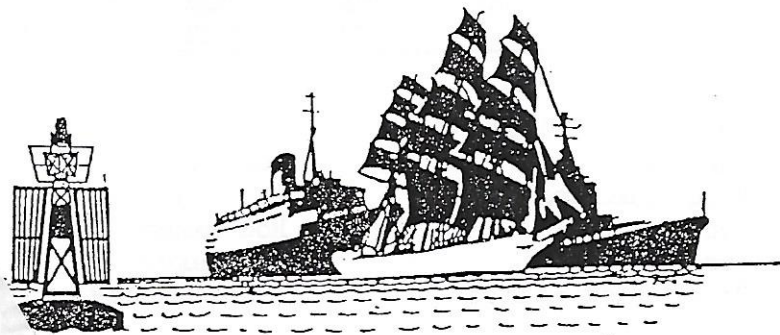


# BLACK JACK



QUARTERLY MAGAZINE  
SOUTHAMPTON BRANCH  
WORLD SHIP SOCIETY

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SPRING No 92

*W.S.S. SOUTHAMPTON BRANCH*



# ANNUAL BOAT TRIP

This is provisionally arranged for  
**SATURDAY, 24th JUNE**

from

11am to 6pm

VISITING SOTON, PORTSMOUTH. ++

Prices will be:

£10 Members, £12.50 Non-members  
and £8 for Children under 16

**Payment *must* be by the June  
meeting latest and a deposit of £5 is  
required when booking**

Numbers will be restricted to 100 to ensure  
enough "viewing" space

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\*\*\*\*\*STOP PRESS\*\*\*\*\*

\*\*\*NEW CONTAINER SERVICES FOR SOUTHAMPTON\*\*\*\*\*

Under headlines like 'Lines choose Southampton' and 'Gloves off in Box War', the INTERNATIONAL FREIGHTING WEEKLY announced new container services for the Port.

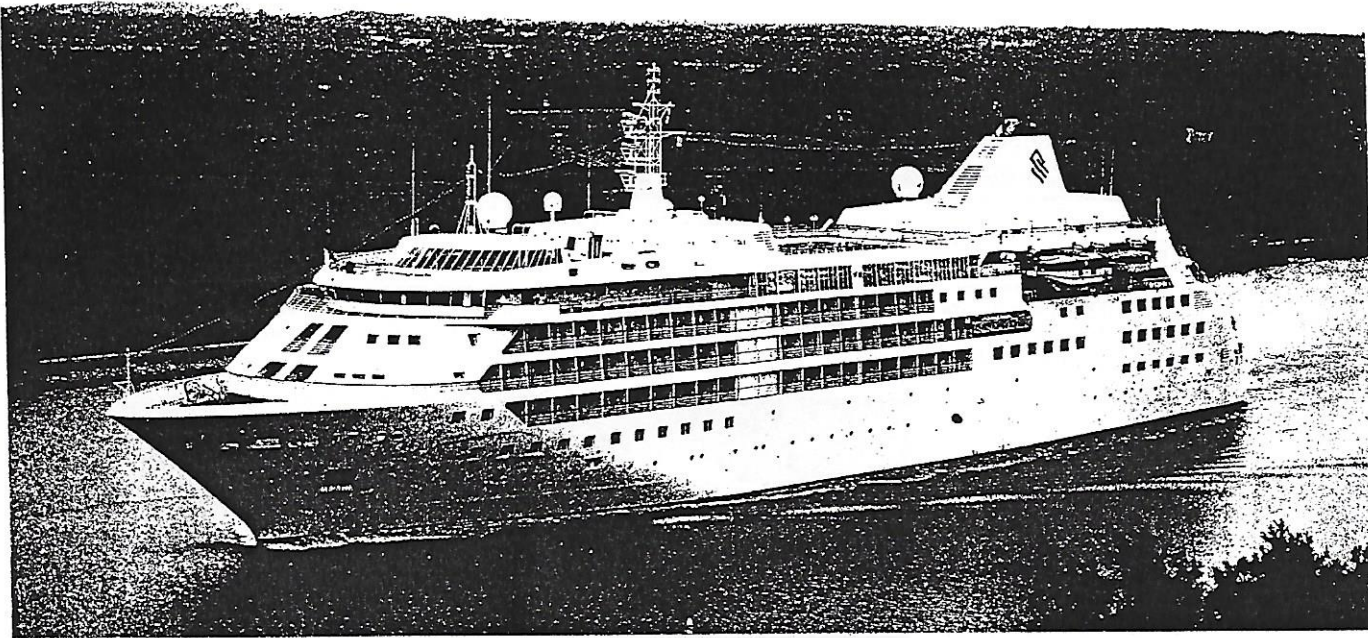
Mitsui OSK, Nedlloyd, Malaysian Int. Sh. & American President Lines intend launching a new service in March from the port to the Far East. It is thought that OOCL will join the above at the end of the year. Southampton Container Terminals is to build at least one new berth.

The trade paper goes on to report that Felixstowe boss, Derek Harrington, commented on Radio Solent that Southampton gave "second rate service". The replies by the Soton and the Shipping Companies themselves were scornful!

The routes served will be as follows:--

1	2
Rotterdam	Southampton
Hamburg	Le Havre
Southampton	Bremerhaven
Le Havre	Rotterdam
Singapore	Darmietta
Hong Kong	Jeddah
Kobe	Port Kelang
Nagoya	Singapore
Shimizu	Hong Kong
Tokyo	Kaoshiung
Hong Kong	Hong Kong
Singapore	Singapore
Rotterdam	Port Kelang
	Jeddah
	Southampton





The 17,000gt mini-cruise liner *Silver Cloud* is the first of two new highly luxurious twins ordered in Italy for Silverseas Cruises.

## Cruise industry review 1994

THE largest cruise ship deliveries during 1994 were Carnival's *Fascination* and Holland America Line's *Ryndam*, these ships being respectively the fourth and third units of their class. Details of these ships may be found in the special feature dedicated to Carnival Corporation.

The only other newbuilding delivered last year was Silversea Cruises' \$125 million *Silver Cloud* (17,000gt). This new cruise venture has been initiated by Monaco-based V Ships, formerly associated with Sitmar Cruises, the cruise line which was purchased by P&O/Princess Cruises in 1988. *Silver Cloud* is the first of two sister ships from the yard of T Mariotti of Genoa in Italy, although the contract was signed with SEC of Viareggio and the hull was built by Cantieri Visentini. The second, *Silver Wind*, is due to enter service towards the end of this month. The ships are basically enlarged versions of the *Seabourn Pride* concept, offering premier deluxe accommodation and worldwide itineraries at a price. Accommodation for 306 passengers comprises all outside suites, the majority with private verandas (114 out of 153), ranging from basic Vista Suites of 22.16m<sup>2</sup> to Grand Suites of 122.17m<sup>2</sup>. The ships feature open sitting dining and a two-tier show lounge (seating 314) which is unusual on a vessel of this size. Interior design by Yran & Storbraaten is Italian in style with artworks in ancient style. Fifteen officers and 184 crew are employed on board.

Propulsion is provided by two Wärtsilä 6R46 diesel engines, each producing 5.85 MW, driving 3.85m KaMeWa cp propellers at 124rev/min for a speed of 18.5 knots. Two 450kW KaMeWa bow thrusters and Fincantieri stabilisers complete the hull outfit. Two Wärtsilä 8R32 engines drive Leroy Somer alternators of 2.75MW output.

For a number of years this annual cruise feature has heralded the possible return of

two veteran passenger liners into cruise service, namely the Blue Riband ship *United States* (52,000gt; 1952) and the notorious *Stockholm* (12,396gt; 1948) famous for the *Andrea Doria* incident in July 1956. Work on the *United States* continues in Turkey after the removal of asbestos in the Ukraine. Apparently the hull and machinery are reported to be in good condition despite the ship's lengthy period of idleness since 1969. Financing to complete the reconstruction as a cruise liner utilising only one of the two main steam turbine machinery plants (maximum 120,000shp from her previous 240,000shp) and incorporating new accommodation, including a lounge atop the retained defunct forward funnel, is reportedly still being sought.

The long-awaited *Stockholm* conversion is now complete and the ship has entered cruise service for NINA SpA as the *Italia Prima*. The ship's owner is a newly formed company headed by Bruno Quiriconi who previously managed the *Achille Lauro*. Originally designated an intermediate North Atlantic liner, the ship has been virtually gutted and stripped out and has emerged as a high class cruise ship with accommodation for 520 passengers. An earlier fanciful rendering for the conversion to incorporate three pencil-thin raked funnels to give the impression of a 1920s vessel has not been fulfilled and the ship has a single funnel.

The graceful lines of the original hull have been somewhat marred by the addition of a huge sponson aft, obviously for compliance with damage stability requirements. Reconstruction work, which included replacement of machinery, was performed at the Varco Chiappella shipyard in Genoa and amounted to approximately US\$100 million. It is interesting to note that four classification societies, RINA, ABS, LR and DnV, were invited to survey

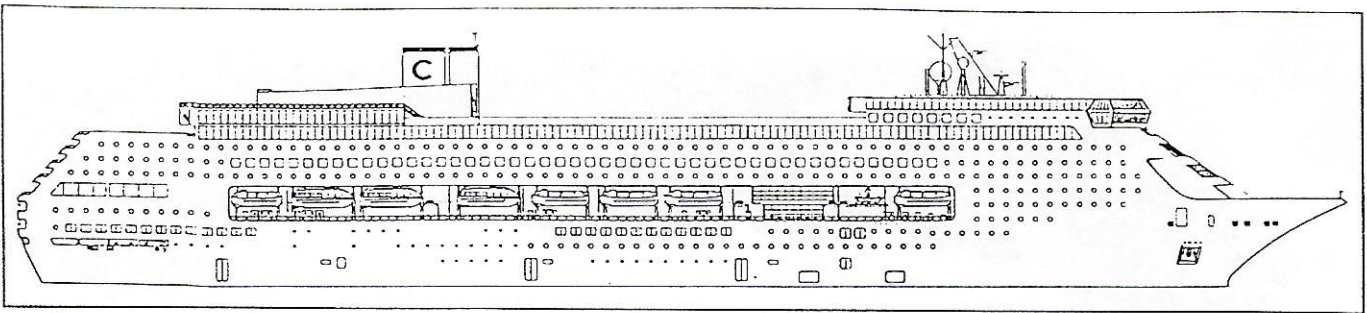
the stripped out hull. Apparently the original Swedish steelwork was found to be in good condition, but the same could not be said for the new bow which was appended to the ship in the USA following her collision with *Andrea Doria*.

The architect Guiseppe de Jorio redesigned the *Italia Prima* and the resulting 15,000gt ship offers eight apartments, 33 suites, 219 outside cabins and 31 inside cabins for passengers and 118 crew cabins. Open sitting dining is a feature of the accommodation and the main dining room can accommodate all the passengers in a single sitting. A service speed of 19 knots will be maintained using medium-speed Wärtsilä machinery with a top speed capability of 21 knots. The ship currently operates on three and four day cruises based on a 'tour of Italy' theme which can be combined into a week long cruise. A fuller description of the *Italia Prima* will appear in the 1st Quarter 1995 edition of our associate journal *Shiprepair and Conversion Technology*.

It is estimated that there are some 27 new cruise ships currently on order with a combined tonnage of 1,352,583gt and a cumulative total of 39,388 beds. Significant events over the past year in the cruise industry include:

- Chandris Celebrity Cruises confirmed a US\$318 million order with Meyer Werft for a third 73,850gt *Century* class ship with delivery in September 1997.
- Costa Cruises of Italy has placed DM600 million order with Brem Vulkan for a 74,000gt liner to be named *Costa Lirica*, with delivery set for July 1996. This was a notable contract as recent Costa ships have been built or converted in Italy. Although an option exists for a sister ship with Brem Vulkan, Fincantieri is known to be

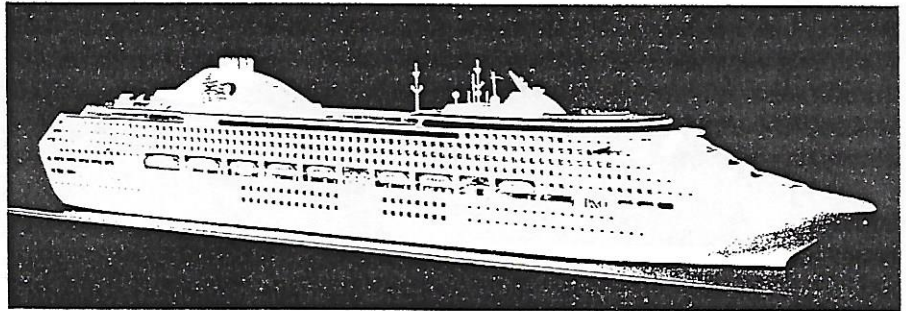




Profile of Costa's new 74,000gt liner *Costa Lirica* ordered – most unusually for this owner – in Germany at Bremer Vulkan. A diesel-electric power plant (based on three MAN B&W 6L58/64 and three 7L58/64 engines totalling 50,700kW) with two 15MW propulsion motors will provide a speed of 23 knots.

working hard to secure this contract for the vessel which will be named *Costa Magica*.

- Royal Caribbean Cruise Line (RCCL) signed an order for a new 2,000-passenger cruise ship at Chantiers de l'Atlantique for delivery in April 1997 with the option for a second unit with delivery April 1998. This order is in addition to the US\$330 million, 1,800-passenger, 70,000gt twins *Legend of the Seas* due in April 1995 and *Splendour of the Seas* due March 1996; both of these ships are currently building at the St Nazaire yard. Meanwhile at Masa-Yards in Helsinki, RCCL has confirmed the order for the second of the pair of US\$300 million 73,000gt cruise ships due in October 1996 and September 1997. These ships will see RCCL's capacity increase by 80% from 14,288 berths to 25,700. Additionally, we understand that the line has entered into an agreement with Mitsubishi Heavy Industries Ltd, builder of the *Crystal Harmony*, for the design and engineering of a new generation of cruise ship – possibly as large as 120,000gt.
- Norwegian Cruise Line has chartered the re-built former Baltic ferry *Sally Albani* for four years. Currently undergoing a further £60 million reconstruction and refit at INMA, La Spezia following grounding and partial sinking in the Baltic Sea in March, the ship will return in June as *Leeward*. Two of the worst aspects of the grounding damage were unseating of machinery and rupture of sewage holding tanks, the contents of



A model of P&O's new 77,000gt pair, *Sun Princess* and *Dawn Princess*, under construction at Fincantieri. A tennis court is contained within the open funnel structure.

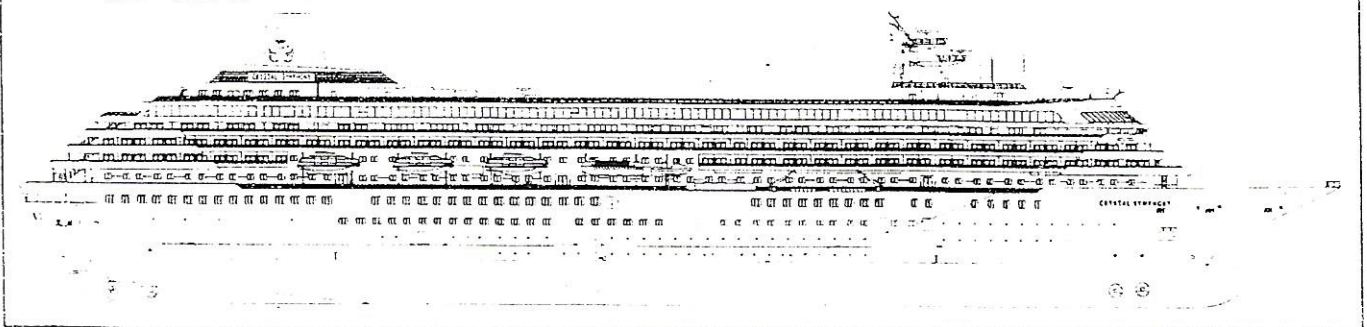
which permeated throughout the sunken portions of the hull.

- An important new move in the industry involves The Disney Corporation which is expected to seek tenders for an initial pair of 70,000gt cruise liners early this year. Rumours suggest that the owner wishes to provide the ships with a profile of either Cunard's former three funneled *Queen Mary* (1936) or *Queen Elizabeth* (1940) and that a fleet of up to eight units is planned. There has been some press speculation that these ships might be powered by gas turbo-electric plants.
- P&O/Princess Cruises now has three large cruise ships on order with Fincantieri. The US\$300 million 77,000gt *Sun Princess* is progressing at the Monfalcone shipyard with delivery set for early 1996. The design provides for five dining areas within two restaurants, two main show lounges and two atriums. A very unusual feature of the ship is the funnel which is a large open structure with the exhaust pipes canted in order to

provide space for a small sized tennis court within! Sister ship *Dawn Princess* (US\$295 million) will be built at the same yard following Carnival's 100,000gt leviathan, whilst the largest P&O of all, *Grand Princess* at 105,000gt, will follow in 1997 with an option for a second yet to be confirmed. These ships will feature three main dining rooms, three show lounges, a virtual reality theatre and a moving glass enclosed walkway from the upper deck to the disco, perched as if a spoiler mounted at the stern. Meanwhile, P&O Cruises' 67,000gt *Oriana* is nearing completion at Meyer Werft and should enter service in May.

- As indicated elsewhere, Carnival Corp placed an order during December with Masa-Yards Helsinki for a seventh unit of the 70,000gt *Fantasy* class. Construction of the US\$300 million contract will commence after RCCL's second Masa delivery and the ship will enter service in February 1998.

Nearing completion at Kvaerner Masa's Turku New Shipyard is the 50,000gt *Crystal Symphony* for NYK's Crystal Cruises. Although nominally similar to the Mitsubishi-built *Crystal Harmony*, this Finnish-built liner features a new hull form. All 960 passengers are berthed in outside-facing cabins (a concept originally developed by the former Wärtsilä company). Like her Japanese-built sister, *Crystal Symphony* is powered by an ABB diesel-electric power plant but this time using six Wärtsilä-Sulzer 9ZAL40S engines, providing power for two 11,500kW ABB propulsion motors. Other modifications include a stern thruster and twin flap rudders.





NOTICE FROM GENERAL SECRETARY\*\*\*\*PLEASE NOTE\*\*\*\*\*

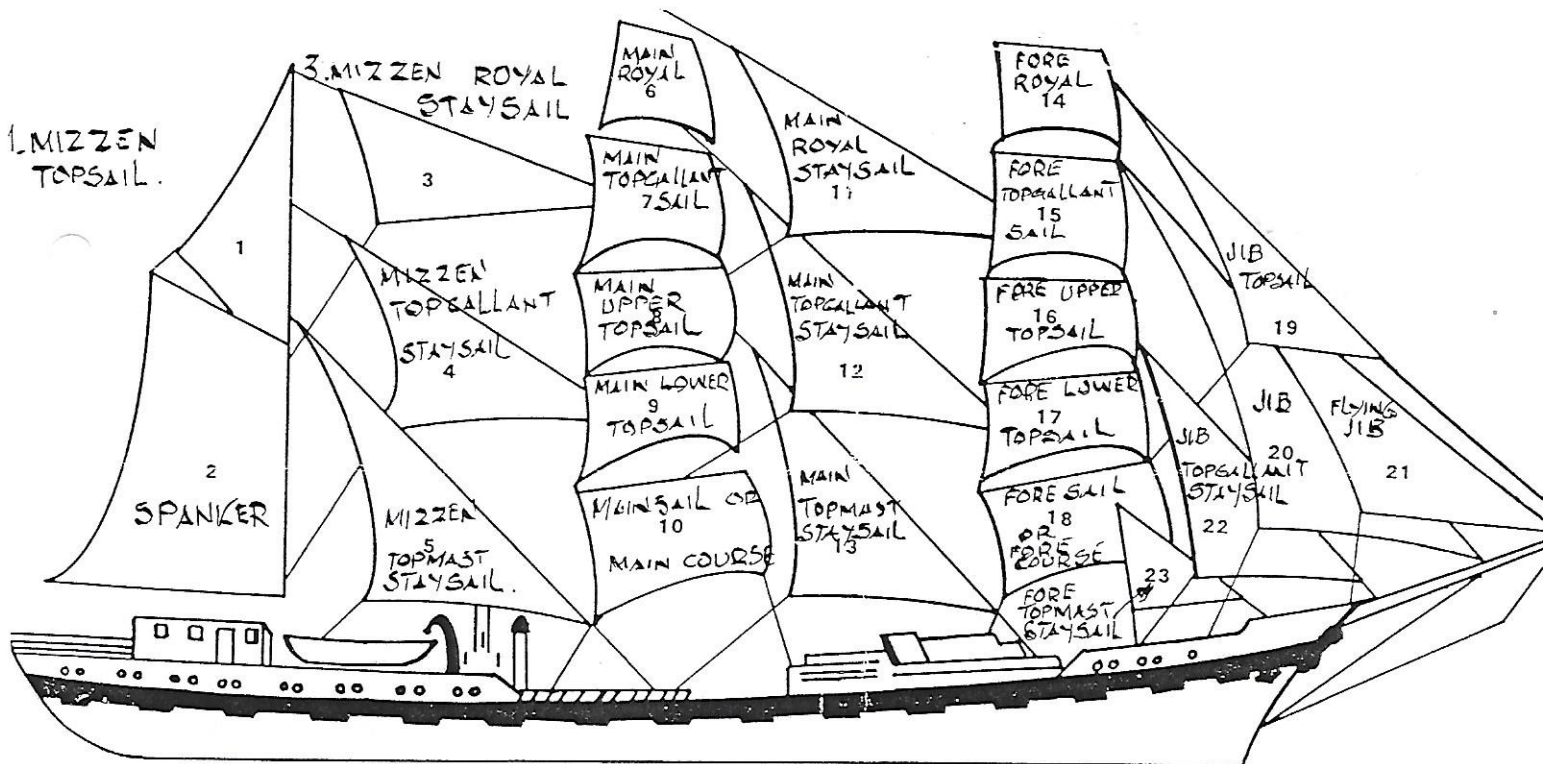
CHANGE TO ONE RENEWAL DATE FOR W.S.S. SUBSCRIPTIONS

Please note that in future there will only be one renewal date for subscriptions instead of the present two. This date will be 1st January. The original reason for having two dates was to spread the load for the Membership Secretary of that time, who dealt with both U.K. and Overseas membership and did not have the advantages that a computer provides. Our auditors have now requested that we have just one date to avoid unnecessary complications in the annual accounts.

To bring members who renew next June into line, they will be given the choice of either paying £10 to take them to 31/12/95 or a discounted £28 to take them to 31/12/96.

Would you please ensure that all references to joining from July are removed from any W.S.S. brochures that you issue. In future all new members will have to join from 1st January. They will of course receive back numbers of Marine News if they do not actually pay their first subscription until later in the year.

THE SAILS.



"SIMON BOLIVAR"

# New generation amphibious hovercraft built in FRP composites

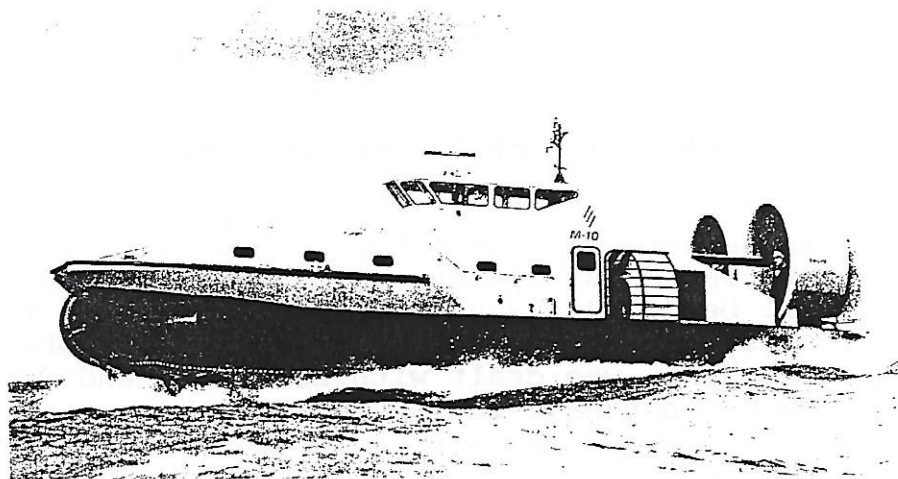
THE world's largest amphibious hovercraft manufactured from composite materials, the ABS M-10, has recently been undergoing trials in the Solent. During demonstrations attended by *Warship Technology*, this prototype ran at speeds up to 30 knots and carried out a series of accelerating, turning, and stopping manoeuvres.

The craft demonstrated its integrated skirt shift system for adjusting air pressure from one side to the other in order to bank when turning, a ballast pumping system for adjusting trim, so enhancing manoeuvrability and control at speed, also low-speed manoeuvrability afforded by controllable pitch air propellers each with twin rudders. Noise levels were notably lower than generally expected from hovercraft.

Forty years on from the first amphibious hovercraft, this 'third generation' craft, designed by Southampton-based ABS Hovercraft Ltd, overcomes the traditional problems of cost, noise and manoeuvrability by using lightweight construction, an economic twin diesel propulsion system offering an exceptional power/weight ratio and an advanced control system.

The M-10 has a continuous speed, fully laden, of 40 knots in calm water. The prototype is claimed to have reached 50 knots within a minute from a cold start and to have operated successfully in 2.5m high waves. The craft can clear sandbanks, mudflats, reefs and other obstacles up to 1m high while carrying a disposable load of 10 tonnes.

The M-10 military hovercraft is targeted at naval, coastguard, special forces and



## PRINCIPAL PARTICULARS ABS M-10

Length overall.....	18.84m
Beam overall.....	8.80m
Draught, shallow water.....	0.35m
Height, with mast.....	7.65m
Obstacle clearance.....	1.0m
Disposable load.....	10,000kg
Engine power.....	2 x 386kW
Speed.....	40kts
Range @ 30kts.....	600nm

paramilitary markets for such activities as landing marines, logistic supply, patrol, interception, inshore mine clearance and rescue work. Optional gunner positions can be provided in the forward cargo bay and on the flying bridge.

With an overall length and beam of about 19m and 9m respectively, the ABS M-10 has a walk-in' engine room, side decks for all-round access, wheelhouse with comfort-

able seating for up to four crew, interior working space for seating 77 personnel or carrying light vehicles with a payload of 10 tonnes, and a 2m wide electro-hydraulic aluminium landing ramp forward.

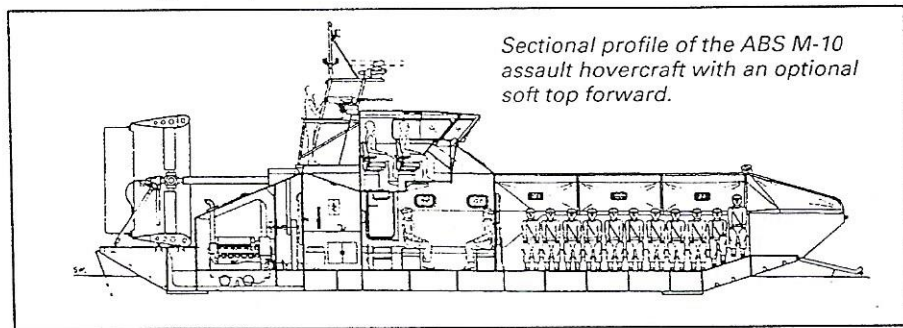
Dimensions are such that two M-10s could be stowed abreast within the dock of the Royal Navy's planned new LPD for which an outline specification has been prepared. Inflatable craft can be launched from the hovercraft's bow ramp at sea.

The ABS M-10 has been built over 18 months by Vosper Thornycroft (VT) at Southampton to Lloyd's Register Building Certificate requirements with respect to hull and machinery and to LR Guidance Notes for Air Cushion Vehicles. VT's role is as sub-contractor with exclusive rights to build in Europe.

The hull is of lightweight, single skin composite FRP intended to provide good resistance to damage, good fatigue characteristics and a shock-absorbent underside minimally susceptible to abrasion from rock and sand surfaces. Material specifications were thus stringent in respect of tensile, flexural and compressive strength and VT was required to produce sample laminates for LR approval before construction began. The deck is constructed of foam sandwich, and the sandwich superstructure is reinforced with Kevlar aramid fibre.

Propulsion power is provided by two Deutz BF12L513C air-cooled engines developing 525bhp (386kW) at 2300 rev/min, belt-driving Hoffman four-bladed cp ducted propellers and centrifugal lift fans. In the event of failure a single engine will provide sufficient thrust and lift to return to base. Fuel capacity is 4600 litres and range is 600nm at 30kts in calm water. For electrical power two 24v dc transmission-driven alternators charge two battery banks.

In addition to its advantages of speed and amphibious capability, the ABS M-10 is claimed to have lower operating costs than a conventional marine craft of the same capacity. Stealth is enhanced by a low radar cross section and the low wake characteristics of air cushion craft. ①



*Sectional profile of the ABS M-10 assault hovercraft with an optional soft top forward.*



## Admiralty Sloop becomes Passenger Ship

The "Lady Enchantress," ex "Bittern," converted at Southampton for the South Coast excursion service of the Three Star Shipping Co. Ltd., London

An interesting conversion, whereby the naval sloop H.M.S. *Enchantress* has been refitted for use as a passenger vessel for service on the South Coast, under the name of *Lady Enchantress*, was recently completed. The vessel concerned was laid down at the yard of John Brown & Co. Ltd., Clydebank, in 1934, as H.M.S. *Bittern*. During construction, modifications were made, mainly to the superstructure, and the vessel was fitted out as the Admiralty yacht, her name being changed to *Enchantress*. Until the outbreak of war she carried out duties as a yacht, then the additional superstructures were removed and she was reinstated as a sloop.

In 1946 the vessel was purchased by the Three Star Shipping Co. Ltd., London, and placed in the hands of John I. Thornycroft & Co. Ltd., Southampton, for conversion to a passenger vessel. Now of 1,173 tons gross, she will carry 1,010 on Steam II Limited certificate.

The vessel has a length of 265 ft. 6 in. between perpendiculars, a moulded

breadth of 37 ft. and a moulded depth of 17 ft. 6 in. The propelling machinery comprises two sets of Curtis geared turbines developing 3,300 S.H.P. The designed speed was 18.75 knots. Steam is supplied by two Admiralty 3-drum boilers burning oil fuel. No alteration has been made to the machinery, and approval has been obtained from the Ministry of Transport for the power necessary to ensure a speed of 18 knots.

Major alterations consist in the extension of the long fore-castle deck and deck houses further aft, while the wheelhouse was moved forward and increased in size to provide the captain's accommodation. The total fuel capacity was reduced by lowering the crowns of the forward oil tanks to the level of the lower deck, and for purposes of trim, the two after wing fuel tanks were brought into the ballast line. The fresh water tanks, which were aft, were converted to water ballast, and the three forward compartments brought into use as fresh water tanks. The Gyro compass was moved down from the lower

deck to No. 4 compartment forward, in order to leave the upper deck free for passenger and crew accommodation.

Flooding calculations rendered necessary modifications to several bulkheads, and in order to get the greatest possible length for the dining saloon on the lower deck aft, a new watertight bulkhead was installed at frame 103, and a watertight door fitted, giving access to the pantry and galley. The new crowns over the forward oil fuel tanks formed officers' and crew accommodation, the balance of the crew being carried on the upper and lower decks forward. Fan induced ventilation is used throughout the ship and the closed stokehold system has been retained.

A new funnel casing of much larger dimensions was fitted and the emergency generator housed in a small deck house, which incorporates the access to the galley aft.

The conversion was carried out under British Corporation survey for class, and Ministry of Transport survey for a Steam II passenger certificate. She is intended for service on the South Coast, and for day trips to the Continent, when the present Home Office ban is lifted.

Plans and specifications for the conversion were prepared by Mr. Norman Dewar, M.I.N.A., London, who supervised the work on behalf of the owners.

An experiment was carried out at Torquay in 1950 with a twin screw turbine steamer LADY ENCHANTRESS. This vessel had been built as a sloop for the Royal Navy and was to have been called HMS BITTERN, but was converted before launching into an Admiralty Yacht ENCHANTRESS. She was in the Coronation Naval Review of 1937 and was brought by the Three Star Shipping Co, and converted into a pleasure steamer. She plied for five or six weeks in the Thames Estuary in 1947, but she drew far too much water and was not a financial success. She was laid up until 1950, then her owners decided to try her out at Torquay on trips to Guernsey. She did not commence sailing until 2nd August and lasted only until 30th August after some very erratic timekeeping, on this day, when returning from Guernsey, the brickwork of both boilers collapsed when she was 15 miles from the Casquets, not a good place to become disabled, she was towed to Torquay by the tug TURMOIL who the next day towed her to Southampton. She was laid there until February 1952, when she was towed to the Tyne and broken up.

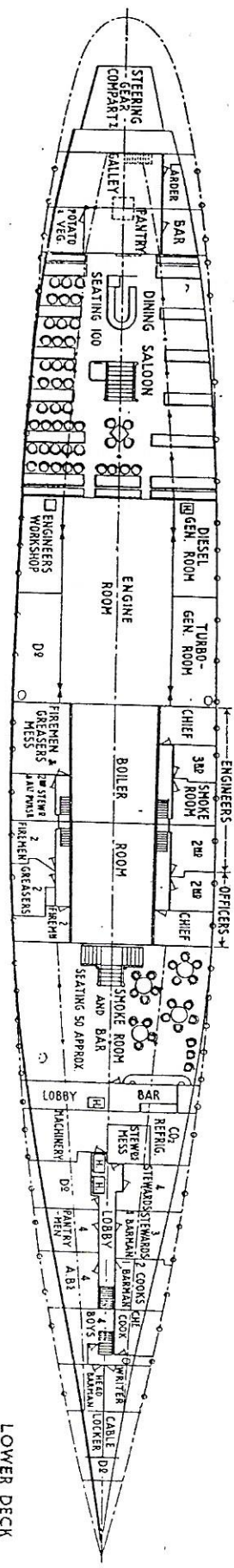
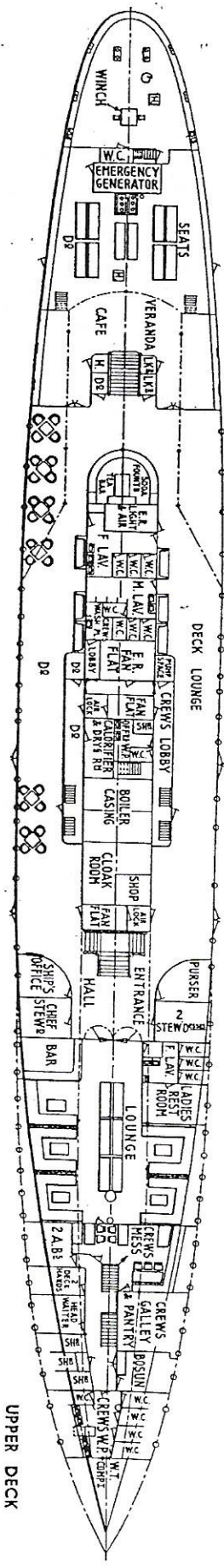
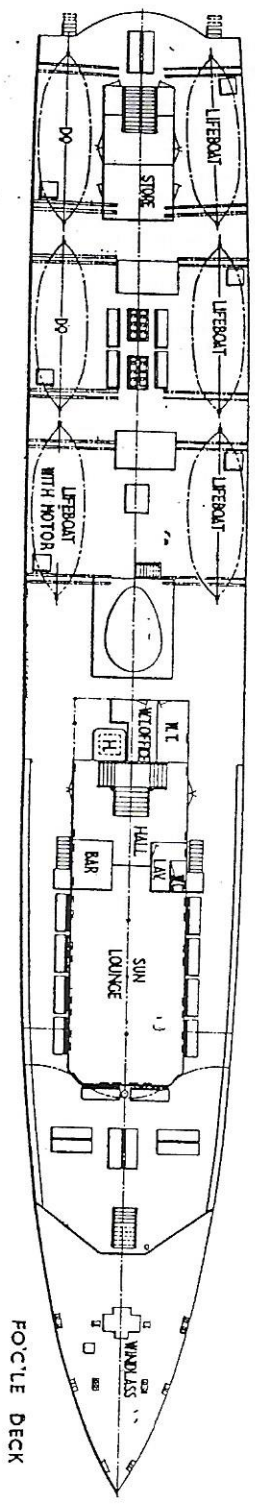
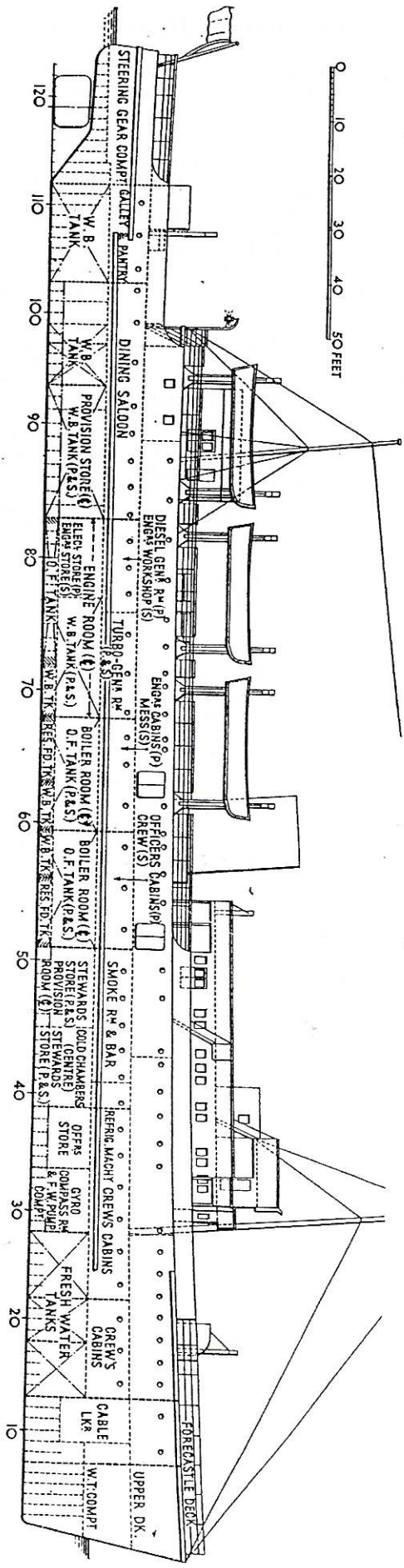
Reference, South Coast Pleasure Steamers by ECB Thonton  
T Stephenson & Sons Ltd 1969.

Doug Toogood.



JOHN I. THORNHROFT AND CO., LIMITED, have completed at Southampton the conversion of the ex-Admiralty yacht *Enchantress* into a pleasure steamer for service on the south coast. Built as H.M. Sloop *Bittern* in 1935, she was recently purchased by the Three Stars Shipping Company, Limited, and has been renamed *Lady Enchantress*. Her port of registry is now Ramsgate.

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The "*Lady Enchantress*" after conversion from a naval sloop

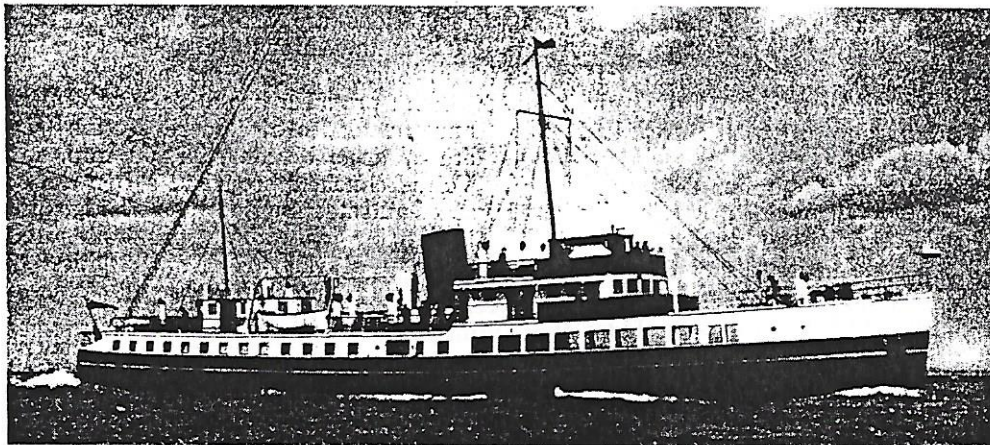
LOWER DECK

UPPER DECK

FO'CLE DECK



## The Diesel-engined "Vecta" with Voith-Schneider Propulsion



The Southampton, Isle of Wight and South of England Royal Mail Steam Packet Co. Ltd. have now taken delivery of the motorship *Vecta* from John I. Thornycroft & Co. Ltd., Southampton. This is the second diesel-engined ship in the company's fleet, the other one being the *Medina*, described and illustrated in our issue of February 19, 1931. She is, however, considerably larger than the *Medina* (about 622 gross tons compared with 342 gross tons of the *Medina*) and is several knots faster. A vessel of just under 200 ft. has been found the best all-purpose size for this company's services on account of the limitations at Cowes, and so she is the same length as the paddle steamer *Gracie Fields*, built in 1936, also by John I. Thornycroft & Co. Ltd., and as a result of experience gained with the *Gracie Fields* the bottom has been coated with D.M.U. undercoat supplied by Detel Products Limited.

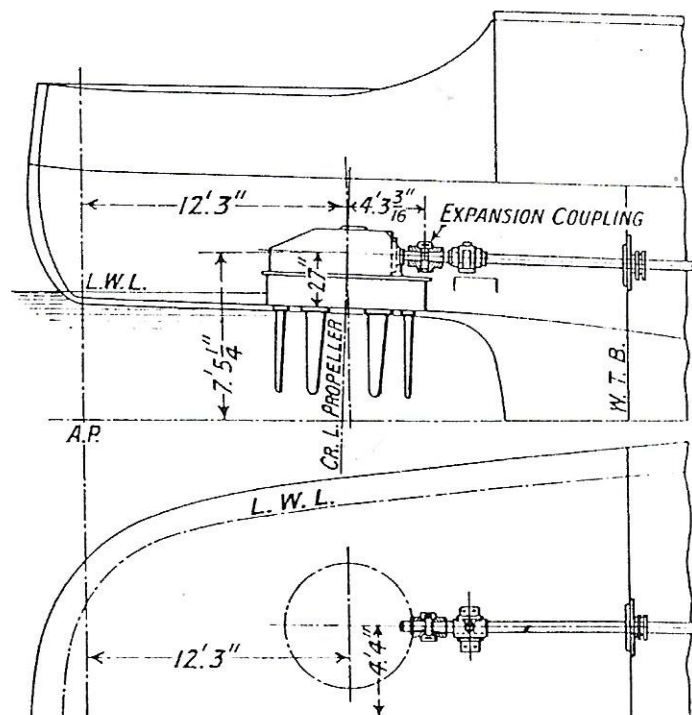
The design of the *Vecta* is the result of two years' research by Mr. John Bartle Hastings, the owner's marine superintendent. She also embodies the experience of eight years' intensive study by the general manager, Mr. Cyril J. Sharp, of the various services for which the company has to cater, both in regard to the carriage of passengers and motor cars to and from the Isle of Wight and its other important business in catering for the requirements of the large passenger shipping companies. The outstanding feature of the *Vecta* is the propulsion which is of the Voith-Schneider type, details of which have been given in our columns on several occasions. The following are the principal dimensions of the *Vecta* :—

Length, o.a. . . . .	197.5	ft.
Length, w.l. . . . .	195	ft.
Beam, moulded . . . . .	31.2	ft.
Beam, w.l. . . . .	27	ft.
Depth . . . . .	10.32	ft.
Mean draught . . . . .	6	ft.
Tonnage, gross . . . . .	621.94	
Tonnage, net . . . . .	362.47	

At the moment, she is the highest powered Voith-Schneider vessel in merchant service. The general layout of the vessel is a complete departure from earlier ships, both the paddle steamers, which are a very familiar feature on Southampton Water, and the *Medina*, to which a reference has already been made. The superstructure is considerably higher and the decks have been broken up in such a way as not only to avoid monotony, but to provide a considerable amount of fresh air space with a great deal

of shelter. There is ample provision for motor cars on the main deck forward and they are well protected during the passage in inclement weather first by a high fore-castle head, and secondly by a high gunwale, which is pierced by wide windows and, thirdly, by extending the promenade deck above well forward so that it forms a cover over three parts of the available motor-car carrying space. There are no stanchions or other encumbrances. The protective fore-castle marks the one point of resemblance to the *Gracie Fields*, on which it was first adopted.

The dining saloon is on the main deck, where full use has been made of wide windows to give diners good views of the scenery as the vessel wends its way from one point to another. It has a seating capacity of 60 and there are ample service arrangements with bars for the use of passengers. Forward on the promenade deck is a large



Arrangement of Voith-Schneider propellers



observation lounge with high chairs of chromium-plated tubular steel, making it an ideal covered position for travellers wishing to view the scenery in inclement weather. Just abaft of this is a special bar, which will avoid the necessity of first-class passengers having to leave the observation saloon for a lower deck for refreshment.

The wheel house on the bridge deck presents a normal appearance, but it contains the unique control column of the Voith-Schneider propulsion unit consisting of the helm, which looks like the steering wheel of a large motor car, and, alongside, two levers working on a quadrant which control the whole movement of the ship. Just abaft this is a roomy wireless cabin equipped with Marconi two-way radio telephony apparatus.

The boats are carried under Columbus davits.

It has been possible to provide exceptionally good accommodation for the officers and crew in advance of what has hitherto been done in vessels of this size. The cabins, which are arranged on either side of the main lobby, are roomy and well equipped with spring mattresses, bunks, lockers, wash-basins, and wardrobes, and, for the first time in the ships of this fleet, there is special accommodation for the stewards for a space extending the whole width of the ship. This is fitted with eight bunks, four on each side of each cabin and each has a lock-up cupboard for his own effects.

Beneath the car deck is a second-class lounge bar, by

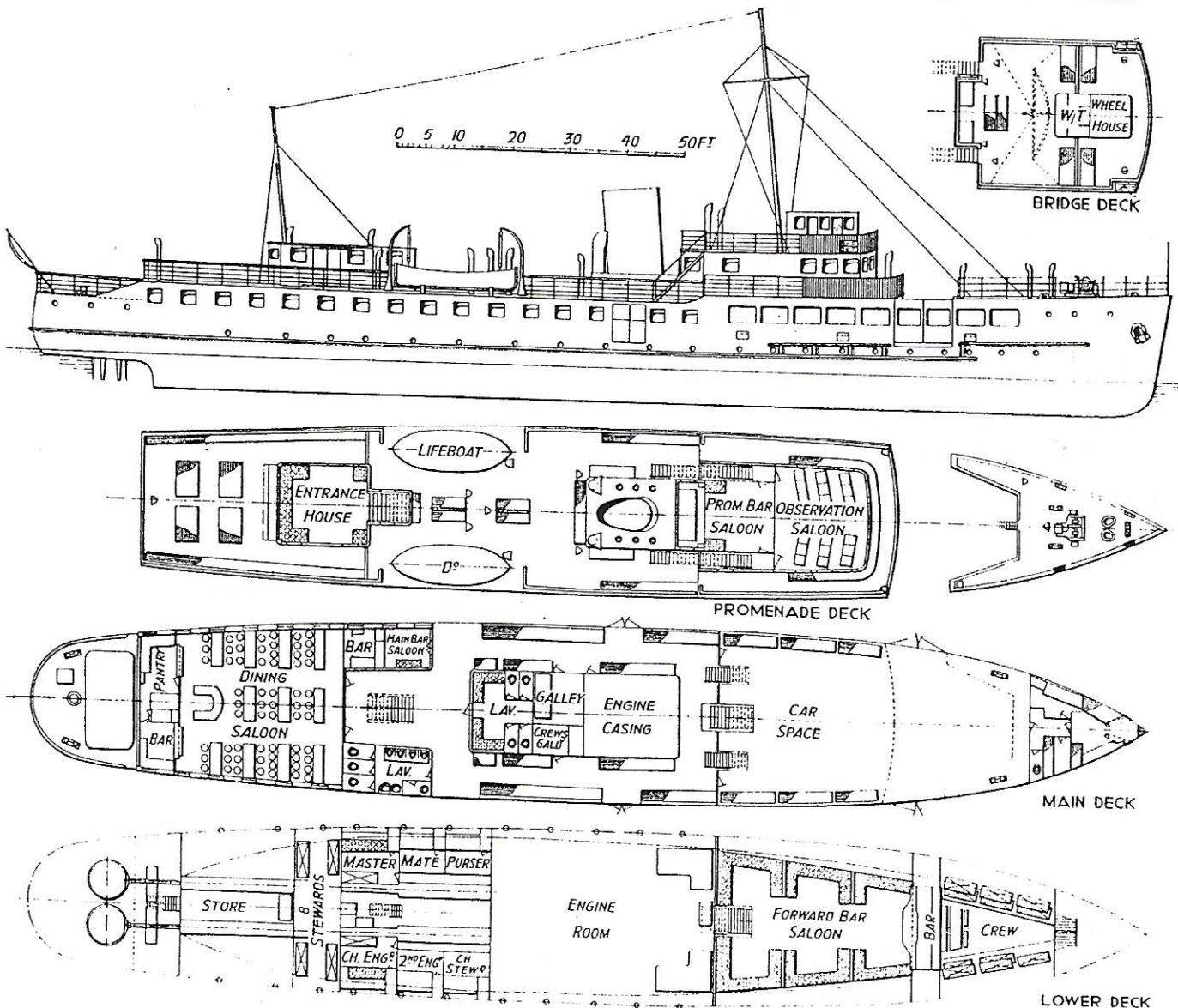
far the largest forward saloon of any ship in the fleet. Ventilation of the public rooms is by electric Thermovent heaters.

There are two Voith-Schneider propellers coupled direct to two English Electric diesel engines, which work at constant speed. The propellers are arranged at the stern of the vessel at an angle of about 3 deg. from the vertical. With an output from each engine of 650 B.H.P., the shaft revolutions are 325 r.p.m., and the propellers turn at 135 r.p.m. through the bevel gears integral with the propellers.

Each propeller has a blade orbit diameter of 1,800 mm., and the blades of aerofoil section (six on each propeller) are of special bronze, 1,200 mm. in length. As in all Voith-Schneider propelled ships, the control for direction, speed and steering is from the bridge direct on the propellers, the engine maintaining constant speed and rotation irrespective of the speed or direction of the vessel. The engines are of identical size and type to those fitted on the Trinity House diesel-electric *Patricia*. There are large primary silencers and secondary silencers of the Burgess type.

Auxiliaries include two Ruston Hornsby 40-B.H.P. 4-cylinder 4-stroke oil engine generating sets, installed on the port and starboard side respectively of the engine room.

On trials the *Vecta* reached a speed of 15.6 knots.



General arrangement of the "Vecta"

"VECTA" WAS CONVERTED TO DIESEL-ELECTRIC IN 1946