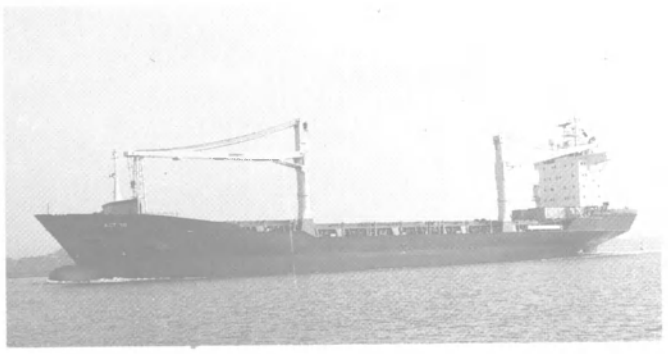
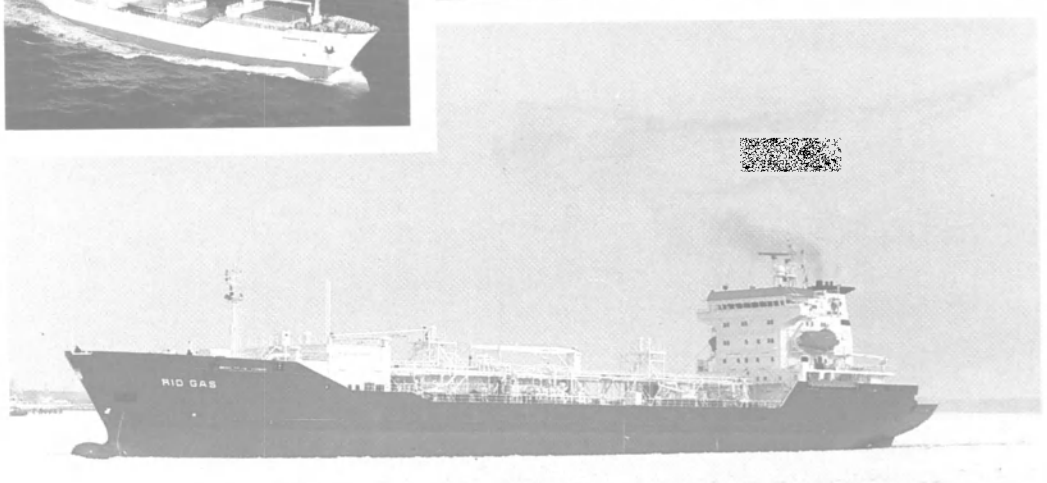
MARITIME REPORTER
AND
ENGINEERING NEWS





NAVAL TECHNOLOGY & SHIPBUILDING

OUTSTANDING OCEANGOING VESSELS

DECEMBER 1986 ISSUE

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Painting courtesy Norman Kjeldsen, Esq.

Unsurpassed Ship Docking and Towing Services Since 1864

In 1895, the Wavertree arrived at New York under sail. This painting by Oswald Brett depicts the historic event. While we cannot say for certain, the Wavertree may have been met by one of the McAllister tugs which have served New York Harbor since 1864. Legends are made of such moments. The Wavertree and her sister ships, in their day, were our responsibility.

We at McAllister take pride in being part of the history and lore of New York Harbor. The Wavertree is now at the South Street Seaport Museum and we support her restoration in order to keep maritime and nautical traditions alive for future generations.

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ON THE COVER

Cover photos: clockwise from logo- Homeric; Stolt Sapphire; Rio Gas; Birka Princess; Henry J Kaiser; Lawrence H. Gianella; (center) Skuptor Tomskij.

$40-Million Containership To Be Built By Samsung

Samsung Shipbuilding & Heavy Industries Co. Ltd. of South Korea has signed a contract with Compagnie Generale Maritime in France for the construction of a 41,000-dwt containership.

The vessel, which will cost around $40 million, will be the first built in Korea in accordance with Bureau Veritas rules and regulations. It will be able to load a total of 2,525 TEU containers (404 TEUs in the hold for insulated containers, and 2,121 TEUs in holds and on deck for others) at 20.5 knots of service speed powered by a Sulzer 7RTA84 type main engine with maximum continuous rating of 31,500 bhp at 90 rpm.

A large refrigerating plant and 60 air ducts are to be arranged for cooling containers in the hold. The refrigerating plant and temperature control/monitoring system, as well as all valve control, can be operated from the computerized remote control center.

The vessel will be approximately 751 feet in overall length, with a breadth of 105½ feet and design draft of 34½ feet. It is scheduled to be delivered in the middle of 1988.

For further information and free literature on Samsung Shipbuilding & Heavy Industries,

Circle 65 on Reader Service Card

Bergen Diesel Inc. Moves U.S. Office

Bergen Diesel Inc. recently announced the relocation of their Louisiana office. Formerly located at Suite 203, 2110 I-10 Service Road, Kenner, La. 70065. Bergen Diesel Inc.'s new address is 2701 Delaware Avenue, Kenner, La. 70062. Their new telephone number is (504) 464-4561, telefax: (504) 464-4565, and telex: 784980.

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

Kuchta Elected VP And General Manager Of Curtis Bay Towing

John P. Kuchta Jr.

John P. Kuchta Jr. was elected vice president and general manager of Curtis Bay Towing Company of Virginia, according to an announcement by company president **Malcolm W. MacLeod.** In this position, Mr. **Kuchta** will assume overall management responsibility for the fleet of Curtis Bay tugs operated from their Norfolk, Va. base.

Mr. **Kuchta** graduated from Louisiana State University in Baton Rouge in 1973 with a B.S. degree in Business Administration and brings to Curtis Bay over 12 years' experience in tug boat sales and operations. He has extensive foreign operating experience having been based in Scotland from 1978 to 1981, first as sales director, Europe, and finally as North Sea division manager for a large marine transportation company. Prior to and after his foreign assignment, he had been employed in management positions operating vessels in the Gulf of Mexico in both towing and anchor handling.

Frederikshavn Werft Offers Color 20-Page RO/RO Ship Brochure

Frederikshavn Werft A/S of Denmark, a leading European shipyard in the field of design and construction of merchant and naval vessels, is offering free, an elaborate 20-page color brochure on their roll-on/roll-off (RO/RO) ships.

The elaborate brochure offered by Frederikshavn Werft, which has more than 10 years' experience in RO/RO ship design, contains a detailed, full-color, four-layer acetate overlay model showing the company's RO/RO multiflex ship under various cargo load conditions. The overlay model reveals the various cargo spaces and holds, as well as fixed and external ramps incorporated into the Frederikshavn Werft-designed RO/RO multiflex ships. The versatile multiflex vessels can carry such cargoes as containers, trailers, cars, low loaders, construction and agriculture machinery, as well as all types of general or semi-bulk cargo, from pallets to project cargo.

A section in the color publication is devoted to each of the four types of RO/RO designs offered by Frederikshavn, as well as blue line drawings for each ship type.

For a free copy of this well-illustrated color brochure from Frederikshavn Werft,

Circle 53 on Reader Service Card

Daniel A. Marangiello Joins ANADAC, Inc.

ANADAC Inc. recently announced the appointment of **Daniel A. Marangiello** as the company's Deputy Director of Submarine Programs. He will be providing top-level program management support to the Strategic Submarine Program Office, Naval Sea Systems Command. Formerly an executive scientist with a Washington, D.C., engineering firm, Mr. **Marangiello** has served as a Senior Executive with the Naval Sea Systems Command in the positions of Deputy Director of the Submarine Directorate and Deputy Submarine Logistics Manager. He is currently the executive director of the Marine Machinery Association, as well as chairman of the ASTM's F-25 (Shipbuilding) Committee.

ANADAC, Inc., is a defense consulting firm headquartered in Crystal City, Virginia. Founded in 1980 by Dr. **John J. Bennett,** a former Assistant Secretary of the Navy (I&L) and Acting Assistant Secretary of Defense (I&L), ANADAC's revenues in 1985 totaled over $6.5 million. In addition to the Naval Sea Systems Command, ANADAC's major clients include the Naval Air Systems Command, the Naval Supply Systems Command, and the Space and Naval Warfare Systems Command.

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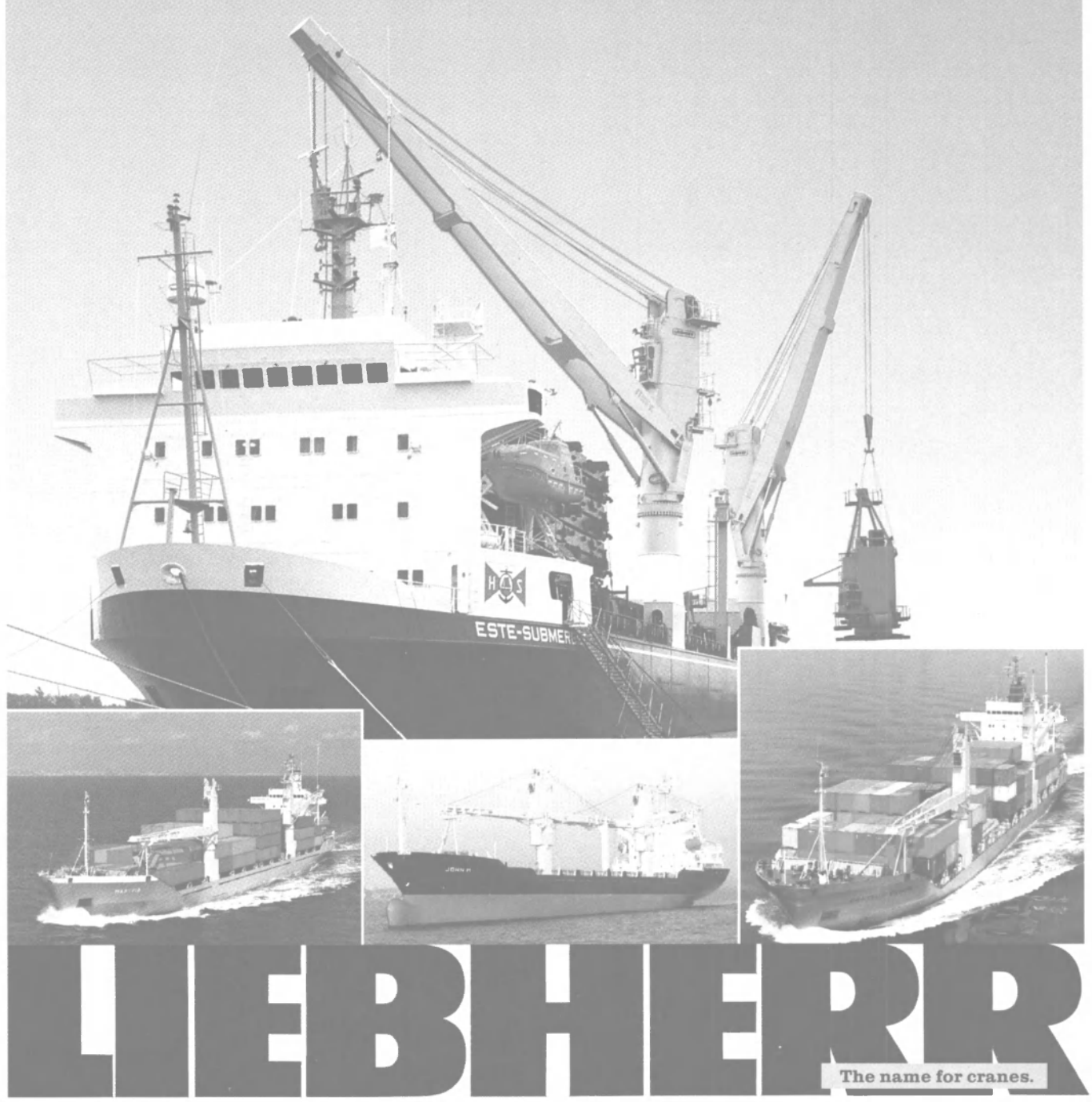

LIEBHERR

The name for cranes.

Circle 125 on Reader Service Card

New Offshore Committee Formed By SNAME— McClure Named Chairman

A new technical committee, the Offshore Committee, has been formed by The Society of Naval Architects and Marine Engineers. Its purpose is to give wider emphasis to the offshore aspects of naval architecture and ocean engineering than heretofore, and permit greater participation by interested members of the Society in its research programs. Chairman of the new committee is **Alan C. McClure,** president of McClure Associates, a Houston design and engineering firm.

Committee members are being assembled from a broad spectrum of offshore applications, including construction, engineering design, offshore mining, and offshore well drilling. Also represented will be people from government, academia, equipment manufacturers, and classification societies.

At its inaugural meeting in September this year, the following areas of interest were identified for panel activity: stability and motion; mooring, station-keeping, and marine terminals; and loads structural design, and riser technology. Also, transportation and installation; mechanical, electrical, and industrial systems; submersibles and diving equipment; and subsea systems and pipelines.

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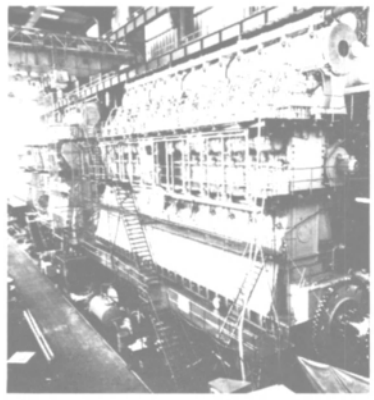
MORE ENGINES SPEND THEIR ENTIRE SERVICE LIFE ON Chockfast® THAN ON ORIGINAL FITTED STEEL CHOCKS



This MAN-B&W diesel is typical of the engines installed on Chockfast.

THE PERMANENT CHOCK

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Steel chocks allow large diesels to pound down on them, causing slack bolts, loose chocks, misalignment — and ultimately — severe damage to costly engines.

Due to the precise fit of poured-in-place CHOCKFAST, critical alignment is permanently maintained. *No engine has ever been damaged as a result of a CHOCKFAST mounting.*

THE ENGINEERED SOLUTION

The concept of poured-in-place resin chocks for marine engines was conceived at Philadelphia Resins Corporation almost 20 years ago. This concept has been proven, unquestionably, through the mounting of 70 million horsepower on CHOCKFAST.

Factors contributing to the remarkable performance of CHOCKFAST include: a precision fit, superior modulus of elasticity, higher coefficient of friction against steel, and the application expertise of factory trained worldwide installation specialists. *The system Philadelphia Resins developed is now protecting more than ten billion dollars worth of valuable diesel engines.*

THE RIGHT DECISION

Contacting the worldwide CHOCKFAST organization for your new construction, engine retrofits and repairs provides owners and operators with proven superior performance and maximum dependability.

We never resort to guesswork in our application engineering; and we never compromise on quality from the finest raw materials to guaranteed product performance.

You can depend on Philadelphia Resins' closely-knit, thoroughly trained CHOCKFAST representatives: skilled specialists who have chocked thousands of marine diesels and provided valuable on-site services in all major ports throughout the world.

TW Philadelphia Resins Corporation

a complete family of formulated products for the marine industry.

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Circle 173 on Reader Service Card

Literature Available On 1987 Edition Of Marine Equipment Catalog

The new 1987 edition of the worldwide Marine Equipment Catalog, to be published in April 1987, is described in a free brochure available from the publishers.

Fully illustrated, marine and naval products and equipment from the world's leading suppliers are displayed in open format to aid buyers in placing direct orders with the manufacturers. The catalog is used as a purchasing guide for vessel owners, shipyard personnel, U.S. Navy procurement officers, consultants and design firms.

Free details are available for companies wishing to display their products in the 1987 edition.

Circle 80 on Reader Service Card

Cost-Saving Numeric Control Service Offered By Maritime Design

Maritime Design, Inc., who offer naval architecture and marine engineering services to the marine industry from their Jacksonville, Fla., facilities, have recently developed a numeric control (NC) parts generation service capability.

According to company president **Jim Konopasek**, the service is cost-effective for single hull production, allowing yards to increase productivity and better utilize their NC equipment. Builders who do not own NC equipment, now have the option of subcontracting burning work with cost savings.

At present, the service comprises computerized hull lines fairing, hull geometry file, parts generation and nesting. Control tapes are produced in either ESSI or EIA format for X-Y axis burning machines. Additionally, existing tapes owned by the yard may be read into the computer and translated for CAD design.

For free literature containing further information on the services offered by Maritime Design,

Circle 62 on Reader Service Card

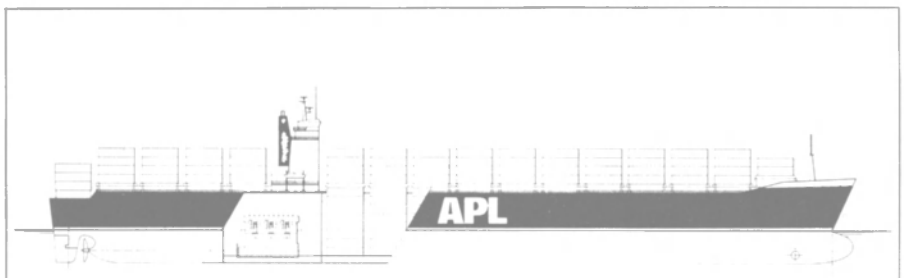
Japan Opens Up For Rauma Winches

Recently, while Deck Machinery Works in Rauma was busy delivering winches to the Korean shipbuilders, they also secured an order for two sets of combined anchor/mooring winches to be installed on tankers being built by Nagaski shipyard of the Mitsubishi Heavy Industries of Japan. In 1984, Rauma delivered electric mooring winches to Nippon Kokan Shipyard.

These winches will be delivered to the U.S.-owned vessels in the summer/autumn of 1987, and each set comprises two combined hydraulic mooring winch/cable lifter units with capacities of 20 tons and diameters of 84 U3 cable, as well as seven hydraulic mooring winches with capacities of 20 tons.

For further information and free literature on Rauma-Repola,

Circle 60 on Reader Service Card



Profile of the 3,800-TEU-capacity ships to be built for American President Lines.

APL To Build Five New Ships

American President Lines has announced plans to build five large new vessels for delivery in mid-1988. The ships are part of a three-year capital program of approximately $500 million to significantly improve efficiency and expand the company's intermodal transportation system in the steadily growing Asia and North America markets. The new ships will replace significantly smaller vessels and will run at a substantially lower operating cost per container move than the older ships.

To expedite the delivery schedule, the shipbuilding order will be divided between two shipyards. Three of the ships will be built by Howaldtswerke-Deutsche Werft (HDW) of Kiel, West Germany. The other two ships will be built at Bremen Vulcan's shipyards in Bremen, West Germany.

The fast, highly fuel-efficient vessels will each be capable of carrying a minimum of 3,800 twenty-foot container equivalents of cargo, including 20-, 40-, 45-, and 48-foot containers. Featuring the latest in propulsion systems and navigational technology, the ships will cross the Pacific at a fast 24 knots. This will enable the company to continue offering highly competitive transit times for time-sensitive shipments, said **Bruce Seaton,** president of APL and its Oakland-based parent organization, American President Companies.

To maximize economies of scale and efficiency of operations, these will be the first cellular vessels not constrained in their design by the dimensions of the Panama Canal. The C10-class ships will have a length of 896 feet and a beam (width) of 129 feet (the maximum for canal transit is 106 feet). The additional width will provide improved stability and performance at sea, facilitate faster loading and unloading of containers in port, and yield additional fuel economies.

The company has developed an intermodal system comprised of fast ships, double-stacked container trains (APL Linertrains) traversing North America, and sophisticated cargo-tracking and information systems. Its 18 containerships have not used the Panama Canal since the mid-1970s, and are deployed exclusively in the Pacific and Indian Oceans.

Mr. **Seaton** said the company has exceeded the average capacity utilization of the industry for some time. "We are running full in the import [eastbound] trade, and near-full in the export trade," he said. "By replacing less competitive tonnage with larger, more efficient ships, we expect to be able to meet customer demand and continue to participate in increasing trade volumes in the Pacific Rim." He noted that the ships have been designed to accommodate elongation at a later date.

With the new ships, APL plans to increase sailing frequency and reduce transit times on key routes, and increase the number of Asian ports served. In conjunction with greater trans-Pacific cargo volumes, the company also plans to expand the routes and service frequencies on its North America stack-train system.

The C10s will be capable of carrying bulk cargoes in addition to their large capacity for dry and refrigerated containers.

The ships will operate under the U.S. flag and with U.S. manning. **Richard L. Tavrow,** APL senior vice president and general counsel, said the Maritime Administration has approved operation of the new ships as replacement vessels under the operating differential subsidy (ODS) program, which compensates the company for the relatively higher wage costs it incurs for the use of U.S. crews. Under MarAd requirements, the ships will have national defense features and will be enrolled in the emergency preparedness program.

Ocean Fleets, Ltd. of Liverpool is serving as design and construction consultant to APL on the shipbuilding project.

In addition to expansion of the ship fleet, APL's capital expansion program includes acquisition of additional rail cars, containers and chassis; modification and expansion of ocean and inland container terminals and cranes; and expansion of the company's information systems and telecommunications.

Beyond these enhancements to APL's international transportation infrastructure, Mr. **Seaton** said APC will separately invest significantly over the next few years in additional equipment for its domestic transportation operations in North America.

For free literature on the facilities and capabilities of HDW shipyard,

Circle 50 on Reader Service Card

Todd Signs Agreement With Australian Shipbuilder For Technology Transfer

Hans K. Schaefer, chairman of the board, has announced that Todd Shipyards Corporation has signed a memorandum of understanding with Australian Shipbuilding Industry Pty., Ltd. of Coogee, Western Australia, for a technology transfer in connection with the repair and overhaul of Australian Navy combatants and auxiliaries. The companies will also work together to acquire repair and overhaul work of U.S. Navy ships that operate in the Far Pacific.

Initially, Todd will provide management and technical personnel to guide the coordination, planning, material procurement, quality assurance, and testing activities for the naval work. "Successful implementation of this program is expected to lead to major overhaul contracts for the Royal Australian Navy that will begin as early as March of 1987," Mr. **Schaefer** said.

This announcement is particularly important in light of the Australian Ministry of Defense announcement concerning the homeporting of destroyer escorts, frigates, and submarines in Western Australia.

Todd Pacific delivered the last of four guided-missile frigates to the Royal Australian Navy in 1983, and has contracted to assist the Australian Government in building two more of these FFGs in Melbourne.

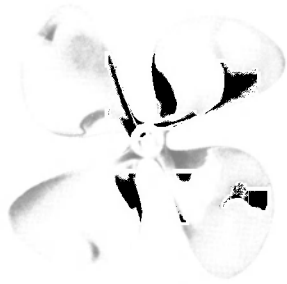
Masson Named Manager, Marine Lubricant Sales At Tramp Oil & Marine

Worldwide bunker supplier Tramp Oil & Marine Limited, London, recently announced the appointment of **Ray Masson** as the company's first manager responsible for the international sale of marine lubricants.

Mr. **Masson** comes to Tramp Oil after 15 years at Esso Petroleum Company Ltd. where he was area manager for International Marine Sales.

columbian

CF-3 STAINLESS PROPELLERS



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Stronger than bronze. More forgiving than Nibral:
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Tremendously resistant to tip wear, edge damage, surface erosion.

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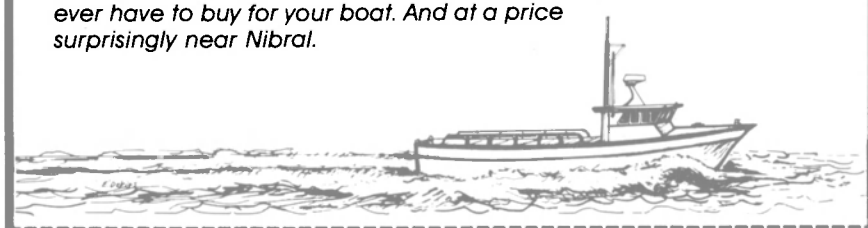
These stainless Columbians could be the last props you ever have to buy for your boat. And at a price surprisingly near Nibral.



For all the facts contact Columbian Bronze Corporation, Dept. M-2

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Circle 135 on Reader Service Card

Volvo Penta Constructing New Production Facility —Literature Offered

Volvo Penta of America, the marine division of Volvo North America Corporation, is constructing new facilities in Chesapeake, Va., which will greatly expand production capabilities for the company's I/O (Inboard/Outboard) and inboard gasoline power plants, including the new, higher performance AQ271 and AQ311 models.

The increase in production space over the existing facility will mean larger component storage, assembly, painting, testing, packing, warehousing and shipping facilities. Additionally, there will be increased space available for industrial and marine diesel engine upfit and modifications requested by OEM customers.

Separate testing facilities and dynamometers are planned for diesel and gasoline engines at the new site, allowing engines to be randomly selected and run in at significant performance levels to check output.

Volvo Penta's superior gasoline engine lineup is constantly being expanded to meet the demands of power boat manufacturers. The company has recently introduced the Low Friction 4-cylinder engine series, and also offers the 16-valve twin overhead cam AQ171, V-8 I/O and inboard propulsion systems.

For a free copy of "The Volvo Penta Pocket Guide to Engines," which provides complete information on the full line of Volvo Penta engines,

Circle 237 on Reader Service Card

Isle Of Man Ship Registry Growing

Spurred by tax incentives and new government laws designed to promote its maritime industry, the shipping registry of the Isle of Man is growing. According to Capt. **Geoffrey Davis,** chief marine surveyor for the 1,000-year-old independent nation, much of the future growth is likely to come from U.S. shipping companies, who are sizing up the nation's unique advantages.

As of late September, there were 53 ships registered to the Isle of Man, with a deadweight tonnage of 603,000. Conversely, in 1980, the only ships on the Isle of Man registry were ferries and local cargo ships, with no oceangoing trade vessels. By the end of this year, the Isle of Man officials estimate that more than 700,000 dwt. will be on their register, and 1987 estimates show an increase to about 4,000,000 dwt. as planned registerations, with Shell U.K. (3,000,000 dwt.), are completed.

The Isle of Man offers complete shipping support which includes ship management, administration, dependable work force, and an active offshore banking center geared for the maritime trade.

Other factors affecting the sharp increase in the ship registry rise include the country's "freeport" or free trade zone, built around the shipping industry; a personal income tax of 20 percent, with no corporation, wealth, or capital gains taxes; low labor and operating costs; and excellent location in the Irish Sea.

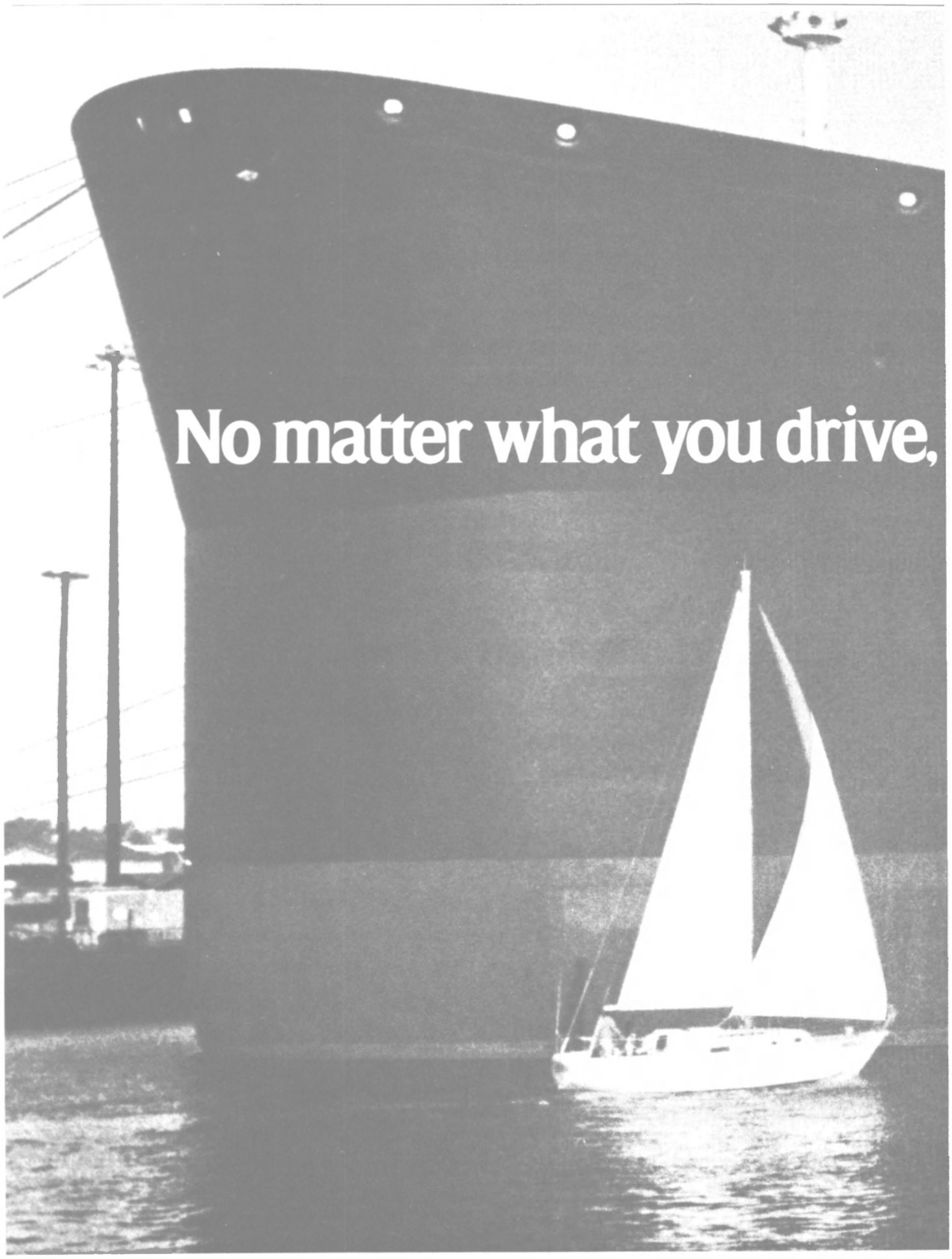
For further information and free literature on the facilities and services offered by the Isle of Man,

Circle 52 on Reader Service Card

James J. Henry

James J. Henry, a leading naval architect and the founder and president of the naval architectural and marine engineering firm bearing his name, died at the age of 73 on November 2, 1986 following a heart attack.

Born at Ancon, Canal Zone, on 22 June 1913, Mr. **Henry** was graduated from the Webb Institute of Naval Architecture in 1935. Following his graduation, he served in the Technical Division of the Bureau of Marine Inspection and Navigation, whose function is now performed by the United States Coast Guard. In 1938, he joined the technical staff of the United States Maritime Commission, working under the supervision of **James L. Bates**, Director of the Technical Division. From 1941 to 1945 he was employed by the Consolidated Steel Corporation at Wilmington, Calif., where he supervised the construc-



tion of the attack transports Doyen and Feland, the first vessels of their type. He later became assistant to the production manager, and was involved in the construction of C1-B cargo ships, BD-1 troop transports and other vessels.

In 1946 he launched his own consulting naval architectural business, incorporating the firm as J. J. Henry Co., Inc. in 1951. Throughout the following 40 years Mr. **Henry** was recognized as a leading innovator in the design, conversion and modernization of specialized cargo vessels. He was a pioneer in the development of vessels for the carriage of liquefied natural gas at cryogenic temperatures and near atmospheric pressure; his design in the early 1960s for Bridgestone Maru, the first large fully refrigerated LPG carrier, led to the construction by others of a worldwide fleet of over a hundred of such ships; he was in the vanguard of those whose promoted the container ship; the range of his designs for the jumboization and conversion of war-built ships (notably the T2 tanker and the C4 transport) to other uses included ore carriers, container ships and chemical carriers in addition to conventional petroleum tankers.

Among Mr. **Henry's** outstanding designs for new vessels were the Seabee barge carriers for Lykes Bros. Steamship Company, the C4-S-1s and C5-S-75a cargo ships for American Mail Line, Ltd., and the revolutionary 33-knot SL-7 container ships for Sea-Land Service, Inc. But his talents were not exclusively devoted to seagoing vessels: he prepared the design of the floating mammal pavilion for the New England Aquarium at Boston, and of barges and other less glamorous ship types.

James J. Henry

Mr. **Henry** joined The Society of Naval Architects and Marine Engineers in 1937 and was elected an Honorary Member in 1970 and a Fellow in 1974. He served as the Society's president in 1969 and 1970. At its annual meeting in 1967, the Society awarded Mr. **Henry** the prestigious Vice Admiral "Jerry" Land Medal for outstanding accomplishments in the marine field. In 1977 he received the Society's David W. Taylor Medal for notable achievement in naval architecture and marine engineering. He was also the recipient of the "Elmer A. Sperry Award" for advancing the art of transportation through the development of barge-carrying ships, and was the author of two major papers before the Society: "Modern Ore Carriers" in 1955, and "Container Ships" (co-authored with **Henry J. Karsch**) in 1966. For the latter, he and Mr. **Karsch** were awarded the Captain Joseph H. Linnard Prize for the best paper contributed to the Society during that year.

He served as chairman of the board of trustees of the Webb Institute of Naval Architecture and was a past president of the Webb Alumni Association and of the Whitehall Club in New York. He was a member of the board of managers of the American Bureau of Shipping, of the American Society of Naval Engineers, as well as many other maritime associations. He was also a member of the academic advisory board of the United States, Coast Guard Academy, and of the board of trustees of the United States Naval Academy Foundation, Inc.

Under the direction of Mr. **Henry**, J. J. Henry Co. became one of the world's largest and most highly respected naval architectural firms. Ships bearing the hallmark of a Henry design were built or converted at shipyards in the United States and throughout the world. A friendly, congenial man whose enthusiastic support of the American marine industry and of Webb Institute was quickly perceived by those fortunate enough to cross his path, either in business or socially, Mr. **Henry** devoted his career to his profession in a way that few persons will ever achieve. The maritime world will miss him and the insightful perspectives of naval architecture and marine engineering that were so much a part of his life.

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OUTSTANDING OCEANGOING SHIPS OF 1986

A roundup of some of the most notable vessels delivered by shipyards during 1986—selected for their outstanding design features, fuel efficiency, performance, and service characteristics.

ACT 10
Jansen Werft

Jansen Werft GmbH of Leer, West Germany, recently delivered the compact containership Act 10 to Sibum GmbH of Haren/Ems. The vessel is a new design developed in close cooperation with the owner and Buss of Leer. She is said to be the most efficient containership of her compact size, and at the same time the biggest full container carrier that Jansen has ever built.

With a grt of less than 4,000, the Act 10 has a capacity of 885 TEUs, with connections for 80 refrigerated boxes. The vessel is fitted with a cellular container guide system in the holds, folding type hatch covers, and two Liebherr cranes with an especially low center of gravity and lifting capacity of 40 tons each.

The ship has an overall length of about 436 feet, beam of 74.5 feet, depth of 35.4 feet, and design draft of 24.6 feet. Propulsion is by a single MAN B&W 7L52/55B diesel engine with a maximum output of about 8,045 bhp. At the service speed of 17 knots fuel consumption will be 20 tons per day; at 15 knots it will be 12 tons per day.

The Act 10 is designed according to the latest IMO rules for the transportation of dangerous cargoes. Also considered was the "Ship of the Future" design in regard to wheelhouse arrangement, life-saving appliances, and arrangements of the accommodations. She is equipped with the latest technology in communications and navigation gear, including satellite communications.

With the cooperation of Fastbox Befrachtungsges of Hamburg, Sibum has arranged a charter for the Act 10 with ACT of the U.K., a consortium of Blue Star Line, Cunard, and Ellerman. She will operate in liner service between the U.S. West Coast and Australia.

Main engine	MAN B&W
Emergency generator & electric generators	Piller/KHD
Reduction gear	Rhenania
V.P. propeller	J.W. Berg
Supply crane	Hatlapa
Cargo cranes	Liebherr

ALPS MARU
Hitachi

The Maizuru Works of Hitachi Zosen in Japan this year delivered the 21,183-dwt heavy-lift cargo carrier Alps Maru to co-owners Baba-Daiko Steamship Company and Mitsui O.S.K. Lines.

The specialist vessel has an overall length of 475.7 feet, beam of 87.9 feet, depth of 45.3 feet, and full-load draft of 31.2 feet. Propulsion is provided by a low-speed Hitachi/B&W diesel engine with a maximum continuous rating of 8,750 bhp at 133 rpm. Trial speed was 16.5 knots.

The cargo area is divided into two long holds for the transportation of long plant equipment and rolling stock. There are one 400-ton and two 30-ton cranes at midship, and 50-ton crane forward and aft of the cargo holds.

The deckhouse aft is eight levels high to provide good forward visibility, and is asymmetric to provide a storage area for the aft crane.

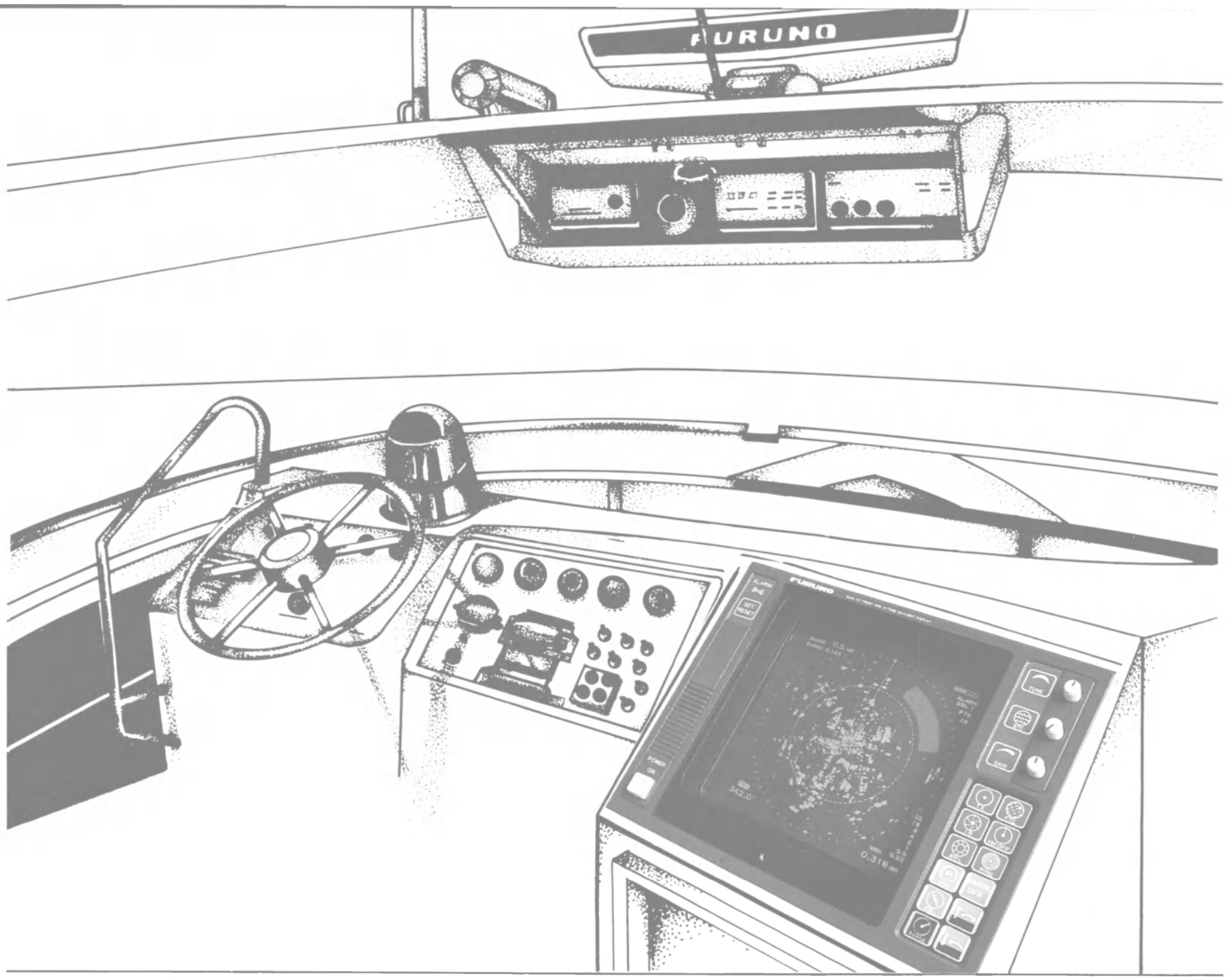
ATLANTIC PRINCE
Halter Marine

Halter Marine, Inc., a Trinity Industries company headquartered in New Orleans, this year delivered the catcher/processor fishing vessel Atlantic Prince. Built at Halter's Moss Point, Miss., shipyard for Lund Fisheries, the vessel was designed by naval architect **Richard Taubler** of Dover, Del. Detail working drawings were produced by Halter.

The Atlantic Prince is fully outfitted with state-of-the-art fish-processing equipment. She is capable of processing and freezing 275 metric tons of boxed fish, and can stay at sea for 21 days. She has an operating

(continued)

Photos: clockwise from top left: Alps Maru, Birka Princess, Mineral Nippon, Nord Baltic, Atlantic Prince, Jubilee, Olympia, Exxon Valdez, (center) Rio Gas.



Furuno. The First Name In Digitized Radars.

Furuno now has a digitized radar perfect for just about any vessel: recreational or commercial, large, small, or in between. Eight different models are available with bright green monochrome CRT's from 9 to 12 inches, radome or open antenna units, output powers from 3 to 10 kW. ranges from 24 to 72 n.mi.

Every model in the line features Furuno's multilevel quantization technique that produces the most detailed high resolution picture available today, built-in VRM and EBL, low noise MIC front end for exceptional sensitivity, on-screen readout of system settings, and a host of standard features that make these radars the best value on the market anywhere.

It's just not possible to describe all the advantages, benefits, or "bells and whistles" in the space available here. See any of these superb radars personally at your nearest authorized Furuno dealer outlet: the Models 1800 and 1900 super-compact radars; the FR-600D Series mid-range units (shown here); the FR-800D top-of-the-line Series.

Visit your dealer today, or send for complete product data.

FURUNO U.S.A., INC.

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crew of four and as many as 22 packers, depending on the particular catch that is being processed.

Main propulsion is provided by twin Caterpillar 3512 diesel engines with a total output of 1,800 bhp. Two Caterpillar 3412 diesel generator sets are each rated 460 kw. The vessel is fitted with a Marco bow thruster. Marco also supplied the anchor windlass, trawl winch, and net reel.

Navigation and communications equipment includes two Furuno radars, Northstar Loran C, Robertson automatic pilot, Datamarine and Skipper depth sounders, Furuno weather facsimile, and Cybernet, Motorola, and Sailor radiotelephones.

Main engines (2)	Caterpillar
Engine controls	WABCO
Bow thruster	MARCO
Clutches	Caterpillar
Gensets (2)	Caterpillar
Steering system	Wagner
Stuffing boxes	Johnson
Generator control panels	Continental
Shaft and stern bearings	BFGoodrich
Propellers	Coolidge
FW pressure and sanitary systems	Myers
Pumps	Marlow & Roper
Trawl winch, net reel, anchor windlass	MARCO
Radars (2)	Furuno
Radiotelephones	Cybernet, Motorola & Sailor
Automatic pilot	Robertson
Weather facsimile	Furuno
Loran	Northstar
Depth sounders	Datamarine & Skipper
Freezer system	Sabroe
Running & navigation lights	Aqua Signal
Searchlight	Perko
Lifesaving gear	RFD-Elliot
Air horn	Kahlenberg
EPIRBS	ARC Electronica

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BERGE STAHL
Hyundai

The gigantic, 365,000-dwt ore carrier Berge Stahl was delivered recently by Hyundai Heavy Industries of Ulsan, Korea, to Bergesen d.y. A/S of Oslo, one of Norway's leading shipowners and operators.

The vessel has an overall length of 1,125.3 feet, beam of 208.3 feet, depth of 99 feet, and design/scantling draft of 75.5 feet. Her volumetric capacity (grain) is 200,000 cubic meters. Propulsion is by a two-stroke, low-speed Hyundai/B&W 7L90MCE diesel engine with a continuous service output of 24,850 bhp at 70.9 rpm, giving a service speed of 13.5 knots under normal sea conditions. Fuel consumption will not exceed 71.2 tons per day. Electric power is supplied by two Wartsila 800-kw diesel generators and one Sinko 800-kw direct-coupled turbogenerator, plus one 200-kw emergency generator.

The machinery space is arranged

Main engine	Hyundai/B&W
Propeller	Kobe Steel
Steering gear	Porsgrunn
Stern tube bearing & seal	HDW
Shafting	Hyundai
Shaft bearings	Dover Japan
Auxiliary boiler	Aalborg
Exhaust gas economizer	Hyundai/Green
Diesel generator engines	Ssang Yong/Daihatsu
Turbogenerators & alternators	Nishishiba
Emergency genset	Man-Demp
Main switchboard	Terasaki
Electric motors	Nishishiba
Air conditioning	Flakt
Cargo/ballast monitoring system	Valmet
FW generators & distilling plant	Nagase-Nirex
Incinerator	Golar
CO_2 system	Heien Larsen
Refrigeration plant	Sabroe
Oil purifiers	Nagase-Alfa Laval
Anchors	Hyundai
Anchor chain	Hamanaka
Hatch covers	Hyundai/Kvaerner
Windlasses & winches	Hyundai/Pusnes
Lifeboats	Harding
Life rafts	Viking
Sewage treatment plant	Taiko
Tank level gauging	Autronica
Hull protection unit	Engelhard
Loading computer	Valmet
Pressure/temperature sensors	Autronica
Level switches	Mobrey
Pressure switches	Danfoss
Flowmeter	ITT
Radar	Krupp-Atlas
Satnav	Magnavox
Bridge maneuvering system	Norcontrol
Gyrocompass, autopilot & magnetic compass	Radio Holland (Anschutz)
Satcom, radio & facsimile	E.B.
Echo sounder & doppler speed log	Krupp-Atlas

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For optimal relation between ship engine and propeller: integrated electronic controls.

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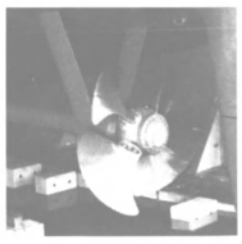

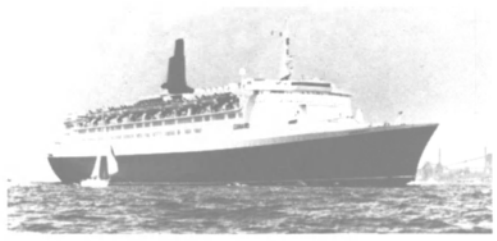

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to include a dual-pressure type exhaust gas economizer for the turbogenerator and general service. A waste heat recovery system utilizes energy from the scavenging air coolers and the cylinder cooling water. The turbo compound system, comprising BBC gas turbine, Renk reduction gear and automatic clutch, contributes to reduction of fuel oil consumption. The freshwater cooling is based on a HDW scoop and central cooler.

Highly advanced automation systems are installed in the vessel. The Damatic control system supplied by Valmet, consisting of double CPUs and CPRs and a multi-function keyboard in the engine control room console, monitors and controls all essential functions with regard to the ship's operations, starters, generator power management system; controllers for pressure, temperature and level; ballast, bilge, and fuel piping systems control. An engine control system supplied Soren T. Lingso allows maneuvering from bridge wing consoles. External remote monitoring CRTs and keyboards are arranged in the wheelhouse, ship's control center, and engineers' cabins.

In order to obtain optimum hull form and a suitable type of propeller, various model tests were carried out at the Norwegian Marintek laboratory. As a result, a barge hull form with ellipsoidal bow was adopted to minimize resistance. For increased propulsion efficiency, a skewed propeller and spoilers of Harmstorf design (hydrodynamic fins) were fitted to the vessel.

BIRKA PRINCESS
Valmet

Valmet Corporation's Helsinki Shipyard in Finland this year delivered its first passenger ship, the Birka Princess, built for Birka Line Ab of Mariehamn, Finland.

Unlike the numerous passenger/car ferries operating in the Baltic area, the Princess is a true cruise liner. She has only a small car deck at the stern that accommodates 50 private cars and six motor coaches, or 75 cars, with access via a side ramp.

The new liner has an overall length of 469 feet, beam of 81 feet, depth to Deck 11 of 100 feet, and draft of 18.4 feet. Main propulsion is provided by four Wartsila-Vasa diesel engines with a total output of 23,600 bhp at 750 rpm, driving two KaMeWa controllable-pitch, highly skewed propellers via Valmet/Renk reduction gears. Cruising speed is 18 knots.

The accommodations, which provide for 1,500 passengers in 500 cabins, are of unusually high quality. This was achieved by detail work, careful selection of materials, unique lighting systems, and other refinements. Passengers can view the impressive Stockholm archipelago and the Aland Sea through special panorama windows in the a-la-carte restaurant and dancing restaurant aft, as well as in the cocktail lounge and one of the large conference rooms forward.

The principal design considerations for the Birka Princess were economical operation, safety, easy maintenance, and a high level of automation. Machinery is controlled by Valmet's Damatic ship automation system. The company's other units are also well represented among the suppliers; the Tampere Works provided the six passenger and service elevators, and the reduction gears were supplied by the Rautpohja Works.

In cooperation with the Finnish company Rakennusvalmiste Oy, Valmet developed a totally new cab-

(continued)

Main engines (4)	Wartsila-Vasa
Reduction gears (2)	Valmet
Propellers (2)	KaMeWa
Machinery control system	Valmet
Steering gear	Tenfjord
Bow thruster	KaMeWa
Stern tubes	Centromor
Auxiliary diesels	Wartsila-Vasa
Generators	Kymi-Stromberg
Anchors	Hollandse Constructie
Chains	Ljusne Katting
Shaft seals	HDW
Sewage disposal plant	Deerberg
Vacuum toilets	Evac-Wartsila
Boilers, mooring winches	Rauma-Repola
Air conditioning system	Nordish Ventilator
Reefer plant for AC system	Stal Refrigeration
Air compressors	Hamworthy
Separators, heat exchangers	Alfa-Laval
Valves	Wouter Witzel
Centrifugal pumps	Maskinfabriken Iron
Oil pumps	IMO
Lube oil filters	Boll & Kirch
Couplings	Vulkan
Elevators	Valmet

CITYVARVET HAS THE CHRISTMAS SPIRIT

For a bulk and timber carrier dock time can be costly in more ways than one.

So when the PASILA tied up at Cityvarvet last December 23rd we knew that, Christmas or not, we had to get her back in the running fast.

The ship had suffered bottom damage and the owners asked Cityvarvet to be prepared to replace a lot of steel during the Christmas holidays. When we got her into the dry dock, however, we found out that the bottom plating was not the only problem. The skegg was damaged too and the rudder post was bent. Putting the PASILA back in commission turned out to be a bigger job than anyone had expected.

If anything though, Cityvarvet people are a loyal breed. Everyone rolled up their sleeves and got to work. "Redilivery was for January 10th", says Superintendent Roger Hellsten, "so the yard had to work 24 hours a day straight through the holidays in order to complete the job on time." Over 50 tons of bottom plating and internals was replaced. The rudder and the rudder post had to be dismantled, a new flange was manufactured and fitted to the rudder post and finally the skegg was straightened and lined up again.

The result was that on January 10th as promised the PASILA was able to leave the yard and resume operations. The entire job including the unexpected rudder repair had taken Cityvarvet only 18 days! Christmas 1985 proved to be a holiday that Etela-Soumen Laiva Oy, the owners, will long remember.

At Cityvarvet we like to think that we have got a kind of Christmas spirit that lasts all year long. Call it Formula 1 Ship Repairs if you want.

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Formula 1 Ship Service

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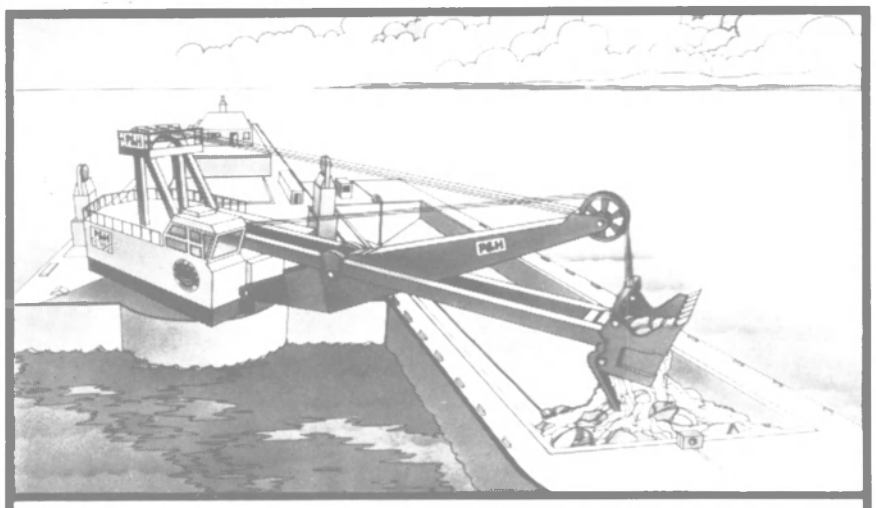
in construction method, with cabin wall elements completely fabricated at the factory. The units were fitted with all needed details, including furniture fastenings, plumbing, and electrical wiring. The partition wall between cabins is comprised of two PVC-coated steel sheets backed by a 15-mm layer of mineral wool, with a 40-mm air gap between. This insures the best possible sound insulation between cabins.

The main navigation equipment in the spacious wheelhouse is concentrated in a cockpit type desk, making it possible for one man to control the navigation of the ship in a sitting position. The radar system is from Racal-Decca; it comprises one 10-cm ARPA radar that is interswitched with a 3-cm true motion unit.

The ARPA radar antenna is installed on the mast atop the wheelhouse, with the 3-cm antenna on the radar mast on the forecastle deck. In addition, there is a third independent 10-cm radar with a true motion display and an antenna atop the wheelhouse. Other navigation equipment includes a Raytheon DSN-450 dual-axis doppler speed log, a Simrad ED 61 echo sounder with a digital repeater, and an Anschutz Standard 4 gyrocompass.

The partially enclosed lifeboats supplied by Fiskars have a total capacity of 536 persons. The 62 davit-launchable life rafts supplied by Viking each have a capacity of 25 persons. All lifeboat and life raft davits are equipped with a remote control for the brake.



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The digging power of P&H electric excavators is now available for channel and harbor excavation.

The P&H model 5700 dipper dredge has a 92-ft. boom and 92-ft. handle with 27-yd. dipper, providing 70-ft. digging depth. Also available with 50-yd. clamshell that digs to 150-ft. depth.

P&H electrics are the world's most reliable excavators and match requirements of large-scale deep water projects.

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CHICAGO
Southern Shipbuilding

The dredge Chicago, said to be the world's largest and most powerful combination clamshell/dipper dredge, was completed recently for Great Lakes International, Inc. (GLI). According to the owner, the new vessel will provide unequaled capability and versatility for the dredging industry in both the clamshell and dipper modes.

The Chicago's hull, built by Southern Shipbuilding Corporation in Slidell, La., is more than twice the size, by volume, of other clamshell and dipper dredges. In order to effectively utilize the great production capacity of the new dredge, two split-hull, hopper dump barges were designed and have been built by Bay Shipbuilding Corporation in Sturgeon Bay, Wisc. With a 6,000 cubic yard capacity each, these vessels, called Hydro-Dump barges, are 1½ times the size of the next largest barge of this type in use. They have an overall length of 277 feet and beam of 63.5 feet, and will be towed by 5,600-bhp tugs with twin screws and Kort nozzles. Additionally, these barges can be operated remotely by a radio transmitter located on the towing tugs which allows the barges to be operated unmanned.

The main power source on the Chicago is two generators driven by two GM Electro-Motive Division 20-710G diesel engines with a total output of 8,800 bhp at 900 rpm. This horsepower is almost four times greater than any previous dipper dredge, and seven times more than any other clamshell.

The Chicago develops a dipper hoist pull of 480,000 pounds at a line speed of 240 feet per minute, about twice that of the next largest dipper currently in operation anywhere in the world. In addition, the new dredge has been designed to operate with a 27-cubic-yard dipper bucket, compared with the 14-cubic-yard bucket that was the biggest previously in use.

The first design criterion for the Chicago was to double the capability of any clamshell or dipper dredge in existence. Constructed by the Harnischfeger Corporation of Milwaukee, Wisc., the dredge will consist of a P&H model 5700 electric excavator mounted on a self-propelled 75-by 220-foot hull. It will operate with either the 27-cubic-yard dipper or a 50-cubic-yard clamshell bucket for excavation of harbors and river channels. The excavator will be readily convertible from shovel configuration to clamshell boom operation to maximize its versatility.

Operating weight of the 5700 excavator, excluding the hull, is about two-million pounds. The 5700's slewing rim (or turntable) will be attached to the hull on a large adapter mounting designed by Harnischfeger for the project using CADAM-NASTRAN computer engineering technology. This design capability not only optimized the configuration and costs of the hull adapter, but also reduced manhours significantly to speed the design process.

As a dipper dredge, the 5700 has a 92-foot shovel boom and 92-foot handle equipped with 27-yard dip-

Main generator engines	EMD
Auxiliary generators	Caterpillar
Hydraulics	Heath Engineering
Electrical instrumentation	GE
Dredge computer	Dredge Technology
Spud winches	Falk
Deck winches	Mobile Pulley
Deck crane	Mariner
Main crane	Harnischfeger
Hydraulic power unit	Sheffer
Cooling water, bilge, ballast, fire & general service pumps	Goulds
F/O transfer pumps	Viking
L/O & dirty oil pumps	Roper
Fuel separator	Alfa Laval
O/W separator	Hyde
Moisture separators	Quincy
Air compressors	Quincy
A/C cooling water pumps	Goulds
Watermaker	Nirex
A/C & heating	Thermacon
Firefighting system	Kidde
Gyrocompass	Sperry
P/A system	Atkinson
Sewage treatment system	Microphor
Quarters	International Building Systems
Coatings	International Paint
Clock	Chelsea

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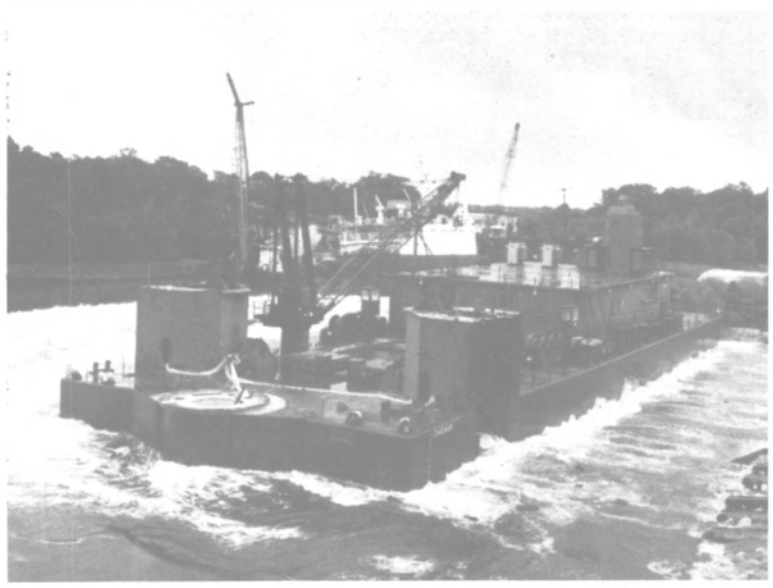

Dredge "Chicago" — World's Largest Combination Dipper/Clamshell Dredge (27 Cu. Yd. Dipper, 50 Cu. Yd. Clamshell)

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per. The boom is set at a 25-degree angle to accommodate an underwater digging depth of more than 70 feet and a maximum dumping radius of 113 feet.

The clamshell has an even more impressive working range. The 155-foot-long lattice-type boom is equipped with 50-yard bucket that has a maximum digging depth of 150 feet below surface. Maximum dumping radius is 120 feet.

The dredge will be controlled by a P&H Electrotorque® solid-state DC system. Total connected DC-rated power of electric motors aboard the 5700 is 5,625 hp.

Working in either the clamshell or dipper mode, the Chicago will provide a continuous operation, dredging material and disposing of it without interruption, even if the disposal area is far from the dredging site. The exceptional dipper power also enables the dredge to excavate extremely difficult material that might otherwise have required blasting.

The Chicago was designed for work in U.S. ports including deepening of harbors, as well as for operation in other ports throughout the world. The $30-million investment in the new dredge and the two Hydro-Dump barges is the largest single appropriation in GLI's 100-year history.

In addition to the main engine/generator plant, there is one 450-kw Caterpillar auxiliary generator and an emergency generator of 150 kw, also supplied by Caterpillar.

EXXON VALDEZ
National Steel

The 211,469-dwt VLCC (very large crude carrier) Exxon Valdez, built at the San Diego yard of National Steel and Shipbuilding Company (NASSCO), was recently delivered to her owner Exxon Shipping Company. The first of two Alaska Class tankers to be built by NASSCO for Exxon, she has an overall length of 987 feet, beam of 166 feet and maximum draft of 64 feet 6 inches. She is powered by a low-speed IHI-Sulzer 8RTA84 engine with a maximum continuous rating of 31,650 bhp at 78.9 rpm. A new design of BBC Brown Boveri NTC254 power turbine is fitted to the engine, which the company claims could provide a fuel savings of up to four percent. The tanker is capable of maintaining an average speed of 16.5 knots.

Said to be the largest ship ever built on the West Coast, the Exxon Valdez will transport 1.5-million barrels of crude per voyage from Valdez, Alaska, to Panama, where the oil can be delivered to U.S. markets on the Gulf and East Coasts. Due to her large size, very efficient low-speed diesel engine and high degree of automation, the Exxon Valdez will enable the Exxon Shipping Company to establish a new level of efficiency in the transportation of Alaskan crude.

The NASSCO-designed Alaska Class tanker is fitted with the most modern equipment available and meets the latest safety and environmental protection standards, including a segregated ballast system, an inert gas system, sewage treatment system, collision avoidance radar and a back-up steering system.

Main engines	Sulzer
Service generators	American MAN
Emergency generators	Detroit Diesel
Auxiliary boiler	IHI
Auxiliary condensers	Delaval
Waste heat boiler	IHI/Senior Greene
Engine room controls	General Regulator
Cargo control console	Paul Munroe
Steering gear	IHI/Sperry/Kawasaki
Inert gas system	Howden
Pumps	IHI/Shinko/Taiko
A/C & refrigeration	York
Ventilation fans & blowers	Buffalo Forge
Fixed halon system	Wormald
Foam system	Feecon
Motors	Reliance
Tank cleaning	Gunclean
Bearings/seals	Waukesha
Elevators	Jered Brown Brothers
Sanitation plant	Red Fox
Joiner work	Hopeman
Doors, hatches & scuttles	Marine Structures
Deck machinery	Norwinch
Deck covering	J.E. Steigerwald
Propellers	Nissho Iwai/Kobe
Boats, davits & winches	Watercraft America

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Avondale

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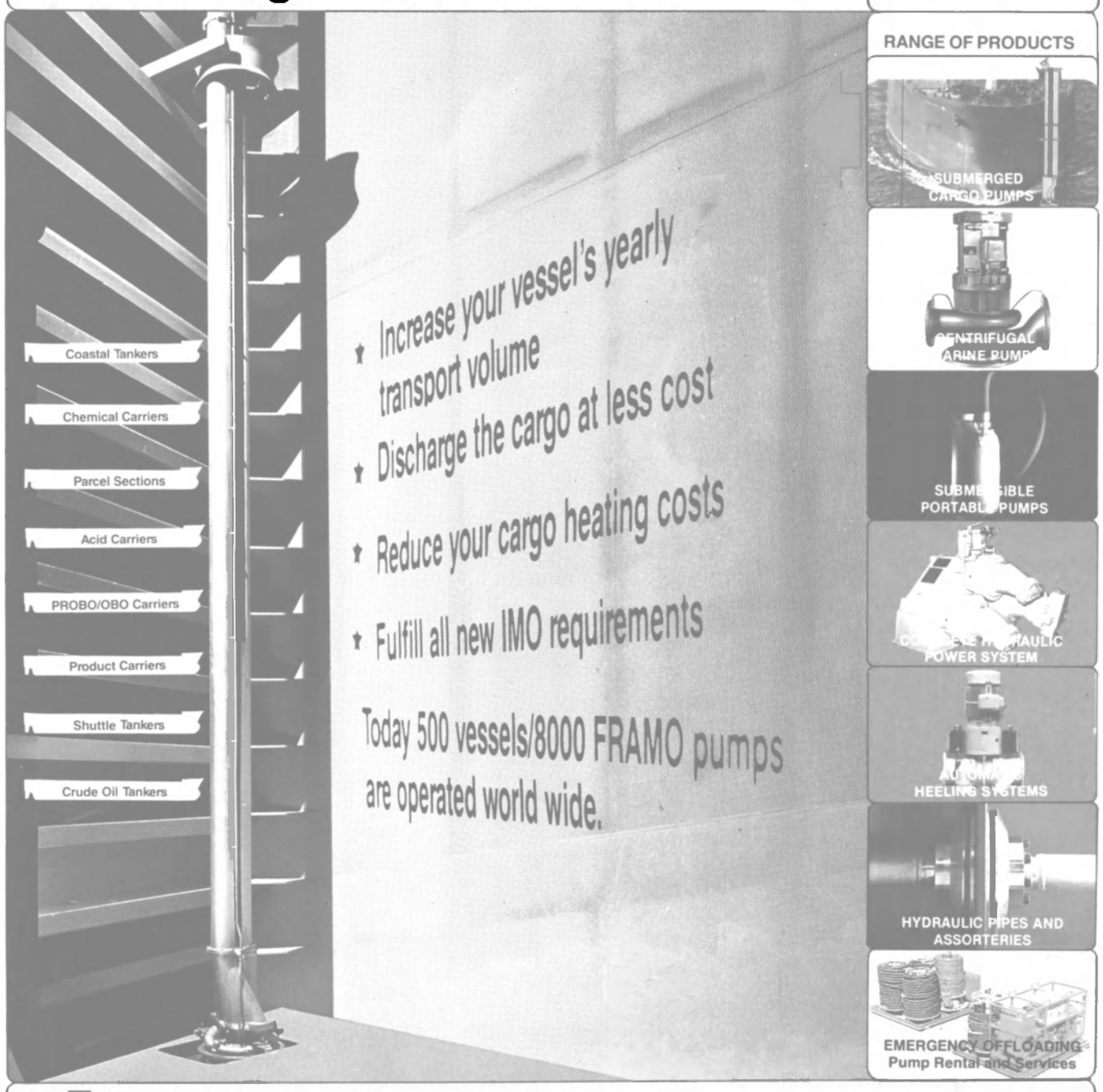

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HENRY J. KAISER
Major Suppliers

Main engines (2)	Alsthom-Atlantique
Reduction gears	Cincinnati Gear
Propellers & shafting	Bird-Johnson
Line shaft bearings	Avondale
Steering gear	Jered Brown Brothers
Boiler	Clayton
Bridge, ER & cargo control consoles	Tano
SS & HP air compressors	Ingersoll Rand
SS diesel generators	Alco Power
PTO generators	Cogenel
Main switchboard & group control centers	Federal Pacific Electric
FO & LO purifiers	Centrico
ME & PTO clutch couplings	Eaton
Distiller	Aqua Chem
Sewage treatment plant	Red Fox
Vacuum collection system	Envirovac
Incinerator	Atlas Danmark
Air conditioning plant	Carrier Transicold
Deck equipment	Lake Shore
Ram tensioner	Western Gear
Valve actuators	Limitorque
Firefighting system	Herbert S. Hiller
Joiner work	Hopeman
Elevator	Unidynamics
Windows	Kearfott/Singer
Emergency diesel generators	Energy Power
Radars	Precision Marine
Compass	Sperry
Paint (hull)	International
Paint (tanks)	Mobil Chemical

Kaiser (T-AO-187), under construction for the U.S. Navy was delivered recently by Avondale Industries' Shipyard Division. The mission of the Kaiser and her sister ships to follow is the transportation of bulk petroleum products from shore depots to combatant ships and support forces under way. These T-AOs will also deliver limited fleet freight, cargo water, mail and personnel.

The Kaiser has an overall length of 667.5 feet, beam of 97.5 feet, and maximum draft of 36 feet. Propulsion is provided by twin medium-speed, 10-cylinder Pielstick diesels manufactured by Alsthom-Atlantique, driving controllable-pitch Bird-Johnson propellers via Cincinnati Gear reduction gearing. Jered Brown Brothers supplied the steering gear, and Tano the bridge and engine room control consoles.

Electrical power is provided by diesel generators supplied by Alco Power and power takeoff generators by Cogenel. The ship's twin-screw design provides improved directional stability, ease of control, and mission reliability under combat conditions.

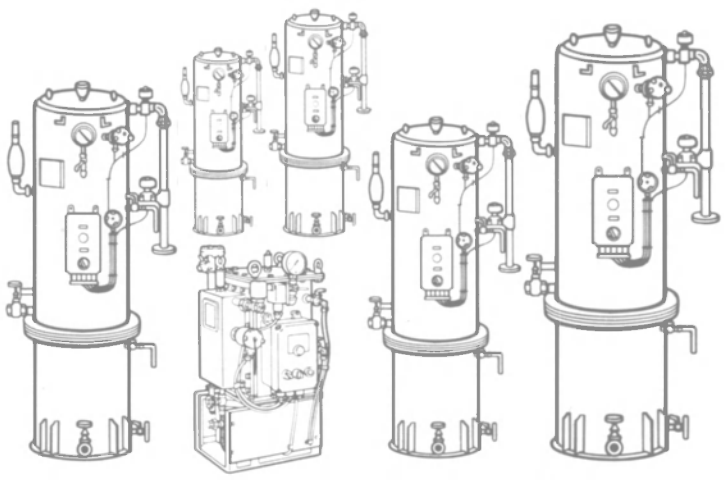
The T-AO-187 has a cargo capacity of 183,500 barrels of oil in 18 tanks, and is capable of simultaneously receiving, storing, and discharging two separate grades of cargo fuel. All cargo pump and valve operations and the segregated ballast system are manipulated from the cargo control center located in the superstructure aft. This center has a good overview of the entire replenishment deck.

Underway replenishment is accomplished using transfer rigs with transfer hoses suspended by a span wire that is automatically maintained in a constant-tension range. The T-AO ships are also capable of refueling helicopters from a vertical replenishment facility aft of the deckhouse.

The Kaiser and her sister ships are being built using state-of-the-art modular construction techniques that include prefabricating and pre-outfitting individual modules that make up the ship. Each of the large modular units is assembled and outfitted with piping, ventilation ducts, electrical wireways, and other equipment in designated outfitting zones throughout the shipyard. The pre-outfitted modules are then moved to the building site and erected into the complete ship. Prepackaged units of heavy machinery are assembled ashore and lifted aboard ship for installation. As a result of these modern techniques, the Kaiser and the two already launched sister ships, the Joshua Humphreys (T-AO-188) and the John Lenthall (T-AO-189) were more than 80 percent complete at the time of their launching.

OIL & WATER

SEPARATION



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HOMERIC
Meyer Werft

Jos. L. Meyer GmbH & Company shipyard in Papenburg, West Germany, this year delivered to Home Lines Cruises, Inc. the luxury cruise liner Homeric. Built at a cost of $150 million, the 42,092-grt, 1,085-passenger vessel has an overall length of 670 feet, beam of 95 feet, and maximum draft of 23 feet. Eight of the ship's 12 decks are devoted to passenger accommodations, public rooms, and outdoor activities.

The contract was awarded to Meyer Werft in 1984 against keen competition from other European shipyards. The order marked a new phase in passenger ship construction at the Papenburg yard. Subsequently, two additional cruise vessels were ordered for delivery in 1988.

Main propulsion is provided by twin MAN B&W 10L55GB diesel engines, each with an output of 16,200 bhp at 155 rpm, driving two Lips controllable-pitch, highly skewed propellers. Service speed is 21 knots. The ship is equipped with Sperry Gyrofin stabilizers for passenger comfort and safety, and with two bow thrusters for enhanced maneuverability during docking and undocking.

Electric power is supplied by four MaK 8M453 medium-speed diesel engines, each driving a Brown Boveri generator. Navigation equipment includes two Krupp Atlas radars (one with ARPA), Magnavox satellite navigator, Simrad Loran C, Anschutz gyrocompass, autopilot and course recorder, Plath radio direction finder, and JMC weather chart recorder. A satellite communications system is installed for telephone and telex services. A conventional communications system is also installed for radiotelephone and telex transmission via radio channels.

HOMERIC
Major Suppliers

Main engines (2)	MAN B&W
Propellers & bow thrusters	Lips
Oil-fired & exhaust gas boilers	Aalborg
Auxiliary diesels (4)	Krupp MaK
Generators (4)	Brown Boveri
Anchors	Blohm + Voss
Anchor/mooring winches	Brohl
Sterntube bearings/seals	HDW
Emergency diesel	KHD
Emergency generator	Siemens
Pumps	Allweiler; Klein, Schanzlin & Becker; Maskin
Air compressors	Jos. L. Meyer
Incinerator plant	Golar Metall
Condenser & evaporator	Serck
Fire alarm system	Siemens
FO & LO purifiers, heat exchangers	Alfa-Laval
Sewage treatment plant	Hamworthy
Vacuum sewage plant	Wartsila
LO coolers, turbocharger	Krupp MaK
LO filters	Boll & Kirch
Electric motors	AEG Telefunken
Impressed current system	Wilson Walton
Control consoles	Rolf Janssen
Soundproofing	Bittner; Philadelphia Resins
Upper deck enclosure	MacGregor-Navire
ER ventilation	Rud. Ottomeyer
Engine telegraph system	Stork Kwant
Davits & winches	Schat
Stabilizers	Sperry
Steel doors	Frinz Hebold
Power meter	ASEA Lepper
Bilge water separator	Fram Europe
Ceilings	Dampa
Elevators	Schindler
Satnav system	Magnavox
Radars	Krupp-Atlas
Loran C, echosounder	Debeg
Gyrocompass, autopilot & speed log	Anschutz
Satcom system	Japan Radio
Radio equipment	EB-Nachrichtentechnik
Navigation & signal lights	Ahlemann & Schlatter
Clearview screens	Atlas
Lifeboats & tenders	Mulder & Rijke
Life rafts	Viking

JUBILEE
Kockums

The 47,262-grt luxury cruise liner Jubilee was delivered at midyear by Kockums AB of Malmo, Sweden, to Carnival Cruise Lines Inc. of Miami. Designed and built as a steel-hulled, twin-screw/rudder passenger ship, she has a raked stem, transom stern, bulbous bow, bow and stern thrusters, and fin stabilizers.

The new liner has an overall length of 733 feet, beam of 92 feet, moulded depth of 25 feet, depth to uppermost continuous deck of 51 feet, and maximum draft of 24.6 feet. A total of 733 standard cabins are arranged on decks 4, 5, 6, and 7, and 10 deluxe veranda suites are located on deck 11 forward. Total passenger capacity is 1,896, and she carries a crew of 680.

Propulsion is provided by two low-speed Sulzer 7RLB66 diesel en-

gines with integral thrust bearings, each coupled directly to KaMeWa controllable-pitch propellers having a highly skewed blade design. The main engines each have a maximum continuous rating of 15,770 bhp at 140 rpm.

The Siemens propulsion control system, which includes automatic main engine overload control as well as an engine load increase feature, incorporated different operating modes, including: constant-speed operating mode at 136 rpm for shaft alternator operation; and two combination operating modes—one thrust mode and one pitch mode—where the engine speed, propeller thrust, and propeller pitch are controlled according to a pre-established curve.

At sea, the Jubilee will normally operate in the constant-speed mode at 136 rpm, and the shaft-driven alternators will feed the main switchboard. As it is not the intention to run the two shaft alternators in parallel, the main switchboard is capable of being operated in a "split" mode by means of a section breaker on the bus bar. In this mode each alternator will feed half of the main switchboard.

The vessel's hull form has been developed to give good propulsion and seakeeping performance with due regard to the large propeller tip clearance requirements at the various design conditions. The lines were designed to give the smallest possible resistance, with the bulbous bow designed for a draft of 24.6 feet and optimized for a service speed of 19.5 knots.

Except for certain parts of the public spaces, where special features are introduced, Dampa continuous ceiling systems consisting of prestressed, baked enamel steel/aluminum panels are used throughout the accommodations, and Ecomax has been used throughout for linings (bulkhead panels). Sound-absorbing decks consisting of mineral wool slabs with steel tops are installed in the crew accommodations above the engine rooms as well as below the bandstand and dance floors to provide maximum insulation against noise.

The Jubilee is the first large passenger vessel built by Kockums, soon to be followed by her sister ship Celebration scheduled to be delivered at the end of Janaury 1987.

Main engines (2)	Sulzer	Purifiers	Laval
Engine controls	Siemens	Bearings	Railco
Propellers & thrusters	KaMeWa	Elevators	Dan
Steering gear	Frydenbo	Lifeboats	Harding
Stabilizers	Sperry	Life rafts	Viking
Alternators (5)	Siemens	Radars (3), Loran C, facsimile recorder, speed log	Raytheon
Alternator diesels (3)	Wartsila-Vasa	SatNav system	Magnavox
PTOs (2)	Lohmann & Stolterfoht	Radio direction finder	Ramantenn
Switchboards	L.K. Ness	VHF/RFD	Furuno
Oil-fired boilers (2)	Sunrod	Gyrocompass	Sperry
Distilling plant	Atlas	Adaptive autopilot	Racal Decca
Air conditioning plant	Flakt	Magnetic compass	Krohn
Compressors	Stal	Echo sounder	Simrad
Sprinkler & alarm system	Wormald	SatCom system	Raytheon/JRC
Deck machinery	Norwinch	Communications equipment	Sailor
Anchors	Ramnaes	Steering controls & rudder indicator	EMRI
Side doors	Velle	TV & PA systems	Phillips
Watertight doors	Schoenrock	Sat/TV-at-sea	Gendra/SeaTel
Windows	Wingerden		
Sanitary system	Evak		

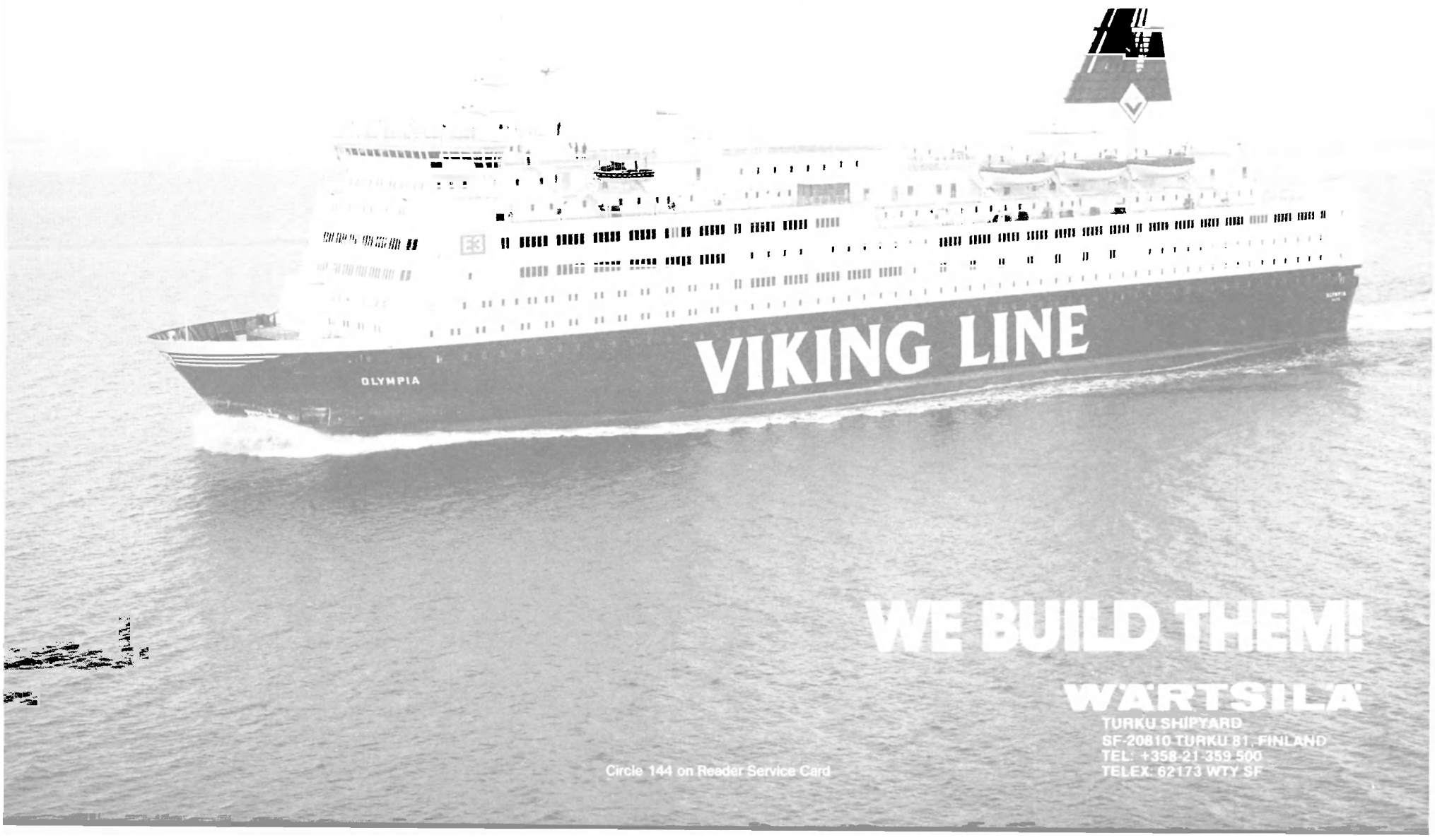
LAWRENCE H. GIANELLA
Tampa Shipyards

The 30,000-dwt motor tanker Lawrence H. Gianella, fifth of five sophisticated products carriers designed and built by Tampa Shipyards Inc. in Florida, was delivered this year to Ocean Shipholdings, Inc. of Houston.

(continued)

Main engine	IHI/Sulzer
Propeller	Ferguson
Diesel generators (3)	Caterpillar/Kato
Shaft generator	Nishishiba
Emergency generator	Detroit Diesel
Waste heat boiler	Kentube
Air compressors (2)	Hamworthy
Waste heat distiller	Alfa-Laval
Steering gear	Hastie
Sewage treatment plant	FAST
Foam system	National Foam
Cargo tank washing system	Dasic
Cargo tank remote level gauge system	Saab
FW cooling, SW cooling, lube oil, ballast and cargo pumps	Framo
Fuel oil purifiers (3)	Alfa-Laval
Main switchboard	Westinghouse
Inert gas generators	Holec

THERE ARE YARDS
WHICH ARE PLANNING TO BUILD
VESSELS LIKE THIS



The Gianella has an overall length of 615 feet, beam of 90 feet, depth of 53 feet 8 inches, and design draft of 34 feet. Propulsion is provided by a low-speed IHI/Sulzer 5RTA76 fuel-efficient diesel with a maximum continuous rating of 18,400 bhp at 98 rpm. The main engine, derated to prolong its service life, drives a shaft generator via a speed-increasing gearbox to provide electric power while under way. These two characteristics contribute to excellent fuel economy.

Designed for unmanned operation, the propulsion plant is classed +AMS, ACCU by the American Bureau of Shipping. The engine is direct-drive to a Ferguson fixed-blade, nickel-aluminum-bronze propeller. Service speed at 75 percent of maximum continuous rating of the engine is 16 knots.

The new carrier is designed to deliver 30,000 long tons of petroleum products worldwide, and is ice-strengthened to ABS Ice Class IC for Arctic and Antarctic operations. Cargo is loaded in seven pairs of tanks, each pair being segregated from any other pair to allow seven different types of cargo to be carried simultaneously. Each cargo tank is fitted with a stainless steel, high-pressure hydraulic pump supplied by Framo. These pumps are sized to discharge the entire cargo within 16 hours.

All cargo tanks are fully inerted by a Holec inert gas generating system designed to supply two pairs of tanks through dedicated systems to guard against cargo contamination; the other five pairs of tanks are served by a common system. Cargo piping and inert gas piping are fabricated entirely of stainless steel. Facilities for underway replenishment at sea are provided at two stations; also incorporated is refueling at sea capability over the stern.

The construction of the cargo tanks developed by Tampa Ship has substantially reduced surface area compared with conventional construction, which results in significant cost reduction for epoxy coating maintenance inside the tanks.

Water ballast is carried in double bottom and wing tanks, completely segregated from the cargo, meeting IMO's Protectively Located Segregated Ballast regulations.

MINERAL NIPPON
Mitsui

The 194,744-dwt coal/ore bulk carrier Mineral Nippon, built by the Chiba Works of Mitsui Engineering & Shipbuilding, was delivered early this year to Toppenish Ltd. of Hong Kong. The single-screw flush decker has a number of energy conservation and labor saving features, including a hold cleaning system.

The bulker has an overall length of 984.2 feet, beam of 155.8 feet, depth of 82 feet, and full-load draft of 60.8 feet. Propulsion is provided by a low-speed Mitsui/B&W 6L80MCE diesel engine with a maximum continuous output of 19,200 bhp at 83 rpm. Trial speed was 16.31 knots. She is equipped with a Mitsui ATG-F1 turbogenerator system (mixed pressure turbine system) for maximum utilization of the waste heat of the main engine exhaust gas.

Other energy conservation features include a Mitsui Integrated Duct Propeller (MIDP), a reaction rudder, and extensive use of high tensile steel in the hull to save weight.

NORD BALTIC
Samsung

Samsung Shipbuilding & Heavy Industries Company in Korea in August this year delivered the 106,700-dwt Nord Baltic to Norstrom & Thulin AB of Sweden, followed by sister ships Nord Ocean and Nord Pacific. They are said to be the largest oil products tankers ever built.

The Nord Baltic has an overall length of 806.75 feet, beam of 140 feet, depth of 67.6 feet, and maximum draft of 47.6 feet. Main propulsion is provided by a KHIC/B&W 6L70MC diesel developing 16,980 bhp at 95 rpm, driving a Kobe Steel four-bladed, fixed-pitch propeller. Service speed is 14.5 knots.

Three 830-kw diesel gensets, two oil-fired boilers, and one exhaust gas boiler are installed to provide electric power and steam for cargo loading and discharge, cargo heating, and for various loads under normal seagoing conditions.

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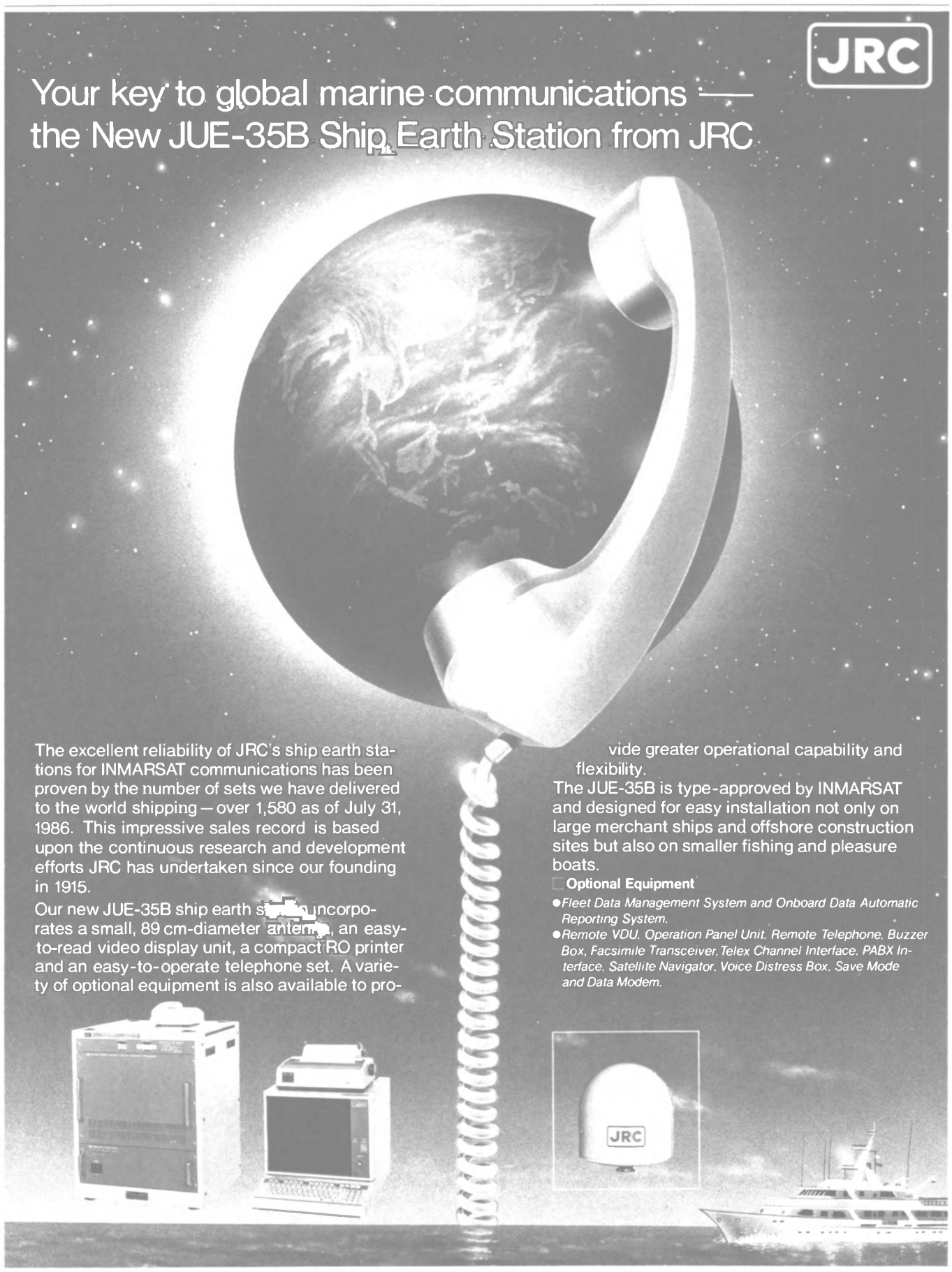

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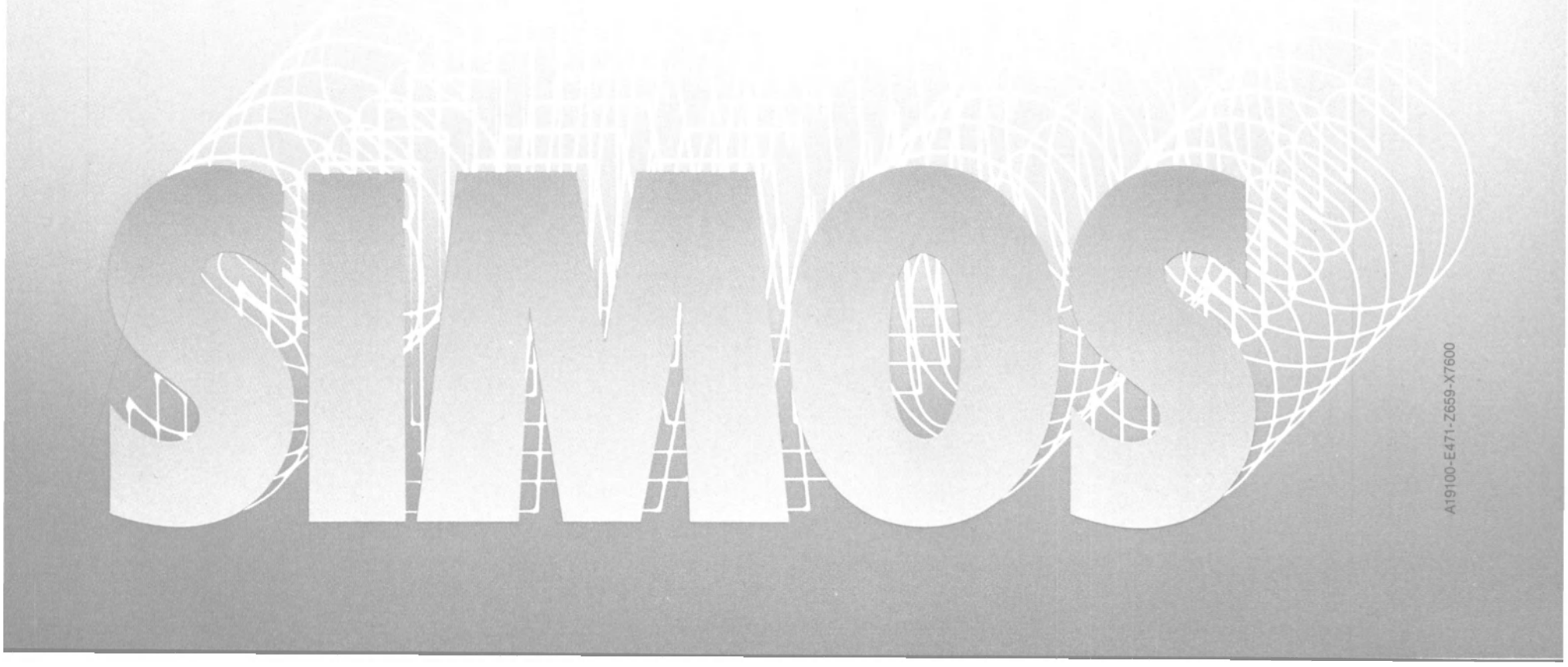

A19100-E471-Z659-X7600

Cargo space is divided by two longitudinal bulkheads and five transverse bulkheads into seven center tanks, four wing tanks on each side, and two slop tanks on the sloped double bottom that is arranged for easy stripping and cleaning and easy repair of tank coatings.

Two of the wing tanks on each side and the double bottom tanks are intended for segregated ballast water according to the requirements of IMO's Marine Pollution Convention (MARPOL) of 1973. The requirements of the 1978 TSPP are also observed, and the vessel conforms to the IMO requirements on minimum ballast draft, trim, propeller immersion, and on the protective location of the segregated ballast tanks.

Special coatings in all center tanks (85,600 cubic meters total) allow the loading of "white" products such as jet fuel, kerosene, gasoline, diesel oil, naphtha, and clean concentrate. At the same time, crude oil can be loading in the uncoated side tanks with a total capacity of 35,500 cubic meters.

The cargo-handling system allows discharge of cargo in about 17 hours. Piping and pumping arrangements permit four parcels to be loaded or discharged simultaneously. Different grades of cargo are always segregated by two valves.

For highly efficient cargo handling and complete stripping, a total of 17 submerged, hydraulically driven centrifugal pumps are installed—seven of 1,400 cubic meters per hour in the center tanks, two of 300 cubic meters per hour in No. 1 wing tank, and eight of 450 cubic meters per hour for the other wing tanks and slop tanks. Two 2,000 cubic meters per hour ballast pumps are installed.

Central control equipment is provided for the cargo oil pumps, ballast pumps, deck machinery, etc. Cargo control stations are arranged on the upper deck in the accommodations space, allowing remote control of cargo/ballast valves, cargo level monitoring, temperature, etc.

NORD BALTIC
Major Suppliers

Main engine	KHIC/B&W
Propeller	Kobe Steel
Steering gear	Kawasaki
Auxiliary engines	Ssang Yong/B&W
Auxiliary boilers	Sunrod
Generators	Taiyo
Emergency generator	Man-Demp
Main switchboard	Taiyo
Purifiers	Nagase Alfa
Air conditioning	Flakt
Inert gas system	Maritime Protection
Tank cleaning machines	Polarmarine
Deck heater	Sunrod
Cargo & ballast pumps	Frank Mohn
Tank level gauges	Autronica
Lifeboats	Watercraft
Galley & laundry equipment	Elektrolux
Paint	International Paint

OLYMPIA
Wartsila Turku

The Turku Shipyard of Oy Wartsila Ab in Finland delivered the 37,800-grt passenger/car ferry Olympia this year to Rederi Ab Slite of Sweden. The vessel is registered for 2,500 passengers and can provide cabin accommodations for almost that number. She has a capacity for 600 private cars or 62 trailers.

The Olympia has an overall length of 580.7 feet and beam of 93.2 feet. Main propulsion is provided by four Wartsila/Pielstick 12 PC2-6V engines with a total output of 31,280 bhp, giving a service speed of 22 knots. Auxiliary machinery comprises three Wartsila 6R32 diesels with a total output of 8,345 bhp. The ferry is operating on Viking Line's Helsinki-Stockholm route.

This is the second big ferry delivered by Wartsila's Shipbuilding Division this year. The Turku yard also has under construction a 24,000-grt passenger-car ferry for A/S Jahre Line of Norway.

The 12-deck Olympia is fitted with two stern ramps, fore gate with driving ramp, bulbous bow, two propellers, two rudders, two bow thrusters, and fin stabilizers. Total lane length for private cars is 2,850 meters or 1,120 meters for trailers.

As a rule, passengers are accommodated in double cabins with berths at deck level. The cabins were prefabricated by the Wartsila Piikkio Works and are fitted with

(continued)

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The BIRKA PRINCESS, a True Beauty.

A passenger vessel is always a challenge for a shipyard. Her design has to appeal to the people she carries. But you have also to consider the conditions under which she performs her daily work.

April 22nd, 1986 Valmet's Helsinki Shipyard delivered the 21,000 GT passenger liner Birka Princess to the Åland Islands-based Birka Line. She is now in service on a really demanding route between Stockholm and Mariehamn. The passengers on this route expect the highest standard of services and comfort.

MS Birka Princess – the Latest Proof of Valmet's Shiptailor Approach

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shower, radio, wake-up call, and emergency communication system with direct connection to the ship's office, which is open 24 hours a day.

ORMOND
Mitsubishi

The 169,247-dwt very large bulk carriers Ormond, built at the Nagasaki Shipyard of Mitsubishi Heavy Industries, Ltd., was delivered early this year to Whichin Company Ltd. The state-of-the-art VLBC incorporates the latest energy-saving measures and several labor-saving devices, including a hold-cleaning system developed by Mitsubishi.

The Ormond is a flush decker with transom stern and Mitsubishi bow, with engine room and living quarters located aft. The cargo space is divided by eight transverse bulkheads into nine holds. The No. 6 hold can also be used as a ballast tank, and the odd-numbered holds are designed to carry iron ore. Each hold has a large, two-panel, side-rolling steel hatch cover and makes use of an automatic hydraulic type cleat system.

Two cleaning eductors are provided in each cargo hold to make it possible to discharge large particles of iron ore from the hold along with the cleaning water. The drive water of these eductors is supplied from the fire and general service pump in the engine room via the general service seawater line of the upper deck. Hold washing is carried out with portable machines.

The VLBC has an overall length of 983.6 feet, beam of 154.9 feet, depth of 80 feet, and design draft of 58 feet. The main engine is a super-long-stroke Mitsubishi/Sulzer 6RTA84 diesel with maximum output of 18,390 bhp at 71 rpm and normal output of 15,650 bhp and 67 rpm. Engine derating and a large-diameter propeller improve fuel economy. A module type Halon 1301 fire extinguishing system is installed in the engine room.

The ship's electrical generation system consists of a turbogenerator as the main power source, two diesel generators as the supplementary power source, and an emergency-use diesel generator. Through the use of a dual-pressure and hot water flush steam type of exhaust gas economizer, it is possible for the turbogenerator to provide all of the electric power needed for normal seagoing use.

The accommodations make use of a gateway type wheelhouse to reduce wind resistance. Mitsubishi reaction fins are installed just in front of the propeller to improve the propulsion efficiency.

A total of eight mooring winches are provided.

OTSO
Wärtsilä Helsinki

The big icebreaker Otso, ordered in 1984 by the Finnish Board of Navigation, was delivered early this year by Wartsila's Helsinki Shipyard. She is the first of two technologically advanced icebreakers of a new type. The second vessel was ordered in December 1985 and is scheduled for delivery in January 1987. The Otso and her sister ship will replace three icebreakers of the Karhu Class, which are more than 25 years old and too small to assist today's much larger merchant ships.

Compared with the Urho Class icebreakers built in the mid-70s, the Otso has a 21.33-foot shorter waterline but a beam 1.3 feet wider. This allows efficient assistance to the bigger ships in use today. The design draft is only 24 feet, less than the Urho Class, making a larger number of harbors accessible to the new icebreaker. The Otso has an overall length of 324.8 feet, beam of 79.4 feet, and maximum draft of 26.25 feet.

The main machinery comprises four Wartsila Vasa 16V32 diesel en-

The Navigation
ATLAS NACOS 20

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gines, each developing 7,320 bhp, driving propulsion motors developed and manufactured by Kymi-Strombery Oy. The motors are of an advanced AC type, in which the rpm is regulated by altering the AC frequency. The machinery can be started and supervised from the wheelhouse using a computer-assisted control system.

The control consoles in the wheelhouse are placed far out on the bridge wings, from which there is nearly 360-degree visibility. The computer-assisted radar system can also supply information on the speed and course, and data on the fairway can be fed into it in advance.

Crew accommodations have been designed to provide sufficient rest and recreation even under arduous working conditions. All cabins are located in the superstructure, which decreases the noise of breaking ice coming from the hull.

The forward propellers common in recent Baltic icebreakers have been replaced by Wartsila's patented air-bubbling system. This and the absence of forward propeller bosses decreased the resistance encountered by the vessel in ice. The ice resistance has also been reduced by modification of the hull shape and the use of compound plate with a surface layer of stainless steel in the ice zone. These features, together with application of epoxy paint to the underwater surfaces, will keep frictional resistance low for longer periods than could be achieved by the methods used previously.

The general arrangement of the Otso differs considerably from that found on earlier icebreakers. The diesel generators are placed on the upper deck, below the helicopter deck, resulting in simpler cable and piping systems. The heavy fuel tanks are placed amidships well away from the hull plating, which decreases the risk of pollution.

A new feature in comparison with earlier Finnish icebreakers is the "power station" type of machinery, in which no auxiliary units are needed. This is an economical arrangement as the vessel can run entirely on heavy oil, which is cheaper than diesel fuel.

RIO GAS
Lindenau

Paul Lindenau Shipyard in Kiel, West Germany, early this year delivered the shallow-draft, 7,150-cubic-meter ethylene/LPG carrier Rio Gas to Cryotrans Schiffahrts & Co. KG. A sister ship, the Santa Clara, was delivered in 1985. Among the most modern ethylene gas carriers in the world, both ships have been optimized for shallow draft (17 feet) with a 4,000-ton cargo deadweight.

Both ships are now transporting ethylene between Brazil and Europe, within Europe, and to South Africa. The current gas transport market requires that an increasing number of calls be made at terminals located on waters having shallow depths. This demands a ship design with special marginal conditions. Despite draft limitation and trim restriction, to name only two of the conditions to be adhered to, these vessels have optimal ship lines insuring low fuel consumption and good behavior at sea.

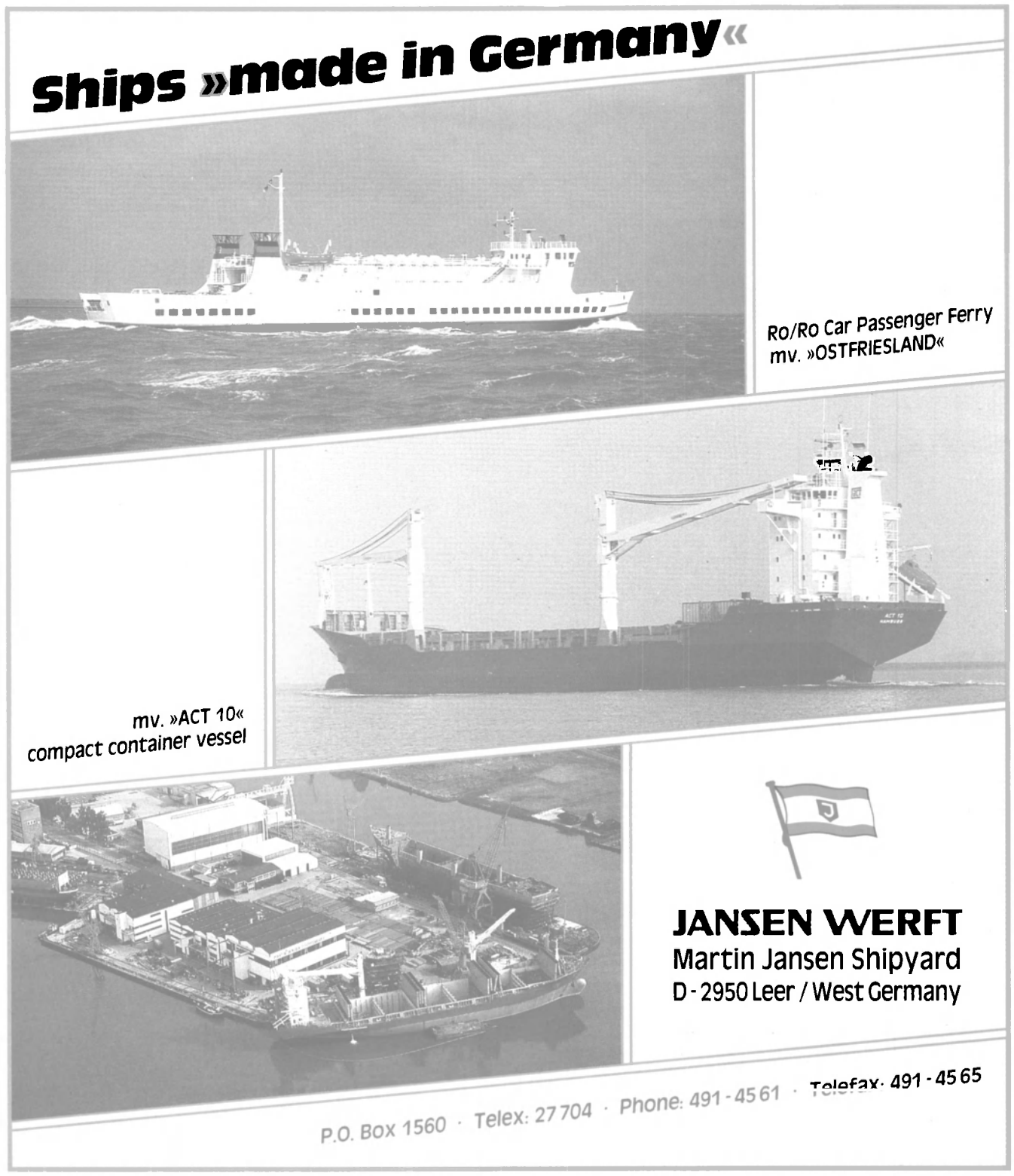
The entire accommodation area is located in a separate deckhouse aft. This house is strictly separated from the exhaust gas funnel in order to reduce any sound transmission. The entire design of the cabins was completed in close cooperation with the shipowner, and incorporated the latest ergonomic developments—light layout, furniture layout, and accommodations system—in order to afford the special crew as much comfort and convenience as possible.

The entire gas plant system was developed, designed, delivered, and put into operation in cooperation with Liquid Gas International (LGI) Ingenieurgesellschaft mbH of Bonn-Bad Godesberg. Prior to delivery of the ship, LGI conducted a one-week gas training course at Bonn for the future crew.

Apart from the economical ship concept, great importance has been attributed to the fact, when completing the gas plant, that shape and arrangement of the tanks and of the deck facilities take into account overall concept relating to minimal draft.

As a special gas carrier the Rio

(continued)



Circle 121 on Reader Service Card

Gas is permitted to transport all of the liquefied gases and chemicals on the list approved for ships of this type by the International Maritime Organization (IMO). These include ethene (ethylene), Propene (propylene), Propane, propane/butane mixture, I+N-butane, anhydrous ammonia, vinylchloride monomer, butene (butylene), butadiene, acetaldehyde, diethyl ether, dimethylamine, propyleneoxide, and ethyleneoxide/propyleneoxide mixture.

The six gas tanks have a total volume of 7,178 cubic meters. They are designed for maximum overpressure of 5 bars (IMO) or 3.2 bars (USCG), and minimum temperature of −104C. It is possible for two products to be simultaneously transported, refrigerated, and loaded or unloaded. Loading/unloading performance is 715 cubic meters per hour.

In order to further increase operational flexibility, the Rio Gas is equipped with an insulated nickel-steel deck tank and a product evaporator. This tank may concurrently transport a certain amount of gas similar to the product that is to be loaded at the next terminal. This gas may be washed into the cargo tanks as early as the ballast trip. Thus, the cargo tanks will, when arriving at the next terminal, already be prepared for the new cargo (temperature and pressure) without losing any time.

The five cylindrical nickel-steel cargo tanks are provided with the necessary internals as well as a residual drain system. The low-temperature insulation consists of cryogenic foam sprayed on in several layers. This achieves an insulating skin effect, inducing a considerable reduction of the thermal absorbtion in the cargo tanks.

The three LGI reliquefaction plants installed in the forward deckhouse have been set up so as to form a cascade refrigeration cycle. They are similar to 15 plants delivered previously by LGI that have proved to be extremely reliable. Unloading of the product is carried out by means of deepwell pumps; two booster pumps provide for an additional increase in pressure.

The power switchgear for the drives of the gas plant is installed in the electrical equipment room in the deckhouse. The plant is remotely controlled from the gas office in the crew deckhouse, where all of the important operating conditions are indicated. The modern outfit of the gas office includes, among other things, a cargo computer suitable for stability and logistic computations.

An LGI inert gas plant installed aft provides for the inerting and flushing of the piping, units, and tanks. This plant consists of generator, compressor, and drier. It operates in the following modes: generation of dry air having a dewpoint of up to −75C at 6 bars; production of inert gas; and production of industrial nitrogen of the lowest CO_2 content.

Main engine	MAN B&W
Auxiliary engines	MAN B&W
Generators	Siemens
CP propeller	Schaffran
Gearbox	Tacke
Steering gear	Svendborg
Electric motors	Schorch
Echo sounder & radar	Krupp-Atlas
Gyrocompass & autopilot	Anschuetz
Satcom plant & wireless equipment	Debeg
Main switchboard & distribution board	Siemens
Communication systems	Debeg
Satnav	Magnavox
Tyfon (electric-driven)	Zollner
Engine monitoring system	Noris
Motor starters, battery chargers, ECR & wheelhouse desks	Janssen
Centrifugal pumps	Behrens
Gear pumps	Dudek
Screw displacement pumps	Bornemann
Compressors	Hatlapa
Separators	Westfalia
Deck auxiliary machines	Hatlapa
Boiler plant	GeKa/Saacke
Firefighting equipment	Minimax
Freshwater evaporator	Alfa Laval
A/C system	Novenco
Heat & fire protection & sound insulation	Heidemann Isoliertechnik
Refrigerating systems	BBC-York
Cold storage room insulation	Kaefer Isoliertechnik
Fans	IG-Witt
Cabling & lighting systems	Siemens
Cargohandling cranes	Hatlapa
Lifeboats	E. Hatecke
Boat davits	Davit
Gangway equipment	Fr. Fassmer
Inflatable life rafts	Autoflug
Deckhouse bulkheads	HW-Metallbau
Cooking installations	AFM Bohnhoft/Edco
Laundry installations	Edco
Sewage treatement	Hamworthy
Sanitary	Triton Belco
Door locks, cabins & furniture hardware	Schwepper Beschlag
Upholstery & decoration	Albert Homburg
Anchor equipment	Dortmunder Kettenfabrik
Windows	Wenner & Bettendorf
Inner deck coverings	Hans Strang
Paints	Hempel's Schiffsfarben

SKULPTOR TOMSKIJ
Aalborg

Early this year Aalborg Vaerft in Denmark delivered the advanced refrigerated cargo ship Skulptor Tomskij to V/O Sudoimport of the U.S.S.R. Named for a famous Soviet sculptor, the 10,700 cubic meter vessel is the second of three ordered in 1984. The last ship in the series, the Akademik Zavarickiij, was also delivered this year.

Built to U.S.S.R Register of Shipping classification, the Tomskij is designed as a multipurpose reefer capable of transporting fruit as well as frozen meat. The ship has large, open type cargo hatches that, with the necessary reinforcement of tank tops and decks, provide the capability of carrying both 40-foot and 20-foot containers in the cargo holds as well as on the weather deck.

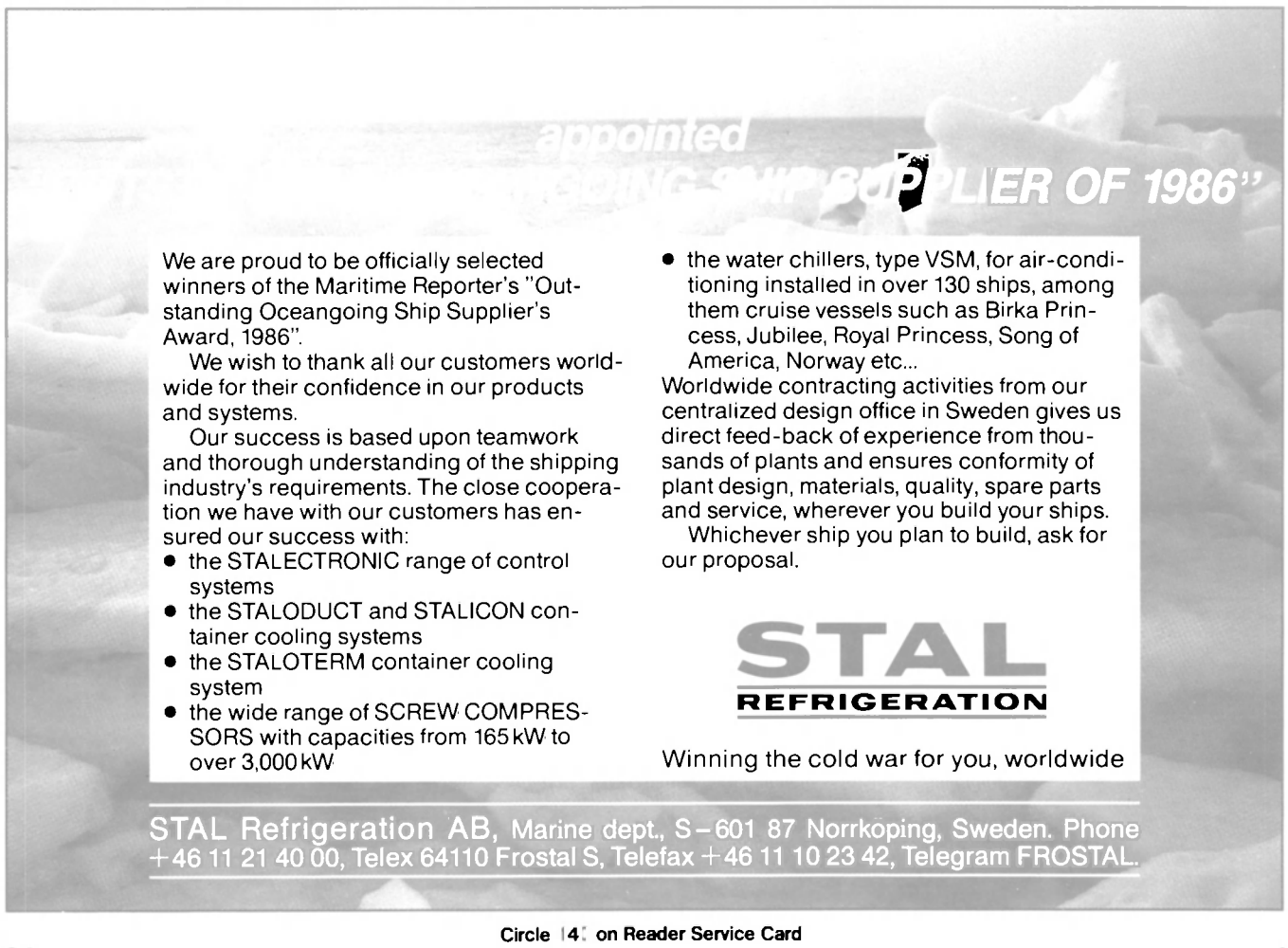
The new reefer has an overall length of 453.4 feet, beam of 70.5 feet, depth of 43 feet, and draft (bananas) of 23 feet. Propulsion is by a low-speed, two-stroke crosshead B&W 6DKRN 67/170 marine diesel manufactured by Bryansk Engine Works in the Soviet Union. The engine is fitted with a constant-pressure Brown Boveri turbocharging system. Main engine output is 12,874 bhp at 123 rpm. It drives, via intermediate and propeller shafting, a four-bladed nickel/aluminum/bronze propeller with fixed pitch. A KaMeWa bow thruster has an output of 800 hp.

The electric supply is provided by four diesel generator units, each consisting of a 720-kw generator coupled to a B&W Holeby four-stroke 6T 23 LH-4 engine with an output of 1,033 bhp at 750 rpm. Both the main and auxiliary engines are designed for burning heavy fuel with a viscosity of 380 cSt at 50C. Under normal operating conditions at sea, two of the gensets are in service. A third is put into operation when the bow thruster is being used for maneuvering. A 100-kw emergency diesel generator set is also installed.

Steam for heating is produced by an Aalborg oil-fired boiler, type AQ-12, also designed for burning heavy fuel. This boiler's capacity is 2,500 kilograms of steam per hour at a pressure of 7 bar. Steam production at sea is provided by a main engine exhaust gas boiler, Aalborg type AQ-7, with built-in steam cabinet, and one four-chamber AQ-7 auxiliary engine exhaust gas boiler.

(continued)

Main engine	Bryansk/B&W
Propeller	Stone Manganese
Bow thruster	KaMeWa
Engine control/alarm system	Valmet
Sterntube bearings & seals	HDW
Anchors & chain	Thyssen Rheinstahl
Steering gear	Frydenbo
Diesel generators	B&W Holeby
Oil-fired & exhaust gas boilers	Aalborg
Centrifuges, heaters & pumps	Alfa-Laval
Alternators & motors	Siemens
Main engine bridge control	ASEA
Switchboards	LK
Sewage plant	Hamworthy
Deck machinery	Rauma-Repola
Hatch covers	MacGregor-Navire
Deck cranes	Liebherr
Davits	Schat
Incinerator	Atlas
Air conditioning	Nordisk
Piping & fittings	Plesner
Ceiling & wall panels	Dampa
Insulation	Rockment
Fire detection system	Ginge
Compressors	Sabroe
Coatings	International



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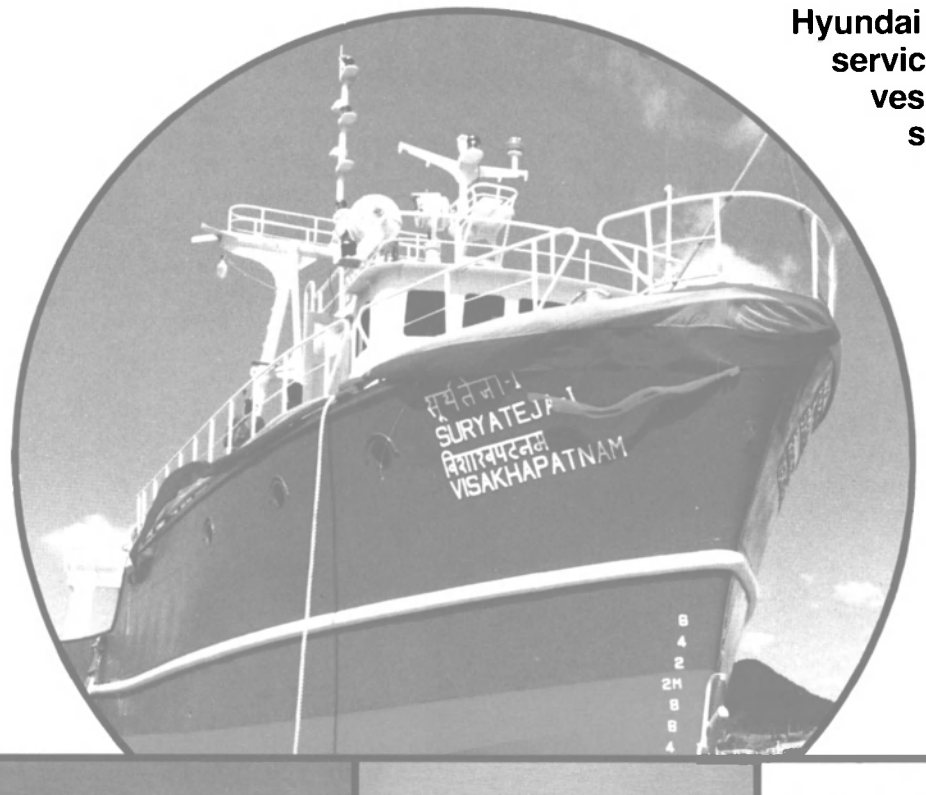
Specialty Vessels and Marine Equipment



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  - Jumboization
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- **Supply of Marine Equipment**
  - Diesel Engine & Its Components
  - Life Boats & Life Rafts
  - Anchors & Anchor Chains
  - Windows & Scuttles
  - Shipboard Cables
  - Stern Frames
  - Valves, Flanges, Bolts & Nuts
  - Deck Machinery
  - Electrical Equipment
  - Steel/Non-Ferrous Pipe Fittings
  - Steel Doors
  - Mooring Fittings
  - Shaftings, etc.

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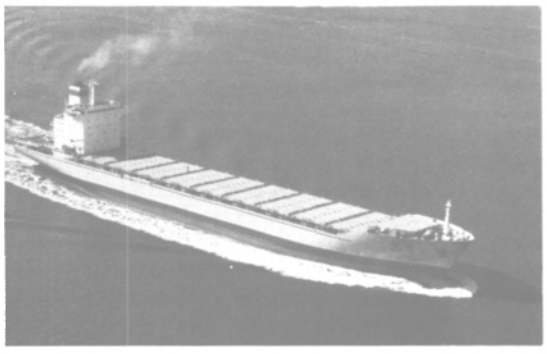

SONG HE
Seebeckwerft

Seebeckwerft AG of Bremerhaven, West Germany, this year delivered the fully cellularized containership Song He to the People's Republic of China. Business relations between Seebeckwerft and China Ocean Shipping Company (COSCO), the state shipping company of the People's Republic, have been active for more than 10 years. During that time 16 ships have been delivered, ranging from a multipurpose cargo vessel to the sophisticated containership Song He.

The new vessel has an overall length of 653.5 feet, beam of 80 feet, depth to first deck of 50.7 feet, and summer draft of 35 feet. Propulsion is provided by a MAN B&W diesel engine. Trial speed was 16.9 knots with an engine output of about 10,000 bhp.

The Song He is classed by Germanischer Lloyd +100 A4E Containership +MC E AUT. She is the most modern vessel currently in the COSCO fleet, embodying state-of-the-art design and construction.

STOLT SAPPHIRE
Daewoo Shipbuilding

The Stolt Sapphire, first of five advanced parcel tankers built for Stolt-Nielsen by Daewoo Shipbuilding & Heavy Machinery Ltd., was delivered by the Korean shipyard early this year. The remaining four ships—named Stolt Emerald, Stolt Topaz, Stolt Aquamarine, and Stolt Jade—have now joined the Stolt Tankers fleet.

These new ships will be among the most sophisticated and flexible parcel tankers in the world. About 70 percent of the total cubic capacity is acid-resistant stainless steel. They are designed to carry the full range of parcel trade products, ranging from full deadweight of inorganic acids such as phosphoric and sulphuric to 6,900 cubic meters of cooled semi-gases like propyleneoxide; from the most toxic chemicals to the most delicate; and from edible oils to high-heat lube oil additives.

The Sapphire has an overall length of 580 feet, beam of 105.8 feet, depth to main deck of 49.2 feet, and design draft of 34.5 feet. Main propulsion is provided by a two-stroke Hyundai/B&W 6L60MC diesel engine with an output of 12,480 bhp at 111 rpm. Service speed is 15

Main engine	Hyundai/B&W
Propeller & bow thruster	Lips
Steering gear	Frydenbo
Engine control console	Terasaki
Torque meter	ASEA
Auxiliary boiler	Sunrod
Purifiers	Nagase/Alfa
Diesel generators	Yanmar/Taiyo
Emergency generator	Kosan
Shaft generator	Fuji
Main switchboard	Terasaki
Freshwater generator	Serok
Sewage treatment system	Sasakura
Incinerator	Golar
SatNav system	Tracor
SatCom system	COMSAT
Radars	Kelvin Hughes
Navigator	Decca
Weather facsimile	Alden
Gyro/autopilot	Radio Holland
Cargo tank hatches	Daewoo/Normarine
Deck crane	Liebherr
Anchor & mooring winches	Daewoo/Norwinch
Cargo pumps & controls	Frank Mohn
Cargo valves	Westad
Fuel oil heating system	Bismo
Cargo heating oils	Bismo
Cargo cooling system	Frank Mohn
Dehumidifier system	Bry-Air
Inert gas generator	Holec
Liquid nitrogen plant	Linde
Tank cleaning machines	Polar Jet
Centrifugal pumps	Shinko
Gear/screw pumps	Taiko

1986 Outstanding Oceangoing Ships AWARDS

These companies participated in the construction of one or more of this year's award-winning Outstanding Oceangoing Ships. For information and free literature on any company's services or product line, circle the appropriate number(s) on the postpaid Reader Service Card bound into this issue.

VESSEL	**SHIPYARD** (Circle Number)	**ENGINE** (Circle Number)
Act 10	Jansen Werft (Circle **301**)	MAN B&W (Circle **322**)
Alps Maru	Hitachi (Circle **302**)	Hitachi/B&W (Circle **323**)
Atlantic Prince	Halter (Circle **303**)	Caterpillar (Circle **324**)
Berge Stahl	Hyundai (Circle **304**)	Hyundai/B&W (Circle **325**)
Chicago (Dredge) Special Barges	Southern Shipbuilding (Circle **305**) Bay Shipbuilding (Circle **306**)	EMD (generator engines) (Circle **326**)
Exxon Valdez	NASSCO (Circle **307**)	Sulzer (Circle **328**)
Henry J Kaiser	Avondale (Circle **308**)	Alsthom Atlantique/Pielstick (Circle **329**)
Homeric	Meyer Werft (Circle **309**)	MAN B&W (Circle **322**)
Jubilee	Kockums (Circle **310**)	Sulzer (Circle **328**)
Lawrence H. Gianella	Tampa Ship (Circle **311**)	IHI/Sulzer (Circle **329**)
Mineral Nippon	Mitsui (Circle **312**)	Mitsui/B&W (Circle **330**)
Nord Baltic	Samsung (Circle **314**)	KHIC/B&W (Circle **332**)
Ormand	Mitsubishi (Circle **315**)	Mitsubishi/Sulzer (Circle **333**)
Olympia	Wartsila-Turku (Circle **316**)	Wartsila/Pielstick (Circle **334**)
Otso	Wartsila-Helsinki (Circle **317**)	Wartsila Vasa (Circle **335**)
M/T Rio Gas	Lindenau (Circle **318**)	MAN B&W (Circle **322**)
Skulptor Tomskij	Aalborg (Circle **319**)	Bryansk/B&W (Circle **336**)
Song He	Seebeckwerft (Circle **320**)	MAN B&W (Circle **322**)
Stolt Sapphire	Daewoo (Circle **321**)	Hyundai/B&W (Circle **325**)

Major Suppliers Advertising In The December 1986 Issue Of Maritime Reporter

SUPPLIER	**Circle Number**	**SUPPLIER**	**Circle Number**
Aalborg	150	Krupp Atlas	164
Alden	151	Krupp MaK	167
COMSAT	152	Liebherr	168
Envirovac	153	Lips BV	169
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Frank Mohn/Framo	156	Philadelphia Resins	172
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Kahlenberg	162	Tracor	180
Kearfott Div/Singer	163		

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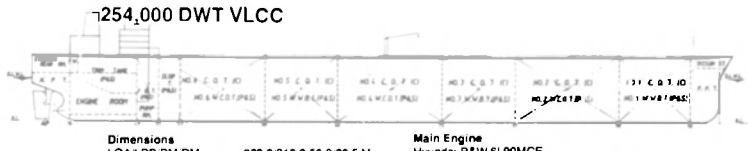
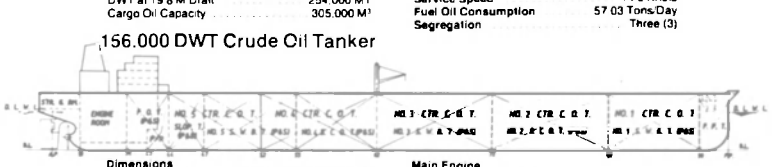


Dimensions
LOA/LBP/BM/DM 322.0/310.0/56.0/29.5 M
Draft (Design Scantling) 19.8 M
Deadweight & Capacity
DWT at 19.8 M Draft 254,000 MT
Cargo Oil Capacity 305,000 M³

Main Engine
Hyundai-B&W 6L90MCE
DMCR 22,110 BHP x 67.7 RPM
NCR 19,900 BHP x 65.4 RPM
Service Speed 14.0 Knots
Fuel Oil Consumption 57.03 Tons/Day
Segregation Three (3)

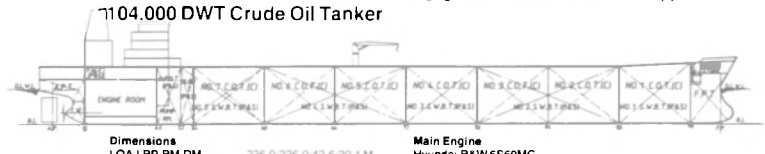
156,000 DWT Crude Oil Tanker



Dimensions
LOA/LBP/BM/DM 274.0/264.0/46.2/8.22.5 M
Draft (Design Scantling) 15.02/16.90 M
Deadweight & Capacity
DWT at 16.9 M Draft 156,000 MT
Cargo Oil Capacity 162,200 M³

Main Engine
Hyundai-B&W 6S70MC
DMCR 19,520 BHP x 88 RPM
NCR 17,570 BHP x 85 RPM
Service Speed 14.5 Knots
Fuel Oil Consumption 51.8 Tons/Day
Segregation Three (3)

104,000 DWT Crude Oil Tanker



Dimensions
LOA/LBP/BM/DM 236.0/226.0/42.6/20.1 M
Draft (Design Scantling) 12.19/14.9 M
Deadweight & Capacity
DWT at 14.9M Draft 104,000 MT
Cargo Oil Capacity 110,000 M³

Main Engine
Hyundai-B&W 6S60MC
MCR 11,200 BHP x 78.0 RPM
NCR 10,100 BHP x 75.3 RPM
Service Speed 14.0 Knots
Fuel Oil Consumption 30.2 Tons/Day
Segregation Three (3)

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Circle 120 on Reader Service Card

knots at the design draft on a daily bunker consumption of 35.8 metric tons of heavy fuel oil, including full seaload on a 900-kw shaft generator.

The ship has 58 cargo tanks, each served by individual stainless steel cargo piping and individual hydraulically driven deepwell pumps, and 13 transverse cofferdams that effectively separate each cross-over group of cargo tanks. These features permit safe, segregated carriage of up to 58 different cargoes on the same voyage.

Many additional features add to the versatility of these parcel tankers. The air dehumidification plant for moisture control, the nitrogen storage plant and inert gas generator, availability of cargo heating by thermal oil, hot water or steam (up to 230 F in certain tanks), and the Skarpenord computerized Cargomaster cargo monitoring and control system, all enhance the cargo-handling capabilities of the ship.

Stolt-Nielsen caters to the "drugstore" trade on its worldwide tanker trade routes. These are the smaller bulk parcels that require the most careful handling. The delivery of the Sapphire and her four sister ships will increase the company's capabilities in this increasingly important transportation segment.

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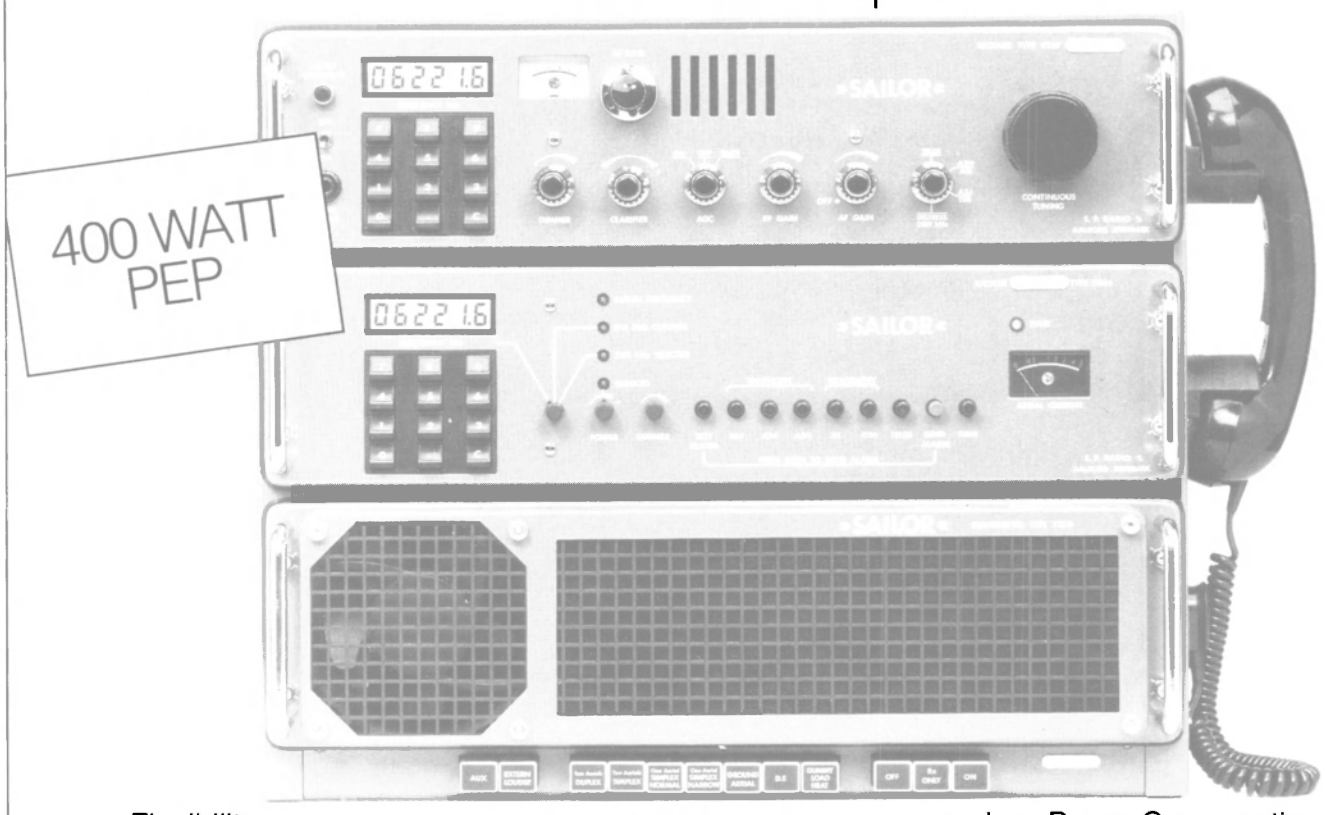
SSB HIGH POWER Short Wave Programme 1000/B with Aerial Coupler



Flexibility

SAILOR Programme 1000/B is able to meet all maritime and point-to-point communication requirements within the maritime bands 1.6 - 28 MHz, and other frequency requirements in the frequency range 1.6 - 28 MHz when the exciter is equipped with option for continuous coverage.

Optional switching between USB and LSB.

The receivers cover from 10 kHz to 30 MHz continuously.

SAILOR Programme 1000/B gives assured radiocommunication by telex as well as telephony over long distances.

Automatic Tuning Aerial Coupler AT1500

The transmitter is provided with an aerial coupler AT1500, which is completely weather-resistant, made in mirror-finish, acid-proof, stainless steel, and insulator in teflon, thus making it extremely suitable for installation in arctic or tropical areas.

The aerial coupler can be placed directly at the footpoint of the aerial, either outdoors or indoors, which means no loss of transmitter power.

Easy Installation

The station can be installed precisely where it is most convenient for the operator and need not be grounded.

SAILOR Programme 1000/B is very simple and fast to operate.

Automatic Telex

The receiver and transmitter with the aerial coupler and the telex modem SAILOR H1240 form a very effective radiotelex station. Combined with scanning receiver SAILOR R1121 it becomes a fully automatic Radiotelex Station. The system works in ARQ-mode on one aerial.

Furthermore the new transmitter and receiver are fast enough to have a telex connection on one frequency (Simplex) in ARQ-mode.

Low Power Consumption

Owing to the high efficiency of the transmitter output stage and the switch mode power supplies, the power consumption is very low.

A Real Radiotelephone

SAILOR 1000/B has a professional, mechanical construction with nylon-coated cabinet and front panel. All controls in mirror-finish, chromium plated brass or impact-proof plastic.

The unique principle of transmitter, aerial coupler and power supplies ensures a high degree of reliability and that high transmitting power is kept even under extreme conditions.

SAILOR 1000/B has separate receiver and transmitter units (full Duplex) and a transmitting power high enough for world-wide communication.

Easy installation, high reliability, and world-wide service are common to all SAILOR products.

"SAILOR" PROGRAMME 1000/B

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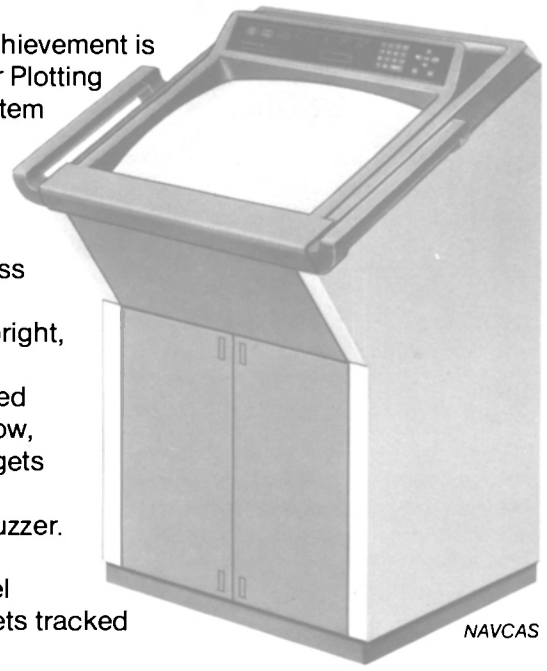
Hitachi Zosen set a new course for computerized and automated ships.

NAVCAS Automatic Radar Plotting Aids.

Hitachi Zosen is constantly looking for ways to improve the safety, efficiency and economy of ship operation. Years of intensive research and development have led to new breakthroughs in computerized and automated systems.

The latest Hitachi Zosen achievement is the NAVCAS Automatic Radar Plotting Aids. This remarkable subsystem provides the operator with up-to-the-minute collision-avoidance information by processing signals from any type of radar, gyrocompass or speed log on the market. It displays all information on a bright, easy-to-read 26″ color CRT — hazardous targets are indicated by a change from blue to yellow, with extremely hazardous targets changing from yellow to red, accompanied by a warning buzzer. Operation is simple and easy through the latest touch-panel technique, with up to 20 targets tracked automatically, or manually.



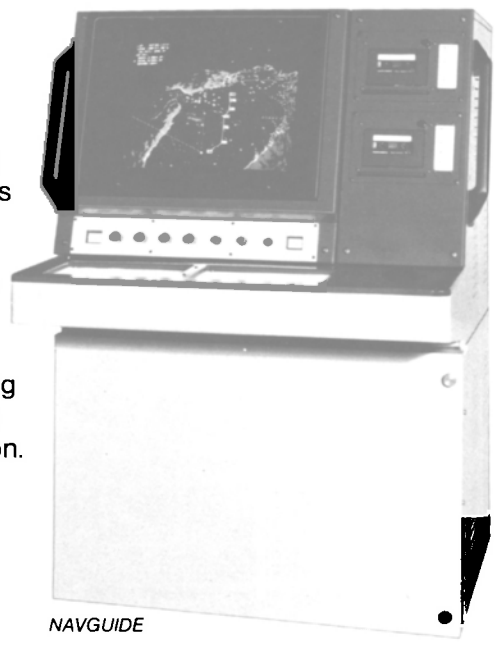
NAVCAS

This new system, together with the other systems shown here, provides you with a complete navigation package that improves both safety and efficiency.

NAVGUIDE for narrow water and harbor navigation.

This breakthrough system allows safer operation in the navigation of constrained areas, such as narrow channels and harbors. It also reduces crew labor, through electronic displays and automation.

NAVGUIDE has advanced features such as simultaneous display of radar raw video, color display of chart information, ship's route information, and various navigational data, including accurate ship's position fixing, course keeping, and alarm for course deviation. With these advantages, NAVGUIDE is indispensable for safer, more efficient navigation of coastlines, harbors, and other constrained areas.



NAVGUIDE

TRANSOLINE MK-II Integrated Automatic Navigation System.

The TRANSOLINE System, first installed in 1976, has computer-controlled, highly-accurate steering, and has consistently reduced both sailing mileage and fuel consumption.

This efficiency has been carried even further with the state-of-the-art TRANSOLINE MK-II.

Designed for container ships, PCC, reefers and other high-speed vessels, MK-II handles complex calculations and routine tasks, and displays the needed navigational data on a CRT.

Navigation language is in 4-letter commands for easy man-machine communications using a keyboard. A "hybrid" positioning-measuring system gives you fast, accurate determination of position, using Loran-C, NNSS, Omega receiver, or Decca navigator data. In addition, computer-controlled autotracking saves labor, improves safety, and cuts fuel usage.

TRANSOLINE MK-II

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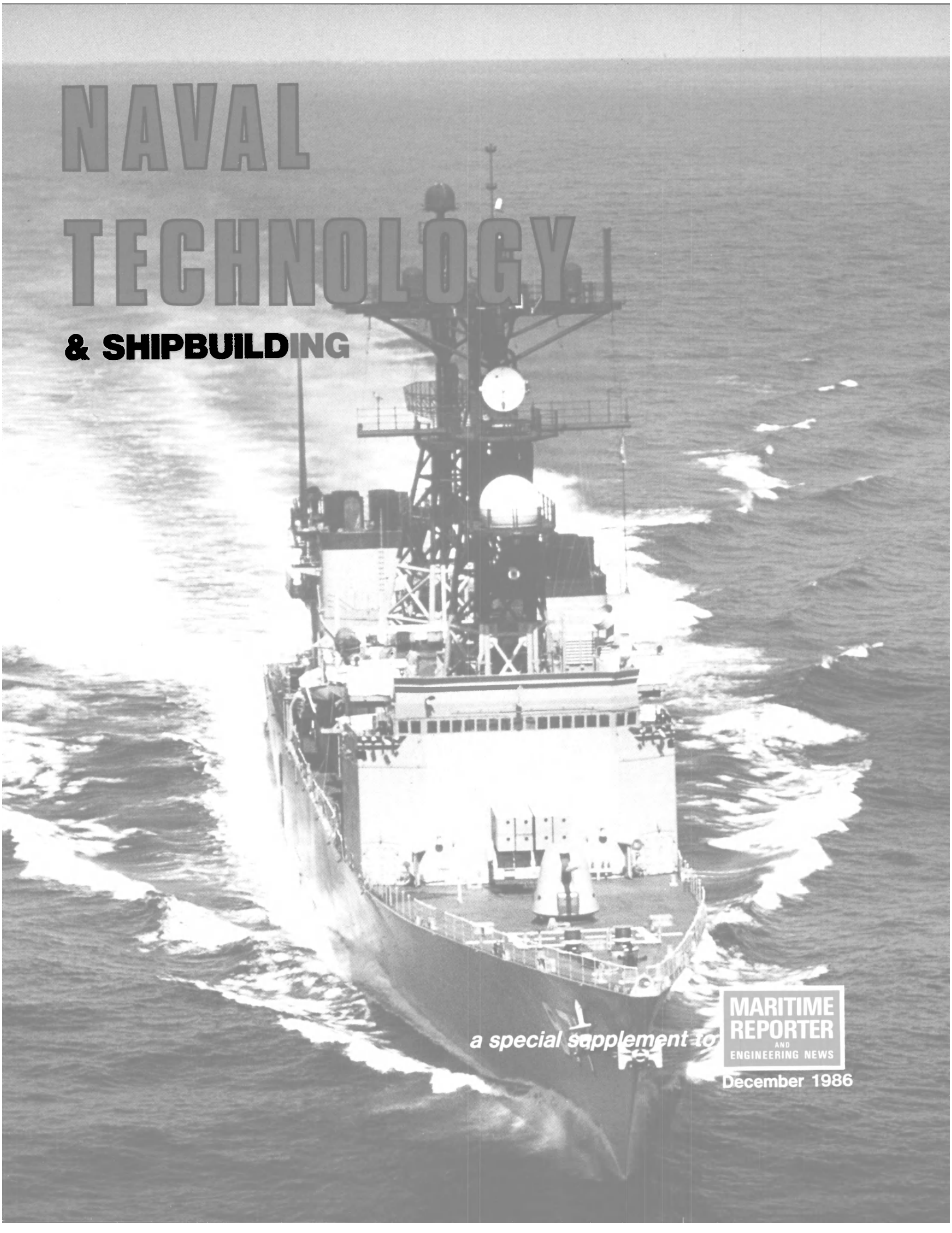

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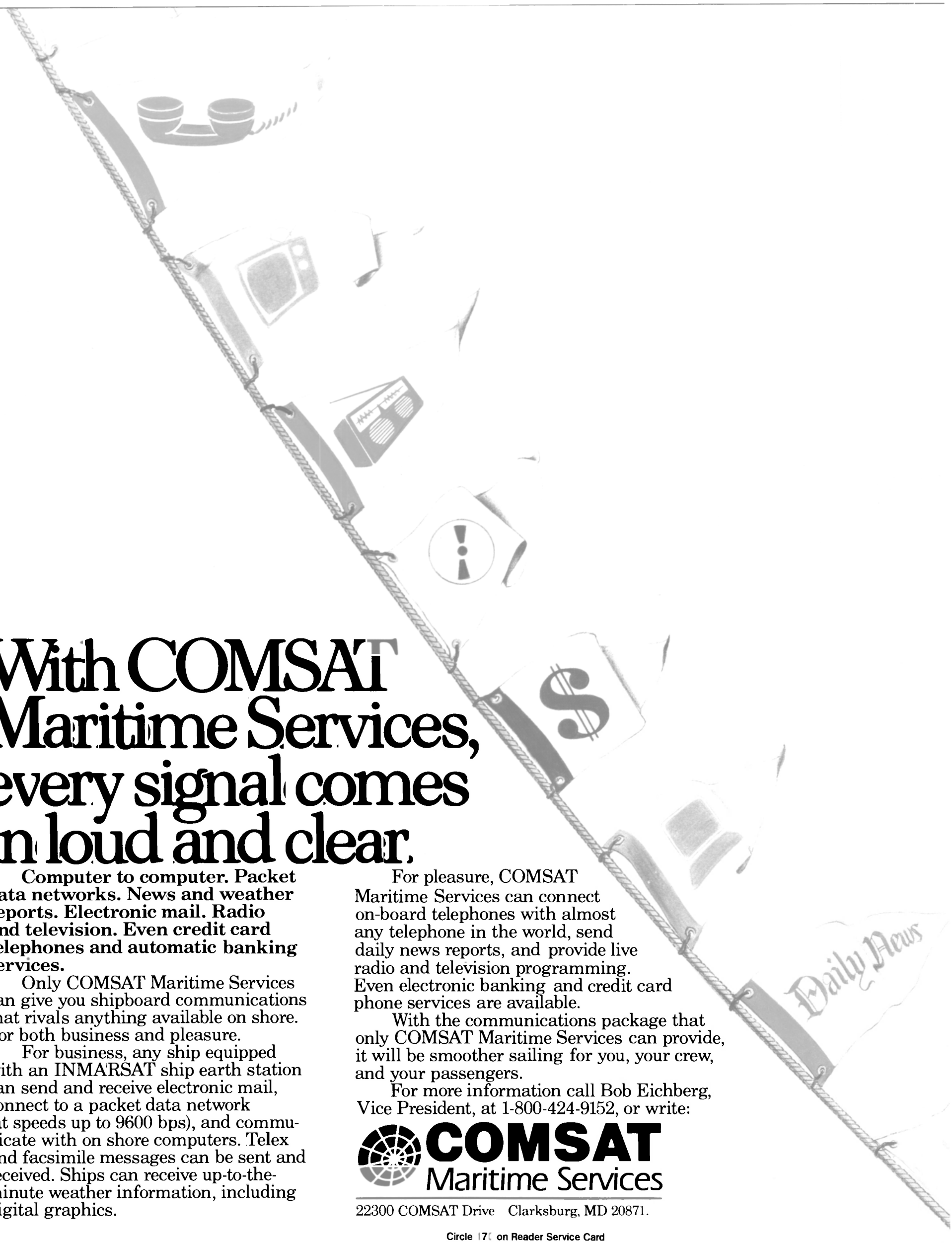
December 1986



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THEODORE ROOSEVELT (CVN-71) COMMISSIONED

Milestone In Newport News Shipbuilding's 100th Anniversary Celebration

The U.S. Navy's fifth nuclear-powered aircraft carrier, Theodore Roosevelt (CVN-71), came alive recently at the Newport News Shipbuilding yard, Newport News, Va., 16 months ahead of schedule and $80 million under budget. In a light, steady rain the ship's crew waited for the order of their new commanding officer, Capt. **Paul W. Parcells.** When he said, "USS Theodore Roosevelt, come alive," a crowd of some 20,000 cheered and applauded.

As the crew came to attention, 16 aircraft in close, four-diamond formation flew directly up the centerline of the ship. The flight, representing Carrier Air Wing Eight soon to be embarked on the Roosevelt, consisted of four each F-14s, FA-18s and A-6s and two each E-2s and S-3s from Carrier Air Groups Eight and 13.

The principal offensive striking power on the Theodore Roosevelt will be shared by two attack aircraft: the A-6E Intruder all-weather attack aircraft and the F/A-18 Hornet strike fighter.

The primary air defense force for Theodore Roosevelt and her surface escort ships will be provided by the E-2C Hawkeye/F-14A Tomcat team, which maintains a defensive barrier of several hundred miles around the carrier battle group and ensures that no unknown ships or aircraft cross the barrier.

The S-3A Viking, the Navy's carrier based anti-submarine warfare aircraft, and the SH-3 Sea King helicopter, working closely with the carrier's Anti-Submarine Warfare Module, provide a highly effective sea-going weapons system to search out enemy submarines.

Airborne electronic defense will be provided by a squadron of EA-6B Prowlers.

USS Theodore Roosevelt, named for the 26th President of the United States, is the 15th deployable carrier in service today and the 11th active carrier built by Newport News Shipbuilding. She is the fourth ship in the Nimitz class, displaces 97,000 tons and achieves speeds in excess of 30 knots powered by two nuclear reactors.

As a key element of the nation's forward defense strategy, USS Theodore Roosevelt is tasked with maintaining open sea lanes of trade and communication. With 85 tactical aircraft and more than 6,200 professional Navy men aboard, she is one of the most powerful warships ever built.

Barbara Lehman, Secretary of the Navy **John Lehman's** wife, sponsored the ship and approved the ship's seal together with **Grace McMillan,** the Matron of Honor and the first grandchild of President **Theodore Roosevelt.**

Secretary of Defense **Caspar W. Weinberger** was the principal speaker at the commissionary ceremony. He said, **"Theodore Roosevelt** was a man of vision and peace, whose policies guided the United States toward the position we now hold—the world's most powerful defender of freedom.

"Nothing we as a nation might do to honor **Theodore Roosevelt's** legacy more appropriately captures his strength of spirit and the force of liberty than this great ship."

Mr. **Weinberger** continued, "this ship is being delivered to the Navy 16 months ahead of schedule and more than $80 million under program costs."

Secretary **Lehman** and **Carlisle A. H. Trost,** Chief of Naval Operations, also spoke at the commissioning ceremony.

Admiral **Trost** said of the commissioning ". . . I have no doubt it will cause concern in the minds of those who might challenge us at sea. And they might also wonder, despite the weather, why so many people are here this morning on this occasion. Could it be there really is a great appreciation by the citizens of our country of the need for a strong Navy?

"There is proof of that belief and I would say to those who might challenge us, you bet there is an appreciation. You'd better look out. We are good. We are ready and we intend to stay that way."

(continued)

Theodore Roosevelt Commissioned

(continued)

100 Years of Shipbuilding Leadership

The delivery to the U.S. Navy of the Theodore Roosevelt by Newport News Shipbuilding is a fitting climax to this leading shipyard's year-long celebration of its 100th anniversary.

The company's first U.S. Navy contract in 1893 was for the construction of three gunboats, the Nashville, Wilmington, and Helena, and marked the beginning of a long association between Newport News Shipbuilding and the Navy that continues today.

In early 1942, the Navy began the conversion of five light cruisers to light carriers. They were 11,000-ton, 610 foot warships capable of 32 knots and carried 35 planes. The first carrier, Independence, was finished in 1943, and by the end of World War II, 17 Essex-class and nine Independence-class carriers were operational.

During the war, the names of Newport News-built carriers were legendary. Yorktown. Enterprise. Essex. Intrepid. Randolph. Hornet, from which **Jimmy Doolittle** launched his B-25 attack against Tokyo. And Franklin, which was the first large U.S. carrier to suffer extensive damage from a kamikaze attack, limped home to the U.S. under her own power.

The post-war years saw the evolution of the Midway-class carriers which were completed in 1945 to 1947, and were the first U.S. carriers to have armored flight decks. The Midway and Essex-classes were later modified for jet aircraft operation.

In 1955, Newport News Shipbuilding built the country's first supercarrier, the Forrestal, 1,039 feet long and designed specifically for jets. She had a large starboard "island" design with four deck-edge elevators that reduced the interruption of flight and hanger deck activities associated with center-line elevators.

The world's first nuclear-powered aircraft carrier was built by Newport News Shipbuilding and delivered to the Navy in 1961. Named the Enterprise, the 1,102-foot-long vessel displaces 85,350 tons and has eight nuclear reactors. During the Vietnam War, the Enterprise was the first nuclear-powered warship to see combat.

In 1975, Newport News delivered the Nimitz, one of the largest mobile structures ever built. The Nimitz and the others in her class, the Dwight D. Eisenhower and Carl Vinson, are 1,092 feet long, displace 91,000 tons and carry about 100 planes and 6,000 sailors.

Newport News is currently building two more Nimitz-class carriers, the Abraham Lincoln (to be delivered in 1989) and the George Washington (to be delivered in 1991).

For the past 50 years Newport News Shipbuilding has been the country's premier designer and builder of 23 of the ocean's mightiest ships—the aircraft carrier.

For free color literature detailing the shipbuilding services and facilities offered by Newport News Shipbuilding,

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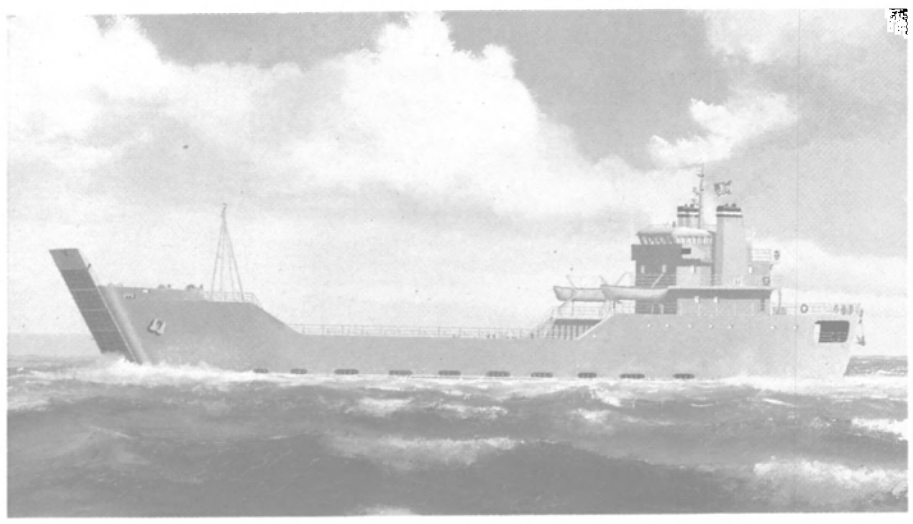

Artist's conception of one of the four logistic support vessels that will be built by Moss Point Marine's Escatawpa, Miss., yard, for operation by the U.S. Army.

Moss Point Marine Awarded $40.7-Million Navy Contract To Build Four LSVs

Moss Point Marine, Inc., has been awarded a $40.7-million U.S. Navy contract to build four logistic support vehicles (LSV). According to **John Dane III,** president of the Escatawpa, Miss., yard, the contract is the largest the company has received since its founding in 1980.

The all-steel landing vessels will each be 272-feet long with 60-foot beams and depths of 16 feet 5 inches. Each LSV will be powered by two 16-cylinder engines developing a total of 3,900 bhp.

The contract was awarded by the Navy's Military Sealift Command, and the Navy's Supervisor of Shipbuilding, Conversion and Repair, Pascagoula, Miss., will administer the contract. The LSVs, however, will be operated by the U.S. Army.

The landing craft feature hinged bow and stern ramps, and are designed to carry RO/RO cargo directly to beach and landing areas that do not have docking facilities.

The LSV design is based on the RO/RO vessel Frances Bay, built in Singapore in 1980, and designed by the Sydney office of Burness, Corlett, a British naval architecture firm.

Seaworthy Systems, Inc., Essex, Conn., was selected by Burness, Corlett to redesign the vessel to U.S. regulations and Army requirements.

Construction of the LSVs began in November, with delivery of the first ship expected to be in the fall of 1987, with one vessel every 60 days thereafter.

For free literature containing complete details on the shipbuilding and repairing services and facilities offered by Moss Point Marine,

Circle 8 on Reader Service Card

Third Aegis Cruiser PSA Awarded To Todd

According to a recent announcement by Todd Shipyards Corporation chairman **H.K. Schaefer,** the Naval Sea Systems Command has exercised its option for the Post Shakedown Availability (PSA) of the Aegis cruiser USS Bunker Hill at the Los Angeles Division of Todd Shipyards. Mr. **Schaefer** said, "the Bunker Hill will be the third PSA performed by Todd on Aegis-equipped ships and will provide an excellent opportunity to gain more hands-on experience with Aegis ship technology." The three-ship contract has an estimated value of $14.8 million.

Len Thorell, vice president and general manager of Todd's Los Angeles Division, said "highly successful PSAs have already been completed on the USS Vincennes and USS Valley Forge. Additionally, the Navy may exercise an option for a fourth PSA on the USS Antietam."

PROVED ENGINEERING AND DEPENDABILITY

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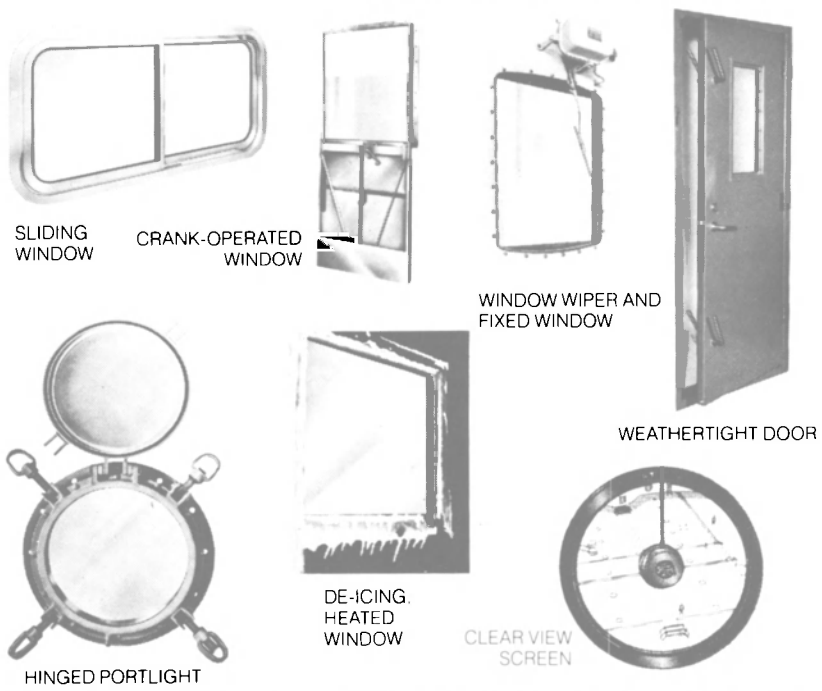

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Circle 205 on Reader Service Card

New Book Accounts Histories of 500 Ships Built By Newport News

A new hardcover book, "Always Good Ships," takes a retrospective look at Newport News Shipbuilding, listing and describing the colorful histories of more than 500 ships built by the famous Virginia shipyard during its first century of operation.

Author **William A. Fox,** a naval architect and native of Newport News, Va., has compiled a biography of each vessel—technical information and narrative accounts—along with over 240 photographs to bring the history of the shipyard alive.

"Always Good Ships" is published by the Donning Company in a limited hardback edition of 1,500 copies, numbered and signed by the author.

The 387-page hardback book is priced at $29.95 and available only from the publisher. For your copy write: The Donning Company, Attention: "Always Good Ships," 5659 Virginia Beach Blvd., Norfolk, Va. 23502. Add $3 per order to the above price for shipping, handling and insurance. Virginia residents should add $1 per book for sales tax, or for additional information

Circle 234 on Reader Service Card

$3.2-Million Navy Contract To TRE-ASTECH To Supply Carrier Hangar Doors

TRE-ASTECH, Los Angeles, Calif., a division of TRE Corporation, recently announced the receipt of a contract for $3.2 million plus additional options to supply large hangar access doors of advanced lightweight design for the U.S. Navy aircraft carrier USS America (CV-66).

This contract is the third major aircraft carrier-related project awarded to TRE in recent months which includes specialty lightweight deck and bulkhead structural assemblies for shipboard avionics shops and storage compartments.

TRE Corporation designs and fabricates advanced structures for the aerospace and marine industries and supplies locksets and plumbing specialty products to the homebuilding industry.

Safety Coating Developed For Navy Is Commercially Available For Marine Use

After two decades of proven reliability aboard flight decks of aircraft carriers, a general purpose, heavy duty, non-slip deck coating is now commercially available from American Abrasive Metals Company. The new abrasive coating known as Epoxo has wide application for boat landings and on decks of commercial fishing boats, etc.

Formulated with epoxy resins to give maximum adhesion to wood, steel and concrete, Epoxo is said to be unaffected by salt water and is resistant to most solvents, gasoline, fuels, oil, grease and hydraulic fluids commonly associated with docking facilities. It is particularly effective in areas exosed to salt water during high tides or to rain such as on ladders, vehicular and pedestrian ramps and docks or piers. For commercial fishing boats Epoxo provides anti-slip protection on decks where fish oil, chum and seawater can cause slippery conditions.

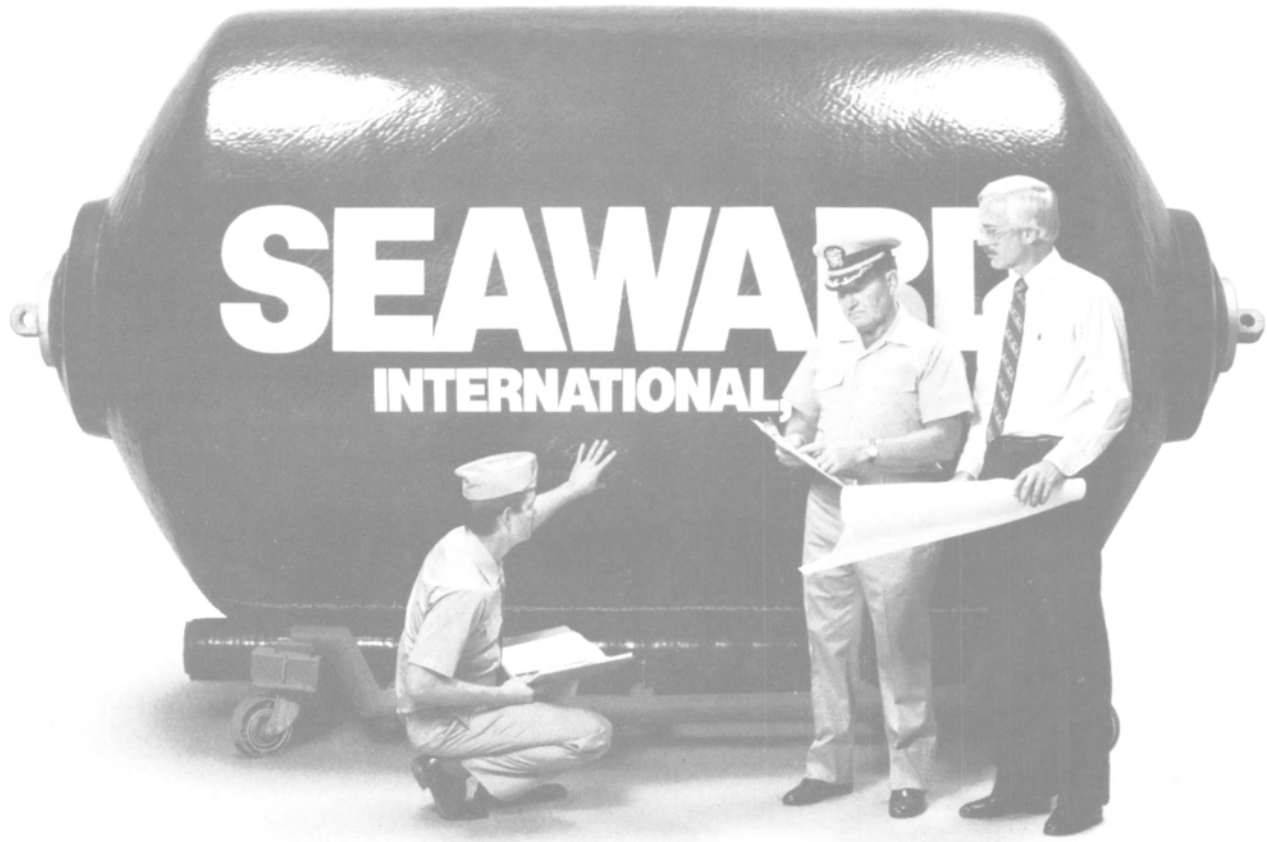
Epoxo can be applied with a roller, trowel or spray over properly prepared wood, metal and concrete surfaces including new concrete. In all cases the non-slip coating tenaciously adheres to the surface, acting as a barrier against penetration of oil and grease. A special urethane prepolymer by American Abrasive called Non-Skid Sealer can be applied to Epoxo to prevent any further penetration of oil or grease into the concrete. Available in colors of dark gray, tile red, beige and yellow, Epoxo will hard-dry in 24 hours.

American Abrasive Metals Company has been designing and manufacturing military, marine and industrial products for 75 years. The flight decks of all U.S. Navy aircraft carriers built since 1962 have been coated with Epoxo.

For more information and free literature on Epoxo and other nonskid safety products from American Abrasive Metals Company,

Circle 3 on Reader Service Card

The Seaward dock fender. If the U.S. Navy thinks it's good enough for the 1990's maybe it's good enough for your facility now.



The U.S. Navy has chosen Seaward dock fenders to protect Pier Zulu, in Charleston, S.C. This new 20 million dollar pier will be the prototype of the Navy's pier designs for the 1990's. Seaward's fenders have also been installed on new Navy berthing facilities in San Francisco, Mayport, and Key West. These fenders are being included in the design of new home port facilities and are being used in the upgrading of Navy docks around the world.

Seaward dock fenders are constructed of a tough, snag-free elastomer coating. And Seaward's closed-cell foam center has a very high energy absorption capacity but a low reaction force. These fenders provide stand-off and safely cushion the impact of approaching vessels, whether they're tugboats or battleships. Yet Seaward dock fenders are as easy to install as they are rugged.

The U.S. Navy didn't settle for an ordinary fender to protect Pier Zulu. So why should you? For more information contact Seaward International, PO. Box 98, Clearbrook, Virginia 22624. Telephone: (703) 667-5191, Telex: 275034 SEAWARD UR.

SEAWARD INTERNATIONAL, INC.

Circle 135 on Reader Service Card

U.S. NAVY SHIP PROCUREMENT

THE FY 87 NAVY SHIPBUILDING AND CONVERSION BUDGET—

An Update On Market Developments

By James R. McCaul, President
International Maritime Associates, Inc.

International Maritime Associates, Inc. publishes quarterly market assessments of Navy ship and ship systems procurement. This article is an excerpt from the November quarterly review. Information in this article is current as of November 1.

EDITORS NOTE: *This Article is not the full quarterly report. It is an excerpt and represents less than 15 percent of the actual data contained in the complete review.*

HOW TO ORDER THE COMPLETE REVIEW

Every three months International Maritime Associates, Inc. publishes a detailed review of the U.S. Navy ship procurement market. These quarterly reviews (30 + pages) provide a totally objective assessment of current and prospective Navy business. Both shipbuilding and ship systems/ordnance procurement are addressed. Each reviews contains a hard hitting assessment of specific programs, lists all major contracts awarded by the Navy, identifies future market opportunities and provides a current directory of key Navy contacts.

More than 220 companies now subscribe to IMA's quarterly market review. The price of a one year subscription is ***$380.*** *The market review can be ordered by contacting,* ***International Maritime Associates, Inc., 3050 K Street N.W., Suite 345, Washington, D.C. 20007, (202) 333-8501***

SHIPBUILDING AND CONVERSION

The Navy requested funding for 24 ships in FY 1987. Congress authorized and appropriated funds for 21 ships. Details are shown in Exhibit 1.

Aegis Ships (CG and DDG)

Funds were provided to build three CG-47 cruisers and two DDG 51 destroyers. Three DDGs were authorized—but only two have been funded. One of the FY 87 DDGs is to be awarded to a second source builder. Todd, Ingalls, Avondale and NASSCO are planning to bid on the follow ship contract.

Coastal Minehunter (MHC)

Reflecting strong political pressure, the Navy developed a fall back plan to build all MHCs in the U.S. A U.S. division of Intermarine (Italy) will receive the lead ship contract. The Navy had wanted to build the first ship overseas and phase in production in this country. The appropriations conferees instructed the Navy to use FY 1986 MSH funds for this program "provided that all MHC ships are built in the U.S. and that the follow-on ships be awarded competitively and selected by the Navy."

Fast Combat Support Ship (AOE)

House/Senate conferees agreed to provide $499 million for construction of the lead AOE. The Navy requested $613 million. The Senate had earlier rejected the AOE on the basis of funding constraints.

Meanwhile, proposals to build the AOE were submitted on October 31. Six yards were invited to submit proposals. Four or five (Avondale, NASSCO, BethSteel, PennShip—maybe Litton) have submitted bids. The contract will be for one ship with three option ships. The contract award is planned in late December.

Oceanographic Ship (AGOR 23)

This year's budget provides $33 million to build an oceanographic ship. A circular of requirements (COR) providing required performance parameters is to be issued this month. Proposals will be submitted in May. The contract award is planned for next August or September.

Coastal Hydrographic Vessels (TAGSC)

The Navy was given $35 million to procure and convert fishing boats for use as hydrographic vessels. They are being referred to as mini-TAGS and will be used for oceanographic use.

A circular of requirements (COR) will be issued inviting owners of fishing boats or small freighters to submit proposals. The conversion contract will probably be awarded in 10-14 months.

Strategic Sealift

The appropriations conferees provided $78 million to purchase ships for the ready reserve fleet. This is $50 million more than the Navy's request. The conferees directed the Navy to "examine the possibility of using a portion of these funds to take advantage of a unique opportunity to acquire a roll-on roll-off vessel built in the United States (in) 1975 which is a sister ship of vessels already in the reserve fleet."

New Carrier(s)

The Navy is understood to have included long lead item funding for a new aircraft carrier in the FY 1988 budget request. Funding may be requested for two sets of long lead items. The Navy now has 15 carriers in active service and two under construction. The proposed new carrier(s) would be delivered in the late 1990s and replace older ships now in service. Newport News will be the major beneficiary of this funding.

SWATH TAGOS

McDermott was the successful bidder for the lead SWATH design TAGOS. Its price of $25.4 million is understood to be significantly under the next lowest bidder. The Navy plans to buy nine of these twin-hull ships.

Amphibious Assault Ships (LHD)

Ingalls won the LHD follow ship competition. On September 11 the firm received a $402.5 million fixed price incentive contract for one ship, with priced options for two additional ships. Three other bids were received.

Funding Recisions

The appropriations conferees agreed to rescind $1.3 billion in prior year shipbuilding and conversion funding. Actual costs to build ships are running significantly below estimated costs and Congress decided to recover some of the excess funds for ships contracted over the past four years. The Navy ship funding recisions represent 24 percent of total defense funding recisions ordered by the appropriations conferees.

A major portion ($338 million) of ship funding recisions was directed at the LHD program. The award of the LHD follow ship contract was made in mid-September—in time for the appropriation conferees to note an award price $300-400 million under Navy expectation.

(continued)

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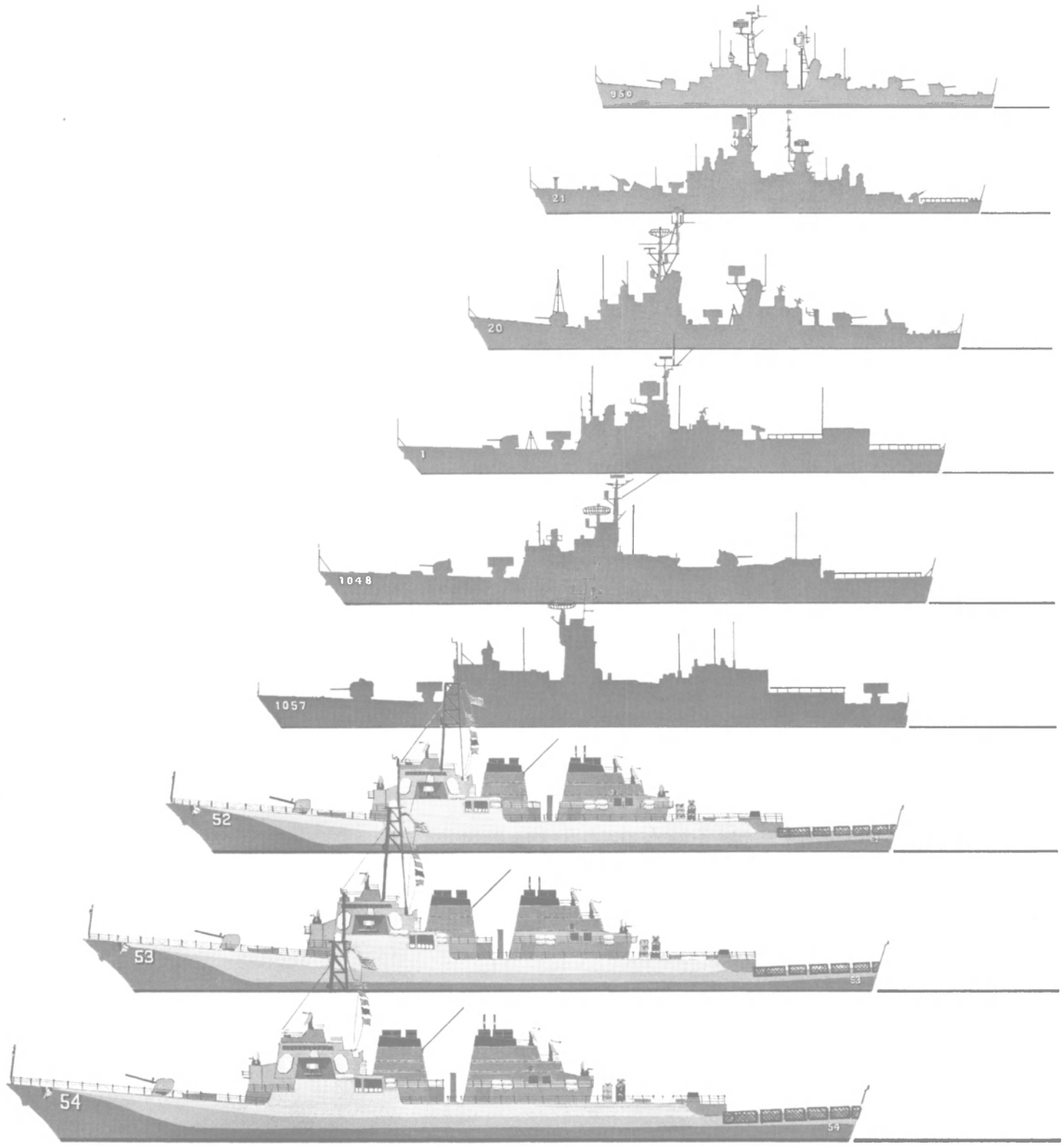

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Navy

(continued)

WEAPONS AND SHIP SYSTEMS

The Navy requested $23.2 billion in FY 1987 for development and procurement of weapons and ship systems. Congress appropriated $20.7 billion. Details are shown in Exhibit 2.

The current status of individual programs, analysis of contract awards, updated names and phone numbers for key contracts, and other business data are provided in IMA's November quarterly report. A one-year subscription to four quarterly market reports is available for $380 from International Maritime Associates, Inc., 3050 K Street, NW, Washington, D.C. 20037, or telephone (202) 333-8501.

Exhibit 1--Legislative Action on FY 1987 Navy Shipbuilding and Conversion Budget
($ in millions)

	Budget Request		Authorization		Appropriations	
Program	**No. Ships**	**$**	**No. Ships**	**$**	**No. Ships**	**$**
Trident Submarine (SSBN)	1	$ 1,509.1	1	$ 1,446.4	1	$ 1,446.4
Attack Submarine (SSN-688)	4	2,332.6	4	2,250.8	4	2,250.8
New Attack Submarine (SSN-21)	—	454.3	—	454.3	—	375.0
Carrier Modernization (CV SLEP)	—	83.5	—	83.5	—	83.5
Aegis Cruiser (CG-47)	2	1,924.3	3	2,725.6	3	2,725.5
Aegis Destroyer (DDG-51)	3	2,527.8	3	2,470.1	2	1,750.1
Amphib. Assault Ship (LHD-1)	—	232.0	—	35.0	—	35.0
Amphib. Transport Modernization (LPD-4)	—	23.1	—	-0-	—	-0-
Coastal Minehunter (MSH-1)	4	196.1	—	-0-	—	-0-
Fleet Oiler (TAO-187)	2	275.5	2	259.0	2	259.0
Fleet Oiler Lengthening (AO 177)	1	62.3	1	32.0	1	40.0
Fast Combat Support Ship (AOE)	1	612.7	1	499.0	1	499.0
Ocean Surveillance Ship (TAGOS)	3	148.1	3	148.1	4	228.0
Oceanographic Research Ship (AGX)	1	33.0	1	33.0	1	33.0
Crane Ship Conversion (TACS)	2	61.1	2	61.1	2	61.1
Service Craft	—	39.9	—	39.9	—	74.9
Landing Craft	—	19.0	—	19.0	—	19.0
Strategic Sealift	—	27.8	—	27.8	—	77.8
Sealift Enhancement	—	20.7	—	20.7	—	-0-
Outfitting	—	226.1	—	226.1	—	217.6
Post Delivery	—	167.8	—	167.8	—	159.3
Ship Contract Design	—	69.4	—	69.4	—	-0-
Budget Adjustments	—	-0-	—	(461.5)	—	(124.0)
Total Funding		**$11,046.2**		**$10,607.1**		**$10,211.0**

Source: Defense Appropriations and Authorization Bills

Exhibit 2—Legislative Action on Other FY 1987 Navy Programs
($ in millions)

	Budget Request	Authorization	Appropriations
Weapons			
Missiles	$4,392.6	$4,199.4	$4,057.5
Torpedoes	807.5	551.9	495.1
Other Weapons	895.3	698.7	740.2
Ship support and electronics	6,538.8	5,826.9	6,033.4
Research and development	10,586.8	9,294.1	9,326.4
Total	**$23,221.0**	**$20,571.0**	**$20,652.6**

Source: Defense Appropriations and Authorization Bills

Major Navy Contracts

This special section includes major Navy contract awards issued between the dates of August 7 to November 12, 1986. For Navy contracts prior to these dates refer to MARITIME REPORTER, September 1986 issue, "Major Navy Contracts," page 37. Contracts between the dates of June 19 to August 6 are covered.

August 7

Metro Machine Corporation, Norfolk, Va., is being awarded a **$13,792,872** firm-fixed-price contract for regular overhaul of USS Mahan (DDG-42). Work will be performed in Norfolk, and is expected to be completed July 29, 1987. Twenty bids were solicited and eight were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8187).

August 8

OMI Bulk Transport Incorporated, New York, N.Y., is being awarded a **$32,196,623** modification exercising an option under a previously awarded contract for the time charter of M/V Rover, a U.S. flag tanker. Four-hundred-fifty bids were solicited, and ten offers were received. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-86-C-1704).

General Electric Company, Electronic Systems Division, Syracuse, N.Y., is being awarded a **$3,984,737** firm-fixed-price contract for 2,640 TR-203A/SQS-26BX transducer elements for the SQS-26 sonar system. Work will be performed in Syracuse, and is expected to be completed in June 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6256).

August 14

Sperry Corporation, Defense Products Group, Great Neck, N.Y., is being awarded a **$6,700,000** cost-plus-fixed-fee contract for design agent engineering support for the MK-92 fire control system. Work will be performed in Great Neck, and is expected to be completed July 31, 1987. This contract combines purchases for the U.S. Navy (81 percent) and the U.S. Coast Guard (5 percent), and for Saudi Arabia (8 percent), Australia (3 percent) and Spain (3 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5436).

August 20

Peterson Builders Incorporated, Sturgeon Bay, Wis., is being awarded a **$96,574,922** fixed-price contract with escalation provisions for two Mine Countermeasure (MCM) ships. Work will be performed in Sturgeon Bay, and is expected to be completed October 30, 1989. Two bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2190).

Marinette Marine Corporation, Marinette, Wis., is being awarded a **$51,848,816** fixed-price contract with escalation provisions for one Mine Countermeasure (MCM) ship. Work will be performed in Marinette, and is expected to be completed August 30, 1989. Two bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2189).

Long Beach Naval Shipyard, Long Beach, Calif., is the successful offeror in a competitive test program between public and private sector shipyards for the regular overhaul of USS Fletcher (DD-992). Long Beach Naval Shipyard is being assigned the overhaul on a fixed-price-incentive basis. The target price for this effort is **$22,698,021.** Work will be performed in Long Beach, and is expected to be completed September 18, 1987. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

Portsmouth Naval Shipyard, Portsmouth, N.H., is the successful offeror in a competitive test program between public and private sector shipyards for the regular overhaul of USS Kamehameha (SSBN-642). Portsmouth Naval Shipyard is being assigned the overhaul on a fixed-price-incentive basis. The target price for this effort is **$112,100,000.** Work will be performed in Portsmouth, and is expected to be completed November 10, 1988. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

National Steel and Shipbuilding Company, San Diego, Calif., is being awarded a **$14,573,936** firm-fixed-price contract for the regular overhaul of USS Albert David (FF-1050). Work will be performed in San Diego, and is expected to be completed September 11, 1987. Fourteen bids were solicited and seven offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8192).

Todd Pacific Shipyard, Pacific Division, Seattle, Wash., is being awarded a **$16,626,571** firm-fixed-price contract for the regular overhaul of USS O'Callahan (FF-1051). Work will be performed in Seattle, and is expected to be completed September 11, 1987. Fourteen bids were solicited and seven were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8232).

(continued)

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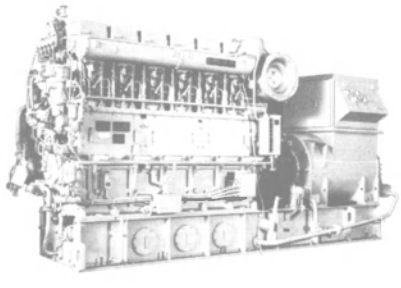

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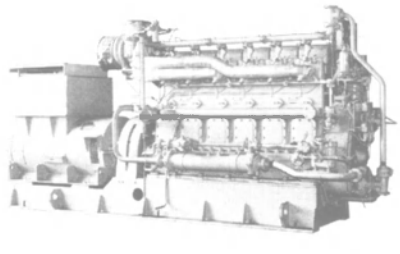

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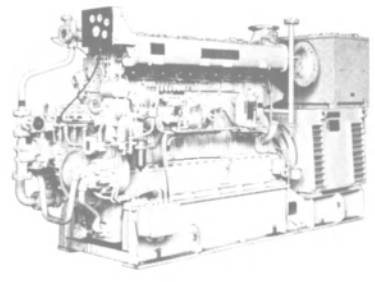

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$240-Million Modernization Program Announced For Portsmouth Navy Shipyard

Members of the Maine and New Hampshire Congressional delegations have announced a $240 million program to modernize Portsmouth Navy Shipyard. Some 600 employees were laid off or retired from the yard earlier this year as competition among Navy-owned shipyards heated up.

The project will consist of converting one of these existing drydocks to a covered facility. This will allow yard personnel to work out of the weather during winter months, and by one estimate could shave some $36 million from the $120 million cost of overhauling a nuclear submarine.

The yard management has been streamlined to reduce cost of operations. This included a reduction of personnel from 8,200 to 7,600 and has resulted in a workload projected to keep all those employed through 1988, a spokesman for the yard said.

Sparrows Point Eligible For All Navy Contracts

Bethlehem Steel's Sparrows Point shipbuilding yard, which has received two repair contracts under a limited expansion of the Navy's homeport rule, will be eligible for all Navy contracts.

Representative **Helen Delich Bentley,** who played a pivotal role in getting the **Reagan** Administration to help the ailing shipyard, announced the decision to allow Sparrows Point to bid on all Navy repair contracts.

In his initial decision to include Baltimore within Norfolk's homeport radius, Navy Secretary **John Lehman** intended that Sparrows Point be eligible for all Navy work. However, in the promulgating the change in policy, Navy brass limited the yard's role to only fixed-price contracts.

Bethlehem officials complained to Representative **Bentley** that the yard had been excluded from the Navy's list of prospective bidders on Phased Maintenance Agreements. **David Watson,** general manager at the Sparrows Point yard, said because of this omission Bethlehem did not receive bid packages for 11 ships.

NCEL Develops New Multi-Function Tool For Naval Diver Use

The first seawater hydraulic multi-function tool system ever developed for Navy divers has been approved for Navy use by the Naval Sea Systems Command (NAVSEA).

The acceptance marks the culmination of a major 10-year research and development effort by the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif.

NCEL project engineer **Bruce Farber** said the system consists of several subsystems, including (1) a self-contained power supply, (2) portable band saw, (3) rotary disc grinder, (4) rotary impact wrench/drill, and (5) rock drill. Three systems will be delivered to the Navy Underwater Construction teams early next year.

A revolutionary 3- by 3- by 2½-inch underwater hydraulic motor, that uses seawater instead of oil as the working fluid, was the first component of the system to be developed. Mr. **Farber** said seawater hydraulics offer many advantages over oil, such as no environmental pollution, dramatic reduction of tool maintenance requirements, and elimination of fire hazards and slippery oil on decks.

Perhaps the biggest advantages are enhanced equipment capabilities. There is no need for a return hose and less pump power is required. NCEL's research divers have found that reduced back pressure gives them the ability to work at greater depths. They also learned that the more flexible single-hose system was easier to handle.

$1-Million Navy Contract To Airflow Company For Dockside A/C Units

A $1,028,666 contract was recently awarded to the Frederick, Md.-based Airflow Company by the Navy Regional Contracting Center. The contract, awarded to Airflow's IMPAC Division, calls for the manufacture and delivery of eleven 75-ton air conditioning units. Airflow Company's air conditioners will provide dockside environmental control for construction and maintenance personnel working inside submarines.

The air conditioner is a single pass, portable, eight-stage unloading, self-contained unit with dual independent refrigerant circuits and six-stage electric heat. It provides automatic variable capacity control which requires only initial temperature and mode selection by an operator. The unit is one of Airflow Company's largest and has a cooling capacity of 900,000 btu/hr total.

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New Jam-Proof High-Speed Data Link Sought By Navy

According to service officials, the Navy hopes the benefits of competition will make it feasible to finally link warships with a jam-proof high-speed data system.

The Navy is laying plans to open to competition its sophisticated AN/WSC-6 communications system. Plans call for holding the competition in 1987 for a fiscal-year 1988 contract to outfit the Navy's 15 aircraft carriers with the system, said Rear Adm. **Stuart F. Platt,** the Navy's Competition Advocate General.

The WSC-6 system costs about $2.5 million each. For the carrier program, the Navy has set aside about $50 million to pay for acquisition and spares. Officials hope the costs will come down with competition. If costs come down enough, the Navy would like to put the system on other warships, including battleships, amphibious assault ships and Aegis cruisers.

The system has eluded competition thus far simply because there is no one prime contractor. Parts of the system are bought from Raytheon Co., Magnavox Government and Industrial Electronics Division, E-Systems Inc., Varian Associates Inc. and Rockwell International Corp. The Navy hands the components to a separate contractor that integrates them into a working data link.

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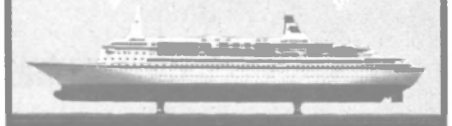

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First Honeywell Hydrostar Plus System Sold To Navy

Honeywell's offshore business has sold its first HydroStar Plus subsea tracking and relocation system to the Naval Ocean Systems Center (NOSC) in Hawaii after a successful performance demonstration in customer-funded sea trials.

Testing was conducted onboard a 48-foot vessel using a gimballed hydrophone mount. The system's capability was tested at pinger separations of 2, 3, 5 and 8 feet, with a 200-foot vertical separation.

The hydrophone, housed in a 5-inch-diameter case, integrates both the pitch-and-roll sensor and power amplifier. The newly added transponder mode allows HydroStar Plus to use slant-range measurements to accurately track subsea objects and remote-operated vehicles at large horizontal offsets from the surface vessel.

The hydrophone is calibrated at Honeywell's new test tank facility near Everett. The facility provides consistent environmental conditions and precise calibration alignment. The calibration process, coupled with Honeywell's patented self-calibrating phase-measurement process, made it possible for Honeywell to achieve the .5 percent accuracies during the NOSC sea trials.

An ultra-short baseline acoustic system, HydroStar Plus uses a single subsea beacon and a single multi-element shipboard hydrophone to provide range, bearing and depth information of subsea positions.

For further information and free literature,

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Trident Ballistic-Missile Sub Tennessee Christened At Electric Boat Division

The Trident ballistic-missile submarine Tennessee (SSBN734) was christened last month in ceremonies held at General Dynamics Electric Boat Division, Groton, Conn.

The christening was done by **Landess Kelso,** wife of the principal speaker for the occasion, Admiral **Frank B. Kelso II,** Commander in Chief, U.S. Atlantic Fleet.

Major Navy Contracts

(continued)

August 21

Puget Sound Naval Shipyard, Bremerton, Wash., is the successful offeror in a competitive test program between public and private sector shipyards for the regular overhaul of USS Alexander Hamilton (SSBN-617). Puget Sound Naval Shipyard is being assigned the overhaul on a fixed-price-incentive basis. The target price for this effort is **$110,713,798.** Work will be performed in Bremerton, and is expected to be completed November 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

August 22

Lockheed Advanced Marine Systems, San Diego, Calif., is being awarded a **$3,029,872** firm-fixed-price contract for the time charter of the research vessel R/V Transquest, a U.S. flag support vessel. The ship will be used to support deep submergence vehicles in the vicinity of San Diego. Three hundred seventy-five bids were solicited and three offers were received. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-86-C-1314).

August 26

Bollinger Machine Shop and Shipyards Incorporated, Lockport, La., is being awarded a **$5,575,000** fixed-price contract for the license, licensed material, spare parts identification list and material list for the Island class patrol boat for the U.S. Coast Guard. Work will be performed in Lockport. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2226).

Continental Maritime, San Francisco, Calif., is being awarded a **$4,878,885** firm-fixed-price contract for materials and services for the drydocking phased maintenance availability of USS Mauna Kea (AE-22). Work will be performed in San Francisco, and is expected to be completed January 27, 1987. Five bids were solicited and four offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Francisco, Calif., is the contracting activity (N62798-86-C-0103).

August 27

General Dynamics Corporation, Electric Boat Division, Groton, Conn., is being awarded a **$15,600,000** modification to a previously awarded cost-plus-fixed-fee contract for design agent support for SSBN-738. Work will be performed in Groton, and is expected to be completed June 30, 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-80-C-2075).

Portsmouth Naval Shipyard, Portsmouth, N.H., is the successful offeror in a competitive test program between public

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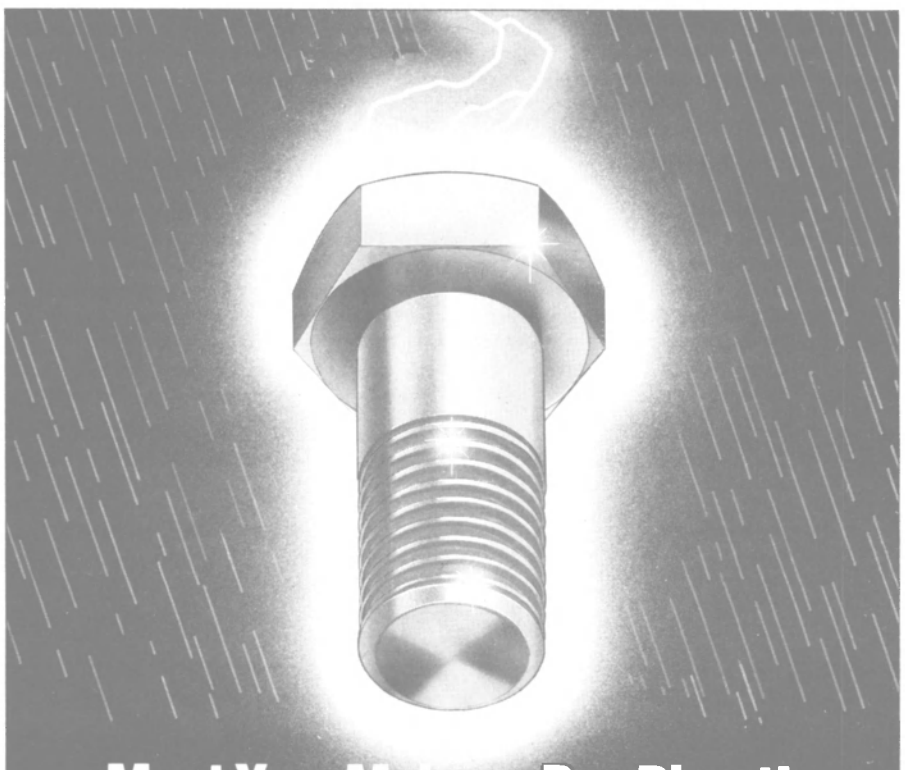

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Major Navy Contracts

(continued)

and private sector shipyards for the Selected Restricted Availability (SRA) of USS City of Corpus Christi (SSN-705). Portsmouth Naval Shipyard is being assigned the selected restricted availability on a firm-fixed-price basis. The target price for this effort is **$6,382,087.** Work will be performed in Portsmouth, and is expected to be completed September 30, 1987. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

August 28

Swiftships Incorporated, Morgan City, is being awarded a **$10,879,255** fixed-price contract for 30 patrol boats. Work will be performed in Morgan City, and is expected to be completed in December 1987. This contract is in support of a Foreign Military Sale to Cameroon. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2209).

August 29

Norfolk Naval Shipyard, Norfolk, Va., is the successful offeror in a competitive test program between public and private sector shipyards for the Selected Restricted Availability (SRA) of USS Lapon (SSN-661). Norfolk Naval Shipyard is being assigned the selected restricted availability on a firm-fixed-price basis. The target price for this effort is **$2,676,557.** Work will be performed in Norfolk, and is expected to be completed August 15, 1987. Five offers were solicited and three were received. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

Dresser Industries, Worthington Pump Division, Harrison, N.J., is being issued a **$3,115,905** delivery order for 18 trim and drain pumps for SSN and SSBN submarines. Work will be performed in Harrison, and is expected to be completed July 1, 1989. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0399).

Hewlett Packard Company, Valley Forge, Pa., is being issued a **$4,355,588** contract for 366 Model 863-B signal generators for the support of the General Purpose Electronic Test Equipment (GPETE) program. Work will be performed in Palo Alto, Calif., and is expected to be completed in November 1987. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-4668).

September 4

Ingalls Shipbuilding Division, Litton Systems, Incorporated, Pascagoula, Miss., is being issued a **$9,900,000** modification to a previously awarded cost-plus-award-fee contract for long lead equipment and material for the CG-47 Class Marine Gas Turbine Training Facility Great Lakes, Ill. Work will be performed in Pascagoula, and expected to be completed in August 1989. The Naval Sea Systems Command Washington, D.C. is the contracting activity (N00024-85-C-2016).

September 5

Rockwell International Corporation, Anaheim, Calif., is being awarded a **$11,500,000** fixed-price-incentive-letter contract for 12 Electrically Suspended Gyro Navigators (ESGN). Work will be performed in Anaheim (90 percent), and El Paso, Texas (10 percent), and is expected to be completed November 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-4095).

September 9

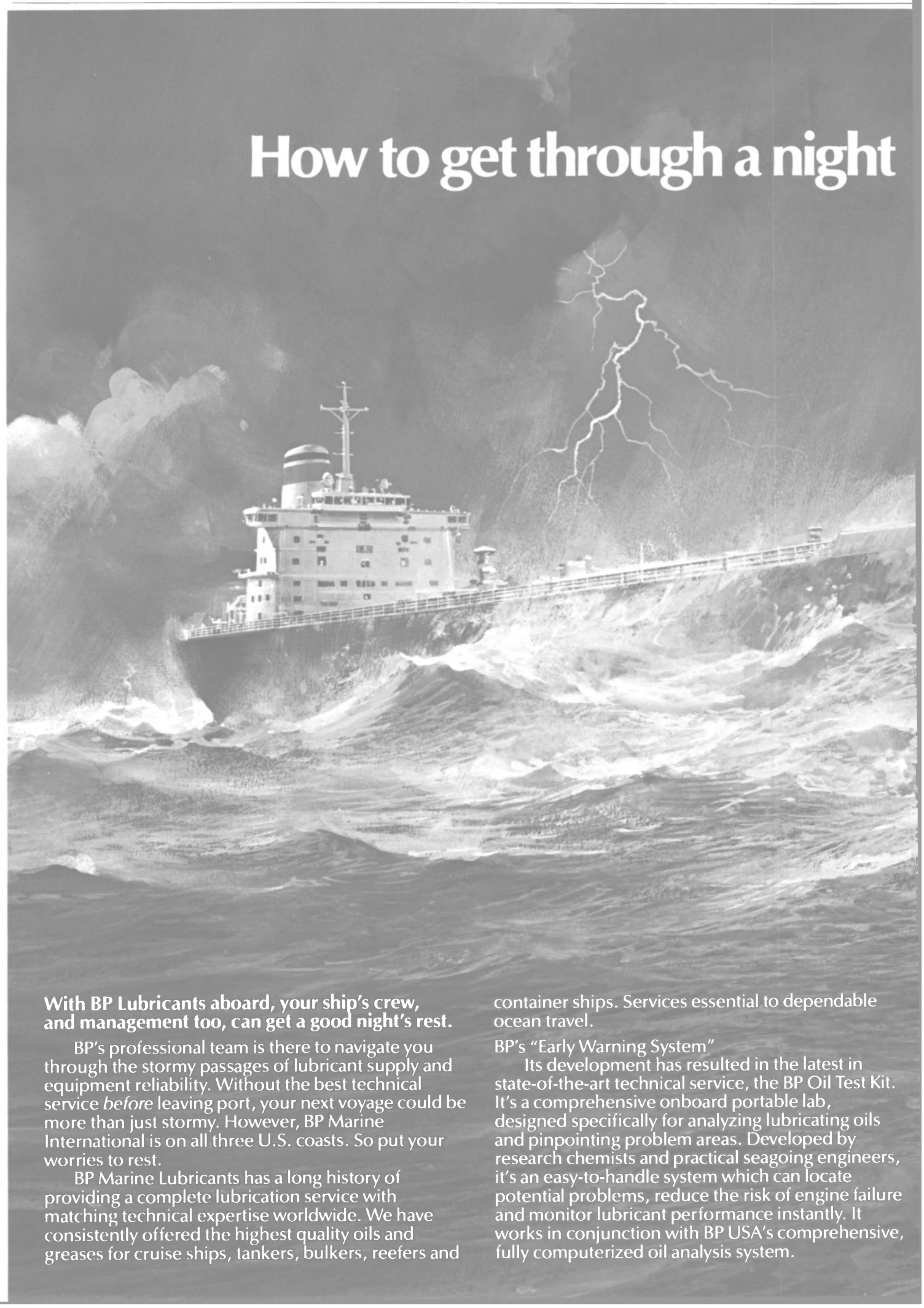
Colonnas' Shipyards Incorporated, Norfolk, Va., is being awarded a **$11,961,478** fixed-price contract with economic price adjustment for the Major Maintenance Availabilities (MMA's) of U.S. Coast Guard ships Durable and Courageous with options for the MMA's of nine other cutters. Work will be performed in Norfolk, and is expected to be completed December 17, 1987. Forty-five bids were solicited and eleven were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8134).

September 11

Scott Aviation, a Figgie International Company, Lancaster, N.Y., is being issued a **$3,184,120** contract to furnish 21,317 emergency escape breathing devices. Work will be performed in Monroe, N.C., and is expected to be completed in 1987. Ten bids were solicited and 2 offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-0032).

Litton Systems Incorporated, Ingalls Shipbuilding Division, Pascagoula, Miss., is being awarded a **$402,494,000** fixed-price-incentive contract for construction of 1 LHD-1 class multipurpose amphibious assault ship. The contract also contains priced options for an FY-88 ship and FY-89 ship. Work will be performed in Pascagoula, and is expected to be completed in April 1992. Five bids were solicited and four offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2005).

Ocean Bulk Ships Incorporated, New York, N.Y., is being awarded a **$3,500,000** fixed-price contract for the time charter of the merchant vessel M/V Overseas Harriette, a U.S. flag dry bulk carrier. The ship will be used to transport DoD coal from the U.S. East Coast to Northern Europe. Forty bids were solicited and four offers were received. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-86-C-1111).



September 12

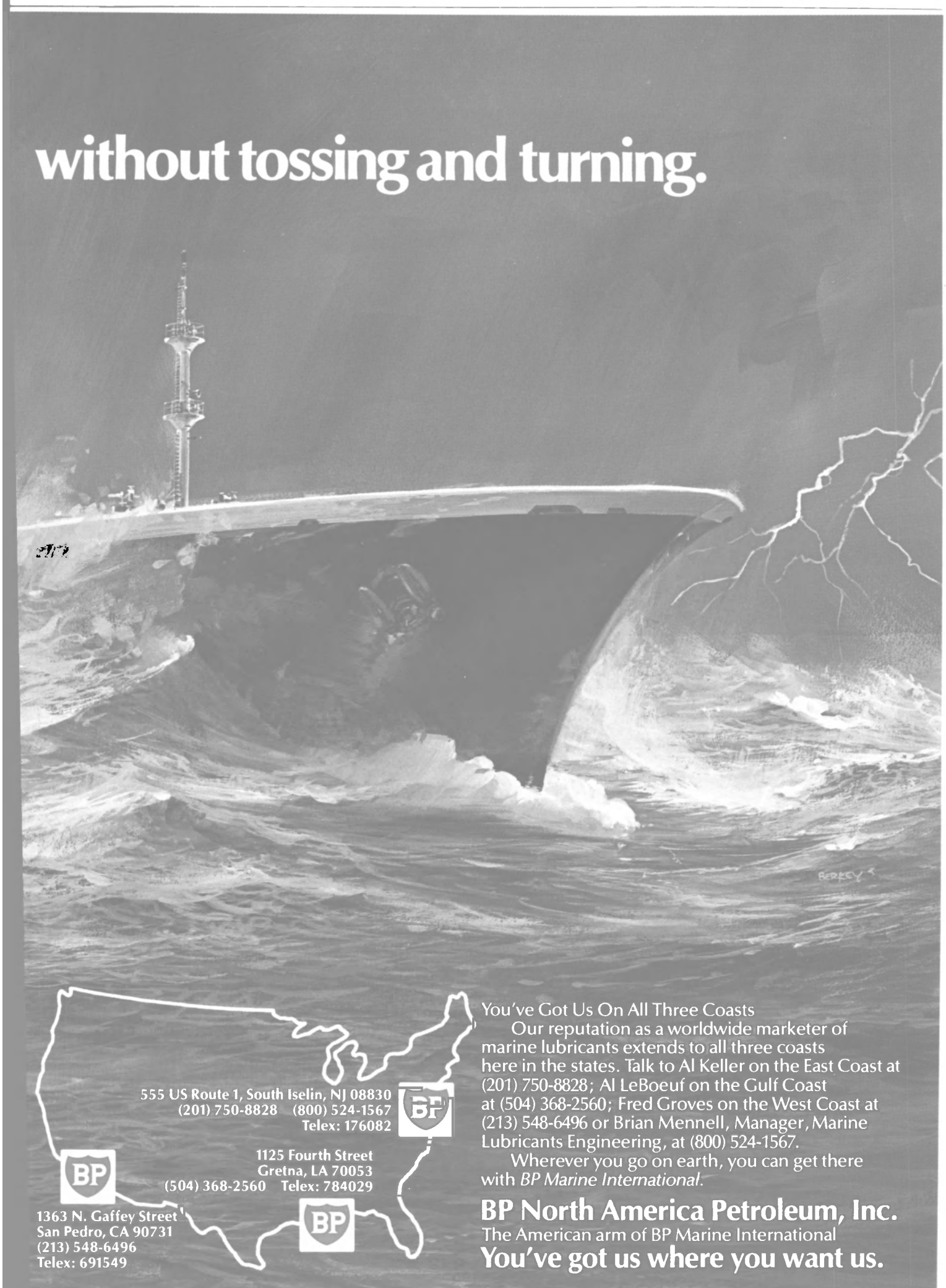
Norden Systems Incorporated, Norwalk, Conn., is being awarded a **$14,053,284** modification to a previously awarded firm-fixed-price letter contract for materials for the AN/SPS-67(V)1 radar. Work will be performed in Melville, N.Y., and is expected to be completed July 31, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7127).

Oregon Iron Works Incorporated, Clackamas, Oregon, is being awarded a **$4,246,038** firm-fixed-price contract for 50 foot workboats. Work will be performed in Clackamas, and is expected to be completed July 15, 1988. One-hundred-fifty bids were solicited and 13 offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2147).

Southwest Marine Incorporated, Terminal Island, Calif., is being awarded a **$6,064,596** firm-fixed-price contract for Drydocking Selected Restricted Availability (DSRA) for USS John A. Moore (FFG-19). Work will be performed in Long Beach, Calif., and is expected to be completed January 16, 1987. Three bids were solicited

September 17

Science Applications International Corporation, San Diego, Calif., is being awarded a **$6,057,400** provisioned items order to provide 1,433 electronic spare parts for radiac meters used on ships. Work will be performed in San Diego, and is expected to and three offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Long Beach, Calif., is the contracting activity (N00024-85-H-8222).



September 18

Gould Incorporated, Systems and Simulation Division, Tampa, Fla., is being awarded a **$8,370,260** firm-fixed-price contract for the Trident submarine ship control team trainer, device 21C10A, and backfit modification to the ship control operator trainer, device 21C10. Work will be performed in Tampa, and is expected to be completed in March 1989. Thirty-three bids were solicited and four offers were received. The Naval Training Systems Center, Orlando, Fla., is the contracting activity (N61339-86-C-0148).

September 19

Moss Point Marine, Escatawpa, Miss., is being awarded a **$40,797,358** fixed-price contract for the purchase of four Logistic Support Vessels (LSV) for the U.S. Army. These vessels will be used to transport dry cargo in ocean coastal and inland waterways. Delivery commences in September 1987 and concludes in March 1988. One-hundred forty-seven bids were solicited and three offers were received. Funding is through Other Procurement Army (OPA) fiscal years 1984 and 1985. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-86-R-3078).

Philadelphia Naval Shipyard, Philadelphia, Pa., is the successful offeror in a competitive test program between public and private sector shipyards for the Drydocking Selected Restricted Availability (DSRA) of USS Clifton Sprague (FFG-16). Philadelphia Naval Shipyard is being assigned the DSRA on a fixed-price basis. The price for this effort is **$4,452,413.** Work is expected to be completed January 13, 1987. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

The Singer Company, Link Simulation Systems Division, Silver Spring, Md., is being awarded a **$19,808,000** firm-fixed-price contract for one acoustic operator trainer for the AN/SQQ-89 (V4) underwater sensor system, device 14E35C, with related support materials and services. Work will be performed in Silver Spring, and is expected to be completed by September 1989. Fourteen bids were solicited and one offer was received. The Naval Training Systems Center, Orlando, Fla., is the contracting activity (N61339-86-C-0140).

September 23

AAI Corporation, Hunt Valley, Md., is being awarded a **$4,797,422** firm-fixed-price modification for the Radar Landmast Simulator (RLMS) portion (subsystem) of the Submarine Piloting and Navigation Trainer (SPAN), Device 15F12A/1 and 15F12C/1. Work will be performed in Hunt Valley, and is expected to be completed in September 1988. Thirty-three bids were solicited and four offers were received. The Naval Training Systems Center, Orlando, Fla., is the contracting activity (N61339-86-C-0023).

ITT Corporation, Gilfillan Division, Van Nuys, Calif., is being awarded a **$8,054,884** provisioning item order modification for 186 line items to support and repair the AN/SPS-48E radar system for shipboard use. Work will be performed in Van Nuys, and is expected to be completed in June 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N0024-86-C-5226).

Scot Pump Company, Cedarburg, Wisc., is being issued a **$15,197,424** firm-fixed-price contract for 675 Navy standard titanium fire pumps and various spare parts to be used on board Navy surface ships. Work will be performed in Cedarburg, and is expected to be completed November 30, 1989. One-hundred-fourteen bids were solicited and 17 offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-0605).

Giga-Tronics Incorporated, Pleasant Hill, Calif., is being awarded a **$3,734,724** firm-

(continued)

Circle 110 on Reader Service Card

Marine Machinery Association Discusses Quality Control With Navy Officials

Recently, the Board of Directors of the Marine Machinery Association met with a select group of U.S. Navy officials to discuss incidents of poor quality in parts and services being supplied to the Navy as a result of awards to less than qualified suppliers.

Participating in the discussions were MMA president, **Larry Holley** of Warren Pumps Inc., MMA Chairman, **Jack Flannigan** of Terry Corporation, MMA vice president, **James Fromfield** of Leslie Controls, Inc., MMA directors, **David Choate** of Turbodyne/Dresser and **J. P. Janetatos** of Baker and McKenzie, MMA counsel, **Stephen Quatannens** and the association's executive director, **Daniel Marangiello.**

Navy representatives were Rear Adm. **Myron Ricketts,** NAVSEA Deputy Commander for Ship Design and Engineering, Rear Adm. **Roger B. Horne Jr.,** NAVSEA Deputy Director of Industrial and Facility Management, **C. G. Geiger,** NAVSEA Deputy Chief Engineer for Logistics, **Richard B. McFarland,** Executive Director Navy Ships Control Center and Dr. **Norman Brown,** Special Assistant to the Competition Advocate of the Navy.

During the meeting the MMA pointed out specific cases where inadequate parts and services were being supplied to the Navy that would not allow equipment to function in conformance to original intent and design. MMA offered its assistance to identify such cases. Specifically, MMA offered to assist in the preparation of technical specifications to establish quality control and inspection requirements and procedures and to provide an independent review of DD 1418s. MMA would function as an expert technical consultant, nothing more.

The Navy officials agreed to review the problem areas discussed and to consider the MMA offer of assistance.

The MMA Standing Committee for Quality would be the direct liaison with the Navy in the development of any future program. This committee, chaired by a MMA director, is comprised of quality professionals from the member companies.

Manufacturers and suppliers interested in joining the Marine Machinery Association can obtain information by writing to MMA, 1700 K Street NW, Suite 903, Washington, D.C. 20006 or calling **Dan Marangiello** at (703) 769-5613.

Masters Named Director At Port Of Beaumont

Billy G. Masters has been appointed director of the Port of Beaumont, Texas, it was announced by the Board of Commissioners of the Port of Beaumont Navigation District. He succeeds **James W. Martin,** who has retired.

Hospital Ship USNS Mercy Dedicated At NASSCO In San Diego

National Steel and Shipbuilding Company (NASSCO) recently held a naming ceremony and open house for the USNS Mercy (T-AH 19), first of two 90,000-dwt tankers NASSCO is converting into 1,000-bed Naval Hospital Ships. Both events were open to the public.

As guest of honor, **Helen K. Copley** named the ship in traditional champagne fashion. Mrs. **Copley** is chairman and chief executive officer of The Copley Press, Inc., and the publisher of *The San Diego Union* and *The Tribune.* Assisting her as matron of honor was **Maureen O'Connor**, Mayor of San Diego. Other featured participants included The Honorable **Pete Wilson**, U.S. Senate, who was guest speaker; Vice Adm. **Lewis Seaton**, Director and Surgeon General, Office of Naval Medicine, Department of the Navy; Rear Adm. **Walter Piotti Jr.,** Commander, Military Sealift Command, Department of the Navy; **Joseph Shrader**, Deputy Commander, Naval Sea Systems Command; **William J. Deasy**, president and chief executive officer, Morrison Knudsen Corporation; and **Richard H. Vortmann**, president and chief executive officer, NASSCO. **Alfred W. Lutter Jr.,** senior vice president, marketing and business affairs, NASSCO, assisted as master of ceremonies.

The 1,000-bed T-AH 19 Class ship is a floating surgical hospital with a mobile, flexible, rapidly responsive capability to provide acute medical care in support of amphibious task forces, Marine Corps, Army and Air Force elements, forward deployed Navy elements of the fleet and fleet activities, and the Rapid Deployment Joint Task Force (RDF).

The extensive medical services of the Hospital Ship include: casualty reception, 12-room operating complex, recovery room, intensive care unit, and intermediate care, light care, and limited care wards.

Delivery of the USNS Mercy is scheduled for this month.

For further information and free literature on NASSCO's facilities and capabilities,

Circle 6 on Reader Service Card

USNS MERCY
Major Suppliers

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Generators	American M.A.N.
Propeller	Ferguson
Switchboard	Federal Pacific
Pumps	Goulds, Delaval, Warren, Nash, Johnston
Motors	Reliance Electric
Collision Avoidance	Raytheon
Controllers	Henberger/Klockner Moeller
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Air Compressors	Carlson Beauloye/ Ingersoll Rand
Air Conditioning	Carrier
Air Conditioning Fan Coils	Marlo
Telephone System	AT&T
Deck Covering	J.E. Steigerwald
Distillers	Riley Beaird
Fire Alarms/ Extinguishing System	Feecon, Wormald
Lifeboats	Lane Marine Technology
Lifeboats, Inflatable Life rafts & Launchers	RFD Elliot
Refrigeration	York
Purifiers	Centrico
Tank Level Indicating System	Gems
Ventilation Fans/Motors	Hartzell
Centrifuges, Microscopes, Balances	Daiger
Marine Sanitation Device	Omnipure (Sigma Chapman)

Marine Machinery Association Meeting Set For February 25

The next full membership meeting of the Marine Machinery Association (MMA) is set for Wednesday, February 25, 1987, at the Sheraton Crystal City Hotel in Arlington, Va. The meeting will be a workshop on "Overhaul and Repair of Naval Machinery."

Participants will include representatives from SupShips, shipyards, Type Commanders and industry. More details on the agenda will be available later.

Sheraton Crystal City is offering guaranteed rates of $88 single/$98 double for attendees. Workshop reservations and information are available by writing to MMA, 1700 K Street NW, Suite 903, Washington DC 20006 or calling **Dan Marangiello** at (703) 769-5613. Early reservations are recommended since seating will be limited.

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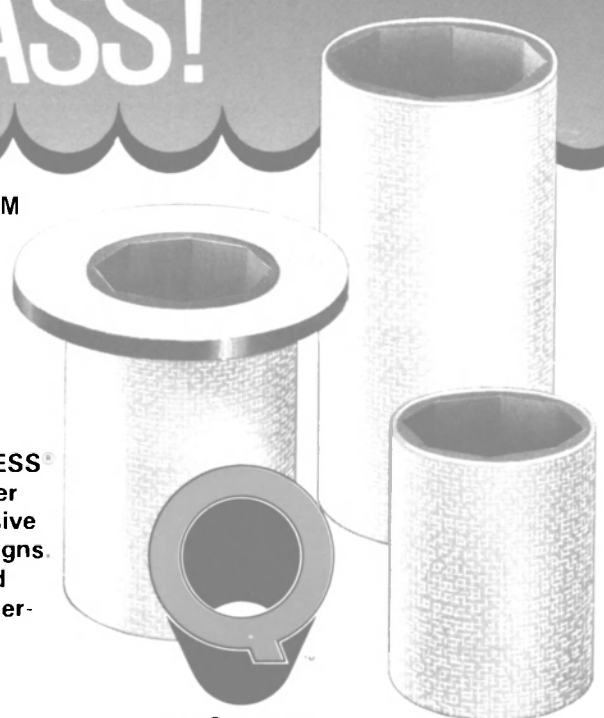

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Circle 197 on Reader Service Card

Major Navy Contracts

(continued)

fixed-price contract for 246 signal generators, model 600/6-12 and is being acquired in support of the General Purpose Electronic Test Equipment Program (GPETE). The generators are used for testing and monitoring purposes throughout the fleet both on board ships and in the shipyard. Work will be performed in Pleasant Hill, and is expected to be completed in February 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-4706).

Newport News Shipbuilding and Dry Dock Company, a Division of Tenneco, Newport News, Va., is being issued a **$3,039,518** task order under a cost-plus-fixed-fee Basic Ordering Agreement for procurement of long lead time material to support future fiscal year Submarine Extended Operating Cycle Modernization Program support (SEOC-MP). One bid was solicited and one offer was received. The Supervisor of Shipbuilding Conversion and Repair, Newport News, Va., is the contracting activity (N00024-85-G-2022).

GTE Government Systems Corporation, Mountain View, Calif., is being awarded a **$13,522,000** modification to a previously awarded firm-fixed-price contract for 18 AN/WLR-8(V) electronic support measure receivers with associated equipment for shipboard use. Work will be performed in Mountain View, and is expected to be completed September 30, 1988. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-85-C-0209).

Systems Management American Corporation, Norfolk, Va., is being awarded a **$9,243,539** firm-fixed-price letter contract for 27 AN/UYK-62(V) Submarine Production Units (SNAP II) for shipboard use. Work will be performed in Norfolk, and is expected to be completed September 30, 1987. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0592).

September 24

Systems Management American Corporation, Norfolk, Va., is being awarded a **$3,701,117** modification to a previously awarded cost-plus-fixed-fee contract for SNAP II installation for fleet vessels. Work will be performed in Norfolk (35 percent), San Diego, Calif. (35 percent), Mayport, Fla. (15 percent), and San Francisco, Calif. (15 percent), and is expected to be completed in January 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-82-C-6101).

Technology Applications Incorporated, Falls Church, Va., is being awarded a **$3,184,480** Modification to a previously awarded cost-plus-fixed-fee contract for AN/UYK-65(V) Shipboard Nontactical ADP Program (SNAP I) for USS Saratoga (CV-60), USS Eisenhower (CVN-69), USS Guam (LPH-9), USS Iwo Jima (LPH-2) and USS Ranger (CV-61). Work will be performed in Norfolk, Va. (75 percent), and Mayport, Fla. (25 percent), and is expected to be completed in March 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-6407).

September 25

Rockwell International Corporation, Autonetics Marine Systems Division, Anaheim, Calif., is being awarded a **$34,000,000** contract for Electromagnetic Systems Environment Design and Engineering (EMSEDE). The contract includes an additional **$7,000,000** in priced options and covers a five-year time period. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity.

September 26

Bay City Marine, National City, Calif., is being awarded a **$4,216,639** firm-fixed-price contract for the regular overhaul of living barge APL-18. Work will be performed in San Diego, Calif., and is expected to be completed March 1, 1987. Eight bids were solicited and five offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8117).

September 30

G.W. Dahl Company Incorporated, Bristol, R.I., is being issued a **$4,408,800** firm-fixed-price contract to furnish 660 tow cable assemblies used on the AN/BRR-6, OE-305 and AB/BSQ-5 buoys for submarine application. Work will be performed in Bristol, and is expected to be completed in March 1990. Twenty-nine bids were solicited and four offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-4689).

Jacksonville Shipyards, Jacksonville, Fla., is being awarded a **$6,955,672** firm-fixed-price contract for the Drydocking Selected Restricted Availability of USS Gallery (FFG-26). Work will be performed in Jacksonville, and is expected to be completed in January 1987. Two bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Jacksonville, Fla., is the contracting activity (N00024-85-H-8171).

Treadwell Corporation, New York, N.Y., is being awarded a **$6,430,622** firm-fixed-price contract for the refurbishment of 11 electrolytic oxygen generators which will replace existing units in the life support systems of nuclear submarines as they come in for overhaul. Work will be performed in Thomaston, Conn., and is expected to be completed in April 1988. The Portsmouth Naval Shipyard, Portsmouth, N.H., is the contracting activity (N00102-86-C-1701).

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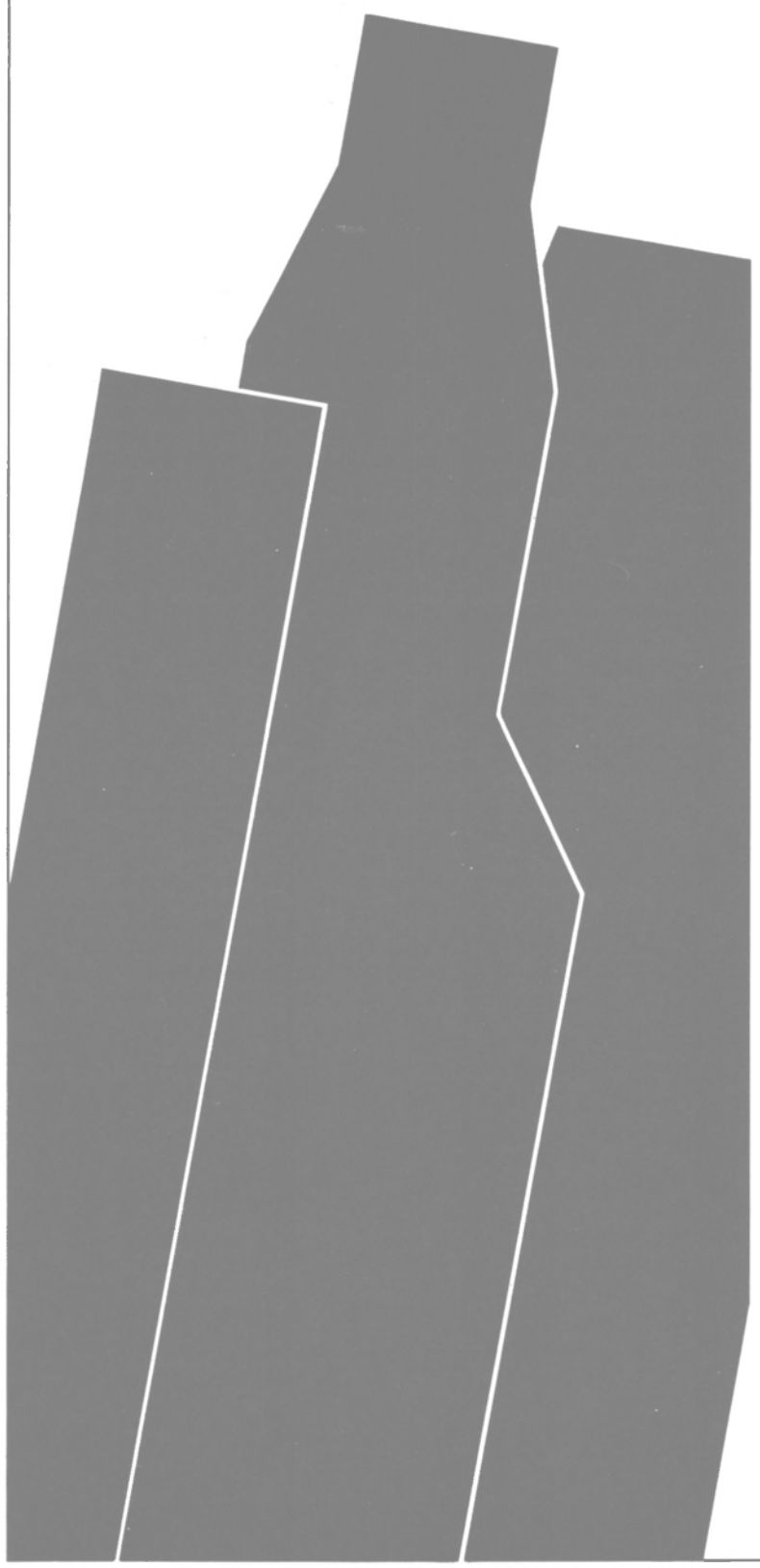

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Circle 147 on Reader Service Card

ASTM Commitree F-25 Honors Adm. Gracey

Just prior to his retirement as commandant of the U.S. Coast Guard, Adm. **James S. Gracey,** USCG, (left) was presented an award from ASTM Committee F-25 on Shipbuilding for his outstanding support in the Society's effort to develop nongovernment specifications and standards for marine systems and equipment. Presenting the award was **Daniel Marangiello** (right), chairman of Committee F-25. Mr. **Marangiello** is also executive director of the Marine Machinery Association.

Major Navy Contracts

(continued)

Gould Incorporated, Glen Burnie, Md., is being awarded a **$3,394,117** firm-fixed-price contract for oceanographic equipment. Work will be performed in Glen Burnie, and is expected to be completed in October 1988. Two bids were solicited and two offers were received. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0088).

Westinghouse Electric Corporation, Machinery Technology Division, Pittsburgh, Pa., is being awarded a **$35,750,503** cost-plus-fixed-fee contract for ship machinery systems engineering and integration effort for the Navy. Work will be performed in Pittsburgh, and is expected to be completed June 30, 1992. Thirty-six bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-4030).

Sofec Incorporated, Houston, Texas, is being awarded a **$10,438,301** firm-fixed-price contract for an offshore petroleum discharge system with options for additional systems. Work will be performed in Houston, and is expected to be completed in 1990 if all options are exercised. Ninety-seven bids were solicited and seven offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2212).

October 1

General Electric Company, Electronics Park, Syracuse, N.Y., is being awarded a **$39,459,963** firm-fixed-price contract for materials and services for the SQS-53B sonar system. Work will be performed in Syracuse, and is expected to be completed in May 1995. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6063).

Tracor Applied Sciences Incorporated, Rockville Laboratory, Rockville, Md., is being awarded a **$9,712,526** cost-plus-fixed-fee contract for support services for submarine programs. Work will be performed in Arlington, Va., and is expected to be completed September 30, 1989. Seventy-nine bids were solicited and three offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6288).

AT&T Technologies, Greensboro, N.C., is being awarded a **$27,105,731** modification to a previously awarded fixed-price-incentive and firm-fixed-price contract for oceanographic equipment. Work will be performed in Burlington, N.C., and is expected to be completed January 30, 1991. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-85-C-0082).

October 3

Hughes Aircraft Company, Ground Systems Group, Fullerton, Calif., is being awarded a **$116,987,583** modification to a previously awarded fixed-price-incentive contract for AN/UYQ-21 Naval Tactical Display Systems (NTDS) for CG-47, DDG-51, CV/CVN and LHD-1 class ships. Work will be performed in Fullerton, and is expected to be completed in November 1988. This contract combines purchases for the U.S. Navy (99.96 percent) and Spain (.004 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-7004).

Raytheon Company, Equipment Division, Wayland, Mass., is being awarded a **$16,999,928** modification to a previously awarded firm-fixed-price contract for the FY-86 Sea Sparrow requirements for the U.S., Germany, and Norway. Work will be performed in Walthan (56.4 percent) and Wayland, Mass. (15.9 percent), Denmark (10.7 percent), Belgium (8.2 percent), Netherlands (4.9 percent) and Norway (3.9 percent), and is expected to be completed in September 1989. This contract combines purchases for the U.S. Navy (57.6 percent), Germany (29.5 percent), and Norway (12.9 percent), under the NATO Sea Sparrow program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-5215).

Southwest Marine Incorporated, San Diego, Calif., is being awarded a **$5,674,613** modification to a previously awarded firm-fixed-price contract for the Selected Restricted Availability (SRA) of USS Brooke (FFG-1). Work will be performed in San Diego, and is expected to be completed January 30, 1987. Ten bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8221).

National Steel and Shipbuilding Company, San Diego, Calif., is being awarded a **$3,647,304** modification to a previously awarded contract for the Selected Restricted Availability (SRA) of USS Lynde McCormick (DDG-8). Work will be performed in San Diego, and is expected to be completed January 23, 1987. Ten bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8192).

Rockwell International, Autonetics Marine Systems Division, Anaheim, Calif., is being awarded a **$13,539,000** modification definitizing a previously awarded fixed-price-incentive contract for the AN/USQ-82 (V) data multiplex for Arleigh Burke (DDG-51). Work will be performed in Anaheim (70 percent) and El Paso, Texas (30 percent), and is expected to be completed in November 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7130).

Bender Shipbuilding, Mobile, Ala., is being awarded a **$6,646,458** firm-fixed-price contract for the overhaul of USNS Redstone, a U.S. Navy missile range instrumentation ship. Work will be performed in Mobile, and is expected to be completed April 6, 1987. This contract includes an option in the amount of **$420,733** for additional materials and an option in the amouht of **$480,000** for 20,000 additional manhours. Forty bids were solicited and seven offers were received. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-85-H-0392).

October 6

Raytheon Company, Equipment Division, Wayland, Mass., is being awarded a **$8,861,411** long leadtime modification to a firm-fixed-price contract for 18 Sea Sparrow transmitters for the Royal Netherlands Navy. Work will be performed in Wayland (75.9 percent), Denmark (13.1 percent), the Netherlands (9.4 percent) and Belgium (1.6 percent), and is expected to be completed in June 1989. This contract covers purchases for the Netherlands under the

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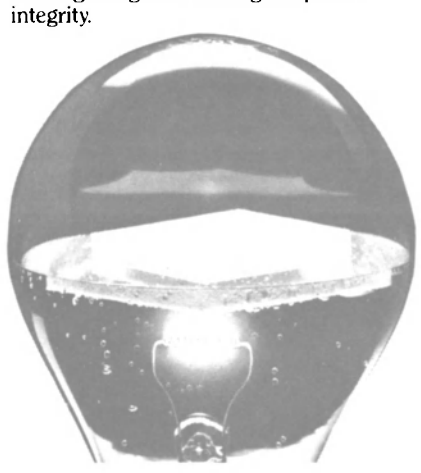

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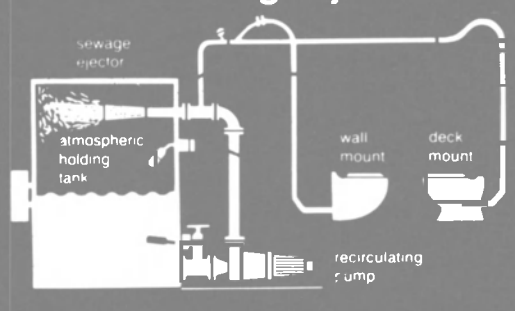

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NATO Sea Sparrow program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5127).

Raytheon Company, Equipment Division, Wayland, Mass., is being awarded a **$17,221,717** firm-fixed-price contract for Sea Sparrow VLS for the Royal Netherlands Navy and updated technical manuals for the U.S. Navy. Work will be performed in Wayland (49.2 percent), Denmark (5.9 percent), Belgium (7.5 percent), the Netherlands (28.4 percent) and Canada (9 percent), and is expected to be completed in February 1989. This contract covers purchases for the Netherlands and the U.S. Navy under the NATO Sea Sparrow program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5127).

Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif., is being issued a **$5,037,275** modification to a previously awarded cost-plus-fixed-fee contract for engineering services for the British Naval Ballistic Missile Program. Work will be performed in Sunnyvale, and is expected to be completed March 1987. Work under this contract is being funded by the U.K. The Strategic Systems Program Office, Washington. D.C., is the contracting activity (N00030-86-C-0121).

Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif., is being issued a **$8,278,947** modification to a previously awarded cost-plus-fixed-fee contract for engineering services for the British Naval Ballistic Missile Program. Work will be performed in Sunnyvale, and is expected to be completed March 1987. Work under this contract is being funded by the U.K. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0121).

October 9

General Dynamics, Pomona Division, Pomona, Calif., is being awarded a **$162,607,646** modification to a previously awarded firm-fixed-price contract for 71 Phalanx Close In Weapon Systems (CIWS) for the U.S. Navy and ships of foreign navies. Work will be performed in Pomona, and is expected to be completed in December 1987. This contract combines purchases for the U.S. Navy (70.6 percent), Australia (1.5 percent), Japan (11.7 percent), Great Britain (14.7 percent) and Pakistan (1.5 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7002).

Jacksonville Shipyard Incorporated, Jacksonville, Fla., is being awarded a **$3,777,613** firm-fixed-price contract for the Selected Restricted Availability (SRA) of USS Paul (FF-1080). Work will be performed in Jacksonville, and is expected to be completed January 6, 1987. Two bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Jacksonville, Fla., is the contracting activity (N00024-85-H-8171).

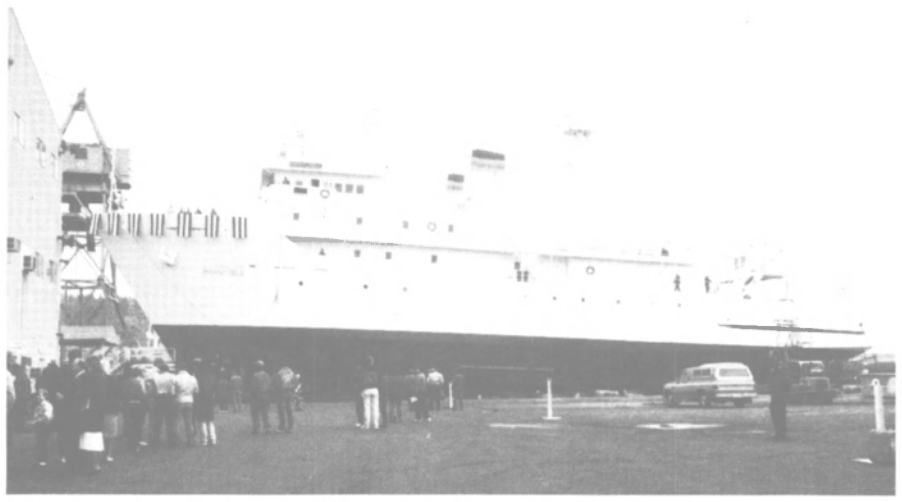
RCA Corporation, Camden, N.J., is being awarded a **$23,750,000** letter contract for three Trident integrated radio rooms (two shipboard and one trainer), trainer upgrade, cables, services and support, data, and an option for an additional radio room with cables. Work will be performed in Camden, and is expected to be completed December 31, 1993. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-87-C-0071).

Vitro Corporation, Silver Spring, Md., is receiving a **$5,538,033** modification to a previously awarded contract to exercise an option for an additional 268,800 man hours of effort as technical support services for the Breakout program under the Naval Sea Systems Command Logistics Support Engineering Activity and the Space and Naval Warfare Systems Command Detachment, Mechanicsburg, Pa. The new total value of the contract is **$10,387,178.** Vitro set aside 52 percent of the total effort for subcontracting (39.5 percent to VSE Corporation, Alexandria, Va. and 12.5 percent to Resource Consultants, Incorporated, Vienna, Va.). Work will be performed in Camp Hill, Pa. (48 percent), Mechanicsburg, Pa. (30 percent), Alexandria (10 percent), and Vienna, Va. (12 percent), and is expected to be completed September 30, 1987. Eighty-five bids were solicited and five offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-C-3822).

October 10

Continental Maritime of San Diego, Incorporated, San Diego, Calif., is being awarded a **$3,169,310** modification to a

(continued)



The USNS Invincible, recently launched at Tacoma Boatbuilding, Tacoma, Wash., is the tenth in a series of 26 T-AGOS class vessels.

Tacoma Boatbuilding Launches Tenth T-AGOS For Navy

The tenth in a projected fleet of 26 Navy oceanographic surveillance ships (T-AGOS) was recently christened "Invincible" at Tacoma Boatbuilding Company in Tacoma, Wash.

The USNS Invincible (T-AGOS-10) will be operated by the Military Sealift Command for the Space and Warfare Systems Command. The T-AGOS class ocean surveillance ships are named to convey positive traits of capability or accomplishment. The 224-foot-long Invincible will be homeported at Little Creek, Va.

Richard E. Metrey, Technical Director, David Taylor Naval Ship Research and Development Center, was the principal speaker, and his wife served as the ship's sponsor.

The primary mission of the USNS Invincible and her nine sister ships is to provide platforms and transportation for the Surveillance Towed Array Sensor (SURTASS), a passive undersea surveillance system. The T-AGOS ships will collect, process and transmit acoustic data.

The 26-ship fleet will operate worldwide, with half being homeported in Little Creek, Va., and the remainder in Honolulu, Hawaii. Tacoma Boatbuilding has built all 10 T-AGOS completed to date.

After operating with a Civil Service mariner crew employed by the MSC for approximately one year, the Invincible will be manned by a civilian crew under contract by the MSC.

For free literature containing full details on the shipbuilding and repairing services and facilities offered by Tacoma Boatbuilding,

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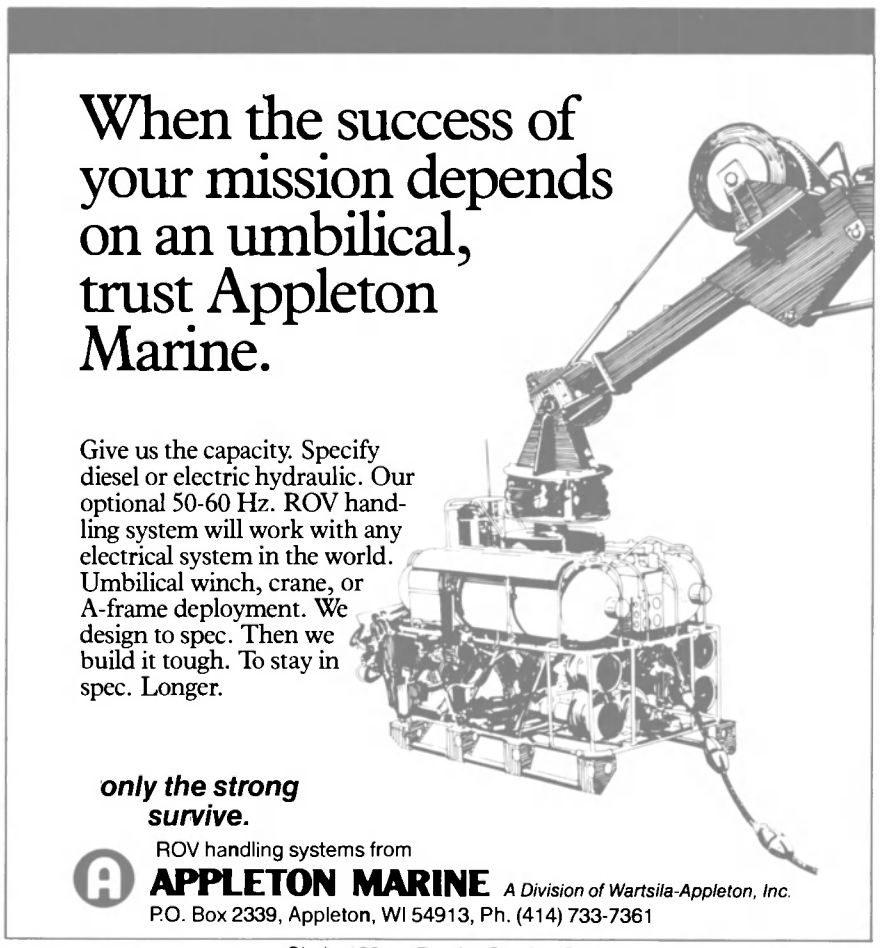

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Aegis cruiser Leyte Gulf (CG-55) shown being moved to outfitting pier following launching earlier this year at Ingalls yard in Pascagoula, Miss.

Aegis Missile Cruiser 'Leyte Gulf' Christened At Ingalls Shipbuilding

The ninth ship in the Ticonderoga Class of Aegis guided missile cruisers, and the eighth to be built by Ingalls Shipbuilding division of Litton in Pascagoula, Miss., has been christened Leyte Gulf (CG-55). Principal speaker at the recent christening ceremony at the shipyard was Adm. **Ronald J. Hays**, USN, Commander in Chief of the U.S. Pacific Commans. His wife, **Jane Hays**, was the ship's sponsor, and their daughter, **Jacqueline Hays**, served as maid of honor.

Mrs. **Jane Hays** christens the Aegis guided missile cruiser Leyte Gulf at ceremonies recently held at Ingalls Shipbuilding in Pascagoula, Miss. She is joined by her husband Adm. **Ronald J. Hays** and the Rev. **Bernard Farrell**, who delivered the invocation.

Other participants in the program included Vice Adm. **Joseph Metcalf III**, USN, Deputy Chief of Naval Operations for Naval Warfare; Vice Adm. **William F. McCauley**, USN, Commander, Naval Surface Force, Atlantic Fleet; Rear Adm. **Donald P. Roane**, USN, Deputy Commander, NAVSEA; Cpt. **Jerry Fee**, USN, Cruiser Division Director, Aegis Shipbuilding Program; and **Jerry St. Pe**, senior vice president of Litton and president of Ingalls.

Including the lead ship of the class, USS Ticonderoga (CG-47), Ingalls has delivered five Aegis cruisers to the Navy, and two more will join the fleet in 1987. Following the Leyte Gulf, which will also be commissioned in 1987, Ingalls has five additional cruisers in various stages of construction.

Aegis cruisers are large ships, 567 feet long with a beam of 55 feet. Four GE gas turbine jet engines power the 9,500-ton ships to speeds in excess of 30 knots.

The cruiser's Aegis Combat System, the heart of her fighting capability, is a significant advance in fleet air defense. Four fixed-array radar antennae, mounted on the sides of the ship's superstructure, enable the crew to "see" in all directions simultaneously.

The Aegis ships compose the most important shipbuilding program in America today. The Leyte Gulf and other ships of the class will provide the primary protection for the Navy's battle forces well into the next century. Aegis ships are designed to counter all present and projected missile threats to the Navy's battle forces.

The Ingalls yard is also building the Navy's new Wasp (LHD-1) Class of multipurpose amphibious assault ships, and modernizing the battleship Wisconsin (BB-64).

For free detailed literature fully describing the shipbuilding services and facilities offered by Ingalls,

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Over Half Of Navy's Procurement Dollars Awarded Competitively

For the first time in history, over one half of the Navy's procurement dollars were awarded on a competitive basis during fiscal year 86. This competition has resulted in significant savings in shipbuilding and in the aircraft, missile, combat systems, spare parts and maintenance programs. In the shipbuilding program alone, this has resulted in savings of $6.1 billion over the past four years.

In a communique to the Navy's competition advocates, Rear Adm. **Stuart Platt,** the Competition Advocate General, announced that a significant milestone was passed when, in addition to introducing competition to the procurement actions, three fourths of all the Navy's contract actions were competitively based. Admiral **Platt** wrote that "We faced a difficult task in overcoming the institutional bias for sole source procurement that had permeated our business practices post World War II."

Since fiscal year 1982, the Navy has gone from awarding seven percent of its dollars for aircraft parts competitively to over 41 percent in 86. For shipboard parts, the Navy was awarding 27 percent of its parts dollars competitively in 1982, while in fiscal year 1986, that number leaped past the 41 percent mark. For Contracted Advisory and Assistance Services, 65 percent of contract dollars were awarded competitively in fiscal year 1986, while the number was under 30 percent in fiscal year 1982. In small purchases, 75 percent of the dollars were awarded competitively in fiscal year 1986, up 67 percent over fiscal year 1982.

Major Navy Contracts

(continued)

previously awarded firm-fixed-price contract for the Selected Restricted Availability (SRA) of USS Ranger (CV-61). Work will be performed at the Naval Air Station, North Island, San Diego, Calif., and is expected to be completed January 19, 1987. Eight bids were solicited and four offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8212).

AT&T Technologies, Greensboro, N.C., is being awarded a **$11,231,578** modification to a previously awarded cost-plus-fixed-fee contract for oceanographic research. Work will be performed in Greensboro, and is expected to be completed September 30, 1987. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0016).

IT&T Corporation/IT&T Gilfillan, Van Nuys, Calif., is being awarded an **$18,098,786** firm-fixed-price modification to a previously awarded contract for spare parts for the AN/SPS-48E Radar. Work will be performed in Van Nuys, and is expected to be completed June 1988. The Naval Sea Systems Command is the contracting activity (N00024-86-C-5226).

October 15

Norfolk Shipbuilding and Dry Dock Corporation, Norfolk, Va., is being awarded a **$3,898,658** firm-fixed-price contract for the drydocking planned restricted availability (DPRA) of USS Austin (LPD4). Work will be performed in Norfolk, and is expected to be completed January 14, 1987. Three bids were solicited and three were received. The Supervisor of Shipbuilding, Conversion and Repair, USN, Portsmouth, Va. is the contracting activity (N00024-85-H-8195).

October 16

Westinghouse Electric Corporation, Plant Apparatus Division, Wilkins Township, Pa., is being awarded a **$103,316,000** modification to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion components. Work will be performed in Wilkins Township, and is expected to be completed September 1990. The Naval Systems Command is the contracting activity (N00024-85-C-4016).

Rockwell International Corporation, Anaheim, Calif., is being awarded a **$11,271,375** firm-fixed-price contract for 88 undersea surveillance acoustic display consoles with associated technical manuals and MTDS VAX interface cards for shore use. Work will be performed in Anaheim, and is expected to be completed August 1, 1989. Space and Naval Warfare Systems Command is the contracting activity (N00039-87-C-0088).

Hughes Aircraft Company, Ground Systems Group, Fullerton, Calif., is being awarded a **$7,825,000** modification to a previously awarded firm-fixed-price contract for three systems of TAS MK 23 Radars. Work will be performed in Fullerton, and is expected to be completed October 1988. The Naval Sea Systems Command is the contracting activity (N00024-84-C-5203).

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October 17

RG&G Washington Analytical Services Center, Incorporated, Rockville, Md., is being awarded a **$5,451,060** modification to a previously awarded cost-plus-fixed-fee contract for Engineering Services for the Command and Control Systems Division of the Strategic Submarine Program Office. Work will be performed in Crystal City, Va. (95 percent) and Rockville (5 percent) and is expected to be completed July 31, 1987. The Naval Sea Systems Command is the contracting activity (N00024-83-C-6299).

RCA Corporation, Moorestown, N.J., is being awarded a **$9,757,680** modification to a previously awarded cost-plus-fixed-fee contract for training for the CG-47 Class Cruiser. Work will be performed in Moorestown (50 percent), Aegis Training Center, Dahlgren, Va. (25 percent) and Wallops Island, Va. (25 percent), and is expected to be completed June 30, 1989. The Naval Sea Systems Command is the contracting activity (N00024-83-C-5138).

General Electric Company, Machinery Apparatus Operation, Schenectady, N.Y., is being awarded a **$99,783,000** modification to a previously awarded cost-plus-fixed-fee contract for Naval Nuclear Propulsion Components. Work will be performed in Schenectady, and is expected to be completed in September 1990. The Naval Sea Systems Command is the contracting activity (N00024-85-C-4012).

IBM Corporation, Federal Systems Division, Manassas, Va., is being awarded a **$3,025,000** firm-fixed-price contract for long lead materials for AN/UYH-2 Disc Memory Sets. Work will be performed in Manassas, and is expected to be completed in January 1989. The Naval Sea Systems Command is the contracting activity (N00024-86-C-6271).

October 20

Atlantic Marine Incorporated, Fort George Island, Fla., is being awarded a **$7,170,692** modification to a previously awarded firm-fixed-price contract for the Selected Restricted Availability (SRA) of USS Antrim (FFG-20). Work will be performed in Jacksonville, and is expected to be completed February 22, 1987. Two bids were solicited and two offers were received.

(continued)

Westinghouse Incorporates Proven GPC-1500 Controller Into CO/O_2 Trim Package

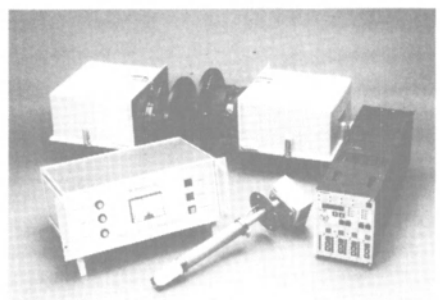
The field-proven, microprocessor-based Model 1500 General Purpose Controller has been incorporated into the Westinghouse carbon monoxide/oxygen (CO/O_2) combustion trim control package by the Combustion Control Division of Westinghouse Electric Corporation.

Labeled TC-910, The Westinghouse CO/O_2 trim control package now calls upon the increased power and flexibility of the GPC-1500. The GPC-1500 controller provides complete panel instrumentation with annunciation and alarm contact outputs for as many as six control loops.

Previously, the Westinghouse TC910 package incorporated the microprocessor-based Model 1400 controller which provided dedicated control for combustion air or fuel trim. The additional control capability of the GPC-1500 enables microprocessor-based control of other important boiler parameters in addition to automatic combustion trim control.

Most combustion control experts agree that oxygen trim control provides up to 90 percent of available fuel savings in an automatic combustion trim control system. The addition of carbon monoxide flue gas analysis to the trim strategy makes the remaining 10 percent of available fuel savings in the combustion process attainable.

The TC910 system utilizes the flue gas analysis provided by the Westinghouse model 620 CO analyzer and the Hagan industrial-type, in situ excess oxygen analyzer. The Model 620 CO analyzer utilizes high resolution infrared absorption spectroscopy to determine CO flue gas content. A microprocessor located in the control room uses the difference in intensities between the infrared energy transmitted across the stack and the energy received to calculate the CO content.



The TC910 CO/C_2 trim package from the Combustion Control Division of Westinghouse Electric Corporation.

The Hagan in situ, zirconium oxide, excess oxygen analyzer provides accurate, reliable measurement of excess oxygen flue gas content from directly within the boiler flue.

The TC910 control system establishes the CO measurement as the primary control parameter. A CO setpoint is established and excess air is trimmed based on the CO measurement. If a sudden boiler load change or other process upset occurs and certain preset O_2 high or low limits be reached, the control of the combustion process is automatically switched to the O_2 control parameter. The system then quickly returns the process to within the O_2 limits. At this time the trim control returns to the CO control parameters.

The GPC-1500 controller can also be programmed with a unique feedforward feature that allows the TC910 system to dynamically bias the air and/or fuel control as a function of boiler load.

The feedforward control action is totally independent of the analyzers' signals from the programmed setpoints. The control action functions as an electronic cam, producing the optimum mechanical relationship between the air and fuel linkages in the combustion process during dynamic boiler load conditions. This action allows optimum combustion trim control at all times.

The TC910 system can also include optional Veritrak recorders for providing permanent records of important combustion and trim control data.

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$8.2-Million Contract Awarded Varian For Communications System

Varian Associates, Inc., has been awarded a multiyear $8.2-million contract by the Greek Ministry of Defense for the Hellenic Navy.

Under the terms of the contract, Varian's Continental Electronics Division will produce and supervise installation of a low-frequency, long-range transmitter and ground-based antenna that will link submarines with on-shore Navy personnel. In addition to the original contract, follow-on agreements and spares orders could amount to several million dollars over the next five years.

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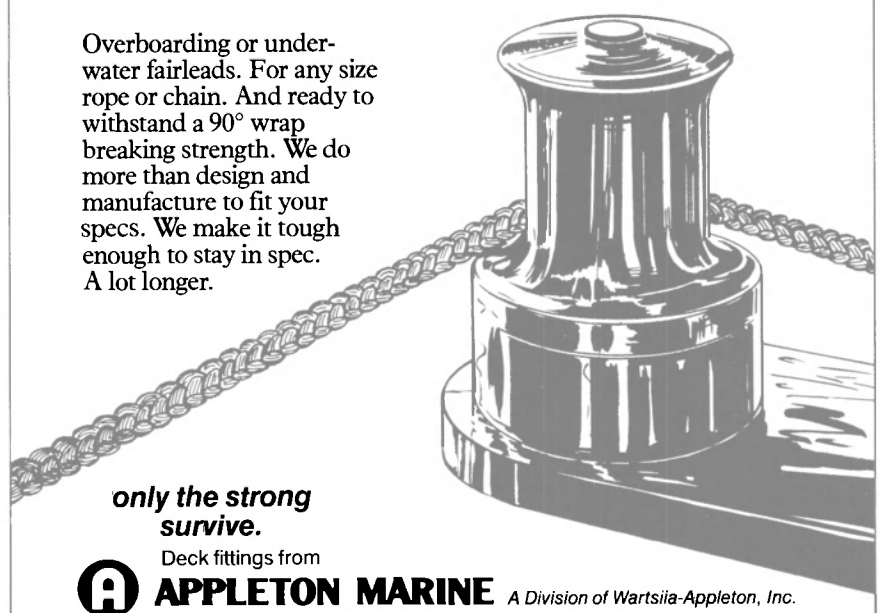

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Major Navy Contracts

(continued)

The Supervisor of Shipbuilding, Conversion and Repair, Jacksonville, Fla., is the contracting activity (N00024-85-H-8111).

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., is being awarded a **$9,500,000** modification to a previously awarded cost-plus-fixed-fee contract for lead yard services for the SSN-688 class submarine program. Work will be performed in Newport News, and is expected to be completed January 31, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-70-C-0238).

AK-WA Incorporated, Tacoma, Wash., is being awarded a **$3,477,303** firm-fixed-price contract for the repair and overhaul of USNS Kawishiwi, a Military Sealift Command fleet support ship. Sixteen bids were solicited and four offers were received. The Military Sealift Command, Washington, D.C., is the contracting activity (N62383-87-C-0002).

October 21

General Electric Company, Knolls Atomic Power Laboratory, Schenectady, N.Y., is being awarded a **$104,000,000** modification to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion research and development. Work will be performed in Schenectady, and is expected to be completed in September 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-79-C-4027).

October 23

Sperry Corporation, Defense Systems Division, St. Paul, Minn., is being awarded a **$9,204,517** modification to a previously awarded cost-plus-fixed-fee contract for engineering services for a mainframe operating system for the AN/UYK-43 computer. Work will be performed in St. Paul, and is expected to be completed in March 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-6235).

The Singer Company, Librascope Division, Glendale, Calif., is being awarded a **$3,207,749** cost-plus-fixed-fee contract for services in support of shipboard data recording instrumentation systems. Work will be performed in Glendale, and is expected to be completed October 7, 1989. Twenty-four bids were solicited and one offer was received. The Naval Underwater Systems Center, Newport, Rhode Island, is the contracting activity (N66604-87-C-0020).

RCA Corporation, Moorestown, N.J., is being awarded a **$59,463,600** cost-plus-fixed-fee contract for Aegis depot operations and technical support services for CG-47 and DDG-51 class ships. Work will be performed in Moorestown (50 percent), and Naval Surface Weapons Systems Engineering Station (NSWSES), Port Hueneme, Calif. (50 percent), and is expected to be completed September 30, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5186).

October 24

Westinghouse Electric Corporation, Bettis Atomic Power Laboratory, West Mifflin Borough, Pa., is being awarded a **$177,400,000** modification to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion research and development. Work will be performed in West Mifflin Borough, and is expected to be completed in September 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-79-C-4026).

ALS Corporation, Anaheim, Calif., is being awarded a **$5,999,505** modification to a previously awarded firm-fixed-price contract to test equipment and management for CG-63, CG-64 and CG-65. Work will be performed in Anaheim, and is expected to be completed September 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5507).

Lakeshore Incorporated, Iron Mountain, Mich., is being awarded a **$11,218,410** firm-fixed-price contract for six modular fuel delivery stations for various Military Sealift Command ships. Work will be performed in Iron Mountain, and is expected to be completed in February 1988. Fifty-five bids were solicited and nine offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2083).

October 28

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., is being awarded a **$3,631,500** modification to a previously awarded cost-plus-fixed-fee contract for planning and preparation work for USS Enterprise (CVN 65) complex overhaul. Work will be performed in Newport News, Va. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2078).

Rexnord Process Controls Division, Malvern, Pa., is being awarded a **$5,685,413** firm-fixed-price contract for underwater breathing apparatus for MK 16 Mod O mixed gas scuba. Work will be performed in Malvern, and is expected to be completed October 24, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-4006).

October 31

Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif., is being awarded a **$13,742,398** fixed-price-incentive contract for production of a ballast system for the Trident Missile Program. Work will be performed in Sunnyvale, and is expected to be completed September 30, 1989. The Navy's Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0145).

Intergrated Systems Analysts, Incorporated, Arlington, Va., is being awarded a **$11,612,837** cost-plus-fixed-fee contract for intergrated logistics overhaul services. Work will be performed in Arlington, and is expected to be completed September 30, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6045).

Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif., is being awarded a **$3,038,829** cost-plus-fixed-fee contract for operation of calibration laboratory for the Fleet Ballistic Missile Program. Work will be performed in Bremerton, Wash., and is expected to be completed September 30, 1987. Sixty-four firms were solicited, and three bids were received. The Navy's Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-87-C-0001).

General Dynamics Corporation, Electric Boat Division, Groton, Conn., is being awarded a **$6,378,155** modification to a previously awarded cost-plus-fixed-fee contract for reactor plant planning yard services for nuclear-powered submarines. Work will be performed in Groton, and is expected to be completed September 30, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-4021).

McDermott, Incorporated, McDermott Shipyards, Amelia, La., is being awarded a **$25,424,347** fixed-price-incentive contract for design and construction of a SWATH T-AGOS 19 Class ship. Work will be performed in Amelia, and is expected to be completed November 1988. Thirty-six proposals were solicited and 10 received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2087).

November 3

IBM Corporation, Bethesda, Md., is being awarded a **$12,231,414** labor hour contract to furnish an estimated 140,040 manhours of systems engineering services in support of the Kuwait Automated Supply System (KASS) project which is being developed by the government of Kuwait with the coordination of the Navy Fleet Material Support Office, Mechanicsburg, Pa. Work will be performed in Camp Hill, Pa., and is expected to be completed December 31, 1987. This contract is in support of a Foreign Military Sale to Kuwait. The Naval Regional Contracting Center, Philadelphia, Pa., is the contracting activity (N00140-87-C-9804).

November 4

Raytheon Company, Marlboro, Mass., is being awarded **$8,540,000** firm-fixed-price modification to a previously awarded cost type contract for the completion of full scale engineering development (R&D) and an option for the production of 340 terminals for ship, shore and submarine use for the Navy's Extremely High Frequency Satcom program. Work will be performed in Marlboro, and is expected to be completed September 30, 1996. Two bids were solicited and two offers were received. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-82-C-0146).

November 10

Westinghouse Electric Corporation, Sunnyvale, Calif., is being issued a **$43,256,919** modification to a previously awarded cost-plus-incentive-fee contract for a launcher subsystem for the Trident missile program. Work will be performed in Sunnyvale, and is expected to be completed September 30, 1989. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-84-C-0105).

November 12

RCA Corporation, Camden, N.J., is being awarded a **$4,000,000** cost-plus-fixed-fee contract for software post-development support for the Trident integrated radio room and trainers. Work will be performed in Camden, and is expected to be completed September 30, 1987. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-87-C-0019).

General Dynamics, Pomona Division, Pomona, Calif., is being awarded a **$8,587,920** order against a basic ordering agreement to furnish various repair parts in support of the Phalanx system. Work will be performed in Pomona, and is expected to be completed in November 1987. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0321).

Woods Hole Oceanographic Institution, Woods Hole, Mass., is being awarded a **$5,077,613** cost-reimbursement contract for continued support of oceanographic research. Work will be performed in Woods Hole, and is expected to be completed September 30, 1988. The Office of Naval Research, Washington, D.C., is the contracting activity (N00014-87-K-0007).

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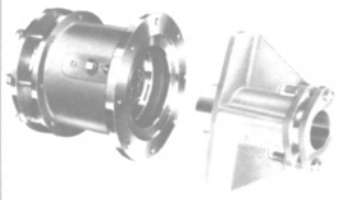

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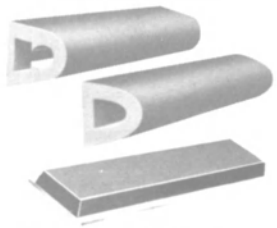

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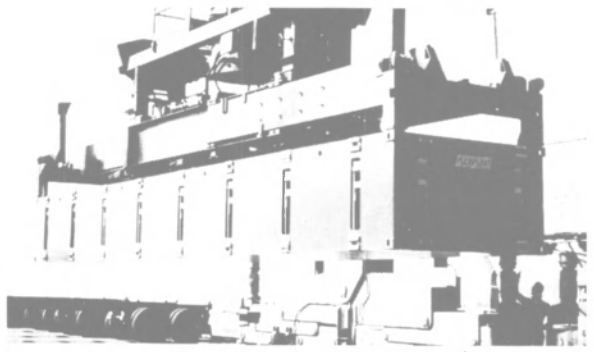

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Mooney Reappointed Chief Of Naval Research

Secretary of Defense **Caspar W. Weinberger** recently announced that President **Reagan** has nominated Rear Adm. **John B. Mooney Jr.,** U.S. Navy, for reappointment as Chief of Naval Research. Adm. **Mooney** has been serving as Chief of Naval Research since November 1, 1983.

New Brochure Emphasizes Products & Services For Defense/Marine Industry

Paul-Munroe Engineering recently issued a new two-page brochure describing the specialized hydraulic and electronic control capabilities of its Defense/Marine Division.

Paul-Munroe Engineering provides total system integration, engineering, procurement, fabrication, field installation and start-up for both defense and marine customers. System integration capabilities include quality assurance programs that meet MIL-Q-9858A, MIL-I-45208A, U.S. Navy, ABS, U.S. Coast Guard, U.S. Army, U.S. Air Force and U.S. Marine standards.

The new literature also describes several support programs—Dockside and Shipboard Hydraulic Field Service and 24-Hour Emergency Service; Spare Parts Procurement for Paul-Munroe, Rucker, Vickers, Honeywell and other major manufacturers of hydraulic components and electronic controls; and specialized training programs in all phases of hydraulics from basic fundamentals to hydraulic system troubleshooting and maintenance.

Paul-Munroe, a leading engineering, manufacturing and service company for over 35 years, has earned a reputation for providing solutions to customers' hydraulic and electronic control technical and service needs.

For additional information and a copy of the brochure,

Circle 4 on Reader Service Card

GE's LM2500 Engines To Power Portuguese Frigates —Literature Available

The Portuguese Navy has selected the General Electric LM2500 marine gas turbine engine to power its three new MEKO 200 guided missle frigates.

Portugal is the 16th nation to order the LM2500 for its naval fleet. The order calls for six engines to be delivered to both Blohm & Voss shipbuilders in Hamburg, West Germany, and Howaldtswerke-Deutsche Werft shipyard in Kiel, West Germany, beginning in 1988. Ship deliveries to Portugal will take place over the next two to three years.

These ships will be the first MEKO-type frigates with an improved propulsion design using two 30,000-shaft-horsepower LM2500s each in a combined diesel and gas turbine (CODOG) configuration. The LM2500 CODOG system will give the ships sprint speed capability in excess of 32 knots, compared with 27 knots for earlier all-diesel versions of the MEKO 200. Other significant operational advantages of the LM2500 CODOG propulsion plant include a lower minimum speed for antisubmarine operation and 90-second start-up from a cold-ship status.

The 3,000-ton-displacement frigates will be equipped for antisubmarine warfare and will play a crucial role in protecting NATO strategic sea lanes in the Azores and the Atlantic.

Approximately 800 LM2500 gas turbine engines have been ordered for marine and industrial applications throughout the world. In more than 4 million hours of operation, the engine has established the industry standard for reliability, the most important requirement of a naval propulsion engine.

The LM2500, a derivative of the TF39/CF6 aircraft engine, is a product of the Marine & Industrial Engines and Service Division of General Electric's Aircraft Engine Business Group. The group is headquartered in Evendale, Ohio, north of Cincinnati.

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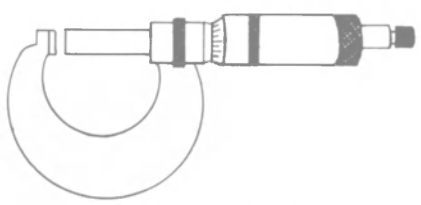

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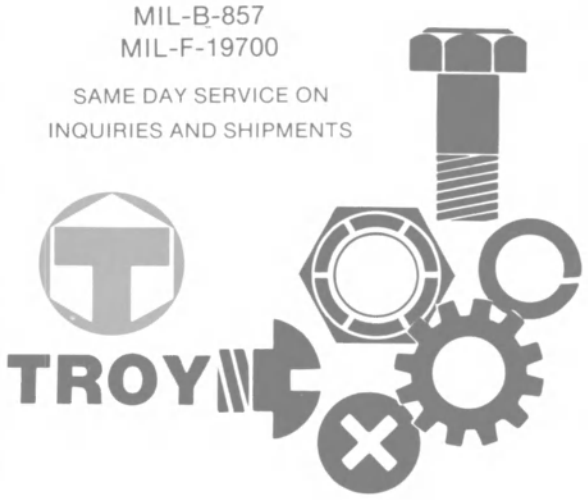

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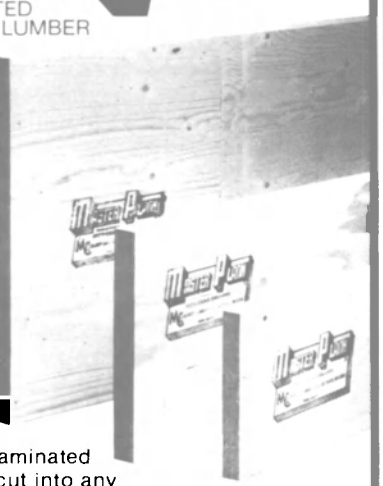

Master Plank, an engineered wood product, is a continuous laminated veneer panel that can be cut into any required size for use as scaffold planks, beams and headers, etc. Available in standard widths. Master Plank, a wood laminate, provides strength properties superior to solid sawn wood. Warping, knotting and twisting are reduced, making the panel more consistently uniform.

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High-Quality Components for Marine Applications

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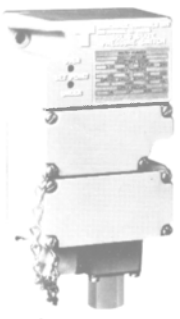
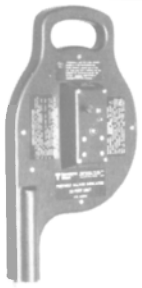
Pressure Switches



Broad choice of electromechanical or solid-state switches to provide shipwide pressure control. Included are diaphragm, bourdon tube and sealed piston types; many are explosion-proof.

Unique Sounding Tape Ullage Indicator

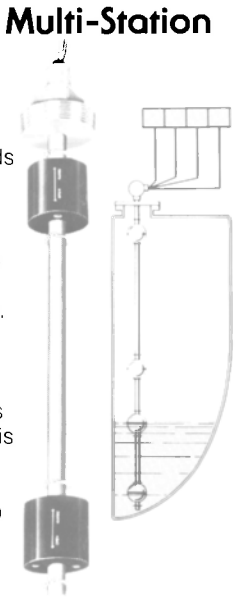


Self-contained, battery-powered unit is convenient to use in shipboard and offshore tanks.

Pressure Transmitters and Transducers

A group of lightweight transmitters and transducers are ideal for monitoring the 'mechanical health' of shipboard machinery and systems and for gauging tank contents. Included are signal conditioned models and vibration versions for monitoring rotating machinery.

Single or Multi-Station Level Switches



Ruggedly built for use in liquids from crude to chemicals. Broad choice includes single station with slosh shielding, oil/water interface models, externally mounted styles where access is limited, and multi-station units with up to six stations spaced to suit.

SureSite Liquid Level Indicators

Bi-colored, interlocking magnetic flags change color as float moves with changing liquid levels

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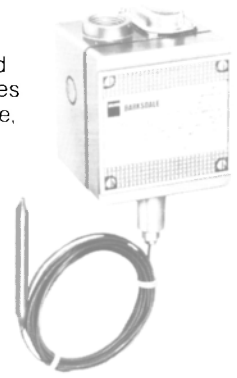
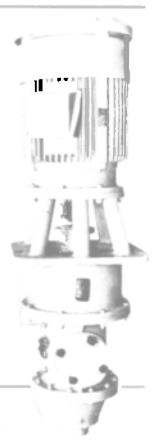
Temperature Switches



Local mount or remote bulb and capillary switches provide accurate, high-stability temperature control. Ideal for sensing engine manifold, lube oil and ventilation ducts, salt and fresh water cooling.

Pumps



Axial Multi-Rotor screw pumps are designed for lube and fuel oil service, fuel transfer and hydraulic service on Naval combatant ships and auxiliary vessels. Flow rates to 1250 GPM and pressures to 3000 PSIG with the lowest noise levels available.

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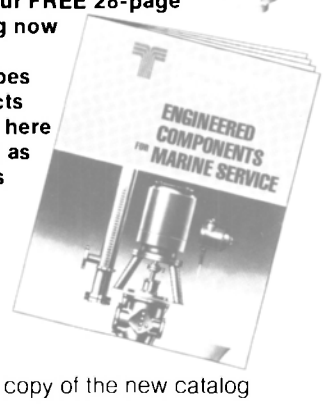

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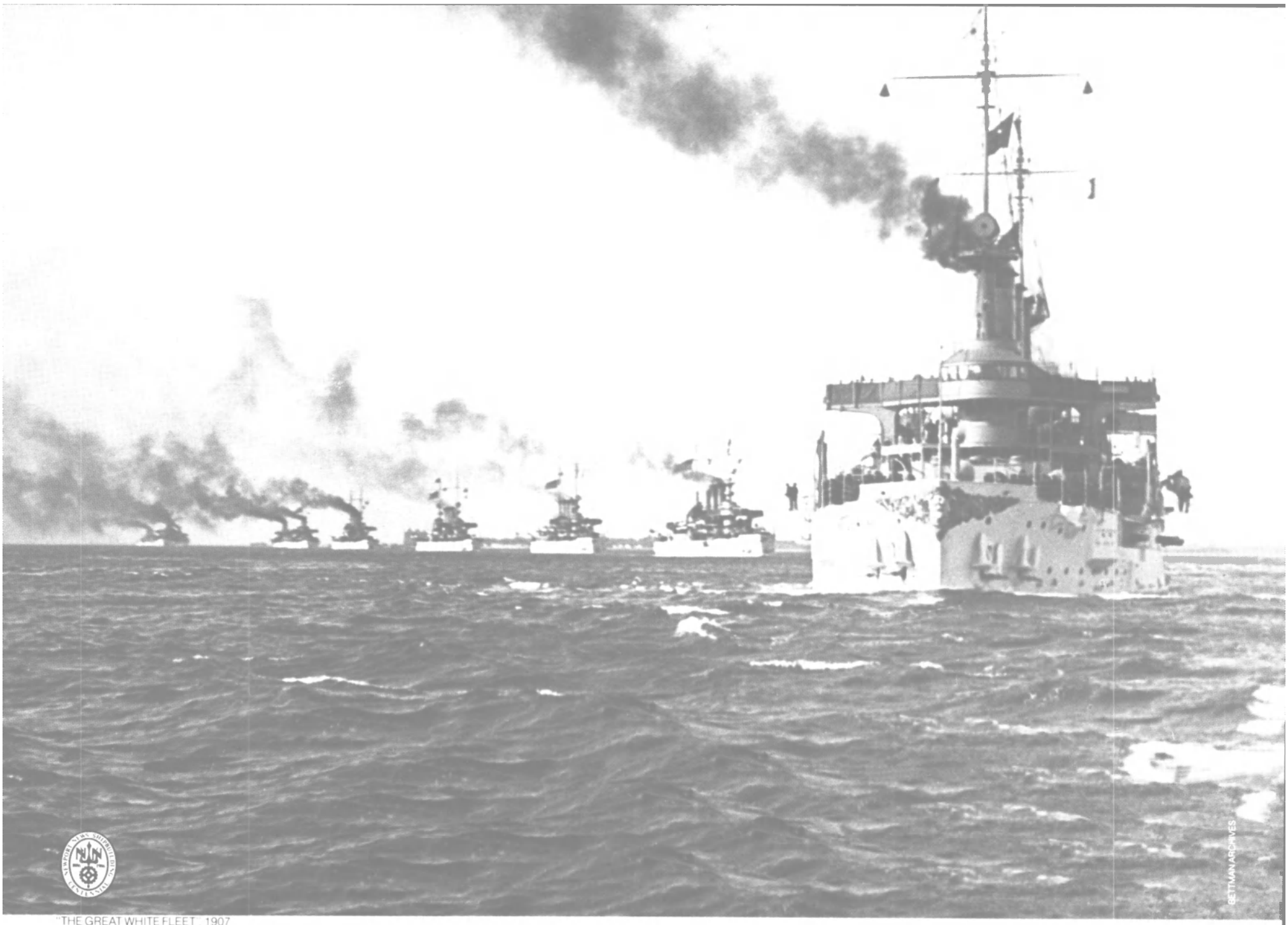

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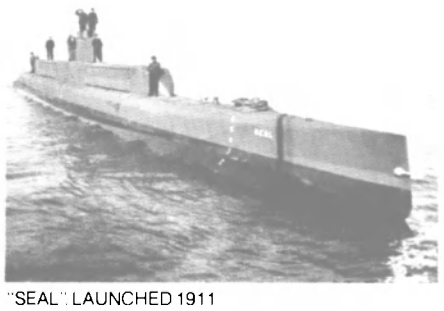

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"NEWPORT NEWS", LAUNCHED MARCH 15, 1986

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Seaworthy Expands Engineering Services

R. Lofaro Jr.

R. Lofaro Jr. has recently joined Seaworthy Electrical Systems in New York as chief electrical engineer. He is a graduate of the N.Y. State Maritime College with a Bachelor of Electrical Engineering, and has done additional work toward an MSEE at Stevens Institute. Mr. **Lofaro** had previously been with another leading naval architect and marine engineering firm in New York for nearly 15 years, most recently as their chief electrical engineer.

J. Connors, president of SES, indicated that the addition of Mr. **Lofaro** enhances Seaworthy's capability to provide comprehensive electrical engineering services to U.S. and foreign-flag vessel operators. In addition to vessel electrical and electronic engineering, surveying, and construction experience, Mr. **Lofaro** has also been responsible for the reflagging effort on nearly 20 foreign flag vessels.

New High Pressure Pumps Offered By Master Blaster —Brochure Available

Master Blaster Corporation of Humble, Texas, recently announced the corporation's new line of Friedrichs industrial high pressure pumps from 1,000 to 6,000 psi.

Strong, compact, portable and extremely quiet, the pumps eliminate fumes and noise and are ideal for indoor use.

Pressure testing, pipe cleaning, sand blasting, sludge pump and chemical injectors are some of the optional accessories available.

For a free detailed brochure,

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Falk To Market Masson Marine Drives —Literature Available

An agreement to market Masson marine gear drive products has been signed by the Falk Corporation, Milwaukee, Wis., and Society Europeenne D'Engrenages (S.E.E.), Saint-Denis-Les-Sens, France, manufacturer of Masson products. The agreement, announced at the Fish Expo conference in Boston, Mass., designates Falk as the exclusive distributor of Masson products in North and South America.

Masson marine propulsion gear drive units are used with engines in the 150 to 2,000 hp range. Falk has long been a dominant factor in the market for applications above 1,500 hp. The agreement also covers replacement parts and calls for Falk to fully service the product line.

"This new agreement will not only help us better serve Falk's present customer base, but will enable us to serve new segments of the marketplace as well," said **Peter Kriesels,** marine sales manager, Falk Corporation.

Marketing of the Masson trademark will give Falk the capability to provide full propulsion gear drive packages from 150 to 7,000 horsepower. The company can also custom design a system for horsepower ranges beyond 7,000 hp.

"This agreement represents an increased commitment by the Falk Corporation to service the requirements of the marine industry," Mr. **Kriesels** said. "We are now able to provide fully system-engineered drive packages including drives, controllable pitch propellers, couplings, bow thrusters, winches, and even custom steel castings."

The Falk Corporation, a subsidiary of Sundstrand Corporation, produces an extensive line of gear drives, shaft couplings, backstops, and fluid power drives.

For further information and free literature from Falk,

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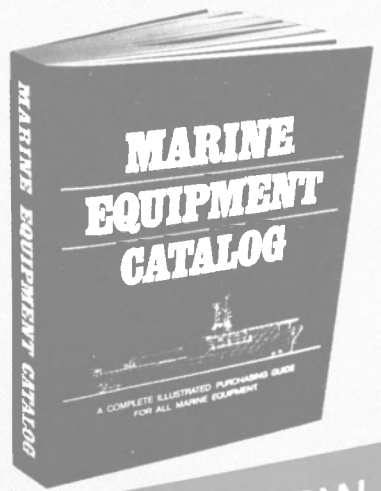
The 1987 Annual

MARINE EQUIPMENT CATALOG



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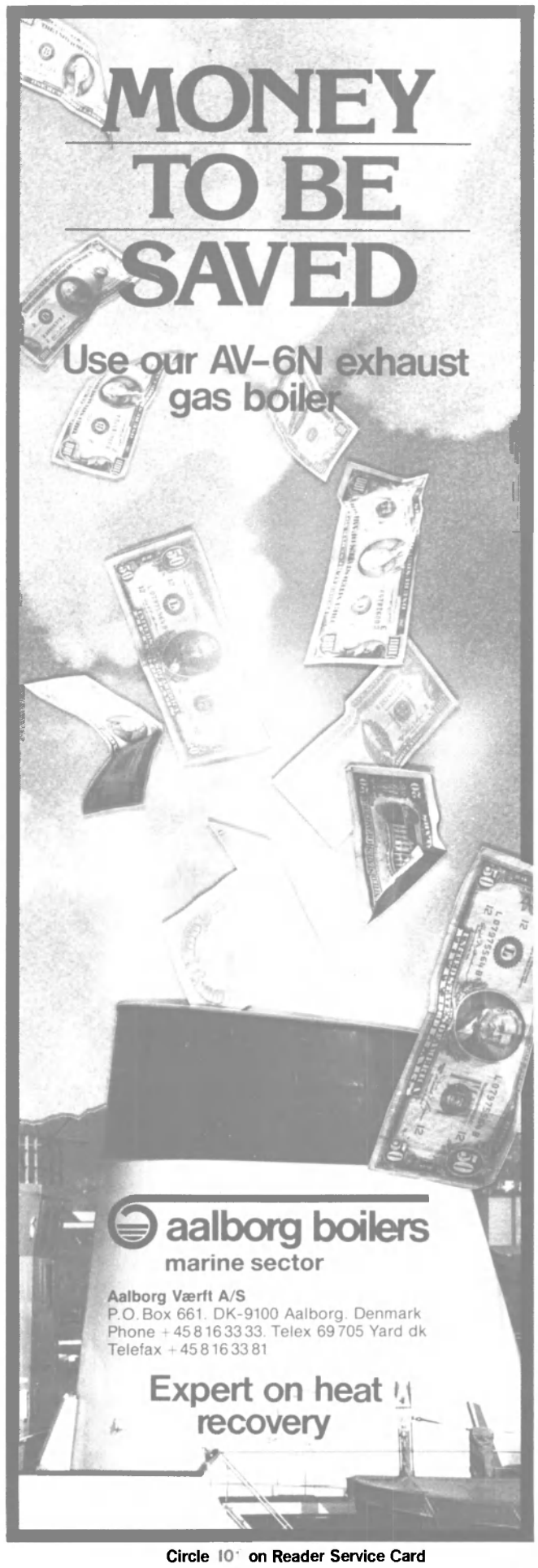

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NAVIGATION & COMMUNICATIONS EQUIPMENT —A REVIEW—

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

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

FOR MORE INFORMATION

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

ALDEN

The first of a new series of Marinefax weather chart recorders was introduced by Alden Electronics, Inc., Westboro, Mass. Designated the Marinefax TR 1, the new recorder features a high-quality thermal printer for crisp, white dry paper recordings and a microprocessor-based programmable memory that lets the operator select not only the time and frequency of desired charts but various transmitters as well. The Marinefax TR 1 will automatically turn itself on, select the desired frequency, select the desired transmitter, receive the chart and turn itself off. This cycle can be programmed to occur for up to 250 on/off sequences. A scrolling LCD display provides all necessary prompts.

The Marinefax TR 1 also incorporates two unique memory functions. One function is permanent and is used to store all worldwide radiofax frequencies for easy two-step recall, the other function is used as a local memory to store up to ten frequencies for single-button recall. Any HF frequency in the world may also be manually entered into the receiver.

The Marinefax TR 1 also features a highly stable radio that can be tuned as precisely as 0.1 kHz for optimized reception without fine tuning. This feature makes it easier to program the radio to receive from transmitters using odd frequencies of half a cycle above whole kHz stops.

The Marinefax TR 1 shares all the features, such as compact size and light weight, as previous Marinefax recorders. It operates off 110 and 220 VAC as well as 12, 24, 32 VDC.

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ATKINSON DYNAMICS

Atkinson Dynamics, a division of Guy F. Atkinson Company, offers several industrial intercoms for the marine industry, which deliver clear dependable voice communication under the most severe operating conditions.

Solid-state components enable the intercoms to withstand vibration or rough usage, while cast aluminum cases prevent internal damage to operating components from dirt, corrosive fumes or moisture, as well as allow stations to be installed in unprotected outdoor locations.

Typical installations of Atkinson intercoms include onboard ship—bridge to deck or engine room, control center to diving bell—on offshore oil platforms—and throughout repair yards, drydocks, piers and storage areas.

Atkinson Dynamics intercoms perform well regardless of high ambient noise, weather or temperature extremes. Each unit is self-contained station that receives, amplifies and transmits, making it possible for the intercom systems to include almost any desired number of stations and to extend over very long distances. Installation is simple, since each unit plugs into a nearby AC or DC power source and then is connected by an ordinary low voltage two-wire cable.

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AT&T

AT&T Communications offers the at-sea communications service, "AT&T High Seas Calling." According to the company's slogan, "Out to Sea Doesn't Have to Mean Out of Touch," shipowners and operators can communicate while at sea via a High Seas phone call to clients or associates on shore or vice versa. High Seas Calling offers reliable, quality transmissions and AT&T operator service.

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FRANK L. BEIER

Frank L. Beier Radio, Inc., is the exclusive distributor of the Robertson Multipurpose Pilot RMP, On-Line-Monitor OLM, and the U.C. Controls Sentinel.

The Robertson Multipurpose Pilot is a single station from which the ship's master can control a vessel under the following operating conditions: vessel maneuvering—three-axis joystick controls vessel position, heading and speed; automatic tracking—input from a navigation system will allow the vessel to track along a predetermined track, with joystick override; remote steering—steer one vessel from another or have the surface vessel follow a sub automatically or manually; and transit—autopilot control.

The On-Line-Monitor is a solid state monitor which provides constant monitoring of insulation values of generators, compressor, pumps, motors and supply cables, in either the running or stand-by mode. As insulation resistance deteriorates due to moisture, cable damage, carbon build-up, etc., an alarm is flashed and sounded.

Secure radio remote control of a barge or rig from a tug or a remote point is available with the U.C. Control Sentinel. The Sentinel is a computer control system which allows the master station to monitor the status and remotely control barge steering, navigation lights, anchor windlass, pumps, motors, compressors, thrusters, generators, ballast control and more.

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COMSAT MARITIME

COMSAT Corporation of Washington, D.C., is celebrating this year the 10th anniversary of the world's first commercial maritime communications satellite system. The first commercial telephone transmission through the company's MARISAT System took place on July 9, 1976.

According to COMSAT Maritime Services officials, the first call passed routinely through the system. It was a business call between the seismic ship Deep Sea Explorer, searching for oil in the Indian Ocean off the coast of Madagascar, and the home office of Phillips Petroleum Company in Bartlesville, Okla.

The MARISAT System was designed and developed by COMSAT General, a subsidiary of COMSAT Corporation. COMSAT General successfully launched three MARISAT satellites in 1976, one over each ocean region, which allowed cost-effective sharing of satellite telecommunications services for both military and commercial maritime interests.

In the 10 years since the initiation of maritime satellite communications, the system has grown dramatically along with the range of services available. In 1982 the International Maritime Satellite Organization (INMARSAT) was formed, and now 46 countries are members. More than 4,000 vessels and offshore oil platforms have been equipped with ship earth stations, allowing more than 300,000 people per day to have access to satellite communications on the high seas.

COMSAT Corporation was selected to represent the U.S. in INMARSAT, and currently utilizes and therefore owns 29 percent of the system. COMSAT Maritime Services oversees the company's role in INMARSAT, and has been instrumental in developing and marketing new services for the seafaring community. It was responsible for the first live television satellite broadcast to a ship at sea when it transmitted the Super Bowl game to the Queen Elizabeth 2 off the coast of Peru early this year.

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COMSAT TELESYSTEMS

COMSAT Telesystems, a COMSAT technology products company, offers the MCS-9100 SatCom, a reliable satellite communications unit which has space age sensors and servos to drive its dome-enclosed antenna. Below-decks electronics employ VLSI micro-miniaturized circuits on quick-change PC boards. The MCS-9100 is rugged, passing MIL STD 167 testing, and is INMARSAT type approved.

The MCS-9100, weighing a mere 99 pounds with a 44-inch diameter antenna dome, provides voice, telex, facsimile, medium and high speed data capability. The unit, which stands 58 inches high, can be mated to shipboard and shoreside computer systems. The below-decks module is the size of a sound system tuner-amplifier.

Circle 15 on Reader Service Card

FURUNO

With an ever increasing number of vessels now sailing outside convenient loran C coverage, Furuno has introduced the FSN-90, a new satnav receiver with some of the most popular performance features.

The FSN-90, after automatically acquiring the satellite signal, shows position in the lat./long. on a bright green, three-line fluorescent display. The system will also show date and time, the last 20 fixes and the next 100 satellite forecasts. It alerts the user for a multitude of operating conditions. For example, arrival and cross-track error alarms, satellite acquisition, fix computation, etc.

The FSN-90 will accept manual entry of up to 10 waypoints and

computes a wide range of navigational data, including range/bearing on either Great Circle or Rhumb Line course, set and drift, and distance run, as well as range/bearing, course to steer and time to go to any waypoint. The unit is completely self checking and permits easy entry of both speed and magnetic heading. The FSN-90 has standard interfaces for speed and either gyro or magnetic heading inputs, plus standard outputs to Furuno GD-170 or GD-2000 video plotters or ZR-394 printer. It will also operate as a hybrid navigation system with either the LC-80 or LC-90 loran receivers.

A built-in keep-alive system protects stored data in case of power failure, and the FSN-90 operates from a standard 12 or 24 VDC supply, requiring just 14 watts.

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

Circle 16 on Reader Service Card

HARRIS

Harris Corporation RF Communications Group, a world leader in the design, manufacture, installation, and support of advanced HF/VHF-FM radio communications equipment, turnkey systems and networks, recently introduced the compact-design RF-755 10 kw HF-ISB Transmitter for critical long distance communications.

This transmitter is contained in a rack only 32 inches wide, with automatic BIT for surveillance of operational readiness and modular-level diagnostic test to isolate any fault. The RF-7405 or RF-777 Remote Control Systems may be used, providing remote BIT and operating control. This transmitter may also be housed in a shorter cabinet for shelter installations. When observation of displays is required, but accidental control changes are to be prevented, an optional front closure panel may be installed.

Also available in a 5-kw version (RF-765), this transmitter is adaptable to coastal stations, diplomatic networks, shipborne installations, and shelterized or fixed station networks.

Circle 17 on Reader Service Card

HENSCHEL

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

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

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

Circle 18 on Reader Service Card

HOSE MCCANN

The Hose-McCann Telephone Co., Inc., one of the pioneers of sound-powered telephones for marine usage, has expanded their product line to include a variety of U.S. Navy electrical and mechanical products. The assortment of Hose-McCann products includes the Call Signal Station IC/D, Symbol No. 2988; Sound-Powered Telephone Jack Box G15A/B/C; Sound-Powered Telephone Handset H203/U; Handset Holder Z33A/B; Sound-Powered Head-Chest H200/U and H202/U; Head-Chest Set Stowage Box, Symbol 2924.1 (1 to 6 compartments); Alarm Bells and Buzzers IC/B2S4 (Other types available); and Horns and Sirens IC/H1S4 (Other types available).

All Hose-McCann Navy products are manufactured, tested and qualified in accordance with the latest military specifications.

Circle 19 on Reader Service Card

HULL ELECTRONICS

The Hull Electronics Company of San Diego, Calif., offers two of the latest SSB telephones available to the marine market. Hull offers the Model 924 and Model 1324 SSB radio telephones which incorporate state-of-the-art electronics, including a special Random Access Memory (RAM) to store individual channels. The units are designed to provide clear, dependable communications between ships, and from ships to private or public shore stations. The Model 924 includes a built-in automatic antenna tuner, while the Model 1324 includes a Hull automatic antenna coupler.

Circle 20 on Reader Service Card

JAPAN RADIO

Japan Radio Company, Ltd., is marketing two new products—the JLR-4000 GPS Navigator and the GSC-80 On-Board Data Automatic Recording System (ODARS).

The GPS NAVSTAR system with timing and ranging is completely new and will eventually use 18 satellites to pinpoint a ship's position and speed anywhere in the world with great accuracy. The system currently uses seven satellites now in orbit, allowing measurement of positions for about three to five hours a day. Twenty-four-hour service will be available in 1987.

The JLR-4000 navigator is said to be one of the most compact and lightweight units in the world, with a unique time-sharing feature. As the GPS navigator receives signals from four satellites to measure a position, four or five receiving channels would normally be required. However, the time-sharing system developed by JRC permits the receiver to receive the signals from all four satellites on a single channel for instant position fixing. The GPS receiver determines not only latitude, longitude, speed, and bearing—the basic functions—but it can also indicate such navigational data in memory as destination, bearing and distance to destination, required time to it, off-course alarm, etc.

The GSC-80 ODARS has been developed to meet demands for automated data communications through the INMARSAT from ship to shore. It is an automatic data reporting system to collect various types of onboard information and to automatically transmit the newest data to the shipowner's office ashore via the INMARSAT telex link.

The system consists of a multi-data interface and a telex channel interface that are connected to an existing or new INMARSAT ship earth station. The GSC-80 can transmit data to shore using three modes—fully automatic, semiautomatic, and manual. The onboard data received at the shore office is analyzed and processed to send a relevant sailing plan back to the ship.

Circle 21 on Reader Service Card

KRUPP ATLAS

New-generation navaids available from Krupp Atlas Elektronik (KAE), with U.S. operations in Rahway, N.J., include the Atlas 7600-8600 16-inch rasterscan radars, which offer continuous television-type viewing under all conditions. Comprising RM, TM and two ARPA models, all are FCC type-

(continued)

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Navigation & Communications Equipment

(continued)

approved and are designed to meet IMO, USCG and other leading specifications.

Over 500 of these radars have already been sold worldwide. U.S. customers include the New Jersey-based Sealand Company who are to install a series of 7600 X and S-band RM and TM units on new container vessels destined for the Alaskan trade.

Principal features of these advanced radars include a centered TM display mode for maintenance of own ship position fixed on PPI while indicating targets with their true trails; adjustable lengths of target trails may also be generated for rapid orientation to given traffic situations.

A newly developed 12-inch variant of the 7600-8600 series, the Atlas 5600, is also available. Suitable for small ships of any size or class, it is designed to operate over nine ranges extending from 0.3 to 72nm. Available with either X or S-band transceiver/slotted array antennae, the 5600 can be interswitched for cross-connection as well as master-slave operation.

The 7600-8600 radars also have been adapted for vessel traffic control applications, allowing for transmission of radar data from remote sites to central control. For these uses, KAE has adopted narrow band compression techniques in which signals from the radar transceiver, such as antenna angle pulses, north reference pulse, radar trigger and video, are all reduced to a common signal and then shaped to conform with any standard industrial TV transmission format using coaxial cable, fiber optic systems, twin-wire connections or microwave links of differing frequencies.

The radars also form an integral part of KAE's advanced NACOS 20 modular navigation bridge control system designed for single manning and which is already beginning to attract considerable U.S. interest. A basic configuration comprises an 8600 ARPA and either a 7600 TM or ARPA, an Atlas Dolog 23 doppler log, echo sounder and an adaptive radar-controlled autopilot, or ARCAP, for which the 8600 also provides input and monitoring facilities. Also included is a full-color navigation information display (NID) console together with interfaces for other sensors and bridge equipment.

Circle 22 on Reader Service Card

MAGNAVOX

Magnavox is offering the new MX 4400 GPS Positioning and Navigation System, designed as a full-featured two-channel C/A code receiver. The unit has been designed by Magnavox for use with the current interim GPS constellation and with increasing utility as more satellites are employed.

The two-channel receiver provides continuous GPS navigation, without interruption, whenever sufficient satellites are available. The MX 4400 can navigate with as few as two visible satellites when an external atomic frequency standard is interfaced and altitude is known (sea level) or determined from the receiver's altimeter. This capability extends the number of hours per day that the MX 4400 receiver can be used. To provide navigation during GPS coverage gaps, the MX 4400 will automatically dead reckon using inputs from external speed and heading sensors.

Magnavox plans to introduce software in 1987 to permit the MX 4400 to accept GPS differential corrections in the standard RTCM SC-104 format. The differential inputs will result in enhanced dynamic accuracy in real time.

In order to provide continuous, optimum navigation and positioning information, the MX 4400 employs an 8-state Kalman filter which evaluates and weighs satellite data. A 16-bit numerical co-processor provides position, speed and heading updates every 1.2 seconds. The system has the capability of providing GPS data to integrated survey systems such as the Magnavox Series 5000 Geophysical Survey System.

In addition, the Magnavox Advanced Products & Systems Company recently announced the creation of a program for worldwide rentals of its navigation, communication and survey products. NAV-COM Inc., a Magnavox subsidiary, will be the rental agent for the program.

Circle 23 on Reader Service Card

MICROLOGIC

Micrologic of Chatsworth, Calif., are the manufacturers of the simple-to-use ML-7500 navigation system, which, according to the firm, can be mastered by the average user in just a few hours.

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

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

Made portable with an optional rechargeable battery pack, the ML-7500 can also be used on several vessels without permanent installation. The battery pack powers the unit

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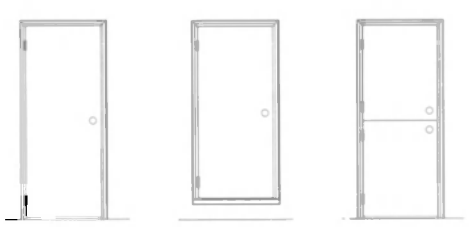

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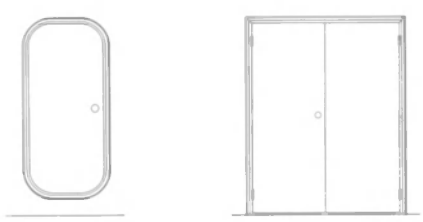

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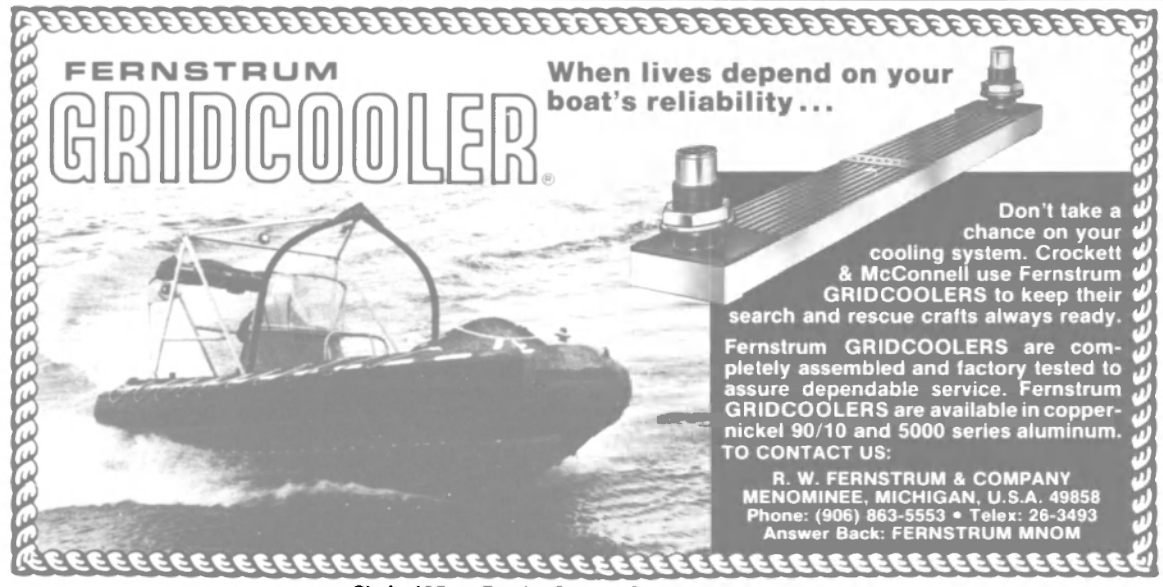

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for five hours of continuous operation. The basic Loran is six inches wide, six inches high, and three inches deep; weight is approximately four pounds.

Circle 24 on Reader Service Card

MOTOROLA

Motorola, Inc., offers its new Triton Series of cellular mobile and portable telephones, designed to be sold through a limited number of full-service marine electronics dealers in selected cities.

The new Triton series includes three models, plus a variety of accessories: The Triton 180, a marine cellular mobile telephone that includes a compact, rugged one-piece control unit package which features 32 telephone number memory locations and super-speed memory dialing. The Triton 480 is a deluxe marine cellular telephone with space-efficient cradle mount, 101 memories, theft alarm, fluorescent display, four call timers, incoming call screening and super-speed memory dialing. The Triton 800 portable cellular telephone, a true hand-held portable unit for the marine market, weighs 30 ounces and provides a full 8 hours of operation, and includes 30 minutes of talk time from one battery.

The Triton series of cellular telephones is qualified under Motorola's Accelerated Life Test (ALT) program. This tests Triton products for extremes of humidity, temperature, vibration and shock.

Motorola is one of the world's leading full service suppliers of cellular systems. More than 65 of the cellular systems in the world's top 90 cities are supplied by Motorola. Also the company offers one of the industry's broadest lines of cellular mobile and portable telephones.

Circle 25 on Reader Service Card

NAV-CONTROL

Nav-Control, Inc., a Halesite, N.Y.-based firm, is the U.S. agent for the navigation/instrumentation products manufactured by the Norcontrol Division of A/S Kongsberg Vaapenfabrikk in Norway.

One project recently undertaken by Norcontrol Automation is the supply of a comprehensive engine room monitoring and automation system for the Sovereign of the Seas, the world's largest cruise liner currently under construction at Chantiers de l'Atlantique's Alsthom yard in St. Nazaire, France. The automation package will include machine monitoring, fuel-economy monitoring, management of electrical power, stability calculations, ballast control and monitoring of ventilation and fire doors. The automation package, based on Norcontrol's DataChief system for engine room automation, will be delivered to the Alsthom yard in the spring of 1987.

A second vessel reaping the benefits of a Norcontrol integrated automation system is the shuttle tanker Sarita, owned by Ugland Shuttle Tanker & Co. The tanker has several Norcontrol systems on board including the DataChief-7 engine room monitoring system and alarm package, AutoChief-7 control system for the main engines, and the DataMaster-7 cargo control system. The independently operated systems have brought substantial benefits in operational efficiency, as well as installation and maintenance cost savings.

Circle 26 on Reader Service Card

NAVAL ELECTRONICS

The MK-20 omni-directional TV antenna offered by Naval Electronics Inc. of Tampa, Fla., distributors for Naval Electronics A.B. of Sweden, features three separate band elements with interference filters and an internal, changeable, low-noise amplifier utilizing state-of-the-art microwave devices.

The MK-20 feeds a special marine cassette amplifier system with "automatic gain control" to compensate for the changing reception conditions of a ship underway. The cassette amplifiers then feed a ship's distribution system that provides TV antenna outlets throughout the ship in lounges, cabins, and other areas.

Naval can arrange system engineering and installation in all U.S. ports as well as in more than 50

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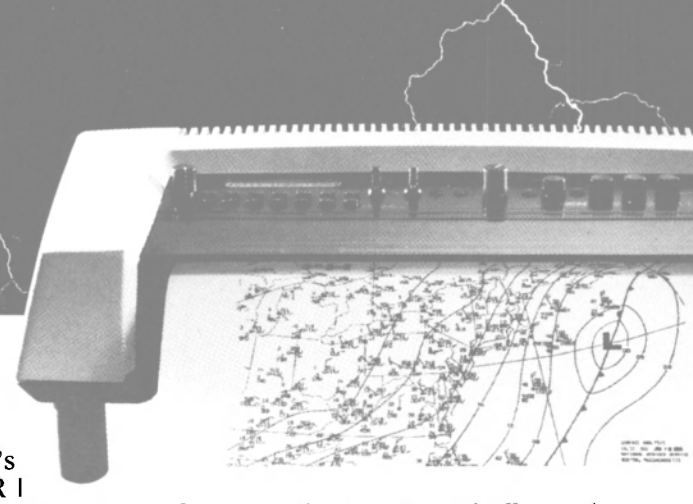

The best way to deal with bad weather at sea is to avoid it. And Alden's new Marinefax™ TR I gives you the information you need to plan your best and safest course.

A Wealth Of Information

With your Marinefax TR I, you can receive a wide variety of charts, available free from over 50 government transmitters worldwide. Charts not just on weather, but on sea conditions as well. Surface analyses and prognoses let you avoid storms or take advantage of favorable winds. Gulf Stream and other oceanographic charts, as well as wave height and direction charts, show you the speediest and most comfortable course.

Beyond comfort and safety, weather charts can help plan a course to minimize fuel consumption. And fishermen will especially appreciate sea temperature information to show the most likely hot spots.

Automatic Reception

Marinefax TR I is a new generation of weather chart recorder from Alden. It features a unique microprocessor that lets you program the recorder to automatically receive the exact charts you want. You tell the recorder when to come on, what frequency to receive, when to change frequency, and when to go off. You get your maps, whether you're onboard or ashore.

Programming is easy, with the LCD display leading you through the steps. Yet despite this sophistication, Marinefax TR I is the smallest weather chart recorder on the market.

Improved Frequency Selection

Recall any transmitter frequency you like just by hitting two buttons. Or store up to ten stations of your own choice for one-button recall.

And the TR I has a new, improved radio. Fine tuning is incredibly simple: just push the button for precise, 0.1 kHz changes until you optimize reception. The frequency then locks in, eliminating the "drift" common to many other radio receivers.

New Paper

Our new Alfax thermal paper is dry for easy storage, and produces bright, high-resolution maps. Thermal printing is exceptionally quiet, and provides for simple and inexpensive operation.

Alden Reliability

For over 40 years Alden has specialized in weather products, serving not only mariners, but professional meteorologists as well. Our one-year warranty is followed by a unique, fixed-price service plan, no matter how old your Marinefax is.

Before you have to face another storm at sea, find out more about Marinefax. Contact your local dealer, or contact Alden Electronics, 130 Washington Street, Westborough, MA 01581 (617) 366-8851.

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ALDEN MARINEFAX TR I

Circle 10 on Reader Service Card

(continued)
countries around the world through its marine service network.

Circle 27 on Reader Service Card

NEWMAR

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

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

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

Circle 28 on Reader Service Card

RACAL MARINE

Racal Marine is one of the leading marine electronics manufacturers in the world. Companies within the Racal organization (Racal-Decca Marine Navigation Ltd., Racal Megapulse Inc. supported by Racal-Decca Advanced Development Ltd.) offer a wide variety of marine radio navigation systems and their associated equipment, including the Decca Navigator, Loran, Omega, Satnav and GPS systems. The company is heavily involved in the development of new radio navigation and high accuracy systems.

Racal is a leader in the production, design and supply of deepsea marine equipment and systems, such as the MNS 2000 Multisensor Navigation Receiver, Integrated Ship Instrumentation System (ISIS) and the type-approved line of color radars, the 2070 and 2090.

Additionally, the company has introduced a range of Integrated Ship Electronic Systems (ISES), through Racal Marine Systems Ltd., which provide significant benefits for onboard ship management.

For the fishing and coastal marine industry, Racal offers a full range of radars, navigation receivers, video plotters, autopilots, gyros, sounders and sonars. The company is also a major supplier of naval radars worldwide.

Furthermore, Racal Simulation Ltd., designs, develops and manufactures advanced training systems and simulators, which include ship bridge and marine radar navigation aid simulators for both civilian and military use.

Circle 47 on Reader Service Card

RADIO-HOLLAND

The Distributor Products Division of Radio-Holland USA of Houston, exclusive distributor in North America for Thrane & Thrane A/S of Denmark, is said to be the first radiotelex manufacturer to offer equipment with the newly passed CCIR Recommendation 625. All Thrane & Thrane standard and double-speed Automatic Telex Over Radio (ATOR) modems will be delivered with a new software package containing not only its high-performance, user-oriented feature package, but also the new CCIR Recommendation 625.

To fully utilize all the benefits that this new recommendation has to offer, automatic coast station systems delivered by Thrane & Thrane will also be upgraded to CCIR Recommendation 625, including Singapore Radio, Hong Kong Radio, Lyngby Radio, Scheveningen Radio, Bern Radio, and WLO Radio in Mobile, Ala.

Of equal importance, the new recommendation programs will be supplied as an upgrading kit for all earlier-delivered TT-1585 series of ATOR modems (more than 2,800 installed), including the very first versions delivered some four years ago.

CCIR Rec. 625 includes nine-digit call codes in accordance with the future requirements of a common call code for all maritime communications systems, and a completely new scheme for exchange of station identification during initial calls and during rephasing procedures, preventing the annoying problems of a third station rephasing into an existing communications connection and possibly receiving the rest of the message.

The 256 kbyte memory ATOR modems will interface with virtually any teleprinter, or supplied free of charge is the copyrighted XCOM program enabling both full control and operations of the modem from DOS-compatible computers, as well as free file transfer between the modem memory and the computer disk system. And for the discriminating user, a high-security telex cipher feature, provides total security against those eavesdropping on the radio circuits.

Circle 29 on Reader Service Card

RAYTHEON MARINE

The Raytheon Marine Company, Manchester, N.H., offers two state-of-the-art low-cost rasterscan radars, the 3604 and 3610 radars. The units, with maximum ranges of 36 and 64 nautical miles, can not only be used by workboat operators, but also as back-up units for oceangoing vessels.

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

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

A commercial, chart-recording echo sounder, the RD-500 sounder, records and prints depth in six ranges to 1,000 feet, meters, or fathoms, and prints time and event marks on the chart. Digital depth display and presettable, audible depth alarm are provided. An 80-kHz transducer is standard.

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

Furthermore, Raytheon Marine has signed a comprehensive distribution agreement with Yokogawa Hokushin Electric Corporation of Japan, which will enhance Raytheon's capability to offer complete bridge systems that interface with Raytheon navigation and communication equipment.

Circle 30 on Reader Service Card

RAYTHEON SERVICE

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

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

Circle 31 on Reader Service Card

RDI

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

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

A shipowner may fit an RDI ARPA I to a 12-inch radar and comply with the spirit of IMO regulations until January 1, 1991.

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

The Star* Trac satellite navigator, a commercial satnav at a competitive price, offers 64 navigation displays plus log/gyro interface.

The new RDI Satcom I features a self-prompting keyboard to make operations simple. Designed for use with Inmarsat, the unit can be interfaced with the Star* Trac satnav to provide an automatic vessel monitoring system.

Circle 32 on Reader Service Card

ROBERTSON-SHIPMATE

As another element of safety of vessels at sea, all ships of more than 300 grt must be equipped with one of the relatively new Navtex receivers by February 1, 1990. Navtex is a 24-hour warning system that transmits a broad range of navigational and weather information relevant for all types and sizes of ships.

In the U.S., Navtex coverage already exists in New England and the Gulf of Mexico. The Coast Guard expects to have national coverage in place by the end of 1989.

In keeping with these new developments, Robertson-Shipmate is offering a new and advanced Navtex receiver.

The RS-6100 Navtex receiver from Shipmate has only four control keys to insure simple, reliable operation. All additional functions are performed via a printed menu that describes required operator responses. It provides the full range of weather and safety information automatically with free choice of transmitter stations.

The RS-6100 consumes very little power, having an economy function in which it only uses 1W. When connected with one of Shipmate's navigation receivers, for example RS-4000, RS-5000 Sat Nav, or RS-5100 Sat Nav, the RS-6100 serves as a printer and prints out information from the navigator's display or satellite predictions from the satellite navigators. The printer will also interface with any other NMEA compatible navigation receiver.

There are three versions of the RS-6100 series: RS-6100 Automatic where area selection is automatic when connected to a navigation receiver; RS-6101 Basic where area selection is carried out manually; RS-6150 is a printer only which can be connected to navigators, computers, or other equipment requiring a print-out.

Other features include built-in audible and visual alarm, end-of-paper alarm, along with an easy touch keyboard with light and dimmer and a 40-character thermal

printer with 131-foot paper capacity.

Robertson-Shipmate is also offering the RS-2000 color track plotter, which the company claims, provides virtually unlimited navigation flexibility.

The RS-2000 is not only a color track plotter, but also an electronic charting system that shows prerecorded charts for many of the most popular fishing and coastal areas. The seven-color display enables users to freely choose any colors to mark tracks, reefs, rocks, etc. This particular feature permits the user to develop his own private "color language" on the screen. It also helps to prevent navigational accidents. Charts are stored permanently on cassette tapes, allowing for easy exchange of maps and charts between users. Charts can also be drawn up before a voyage and new information can be added as needed and then stored for future use.

Circle 33 on Reader Service Card

SAIT

SAIT, Inc. is offering the new SAIT XH 5112 Radio Telex System, which is fully compatible with the IMB PC or IBM compatible computers. Utilizing Crosstalk© software, the PC interface consists of one additional printed circuit board with external ports. The system memory is expanded from the standard supplied 32 K to 64 K.

With this feature, a computer in an office can link directly with another computer onboard a ship via two XH 5112 radio telex modems, one at the sending and one at the receiving end. Alternately, communication can also be accomplished via a coast radio station with radio telex capability, for example, WCC or WLO. This capability was previously available via the Inmarsat system with equipment cost in the range of $35,000. The same technology is available with the SAIT XH 5112 Radio Telex at a substantially lower price.

Circle 34 on Reader Service Card

SHIP ANALYTICS

Ship Analytics of North Stonington, Conn., is in the second year of a three-year U.S. Navy contract in which the company provides training for senior officers at the Maritime Training and Research Center (MTRC) in Toledo, Ohio.

For seven weeks each year, Navy personnel will take part in a comprehensive, scientifically structured training program developed to enhance shiphandling skills on the $6-million simulator that was designed, built, and operated for the MRTC (MEBA/AM, District 2) by Ship Analytics.

Through courses specifically tailored by the firm to meet Navy requirements, Naval personnel will train on bridge and radar simulators, with computer-assisted classroom sessions. These sessions allow trainees to observe and analyze the progress of others, while examining alternative approaches to maneuvering their vessel, under a variety of environmental conditions.

Ship Analytics is a world leader in the design of real-time computer graphics software. It provides major systems in technologies ranging from marine simulation to military tactics. It also markets a variety of graphics presentation software to business.

Circle 35 on Reader Service Card

SIEMENS

Siemens Energy & Automation, Inc., Power Engineering Marketing Division, is offering several new cost effective methods of ship control which concentrate control on the bridge and reduce the size of crew required to operate a vessel.

One development from Siemens is the SINEC H1 industrial bus, which serves to link the automation systems of a vessel to each other and with a combined central control station/bridge control center in such a way that the systems remain unaffected by a fault in another system.

For central operation and monitoring tasks, the SIGOS 41 (Siemens Graphic Operating and Supervising System) is tied into the industrial bus. Up to eight video display terminals with color graphics capability can function in multi-terminal operation.

All monitoring, open and closed-loop control systems are configured autonomously and have their own operation and monitoring possibilities. The bus system and linked units insure: simple monitoring, operation and control; flexible adjustment to changing conditions; high system availability; continuation of automatic operation, even if central control system fails; and continuation of automatic operation, even if a bus fault occurs.

Circle 36 on Reader Service Card

SIMRAD

Simrad, Inc., a leading manufacturer of a complete line of marine electronics, navigation, instruments and systems for the commercial, offshore, fishing and naval industries, is offering the Simrad/Taiyo synthesized MF/HF CRT automatic direction finder, Model TD-C338HS.

The automatic direction finder is a synthesized, triple-superheterodyne receiving system, with no spot crystals required. The unit features a wide frequency reception for direction finding, 200 kHz to 17,999.9 kHz, with an LED display of frequencies in 0.1 kHz steps. Other features of the automatic direction finder include: 100 channel memory capability with scanning; automatic sense determination without separate antenna; built-in goniometer; an LED level/distance indication meter; and an optional gyrocompass interface unit.

Circle 37 on Reader Service Card

SI-TEX

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

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

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

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

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

Circle 38 on Reader Service Card

SPERRY

Sperry Corporation, a major manufacturer of marine navigation and control systems, and a leader in the field of radar and collision-avoidance systems, offers the Sperry GPS Core Module that the company has designed and manufactured specifically for the marine market.

(continued)

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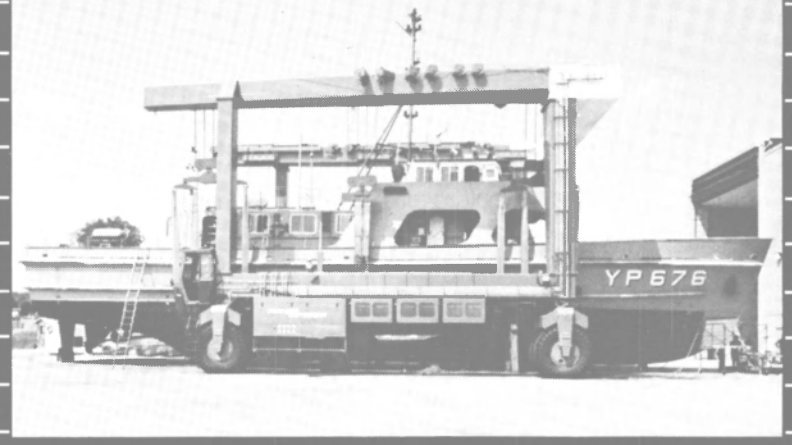

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Circle 128 on Reader Service Card

Navigation & Communications Equipment

(continued)

The Sperry GPS Core Module is a single-channel, C/A Code, sequenced receiver, with position calculation accuracy to 30M. Latitude, longitude and GMT are available every two seconds on either of two RS232 Ports.

The Core Module can be directly connected to Sperry Satnav's or Sperry PCs (or IBM compatible). Optional interfaces range from simple navigators to integrated systems.

Owners of one of the following satellite navigators will be interested to know that Sperry can upgrade your existing set to a full Global Positioning System receiver: Sperry 501TR/GPS; Sperry SRN501; Sperry ESZ4000; and SAL4000.

The Sperry GPS Core Module enables the reception and navigation computations from both the Transit and GPS satellites to be displayed on your existing system display.

During the transition from Transit to GPS, the 501 TR/GPS will automatically select the best fix source and continue to provide you with total navigation data with no need for time-consuming switching or input coding. In GPS mode, the 501's format will provide continuous course readout and bottom speed at any depth.

Circle 39 on Reader Service Card

SP RADIO

S.P. Radio A/S of Aalborg, Denmark, offers the Sailor SSB high-power short wave program 1000/B radiotelephone with an aerial coupler.

The Sailor Program 1000/B is able to meet all maritime and point-to-point communication requirements within the maritime bands 1.6 to 28 MHz, and other frequent requirements in the frequency range of 1.6 to 28 MHz when the exciter is equipped with a continuous coverage option. The radiotelephone offers assured radio communication by telex as well as telephone over long distances.

In addition, a transmitter is provided with an aerial coupler AT1500, which is completely weather-resistant, making it suitable for installation in arctic or tropic environments.

The receiver and transmitter with the aerial coupler and the telex modem Sailor H1240 form a very effective radiotelex station. Combined with the Sailor R1121 scanning receiver, it becomes a fully automatic radiotelex station. The system works in an ARQ mode on one aerial.

Furthermore, the new transmitter and receiver are fast enough to have a telex connection on one frequency (Simplex) in the ARQ mode.

The unique principle of transmitter, aerial coupler and power supplies ensure a high degree of reliability, and that high transmitting power is kept even under severe conditions.

The Sailor 1000/B has separate receiver and transmitter units (full Duplex) and transmitting power high enough for worldwide communication.

Circle 48 on Reader Service Card

SPT LTD.

SPT Ltd., with full sales and service facilities in Houston, Texas, offers an extensive line of sound powered telephones and accessories for offshore, marine and land-based use.

SPT sound powered telephones operate independently of a power supply or batteries. The units are, in fact, powered by the user's voice, making communication simple, low cost and maintenance free. The sound powered telephones meet fail-safe communications requirements, as well as isolated site, intrinsically safe and portable communications requirements.

SPT Ltd. also offers a variety of quality broadcast and general entertainment products for the marine market such as radio receivers, cassette players and power amplifiers in rack systems or as separate components.

Circle 40 on Reader Service Card

STANDARD

Standard Communications Corporation of Los Angeles, Calif., recently introduced the Horizon HX220S Portable Hand-Held Phone.

The Horizon HX220S features a large easy-to-read LCD display with a light for night viewing. The unit, which uses just 6 watts, has superior waterproofing with fewer push buttons to insure water integrity. The HX220S also has instant access to Channel 16 as well as expansion channels in the microprocessor with rapid up/down channel selection and a user programmable scanner.

Standard Communications offers a full line of marine radios, marine hand-held radios, Horizon marine instruments and HRO Systems Reverse Osmosis Desalinators.

Circle 41 on Reader Service Card

STANDARD RADIO

Standard Radio & Telefon AB of Vallingby, Sweden, offers the PNW900 Navtex receiver. This Navtex receiver has dual channels for national and international transmissions.

All ships over 300 gross tons must be equipped with a new Navtex receiver by February 1, 1990. The Navtex system, which has coverage in the U.S. ranging from the New England area to the Gulf of Mexico, transmits 24-hour warnings of navigational and weather conditions. The Coast Guard expects that total U.S. coverage will be provided by the Navtex system by late 1989.

Circle 49 on Reader Service Card

TELEDYNE

Teledyne Hastings-Raydist, Hampton, Va., manufacturer of medium-range, precision radiopositioning systems, has introduced the TRAK IV system.

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

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

The ability to track up to four LOPs continuously and simultaneously greatly increases system reliability. When used with the Raydist Director (microcomputer), interchecking is permitted between the redundant position data to achieve a statistically desired "best-fit" position solution and a "figure of merit" indication of probable accuracy. The Raydist Director also permits op-area initialization so that the correct fractional values of the several LOPs can be established and/or verified in the actual area of operations.

Circle 42 on Reader Service Card

TEXAS INSTRUMENTS

Texas Instruments has introduced a new relative-positioning software package, Geomark, designed to process data collected by the TI-4000 Global Positioning System (GPS) Navigators.

The Geomark software for GPS provides highly accurate postprocessing positioning information from data collected by two TI-4100 GPS Navigators simultaneously tracking the same four GPS satellites.

AUCTION

LOUISIANA DOCK COMPANY, INC.

(LIQUIDATION OF SURPLUS EQUIPMENT)

THURS., DEC. 18TH 10:00 A.M. ST. LOUIS, MISSOURI

NO MINIMUMS OR RESERVATIONS

SALE SITE: LOUISIANA DOCK CO., INC. yard, 700 East Davis **INSPECTION TIMES:** Thursday, December 11th thru Wednesday, December 17th. 8:00 A.M. until 5:00 P.M

(PARTIAL LISTING ONLY)

4—DRY DOCKS

(1) 1973 2300-Ton Dry Dock 180'L x 80'W x 7'Depth, WBW-70', 16' Wing Walls. 6) 12" & 6) 10" Fairbanks Morse Verticle Pumps, 48) Air Valves Operated from Control House. 440V Controls. 1) R 30 Compressor 25-HP.. 5) Lincoln Welders 400A & Lights. **(2) 1970** 450-Ton Dry Docks 56'L x 70'W x 6'Depth. WBW-60' 13' Wing Walls. 2) 10" Fairbanks Morse Vert. Pumps. Hand Oper. Valves, 12-Compartment. 440V Controls. **(1) 1961** 400-Ton Dry Dock 62'L x 54'W x 5'Depth. WBW-46'. 15' Wing Walls. 2) 6" Deep Well Pumps. Hand Oper Valves, 10-Compartment

3-BARGES

(1) Late Model Crane Barge, 110'L x 45'W x5'Depth, Sgl. Rake, 8-Compartment w/Manitowac 3000 Pedistal Crane, s/n. 30248 w/80' Boom, 20' Jib, 3rd Drum, Power Lowering. **(1) Tank Barge** 60'L x 25'W. x 6'Depth, Dbl. Rake, 30'L x 25'W x 6'Depth Compartment (Appx. 30,000-Gal.), 9000-Gal. Fuel Tank, Mtd. on Deck, (Coastguard Inspected 1985). **(1) Flat Deck Barge** 60'L x 18'W x 4'Depth. Dbl. Rake. Pump House Mtd. on Top, Marlow Centrifugal Pumps. **Hopper Barge** 110'L x 26'W. Draft Loaded 6' Draft Light 1'

6-WORK FLATS

(1) Flat Deck Barge, 33'L x 18'W x 3'Depth Dbl. Rake. 3) Winches. Pwrd. by Wisconsin Eng. w/Boom Pole. **(1) Office & Shop Barge,** 264'L x 37'W x 12'Depth, Concrete Hull, 12-Compartment, 30' x 50' 2-Story Office. 30' x 130' Machine Shop w/10' Hook Height, Barge Contains Red Fox Sewage System. **MISCELLANEOUS MARINE:** Various Sized Work Flats.

2-BOATS

(1) 1958 Shift Boat 46' x 15' 330-HP., 2) GM 671 Diesels, M/V Little Giant Twin Screw. 2) Steering Rudders & 4) Flanking Rudders. **M/V John Prince:** Push Boat 42'L x 14'W x 5'4"Depth, (Loaded or Light) Double Flanking Rudders, 2) Cat. 335 Diesels, 400-HP

OTHER EQUIPMENT

(1) American 999C Crawler Crane, s/n. GS9372, 60' Boom, 36"W Crawlers, Pwrd. by Detroit 8V71 Diesel, Power Lowering. **(2) Ohio DE 600** Locomotive Cranes, s/n. 4967 & 4968, 55/80T-55' Boom, Pwrd. by Detroit 8V71 Power Lowering, Worthington Air Comp., Manual Outriggers. **(1) Austin Western Mdl.** 410 Rubber Tired Crane 25' Boom w/Detroit 471 Diesel, s/n. G-12AW. **(1) Cat. Mdl.** VGT80D 8000# Forklift, s/n. 33S2115, Diesel, Hyd. Side Shift Forks, Good Condition

AIR COMPRESSORS

(2) Sullair 32-200L 1000 CFM, 110 PSI, s/n. 34019 EGG & s/n. 17028 GGD w/200-HP. Elect. Mtrs. Both are enclosed & skidded, excellent condition

WELDING EQUIPMENT

Appx. 100) 100A-600A Miller & Lincoln Welders-Rectifiers, Wire Feed & Accs. **(1) Lincoln MA3**-S Strip Feeder w/30/60 MM Strip Head, used f/Shaft Cladding Mdl. 8S84 w/Lincoln DC1500, Shaft Overlay Fixture & Flux Recovery Unit. Large inventory of cutting torches & welding accessories.

TRACK WELDERS

(2) Automatic Track Welders, 27' Span w/(1) 1500 AMP & (1) 400 AMP Lincolns, (2) Lincoln Wire Feed Welders, Flux Vacuum System, Hyd. Raising, Lowering & Drive

11-BRIDGE CRANES

(2) Conco Tellus & **(2) P & H** 20-Ton Overhead Bridge Cranes, Cab Oper., 100' Span, Dbl. Girder. **(1) P & H** 10-Ton Overhead Bridge Crane, Ground Oper., 47' Span, Dbl. Girder. **(1) Whiting & (1) Shopbuilt** 5-Ton Overhead Bridge Crane, Cab Oper., 48' Span, Dbl. Girder. **(1) Wright, (2) Abel & Howe & (1) Shopbuilt** 5-Ton Overhead Bridge Crane, Ground Oper., 48' Span, Dbl. Girder

OTHER EQUIPMENT

(1) Pacific 400-Ton Hydraulic Press Brake Mdl. K-400-16, Cap. ½" x 15', s/n. 8921. Iron Workers, Threaders, etc.

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The TI-4100 is a satellite-based navigation system that provides precise absolute positioning or relative point-positioning surveys, including aerial surveys, offshore platform positioning, marine navigation and oceanographic and geophysical surveys.

The Geomark software provides typical solutions in less than one hour of off-line processing using as little as 30 minutes of collected data, including data cassette translation.

Geomark offers totally automatic operation. Users may enter custom specifications by overriding the automatic defaults. Users can also specify the reference location or derive the location using the TI-4100. Geomark processes both Precise Code (P-Code) or Coarse/Acquisition (C/A Code). The software uses broadcast ephemeris, but can also support post-mission precise ephemeris.

Geomark records all necessary data on a one-page report that provides the user with the monument-to-monument baseline vector. The system can provide the answer in standard latitude, longitude, altitude; state plane; UTM; or local datum.

The complete TI-4100/Geomark package is available now and includes Geomark and MS-DOS™ software. The package also includes the TI Portable Professional Computer with 256K bytes RAM, a multifunction board with an additional 256K RAM, a single floppy diskette drive, a 10-megabyte Winchester hard disk drive, an 8087 coprocessor, three-plane graphics board, a built-in high-resolution 9-inch color monitor, two Memtec cassette readers, two RS-232 cables, and the TI 855 microprinter.

Circle 43 on Reader Service Card

TRACOR INSTRUMENTS

Tracor Instruments of Austin, Texas, offers the new Tracor SatNav II, a fully automatic microprocessor-based system. The Satellite Navigator II is a third generation of satellite navigation receivers manufactured by Tracor. Along with their Omega systems, it represents worldwide navigation experience and capabilities dating back to 1967.

The SatNav II is fully automatic, providing continuous navigation information, updated by periodic satellite passes. Once initialized, the receiver continues to compute all essential navigation data, which is always available to the navigator. Some of the special features of the SatNav II include: a large uncluttered display; multipass discrimination; continuous display of lat/lon; minimal power requirements (1.6 amps at 12V DC); automatic dead reckoning between fixes, using input from the ship's gyro and speed log, or manual entries; and internal battery backup.

Another product from Tracor is the Automatic Omega II, a fully automatic, microprocessor-based system which provides continuous navigation information from the worldwide Omega station network. The Automatic Omega II presents navigation data on a large uncluttered display. Reliability safeguards for each unit such as ceramic components, a 250-hour burn-in with four temperature cyclings, built-in test equipment, oscillator warning and a dead reckoning indicator are included at no extra cost.

Other Tracor navigation products include the Bridgestar satellite navigator, the Omega Navigator and the Transtar satellite navigator.

Circle 44 on Reader Service Card

TRACOR MARCON

Tracor Marcon, Inc., a wholly owned subsidiary of Tracor Inc., Austin, Texas, engineers and manufactures shipboard monitoring, alarm and control systems.

Tracor Marcon offers several outstanding monitoring systems including: the PMS 6000 shipboard performance monitoring system; CS 5000 shipboard automated machinery remote-control system; TMS 100 engine temperature monitoring system; and PMS II shipboard monitoring system.

The PMS 6000 is an integrated system providing remote instrumentation display, constant alarm monitoring, event recording and data logging.

The system consists of analog, rate and switch sensors which feed data to nearby collectors mounted in the machinery spaces. These data collectors pre-process the information and transmit it via a single cable to a main processor which can receive and process information from up to eight remote units. The processed data is then displayed in page format on video (CRT) displays and can be printed, with additional capability for recording on tape cartridges.

The CS 5000 is an integral remote control system providing remote start/stop capability for vessels main engine(s), generator(s), steering systems, and emergency pumps, from both the wheelhouse and engineer's main control station. CS 5000 is designed for use with either the PMS II or PMS 6000. The control system consists of a single central processing unit designed for engine room mounting.

The TMS 1000 is an integral microprocessor-based system providing simultaneous display of an engine's individual cylinder temperatures, with input capacity to accept twin engines of up to 20 cylinders each, plus stack temperatures.

The PMS II shipboard performance monitoring system offered by Tracor Marcon provides remote instrumentation display and constant alarm monitoring utilizing up to 168 separate inputs. Event recording and data printing capabilities are also available.

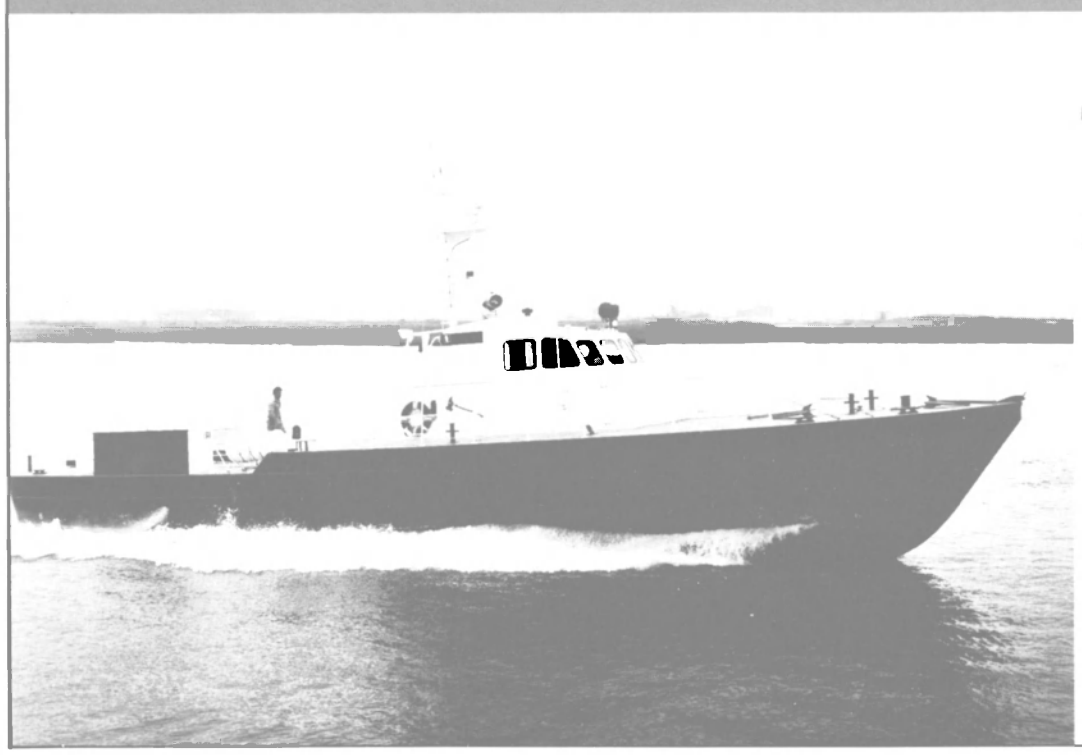
Circle 46 on Reader Service Card

WATERCOM

Waterway Communications System, Inc., Jeffersonville, Ind., has formed a new communications net-

(continued)

Two New 20 Knot, 78 Foot Multi-Purpose Boats Now Available at Greatly Reduced Prices



Will sell for $795,000 each. Reduced from $1,180,000 each.

Many uses such as: Utility; Police & Customs; Harbor Patrol; Rescue; VIP; Port Authority; Survey; Charter; Dive; Pilot; Water Taxi, and more. Immediate delivery. Easily modified.

Built to U.S. Coast Guard and Lloyds specifications, both are 78′ × 18′6″ × 11′6″ with lightweight steel hulls and aluminum superstructures. Each is powered by two GM12V71TI's developing 1350 BHP through Twin Disc 514 gears. They carry 3000 gallons of fuel and 1000 gallons of fresh water. Full galley. Air conditioned quarters for 10, extensive electronics package. 30KW generator driven by GM 2-71 diesel.

USA Racing Team

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Tel. (305) 931-1533, Telex: 522190

Navigation & Communications Equipment

(continued)

work to provide voice and customized data services between inland river towboats and their central offices. Full service was instituted in mid-1986.

The WATERCOM System, through a series of 54 shore stations, provides continuous coverage of approximately 4,000 miles of inland waterways. It serves the Mississippi River from south of New Orleans to Minneapolis/St. Paul, the Illinois River from the Mississippi to Chicago, and the Ohio River from Cairo to Pittsburgh. On the Gulf Intracoastal waterway, coverage extends from Apalachicola, Fla., to Brownsville, Texas, with incidental coverage on the Gulf of Mexico.

WATERCOM provides service comparable in quality to that of the National Telephone Network, and in fact connects to NTN lines just like any other telephone network.

The WATERCOM system consists of three major components: vessel telephones, shore stations and the Operations and Control Center in Jeffersonville. Vessel telephones consists of a radio transmitter and receiver, a microprocessor-based phone control unit, and the main telephone handset. An optional extension phone may be added to provide credit card calls from facilities in the crew's quarters.

Each of the 54 shore stations serves compatible equipped vessels within its operating range, providing continuous telephone service. Each station is interconnected with the local area central control office, from which incoming and outgoing calls are routed to and from the vessel.

The Operations Control Center is the heart of the WATERCOM system. It provides the principal automatic switching and routing functions for all long-distance calls entering the system.

Circle 51 on Reader Service Card

New Corrosion-Resistant Monel Hose From Cajon —Literature Available

Monel flexible hose lined with TFE, combining flexibility with the benefits of special alloy construction, is now available from Cajon Company, Macedonia, Ohio.

Monel is used for the hose overbraid as well as the end connections, providing chemical resistance, pressure capability and durability. The hose remains flexible at low temperatures, and maintains its strength at high temperatures.

The smooth bore TFE lining assures low pressure drop. Tube Adapter ends offer easy connection to tubing or NPT pipe systems.

Standard lengths are 12, 24 and 36 inches, with optional lengths available in one-inch increments from four inches to 20 feet. Service ratings are −65° to +450° F (−53° to +232° C), and 1,500 psi at 70° F (10,300 kPa at 21° C).

Application areas include chemical service, sampling systems, hydraulics and pneumatics.

For free literature on the new Monel flexible hoses from Cajon,

Circle 88 on Reader Service Card

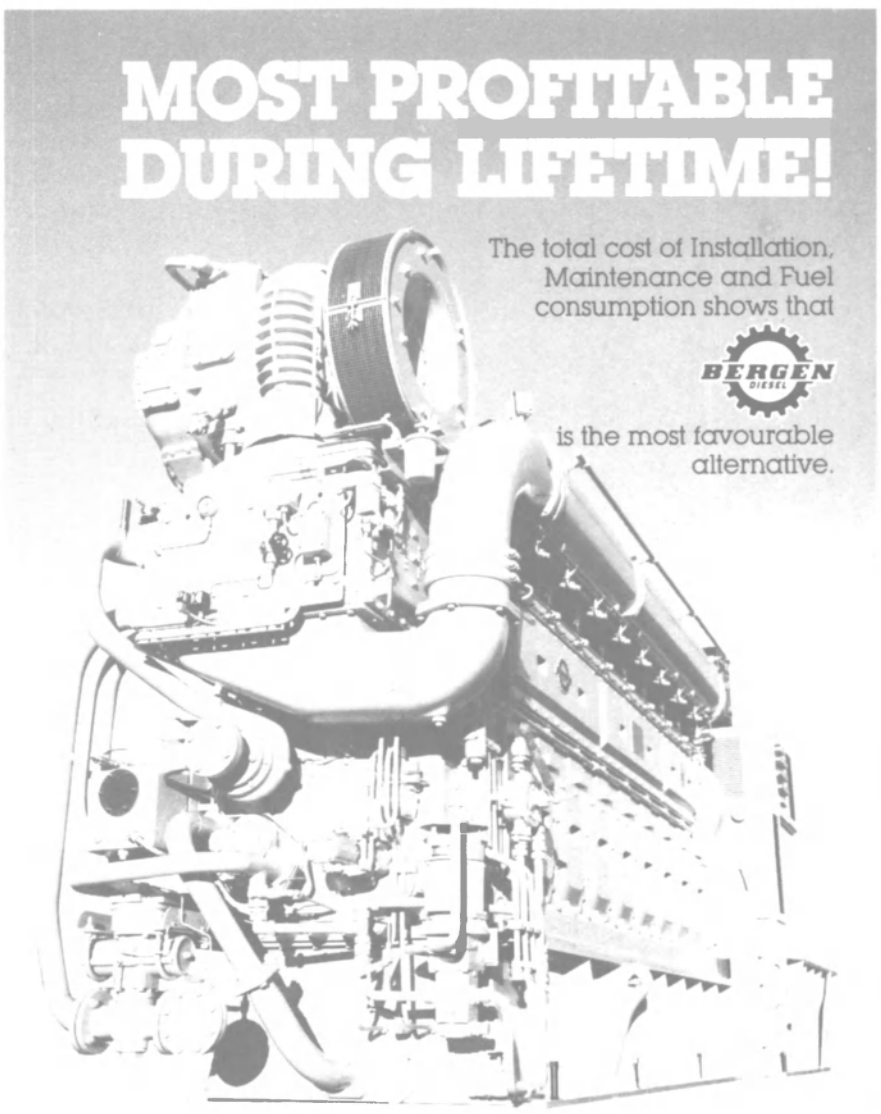
Hempel Coatings (USA) Offers Free 1987 Calender

Hempel Coatings (USA) Inc., Houston, Texas, is offering a free 1987 Hempel calender. The 1987 Hempel calender depicts seven famous America's Cup winners, drawn especially for Hempel by reknowned Scottish artist **John Gardner.**

This very attractive calender has been printed in five different languages: Danish, English, German, French and Spanish, and no fewer than 70,000 copies will be distributed.

For your free copy of the colorful 1987 Hempel calender (printed in English),

Circle 77 on Reader Service Card



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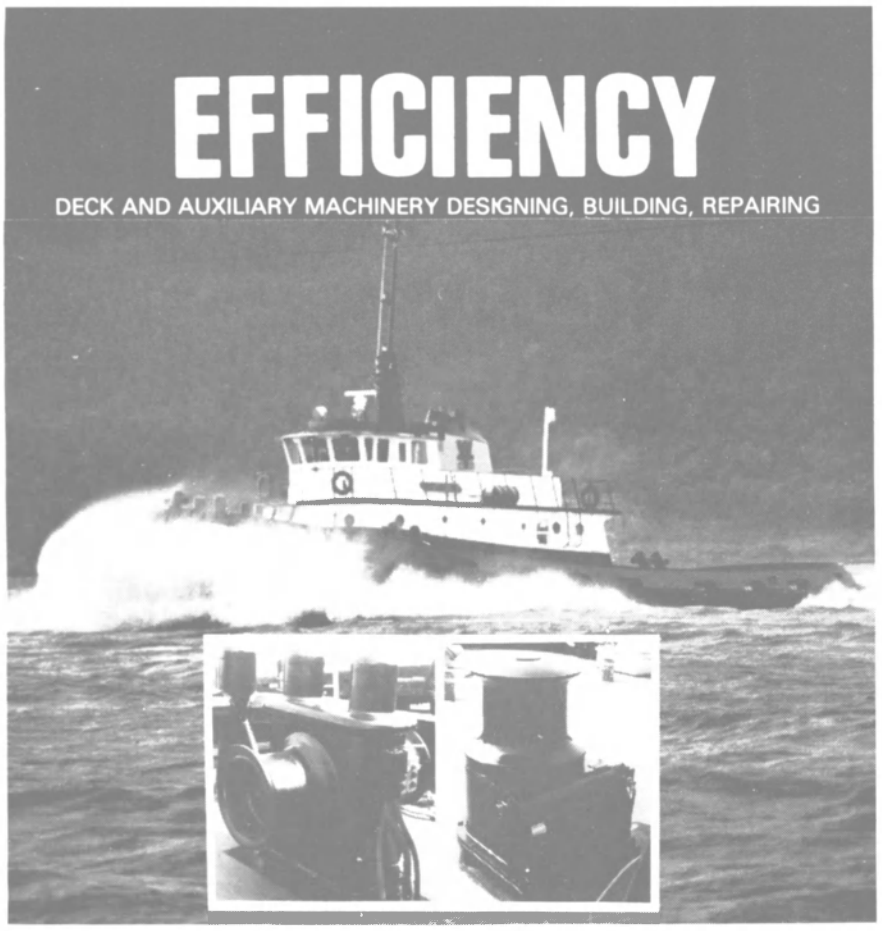

The Choice is Markey

Wilmington Transportation co.'s newest tug the 95' "PHILIP W." joins the fleet in handling many ships in these harbors. Once again Wilmington selects Markey deck machinery to give the tug the capability of working her chores more efficiently. Her Hydraulic stern Capstan and Gypsy Bitt Windlass are "MARKEY." How about yours?

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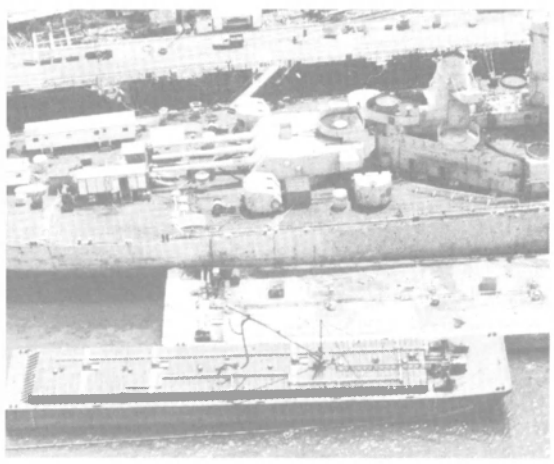
Circle 331 on Reader Service Card

Koch-Ellis Provides Service To Meet Pollution Prevention Standards Of MARPOL 73/78



A Koch-Ellis bunkering barge (foreground) is in position to handle MARPOL oily waste water removal from the battleship USS Iowa, which is being renovated at a shipyard near New Orleans.

In October 1983, Annex I of the International Convention for the Prevention of Pollution, known as MARPOL 73/78, entered into force for the maritime and shipping industry. This convention concerns pollution from oil. The regulation was created to reduce operational discharges from ships, which have become a major source of oil pollution on the sea. The IMO estimates that 13.6 million barrels of oil are discharged annually, substantially more than all oil accidently spilled worldwide over the past few years. Stopping this wasteful, costly, and detrimental-to-life pollution is why compliance with MARPOL 73/78 is so important.

Annex I has three requirements to prevent oil pollution; these require vessels to be equipped with segregated ballast tanks, dedicated clean ballast tanks, and when appropriate, crude oil washing (COW) systems.

These new regulations try to limit the discharge of oily wastes from cargo and bilge areas by requiring oily water separators and monitors. No discharges of oil are allowed within U.S. territorial waters—less than three miles off shore; therefore, these wastes must be retained onboard.

For shipping in the Gulf of Mexico region, Koch-Ellis has combined equipment and facilities of its two divisions to offer a convenient way to conform with MARPOL 73/78. Koch-Ellis Marine has long been a leader in ship bunkering in the New Orleans area, and Koch-Ellis Barge and Ship Service is known for its gas-freeing, cleaning, steaming, and waste water treatment facilities under its EPA permit.

By using its existing bunkering barge equipment to gather these oily waste waters, Koch-Ellis can go to the ship. The company can provide service to shipping from Pilot Town to Baton Rouge, and with only 24 hours notice, can supply extremely fast turnaround service in the New Orleans area. Ships can get both bunkering service and oily waste water removal in the same operation, saving time and money. Koch-Ellis is said to be the only facility in the Gulf region that can both transport and process MARPOL slops.

Small ships can also dock directly at the Koch-Ellis facility at mile 104 of the Mississippi River for service. The oily waste slops are processed there using the latest in bacterial technology. The company has worked closely with the EPA to develop one of the most effective aerobic digesting systems for the treatment of wash water in the Gulf region.

For additional information on the facilities and services of Koch-Ellis,

Circle 236 on Reader Service Card

Cunard Line To Spend $130 Million To Overhaul The Queen Elizabeth 2

Approximately $130 million will be spent by the Cunard Line Ltd. to refurbish and re-engine the Queen Elizabeth 2, an amount many companies pay for a new vessel.

After replacing the steam turbines with nine diesel engines, the vessel will still be capable of traveling at speeds of up to 32.5 knots, preserving its status as the fastest passenger ship afloat.

The QE2 will be out of service until the end of April 1987 while the work is being completed at the Lloyd Werft Yard in Bremerhaven.

A new all-diesel electric propulsion plant comprising nine MAN B&W Diesel engines and GEC generators will be installed, resulting in an estimated 30 percent reduction in fuel use. Approximately $100 million will be spent for this.

Lubriquip Offers Literature On Automatic Centralized Lubrication Systems

Lubriquip-Houdaille, Inc., a subsidiary of Houdaille Industries, Inc. of Cleveland, Ohio, has made available free literature on automatic centralized lubrication systems, pumps, feeders, controllers and accessories for proper and exacting lubrication that is said to reduce friction, wear and downtime.

The publication points out that units of the U.S. Navy have recognized the advantages of installing Lubriquip Centralized Lubrication Systems.

Many land-based applications can also use Lubriquip systems, such as shipyard cranes, antenna pedestals, etc.

For more information on the advantages, benefits and applications of Automatic Centralized Lubrications Systems,

Circle 55 on Reader Service Card

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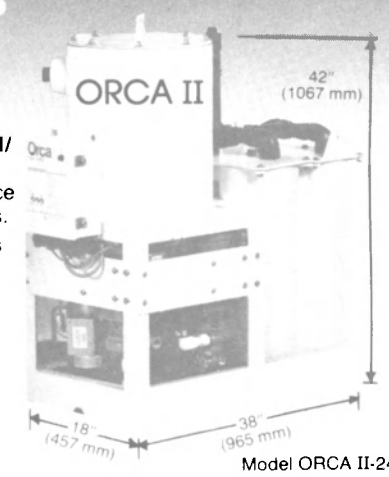

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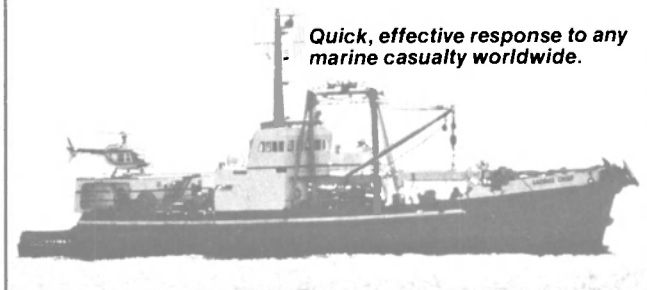

Circle 187 on Reader Service Card

McAllister Appoints Bishop VP-Sales, Southern Ports

Brian McAllister, president of McAllister Brothers Inc., has announced the appointment of **F. Rollins Bishop** as vice president-sales, southern ports. Mr. **Bishop** will be based at McAllister Brothers' Hampton Roads offices. This appointment follows the retirement of **Robert Benze.**

Born in Norfolk, Va., Mr. **Bishop** began his career with McAllister Brothers in 1972 when he joined the Norfolk division as chief dispatcher. In 1981 he transferred to McAllister Brothers' Baltimore office as general manager.

A graduate of Marshall University with a B.Sc. degree in economics, Mr. **Bishop** has an extensive background in the maritime industry, including all phases of tug and barge operations.

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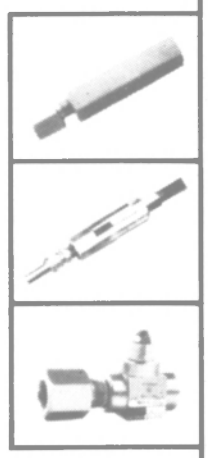

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Circle 106 on Reader Service Card

Mobil Oil Introduces Six Hydraulic Fluids —Literature Available

Mobil Oil Corporation has introduced six hydraulic fluids for general industrial use. They all meet requirements of system and pump builders for resistance to heat, wear, water, and rust.

The Mobil Hydraulic Oil Series consists of six ISO (International Standards Organization) viscosity grades. Four are anti-wear (AW) oils in viscosities of 32, 46, 68, and 100. The other two are mild extreme pressure (EP) oils in viscosities of 150 and 220. All have typical viscosity indexes (VI) of 95.

The four AW fluids are recommended for use in most hydraulic systems with gear, vane, radial piston, and axial piston pumps where pressures and speeds require an anti-wear product. The two EP oils are recommended for hydraulic systems which require heavier oils and for lubrication of moderately loaded enclosed gear sets and bearings lubricated by circulation or bath.

Applications include machine tool hydraulic systems, materials forming and handling equipment, presses, cutters and grinders, and underground mining equipment.

These Mobil Hydraulic Oil Series are formulated from high-quality, chemically stable, petroleum base stocks. Additives give them additional protection against heat, abnormal component wear, the effects of water contamination and rust.

Mobil also markets two other lines of hydraulic fluids: the SHC Series synthetic-based fluids, and the DTE 20 Series oils, the top-of-the-line petroleum-based products. Both have demonstrated the ability to perform well under extended changeout periods and to resist deposit formation and oxidation.

For further information and free literature on Mobil Hydraulic Oil Series,

Circle 87 on Reader Service Card

New Submarine Base Built In The Arctic By Soviet Union

A vast submarine base for a new type of sub built to operate under the polar ice cap has been built in the Arctic by the Soviet Union. The first pictures of it, taken by a commercial satellite, have been shown on Swedish television. The pictures showed a dozen piers several hundred yards long that make up the submarine port at Gremikha, 200 miles east of Murmansk.

Thomas Ries, an expert at the Norwegian Institue of International Affairs, said the base was the home of the Soviet Union's mammoth nuclear Typhoon-class submarines, built for service in Arctic waters.

Defense analysts said that in the event of war, the titanium-hulled 30,000-ton Typhoons would hide and fire their missiles from underneath the polar ice only a short distance from the new base.

Textron Marine Appoints L.N. Hairston Executive Director Of Marketing

Larry N. Hairston has been appointed executive director of marketing for Textron Marine Systems of New Orleans, La.

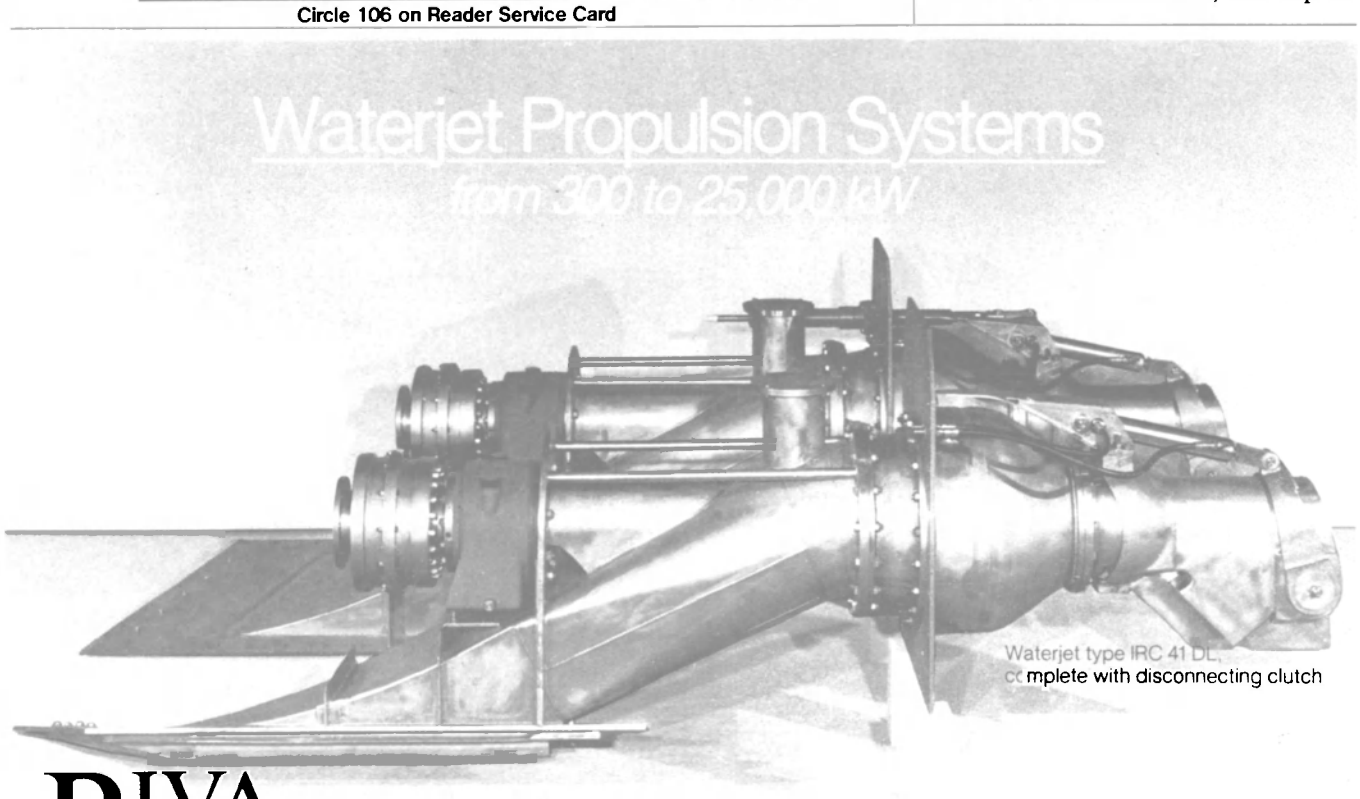
Mr. **Hairston** will be responsible for developing and implementing all marketing strategies and evolving a continuing strategic plan representing Textron Marine Systems business interests.

The appointment was announced by **John J. Kelly,** president of Textron Marine Systems and Bell Halter Inc.

Mr. **Hairston** has more than 17 years of experience in the marine industry, and most recently served as vice president, marketing of Marinette Marine Corporation, Marinette, Wis. He also served as vice president, engineering of Equitable Shipyards, New Orleans, and has held similar management positions with other New Orleans-based shipbuilding companies.

Mr. **Hairston** reports directly to the president of Textron Marine Systems, and will serve as a principal advisor for all matters concerning the future direction and growth of the company.

Textron Marine Systems (formerly known as Bell Aerospace Textron, New Orleans Operations) is an established leader in innovative marine design and production of air cushion and surface effect craft for military and commercial applications. Textron Marine Systems is a division of Textron Inc. of Providence, R.I.



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New Ship Repair Facility At Port Of Portland

Douglas Watson, president and general manager, has announced the formation of West State, Incorporated (WSI) and the opening of their new facility at the Port of Portland Ship Repair Yard on Swan Island, Portland, Ore.

This full-service ship repair company was founded, according to Mr. **Watson,** in order to provide quality ship repair services to the commercial ocean going vessel owners/operators at a price more competitive than was formerly available in Portland. Several of WSI's shipping company customers have indicated that the new repair firm is very welcome and will certainly be given the opportunity to participate in the competitive process.

WSI's management nucleus consists of Mr. **Watson,** formerly operations manager for Dillingham Ship Repair in Portland, general superintendent **Michael McDougall** and assistant general superintendent **Edward Yeager,** both also former Dillingham supervisors. There is over 50 years of ship repair experience combined in this team.

For more information on the new ship repair facility,

Circle 72 on Reader Service Card

300-Page Fishing Vessel Safety Manual Published

The *Vessel Safety Manual,* prepared for the commercial fishing industry in conjunction with the North Pacific Fishing Vessel Owner's Association (NPFVOA), the U.S. Coast Guard and the National Marine Fisheries Service, was recently published.

Some 300 pages long, with more than 300 illustrations, the manual represents one of the most comprehensive sets of operational recommendations ever prepared for the U.S. commercial fishing industry.

The *Vessel Safety Manual* is priced at $30 per copy (Washington residents add $2.37 per copy state sales tax) with proceeds used to sustain the NPFVOA Crew Training Program and related safety activities. In 1987, the NPFVOA Safety Program intends to create a set of video tapes devoted to fishing vessel safety, to complement the manual and the training program.

To order copies of the *Vessel Safety Manual,* telephone: (206) 283-0861 or write: NPFVOA Vessel Safety Program, Building C-3, Room 207, Fishermen's Terminal, Seattle, Wash. 98119.

MarAd Awards Contracts For M&R Work On Two Academy Training Ships

Contracts for maintenance and repair work on two training vessels operated by state maritime academies have been awarded by the Maritime Administration.

Houston Ship Repair of Channelview, Texas, will get $406,800 to perform work on the Texas Clipper, the training ship of the Texas Maritime College at Galveston. The other contract, for $525,979, was awarded to Service Engineering Company of San Francisco for repairs to the Golden Bear, operated by the California Maritime Academy at Vallejo.

The Texas Clipper work is to be completed in 30 days and the Golden Bear in 45 days.

TDI Catalog Now Includes 100-MM Chart Recorders —Literature Available

TDI Catalog Sales of Plainville, Conn., now includes compact programmable 100-mm recorders in either 1-, 2- or 3-pen models in the TDI Catalog for Sensors and Controls.

Input can be DC voltage, or nine types of thermocouples or RTDs when used with temperature transmitter. In addition to analog data writing, they also provide digital and bar graph monitoring displays, and digital monitoring printout.

Programming is through a multifunction membrane keypad. And all controls slide into a short-sized case for protection. For long life, noncontact servo elements are used. The swing out digital display allows viewing from different angles. Chart speed can be set at 1 mm/hr. steps; Z-fold paper is used.

Dimensions of the 1-pen model are approximately $5^{11}/_{16}$ inches square for the fact and $10^{1}/_{8}$-inches long. The 2- and 3-pen models are $2^{1}/_{2}$ inches long; the face is same as the 1-pen model.

For literature containing more information,

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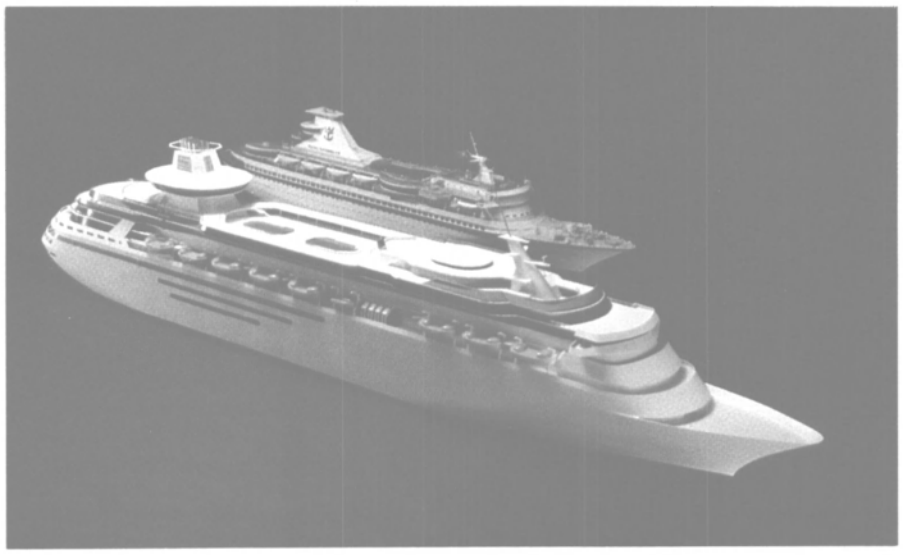

Model of the 70,000-grt Sovereign of the Seas being built at Chantiers de l'Atlantique, France, will be outfitted with approximately 500,000 square feet of Rockwool TNF panels.

Rockment To Supply Rockwool TNF Panel System For Cruise Liner

Rockment, manufacturers and marketers of the Rockwool TNF joiner system, recently received the accommodation order for the Royal Caribbean Cruise Lines ship Sovereign of the Seas, the largest cruise liner to be built since the Frances and the United States.

The Sovereign of the Seas, with a 2,276-passenger capacity and 70,000 grt, will require approximately 500,000 square feet of Rockwool TNF panels. All panels between staterooms will feature an extra high noise reduction factor, 44 decibels.

Chantiers de l'Atlantique, St. Nazaire, France, who is building the Sovereign of the Seas, has often utilized the Rockwool TNF panel system, such as on the Holland American Cruise Line vessels, Niew Amsterdam and Noordam.

For free literature containing detailed information on the Rockwool TNF panel system,

Circle 66 on Reader Service Card

New Technology for High Performance Compact Heat Exchangers

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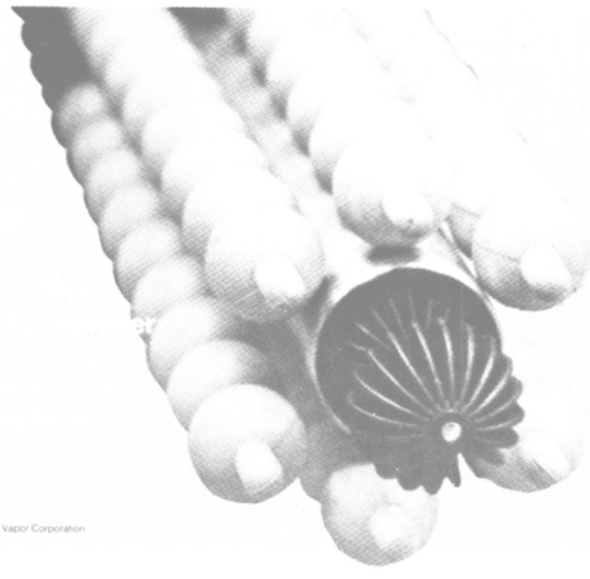

The heart of the SPHERE MATRIX Technology consists of nesting the tubes in a regular matrix of solid spheres around the outside and utilizes fluted spheres, properly spaced, on the inside. The spheres interrupt the boundary layer growth and thereby enhance the heat transfer performance.

Fluted sphere inserts or solid sphere bundles can be used separately depending on the needs of the application.

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VAPOR

Circle 345 on Reader Service Card

PROPULSION UPDATE

General Electric Expands LM Family Of Aeroderivative Gas Turbines For Marine Service

—Free Literature Offered—

Royal Danish Navy Standard Flex 300 ship.

With its first installation in the GTS Admiral Wm. M. Callaghan, a RO/RO cargo ship in 1969, the General Electric LM2500 marine gas turbine has been a favorite selection for naval ship propulsion.

Powering ships with displacements ranging from just over 200 tons to the planned 53,000-ton AOE-6 combat support ships, the LM2500 has been selected by 15 international navies, as well as the U.S. Navy itself. More than 500 LM2500s will be fitted on 223 ships in 28 navy ship programs.

The new U.S. Navy Arleigh Burke Class destroyer (DDG-51) is powered by the General Electric LM2500.

Recently, the U.S. Navy selected the LM2500 to power the new Arleigh Burke Class destroyers (DDG-51), which will be one of the Navy's major surface combatant ships. For these destroyers, the LM2500 will be uprated to 26,250 hp and have single shank high-pressure turbine blades. The Navy selected the LM2500 because its more than 1.5-million hours of reliable service, and current and future programs incorporating the LM2500 will ensure production until 2030.

This year, the smaller LM500, rated at 6,000 hp, was selected by the Royal Danish Navy to power its new Standard Flex 300 ships. The installation of the LM500s in the Standard Flex 300s not only marks the company's first installation in a mine countermeasure ship, but also in a naval combatant as well. It is also said to be the first LM engine in a combined diesel and gas turbine (CODAG) propulsion system. The power turbine of the LM500 will drive a fixed-pitch propeller directly through a reduction gear, saving weight by eliminating an engine-mounted epicyclic gearbox. Some of the design features that make the LM500 attractive to marine and industrial operators include: the highest efficiency in its power class; the use of corrosion-resistant materials; borescope inspection ports for reduced maintenance; a variable stator compressor for good stall margin and an operational envelope from −54°C to 54°C; and reliability.

In addition to the Standard Flex 300, the LM500 is said to be ideal for patrol boats in the 100- to 300-ton range, and is excellent for air-cushion vehicles, fast-attack craft and vessels such as the Italian Navy Spaviera Class hydrofoil, where higher power density, weight and size are at a premium.

In the fall of this year, the LM1600 simple cycle gas generator was added to the expanding General Electric LM family of advanced aeroderivative gas turbines. This new entry was derived from the highly respected F404 aircraft engine which powers the Navy's F/A-18.

The LM1600's introductory rating is 19,000 isentropic gas hp with an overall gas generator thermal efficiency of 40.2 percent. Incorporating the F404's simple design and reliability, the LM1600 features one of the best fuel efficiencies in its power class. Its extremely high power density enables the engine to produce the same power output with an airflow of 100 pounds per second (pps) as did earlier engines with airflows of 125 to 145 pps. The fuel-efficient LM1600's size is said to make it ideal for industrial mechanical drive, power generation and ship propulsion.

The LM1600 Intercooled Regenerative engine is being studied in a development program funded by the U.S. Navy as a major candidate for the next generation naval engine. Requirements for this engine include delivery of 24,000 bhp at 100°F, while consuming 30 percent less fuel and fitting into the same space as the current LM2500s.

One of the direct results of this development will be a gas turbine engine which can effectively match diesel fuel consumption over a wide range of power output. This would clearly be of interest to both naval and commercial ship designers and builders in the mid- to late 1990s.

For free color literature containing detailed information about General Electric's LM family of advanced marine gas turbines,

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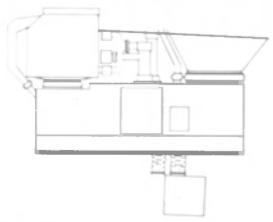
LM1600 Intercooled Regenerative Engine



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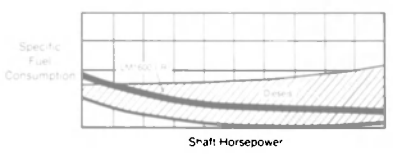
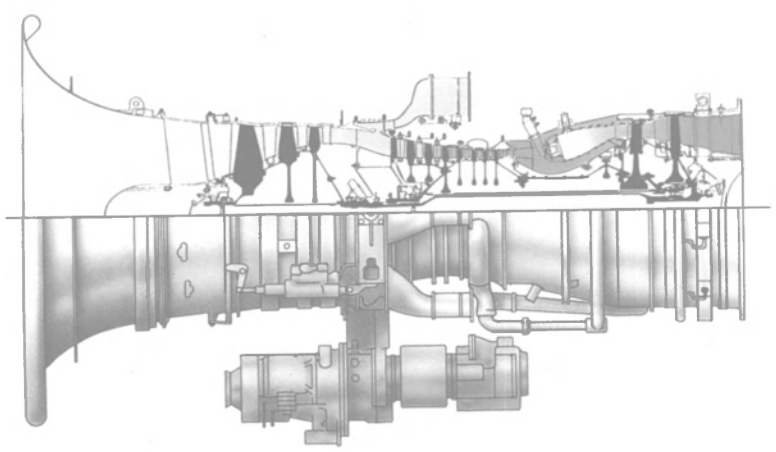
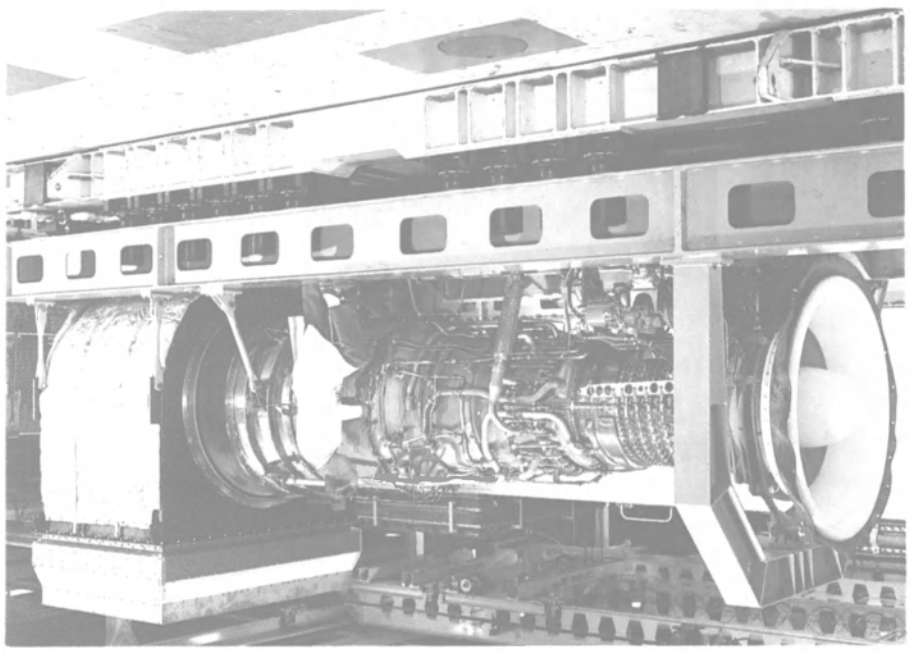
LM1600 Intercooled Regenerative Engine Performance





General Electric's LM1600 Simple Cycle Gas Generator.



The LM2500 Marine Gas Turbine, selected by 15 international navies to power ships ranging in size from 200 tons to 53,000 tons displacement.

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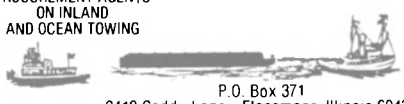

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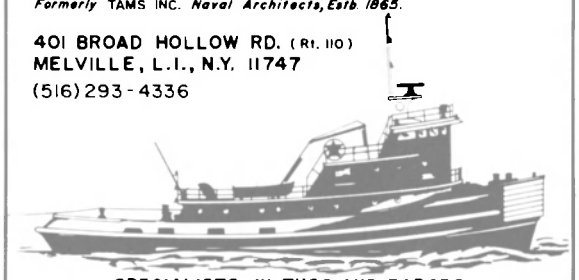

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Magnavox Offers Dual Telephones With Satcom Terminals—Literature Available

Magnavox has become one of the first manufacturers to take advantage of a recent decision by INMARSAT to allow satellite ship earth stations to be equipped with two separate telephone identification codes. Magnavox Advanced Products and Systems Company has announced that its MX 2400 Integrated Satcom Terminal, introduced last year, has been designed specifically to permit users to take advantage of this new service through a simple software option.

The INMARSAT Council decided earlier this summer to permit second telephone ID code for Standard-A ship earth stations. This would provide two independent telephone circuits on the ship, which can be reached by dialing either of two different numbers from shore.

"Dual telephone IDs will make it easier and more cost-effective for ships to receive computer data and facsimile transmissions, as well as voice and telex calls," said Magnavox senior product manager **George Zachmann.** "The second telephone port can be linked directly to a computer modem or fax machine so that an incoming data call can be instantly and automatically received without the need for manual switching by the shipboard operator."

A second advantage of this service, said Mr. **Zachmann,** is that users can now arrange for separate billing of outgoing calls. This is of special interest to offshore oil rigs and other users in which two separate organizations share the same satcom terminal, he noted.

In designing the MX 2400, Magnavox engineers foresaw the probability that INMARSAT would allow dual voice ID service, and designed this option into the equipment, according to Mr. **Zachmann.** The MX 2400 is built with two independent telephone ports which are compatible with all standard telephones and commercial telephone interconnect equipment, including modems, facsimile machines and PABX systems. The two telephone ports can be controlled through the operator's keyboard, permitting one telephone to be reserved exclusively for data, while the other can be used for normal voice calls. The dual ID option can be ordered to upgrade existing MX 2400 terminals, as well as with new terminals.

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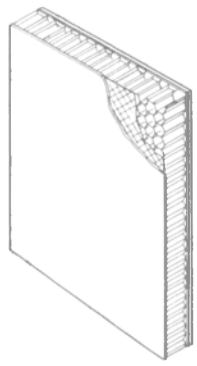

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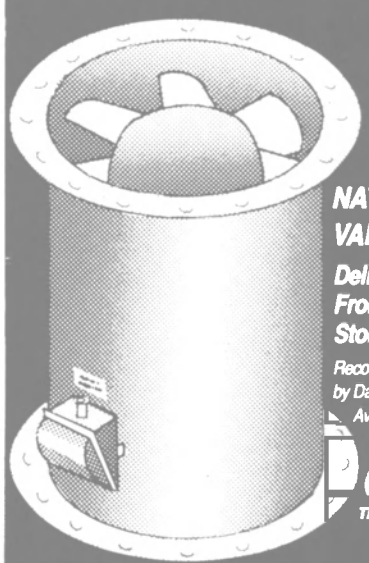
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Bay Shipbuilding Completing Three Containerships For Delivery To Sea-Land In 1987

Bay Shipbuilding Corp., Sturgeon Bay, Wis., recently announced that the second in the three-ship series of containerships being built for Sea-Land Service, Inc. was floated from Bay's 1,158-foot graving dock. The 710-foot containership, designated Hull 736, will be berthed at one of Bay's outfitting piers for completion.

The keel for Hull 736 was laid in November 1985. In May 1986, the hull was floated forward

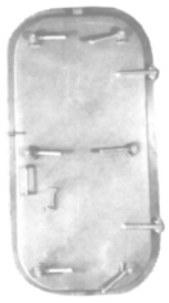

Bay Shipbuilding's 1,158-foot graving dock, where hulls for the three containerships were constructed.

in the graving dock, allowing the keel for Hull 737, the third in the series, to be laid in June 1986.

Upon completing the floatout of Hull 736, the graving dock's three intermediate gate sections were removed to allow construction to continue on Hull 737, the last of the three containerships being built for Sea-Land. All three containerships are scheduled to be delivered in 1987.

For more information and free literature on Bay Shipbuilding,

Circle 225 on Reader Service Card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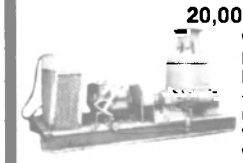
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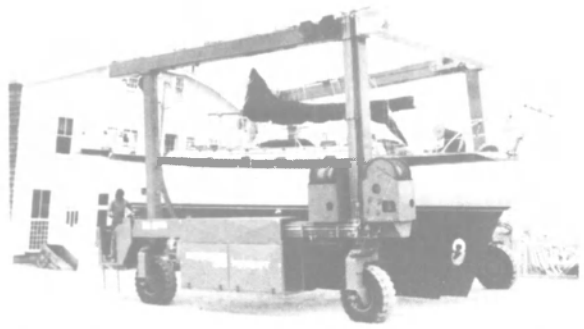
FOUR-WHEEL DRIVE—Shown above is a Marine Travelift, Inc. 35BFM mobile boat hoist at Bass Harbor Marine, Bass Harbor, Maine, utilizing the optional four-wheel drive feature now available on their 15-, 25-, and 35-ton capacity hoists. The newly designed direct wheel drive eliminates drive chains and increases reliability and performance while reducing possible downtime. The feature adds extra gradeability and rough terrain mobility to the units. For complete details on the new Marine Travelift mobile hoist four-wheel drive system or for specifications on their complete line of mobile boat hoists with capacities from 15 to 500 tons,

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Bostik Introduces New Marine Grade Anti-Seize Compound —Literature Available

New literature is now available completely describing a new anti-seize and lubricating compound, specifically designed for marine applications, which is now available from Bostik Division of Emhart.

A proven combination of copper flake, graphite, and aluminum paste in a specially formulated marine grease, Marine Grade Never-Seez® provides superior protection to metal parts in salt water, salt air, and high moisture environments. It is an extreme pressure lubricant with excellent water washout properties and temperature resistance to 1,800° F.

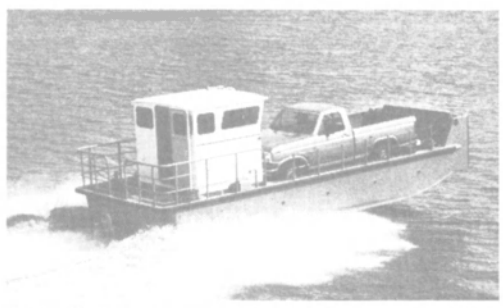
Marine Grade Never-Seez is recommended for use on propeller shafts, bearing housings, winches, cables and anchor chains, porthole studs, and other metal parts for protection against rust, galling and galvanic corrosion. It is recommended for protecting parts above and below the water line.

Marine Grade Never-Seez is available in 4-ounce, 8-ounce, 1-pound, 8-pound, 42-pound, and 425-pound units from Never-Seez industrial distributors throughout the United States and Canada.

For complete details and free copies of the literature from Bostik,

Circle 223 on Reader Service Card

MonArk Boat Delivers 30-Foot All-Aluminum Transportation Barge



MonArk's 30-foot transportation barge is powered by twin AQAD40/290 Volvo I/O diesels (165 hp each).

A 30-foot all-aluminum transportation barge, designed and manufactured by MonArk Boat Company's Work Boat Division at Monticello, Ark., has been delivered to the Panama Canal Commission to aid in their survey operation.

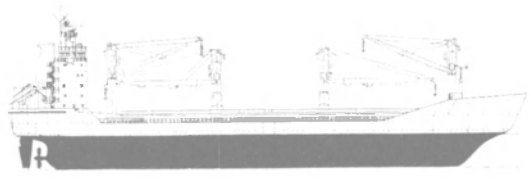
John Smith, national sales manager for MonArk, said the boat's shallow draft makes it an excellent choice for loading and off-loading equipment and supplies in shallow water. The barge will hold a ½-ton pickup truck, farm tractors, mobile equipment and maintenance gear. The barge has an 8,000-pound capacity, has a 12-foot beam, and is powered by twin AQAD40/290 Volvo I/O diesels (165 hp each). Speed in light condition is 28.5 knots (32 mph), and in loaded condition, 24 knots (27.5 mph).

A spacious cargo bay is 21 feet 8 inches and 7 feet 6 inches wide. The bifold ramp is operated by two 12-volt 9,000-pound-capacity electric winches.

For more information and free literature on MonArk Boat Company,

Circle 224 on Reader Service Card

Multipurpose Cargo Ship Launched At Jansen Werft Yard



Drawing of recently launched M/V Nordland.

The multipurpose cargo vessel Nordland (hull no. 179) contracted by Nordland Schiffahrtsges. mbH of Dorpen, West Germany, was recently christened and launched at ceremonies held at Jansen Werft's Leer yard in West Germany. The sponsor of the vessel was Miss **Tiina Valve,** daughter of **Veijo Valve,** managing director of Nordland Papier GmbH of Dorpen.

The 416½-foot vessel has a breadth of 66 feet and a design draft of 26½ feet. Her main propulsion will be provided by a Krupp MaK four-stroke marine diesel engine, type 8M551. The ship's speed will be approximately 16 knots, based upon a deadweight of 8,500 tons at a draft of 26 feet.

The design of the Nordland was developed in close cooperation between the owners and the contractual owners, Baum & Co. of Nordenham, West Germany.

She has a capacity of 476 TEUs, and connections for 30 refrigerated containers will be installed. The newbuilding has folding-type hatch covers, and two hydraulically operated 20-ton-capacity cranes and two 30-ton-capacity cranes will be installed

The vessel was outlined according to the latest IMO rules for dangerous cargo. Her nautical and navigation equipment will be of the latest technology, with "ship of the future" design being considered for her wheelhouse arrangement, lifesaving equipment and accommodations.

Especially significant is that the vessel will receive the highest ice class, Finnish 1A Super, enabling her to operate in the Baltic Sea area.

For free literature on the shipbuilding services and facilities of Jansen Werft,

Circle 232 on Reader Service Card

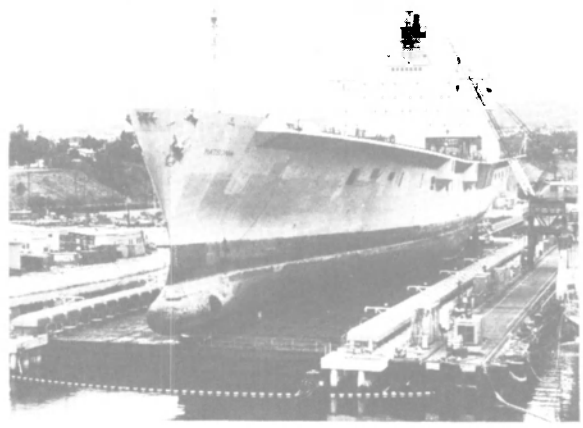
Republic Of China Submarine Christened At Wilton-Fijenoord

A naming ceremony has held recently at Doken Werf-Maatschappij Wilton-Fijenoord B.V. in The Netherlands for the Sea Dragon, first of two submarines under construction for the Republic of China/Taiwan. The naming was performed by Mrs. **Hoh-tu Liu,** wife of the managing director of the Far East Trade Office.

The two submarines were under construction in a covered graving dock at the yard. In order to undock the Sea Dragon, both vessels had to be floated in the dock. After the Sea Dragon was towed out to be moored in Wilton harbor, the second sub was repositioned on her blocks and the dock pumped out.

For free literature on the shipbuilding and repairing capabilities and facilities of Wilton-Fijenoord,

Circle 231 on Reader Service Card



CONVERSION PROJECT—Raised from water by Todd Pacific Shipyard Syncrolift, Matson Navigation Company's roll-on/roll-off trailership Matsonia is being readied for major phase in its conversion to combination lift-on, lift-off containership and RO/RO carrier. A 291½-foot midsection will be cut out of the 700-foot vessel and replaced by a new 351½-foot midbody, which will make the ship 760 feet long; and capacity will be tripled to more than 1,200 containers, plus autos and bulk molasses when the Matsonia returns to West Coast-Hawaii service next summer.

For more information on Todd Pacific Shipyard Syncrolift,

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MacGregor-Navire System Centerpiece At Dartford 'Miniport'

The concept of creating a modern RO/RO terminal near the estuary of the River Thames became reality this fall when the first vessel to use the facility berthed at the Linkspan. The inaugural honor fell to Kent Line's 108-meter-long (about 354 feet) vessel Arroyofrio Uno of 5,080 dwt which loaded a cargo of trailers bound for Zeebrugge and by so doing commenced a new daily service that will run between Dartford and the Belgian port.

Centerpiece of the new "miniport" is the portable MacGregor-Navire (MGN)-designed pontoon and bridge ramp which, designed to cope with tidal extremes as high as 9.66 meters (about 31½ feet), is the essential element enabling the horizontal loading of cargo—the pivot around which the project has revolved.

The Dartford linkspan, being T-shaped, is designed to service two RO/RO vessels simultaneously. Vessel lengths of 200 and 150 meters can be accommodated on the downstream and upstream berths, respectively.

Vessels of up to 23,000 dwt and 36-foot draft can use the facility and adjustable "landing" ramps at each end of the pontoon will enable ships having threshold heights of between 0.875 meters and 3.37 meters above water level to use the berths. The 2,600² surface area of the pontoon and the 8 meter clear width of the bridge ramp is designed to provide ample room for turning traffic and for its transit to the hard-

The first ship to berth at the new MacGregor-Navire-designed linkspan situated at Dartford, U.K. on the River Thames, the Arroyofrio Uno, is shown as she embarks a cargo of trailers bound for Zeebrugge, Belgium. Regarded as a new "gateway to Europe," this new RO/RO ferry terminal is expected to make a major impact on U.K. Continental freight shipments.

standing area ashore in two simultaneous lanes.

The unit was design-appraised and built under the survey of Lloyd's Register and is classed as being suitable to withstand the most severe requirements laid down for road bridges.

The successful completion of the Dartford International Ferry Terminal (DIFT) represents a high level of technical and commercial achievement for all concerned. Certainly it is confirmation that MacGregor-Navire's extensive linkspan technology, harnessed to other factors such as the unrivalled road and rail transport links of the Dartford location, can make a major impact on the life of a region.

For further information and free literature from MacGregor-Navire,

Circle 221 on Reader Service Card

New Jamesbury Spring Actuator Is Compact, Corrosion-Resistant, Economical—Literature Offered

Jamesbury Corp., a subsidiary of Combustion Engineering, Inc., has introduced the new Jamesbury V15SR spring return pneumatic vane actuator.

According to the manufacturer, this unique actuator fills applications in any piping system involving automatic valve operation where the valve must quickly close (or in certain instances open) in the event of air supply or electrical failure, thereby providing for more reliable fluid handling.

The Jamesbury V15SR is made of polyester thermoplastic and stainless steel construction which makes the actuator extremely corrosion resistant—this is not a coating, but a unique molded polyester thermoplastic construction.

The Jamesbury V15SR is rated at 60 psi supply pressure (125 psi max.), suitable for operating ball valves in ¼-inch to 2-inch sizes. The actuator is available in both spring-to-close and spring-to-open designs. It is an extremely compact actuator and weighs only five pounds. The spring return cartridge is a sealed housing with a spring of infinite life design. A high visibility position indicator is mounted on top of the spring return cartridge. Optional limit switches mount directly to the V15SR without requiring linkage.

For more information and free literature from Jamesbury,

Circle 233 on Reader Service Card

BUYERS DIRECTORY

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

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Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221
York International Corp., P.O. Box 1592-361C, York, PA 17405

ALARM SYSTEMS
Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

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

ANODES—Cathodic Protection
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
Kaiser Chemicals, 7311 E. 41st St., Tulsa OK 74147
Saphire Technology, Inc.; 9370 Sunset Dr., Suite A215, Miami FL 33173
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030

AUTOMATION SYSTEMS
Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BOILERS
Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK
Combustion Engineering, Inc., Windsor, CT 06095
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
Infrasonik AB (an ASEA Stal Co.). S-612 20 Finspong, SWEDEN

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
Bergeron & Associates, P.O. Box 726, Chalmette LA 70044
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
R.J. Keough Co., 39 Mill Rd., Eastchester, NY 10709
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE
Belcher Company Inc., 8700 West Flagler, P.O. Box 025500, Miami FL 33152
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144
Tramp Oil & Marine ltd., London ENGLAND. Telex: 8812194

CARGO ACCESS EQUIPMENT
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
MacGregor-Navire International A.B., P.O. Box 4111, S-400 40 Gothenburg SWEDEN
MacGregor Navire (U.S.A.) Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600

CHOCKING COMPOUND
InterProducts, Inc., 129 King Road E, Nobleton, Ontario LOG INO Canada
InterProducts, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903
Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936
Wirelock, 129 King Road E, Nobleton, Ontario LOG INO Canada

CLAMPS
Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

CLOSURES—Marine
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS
Fisher Scientific, 711 Forbes Ave., Pittsburgh PA 15219
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3245 Wight St., Detroit MI 48207

CONTROL SYSTEMS—Monitoring
ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Instruments Computers & Controls Corp., 6942 Haven Creek Dr., Katy TX 77449
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products Ltd., Flow Switch Div., 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway
S.S. White Industrial Products, 151 Old New Brunswick Rd., Piscataway, NJ 08854

CRANES—HOISTS—DERRICKS—WHIRLEYS
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134

DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Illman Jones Inc., 5505 Broadway, American Canyon CA 94589

DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

ELECTRICAL EQUIPMENT
Eldec Corporation, 16700 13th Ave West, P.O. Box 100, Lynwood WA 98036
Lima Electric Co., P.O. Box 918, Lima OH 45802
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Newmar, P.O. Box 1306, Newport Beach, CA 92663
Ward Leonard Electric, 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTRONIC INFORMATION SYSTEMS
Inventory Locator Service Inc., 3820 Premier Ave., Memphis TN 38118

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327
Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2

EMULSIFICATION SYSTEMS
Sunbelt Energy Systems, Inc., Park Square, 2105 Park Ave., Suite 14, Orange Park, FL 32073
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
Todd Marine Systems, 61 Taylor Reed Place, Stamford, CT 06906

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94083
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Boston Metals Company, 233 E. Redwood St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Daito Engineering Co., Ltd., 10-23 Kawaguchi, 3-chome, Nishi-ku, Osaka JAPAN
Hossfeld Manufacturing Co., P.O. Box 557, Winona MN 55987
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Nicolai Joffe, P.O. Box 5362, 9171 Wilshire Blvd., Beverly Hills, CA 90210
Raytheon Service Company, 100 Roester Rd., Suite 103, Glen Burnie, MD 21061
Transamerica Delaval Inc., Corporate Marine Program, Cowles Rd., Plainville CT 06062
Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748

EVAPORATORS
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Bllerup, Copenhagen DENMARK
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402
Marlo Coil, P.O. Box 171, High Ridge, MO 63029
Robinson Industries, P.O. Box 100, Zelienople, PA 16063

FASTENERS
Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455
Hardware Specialty Co. Inc., Ships Division, 48-75 36th St., Long Island City NY 11101
Non-Ferrous Bolt & Mfg Co., Inc., 3650 W. Russell Rd., Las Vegas NV 89118
Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006

FENDERING SYSTEMS—Dock & Vessel
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FILTERS
Dahl, J.A. Baldwin Mfg., Co., P.O. Box 610, Kearney, NB 68848
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540

FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Formica Corp., One Cyanamid Plaza, Wayne NJ 07470
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL ADDITIVE
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton NJ 07005

FUEL OIL/LUBE OIL—Analysis & Testing
Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
Ocean Fleet Services, 1301 Metropolitan Ave., Thorofare, NJ 08086

FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001

GALLEY EQUIPMENT
Greitzer, Inc., 101 Riverdale Rd., Riverdale NJ 07457

GANGWAYS
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960

GAUGES
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062

HATCH & DECK COVERS—Chain Pipe
MacGregor-Navire International, A.B., P.O. Box 4111, S-400 40 Gothenburg SWEDEN
MacGregor Navire (U.S.A.) Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

HEAT EXCHANGERS
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Vapor Corp., 6420 West Howard St., Chicago IL 60648

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HULL CLEANING
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter Associates Inc., 510 Bering Dr., Houston TX 77057

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

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

LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DELMARINE
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231

METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

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

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
CDI Marine Co., 900 Regency Square Blvd., Suite 203, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
DiSalle Marine Consultants (Corrosion Control), P. O. Box 8686, Naples FL 33941
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001

John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Korkut Engineers Inc., P. O. Box 7515, Metairie LA 70011
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
Omega Marine Engineering Systems Inc., 11757 Katy Freeway, Suite 390, Houston TX 77079
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
John G. Smith, 5 Shetland Rd., Florham Park, NJ 07932
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
TIMSCO, P. O. Box 91360, Mobile AL 36691
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT

AT&T Communications, 412 Mt Kemble Ave., Room N420, Morristown, NJ 07960
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
Comsat Maritime Services, 22250 Comsat Dr., Clarksburg MD 20871
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Radio & Telefon AB, P.O. Box 501, S-162 15 Vallingby, SWEDEN
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives

B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OIL/WATER SEPARATORS

Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
Equipment Engineering, 666 Baker St., No. 265, Costa Mesa CA 92626
FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings

Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Murdock Engineering, P.O. Box 152278, Irving, TX 75015
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137
Willcox, P.O. Box 484, Garfield NJ 07026

PLASTICS—Marine Applications

Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231

PNEUMATICS

Limtorque Corporation, 5114 Woodall Rd., Lynchburg, VA 24506

PROPELLER POLISHING

Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Coolidge Propeller, 1608 Fairview Ave. East, Seattle, WA 98102; 3717 Industrial Rd., Pascagoula, MS 39567
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Happauge NY 11788
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
Riva Calzoni, Via Stendhal 34, 20144 Milan ITALY
SKF Steel, Couplings Div., 22 Waterville Rd., P.O. Box 745, Avon, CT 06001
S W Diesel Gulf Inc., 1500 Fourth St., Suite F, Harvey, LA 70058
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030
Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Ulstein Propellers, N-6065 Ulsteinvik, NORWAY
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH, Marine Division, Postfach 1940, 7920 Heidenheim/Brenz, WEST GERMANY Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives

Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
FMC Coffin Turbo Pump, 326 S Dean St., Englewood NJ 07631
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

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United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse, NY 13221

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Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
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FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
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Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

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Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

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M.A.N.—GHH, Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

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Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
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Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
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Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424
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Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
Enterprise Marine & Industrial Repairs Inc., Tyler & Coastwise Streets, Port Newark, NJ 07114
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Gladding-Hearn Shipbuilding, Box D (1 Riverside Ave.), Somerset MA 02726
Good People Sea And Shore Services Inc., 255 Commercial St., North Sydney, Cape Breton Island, NS CANADA B2A 3M3
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Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
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Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
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Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
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Farrell Says New Waterways Bill Is 'Major Step Forward' Toward Rebuilding Nation's Infrastructure

Following Congressional passage of The Water Resources Development Act (H.R. 6), on October 17, **Joe Farrell,** president of The American Waterways Operators (AWO), said that "This first omnibus waterways bill in 16 years is a remarkable achievement. The development of this legislation is the result of a constructive compromise between a large number of parties that have traditionally been warring with one another for many years.

"It is a major step forward when the House, the Senate, the Administration, municipalities, states, the Army, environmentalists, shippers, water carriers, ports, agricultural interests, and many others, can put together a viable and historic piece of legislation that will affect the future of this country for years to come," he said.

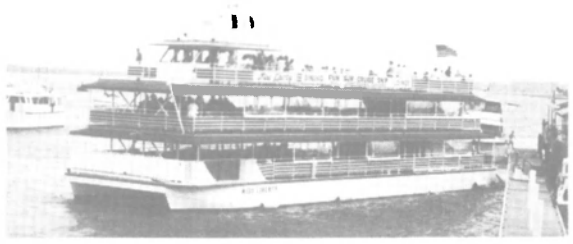
"Not only is this legislation vital to rebuilding the infrastructure of this nation, but its passage is symbolic recognition that the 'pork barrel' image of the waterways industry is dead and buried—forever," Mr. **Farrell** said.

Mr. **Farrell** said that the House and Senate conferees on the legislation deserve particular praise for seeing this legislation through what he described as "sometimes very sensitive and difficult negotiations." He singled out for extraordinary praise Rep. **Robert A. Roe,** Sen. **James Abdnor,** respective Chairmen of the House and Senate Water Resources Subcommittees, and **Robert K. Dawson,** Assistant Secretary of the Army for Civil Works.

The result of four years of work, this historic measure authorizes construction of a number of new Army Corps of Engineers water resources projects, and requires that the non-federal beneficiaries of those projects pay a considerable share of the cost of building, operating and maintaining them. The bill authorizes construction or study of a number of new Army Corps of Engineers water projects, including 41 for ports, 7 for inland waterways, 113 for flood control, 21 for shoreline protection, and 77 water resource conservation and development projects such as fish and wildlife mitigation projects.

The bill authorizes a total of $16.3 billion for water resource projects, of which $12 billion will be paid by the federal government and $4.3 billion by non-federal interests such as states, localities, port authorities, and commercial navigation companies. Under the bill, the inland waterway lock and dam projects authorized in the legislation will be partially funded with revenues from a user tax on diesel fuel paid by commercial waterway operators. The current user tax on inland waterway operators, which has been in place since 1979, is 10 cents for each gallon of diesel fuel. Under the new bill, this tax will gradually double to 20 cents per gallon.

St. Augustine Trawlers Delivers DeJong & Lebet-Designed Excursion/Diving/Cruise Ship



The M/V Conch Republic is shown during a short stay in St. Augustine, Fla., where, in accordance with 4th of July activities her name was temporarily changed to Miss Liberty. She now operates as an excursion/diving/cruise ship tender in Key West, Fla., under her original name, Conch Republic.

The M/V Conch Republic was recently delivered by St. Augustine Trawlers, Inc. to her owner, Caribbean Travel Services. She is the latest of many passenger vessels designed by DeJong & Lebet, Inc., naval architects, of Jacksonville, Fla.

The Conch Republic is certified for 500 passengers in ocean service by the U.S. Coast Guard, under Subchapter T. In addition, she carries an ABS International Loadline.

The vessel has several novel features, including a 4- by 8-foot underwater viewing well, port and starboard water-level dive platforms with freshwater showers, and special bottom construction forward for beaching the vessel. She is equipped with a forward boarding ramp for beach loading and unloading, and a stern capstan for pulling off the beach.

The Conch Republic features three passenger decks, all equipped with complete bars. The main deck features a complete galley and dance floor. The pilothouse is located on the third deck. A variety of seating accommodations on the vessel, including fixed booths, portable tables and chairs, bar stools, and benches, allow a seat for all 500 passengers. The main and second decks are equipped with roll down curtains in case of inclement weather.

The Conch Republic is powered by twin Caterpillar 3406TA diesels, developing 350 hp each at 1,800 rpm. Each engine drives a 42-inch-diameter four-bladed propeller, furnished by Columbian Bronze. Electrical power is provided by two Caterpillar 3304 generators, developing 55 kw. All the engines were furnished by Ring Power, Jacksonville, Fla. Engine exhausts are water cooled and discharge through the hull side at the waterline.

The Conch Republic hull design, by DeJong & Lebet, Inc., is a modified catamaran. The outboard hulls are connected by a partially submerged center-hull, combining the stability and efficiency of a catamaran with the seakeeping and below decks accessibility of a mono-hull.

The principal characteristics of the Conch Republic are as follows: length overall 104 feet 6 inches; beam 30 feet; depth 9 feet 6 inches; draft 5 feet; tonnage 93 gross tons; speed 11 knots; fuel oil 6,400 gallons; potable water 2,600 gallons; and holding tank 3,000 gallons.

M/V CONCH REPUBLIC
Equipment List

Propellers	Columbian Bronze
Engines	Ring Power (Cat)
Generators	Ring Power (Cat)
Windows	Wynne Enterprises
Stern Capstan	McElroy
Steering	Wagner
Engine Controls	Kobelt
Generator Panel	Industrial Power Systems
Battery Charger	LaMarche Constavolt
Air Supply Fans	Hartzell

National Crane Offers Free Literature On Cranes For Marine Applications

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The National Series 666A Skid Wireline Support Unit is especially designed for the well-service industry. The skid-mount's mobility means a larger number of wells in different locations can be serviced than ever before. After transport to platforms by truck, the unit secures to any solid base.

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Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
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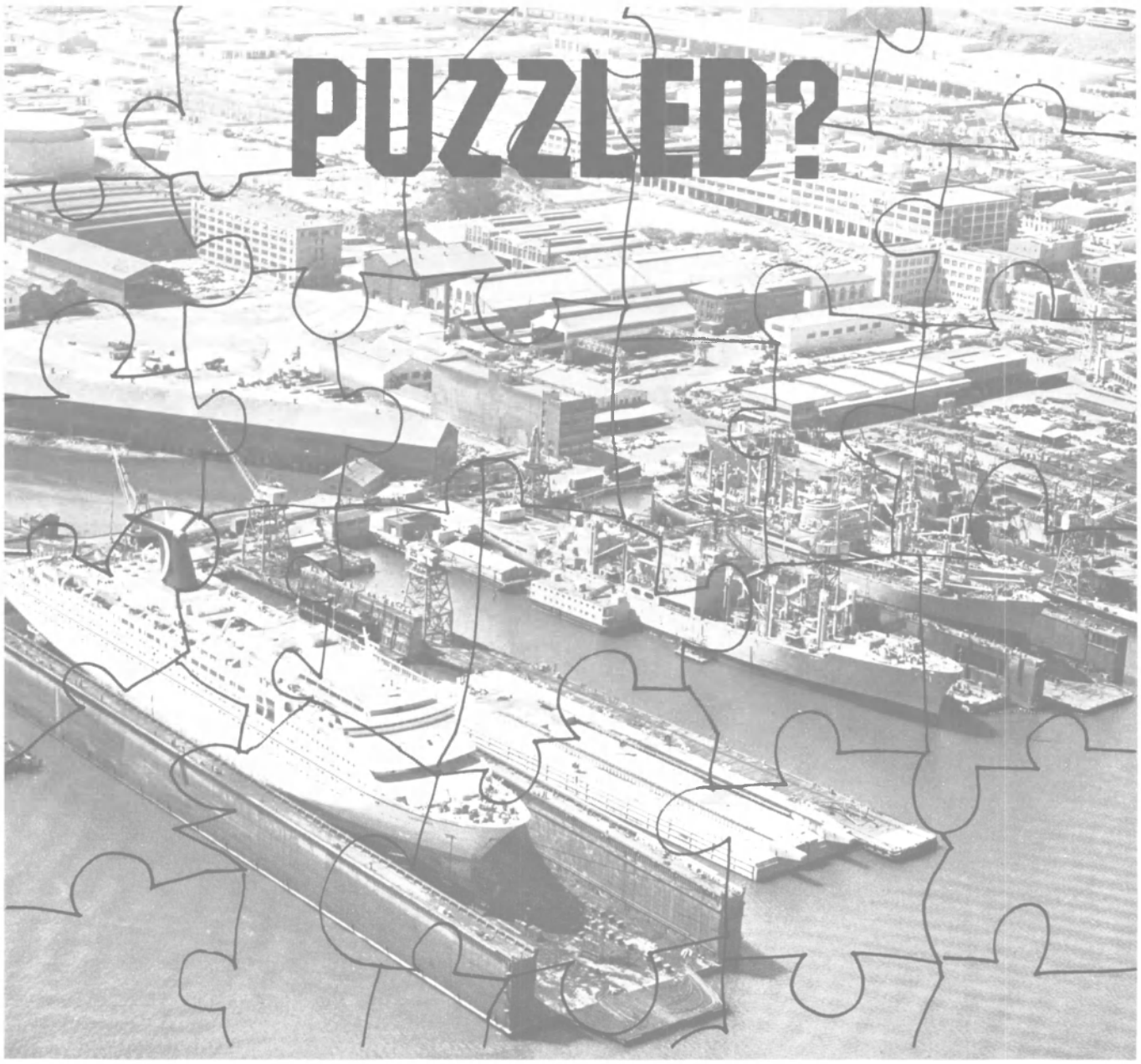

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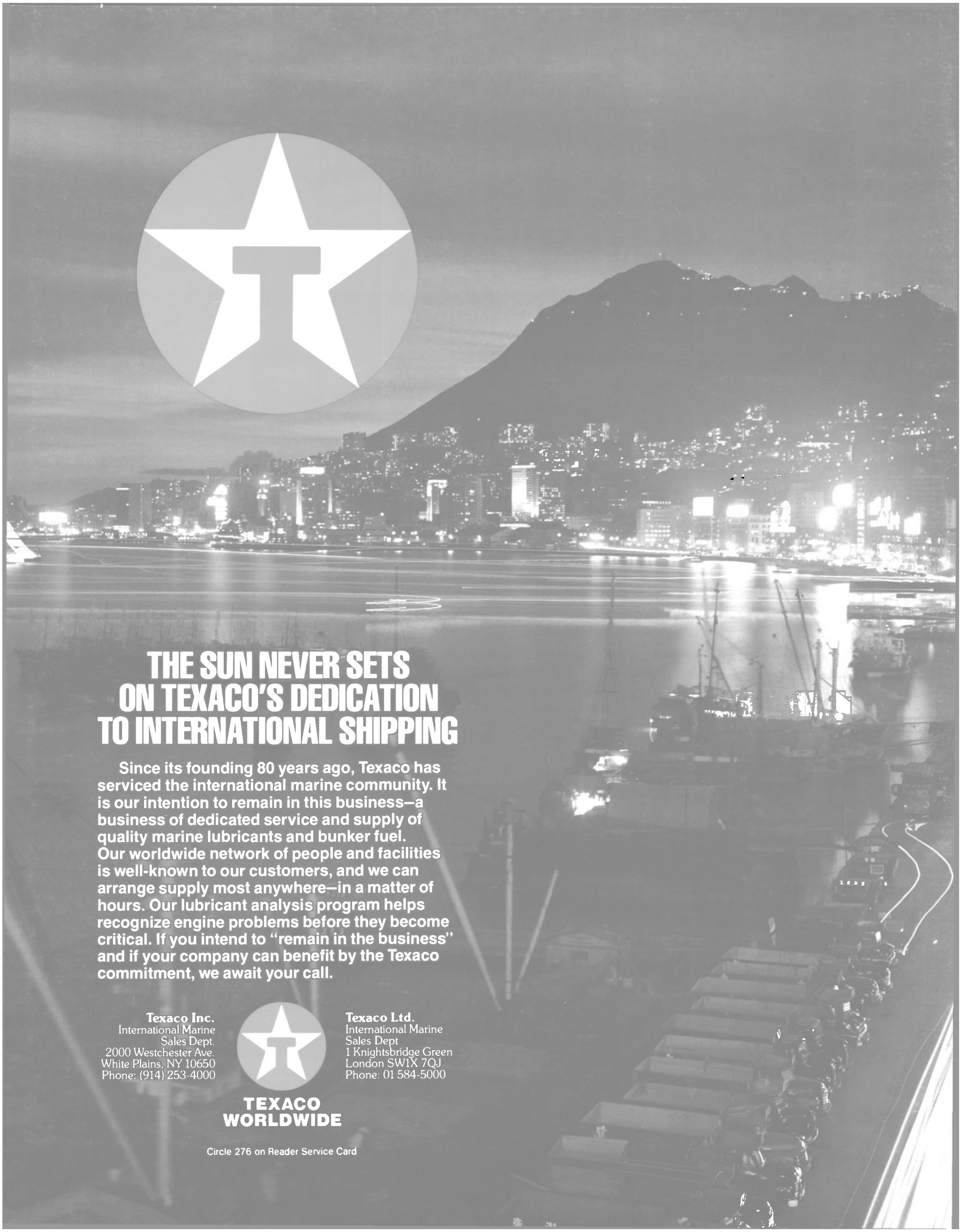

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