite 400 are easily maintained by periodic use of Ballastite 300®, a flotation type coating that ensures continuous coverage and protection of the metal tank surfaces.

For further information and technical data sheets, write to Joseph Harrington, Farboil Company, Dept. MR, 8200 Fischer Road, Baltimore, Md. 21222.

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An additional 205,000 square

feet under roof is proposed for the total expansion, which will include a new machine shop (approximately 60,000 square feet), an environmentally controlled blast and cleaning facility (44,250 square feet), fabrication bay area (54,600 square feet), and a plant services building (9,300 square feet). After completion of the program, total plant facilities will cover 508,000 square feet (more than 11 acres under roof).

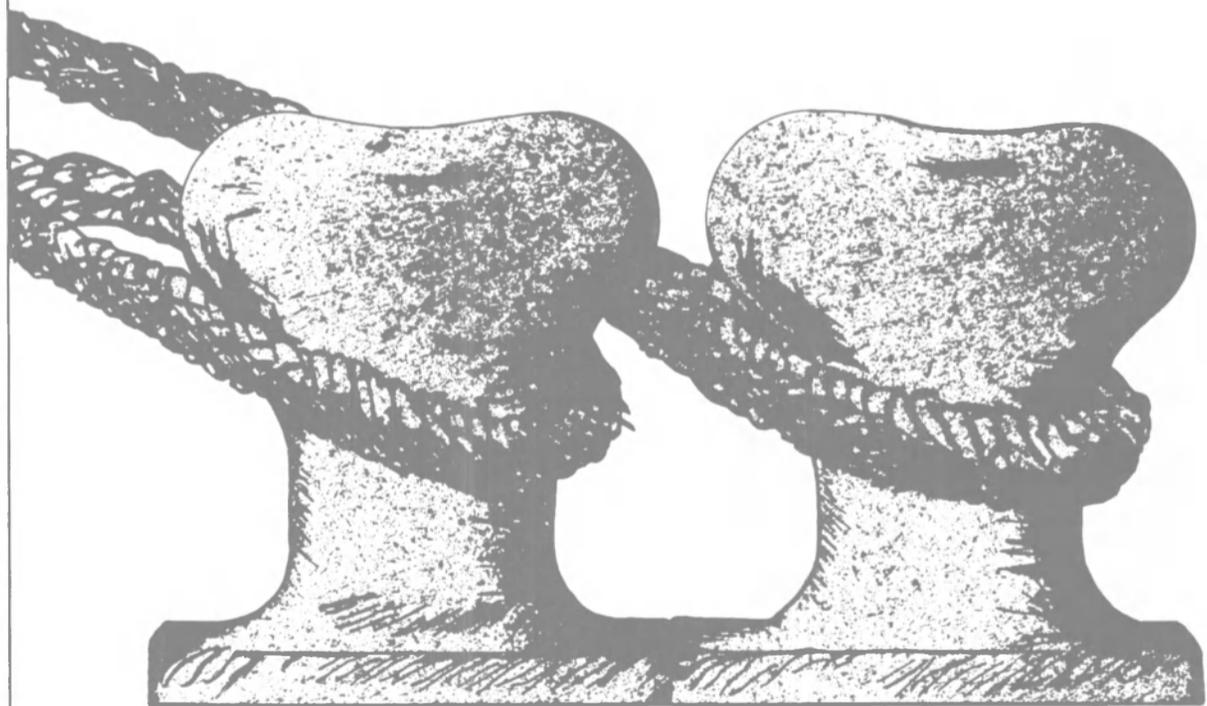
## **IT TAKES KNOWING THE ROPES TO BE A WINNER ON THE WATERFRONT. IT TAKES MIDLAND.**

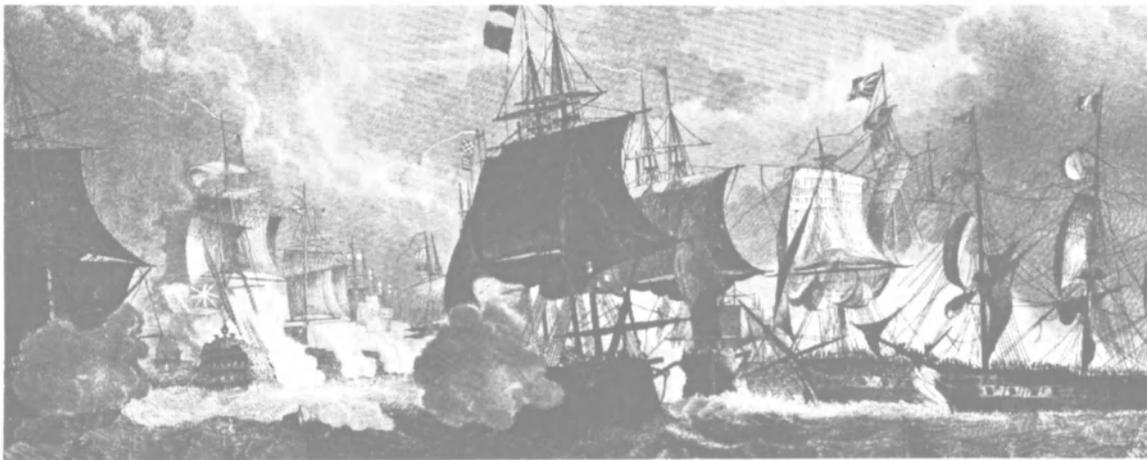
Midland's high level of experience as *the* insurer in complex and specialized Maritime waterfront operations means you have access to the expertise needed to plan the specific coverage that's right for you.

If you're in stevedoring, ship repair, dredging, terminal operations—in short, if you're on the waterfront—call Midland.  
*We know the ropes.*



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The Decisive Specialists  
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Telephone (212) 248-1130





## Keep your cool.

Our marine air conditioning wasn't around during this scene. But if it was, many ships might not have gone down with men.

James D. Nall marine air conditioning keeps you cool on seagoing vessels... from the largest tanker to your weekend runabout.

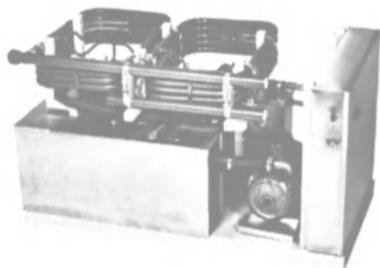
Our expertise and over 36 years serving the marine industry insures cool comfort in the tightest, hottest seafaring situations.

Write today for our free booklet. Or call to talk about your individual marine air conditioning application. For cooler men who go down to the sea in ships.

### JAMES D. NALL COMPANY, INC.

marine air conditioning

3195 NW 20th Street  
Miami, FL. 33142  
(305) 633-6040



marine air conditioning



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Michael F. Culp



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L.O.A. 118'  
BEAM 26'  
DEPTH 11.5'

Service Machine built boats and barges have an unsurpassed reputation for performance earned during the past 20 years in waters all over the world. Our credit department may also be able to help with the construction and permanent financing. If you need a proven offshore utility boat which features U.S.C.G. certification, A.B.S. Load line, 1200 sq. ft. for 104 tons of Deck cargo, 30,000 gallons of fuel oil, 10,000 gallons of potable water, 55,000



gallons of rig water and 16V92 G.M. Power, then call the Marketing Department at (504) 631-0511 or (504) 384-0804.

The Service Machine Group, Inc.  
P.O. Box 2664, Morgan City, Louisiana 70380  
U.S.A. Telex 784620. Cable: SERMAC



"-CAN PACKERS, -FROM THAT SARDINE FACTORY SHIP."

**PUMPS**



**COFFIN  
FEED PUMPS**

**G. M. 3-268A**

### **Santa Fe International And Acres Consulting Form Joint Venture**

Santa Fe International Corporation and Acres Consulting Services Ltd. have formed a joint venture to provide design and engineering services for offshore oil and gas operations in Canada.

The new organization, headquartered in Calgary, Alberta, will be incorporated as a jointly owned company, Acres-Santa Fe Inc. It will offer design, consulting, and engineering management services for offshore drilling and production platforms, pipelines, terminals, loading buoys, and other installations required for the development of oil and gas fields in Canadian waters. Services also will include economic, environmental, and engineering studies for projects in the early planning stages.

Acres Consulting Services, of Calgary, is one of Canada's largest civil engineering companies. Santa Fe International, of Orange, Calif., is a leading engineering, drilling, and construction contractor to the international petroleum industry.

### **New Rust Inhibitor Introduced By Farboil —Literature Available**

A new, rust-preventive marine ballast tank coating that is said to provide economical and long-lasting protection to ferrous metals in a saltwater environment has been introduced by Farboil Company of Baltimore.

The new coating, named Ballastite 400®, is non-toxic and does not contaminate ballast water. It is semipermanent and can be applied by spray to ballast tanks and voids during new ship construction or drydock periods. The coating adheres to millscale and is thermally stable, fire resistant, electrically insulating, and self-healing. It does not interfere with welding.

Tanks coated with Ballastite 400 are easily maintained by periodic use of Ballastite 300®, a flotation type coating that ensures continuous coverage and protection of the metal tank surfaces.

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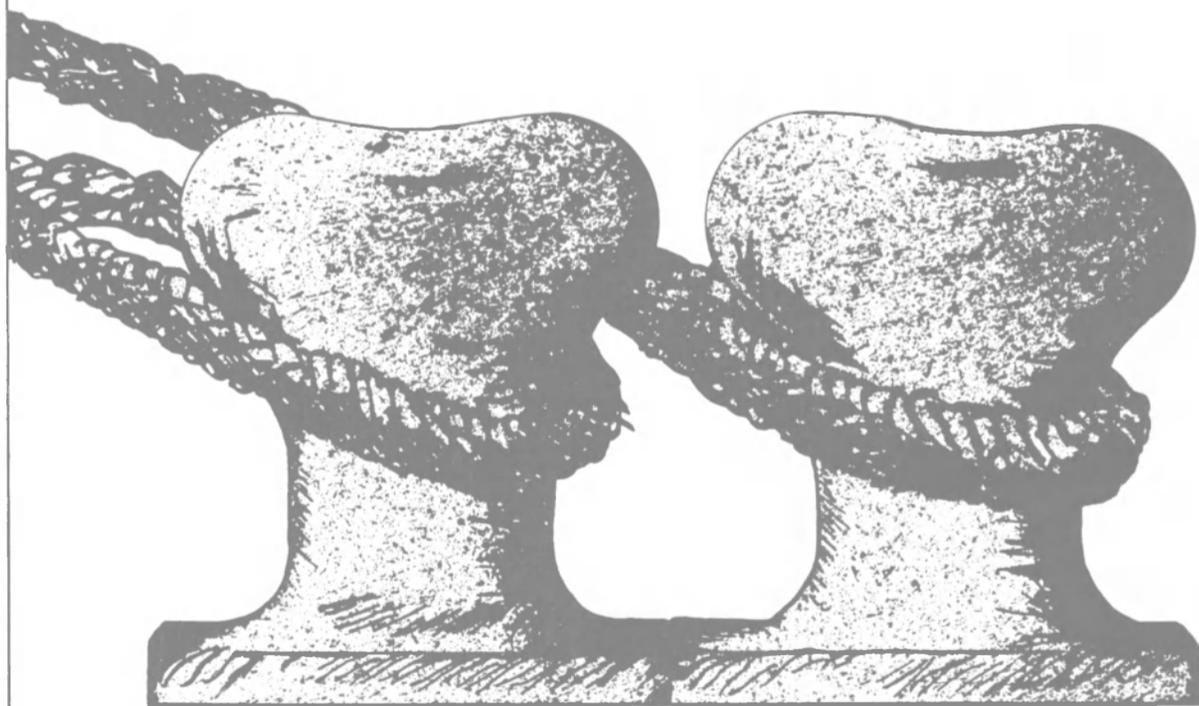
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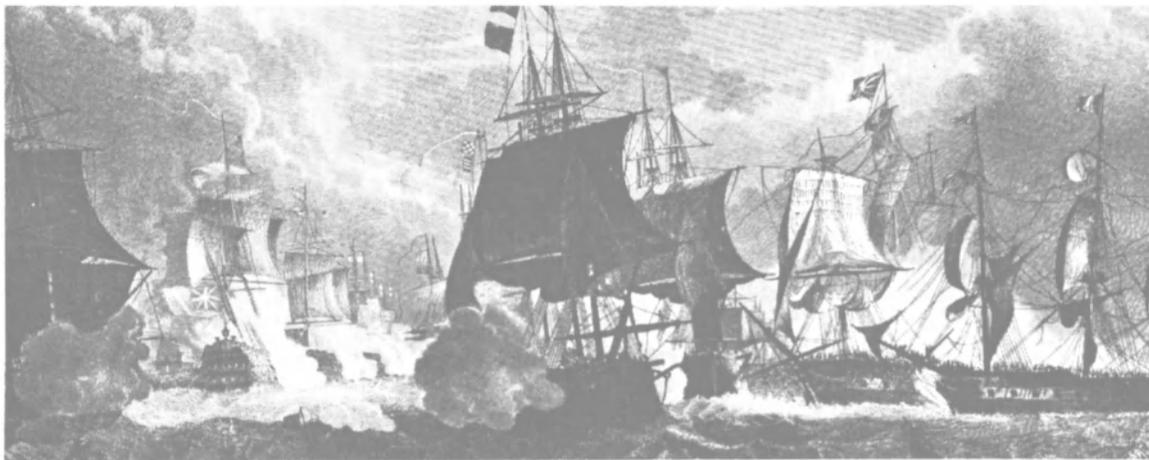
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## Keep your cool.

Our marine air conditioning wasn't around during this scene. But if it was, many ships might not have gone down with men.

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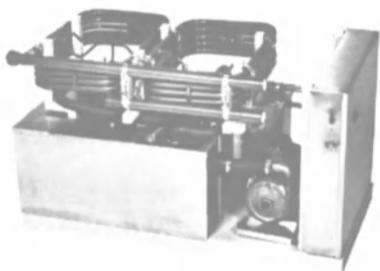
Our expertise and over 36 years serving the marine industry insures cool comfort in the tightest, hottest seafaring situations.

Write today for our free booklet. Or call to talk about your individual marine air conditioning application. For cooler men who go down to the sea in ships.

### JAMES D. NALL COMPANY, INC.

marine air conditioning

3195 NW 20th Street  
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marine air conditioning



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L.O.A. 118'  
BEAM 26'  
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Service Machine built boats and barges have an unsurpassed reputation for performance earned during the past 20 years in waters all over the world. Our credit department may also be able to help with the construction and permanent financing. If you need a proven offshore utility boat which features U.S.C.G. certification, A.B.S. Load line, 1200 sq. ft. for 104 tons of Deck cargo, 30,000 gallons of fuel oil, 10,000 gallons of potable water, 55,000



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"-CAN PACKERS, -FROM THAT SARDINE FACTORY SHIP."

# PACECO IS A WORLD OF EXPERIENCE



In design, manufacturing and marketing

#### IN CONTAINER HANDLING CRANES

Over 225 Portainer<sup>®</sup> cranes in more than 100 ports world-wide, plus over 250 Transtainer<sup>®</sup> cranes for container handling and storage in more than 70 major terminals. Also, Shipstainer<sup>®</sup> cranes on many vessels serving ports on all continents.

#### IN HEAVY LIFT REVOLVING CRANES

Rotating cranes from 150 to 3,000 tons capacity; advanced slewing mechanism; clamshell dredge versions handle up to 40 tons at a grab.

#### IN BULK HANDLING EQUIPMENT

PACECO Continuous Catenary Bulk Handlers unload, stack, and reclaim most dry free flowing bulk commodities with capacity up to 5,550 tons per hour.

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Cranes of all types for nuclear, hydro-electric and fossil fuel plants to high tonnage capacity. Also, hydro-electric dam gates and gate hoists.

**Put our world of experience to work for you.**



**PACECO, INC.**

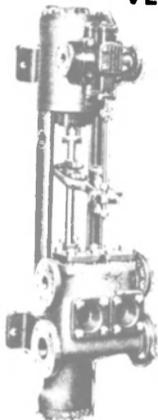
*The Only Manufacturer Offering A Complete Line Of Container Handling Systems And Equipment With World-Wide Sales And Service.*



Contact PACECO or the office nearest you. Headquarters Office—PACECO, Dept. 22-F Alameda, CA 94501, (415) 522-6100, Telex 335-399 • New York Representative—ROBERT MOORE CORP., 350 Main St., Port Washington, N.Y. 11050 • PACECO European Sales Office—PACECO INTERNATIONAL LIMITED, London, Tel: 01-681-3031/4 • PACECO Licensees; Australia—VICKERS HOSKINS DIVISION, Perth. Canada—DOMINION BRIDGE COMPANY LIMITED, Montreal. France—ATELIERS ET CHANTIERS DE BRETAGNE, Paris. India—BRAITHWAITE & CO., LIMITED, Calcutta. Italy—REGGIANE O.M.I. S.P.A., Reggio Emilia. Japan—MITSUI ENGINEERING & SHIPBUILDING CO., LTD., Tokyo. Korea—HYUNDAI INTERNATIONAL, INC., Seoul. South Africa—DORMAN LONG VANDERBIJL CORPORATION LIMITED, Johannesburg. Spain—FRUEHAUF S.A., Madrid. United Kingdom—VICKERS ENGINEERING GROUP LIMITED, South Marston, Swindon, Wiltshire.

# PUMPS

## UNUSED WORTHINGTON VERTICAL SIMPLEX PUMPS

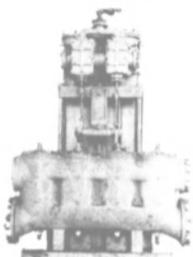


8 to 20 GPM—up to 350#. Also suitable for small boiler feed service. Steam WP 220# and 10# exhaust.

for Liberty Ships EC-2 & Victory Ships VC2, AP2 & AP3. (Fuel oil service) liquid capacity from 7½x4x10-3" suction-2" discharge-1¼" steam-1½" exhaust. OAH 5'2"; OA depth 23"; OAW over air dome 2'2". Weight about 800#. Suitable

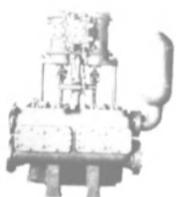
**\$1195**

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



1400 GPM @ 110 PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction — 10" discharge — 2½" steam — 4" exhaust. Overall width 6'8" — overall height 9'1½" — depth 3'9½". Wt. approx. 10,000 lbs.

## STEAM DRIVEN VERTICAL DUPLEX FIRE & GENERAL SERVICE PUMPS



10 X 11 X 12 — Worthington — 560 GPM @ 125# G. 8" Suction — 6" discharge pumps bronze fitted.

## 8" X 8" X 10" VERTICAL DUPLEX PUMP



Hendy design Suction 8" — discharge 6" — 160 GPM @ 100 PSI.

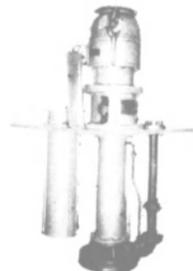
**PRACTICALLY  
NEW**

## LIDGERWOOD STEAM CAPSTAN



8 X 8—125 lb. working pressure. Reversible.

## 4 NEW UNUSED SUMP OR LOW PRESSURE DRAIN PUMPS



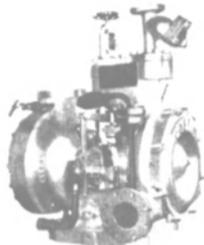
Bronze—40 GPM @ 40 PSI. 2" discharge—single impeller—CW rotation—32" from deck plate to base. Complete with flotation equipment. Totally enclosed 5HP 440/3/60 1725 RPM motor. Repair parts for motor & pump included.

## COFFIN FEED PUMPS — ALL SIZES — TYPE DE



### 3 TYPE DE-2 540 GPM 1870' NET HEAD

8450 RPM — 585 PSIG — 0°-200° superheat — exhaust pressure 15 lbs — NSPH 30 — typical serial 4683DE



### TYPE CG

### 2 TYPE CG 350 GPM 1880' NET HEAD

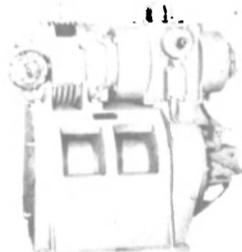
7220 RPM—311 HP. Steam pressure 580 PSIG—0°-100° superheat. Exhaust 15 lbs—typical serial #5437-CG-8-8-33

## DAVIT — WINCH

Mfg. by Skagit

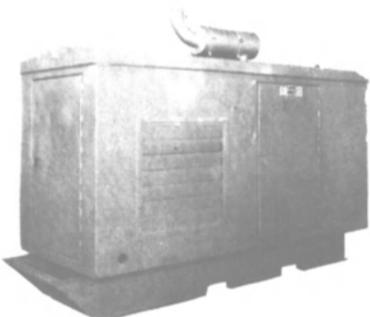
Rated 4000 lbs. @ 80 FPM

6500 LBS OF  
BOAT & MAN  
AT 40 F.P.M.

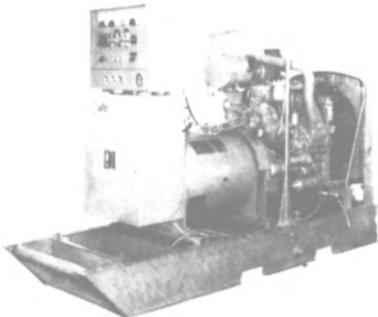


Motor: 13.5 HP — 440/3/60. Designed for ½" 6x37 wire rope. Divided drum with 2 spooling areas. Drum 8½ wide — 4" flange — 10" diameter. Complete with level wind. Also capable of manual operation by crank in case of motor failure. Hand brake & speed limiting brake are provided for holding & lowering boat by gravity. Non-magnetic.

## GM 4-71-T TURBO-CHARGED 100 KW 440/220/3/60 10 WIRE DIESEL GENERATOR SET ALL VOLTAGES POSSIBLE



UNIT WITH CABINET IN PLACE

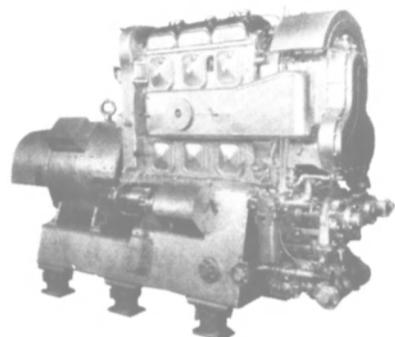


UNIT WITH CABINET REMOVED

100 KW 440/220/3/60 generator driven by GM 4-71-T radiator cooled turbo charged diesel. P.F. 0.80—for T-2, etc. 1800 RPM. With switchgear. Generator is 10 wire—all voltages possible.

WITH SWITCHGEAR / ALARMS / DISCONNECT

# G. M. 3-268A 100 KW A.C. DIESEL GENERATOR SETS



ENGINE: GM 3-268A—6½x7—1200 RPM—80% power factor—electric starting. GENERATOR: 100 KW—440/3/60/1200 RPM—161 amps. Dripproof—open—self-ventilated. (Class "A" insulation stator—Class "B" insulation on field). EXCITATION: 2 KW DC unit—9' 1¼" long—37" wide.

## FOR C4-SA1-VESSELS

"General" Class — like-new condition

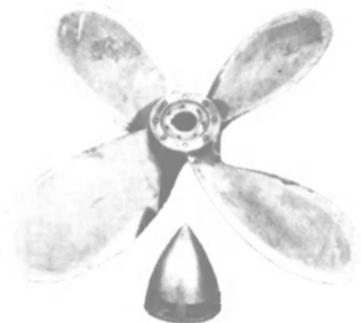
## 2 MAIN CF2V CONDENSATE PUMPS

Size 6X3 — 175 GPM  
185 Ft. Head — 1750 RPM

### ALSO AVAILABLE

Turbine rotors — transfer pumps — complete Turbo Generators, etc.

## 4-BLADE LST BRONZE PROPELLERS



Starboard — 7' diameter — pitch constant 4.699; Bore tapers from 6¼" to 4¾". 14½" taper equal to 1" / foot on diameter. U.S. Navy reconditioned. Average weight 1760 lbs.

## PLEASE NOTE:

Our Marine Dept. & Warehouse is now  
250 Scott St. at McHenry — Baltimore



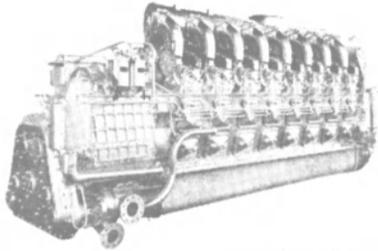
# THE BOSTON

313 E. BALTIMORE

Marine

CABLE: BOSIRON—BALTIMORE

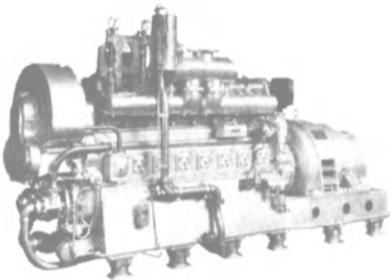
## G. M. 16-278A 1700 H. P. DIESEL ENGINES



Limited supply remaining

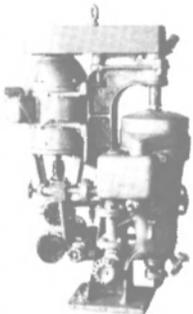
Complete, clean and in very good condition. As removed from U.S. Naval vessels. 1700 HP @ 750 R.P.M. Your inspection invited.

## G. M. 8-268A 200 KW A.C. DIESEL GENERATOR SETS



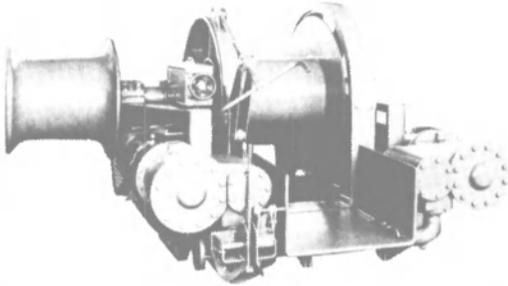
ENGINE: 8-268A—6½" bore—7" stroke—1200 RPM—driving Westinghouse generator—200 KW—440 volts—3-phase—60 cycle—321 amps—80% power factor at 1200 RPM. Switchgear available.

### SHARPLES OIL PURIFIER



Ex. U.S.N. As removed from vessel. For lube or fuel oil. 225 GPH—viscosity 45, SSU @ 100°F fuel oil. 225 GPH—viscosity 180-200 SSU—130° lube oil. For lube oil models M-85-34-5-23BM-44 — for fuel oil M-85-35-5-8CA-13. Bowl speed 17,000 RPM—1" oil inlet & outlet. Vertical 2 HP 440/4/3400 RPM motor. Many units with stainless steel bowls.

### STEAM MOORING WINCHES 12" x 14" — AUTOMATIC TENSIONING 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

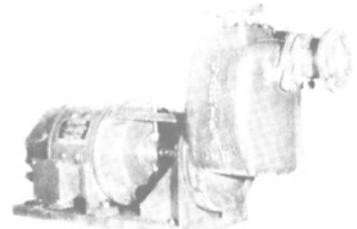
Drum will show 1500 ft of 1½" wire in 9 layers. Steam inlet 3½"—4" exhaust—171 PSI working pressure. BASE DIMENSIONS: 6' x 6' 3½"—overall 8' 4½" wide x 9' long. Mfg by Friedrich Kacks—Bremen, Germany. Recently removed from ARCO "Challenger".

#### ALSO IN STOCK

12" x 14" Double Gypsy Unit

ALL UNITS CAN BE DEMONSTRATED RUNNING

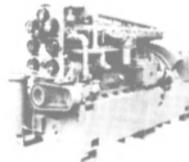
### CARTER BRONZE SELF-PRIMING BILGE & GEN. SERVICE PUMP



85 GPM @ 50 lbs. — 3500 RPM — 2" X 2". 5 HP — 115 VDC — 1750 RPM motor.

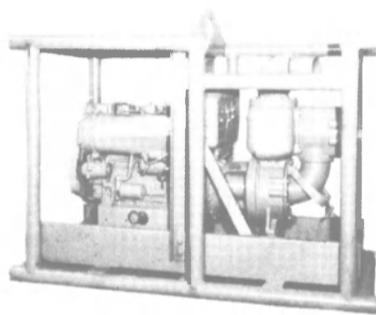
\$1466

### 100 KW GBD-8 DIESEL GENs.



From LST vessels. 120/240 VDC — 417 amps — stab shunt — 1200 RPM — Delco gen.—self-excited. ENGINE: Superior GBD-8—8 cyl—5½x7—150 HP—30 volt electric starting. Reconditioned to ABS. Dry wt 10,000 lbs—DAL 124"—65-11/16" high—42" wide. Ht necessary to pull piston 68". Fuel consumption 0.620 lbs/hr

### MARLOW 6" Self-Priming Salvage Pump



Marlow model 6EF18—driven by VM air-cooled 3-cylinder 52 HP diesel engine. 96,000 GPH at 40 ft. Maximum heads to 70 feet.

## T-2 EQUIPMENT

### Selected Items Listed

#### T-2 UNUSED G.E. MAIN PROPULSION STEAM TURBINE WITH ROTOR

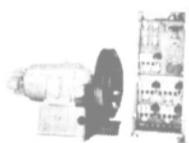
10 Stage — 435# — 720°T.T.

Turbine complete with rotor — serial No. 109166 — 4925/5400 KW — 3600/3720 RPM — 10-stage — 435# — 720° TT — 28.5" VAC.

#### WESTINGHOUSE MAIN PROPULSION GENERATOR STATOR

From Ex-Pecos — in like-new condition. With A.B.S.

#### 5-SPEED FORCED DRAFT FAN MOTOR



For T-2 Tanker. MOTOR: Totally enclosed—frame 505-S—440/3/60 —1770 RPM—typical serial #673-1807. CONTROLLER: 50 HP — CR-5333-820 — Cat. 932-1485. Max. amps 60.

#### WESTINGHOUSE 538KW TURBINE ROTORS

#### WESTINGHOUSE 538 KW AUX. GENERATOR EXCITER ARMATURE 400 KW REVOLVING FIELDS

We have both types:

110KW — 32KW — 5.5KW  
110KW — 28KW — 5.5KW

#### FOR G.E. 525 KW T-2 TURBO GENs.

- G.E. DORV-325M TURBINE ROTORS
- 400 KW 450/3/60/1200 A.C. 6-POLE REVOLVING FIELDS
- D.C. EXCITERS — 75KW/55KW
- AMPLIDYNE GENERATORS — NEW STYLE — LY-148

located at  
Md. 21230

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752-1077

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### IMMEDIATE DELIVERY

## 2 3 / 4" STUD LINK CHAIN

10 Shots — with connecting links. ABS certificate.  
Practically New

**Halifax Yard Awards  
\$1.3-Million Contract  
For Modernization**

TTS (International) A/S of Bergen, Norway, has received a contract from Halifax Industries Limited of Halifax, Canada, through its U.S. subsidiary, TTS, Inc. of Newport News, Va.

The \$1.3 million contract in-

volves a major modernization that will result in Halifax Industries being one of the most modern shipyards of its size in North America.

This modernization will include a complete shotblast and paint line for steel plates and structural shapes. An automated material-handling system will convey the surface-treated material into Halifax's fabricator shop where the

material can be stored or fed to the TTS Panel Production Line. The panel line will be used to produce stiffened panels and sections.

The panel line features a single-side welding process that welds a series of plates into a plate blanket. Also featured will be several TTS patented mobile gantry systems for the mounting and welding of stiffeners and webs to the plate blankets.

This is the third major panel line contract received by TTS, Inc. in the past 11 months from North American concerns, and is the 16th shipyard production system installation contracted from TTS internationally in the past three years.

**MarAd Approves Title XI  
For Tug/Supply Vessel  
To Cost \$2.7 Million**

The application by Offshore Southern Ships, Inc. of Belle Chasse, La. for a Title XI loan guarantee to aid in financing the construction of a tug/supply vessel has been approved in principle by the Maritime Administration.

The 180-foot, 2,520-bhp vessel, scheduled to be delivered in December this year, will be operated in U.S. and foreign waters. The estimated cost of the vessel is \$2,720,000; the Title XI guarantee will cover 87 1/2 percent of that amount.

**J.J. Henry Elected  
To Norshipco Board**

James J. Henry, chairman of the board of the J.J. Henry Co., Inc., New York, N.Y., has been elected to the Norshipco board of directors. The announcement was made recently by John L. Roper 2nd, Norshipco board chairman.

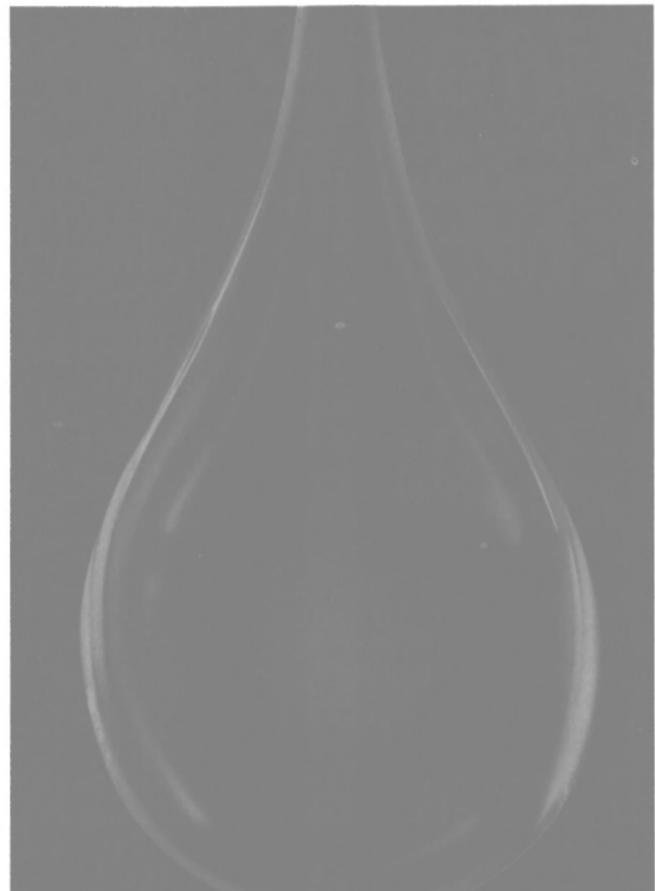


James J. Henry

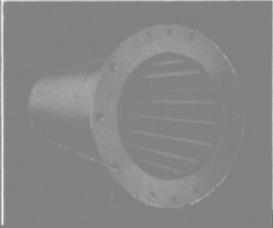
A graduate of the Webb Institute of Naval Architecture, Mr. Henry formed his own company in 1947 to provide engineering and design services to ship construction companies throughout the world.

He is responsible for several innovations in ship design, including the world's largest self-unloading bulk carrier, the first vessel to carry liquefied natural gas at low temperatures at atmospheric pressure, and American Mail Line's record-breaking trans-Pacific liners. He also designed the U.S. Navy's first automated steam plant.

Mr. Henry is on the board of managers of the American Bureau of Shipping, and is past president and an honorary member of The Society of Naval Architects and Marine Engineers. He is past chairman and currently vice chairman of the Webb Institute board of trustees, and a former member of the Academic Advisory Committee of the U.S. Coast Guard Academy.



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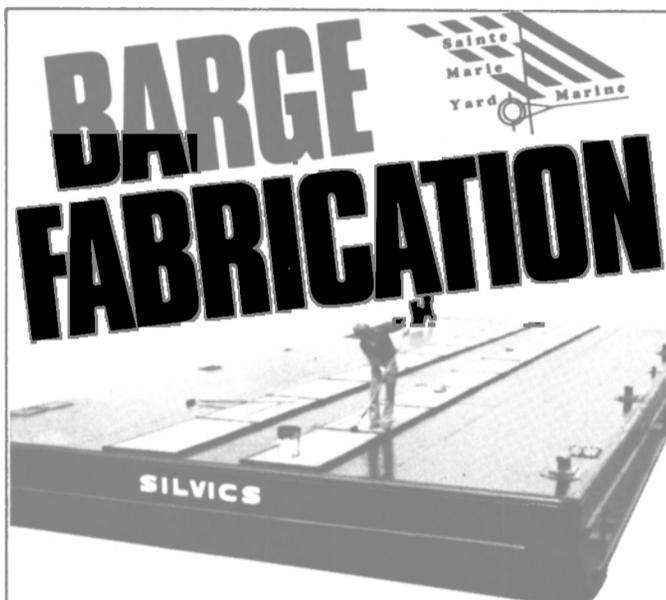
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**Tom Campbell Promoted  
At STAR Associates**



Tom Campbell

Seaborne Technology and Resource Associates Corporation (STAR Associates), Westville, N.J., recently announced the selection of **Tom Campbell** to head the company's newly formed Production Department. In his new position, Mr. Campbell will be responsible for consolidation and management of the company's computer programming and ship-overhaul support (planning, engineering, and scheduling) work groups.

Mr. Campbell has been employed by STAR Associates since his departure from active Naval service in early 1979. During this period, he has been a project manager charged with development of ship-overhaul schedules for major Naval combatants, including scheduling of the CV-SLEP overhaul of the USS Saratoga.

**Hoover Joins Tracor  
As Service Manager**



Will W. Hoover

Will W. Hoover has been appointed field service manager for Tracor Marine Systems, Austin, Texas, which is part of the Tracor Instruments Division. He will have service responsibilities for Tracor's navigation products including the Satellite Navigator II and the Automatic Omega Navigator in the commercial marine, fishing, and pleasure craft markets. He reports directly to **John Hoerber**, sales manager of Tracor Instruments.

Before joining Tracor, Mr. Hoover was station manager of the satellite tracking station at the Defense Research Laboratory of the University of Texas. He also served as a communications technician for four years in the U.S. Navy.

May 15, 1980

**Vincent Fiorenza Gets  
Added Duties At  
Moore McCormack**

Robert E. O'Brien, president and chief executive officer of Moore McCormack Lines, Incorporated, has announced that **Vincent Fiorenza**, assistant vice president-cost and subsidy, will be

assuming additional responsibilities for directing the purchasing and inventory departments.

Mr. Fiorenza's new title will be assistant vice president-purchasing and cost control. He will oversee all purchasing and inventory activities related to materials and supplies within Moore McCormack Lines operations ashore and afloat.

Since joining Moore McCormack

in 1945, Mr. Fiorenza has served in various financial and operating posts within the company, including the position of director of management information and statistics. He currently exercises control over subsidy research and planning, maintaining liaison with Maritime Administration officials in Washington and in MarAd regional finance offices.

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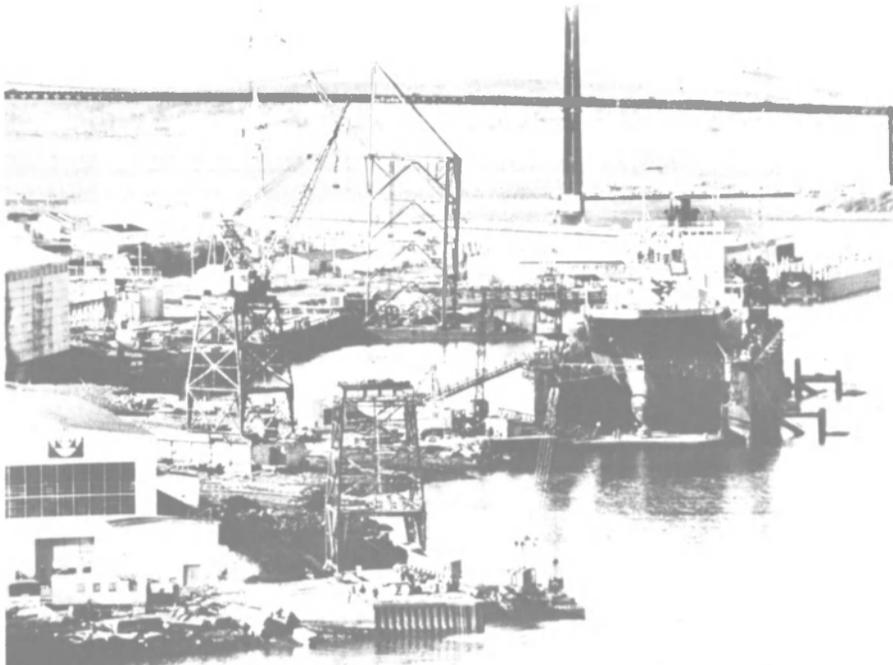
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Work is continuing on the two-phase modernization scheme at Halifax Shipyards in Nova Scotia. First new floating dock named Scotiadock (shown here) is now in operation. The oversized Panamax floating drydock will be inaugurated in late 1980.

## \$C19.5-Million Modernization Under Way At Halifax Shipyards

A two-phase, 19.5-million Canadian dollar modernization program is being carried out by Halifax Industries Limited, Halifax, Nova Scotia, at its ship repair facility, Halifax Shipyards.

**William J. Riley**, president and chief executive officer of Halifax Industries Limited, says: "Given our very competitive cost levels and our strategic geographic location, we believe Halifax has a big future in North Atlantic ship repairing, and this modernization program will greatly increase the efficiency and technical standards we can offer customers."

Phase one of the modernization scheme, which cost \$C7.5 million, has already been completed. This phase entailed construction of the foundation for the yard's recently commissioned 185-meter by 25.2-meter (about 607 by 83 feet) floating dock, Scotiadock, which has a lifting capacity of 16,000 tons. Also involved in phase one was the replacement of older piling at Pier 6, and the total rebuilding of the machine shop wharf.

The water supply distribution system in the yard has been totally replaced with a new underground system that provides greater fire protection and pumping capabilities. Also replaced were the distribution systems for steam, air, oxygen, acetylene, and condensate. The new systems can supply 100 pounds pressure of steam or air to any location in the yard. Oxygen and acetylene are now stored centrally, and there is a new underground supply system to all the yard's facilities. Also underground is a new 25,000-volt electrical system.

In total, 33,000 feet of piping was used to install the new systems.

New machinery purchased included a heavy-duty lathe with a 72-inch swing over the bed and capable of handling shafts to 40 feet. Also acquired as part of the first phase improvements were a metal-cutting saw, a jib crane, a heavy-duty spray washer, a turret lathe, a bandsaw, a bake oven, pipe-threading machinery, and a drill press.

In addition to the yard's \$C7.5-million first phase, \$C6 million was spent on the purchase and commissioning of Scotiadock.

The next phase of the scheme, which will cost another \$C6 million and involve the modernization of the yard's steel fabrication facilities, is now going ahead. New machinery for a plate preparation (shot blast and paint) line and a panel welding line will be purchased. Also in this phase will be the rebuilding of the yard's slipway, on which stern trawlers are to be built.

In addition to Scotiadock, Halifax Shipyards is to acquire in late 1981 the use of an over-sized "Panamax" floating dock capable of handling vessels of up to 116,000 dwt. This \$C43.5-million facility is to be bought jointly by the Canadian Federal Government and the Provincial Government of Nova Scotia, and then leased to Halifax Industries Limited.

### Three Promoted At Foss Seattle Headquarters

Officials at Dillingham Maritime recently announced appointments at the Seattle, Wash., headquarters of Foss Launch & Tug

Company and the Dillingham Maritime Group, of which Foss is a part.

Named to new positions are **Alfred J. Conway**, from vice president-finance for the Western Division of Dillingham Maritime to director-group administration and finance for Dillingham Maritime Group; **Gary Høglund**, from manager-planning and control to vice president-finance and planning for Foss; and **Gary Low**, from senior financial analyst to supervisor of planning and control for Foss.

**Mr. Conway** has been with Dillingham since 1968, and in Seattle since 1974. He will transfer to Dillingham's corporate headquarters in Hawaii later this summer. **Mr. Høglund** joined Foss in 1970.

### Mullan Named General Manager At Jet Blast

**Jim Mullan** has been appointed general manager for the Norfolk Division of Jet Blast Company, a wholly owned subsidiary of Marine Equipment & Services Co. of Hoboken, N.J. The announcement was made by Marine Equipment president **Francis J. Dunlap**.

Before joining Jet Blast early this year, **Mr. Mullan** was sales manager, Gulf Coast District, for Norlin Corporation.

Jet Blast offers a wide range of high-pressure water blasting and related services to the marine industry. **Mr. Mullan** will be located at the Jet Blast office at 1306 Raleigh Avenue, Norfolk, Va. 23507.

### Student Paper Presented At SNAME Chesapeake Section



Authors and officers at recent Chesapeake Section SNAME meeting (left to right): **Norman Hammer**, Maritime Administration, moderator; **Richard A. Swanek**, David Taylor NSRDC, author; **Alfred Dinsenhacher**, David Taylor NSRDC, author; **James A. Lisnyk**, Maritime Administration, Section chairman; **Robert J. Kastner**, U.S. Naval Academy, author, student paper; **Michael McCormick**, professor, U.S. Naval Academy; and **Phillip Eisenberg**, president, Hydronautics, Inc., past Section chairman and past president of SNAME.

The Chesapeake Section of The Society of Naval Architects and Marine Engineers met recently at Walter Reed Army Hospital's Officers' Club to hear a paper by **Richard A. Swanek** and **Alfred L. Dinsenhacher**, both of David Taylor NSRDC, and Lt. **Michael F. Flessner** of the U.S. Coast Guard, on "Cargo Tank Overpressurization and Procedures for Vent System Evaluation and Design."

Because of the number of accidents in tank vessel operations, more attention is now being given to the design and operating procedures for tanks containing liquids that produce flammable and/or toxic vapors, to ensure that the safety of the ship and its personnel not be compromised.

The paper presented analytical methods for evaluating pressure

buildup in marine cargo tanks so as to prevent overpressurization of these tanks. In particular, the paper addressed the loading and unloading of volatile and non-volatile liquid cargoes carried in bulk, and provided a method for evaluating overpressurization hazards during cargo transfer operations.

The student paper presented by **Robert J. Kastner**, a midshipman at the U.S. Naval Academy, discussed the harnessing of ocean wave energy through wave energy focusing using a submerged lens-shaped structure. Midshipman **Kastner** recounted the experiment he conducted at the Academy, which showed that a lens-shaped structure can cause wave height magnification of 1.5 times the incident value.

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## \$46.8-Million Research Facility To Be Built In St. John's, Newfoundland

Newfoundland's Premier Brian Peckford has announced that the National Research Council of Canada has given final approval for the construction in St. John's of a \$46.8-million marine research institute that will accelerate the

Province's promising offshore oil potential.

Calling the institute "a world class establishment," Mr. Peckford said that the center "would lend invaluable impetus to Canada's highly advanced ice operations technology," and predicted that it would become "the world's premier research and development center in the field of marine dynamics and Arctic testing."

The institute, which will be owned and operated by the National Research Council of Canada, will carry out an intensive effort to improve the design of icebreaking craft and offshore structures, thus assuring their safe and efficient operation in ice-covered waters.

The facility is slated for completion by 1982-83, and will be located on the campus of Mem-

orial University in St. John's. Among its features will be an 80-meter-long towing tank for experiments simulating Arctic salt-water environments, a companion clear-water tank 200 meters long for testing hydrodynamic forces on larger model structures, and a 31-meter by 75-meter stability tank for the study of graduated wave impacts.

Establishment of the research center at Memorial University will bolster the cold-water engineering efforts of that institution's Ocean Engineering Division. It will also aid those of the Centre for Cold Ocean Resources Engineering (C-CORE), and of the Newfoundland Oceans Research and Development Corporation (NORDCO).

C-CORE was created by Memorial University in 1975 to conduct research facilitating the safe and economical development of Atlantic offshore resources. Now functioning in the private domain, its facilities at Memorial include environmental and heavy-structure testing laboratories, a materials-behavior analysis installation, and a wave-generator-equipped, 200-foot vessel model testing tank.

Unlike C-CORE, NORDCO operates in the private sector. A "Crown Corporation" founded by the Provincial Government in 1975, NORDCO carries out research and development programs for both industry and governments geared toward developing Arctic and cold-water operations technology.

Leo D. Barry, Newfoundland's Minister of Industrial Development, said that the new center could be expected to contribute to the overall economic strength of the Province by drawing private high-technology firms, which tend to locate in areas where R&D expertise is available.

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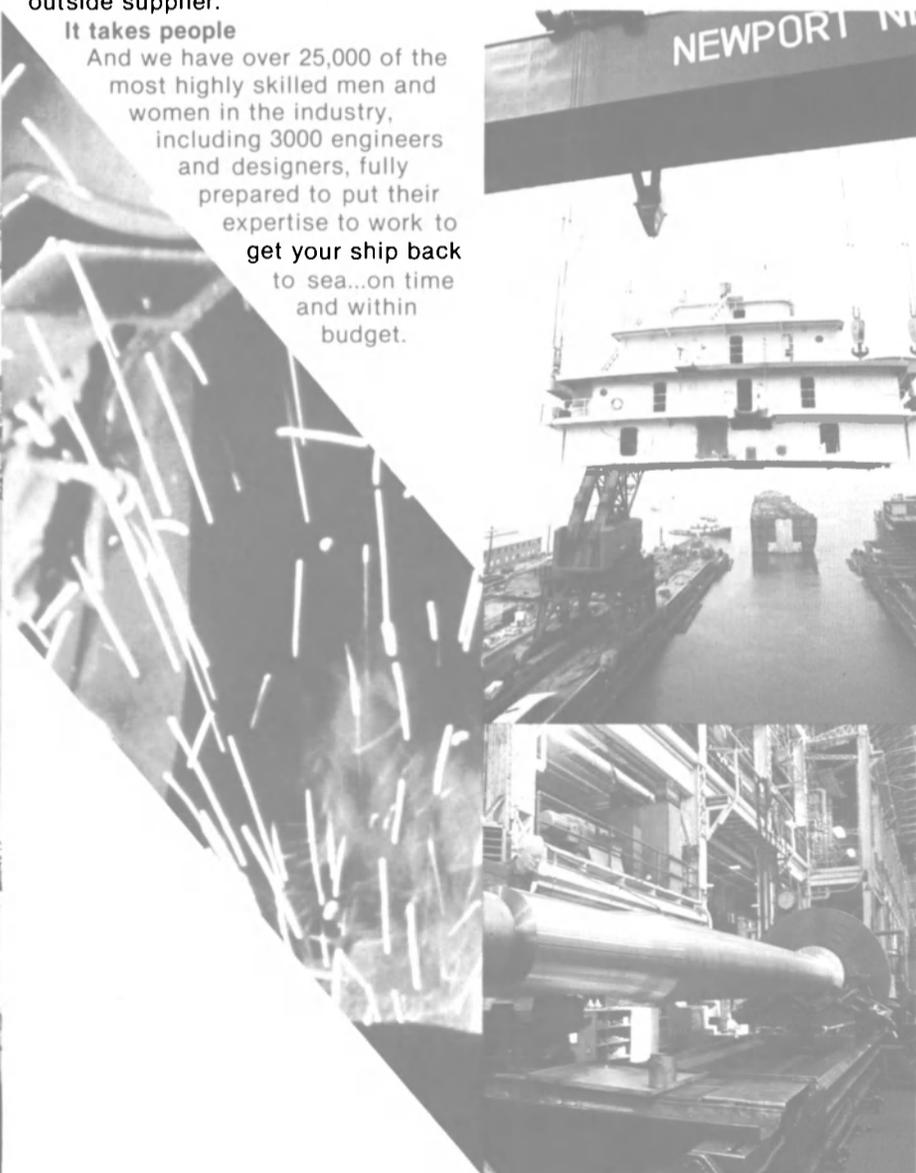
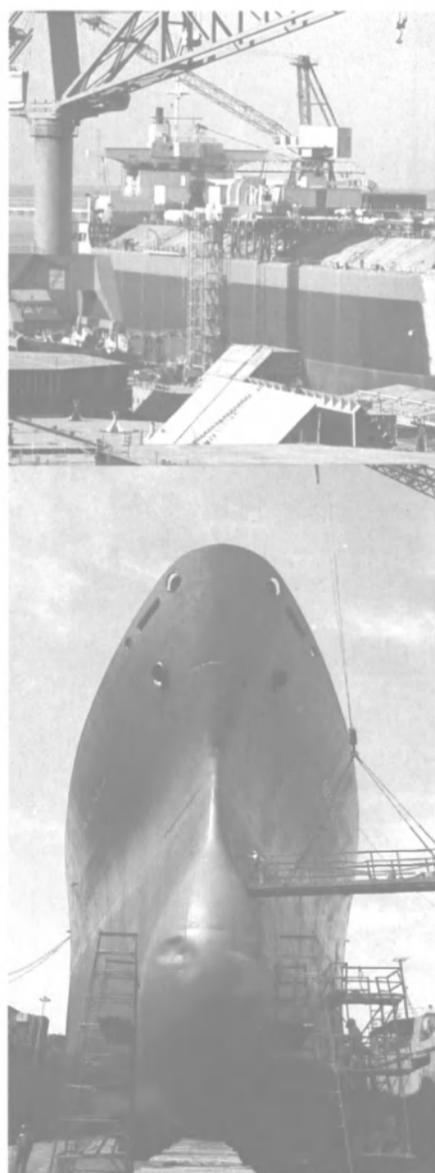
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## L.W. Ebner Appointed Marketing Manager At G.E. Credit Corp.

Leslie W. Ebner has been named marketing manager for General Electric Credit Corporation's Industrial Equipment Financing Department. GECC, the nation's third largest diversified financing company with assets of more than \$7 billion, is headquartered in Stamford, Conn.

Mr. Ebner's new responsibilities include planning and developing marketing strategies for the Industrial Equipment Financing Department, as well as testing and implementing new marketing programs. He will also be responsible for developing advertising and sales promotion programs, administering the department's insurance programs, and developing a formal sales training program.

Mr. Ebner joined GECC in St. Louis, Mo., in 1970. He was district manager in Denver, Colo., before accepting his current assignment.

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Peter U. Motzfeldt

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Mr. Motzfeldt, who previously held senior management positions with Barber in the company's Singapore, Oslo, and Hong Kong offices, will also participate in the buildup of Barber Steamship Lines' tramp and tanker agencies in the Gulf area.

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Subjects covered are: Compressed Air System Contaminants, Their Source, Formation and Identification; Compressed Air Purification by Activated Carbon Absorption; Simplified Method for Determining Compressed Air Line Freeze-Up Potential; and Oil Removal from Compressed Air.

Copies may be obtained by writing to John Quigg, Hankison Corporation, Canonsburg, Pa. 15317.

May 15, 1980

## New Salvage Technique Developed In Sweden

A new way of salvaging ships by the use of a highly sophisticated balancing/regulating technique has been developed by the Gothenburg firm of MP Consult. The method also can be used for the accurate positioning of sub-sea pipelines.

A submerged vessel is first blasted free of marine growth

and other clinging material, and a series of inflatable pontoons are secured to it by means of special fastenings. The pontoons—made of PVC, rubber, or other material—are then inflated by compressors aboard a surface vessel.

Any tendency for the ascending ship to list is instantly corrected by means of special computer-controlled valves that either feed more air to the correct pontoon or deflate it to the required ex-

tent. Tilts are thus corrected without delay. The computer also controls the compressor.

Simulator tests on the new method—dubbed octopus—carried out at Chalmers University of Technology in Gothenburg, have yielded very promising results. A major advantage of the new systems is that it can be controlled by only one surface vessel, and functions even in fairly rough weather.

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**M.A.N. Acquires  
Majority Shares In  
B & W Diesel A/S**

Maschinenfabrik Augsburg-Nurnberg AG of West Germany has acquired all of the shares held by Burmeister & Wain A/S in the Danish company B & W Diesel A/S. M.A.N. now holds 99.5 percent of the shares in that com-

pany; the remaining shares are owned by the Norwegian shipowner **Otto Grieg Tidemand**.

B & W Diesel A/S, which started as a new organization on January 1 this year, comprises all the diesel-related activities of B & W Engineering, B & W Engine Works, B & W Alpha Diesel, and B & W Holeby Diesel.

The ever-increasing emphasis on energy conservation, coupled

with the fact that B & W Diesel is marketing a most fuel-efficient diesel engine, classifies the recent acquisition of the B & W shares by M.A.N. as a sound investment in the energy sector. The M.A.N. management has expressed their desire to maintain and strengthen the unique diesel engine development and know-how of B & W Diesel.

The subsequent strengthening

of the business efforts as a result of being consolidated under one strong financial responsibility is expected to further enhance the success of B & W Diesel A/S, thereby assuring the owners and operators worldwide that the reliable and efficient diesel engines of the B & W design will continue their strong representation on the world market.

**R.E. Waegner Named  
Executive VP For  
Bay & River Navigation**

**Robert E. Waegner** has been elected executive vice president-general manager and a director of Bay and River Navigation Company, Richmond, Calif. He joined the company in 1979, after holding various executive positions with Matson Navigation Company and Seatrain Lines.

At the same time, **Capt. C.C. Rasmussen** announced his retirement as president-general manager and a director of Bay and River. Captain **Rasmussen** has been active in the maritime industry for 45 years both at sea and ashore. He joined Bay and River in 1955, and for the past 12 years served as president of the company.

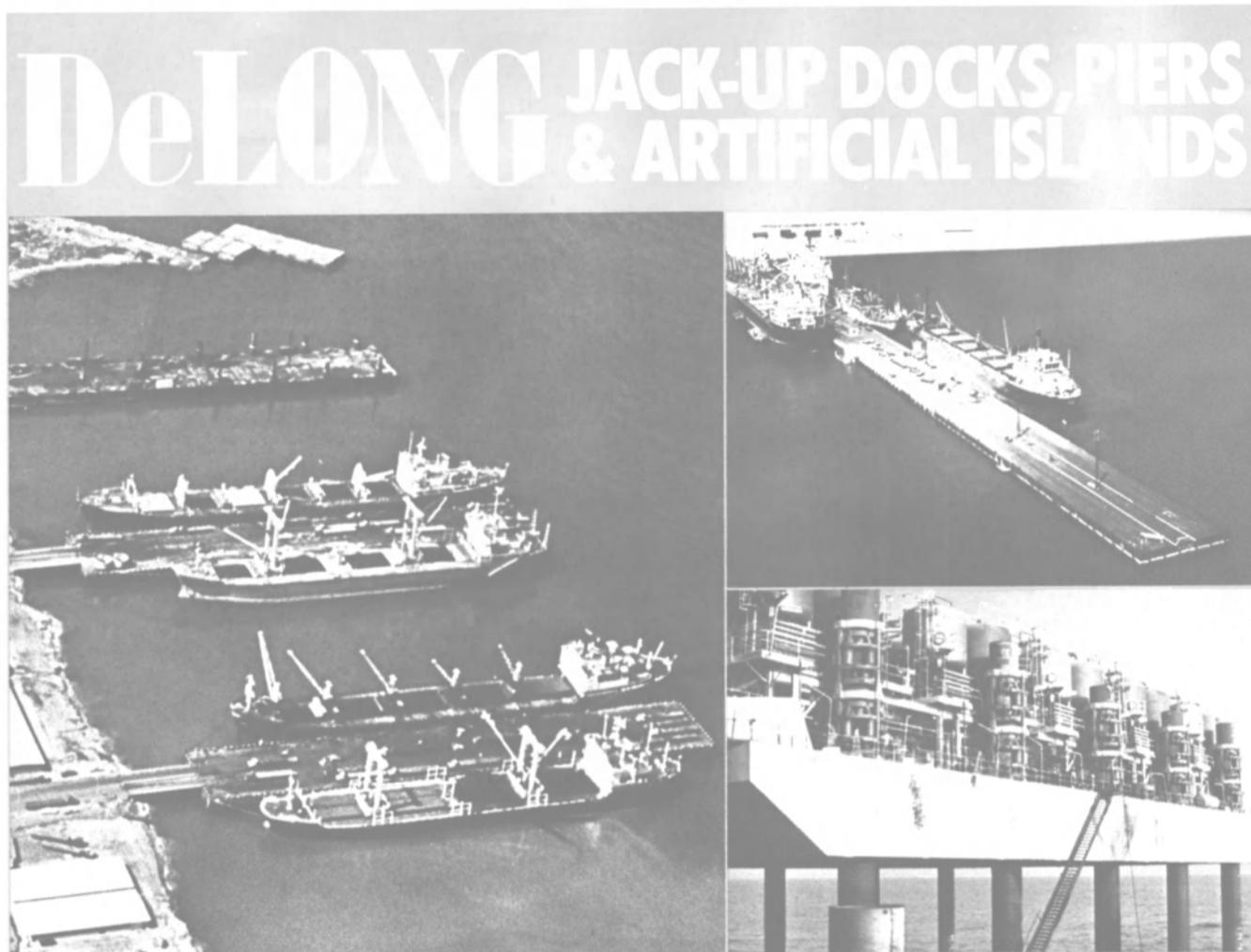
**Literature Available  
On Chesterton Pump  
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Two high-performance, multiple service mechanical packings have been developed by A.W. Chesterton Company, Stoneham, Mass., for pump and valve applications in media in pH range of 4 to 11, and in temperatures up to 400F (205C).

Greater yarn strength and the incorporation of PTFE and other lubricants enable both styles to be particularly effective. Each strand of the yarn has been individually coated to dissipate heat, and to allow proper frictional characteristics in centrifugal pump applications.

Du Pont's Kevlar aramid fibers are used in the yarn manufacture. This permits the packing's use in higher pressures than are tolerated by other braided packings. Chesterton Style 340 and 1740 can be used as backup rings in combination with other types of packing because of their greater strength.

Style 340 is square-braided. Such construction generally allows greater flexibility and reduces shaft wear. Style 1740 is an interbraid construction, and is designed for applications in which pressures are high or/and shaft bearing support is weakened.



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A new way of salvaging ships by the use of a highly sophisticated balancing/regulating technique has been developed by the Gothenburg firm of MP Consult. The method also can be used for the accurate positioning of sub-sea pipelines.

A submerged vessel is first blasted free of marine growth

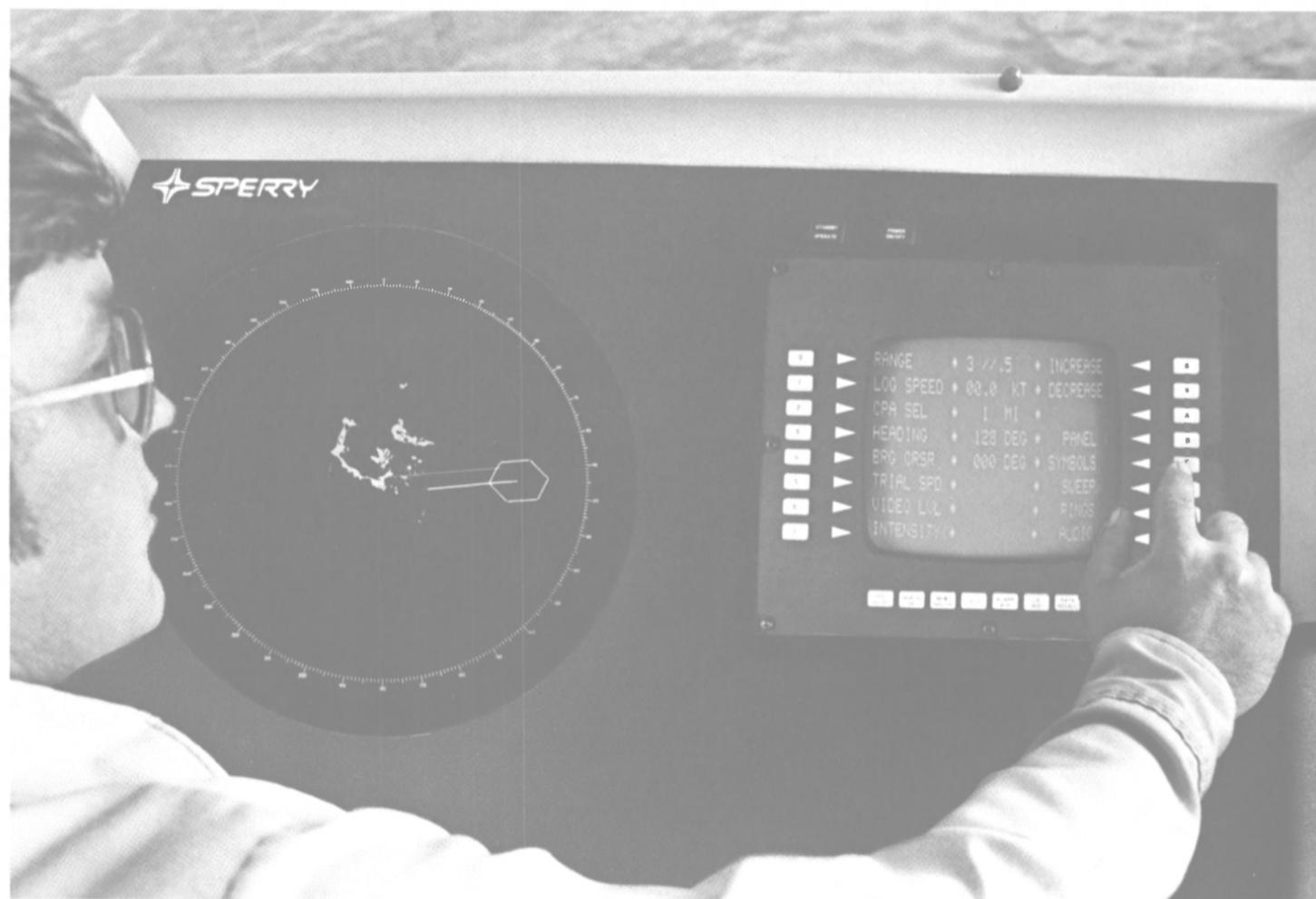
and other clinging material, and a series of inflatable pontoons are secured to it by means of special fastenings. The pontoons—made of PVC, rubber, or other material—are then inflated by compressors aboard a surface vessel.

Any tendency for the ascending ship to list is instantly corrected by means of special computer-controlled valves that either feed more air to the correct pontoon or deflate it to the required ex-

tent. Tilts are thus corrected without delay. The computer also controls the compressor.

Simulator tests on the new method—dubbed octopus—carried out at Chalmers University of Technology in Gothenburg, have yielded very promising results. A major advantage of the new systems is that it can be controlled by only one surface vessel, and functions even in fairly rough weather.

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speed, course, closest point of approach, and time to closest point of approach.

CAS II reduces troubleshooting and service time through its self-test capability and interchangeable modular circuit boards. The system conforms to the specifications of IMCO (ARPA), MARAD, U.S. Coast Guard and other international organizations. And the surprisingly low cost of CAS II is one more significant advantage over other systems.

The Sperry CAS II. Collision avoidance simplified.

For further information, see your Marine Systems representative, or call or write: Sperry Division Headquarters, Marine Systems, Great Neck, New York 11020. (516) 574-2183.

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## M.A.N. Acquires Majority Shares in B & W Diesel A/S

Maschinenfabrik Augsburg-Nurnberg AG of West Germany has acquired all of the shares held by Burmeister & Wain A/S in the Danish company B & W Diesel A/S. M.A.N. now holds 99.5 percent of the shares in that com-

pany; the remaining shares are owned by the Norwegian shipowner **Otto Grieg Tidemand**.

B & W Diesel A/S, which started as a new organization on January 1 this year, comprises all the diesel-related activities of B & W Engineering, B & W Engine Works, B & W Alpha Diesel, and B & W Holeby Diesel.

The ever-increasing emphasis on energy conservation, coupled

with the fact that B & W Diesel is marketing a most fuel-efficient diesel engine, classifies the recent acquisition of the B & W shares by M.A.N. as a sound investment in the energy sector. The M.A.N. management has expressed their desire to maintain and strengthen the unique diesel engine development and know-how of B & W Diesel.

The subsequent strengthening

of the business efforts as a result of being consolidated under one strong financial responsibility is expected to further enhance the success of B & W Diesel A/S, thereby assuring the owners and operators worldwide that the reliable and efficient diesel engines of the B & W design will continue their strong representation on the world market.

## R.E. Waegner Named Executive VP For Bay & River Navigation

**Robert E. Waegner** has been elected executive vice president-general manager and a director of Bay and River Navigation Company, Richmond, Calif. He joined the company in 1979, after holding various executive positions with Matson Navigation Company and Seatrain Lines.

At the same time, Capt. **C.C. Rasmussen** announced his retirement as president-general manager and a director of Bay and River. Captain **Rasmussen** has been active in the maritime industry for 45 years both at sea and ashore. He joined Bay and River in 1955, and for the past 12 years served as president of the company.

## Literature Available On Chesterton Pump And Valve Packings

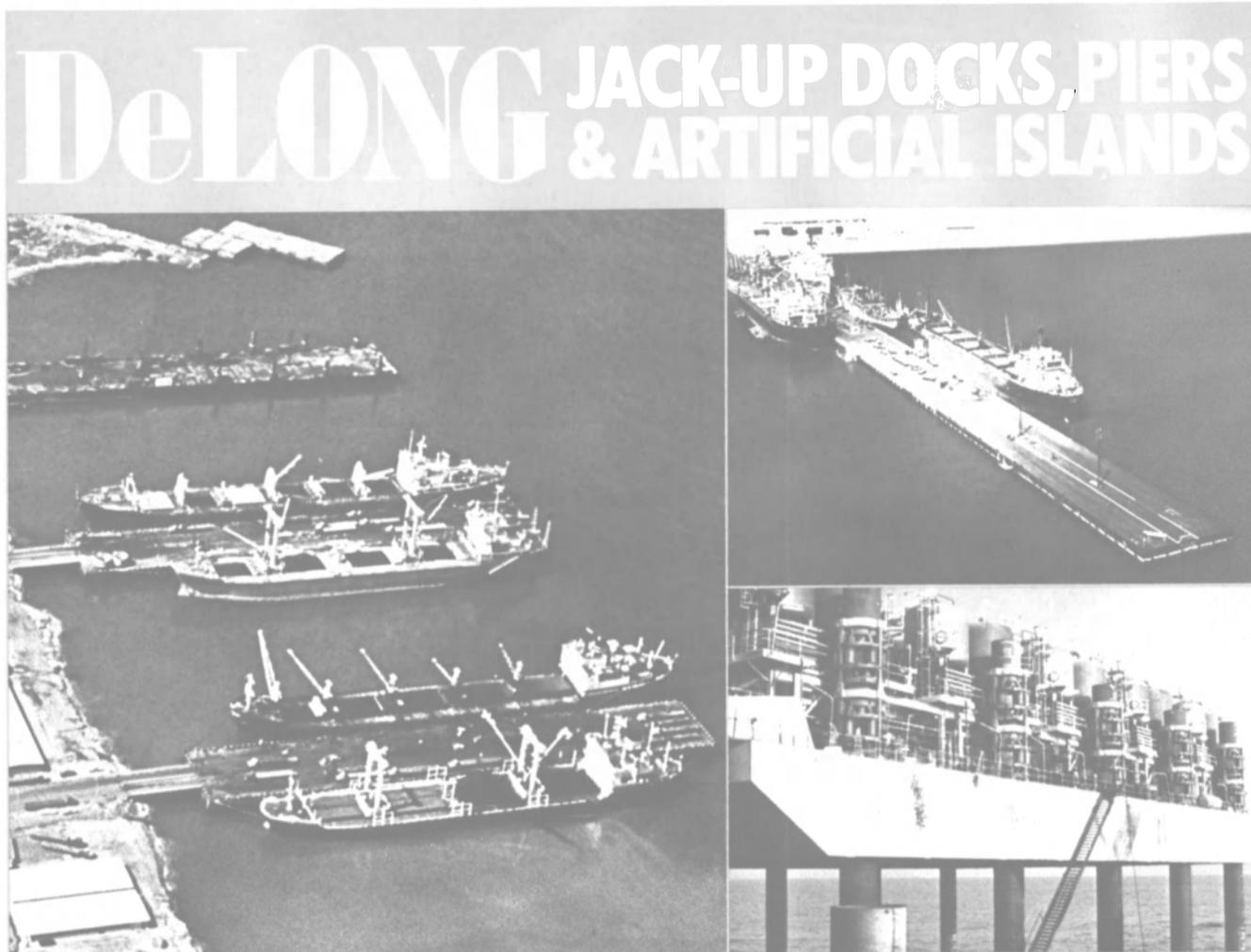
Two high-performance, multiple service mechanical packings have been developed by A.W. Chesterton Company, Stoneham, Mass., for pump and valve applications in media in pH range of 4 to 11, and in temperatures up to 400F (205C).

Greater yarn strength and the incorporation of PTFE and other lubricants enable both styles to be particularly effective. Each strand of the yarn has been individually coated to dissipate heat, and to allow proper frictional characteristics in centrifugal pump applications.

Du Pont's Kevlar aramid fibers are used in the yarn manufacture. This permits the packing's use in higher pressures than are tolerated by other braided packings. Chesterton Style 340 and 1740 can be used as backup rings in combination with other types of packing because of their greater strength.

Style 340 is square-braided. Such construction generally allows greater flexibility and reduces shaft wear. Style 1740 is an interbraid construction, and is designed for applications in which pressures are high or/and shaft bearing support is weakened.

For further information, write to **Robert Robotham** for Bulletin 71780, A.W. Chesterton Company, Middlesex Industrial Park, Stoneham, Mass. 02180.



For more than 30 years DeLong has provided engineering, fabrication and installation services for heavy marine structures world wide.

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### Gerry Grammenos Named Marine Superintendent For Cleveland Tankers

Gerry Grammenos has been promoted to marine superintendent for Cleveland Tankers, Inc., Cleveland, Ohio, according to Robert T. McCowan, president of the parent Ashland Petroleum Company. In his new position Mr. Grammenos plans and recommends tanker maintenance and repair, schedules and analyzes shipyard bids, and reviews all procedures and specifications necessary for compliance with regulatory, legislative, and classification societies requirements.

Mr. Grammenos joined Cleveland Tankers in 1977 as fleet engineer, and was named assistant to the marine superintendent in 1979. He is a graduate of the Merchant Marine Academy in Piraeus, Greece.

### Literature Available On Tracor Automatic Omega

A new brochure on its automatic Omega navigation system is available from Tracor, Inc., Austin, Texas.

The Tracor Automatic Omega is said to provide the capability to reestablish a position fix even if "lost" by as much as 100 miles. This is possible by judicious use of a fourth transmitter combined with the three-frequency reception of the Omega receiver.

Complete navigation information supplied by the Tracor system includes latitude and longitude; GMT and date; input speed—manual or automatic; input heading—manual or automatic; great circle course and distance; and dead-reckoning status.

The receiver automatically performs synchronization, transmitter selection, propagation corrections, three-frequency lane checks, diagnostic routines, and switch-over to standby battery. The operator is required only to turn on the receiver and enter initial latitude, longitude, GMT, and day.

For additional information and a free copy of the brochure, write to John L. Hoerber, sales manager, navigation systems, Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721.

### NKK To Build Two Drill Rigs For Sedco At Cost Of \$29 Million

Nippon Kokan (NKK) of Japan has signed a construction contract with the world's largest drilling contractor, Sedco, Inc. headquartered in Dallas, Texas, for two NKK/BMC 250 mat-supported type jackup rigs.

Masato Hiraki, NKK New York general manager, said the order

covers the third and fourth units it has so far been awarded for this type rig. Two previous orders were received from J.F.P. Well Services Inc. of the U.S., each for one unit of the same type.

Contract price for the Sedco rigs is about \$14.5 million each. This price does not include machinery and equipment to be supplied by the owner. NKK reports that the first unit will be completed at its Tsu Works and delivered in May 1981. The second

rig is to be delivered in July of that year. The two units are to be used for drilling operations off the coast of West Africa.

These rigs will be 191 feet long, 132 feet wide, and 16 feet deep. The mat base measures 195 feet 6 inches by 164 feet by 10 feet. Maximum operating depth will be 250 feet, and drilling capability will be 20,000 feet. Classed by the American Bureau of Shipping, each rig will have a complement of about 80 persons.

### \$3.5-Million Awarded To Newport Ship Yard

Newport Ship Yard, Newport, R.I., has been awarded a \$3,538,962 firm fixed-price contract for the regularly scheduled overhaul of the APL-29, a non-self-propelled barracks craft. The Supervisor of Shipbuilding, Conversion and Repair, USN, Boston, Mass., is the contracting activity. (N62665-77-C-0007)

# Goodyear Brakeability: Disc brakes, more efficient, more effective than band brakes under dynamic operation.

As a leader in disc brake technology, we supply brakes for bow thrust engines, propeller shafts, anchor windlasses, winches, as well as other uses.

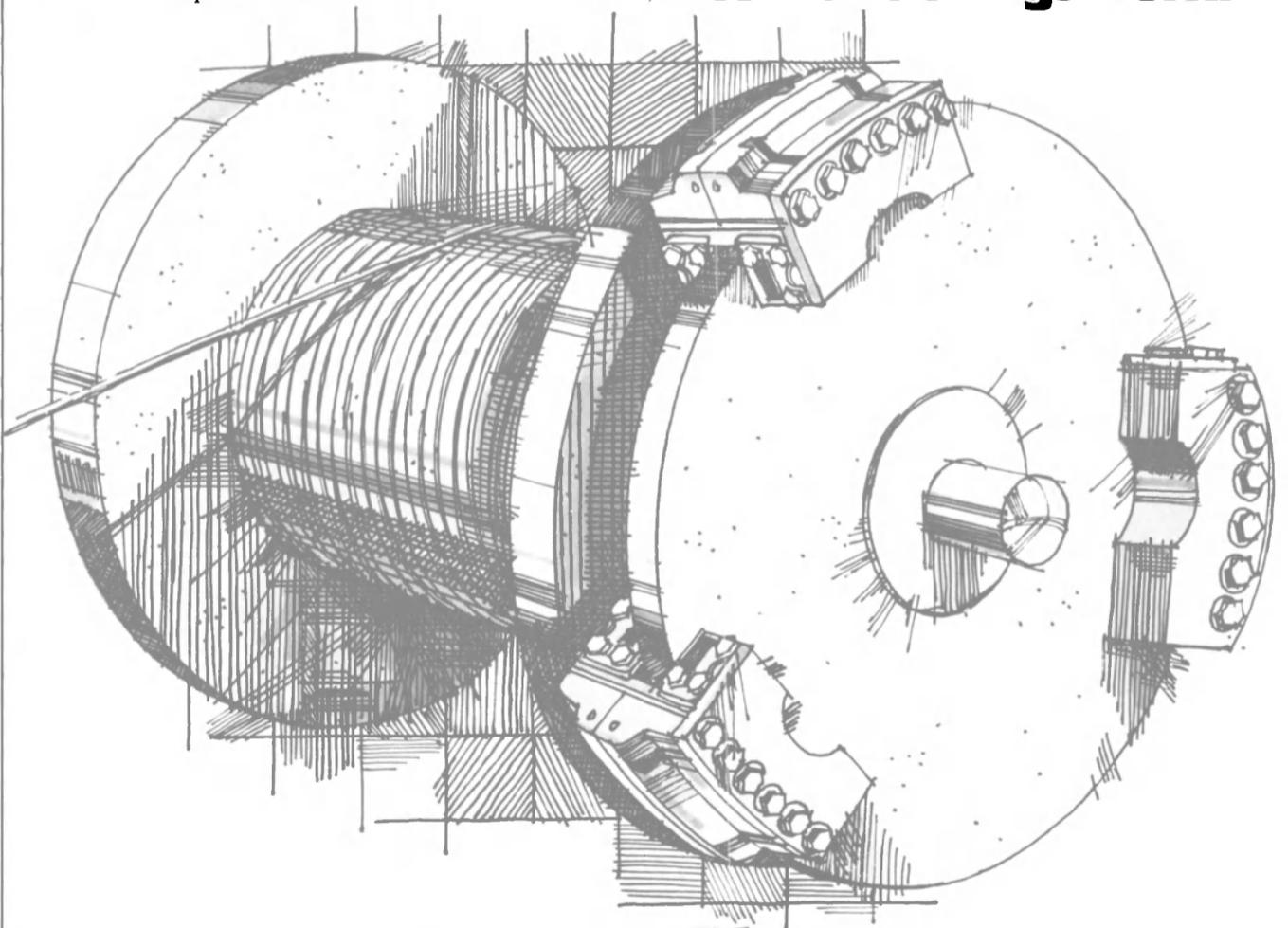
Disc brakes offer many advantages over band and shoe brakes. They are smaller. They can perform in both static and dynamic situations. Their non-self-energizing characteristic assures smooth, controlled payout and superior brake control. The large exposed disc surface dissipates more energy and heat.

Goodyear manufactured friction materials exhibit minimum fade at elevated temperatures and high energy input rates. As the linings wear, pistons continually advance, keeping displacement constant for each application. Quick-change lining design allows minimum downtime for replacement.

Our disc brakes are available in a complete line of caliper designs from 2½ lb. to 300 lb. units. By varying caliper multiples, disc thicknesses, operating pressures, etc., one brake caliper can be used across a complete product line.

For complete information, call Jim Evans, Marketing Manager, Industrial Brakes, Goodyear Aerospace Corporation, Box 427, Berea, Kentucky 40403, (606) 986-9381.

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to make things work.**



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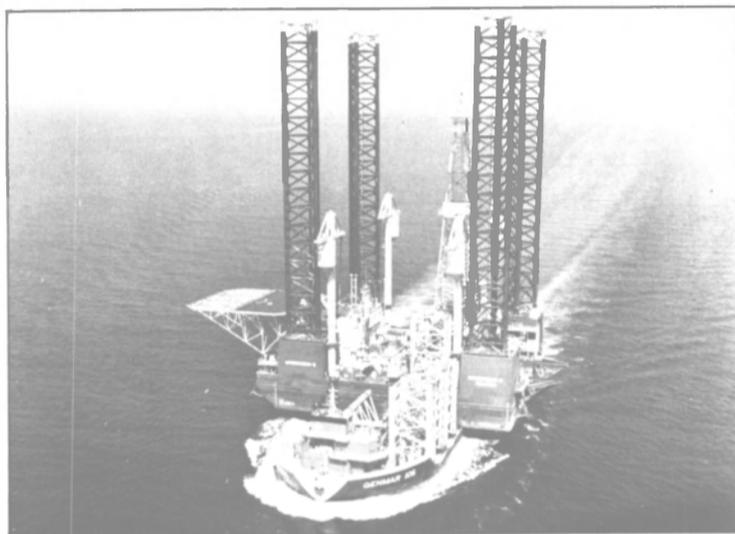


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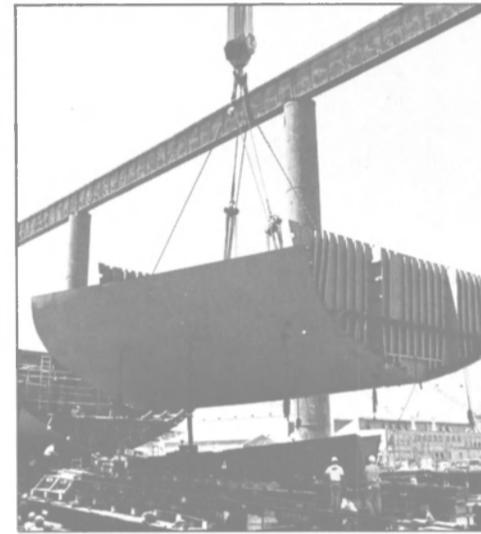
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**MARITIME  
REPORTER**  
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ENGINEERING NEWS

## John Moren Gets New Sales Post At Ashland

John W. Moren has been named manager of transportation fuel sales in the Refinery Sales Department of Ashland Petroleum Company, according to company president Robert T. McCowan.

Mr. Moren is responsible for directing all light oil sales to the

transportation industry. In addition, he will oversee the department's administrative personnel, including all billing functions. He will report to John M. Allard, vice president of refinery sales.

An Ashland employee since 1968, Mr. Moren was named manager of the Findlay, Ohio, jobber sales division in 1978. He will relocate to the Ashland, Ky., area in his new position.

## R.A. Sleiertin Joins Career Associates

Robert A. Sleiertin has joined the staff of Career Associates, Inc., North Dartmouth, Mass. as director of recruiting and placement for technical, management, marketing, sales, and purchasing personnel in the maritime industry.

Career Associates is an established professional placement

firm. Its computer-based data retrieval system permits rapid matching of job requirements and available talent. Mr. Sleiertin's maritime background and knowledge will enhance the ability of the firm to serve the maritime industry effectively.



Robert A. Sleiertin

Mr. Sleiertin is a graduate of the U.S. Merchant Marine Academy. He sailed as a licensed deck officer, and for the past 21 years has been actively engaged in development, marketing, and sales of shipboard navigation, cargo planning, and propulsion systems. Prior to joining Career Associates, he was marketing manager for commercial marine systems at Raytheon's Submarine Signal Division.

## Brochure Available On Comsat General Marisat Terminal

A versatile onboard communications center, Marisat terminal model 3055M, is described in a new four-color brochure being offered by Comsat General Corporation of Washington, D.C. The 3055M terminal gives a ship or offshore facility at sea many of the same communications capabilities that businesses ashore have enjoyed for years. These capabilities include fast and dependable telex, telephone, facsimile, and data communications.

Compact and simple to operate, this terminal basically consists of an antenna unit installed above deck, and electronics/power units installed below deck, the latter generally in the radio room. The 3055M terminal offers the below-deck electronics and power units in separate modular form, permitting greater flexibility for installation of the equipment in space-limited quarters.

The model 3055M has been engineered and built to rigid specifications for reliable operation in a marine environment. It is based on the same proven design used in the model 3055 terminals that Comsat General has provided to the maritime industry since the beginning of commercial Marisat services in 1976. The 3055M also incorporates features designed to further improve reliability and performance.

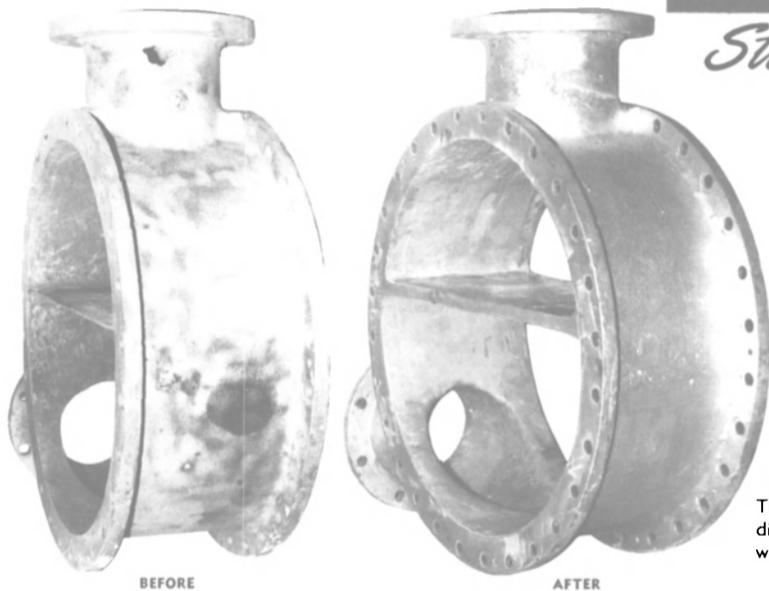
For a copy of the brochure, write to Karen Creager, Comsat General Corporation, 950 L'Enfant Plaza, S.W., Washington, D.C. 20024.

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R. Landry & Company, Ltd.

## Second Trident Submarine Launched At Electric Boat

The chairman of the Installation and Facilities Subcommittee of the House Armed Services Committee termed the development and deployment of the Trident ballistic missile submarine "the heart of our nuclear strategy." Speaking at recent christening ceremonies for the USS Michigan (SSBN-727), the second ship of the Trident class, at General Dynamics' Electric Boat Division in Groton, Conn., Congressman **Lucien N. Nedzi** (D-Mich.) called the project "simply indispensable."

Congressman **Nedzi** said the submarine, "because of its firepower and range . . . will have more 'sea room' than our older submarines and be less detectable, less vulnerable, less dependent on foreign bases." The Congressman said he hoped that when the Michigan is retired "on some distant day" it will have helped preserve the peace "ever vigilantly, yet

never having fired its awesome nuclear punch in anger."

In saluting "the men and women who conceived and managed this project," Congressman **Nedzi** said that it was "no routine assignment. You are, rather, asked to be pioneers in concept and in craftsmanship, taking your skills to the outer edges of knowledge and execution."

Later in the ceremonies, Congressman **Nedzi's** wife, **Margaret Garvey Nedzi**, christened the Michigan, smashing the traditional bottle of champagne on the superstructure of the 560-foot, 18,750-ton ship.

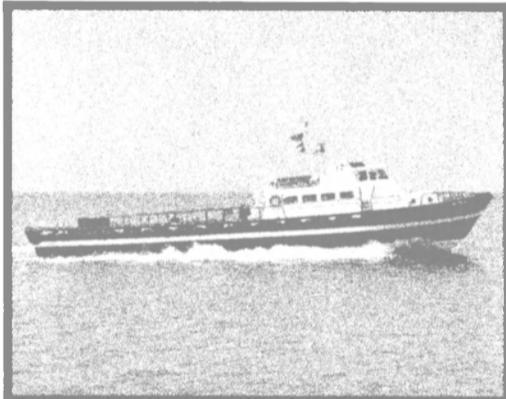
Also participating in the ceremonies were **Robert J. Murray**, Under Secretary of the Navy; **David S. Lewis**, General Dynamics' board chairman; and **P. Takis Veliotis**, General Dynamics' vice president-marine and general manager of the Electric Boat Division.



Nation's second Trident ballistic missile submarine, USS Michigan (SSBN-727), was christened recently at General Dynamics' Electric Boat Division in Groton, Conn. At right is third Trident sub, SSBN-728.

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Here are the boat shafts that are proving themselves in most every type of service. The Armco "AQUAMET" Boat Shaft family serves about every type of boat—crew and supply boats—trawler fleets—naval craft—inland and offshore tugboats—high-powered unlimited hydroplanes—and ocean power boats.

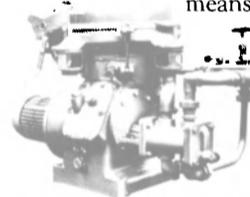
Armco AQUAMET Shafts—AQUAMET 17, 18, 19 (formerly SEALOY\*), and 22—are available in diameters to 12" and lengths up to 39' for crafts of all sizes. For the complete story on these rugged, dependable shafts, just clip this ad to your letterhead and mail your request for the Armco Boat Shafts Product Data Bulletin to Armco, Advanced Materials Division, Dept. A-120, Box 600, Middletown, Ohio 45043.



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tinuously and efficiently. Units are compact, easy to install and maintain. Thousands are in use worldwide aboard small fishing boats, supply vessels, tugs, work boats, etc.

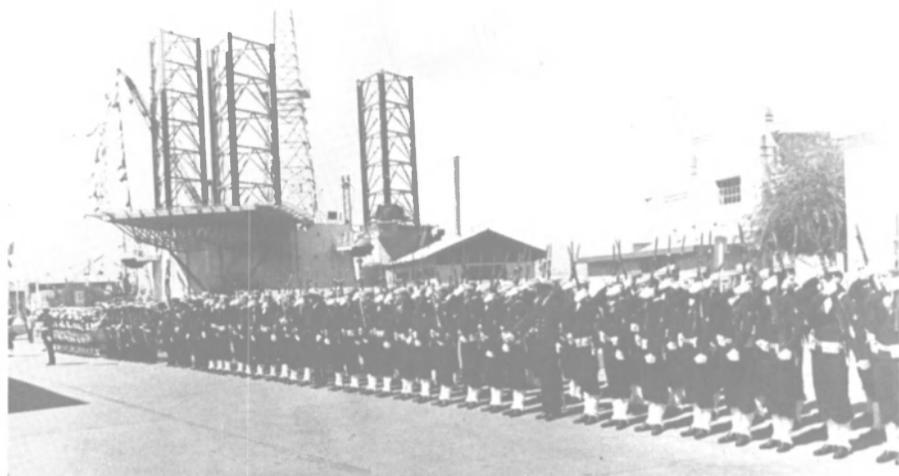
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Write for further information about the full line of De Laval marine and offshore equipment. Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, New Jersey 07024. Phone 201-592-7800 for the name of your nearest Alfa-Laval marine representative.



**ALFA-LAVAL**





Christening ceremonies for the new offshore drilling rig Magallanes were held recently at Asmar Shipyard in Chile. First of its class, rig was constructed for Diamond M Drilling Company of Houston.

## Levingston And Asmar Deliver First Drill Rig Of A New Class

Levingston Shipbuilding Company of Orange, Texas, a subsidiary of Ashland Oil, Inc., and Astilleros y Maestranzas de la Asmar of Chile recently delivered the first Class 011-C jackup drilling rig. The customer, Diamond M Drilling Company, is a Houston-based international offshore drilling contractor with 30 drilling units, the majority of which are operating in U.S. coastal waters. Official christening of the shallow-water jackup took place at the Asmar Shipyard in Talcahuano, Chile.

Asmar was selected as the subcontractor for the lower hull and final outfitting, while the legs and footings were built in Orange. Levingston also provided support

in engineering, purchasing, and supervision. Asmar operates three shipyards in Chile — at Punta Arenas, Valparaiso, and the largest one in Talcahuano.

The Levingston-designed, self-elevating three-legged jackup is able to drill to a depth of 25,000 feet in 150 feet of water. A notable characteristic of this rig is its ability to withstand the harsh weather conditions of the Strait of Magellan, where the rig will be searching for oil. The rig, named the Magallanes, measures 184 feet by 178 feet by 22 feet deep, and has comfortable accommodations for 50 people. She will join another Levingston jackup, the Diamond M Nugget, which is currently operating in the Strait.

These rigs will be working for Empresa Nacional Del Petroleo, the Chilean National Oil Company.

Christening sponsor of the vessel was Mrs. Lucia Hiriart de Pinochet, the wife of the President of the Republic of Chile. Mrs. Pinochet was presented a diamond pendant for performing the christening honors by Ed Paden, president of Levingston Shipbuilding. Among other dignitaries and their wives from the United States were the president of Ashland-Warren, Inc., Bill Voss; and Joe Romano, program

manager for Levingston. Representing Diamond M Company were Jim Hunt, president and chief executive officer; Ned Simes, president of the Drilling Division; Herb Whalen, vice president of foreign operations; and Ken Bissett, vice president of special projects.

In attendance from Chile were the President, Mr. Pinochet, and a number of other government officials. Asmar was represented by all of its senior management, including Adm. Oscar Paredes, president.

## IME Meeting Discussed Combustion Systems And Use Of New Fuels



Among those attending recent meeting of the Eastern U.S.A. Branch, The Institute of Marine Engineers, were (left to right): Joseph Tiratto, American Bureau of Shipping; Gilles E. Merlin, S.E.M.T. Pielstick and French Line; Thomas W. Ryan III, Southwest Research Institute; Everett C. Hunt, U.S. Merchant Marine Academy; and M.K. Eberle, Sulzer Brothers Limited.

A recent meeting of the Eastern U.S.A. Branch of The Institute of Marine Engineers was devoted to the topic, "Ship Propulsion Systems for the Eighties." An all-day session held at the

U.S. Merchant Marine Academy in Kings Point, N.Y., the theme of the symposium was how the continuing escalation of fuel costs has directed the attention of ship operators, shipbuilders, and machinery manufacturers to the urgent need to seek new fuels and to improve methods of burning current fuels.

Topics discussed included research in developing new fuels, methods of dealing with deterioration of fuel quality, and advances in combustion for internal combustion engines and steam generators.

Five papers were presented, as follows:

"The Use of Hybrid Fuels in a Diesel Engine," by Thomas W. Ryan III, Southwest Research Institute; "Solid Fuel Fired Marine Boilers," by J.T. Schroppe and N.G. Wattis, Foster Wheeler Boiler Corporation; "Additives for Marine Fuels," by E.J. Levi, Drew Chemical Corporation; "Twenty Years Experience on PC Medium-Speed Diesels Burning Heavy Fuels—Achieved Results and Research Work Carried Out to Burn the Coming Fuels," by G.E. Merlin, S.E.M.T. Pielstick Company and French Line; and "The Marine Diesel Engine in View of Present and Future Low-Grade Fuels," by M.K. Eberle, Sulzer Brothers Limited.

The meeting concluded with a reception and dinner at the Academy Officer's Club.

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## Ben Wilcox Joins Adams & Porter



Ben Wilcox

Ben Wilcox has joined Adams & Porter Associates, Inc. Previously, he was a vice president with a Houston, Texas, underwriting agency for six years.

A specialist in offshore oil properties and liabilities, he is a veteran of 12 years in the insurance industry. He is a graduate of Yale University.

Adams & Porter Associates, Inc. is a Houston-based international insurance brokerage company founded in 1907.

## Gary Dayton Named National Sales Manager At Bird-Johnson

Bird-Johnson Company, Walpole, Mass., recently appointed Gary W. Dayton to the position of national sales manager, Marine Division. He will coordinate the development and execution of all sales activities with the support of the company's established regional sales offices.

Bird-Johnson manufactures, markets, and services KaMeWa propellers, thrusters, and Cedervall stern tube seals, and is the exclusive U.S. distributor for the OK coupling from SKF Steel.

Mr. Dayton joined the company in 1973 as an applications engineer. He became Gulf Coast sales engineer, based in Houston, Texas, in 1976, and was named Gulf Coast regional manager one year later. Until this recent appointment, he was the assistant national sales manager.

## New Oil/Water Emulsion System From Hoffert— Literature Available

Hoffert Marine Inc. plans to manufacture a fuel oil/water emulsion system that will provide economic boiler operation and assist in pollution control. According to Paul E. Hoffert, president of the Jacksonville, Fla., company, the new unit will be known by the trade name Fire-Brite.

Mr. Hoffert said that fuel savings of between 3.6 and 6.5 percent can be realized using this system in boiler firing. And, to quote from a recent Maritime Administration report prepared by Sea-

worthy Engine Systems, Inc., "a 33-percent reduction of combustibles from the boiler fireside deposits can be achieved."

Manufacture of the Fire-Brite unit will be conducted in Hoffert Marine's plants in Jacksonville and Norfolk, Virginia.

For additional information and free literature write to William H. Byrne, executive vice president, Hoffert Marine Inc., 1007 Holly Lane, Jacksonville, Fla. 32207.

## \$80.5-Million Contract For Swedish Yard From People's Republic

An order has been placed with the state-owned Svenska Varv group in Sweden by the People's Republic of China for two 80,000-dwt oil tankers. The contract, said to be the first placed with a Western shipyard in several years, is with Uddevallavarvet.

Ingar Trogen, managing direc-

tor of the Uddevalla yard, announced that the first ship will be delivered during the first half of 1982, and the second completed before the end of that year.

Total amount of the contract was not disclosed, but it is thought to be some 350 million Swedish kroner (about \$80.5 million). Payment will be made in U.S. dollars.

It is believed that Uddevallavarvet is negotiating for additional orders from the People's Republic.

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This new microprocessor-based receiver offers features and advantages which make it one of the most advanced Loran-C systems in the world.

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- Gives course, speed and time to pre-selected destinations
- Plus all the features of the C-Nav 2

When turned on, C-Nav XL in as little as 10 seconds acquires all usable secondaries in a selected Loran chain. It then locks on and displays the pair used to

compute optimum Lat/Long conversion. Selecting another secondary (or pair) is as simple as keyboard entering a single digit.

With an optional remote meter, the new C-Nav XL also displays cross track error, enabling a vessel to be steered to a true computed course.

### C-NAV 2—Full range of features at realistic price.

The C-Nav 2 is for the navigator who does not require the unique features of the C-Nav XL. Also a microprocessor-based Loran-C receiver, it provides ease of use and precise navigation.

- Fully automatic rapid acquisition
- Tracks up to five secondary stations automatically
- Track mode prevents cycle slip
- Warning indicators for Blink, Cycle and SNR
- Four-digit rate format
- Displays any two secondaries on request
- Hold button allows "freezing" of display
- Four notch filters eliminate interference

### C-PLOT 2—The position plotter to complete the line.

This unique Loran-C position plotter draws

a permanent, repeatable record of a vessel's track on a 10" square plotting surface in true north-up format. With its computerized program, the C-Plot 2 converts time/distance readings to latitude/longitude. The C-Plot 2 can be interfaced (using an optional Epsco circuit board) with most other Loran-C receivers, but it has been designed and factory-matched to interface with Epsco's C-Nav XL or C-Nav 2 to provide an integrated plotting system with the highest level of accuracy.

### Full line of electronics.

In addition to its newest Loran-C receivers and plotters, Epsco also offers 25 commercial products... a complete line of radars, graph and video depth sounders, autopilots, and radio directional finders. All are designed and built to provide the highest level of dependable, precise operation in the toughest environment.

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## John Tyrrell Elected President Of Oil Mop

John P. Tyrrell has been named president of Oil Mop, Inc., New Orleans, it was announced by Kelvin J. Smythe, who has been president of the company since 1976. Mr. Smythe will continue as chairman of the board and chief executive officer, devoting the ma-

majority of his time to corporate planning and continued international development, while Mr. Tyrrell concentrates on the day-to-day management of the Oil Mop group of companies.

Mr. Tyrrell was formerly executive vice president and senior financial executive in the investment banking firm of Loeb, Roesch, Hornblower, Inc., a position he left to join Oil Mop.

## Literature Available On Simrad's Latest Digital Echosounders

Two new digital, recording navigation echosounders are announced by Simrad, Inc., Armonk, N.Y. The ED 161 and ED 162 recording echosounders not only meet IMCO recommendations for merchant vessels but also display

depth digitally. In addition, both include audible depth alarms.

The ED 161 has four recording ranges of 0-25, 0-250, 150-400, and 300-550 fathoms, utilizes a 50 or 70 kHz transducer, and the alarm can be set to any depth down to 500 fathoms. The ED 162 has three special shallow-water ranges for safe operation in rivers, channels, and harbors. It uses a 200 kHz transducer and has 0-30, 0-75, and 0-150 foot recording ranges, plus a 0-1,500 foot deep range. Its alarm can be set to any depth down to 1,500 feet. Both echosounders use 6-inch chart paper, operate on 11-48 volts dc, and have 250 watts minimum of transmitting output power. Models are also available for 220-volt ac or 110-volt dc use.

For literature or more information write to Gilbert Nelson, Simrad, Inc., One Labriola Court, Armonk, N.Y. 10504.

## R.R. Barkerding Joins Ryan-Walsh Stevedoring



Robert R. Barkerding Sr.

Robert R. Barkerding Sr., foreign trade consultant and past port director of New Orleans, has joined Ryan-Walsh Stevedoring company as senior vice president. He will be responsible for the overall supervision of all corporate activities in the New Orleans area. The announcement was made by Ryan-Walsh president Gregory L. Leatherbury.

H. Kingsley Baker Jr. remains as vice president-administration and inland port development, with essentially the same duties as in the past. David J. Turner has been reassigned as vice president-New Orleans sales and customer relations.

After sailing for some 10 years in the U.S. merchant marine, Mr. Barkerding began his shoreside career at the end of World War II by joining Alcoa Steamship Company's Traffic Department. He reached the position of freight traffic manager, then resigned to join Texas Transport & Terminal Company (TTT Ship Agencies Inc.) as manager of the Latin American Division. He left them as executive vice president and director in 1969 to become executive director and general manager of the Port of New Orleans. In 1970, he rejoined TTT as president, and elected to take early retirement in 1974.



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## Title XI Approved For 90 Barges At Total Cost Of \$21.5 Million

The Maritime Administration has approved in principle the application by SCNO Barge Lines, Inc. of St. Louis for a Title XI guarantee to aid in financing the construction of ninety 200-foot jumbo river barges. Thirty-eight of them will be covered hopper barges, and 52 are single-rake, covered hopper barges. All are designed for the transport of dry-bulk cargo on the inland waterways.

Cargo Carriers, Inc., Port Allen, La. is the proposed builder of 38 barges; Nashville Bridge Company in Tennessee is building the balance of the barges. Lemont Shipbuilding and Repair Company of Lemont, Ill. will supply 85 sets of hatch covers for the barges.

The estimated total cost of the barges is \$21,514,960, with the approved loan guarantee \$18,484,000 or 87½ percent of the cost.

## Charles Senner Named President Of TTT, Inc.

TTT Ship Agencies, Inc., New York City, announces the appointment of **Charles R. Senner** as president and chief executive officer. Mr. Senner's experience spans 35 years in all phases of the steamship industry. Most recently he served as executive vice president and supervisor of liner operations for Barber Steamship Lines. Previously, he was president and chief executive officer of Boise-Griffin Steamship Company, and for 20 years prior held various executive posts with States Marine International both in the U.S. and Far East.

## Literature Available On Rockwell's Redesigned Steel Globe Valves

A new catalog describing the redesigned Rockwell Univalve® forged steel globe valves is now available from the Flow Control Division, Pittsburgh. These high-pressure, high-temperature stop, stop-check, and check valves are used in the power, process, and general industries.

The catalog reviews product design, development, and testing. It contains cutaway illustrations, dimensions, pressure/temperature ratings, and other data in standard and metric notation. Of special interest are the Rockwell tools for faster in-line internal valve repairs. Univalve forged steel globe valves are available in ½- through 4-inch sizes, for ANSI classes 1690, 2680, and 4500.

For catalog V-30, Rockwell Univalve forged steel globe valves, write to **C.L. Stevens**, Rockwell International, Flow Control Division MR, 400 North Lexington Avenue, Pittsburgh, Pa. 15208.

## J.H. Leonhard Named Marketing Manager At International Paint



James H. Leonhard

**James H. Leonhard** has been appointed to the newly created position of marketing manager for the International Marine Coatings Division of the International Paint Company, Inc., New York City. The appointment was announced jointly by **John P. Merrill Jr.**, executive vice president, and **W. Norman Duncan**, vice president and general sales manager.

Mr. Leonhard's responsibility is to develop marketing programs to support the division's sales effort. Initially, he plans to concentrate on methods to promote further market penetration of International Paint's Intersmooth SPC®, a technologically advanced, self-polishing, antifouling bottom coating system.

Mr. Leonhard formerly was director of international operations in the specialty chemicals division of FMC Corporation in Philadelphia.

## SNAME New York Section Hears Paper On SWATH Vessels



Shown at recent meeting of the New York Metropolitan Section of SNAME are, left to right, front row: **Walter Maclean**, Section chairman; **Edward Numata**, Davidson Laboratory, Stevens Institute of Technology, author; **Harry S. Townsend**, U.S. Salvage Association (retired), honored guest; **Lester Rosenblatt**, president of the Society; **Moses W. Hirschowitz**, Section Executive Committee; Prof. **Jacques B. Hadler**, Webb Institute; back row: **Neil Reddy**, Section secretary-treasurer; **Eric E. Lithen**, Section vice-chairman; **John C. Daidola**, Section Executive Committee; and **William H. Garzke Jr.**, Section librarian.

A recent monthly meeting of the New York Metropolitan Section of The Society of Naval Architects and Marine Engineers heard a paper titled "Predicting Hydrodynamic Behavior of Small Waterplane Area, Twin-Hull (SWATH) Ships." The author was **Edward Numata**, chief of the Dynamics Division at Davidson Laboratory, Stevens Institute of Technology.

The paper described existing naval and commercial SWATH vessels, and cited the reasons for choosing this type of hull configuration. It also examined effects of changes in hull form and pro-

portions on smooth-water resistance, and motions in rough water.

Analytical and experimental techniques presently available for use in the design process also were discussed. In conclusion, the author presented some relationships for use in predicting resistance and seakeeping behavior in early stages of SWATH design.

The honored guest for the meeting was **Harry S. Townsend**, who retired from the U.S. Salvage Association, Inc. in 1975. Mr. Townsend was very active in ship research and SNAME activities; he wrote several technical papers and served on various panels.



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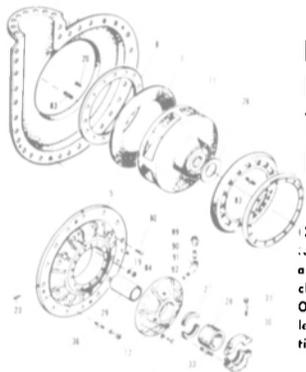
## Calendar Of Coming Events

**7th Ocean Energy Conference** June 2-5  
Sponsored by the Ocean Systems Branch, U.S. Department of Energy, and organized by Gibbs & Cox, Inc. Shoreham Americana Hotel, Washington, D.C. Contact Gibbs & Cox, Inc., 2341 Jefferson Davis Highway, Suite 1020, Arlington, Va. 22202; (703) 979-1240.

**Posidonia International Shipping Exhibition** June 2-7

Sponsored by Greek shipowners and the Greek Ministry of Mercantile Marine. St. Nicholas Terminal, Piraeus, Greece. Contact Posidonia '80, 7 Bridge Street, Coggeshall, Colchester CO6 1NP, England; (0376) 62102; telex 98343.

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**SNAME Spring Meeting/STAR Symposium** June 3-5

Sponsored by The Society of Naval Architects and Marine Engineers. Hotel del Coronado, Calif. Contact SNAME, One World Trade Center, Suite 1369, New York, N.Y. 10048; (212) 432-0310.

**Naval Technology Expo & Conference** June 3-5

Sponsored by *International Defense Review*. Ahoy' Exposition Center, Rotterdam, the Netherlands. Contact **Joseph Maurer**, Industrial & Scientific Conference Management, Inc., 222 West Adams Street, Chicago, Ill. 60606; (312) 263-4866.

**High-Speed Surface Craft Exhibition & Conference** June 24-27

Organized by Hovering Craft and Hydrofoil Exhibitions Ltd., 52 Welback Street, London W1M 7HE, England. Metropole Hotel, Brighton, Sussex, U.K. Contact the organizers.

**KORMARINE '80: International Shipbuilding, Marine Equipment, Ports & Harbors Exhibition** July 28-Aug. 4

Organized by Industrial and Trade Fairs Limited (ITFL). Contact **Tony May**, sales manager, ITFL, Radcliffe House, Blenheim Court, Solihull, West Midlands B91 2BG, England; telex 337073.

**NORFISHING '80: International Fisheries Fair** Aug. 11-17

Organized by the Norwegian Directorate of Fisheries in collaboration with the Norwegian Fair Organization. Nidaro Hall, Trondheim, Norway. Contact **Mrs. Else-Marie Gehrken**, information consultant,

Norwegian Fair Organization, P.O. Box 130, Skoyen, Oslo 2, Norway; telex 18748.

**Shipboard Energy Conservation '80** Sept. 22-23

Sponsored by The Society of Naval Architects and Marine Engineers and presented by the New York Metropolitan Section. Waldorf-Astoria Hotel, New York City. Contact **John C. Daidola**, M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013; (212) 431-6900.

**Ship Operations Symposium** Sept. 23-25

Sponsored by the Maritime Association of the Port of New York and others. Downtown Athletic Club, New York City. Contact **MAPNY**, 80 Broad Street, 34th Floor, New York, NY 10004; (212) 425-5704.

**Exhibition & Congress: Ship, Machinery, Marine Technology International** Sept. 23-27

Organized by Hamburg Messe and Congress GmbH. Fair Grounds Exhibition Centre, Hamburg, West Germany. Contact the organizers, Tungiusstrabe 18, Messehaus Postfach 302360, Hamburg 36, Federal Republic of Germany; telex 0212609.

**International Oil Pollution Prevention Exhibition & Conference** Sept. 23-27

Organized by Hamburg Messe and Congress GmbH. Fair Grounds Congress Centre, Hamburg, West Germany. Contact **Millard F. Smith**, co-chairman, IOPPEC, c/o Slickbar, Inc., 250 Pequot Avenue, Southport, Conn. 06490; (203) 255-2601.

**SNAME Annual Meeting** Nov. 13-15

Sponsored by The Society of Naval Architects and Marine Engineers. New York Hilton Hotel, New York City. Contact SNAME, One World Trade Center, Suite 1369, New York, NY 10048; (212) 432-0310.

**Europort Exhibition & Conference** Nov. 25-29

Organized by the Europort Group. RAI Halls, Amsterdam, the Netherlands. Contact **Peter K. Johnson**, Europort Inc., 6006 Bellaire Boulevard, Suite 101, Houston, Texas 77081; (713) 666-5188.

**Amoco Presents \$2,000 Grant To Webb Institute**



**George M. Kellner** (left), supervisor, marine operations, Amoco International Oil Company, presents \$2,000 check to Rear Adm. **Charles N. Payne**, president Webb Institute of Naval Architecture, Glen Cove, N.Y.

Webb Institute of Naval Architecture recently accepted a \$2,000 Departmental Assistance Grant from Amoco International Oil Company. Webb is one of the most select colleges in naval architecture in the U.S. It is tuition-free and has a normal enrollment of about 80 students.

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### Electric Boat Division Launches Navy Attack Submarine 'Boston'

The historic capital of Massachusetts gained a new symbol of its rich heritage recently when the USS Boston (SSN-703), a high-speed attack submarine, was launched at General Dynamics' Electric Boat Division in Groton, Conn.



Thousands of spectators watched recent launching of high-speed attack submarine USS Boston (SSN-703) at General Dynamics' Electric Boat Division.

Secretary of the Navy **Edward Hidalgo** hailed the 360-foot, 6,900-ton vessel and her sister ships as "the vanguard of our leadership well into the next century." The Secretary's wife, **Karen Hidalgo**, smashed the traditional bottle of champagne on the Boston's bow, sending the submarine down the ways into the Thames River.

Secretary **Hidalgo** spoke of "the serious test of our leadership today," and said that "eternal vigilance is still an imperative, and will continue to be so . . ." The Secretary said that the Navy was working constantly to enhance its strength and capability for immediate response. "I am absolutely confident," he continued, "that we shall continue to respond."

The Navy Secretary also paid tribute to the shipyard work force. Twice during his address he called them "the unsung heroes."

**P. Takis Veliotis**, General Dynamics' executive vice president and general manager of the Electric Boat Division, termed the Boston the "New Ironsides," referring to one of the City of Boston's historical treasures, the USS Constitution — known as "Old Ironsides." "Today the City of Boston gets a 'New Ironsides,' and I hope you will be as proud of her as we are," he said.

General Dynamics holds contracts for 15 of the fast attack submarines and for seven Trident ballistic missile subs.

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Qualifications: Degree or equivalent technical qualifications plus progressive responsible experience in shipyard marine engineering work.

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Duties: To teach courses in Shipbuilding and Ship Theory to students studying for a Diploma of Technology in Naval Architecture. Applicants should have particular proficiency in the following areas: stability and trim; freeboard; tonnage; launching calculations; subdivision and damage stability; and all aspects of steel ship drawing and construction.

Qualifications: Applicants should hold a degree or other appropriate technical qualification in Naval Architecture with working experience in a ship drawing or ship design office.

This position is on a one year only contract basis commencing September 1980.

Salary for the above positions: Commensurate with qualifications and experience. Reasonable travel and removal expenses will be paid. A pension plan, group life and long term disability insurance scheme is administered by the College. Applications should be forwarded to:

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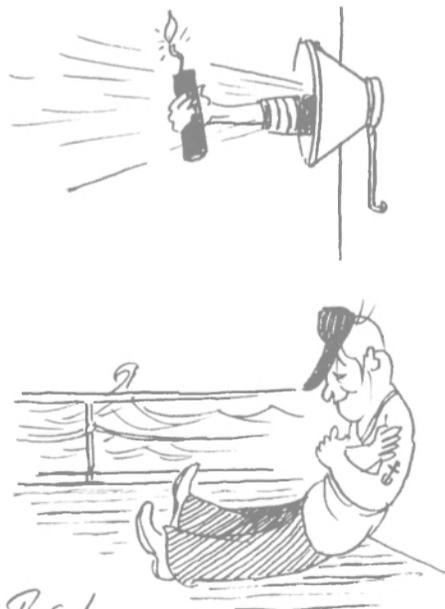
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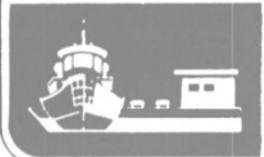
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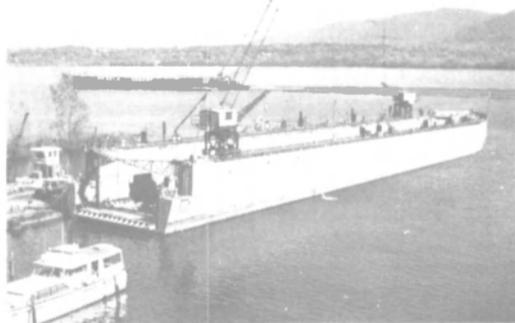
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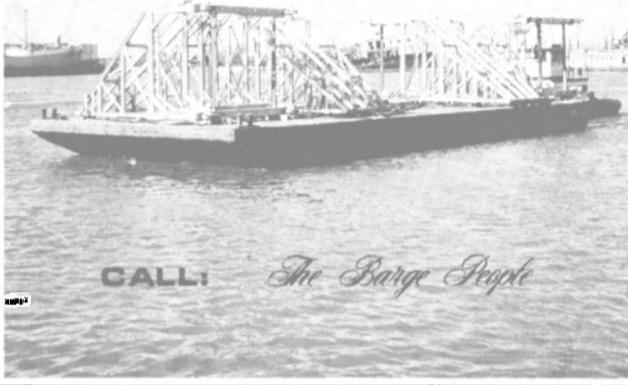
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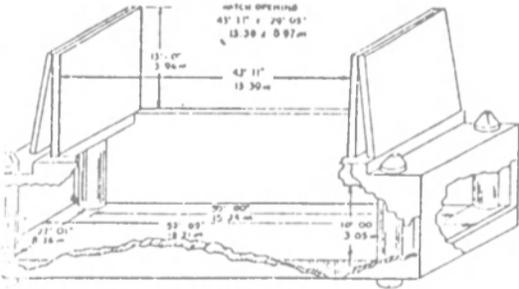
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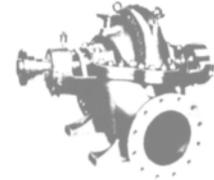
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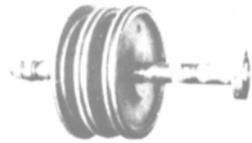
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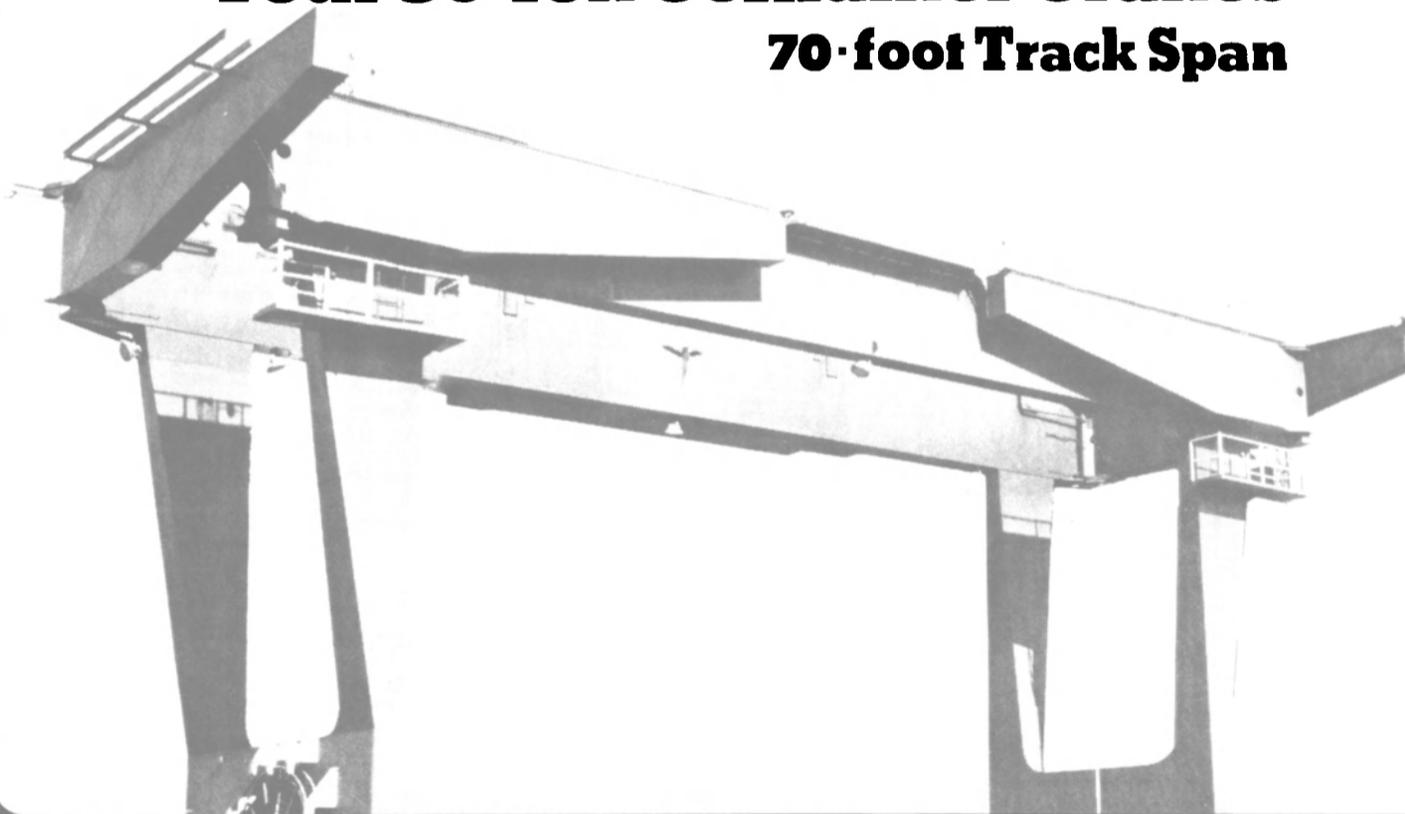
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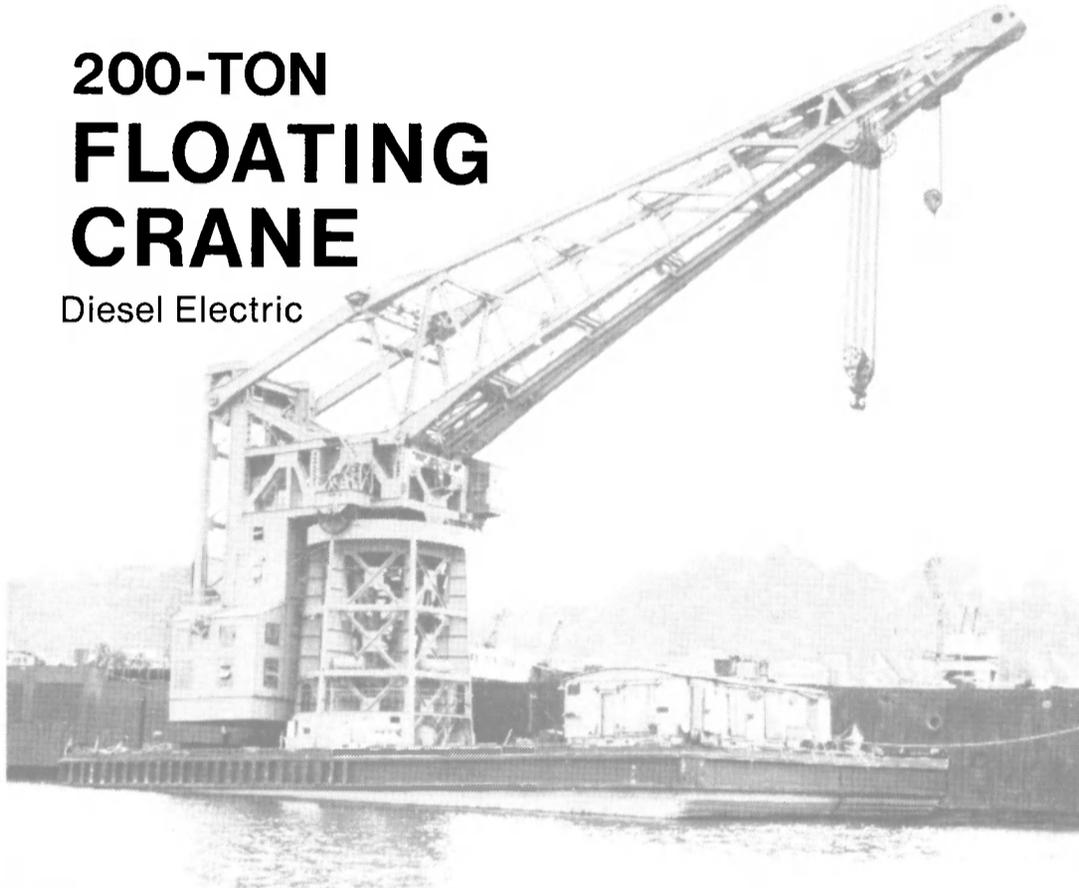
3121 S.W. Moody Ave., Portland, Oregon 97201  
Phone: (503) 228-8691 • Telex 36-0503 • Cable "Zidell"

# The BIG ONES at ZIDELL FOR SALE — RENT — CHARTER

Ready To Go To Work NOW

## 200-TON FLOATING CRANE

Diesel Electric



MR 7601

### VESSEL CHARACTERISTICS 200-TON LIFTING CAPACITY

|   |            |
|---|------------|
| LENGTH OVERALL .....  | 140 FT.    |
| BEAM .....  | 84 FT.     |
| DRAFT .....   | 7 FT.      |
| LIGHT DISPLACEMENT .....  | 2,334 TONS |
| ALL STEEL CONSTRUCTION  |            |
| ELECTRIC REVOLVING TYPE — FULL 360°   |            |
| WEB BOOM .....  | 146 FT.    |
| MAIN HOIST: 200-Ton—By 2 only, 8 part blocks.<br>Each block carries 2,050 ft. of 1½",<br>6 x 37 I.P.S. wire rope (New). |            |
| AUX. HOIST: 25-Ton—By 1 only 4 part block.<br>Block carries 1,110 ft. of 1¾", 6 x 37<br>I.P.S. wire rope (New).         |            |

### ADDED FEATURES

1. Diesel Electric Powered with G.M. 8-278A diesel engine (engine just majored) and 300 KW, 230 volt Generators. Both in A-1 first class condition.
2. All New Wire Rope Throughout.
3. All sheaves, bushings and sheave pins have been removed, inspected and replaced in Good Condition.
4. All Electrical systems and controls have been placed in good operating condition.
5. Large Fuel Tank Capacity.
6. 25 Ton auxiliary hoist has full 140 ft. of boom travel.
7. Two main hoist drums can be operated independently.

AVAILABLE FOR INSPECTION AND DEMONSTRATION AT OUR PIER — PORTLAND, OREGON

Contact: **Hugh Sturdivant**

Sales Manager

Phone: 503/228-8691

## and 2 FLOATING DOCKS

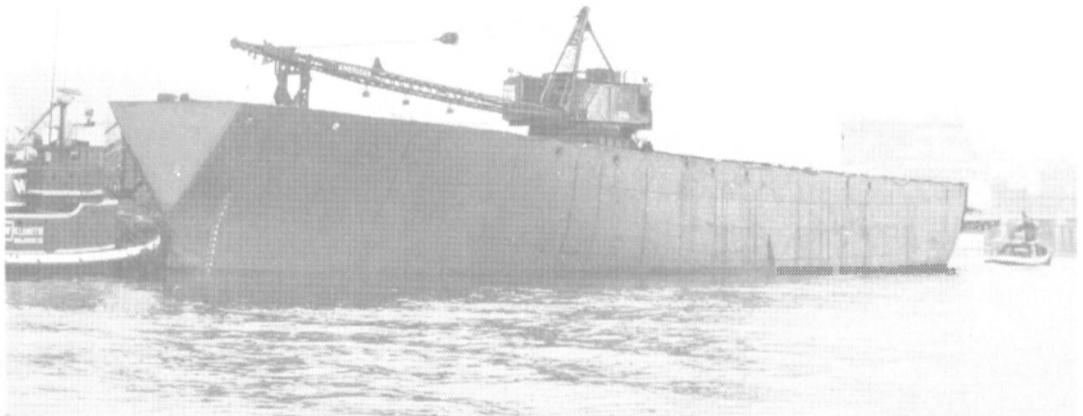
with 50-Ton Whirley Cranes

### VESSEL CHARACTERISTICS

|  |                       |
|--|-----------------------|
| LENGTH OVERALL .....   | 442 FT.               |
| BEAM .....   | 57 FT.                |
| DRAFT .....  | (Light Displ.) 14 FT. |
| CRANES: Main Hoist 50 Tons<br>Whip Hoist 10 Tons<br>Boom 105 Ft. |                       |

### Check these ADDED FEATURES

- ✓ 400 ft. Whirley Track on deck.
- ✓ 564,000 Cubic ft. of inside storage—5 Holds
- ✓ YES—IMMEDIATELY Available for Use.
- ✓ 3 Units in One—A Dock, A Whirley Crane and Large Dry Storage Facility.



MR 7602

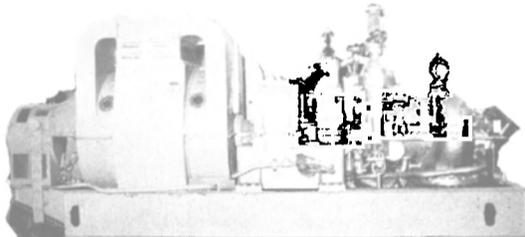
Available for inspection and demonstration at our pier—Portland, Oregon

Contact: **Hugh Sturdivant**  
or **A. D. Canulette, Jr.**  
Phone: 503/228-8691  
Telex: 36-0503 • Cable "ZIDELL"

**ZIDELL**  
**EXPLORATIONS, INC.**  
3121 S.W. Moody Avenue  
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LEVIN METALS CORPORATION —  
RICHMOND, CALIF.



4 Westinghouse, Ship Service, Turbo Generators 1250 KW, 1563 KVA, 2010 Amps, 450 Volts, A.C., 3-Phase, 60 cycles, 1200 RPM.

Turbin Data: 8050 RPM, 525 PSI

These machines are complete and available from stock. Inside storage.

Please Call:

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Contact:

Bruno Moreschi, Sales Manager

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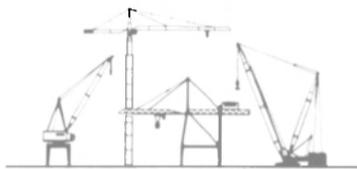
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Large inventory of surplus chain and fittings

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

9 x 12 American Hoist & Derrick Winches, reconditioned  
equal to new

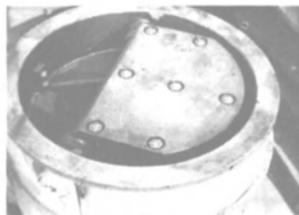
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150 lb. cast steel, stainless steel trim. ABS &  
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Mfg. Farrell Birmingham  
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### SEA CUSHION MARINE FENDERS

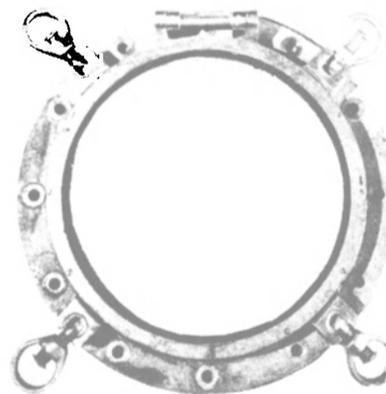
Small SEA CUSHION Fender with  
Elastomer Coated Nylon Net

| Size<br>Inches | Energy Absorption<br>at 60% Compression<br>Foot-Pounds | Weight<br>Pounds | Price<br>\$ |
|----------------|--|------------------|-------------|
| 24x36          | 4,000  | 67               | 900.        |
| 32x50          | 10,000   | 145              | 2,100.      |

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15 1/2" & 16" CLEAN BRASS  
4-DOG MARINE  
PORTLIGHTS  
15 1/2" CLEAR OPENING  
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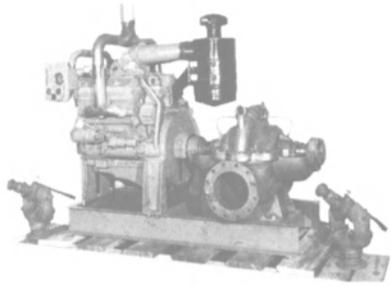


Recently carefully hand removed from ocean vessels.  
Suitable for re-use on shipyard conversions or for marine  
ornamental use. Heavy marine standard glass . . .  
clear or can be furnished frosted for use in special locations.

THE BOSTON METALS COMPANY

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## DIESEL DRIVEN FIRE PUMP



**3510 GPM @ 350' HEAD or 161.7 PSI**  
 Pump: 10" x 8" horiz. split case. Diesel: GM 6V-71 or 6-71 in-line, radiator or heat exchanger cooled.

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## CROUSE HINDS FLOODLIGHTS

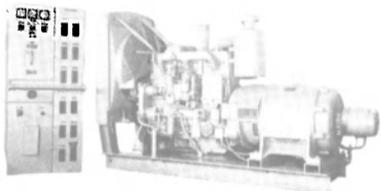


Heavy duty cast aluminum marine floodlights—500 watts incandescent NEMA 5-beam spread—ADE 14—meets Marine Underwriters Lab Standard 595. Corrosion-resistant—hinged door.

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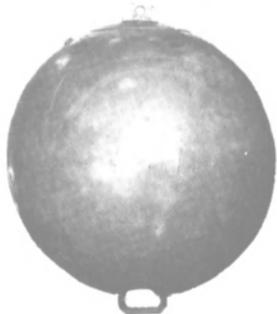
## CUMMINS 75KW 93.8 KVA DIESEL GENERATOR SET



440/3/60 Generator—1200 RPM—driven by 6-cylinder Cummins diesel with electric starting. Free standing switchgear.

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## NEW — UNUSED SPHERICAL MOORING BUOYS

About 58" diam. With tieplates top & bottom. Est. wt 680 lbs each.

**\$349.00**  
 each F.O.B. BALT.

## CYLINDRICAL BUOYS

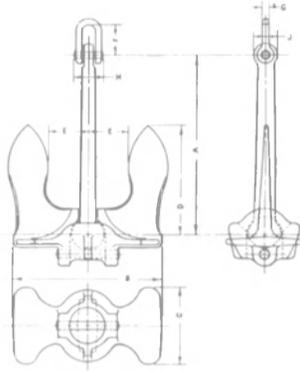
3 Available — 5 ft X 9 ft — with wood bumpers

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DETACHABLE LINKS  
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**LARGE BALDT-TYPE ANCHORS**  
 16000 LBS/12000 LBS/8000 LBS/3000 LBS

10 EA. 5" x 15" I.D. STEEL RINGS  
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10 X 90 FT. 3" DILOK CHAIN  
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3 EA. 2 5/8" — 3" E&E SWIVELS  
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## FIBERGLASS MOTOR LIFEBOAT



**24'3" X 8'2" X 3'4" — 38/42 PASSENGERS**  
 426 CU. FT.

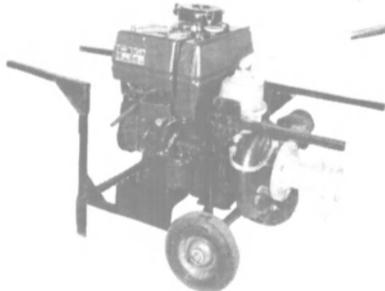
6 1/2 HP Lister engine Model SR-1. Just overhauled, with gearbox & clutch. Rottner Release Gear mfg by Maseco. 20'10 1/4" between hooks — 7000 lbs/hook. Mfg by Watercraft, Surrey, England 8/23/69. Reconditioned wooden gunnels, steel keel & rudder. Foam air cases. Very good condition. Will furnish with ABS Certif.

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## PORTABLE - EMERGENCY DIESEL FIRE PUMP

70 GPM @ 105 PSI



ENGINE: Mfg by V.M.—model HR192A—13.5 HP—3000 RPM — rope start (crank optional). PUMP: Hale — cast iron—3"—N.P.T.—hand priming—weight 410 lbs. Carrier mounted with 2 pneumatic tires for easy handling or 2-man hand carry. Ideal for oil barge, tankers, dock-side, etc use.

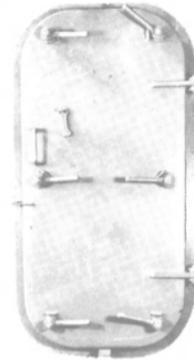
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### NEW WATERTIGHT DOORS

#### Steel Dogs



6-Dog right and left hand hinged doors with frames. Constructed of 1/4" steel plate and meet Coast Guard regulations for above deck as well as below deck use. All dogs are bronze bushed.

#### SIZE

26" x 48" 26" x 66"  
 26" x 60" 30" x 60"

EACH DOOR

**IMMEDIATE DELIVERY**

### NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)  
 14" X 10" CLEAR OPENING



With extended legs for welding to deck. 14" Wide on base — length 28" — height 27 1/4". IMMEDIATE DELIVERY FROM STOCK.

### NEW UNUSED PANAMA CHOCKS FOR SMALL VESSELS



Closed chocks — 12" X 6 1/2" inside opening — 23" overall outside — 8" high — 15" high — 7" radius — weight 110 lbs. IN STOCK.

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- Rotors for G.E. 525KW DORV-325M aux. turbo-gen. sets. Also rotors for Westinghouse 538KW turbo-gen. sets.



- G.E. Main Turbine Rotors — Lynn and Schenectady
- 75/55 KW Excitation Armatures for auxiliary generators



- G.E. Revolving Field — August 1979 Certificate — for immediate delivery
- 1 Main circulating pump — complete — Ingersoll-Rand 24CVM. New certif. 1979 — completely rebuilt.
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IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

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Adams & Porter, 5 World Trade Center, Suite 6433, New York, N.Y. 10048

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Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501

## MACHINERY MAINTENANCE, REPAIR, AND OVERHAUL

General Electric Company—Bldg. 2, Rm 216, Schenectady, N.Y. 12345

## MOORING SYSTEMS

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

## NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., Suite 500, 2341 Jefferson Davis Highway, Arlington, Va. 22202

Agemar, Avenida 3E No. 71-51, Edif. Acuario (Planta Baja) Apartado 1465, Maracaibo, Venezuela

American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004

Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015

J.L. Blutworth, 8207 Glen Loch, Houston, Texas 77061

Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130

CCS Marine Associates Ltd., 2784 Crescentview Drive, N. Vancouver, B.C. Canada V7R2V1

C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211

CTS & Associates, 11320 S.W. 108 Court, Miami, Fla. 33176

CADCOM, 107 Ridgely Ave., Annapolis, MD 21401

Childs Engineering Corp., Box 333, Medfield, Mass. 02052

John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243

Columbia-Sentinel Engineers Western, Inc., P.O. Box 21542, Seattle, WA 98111

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026

Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148

C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048

Norman N. DeJong & Associates, Inc., 1734 Emerson St., Jacksonville, Fla. 32207

Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119

Designers & Planners Inc., One State Street Plaza, New York, N.Y. 10004

Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034

Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050

Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112

Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006

John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110

L.R. Glasten & Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, Wash. 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

Hampton Roads Engineering, Inc., 119 E. Little Creek Rd., Norfolk, VA 23505

J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048

Hydronautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810

Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227

James S. Kragen & Co., Inc., 3333 Rice St., Miami, Fla. 33133

Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063

John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048

MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036

Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114

Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746

Marine Technical Associates, Inc., 195 Paterson Avenue, Little Falls, NJ 07424

Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106

Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225

Mechanical Resources Inc., 191 Cambridge Avenue, Jersey City, N.J. 07307

George E. Meese, 194 Acton Rd., Annapolis, Md. 21403

Metritape, Inc., 33 Bradford Street, Concord, MA 01742

Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169

Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104

Robert B. Niederberger, P.E., 507 Evergreen Road, Severna Park, MD 21146

Norgaard and Clark, 114 Sansome St., San Francisco, CA 94104

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, Florida 33156

S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317

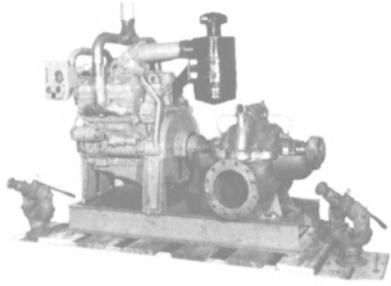
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013

and 657 Mission St., San Francisco, Calif.

Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130

Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

## DIESEL DRIVEN FIRE PUMP



**3510 GPM @ 350' HEAD or 161.7 PSI**  
 Pump: 10" x 8" horiz. split case. Diesel: GM 6V-71 or 6-71 in-line, radiator or heat exchanger cooled.

### THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202  
 Marine Warehouse (301) 752-1077

## CROUSE HINDS FLOODLIGHTS

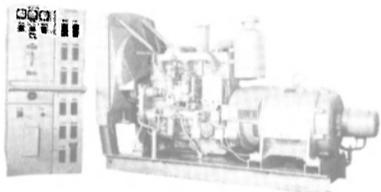


Heavy duty cast aluminum marine floodlights—500 watts incandescent NEMA 5-beam spread—ADE 14—meets Marine Underwriters Lab Standard 595. Corrosion-resistant—hinged door.

### THE BOSTON METALS COMPANY

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 Marine Warehouse (301) 752-1077

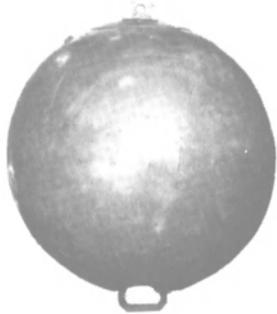
## CUMMINS 75KW 93.8 KVA DIESEL GENERATOR SET



440/3/60 Generator—1200 RPM—driven by 6-cylinder Cummins diesel with electric starting. Free standing switchgear.

### THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202  
 Marine Warehouse (301) 752-1077



## NEW — UNUSED SPHERICAL MOORING BUOYS

About 58" diam. With tieplates top & bottom. Est. wt 680 lbs each.

**\$349.00**  
 each F.O.B. BALT.

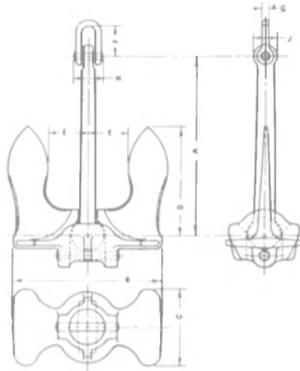
## CYLINDRICAL BUOYS

3 Available — 5 ft X 9 ft — with wood bumpers

### THE BOSTON METALS COMPANY

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 Marine Warehouse (301) 752-1077

## ANCHORS — CHAIN DETACHABLE LINKS PEAR-SHAPED DETACHABLE LINKS



**LARGE BALDT-TYPE ANCHORS**  
 16000 LBS/12000 LBS/8000 LBS/3000 LBS

10 EA. 5" x 15" I.D. STEEL RINGS  
 3 EA. R.P. ANCHOR SHAX 3/8" STK, 3/8" PIN CHAIN  
 10 X 90 FT. 3" DILOK CHAIN  
 9 X 90 FT. 2" DILOK CHAIN  
 SWIVELS  
 3 EA. 2 5/8" — 3" E&E SWIVELS  
 13 EA. 3/8" DETACHABLE LINKS  
 PEARSHAPED DETACHABLE LINKS  
 25 EA. #7 — 17 EA. #5

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## FIBERGLASS MOTOR LIFEBOAT



**24'3" X 8'2" X 3'4" — 38/42 PASSENGERS  
 426 CU. FT.**

6 1/2 HP Lister engine Model SR-1. Just overhauled, with gearbox & clutch. Rottner Release Gear mfg by Maseco. 20'10 1/4" between hooks — 7000 lbs/hook. Mfg by Watercraft, Surrey, England 8/23/69. Reconditioned wooden gunnels, steel keel & rudder. Foam air cases. Very good condition. Will furnish with ABS Certif.

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## PORTABLE - EMERGENCY DIESEL FIRE PUMP 70 GPM @ 105 PSI

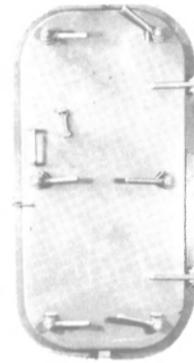


ENGINE: Mfg by V.M.—model HR192A—13.5 HP—3000 RPM — rope start (crank optional). PUMP: Hale — cast iron—3"—N.P.T.—hand priming—weight 410 lbs. Carrier mounted with 2 pneumatic tires for easy handling or 2-man hand carry. Ideal for oil barge, tankers, dock-side, etc use.

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313 E. Baltimore St. Baltimore, Md. 21202  
 Marine Warehouse (301) 752-1077

## FOR SALE NEW WATERTIGHT DOORS



### Steel Dogs

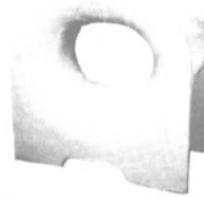
6-Dog right and left hand hinged doors with frames. Constructed of 1/4" steel plate and meet Coast Guard regulations for above deck as well as below deck use. All dogs are bronze bushed.

### SIZE

26" x 48" 26" x 66"  
 26" x 60" 30" x 60"

EACH DOOR

**IMMEDIATE DELIVERY**



## NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)  
 14" X 10" CLEAR OPENING

With extended legs for welding to deck. 14" Wide on base — length 28" — height 27 1/4". IMMEDIATE DELIVERY FROM STOCK.

## NEW UNUSED PANAMA CHOCKS FOR SMALL VESSELS



Closed chocks — 12" X 6 1/2" inside opening — 23" overall outside — 8" high — 15" high — 7" radius — weight 110 lbs. IN STOCK.

### THE BOSTON METALS COMPANY

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 Marine Warehouse (301) 752-1077

## FROM OUR QUICK DELIVERY DEPARTMENT

## FOR T-2 TANKERS



● Rotors for G.E. 525KW DORV-325M aux. turbo-gen. sets. Also rotors for Westinghouse 538KW turbo-gen. sets.



● G.E. Main Turbine Rotors — Lynn and Schenectady  
 ● 75/55 KW Excitation Armatures for auxiliary generators



● G.E. Revolving Field — August 1979 Certificate — for immediate delivery

● 1 Main circulating pump — complete — Ingersoll-Rand 24CVM. New certif. 1979 — completely rebuilt.

● Forced Draft Fan Motors — Westinghouse  
 ● Cargo Pumps — 6GTM — 2000 GPM @ 280' head

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 Marine Warehouse (301) 752-1077

# BUYERS DIRECTORY

## AIR & GAS PURIFICATION

Robbins Aviation, Inc., 3817 Santa Fe Ave., Vernon, CA 90058

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Adrick Cooling Corp., 30 B. Remington Blvd., Ronkonkoma, N.Y. 11779

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

R.W. Fernstrum & Company, 1716 Eleventh Avenue, Menominee, MI 49858

James D. Nall Co., Inc., 3195 NW 20th Street, Miami, FL 33142

Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, N.Y. 11101

York Division (Borg-Warner Corp.), P.O. Box 1592, York, PA 17405

## BEARINGS—Rubber, Metallic, Non-Metallic

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44052

Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309

Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850

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

## BLASTING—Cleaning—Equipment

GMMC/Porta-Shotblast, 1112 Davidson Road, Nashville, Tenn. 37205

Pepper Industries, Inc., P.O. Box 11367, San Diego, CA 92111

## BOILERS—Tube Cleaning

Combustion Engineering, Inc., Windsor, Connecticut 06095

Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, N.Y. 11101

## BRAKES

Goodyear Aerospace (Industrial Brakes Division), Box 477, Berea, KY 40403

## BROKERS

Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, La. 70153

Crown Assets Disposal Corp., 300 Notre Dame St., Ville St.-Pierre, Quebec, Canada H8R 3Z6

Daniel Yacht & Ship Brokerage Ltd., 1300 S.E. 17th St., Ft. Lauderdale, FL 33316

Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006

Max Rouse & Sons, Inc., P.O. Box 5250, Beverly Hills, CA 90213

## BUNKERING SERVICE

Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019

## CARGO TRANSFER & ACCESS EQUIPMENT

MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016

## CHECKING SYSTEMS

Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, Pa. 18936

## CLOCKS

Wempe Chronometerwerke Germany, Stubbenhulk 25 2000 Hamburg 11, Germany

## COILS—Cooling, Heating, Ventilating

Colmac Coil, Inc., Colville, Wash. 99114

## CONTAINERS—Cargo Container Handling

Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

## CONTROL SYSTEMS—Monitoring

Arnessen Marine Systems, Inc., One Battery Plaza, New York, NY 10004

Foxboro Marine Operations, P.O. Box 435, Burlington, Mass. 01803

Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913

Megasystems, Inc., 5909 West 130th Street, Cleveland, OH 44130

Seatronic Engineering & Mfg. Co., 1230 E. Joppa Rd., Towson, MD 21204

Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032

## COUPLINGS

Bird-Johnson Co., 110 Norfolk St., Walpole, MA 02081

## CRANES—HOISTS—DERRICKS—WHIRLEYS

Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027

M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07087

J.D. Neuhaus, Witten-Heven, Hebezeuge, D 5810 Witten-Heven, West Germany

Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

## DECK COATINGS—Non-skid

Selby, Battersby & Co., 5220 Whiby Ave., Philadelphia, PA 19143

## DECK MACHINERY—Cargo Handling Equipment

Appleton Machine Co., Marine Division, 618 S. Oneida St., Appleton, WI 54911

Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134

New England Trawler Equipment Co., 291 Eastern Ave., Chelsea, MA 02150

## DIESEL ACCESSORIES

B & W Marine Service, One State Street Plaza, New York, N.Y. 10004

General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02360

Golden Marine Company, Inc., 162 Van Brunt Street, Brooklyn, NY 11231

## DOORS—Watertight—Joiner

Walz & Krenzer Inc., 400 Trabold Road, Rochester, N.Y. 14624

## DRAFTING EQUIPMENT

AM Bruning, 1834 Walden Office Square, Schaumburg, IL 60196

## ELECTRICAL EQUIPMENT

Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013

Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014

Port Electric Supply, 157 Perry Street, N.Y., N.Y. 10014

Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

## EMULSIFICATION SYSTEMS

American United Marine Corp., 575 Madison Ave., New York, NY 10022

Hoffert Marine, Inc., 265 Franklin Ave., Nutley, N.J. 07110

## EQUIPMENT—Marine

Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013

Baldt, Inc., P.O. Box 350, Chester, PA 19016

Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014

Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550

Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080

Sudaimport, 5 Kalyaevskaya, Moscow K-6, USSR

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

## EVAPORATORS

Riley-Beard, Inc., P.O. Box 1115, Shreveport, La. 71130

## EXPANDED METALS

Washington Iron Works, 1500 Sixth Avenue South, Seattle, WA 98134

## FANS—VENTILATORS—BLOWERS

Hartzell Propeller Fan Company, 901 S. Downing Street, Piqua, OH 45356

Joy Manufacturing Co., 338 So. Broadway, New Philadelphia, Ohio 44663

Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201

## FENDERING SYSTEMS—Dock & Vessel

Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850

Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

## FINANCING—Leasing

Continental Illinois National Bank, 231 S. LaSalle, Chicago, IL 60693

General Electric Credit Corp., P.O. Box 8300, Stamford, Conn. 06904

Greyhound Leasing & Financial Co., Greyhound Tower, Phoenix, AZ 85077

Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10005

Salomon Brothers, One New York Plaza, New York, N.Y. 10004

Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670

## FITTINGS & HARDWARE

Custom Alloy, 2040 N. Loop W., Houston, TX 77018

Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

## FURNITURE

Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231

IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

## GANGWAYS

Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

## HATCH & DECK COVERS—Chain Pipe

MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016

Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

Julius Mock & Sons, Inc., 20 Vesey St., New York, NY 10017

## HULL CLEANING

Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932

Phosmarin Equipment (Phocenne Sous-Marine S.A.), 21 Boulevard de Paris, 13002 Marseille, France

Sub Enterprises, Inc., P.O. Box 16531, Irvine, CA 92713

## HYDRAULICS

Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229

## INERT GAS—Generators—Systems

Camar Corporation, P.O. Box 460, Worcester, MA 01613

Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039

Fredrikstad mek. Verksted, N. American Agents, American United Marine Corp., 575 Madison Ave., New York, N.Y. 10022

## INFORMATION—Marine

Maritime Data Network, 300 Broad Street, Stamford, CT 06901

## INSULATION—Cloth, Fiberglass

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

Dupont Company, Nemours Bldg.-RM C31H6, Centre Rd. Bldg., Wilmington, DE 19898

IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

## INSURANCE

Adams & Porter, 1819 St. James Place, Houston, Texas 77027

Adams & Porter, 5 World Trade Center, Suite 6433, New York, N.Y. 10048

Alexander & Alexander, Inc., 1185 Ave. of the Americas, New York, N.Y. 10036

Midland Insurance Co., 160 Water St., New York, N.Y. 10038

Whitehall Brokerage, Inc., 17 Battery Place, New York, NY 10004

## KEEL COOLERS

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

## LADDERS

Duo-Safety Ladder Co., 513 West 9th Ave., P.O. Box 497, Oshkosh, Wisc. 54901

## LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014

Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123

Perko Inc., P.O. Box 6400D, Miami, Florida 33164

Phoenix Products Company, 4785 North 27th Street, Milwaukee, WI 53209

Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

## LNG CONTAINMENT

McDonnell Douglas Astronautics Co., 5301 Bolsa Ave., Huntington Beach, CA 92647

## LUMBER

R.N. Templeman, Inc., 3000 Perdido St., New Orleans, LA 70119

## MACHINE TOOLS

Climax Manufacturing Company, P.O. Box 230, Newberg, OR 97132

Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501

## MACHINERY MAINTENANCE, REPAIR, AND OVERHAUL

General Electric Company—Bldg. 2, Rm 216, Schenectady, N.Y. 12345

## MOORING SYSTEMS

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

## NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., Suite 500, 2341 Jefferson Davis Highway, Arlington, Va. 22202

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Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015

J.L. Bludworth, 8207 Glen Loch, Houston, Texas 77061

Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130

CCS Marine Associates Ltd., 2784 Crescentview Drive, N. Vancouver, B.C. Canada V7R2V1

C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211

CTS & Associates, 11320 S.W. 108 Court, Miami, Fla. 33176

CADCOM, 107 Ridgely Ave., Annapolis, MD 21401

Childs Engineering Corp., Box 333, Medfield, Mass. 02052

John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243

Columbia-Sentinel Engineers Western, Inc., P.O. Box 21542, Seattle, WA 98111

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026

Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148

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Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119

Designers & Planners Inc., One State Street Plaza, New York, N.Y. 10004

Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034

Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050

Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112

Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006

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L.R. Glosten & Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, Wash. 98104

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Hampton Roads Engineering, Inc., 119 E. Little Creek Rd., Norfolk, VA 23505

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James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 33133

Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063

John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048

MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036

Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114

Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746

Marine Technical Associates, Inc., 195 Paterson Avenue, Little Falls, NJ 07424

Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106

Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225

Mechanical Resources Inc., 191 Cambridge Avenue, Jersey City, N.J. 07307

George E. Meese, 194 Acton Rd., Annapolis, Md. 21403

Metritape, Inc., 33 Bradford Street, Concord, MA 01742

Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169

Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104

Robert B. Niederberger, P.E., 507 Evergreen Road, Severna Park, MD 21146

Norgaard and Clark, 114 Sansone St., San Francisco, CA 94104

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, Florida 33156

S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317

M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013

and 657 Mission St., San Francisco, Calif.

Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130

Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.  
Texas Instruments Inc., P.O. Box 226080, M/S 3107, Dallas, TX 75265  
Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

#### OILS—Marine—Additives

Ferrous Corporation, P.O. Box 1764, Bellevue, WA 98009  
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001  
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019  
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
A. Margolis & Sons Corp., One World Trade Center, Suite 8751, New York, N.Y. 10048  
Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017  
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

#### OIL/WATER SEPARATORS

Alfa-Laval, Inc., 2115 Lindwood Avenue, Ft. Lee, NJ 07024  
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932

#### PAINTS—COATINGS—CORROSION CONTROL

Belzona Molecular Metalife Inc., 224 7th Street, Garden City, NY 11530  
"CONSOL" manufactured by Hanline Bros., Inc., 1400 Warner St., Baltimore, MD 21230  
Devoe & Reynolds Co., Inc., P.O. Box 7600, Louisville, Ky. 40207  
Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94080  
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004  
Kaiser Aluminum & Chemical Corp., 300 Lakeside Drive (Room 1139KB) Oakland, CA 94643  
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817  
The Skybryte Co., 3125 Perkins Ave., Cleveland, OH 44114  
Woolsey Marine Industries, Inc., 100 Saw Mill Rd., Danbury, CT 06810

#### PETROLEUM SUPPLIES

Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

#### PIPE—HOSE—Cargo Transfer, Clamps, Couplings

Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073  
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

#### PLASTICS—Marine Applications

Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

#### PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021  
Alsthom-Atlantique, 2 quai de Seine, 93203 Saint-Denis, France  
Armo Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
Burmeister & Wain, One State Street Plaza, New York, N.Y. 10004  
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark  
Caterpillar Tractor Company, Engine Division, Peoria, IL 61629  
Colt Industries' Fairbanks Morse Engine Division, Beloit, Wisc. 53511  
Combustion Engineering, Inc., Windsor, Connecticut 06095  
Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102  
Electro-Motive Division, General Motors Corp., LaGrange, Ill. 60525  
Elliott Company, (Div. of Carrier Corp.), Jeanette, PA 15644  
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531  
MTU of North America, Inc., 10450 Corporate Drive, Sugar Land, TX 77478  
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3  
Michigan Wheel/Gulf Coast, P.O. Box 1528, Pascagoula, MS 39567  
Motive Power Corp., P.O. Box 365, Mineola, NY 11501 70124  
Omnithruster Inc., 16837 So. Normandie Ave., Gardena, CA 90247  
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014  
Propulsion Systems Inc., 21213 76th Ave., So. Kent, WA 98031  
Schottel of America, Inc., 8375 N.W. 56 Street, Miami, Fla. 33166  
Tacoma Boatbuilding Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422  
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621  
Transamerica DeLaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650  
Voith Schneider of America—U.S. Agent: Eli Sharprut, 347 Evelyn St., Paramis, N.J. 07652

#### PUMPS—Repairs—Drives

Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
Transamerica DeLaval, Inc., IMO Pump Div., P.O. Box 321, Trenton, NJ 08602  
Warren Pumps, Inc., Bridges Ave., Warren, Mass. 01083  
Worthington Pump Inc., P.O. Box 1250, Mountainside, N.J. 07092

#### REELS—Coiling Systems

Reel-O-Matic Systems, Inc., 418 Hellman St., Wrightsville, Pa. 17368

#### REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
Port Refrigeration Div., 157 Perry Street, New York, N.Y. 10014

#### ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431  
Jackson Rope Co., Reading, Pa. 19603  
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110  
Tubbs Cordage Co., Orange, CA 92666

#### RUDDER ANGLE INDICATORS

Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011  
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

#### SALVAGE

Levin Metals Corp., 1310 Canal Blvd., Richmond, CA 94807

#### SANITATION DEVICES—Pollution Control

Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013  
Demco, Inc., P.O. Box 94700, Oklahoma City, OK 73109  
Envirovac (Division of Dometic Inc.), 1260 Turret Drive, Rockford, IL 61111  
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184  
Microphor, Inc., P.O. Box 490, Willits, CA 95490  
Red Fox Industries, P.O. Drawer 640, New Iberia, LA 70560  
Research Products/Blankenship, 2639 Andjon, Dallas, Texas 75220  
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111  
Sigma Treatment Systems, 2 Davis Ave., Frazer, PA 19355

#### SCAFFOLDING EQUIPMENT—Work Platforms

Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024  
Spider Staging Sales Co., P.O. Box 182, Renton, Washington 98055  
Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

#### SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

#### SHIPBREAKING—Salvage

American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210  
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202  
National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731  
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

#### SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

#### SHIPBUILDING—Repairs, Maintenance, Drydocking

A.D.M. (Amsterdam Drydock Mfg.), Moatschappij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland  
Asmar Shipyards Co., Astilleros y Maestranz de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.  
Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S/N, Apdo. Postal 647, Veracruz, Ver., Mexico  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085  
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004  
Blohm + Voss AG, D-2000 Hamburg 1, P.O.B. 10 07 20  
Blohm + Voss Co., 55 Morris Ave., Springfield, N.J. 07081  
Blount Marine Corp., P.O. Box 368, Warren, RI 02885  
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124  
Ira S. Bushey & Sons, Inc., 764 Court Street, Brooklyn, N.Y. 11231  
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322  
Centromar, One World Trade Center, Suite 3557, New York, N.Y. 10048  
China Shipbuilding Corp., c/o Allegro Transportation Supply Co., One Penn Plaza, Room 1606, New York, NY 10001  
Coastal Dry Dock & Repair Co., Building 131, Brooklyn Navy Yard, Brooklyn, N.Y. 11205  
Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles  
Curacao Drydock, 26 Broadway, Suite 741, New York, N.Y. 10004  
Delattre-Levivier, Tour Fiat, Cedex 16, 92084 Paris La Defense, France  
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London Republic of South Africa  
Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602  
Empresa Nacional Bazan, Paseo de la Castellana 65, Madrid 1 Spain  
Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122  
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208  
Galveston Shipbuilding Co., P.O. Drawer 2660, Galveston, TX 77553  
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219  
Halifax Industries, Ltd., P.O. Box 1477, Halifax, Nova Scotia, Canada, B3K 5H7  
Halter Marine, Inc., P.O. Box 29266, New Orleans, La. 70189  
Havre de Grace, Havre de Grace, Md.  
Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan  
Hongkong United Dockyards Ltd., Kowloon Docks, Hong Kong  
Hudson Shipyards, Inc., P.O. Box Q, Pascagoula, MS 39567  
Ingalls Shipbuilding, P.O. Box 149, Pascagoula, MS 39567  
Jackson/New York, 29 45 Richmond Terrace, Staten Island, NY 10303  
Jeffboat, Inc., Jeffersonville, Ind. 47130  
Keppel Shipyard Ltd., P.O. Box 2169, 325, Telok Blangah Road, Singapore 4  
Kockums Shipyard, S-201, 10 Malmo 1, Sweden  
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134  
J. Ray McDermott & Company, Inc., 1010 Common Street, New Orleans, LA 70160  
MacGregor Land & Sea, Inc., 135 Dermody Street, Cranford, NJ 07016  
Mangone Shipbuilding Co., 819 South 80th Street, P.O. Box 5446, Houston, TX 77012  
Marathon Manufacturing Company  
Marathon LeTourneau Offshore Company, 1700 Marathon Building, 600 Jefferson, Houston, Texas 77002  
Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520  
Marinette Marine, Ely Street, Marinette, WI 54143  
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047  
J. Ray McDermott & Co., Inc., P.O. Box 60035, New Orleans, LA 70160  
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681  
Mississippi Marine Towboat Corp., P.O. Box 539, Harbor Front Industrial Park, Greenville, MS 38701  
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655  
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202  
National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
Newpark Shipbuilding & Repair, P.O. Box 5426, Houston, TX 77012  
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607  
Norfolk Shipbuilding & Drydock Corp., P.O. Box 2100, Norfolk, Va. 23501  
Northwest Marine Iron Works, P.O. Box 3109, Portland, Oregon 97208  
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395, Genoa, Italy 16100  
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501  
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156  
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862  
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767  
Port Houston Marine, Inc., 7220 J.W. Peavy Drive, Houston, TX 77012  
Port of Portland, P.O. Box 3529, Portland, OR 97208  
S.E.B.N., Societa Estercizio Bacini Napoletani, Via Marinella Varco N.6 (80133) Naples, Italy  
St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111  
STE Marie Yard & Marine, Inc., 741 East Portage Ave., Sault Ste Marie, MI 49783

Savannah Machine & Shipyard Co., P.O. Box 787, Savannah, Ga. 31402

Sembawang Shipyard Ltd., Sembawang, P.O. Box 3, Singapore 9175

The Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70308

Setenave-Estaleiros Navais De Setubal, P.O. Box 135, Setubal, Portugal

Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR  
Sun Shipbuilding, Foot of Morton Ave., Chester, Pa. 19013  
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380  
Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98422

Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
Total Transportation Systems Inc., 813 Forest Dr., Newport News, VA 23606

Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201 Oslo, Norway

Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316  
Tug Barge Systems, Inc., subsidiary of Ingram Corp., 4100 One Shell Square, New Orleans, La. 70139

Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087

Valmet OY, Helsinki Shipyard, Laivanrakentajantie 2, P.O. Box 910 SF-00101 Helsinki 10, Finland

Wall Shipyard, P.O. Box 419, Harvey, La. 70058  
Wiley Manufacturing, a unit of AMCA International Corp., P.O. Box 97, Port Deposit, MD 21904

Zigler Shipyards, P.O. Box 2607, Morgan City, La. 70380

#### SHIP STABILIZERS

Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

#### SMOKE INDICATORS

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

#### STUFFING BOXES

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

#### SURVEYORS AND CONSULTANTS

Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903  
Hull & Cargo Surveyors, Inc., 99 John St., New York, NY 10038

#### TANK CLEANING

Butterworth Systems Inc., 224 Park Ave., P.O. Box 352, Florham Park, N.J. 07932  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

Salwico, Inc., 77 River St., Hoboken, N.J. 07030

#### TANK LEVELING INDICATORS

Transamerica DeLaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032

Vu-Gage System, 150 E. 42nd St. (Room 910), New York, NY 10017

#### TECHNICAL MANUAL PREPARATION

Benhof, Inc., 2468 N. Jerusalem Road, N. Bellmore, NY 11710

#### TERMINALS—Oil-Transfer

Delong Corp., 29 Broadway, New York, N.Y. 10006  
Transportation Concepts & Techniques Inc., 1020 West Main Street, Charlottesville, VA 22903

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.  
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002

Chotin Transportation, Inc., 580 Walnut St., Cincinnati, Ohio 45202  
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202  
Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771

Gulf Fleet Marine Corporation, Canal Place One, Suite 2400, New Orleans, LA 70130

James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004  
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
McDonough Marine Service, P.O. Box 26206, New Orleans, La. 70117  
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048  
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002

Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

#### UNDERWATER SERVICES—Contracting

SeaTec International Ltd., Blackburn Industrial Center, Gloucester, MA 01930

#### VALVES AND FITTINGS

American United Marine, Corp., 575 Madison Ave., New York, NY 10022

Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101

Demco, Inc., P.O. Box 94700, Oklahoma City, Okla. 73109  
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

Marland Environmental Systems Inc., N. Main St., Walworth, WI 53184

Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027  
Rockwell International, Flow Control Division, 400 N. Lexington Avenue, Pittsburgh, PA 15208

Stacey Valve Co., 29 Meserole Ave., Brooklyn, N.Y. 11222  
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229  
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

#### VIDEO EQUIPMENT

Video Library Systems, 185 Osoer Avenue, Hauppauge, NY 11787

#### WEATHER FORECASTS

ERT, 696 Virginia Road, Concord, Mass. 01742

#### WELDING SYSTEMS

MK Products, Inc., 16882 Armstrong Ave., Irvine, CA 92705

#### WINCHES AND FAIRLEADERS

Bloom Inc., Highway 20, West Four Miles, Independence, IA 50644  
Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027

Gearmatic Co. Ltd., 7400 132nd Street, Surrey, B.C., Canada  
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134

Smith-Berger Manufacturing Corporation, 3236 16th Avenue S.W., Seattle, WA 98134

#### WINDOWS

Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

#### WIRE AND CABLE

Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076

Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055  
Seacoast Electric Supply Corp., 1505 Olive St., Houston, TX 77007

#### WIRE ROPE—Slings

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

#### ZINC

Smith & McCorken, 153 Franklin St., New York, N.Y. 10013

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.

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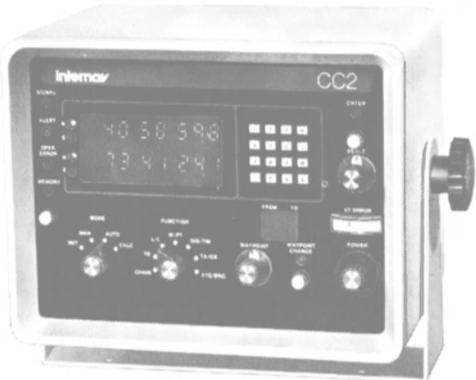
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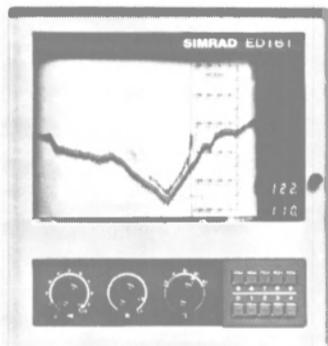
Simrad's CC-2 Navigation Computer gives complete position, steering and piloting information in an easy-to-use system. It is still the only separately packaged Loran C navigation computer, and can accept input data from any Simrad Loran C receiver.

The CC-2 can repeat Loran C time difference numbers, convert Loran C position to latitude/longitude, and will store up to nine "waypoints" or destinations. It continuously computes distance, time to destination and bearing from your present position to any

of the nine selected destinations or waypoints. It also computes speed over the ground, course made good and off-course "cross track error" for steering adjustments. Lat/Long position is read out to tenths of seconds (ten feet) and off-track deviations can be read out in hundredths of a nautical mile. The computer is so flexible, you can even use it to solve separate time/course/distance problems while it continues to update actual navigation data internally.

## New digital recording sounders meet IMCO requirements.

Simrad now offers two economical navigation recording echosounders that meet IMCO recommendations for merchant vessels. In addition to showing a well defined bottom on recording paper, the systems have independent digital depth indicators and depth alarms. The Simrad ED-161 has four recording ranges from 0-25 to 550 fathoms. The ED-162 has 0-30, 0-75, and 0-150 foot recording ranges for navigating in shallower waters, plus a 0-1500 foot deep range. The optional IR 201 Remote Digital/Analog Indicator displays depth in feet, meters and fathoms.

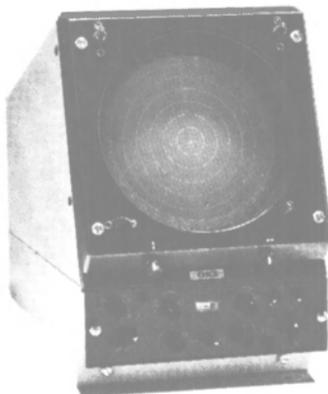


These systems are also designed as replacements for existing older systems. Due to Simrad's special engi-

neering, some vessels can be retrofitted from *inside* the hull without having to dry dock.

## Ship's radar from Simrad.

Ten and twenty KW radar models from Simrad are building a reputation for extra fine resolution that you can count on. It is natural to think about long range use, and they do have six ranges from  $\frac{1}{4}$  n.m. to 48 n.m., with an additional 30 to 78 n.m. setting on the 20 KW model. However, they really out perform competition at extremely close distances. At the  $\frac{1}{4}$  n.m. range, they provide the unusual resolution you need to pick out small boats and channel markers in a dense fog. And that's the most critical test for any radar. Choice of four or six foot antenna. Variable range marker (VRM) with digital readout, and early warning target alarm options are available. For smaller vessels, Simrad's ONX-6



(5KW) with choice of 3 or 4 foot slotted array antenna, and all electronic scope sweep, is recommended.

## Loran C means Simrad.

Throughout the world, skippers have learned to trust Simrad's Loran C reliability and accuracy... and to rely on Simrad's sales, installation and service network in more than 450 ports throughout the world.

Our "New Generation" LC-123 now has many more advanced features, including signal integration that sets a new standard in readout accuracy. With its "touch pad" keyboard, our new LC-112 provides high performance at an economical price. Both models have been designed and manufactured to meet or exceed all Minimum Performance Standards (MPS) of the Radio Technical Commission for Marine Services (RTCM), adopted 12/20/77, including Addendum #1 dated 7/19/79, as endorsed by the U.S. Coast Guard for use aboard vessels over 1600 gross tons when calling at ports in the Continental U.S. This is a legal requirement for ship operation in U.S. waters.

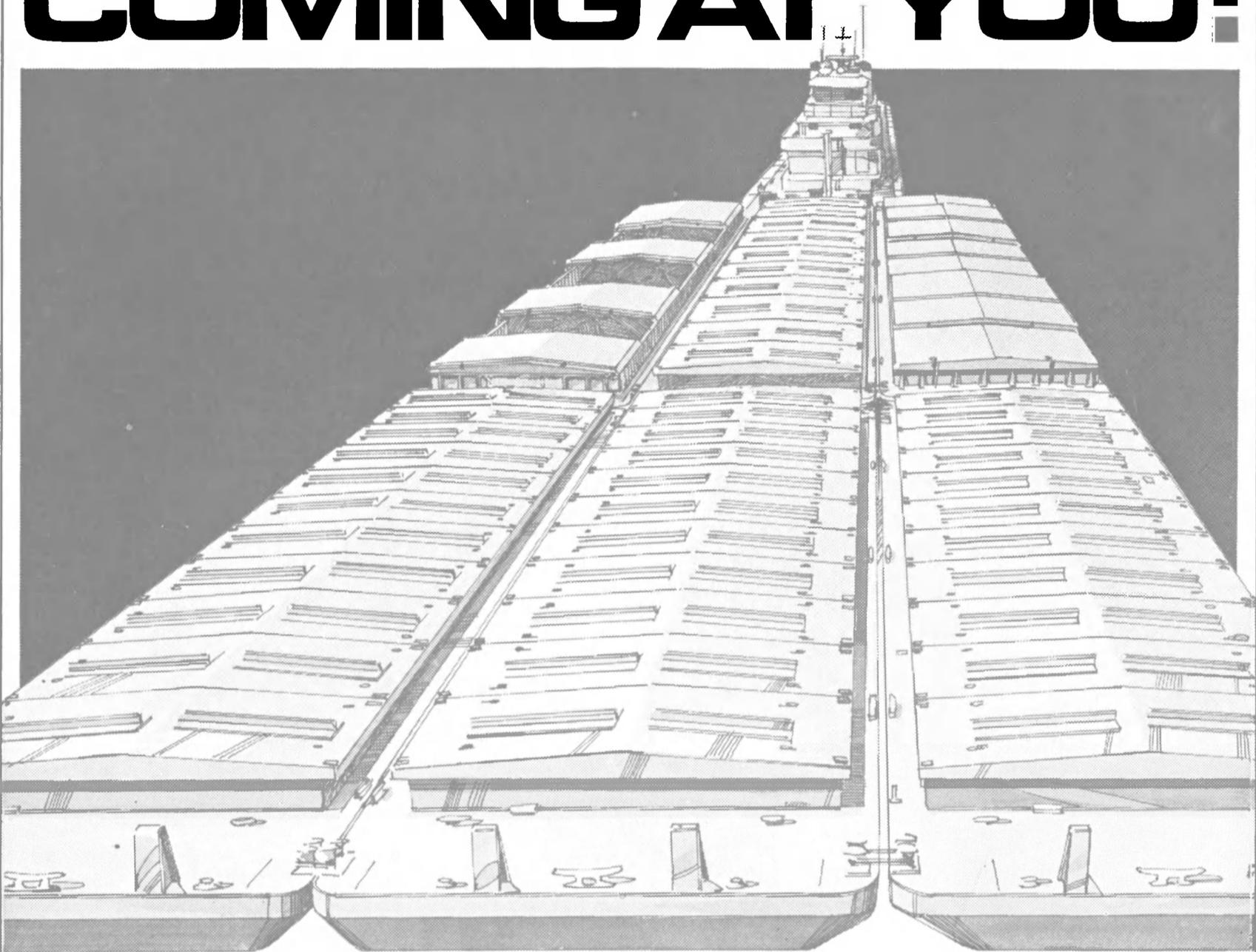


Simrad's Loran was recently tested against eleven other receivers by an independent testing laboratory under contract to the Canadian Department of Fisheries and Oceans. Since the LC-112 had not been introduced yet, it couldn't be included in the test. However, in long range tracking tests, three units were judged superior... Simrad's LC-123, Simrad's older LC-204 and another manufacturer's receiver that costs over \$2,000 more than an LC-123. Several competitors complimented Simrad by copying our LC-123, but evidently they still couldn't match Simrad's performance and reliability. Our ten years of experience in developing Loran C technology is important to you. A cheap loran could be costly.

# SIMRAD

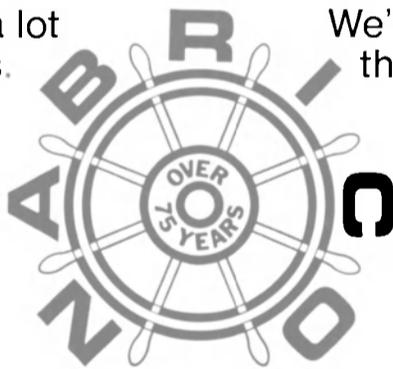
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