

DISCLOSED
SECTION
No. 7 57

-6. MAY 63

Rpt. 17 (b)

Date of writing Report 22.4.1963

Received London

Port SPLIT

No. 2390

Survey held at SPLIT

No. of visits 19

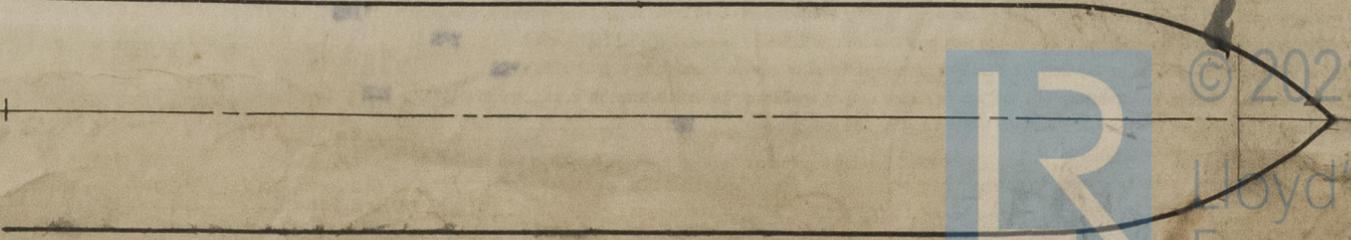
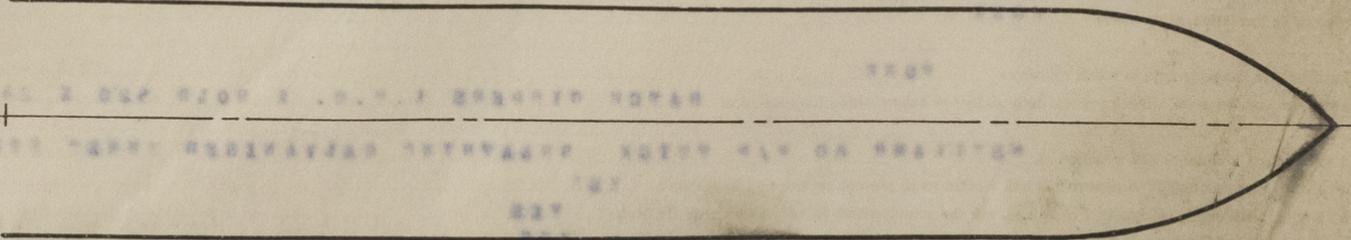
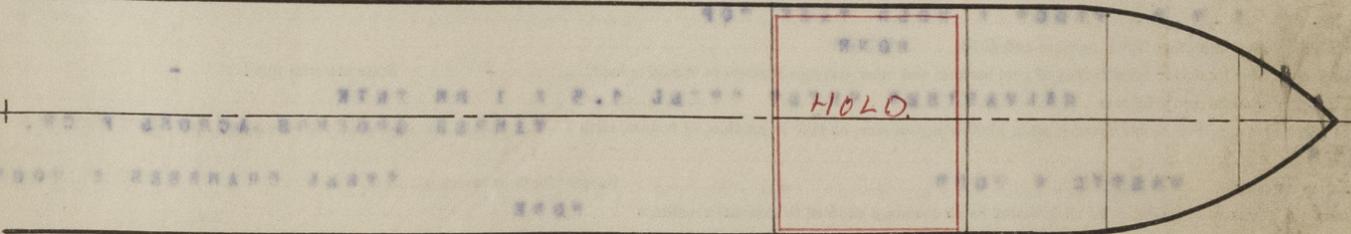
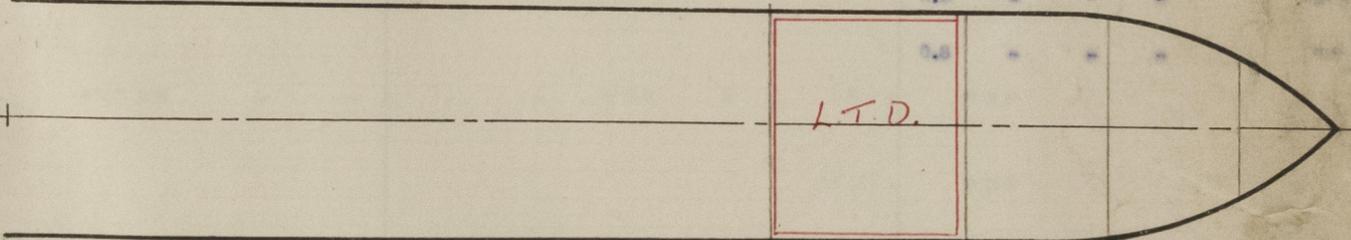
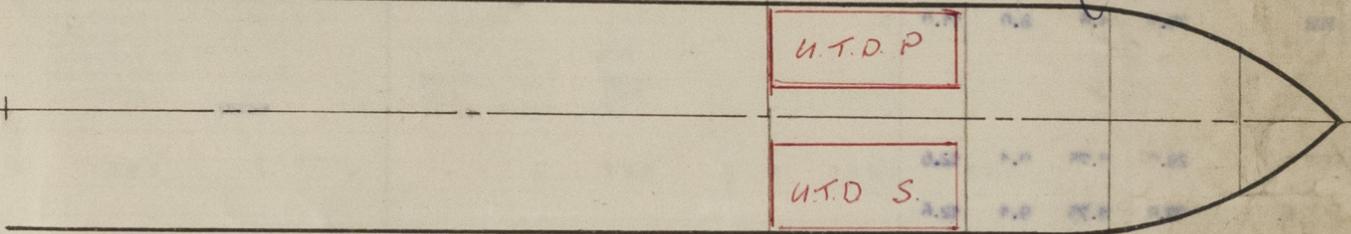
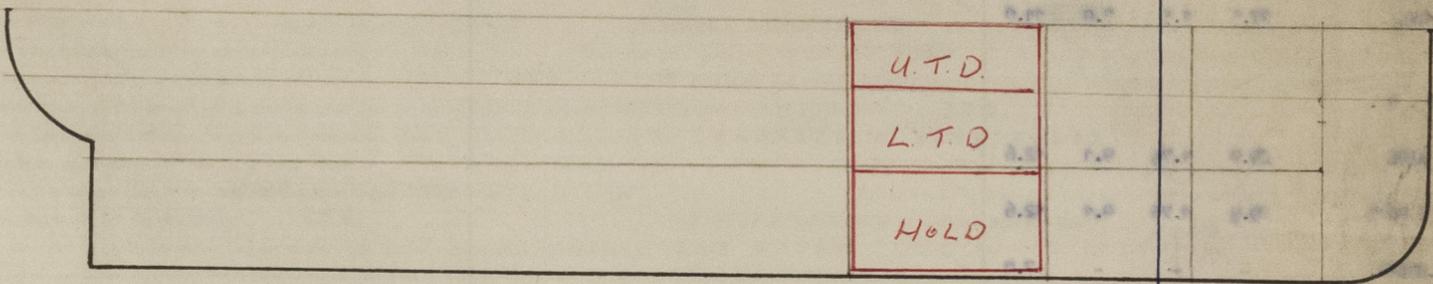
First date 22-9-62

Last date 24.12.63

REFRIGERATED CARGO INSTALLATION—REPORT ON INSULATION WORK, ERECTION OF PLANT ON BOARD AND TESTS AFTER COMPLETION

No. in R.B. 92140 Name M.V. WIENIAWSKI
 Built at SPLIT By whom BRODOGRADILISTE "SPLIT"
 Owners POLSKIE LINIE OCEANICZNE Port of Registry GDYNIA
 Refrigerating Machinery made by T. SABROE & Co. Machine Nos. 43256-7-8-9 When made 1962
 Insulation fitted by BRODOGRADILISTE "SPLIT" - SPLIT Total No. of Chambers 4
 Total refrigerated cargo capacity measured in accordance with Society's requirements 95460 cu. ft.

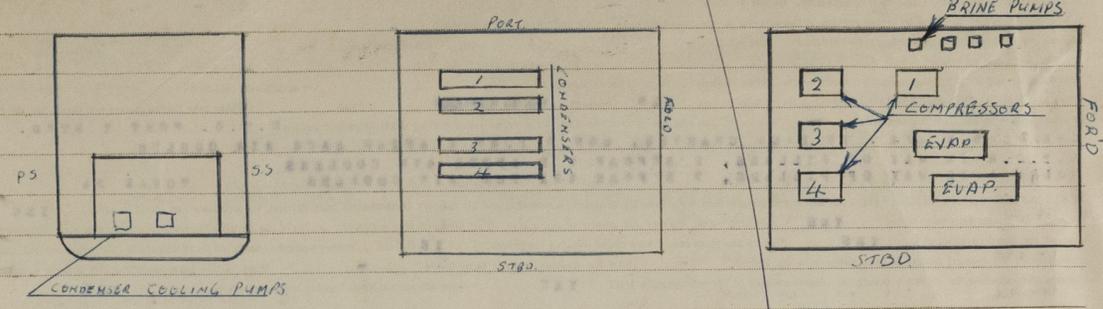
Location and boundaries in elevation and plan of each refrigerated cargo chamber, main and refrigerating machinery space(s), evaporator and brine rooms, and cooler houses to be shown by inserting decks and bulkheads in the diagrams. The frame numbers to be shown at each transverse bulkhead. The decks to be clearly marked in elevation and plan. Insulation to be shown by a line (preferably in colour) on the appropriate side or sides of decks and bulkheads. Oil storage tank tops and bulkheads adjoining refrigerated chamber(s) also to be shown. (If desired, a separately prepared diagram sheet may be attached by paste or staples provided the size is not greater than that below, all the required particulars are shown and the sheet is signed by the Surveyor.)



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Foundation

of refrigerating units... Can each unit operate on all chambers? YES... if not, state how connected... Primary refrigerant AMMONIA... Where specified in the Rules, is the machinery isolated in an efficiently ventilated compartment? YES... Medium for cooling chambers BRINE & AIR... For particulars of refrigerating machinery see AALBORG Report No. ... Diagrammatic sketch sufficient to show relative position (port or starboard, fore or aft) of each compressor, condenser, evaporator (brine cooler), condenser cooling pumps, and brine pumps



Provision made for subcooling the liquid refrigerant (if so, state method) NO... MOTIVE POWER supplied from (state No. of boilers or electric generators) 3 DIESEL DRIVEN... CONDENSER COOLING PUMPS No. TWO Capacity of each 2000... BRINE PUMPS No. 4 Capacity of each 600... No. of brine temperatures which can be circulated simultaneously 3... Are thermometers fitted to brine delivery and each return pipe? YES... Are steel brine and refrigerant pipes, cooling grids and air cooler coils galvanized externally where required by the Rules? YES... How are the brine and refrigerant steel pipes connected (flanges, butt welds, screw joints, etc.) FLANGES & BUTT WELDS... Where brine pipes are connected by screwed couplings, are the coupling and back nut threads a good fit? ... What is the pipe thickness at the bottom of the thread? ... Are the screw threads clear of the coupling coated as required by the Rules? ... Are air cooler coils parallel to or across the air stream? ACROSS... Is provision made for air refreshing? YES... If so, are the arrangements in accordance with the Rules? YES... What provision is made for defrosting air cooler coils and/or cooling grids in chambers? HOT BRINE HEATING COILS IN TRAYS

INSULATION OF BOUNDARIES EXPOSED TO EXTERNAL CONDITIONS

In cols. (1) identify each chamber by position (e.g. No. 2 UTD PORT) with each of its exposed surfaces immediately below (e.g. ships side, overhead, etc.), where the size of frames etc. change on any surface, give frame Nos. (e.g. Fms. 102 to 109) applicable to each size, on separate lines. Depth of insulation in cols. (3) to exclude any air space, linings, etc.

(1) Chamber(s) and Boundary	(2) Frames, reverse frames, beams, stiffeners, etc., within insulation			(3) Depth of Insulation fitted	(1) Chamber(s) and Boundary	(2) Frames, reverse frames, beams, stiffeners, etc., within insulation			(3) Depth of Insulation fitted
	Pitch ins.	Width of face ins.	Depth ins.			Pitch ins.	Width of face ins.	Depth ins.	
U. T. D. PORT									
SHIPSIDE	29.9	1.7	7.9	11.0					
FORD. BULKD.	-	-	-	7.9					
AFT BULKD.	-	-	-	7.9					
DECK OVER	27.5	1.5	7.0	11.0					
U. T. D. STBD.									
SHIP SIDE	29.9	1.7	7.9	11.0					
FORD. BULKD.	-	-	-	7.9					
AFT BULKD.	-	-	-	7.9					
DECK OVER	27.5	1.5	7.0	11.0					
L. T. D.									
SHIP SIDE	29.9	1.75	9.1	12.6					
SHIP S. PORT	29.9	1.75	9.1	12.6					
FORD. BULKD.	-	-	-	7.0					
AFT BULKD.	-	-	-	8.0					
DECK OVER	29.9	1.6	8.0	11.0					
HOLD									
SHIP SIDE P.	29.9	1.75	9.1	12.6					
" " S.	29.9	1.75	9.1	12.6					
FORD. BULKD.	-	-	-	7.0					
AFT BULKD.	-	-	-	8.0					
TANK TOP	-	-	-	8.0					

Are all divisional bulkheads of steel construction in accordance with the Rule? YES... If not, state position and when approved... Insulating material(s) (if more than one, state where fitted) "SILLAN" SHIPS SIDE P&S & OVERHEADS & BULKHEADS SLAB COCK U.T.D. & L.T.D. FLOOR & HOLD TANK TOP... Air space, if any, within insulation lining, position and depth NONE... State material fitted... Insulation lining(s) material and thickness GALVANISED SHEET STEEL 1.5 & 1 MM THIK... Methods of securing lining(s) (if timber grounds state whether across face, on face or on sides of frames, etc.) TIMBER GROUNDS ACROSS FACE, PATENT RAILS... Floor insulation covering MASTIC & WOOD... Support for floor covering STEEL CHAMBERS & WOOD GROUNDS... State location and thickness of insulation of all insulated hatch coamings exposed to external conditions NONE... Insulation ribbands state where, the insulating material, thickness, width and covering L.T.D. SLAB CORK 100 MM x 1000MM WIDE MASTIC... Hatch covers, type and thickness of insulation PLUG 250 MM... Exposed loading and tonnage doors, state thickness of insulation 150 MM... Air ducts buried in insulation, state where NONE... Meat rail and/or grid hangers, state in which chambers NONE... State location and dimensions of all web frames, deep girders or beams within the insulation HATCH GIRDERS L.T.D. & HOLD 520 X 240 MM... State how hold pillars and masts are insulated "SILLAN" 80 M/M THICK SHEATHING GALVANISED SHEET STEEL... Are air ducts and insulation linings so constructed and erected as to prevent air entering insulation? YES... Where oil storage tanks adjoin refrigerated chambers, are the arrangements in accordance with the Rules? YES... Are screens fitted over cooling grids on sides of chambers?... Is the insulation in way of hatchways on the tank and tunnel tops protected in accordance with the Rules? YES... Are hatch plugs and their supports; chamber, air cooler and other access doors and frames; closing appliances of tonnage openings; bilge limbers and plugs, satisfactorily fitted and airtight? YES... Are access plugs and/or panels provided in the insulation where required for easy access to the bilges, bilge suction roses, drains, tank manhole doors, air and sounding pipes?... Are cargo battens provided in accordance with the Rules? YES... Dimensions and spacing on sides, vertical surfaces and tunnel top 50 M/M X 50 M/M SPACED 300 M/M... Have all ventilators and ducts passing through refrigerated chambers to other compartments been made airtight and efficiently insulated? YES... Where ventilators are provided to refrigerated spaces, are they provided with airtight and insulated closing appliances? YES... Are insulation linings and air screens on the sides of chambers suitably stiffened to prevent crushing by cargo? YES... Are all steel bolts, nuts, hangers and fixtures which support or secure cooling appliances, insulation, meat rails, etc., galvanized? YES... Is the insulation and air ducting in accordance with the approved plans and specification? YES... The foregoing is a correct description of the insulation and appliances.

Kurt...
Builders or Insulation Contractors

PARTICULARS OF COOLING APPLIANCES IN EACH CHAMBER

Identify each chamber by position (e.g. No. 2 LTD. Port, No. 3 Orlop D., No. 5 L.H. etc.)

Chamber(s)	Capacity measured in accordance with Society's requirements cu. ft.	Roof grids		Side grids		Battery coils		FANS						
		Length in ft.	No. of sections	Length in ft.	No. of sections	AREA SQUARE FEET	No. of sections	Number	Maximum RPM	Minimum RPM	Cubic ft. of air per minute at maximum RPM	Static water gauge ins.	BHP of fan motor	Motor inside or outside insulated envelope
U. T. D. PORT	7593					190	2	1	1460	960	190	22	4/1.5	INSIDE
U. T. D. STBD.	7593					190	2	1	1460	960	187	22	4/1.5	"
L. T. D. P.	37894					410	2	2	1470	980	580	24	11/3.5	"
S.									1470	980	566	24	11/3.5	"
HOLD P	42380					410	2	2	1470	980	545	24	11/3.5	"
S									1470	980	495	24	11/3.5	"
	95460													

Are air cooler fans reversible? ... Is access to the refrigerating plant including air cooler fans and their motors, in accordance with the Rules? YES... Can each section of air cooler coils and chamber grids be readily isolated? YES... Where cooling pipes pass through watertight bulkheads or deckplating, are the fittings and gland packing both watertight and fire resisting? YES... PRIMARY REFRIGERANT PIPING (not fabricated at Plant Makers Works) internal diameter and thickness of each size 2 1/2 x 2", 365 M/M THK, 1", 1 1/2", 3.25 M/M THK, 1 1/2", 2.65 M/M... Material... How manufactured... Pressure tests... Brine system pressure test on completion... Pressure tests after erection 27... Brine system pressure test on completion 5

Do all pipes, including scupper pipes, air pipes and sounding pipes which pass through refrigerated chambers comply with, and are they erected and insulated in accordance with the Rules? **YES**

Are air cooler trays provided in accordance with the Rules? **YES** Are the drainage arrangements of the refrigerated chambers, cooler trays and air spaces behind insulation in accordance with the Rules? **YES** Are liquid sealed traps provided as required by the Rules? **YES** Has the spare gear (see Report 17(a)) been placed on board? **YES**

Is a separate plant fitted for ships stores and/or air conditioning purposes? **YES** Where the installation is on a ship not classed or intended to be classed with the Society, have the generator engines and electrical equipment which supply power to the refrigerating plant been examined generally and under working conditions and found sufficient and satisfactory? **YES**

Steam or oil engines driving refrigerant compressors. Report 4c, Port **NO**

Where the machinery is driven by steam engines, is the exhaust steam connected to the main and auxiliary condensers? **NO**

Motors over 100 BHP driving refrigerant compressors. Port **NO** Certificate Nos. **4-L DATED 10/10/61 & 7/8/61 1363271-2-3-4-5-1366**

Air cooler fan driving motors. Port **COPENHAGEN** Are certificates attached? **NO FORWARDED UNDER SEP COVER**

Motors under 100 BHP driving refrigerant compressors. Have makers' certificates been obtained? **YES** Type **HELVIG MIKKLESON** Where tube thermometers are fitted, are the tubes in accordance with the Rule requirements? **NO** No. and position of thermometers in the cargo space and air ducts of each chamber. **U.T.D. PORT & STRD. ONE PORT & AFT. IN EACH CHAMBER, ONE BEFORE & 2 AFTER EACH AIR COOLER L.T.D. 4 IN WAY OF PILLARS, 2 BEFORE & 2 AFTER AIR COOLERS HOLD: 4 IN WAY OF PILLARS, 2 BEFORE & 2 AFTER AIR COOLERS TOTAL 24**

TESTS AFTER-COMPLETION: Have the thermometers provided for measuring chamber, air suction and air delivery temperatures been checked for accuracy and found in order? **YES**

Have the air cooler fans been tested? **YES** (the statements showing the results of these tests to be attached to the report). Have the air distribution arrangements in each chamber been checked and found satisfactory? **YES** Has all the plant been tested under working conditions? **YES** Where a plant is operated by thermostatic refrigerant control, are the arrangements for manual control in accordance with the Rules? **NO** Have the manual controls been tested? **NO** Were all the plant electrical instruments, gauges and thermometers checked for accuracy before the commencement of the refrigeration test? **YES** Have the air cooler defrosting arrangements been tested? **YES**

REFRIGERATION TEST. When did cooling down chamber(s) commence? Date **14.12.62** Time **20.00** When was the desired temperature of **-20** °C attained in the chambers? Date **15.12.62** Time **04.00** When was the balance test commenced? Date **17.12.62** Time **07.00** When was the Balance Test completed? Date **17.12.62** Time **13.00**

Log sheets of the chamber and external temperatures, machinery operating conditions including fan and brine pump motor particulars, also a copy of the sheet showing the calculations of the estimate of the theoretical heat leakage on the average temperatures during the balance test period, to be attached to the report.

TOTAL THEORETICAL HEAT LEAKAGE DURING THE BALANCE TEST PERIOD

MEASURED HEAT LEAKAGE

Through surfaces, etc., of cargo chambers, brine rooms, cooler houses, etc. **16624.6** kg. cal./hr

Through refrigerant leads **677** kg. cal./hr

Total **16901.6** kg. cal./hr

Compressor Operating Conditions:

State which compressor(s) used **PORT No. 2 COMPRESSOR**

Average evaporator gauge **-19°C - 23°C**

Average condensing temperature **18 19°C**

Compressor R.P.M. **990**

Machine output from curves **58,400** kg. cal./hr

Fan, brine pump etc., heat load.

Average total fan heat load **30500** kg. cal./hr

Average total brine pump heat load **11820 5,300** kg. cal./hr

Any other heat load such as heaters in chamber **—** kg. cal./hr

Total of above loads **42320** kg. cal./hr

Total measured heat leakage load **31880 22,500** kg. cal./hr

Ratio $\frac{\text{measured heat leakage}}{\text{theoretical heat leakage}} = \frac{31880}{16901.6} = 1.88$

$\frac{22,500}{16,900} = 1.33$

Maximum ratio permissible for temperature qualification desired by Owners (state head office figure) **2**

If the arrangements and details are not precisely in accordance with the approved specifications and plans, have full details of deviations been forwarded with this Report? **NO**

Is the refrigerated cargo installation a duplicate of a previous case? **YES** If so, state name of vessel or Yard and Yard No.

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done

COMPLETE

GENERAL REMARKS. (State whether installation has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship, opinions as to class, etc.)

THE REFRIGERATED CARGO INSTALLATION OF THIS SHIP HAS BEEN CONSTRUCTED & INSTALLED UNDER SPECIAL SURVEY IN ACCORDANCE WITH THE SECRETARY'S LETTERS, APPROVED PLANS AND RULE REQUIREMENTS. MATERIALS AND WORKMANSHIP ARE GOOD. ON COMPLETION A BALANCE TEST WAS CARRIED OUT WITH SATISFACTORY RESULTS. THE REFRIGERATED CARGO INSTALLATION IS ELIGIBLE IN MY OPINION TO BE CLASSED WITH THE NOTATION + LLOYD'S RMC 12,62 TO MAINTAIN TEMPERATURE 10°F WITH SEA TEMPERATURE 86°F MAXIMUM.

PARTICULARS FOR REGISTER BOOK

MACHINERY

No. of units **4** Prime movers **ELECTRICAL MOTORS**

Total BHP of all Compressor prime movers **220**

Refrigerant **AMMONIA**

Makers **T. SABROE & Co.** Date of Construction **1962-9**

Machinery particulars **3 SMC 6-100 NH COMPRESSORS FOUR SHELL & TUBE CONDENSERS TWO SHELL & TUBE EVAPORATORS EACH IN TWO SECTIONS**

CARGO CHAMBERS

Total capacity in cubic feet **95460** Total No. **4**

No. Independent **4** No. independently refrigerated **4**

Method of Cooling **BRINE & AIR**

Insulating material(s) **SLAB CORK & MINERAL ROCK WOOL (SILLAN)**

Insulation lining **GALVANISED SHEET STEEL**

Survey Fee **£ 116-16-10:2** Fee applied for, **19**

Travelling Expenses **Nil. 245.368.-** Received by me, **19**

Date of Committee **FRIDAY 24 MAY 1963**

Class assigned **FRIDAY 24 MAY 1963**

+ LLOYD'S RMC 12.62 to maintain temp of F with sea temp 86°F max.

5m,2,58. T.

CERTIFICATE WRITTEN:



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F. B. Gray
Surveyor to Lloyd's Register

4 JUN 1963

Write for...