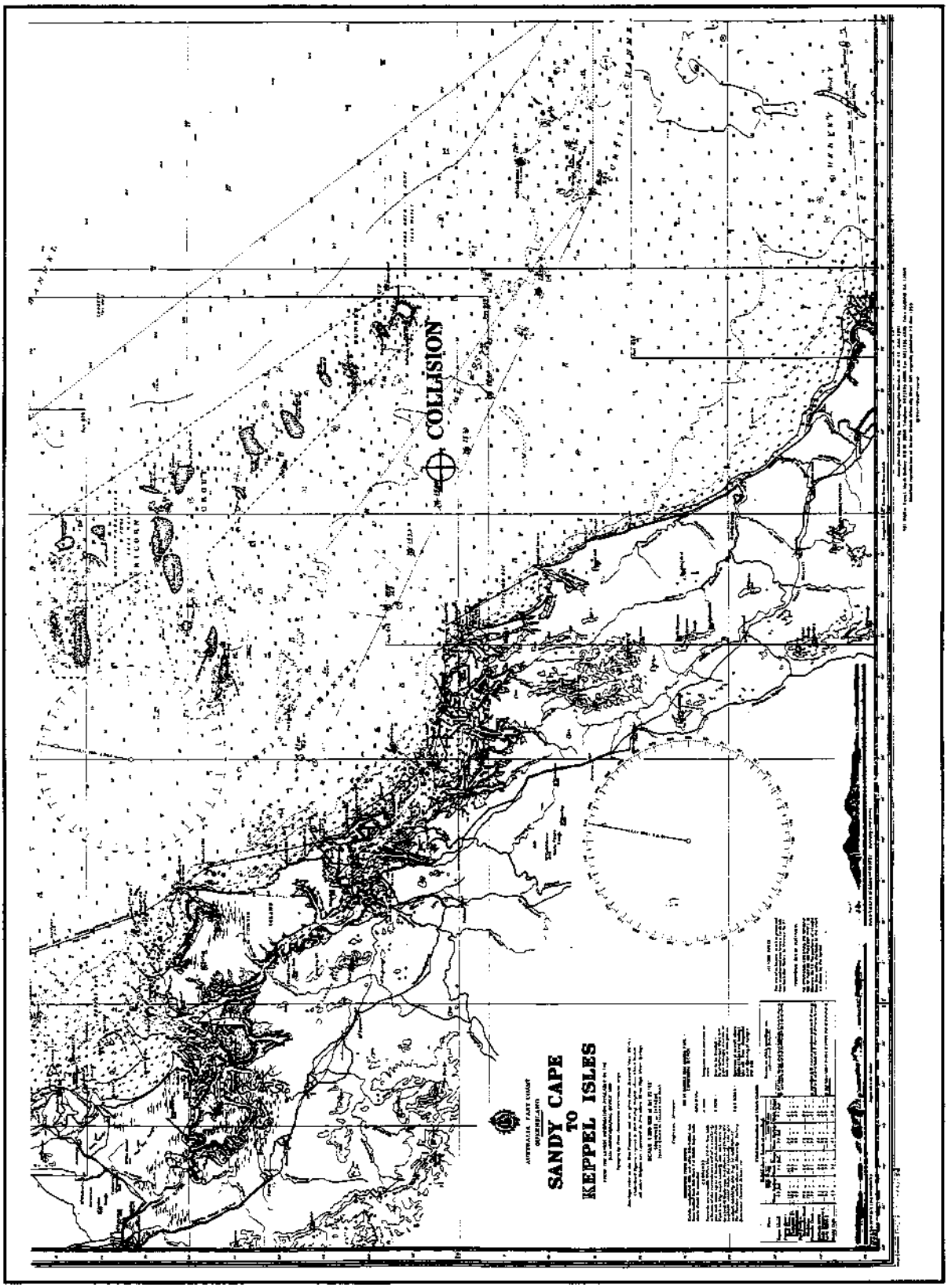
Contents



Part of chart Aus 336 Showing Position of Collision

Summary

At about 1830 local time on 1 September 1992, the Australian yacht Champers, while on a voyage from Gladstone to Tweed Heads, was involved in a collision with a ship in a position 18.5 miles east of Bustard Head.

The ship involved in the collision failed to stop and render assistance, and Champers, which was dismasted in the collision, was eventually assisted by the fishing vessel Star Track. After the mast and rigging had been cut free, the yacht was able to return to Gladstone under engine power.

As a result of the collision paint and rust from the unidentified ship fell on to the Champers deck.

An exhaustive check of shipping in the area found that only one ship was known to be in the area of the collision at the time, the Russian flag tanker Antares.

Although the tankers reported position at the time of the collision was at least two miles from the charted position of the yacht, samples taken from the paint and rust that had fallen to the Champers deck and samples subsequently taken from the hull of the tanker established that it was very likely that the samples had a common origin. It was therefore considered probable that the Antares was the ship involved.

Sources of Information

Information was provided by:

The Skipper and crew-member of the Champers

The Master and Chief Mate of the Antares

The Master of the Star Track

Agnes Water Fishing Club Base

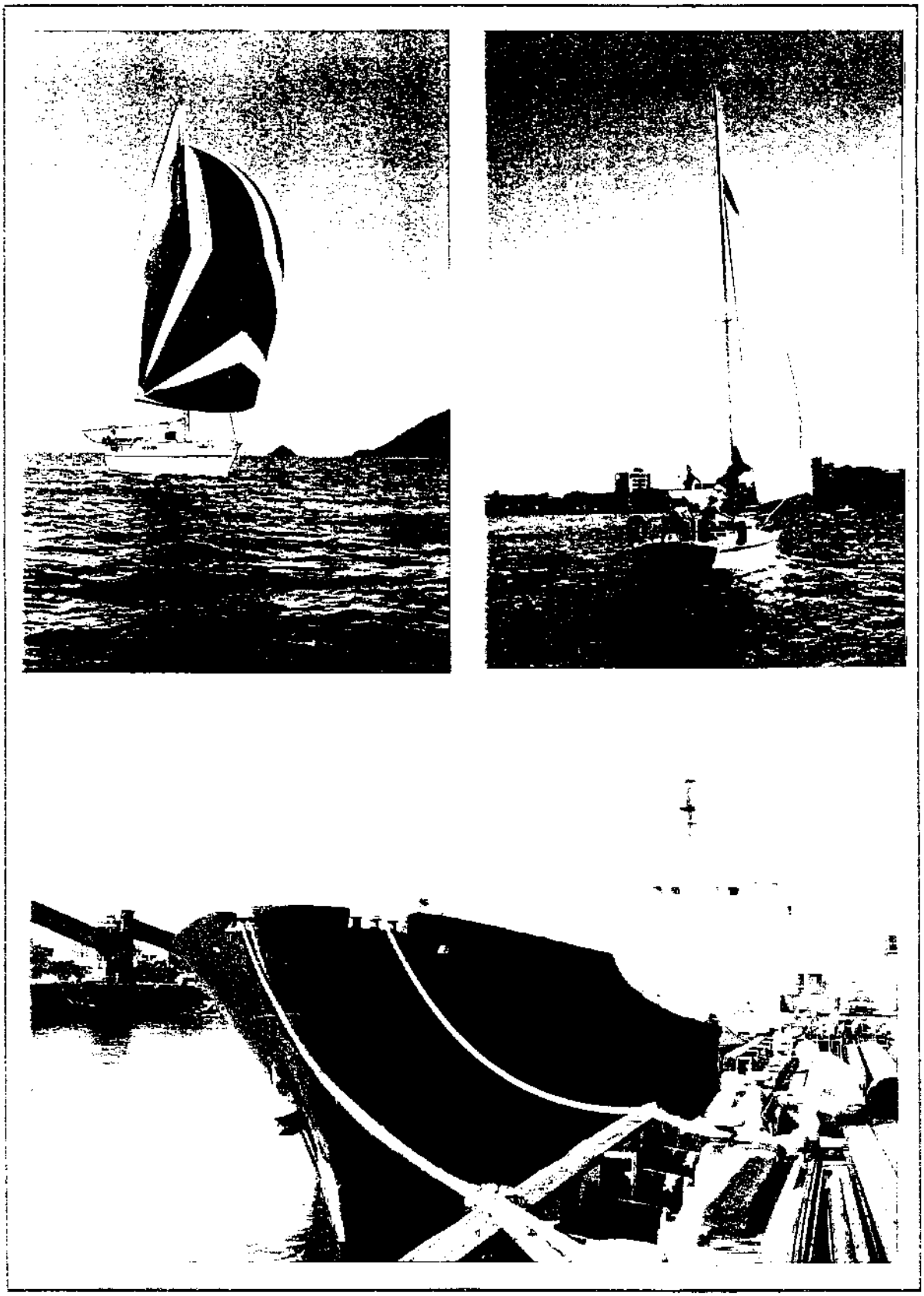
Round Hill Air Sea Rescue

Gladstone Air Sea Rescue

Bundaberg Police Station

The Australian Maritime Safety Authority, Melbourne

The Inspector wishes to acknowledge the assistance of the Australian Federal Police Forensic Laboratories in Canberra.



Photographs: yacht "Champers" and MV "Antares"

Sequence of Events - Champers

The Champers, a "Northshore 38" design yacht , sailed from Airlie Beach, Queensland, on Monday, 24 August 1992, bound for Tweed Heads, on the NSW/Queensland border. There were two people on board - the owner/skipper and a crew-member.

On Monday 31 August the yacht put in to Gladstone and, after an overnight stay in the marina, put to sea again at 0530 on Tuesday 1 September.

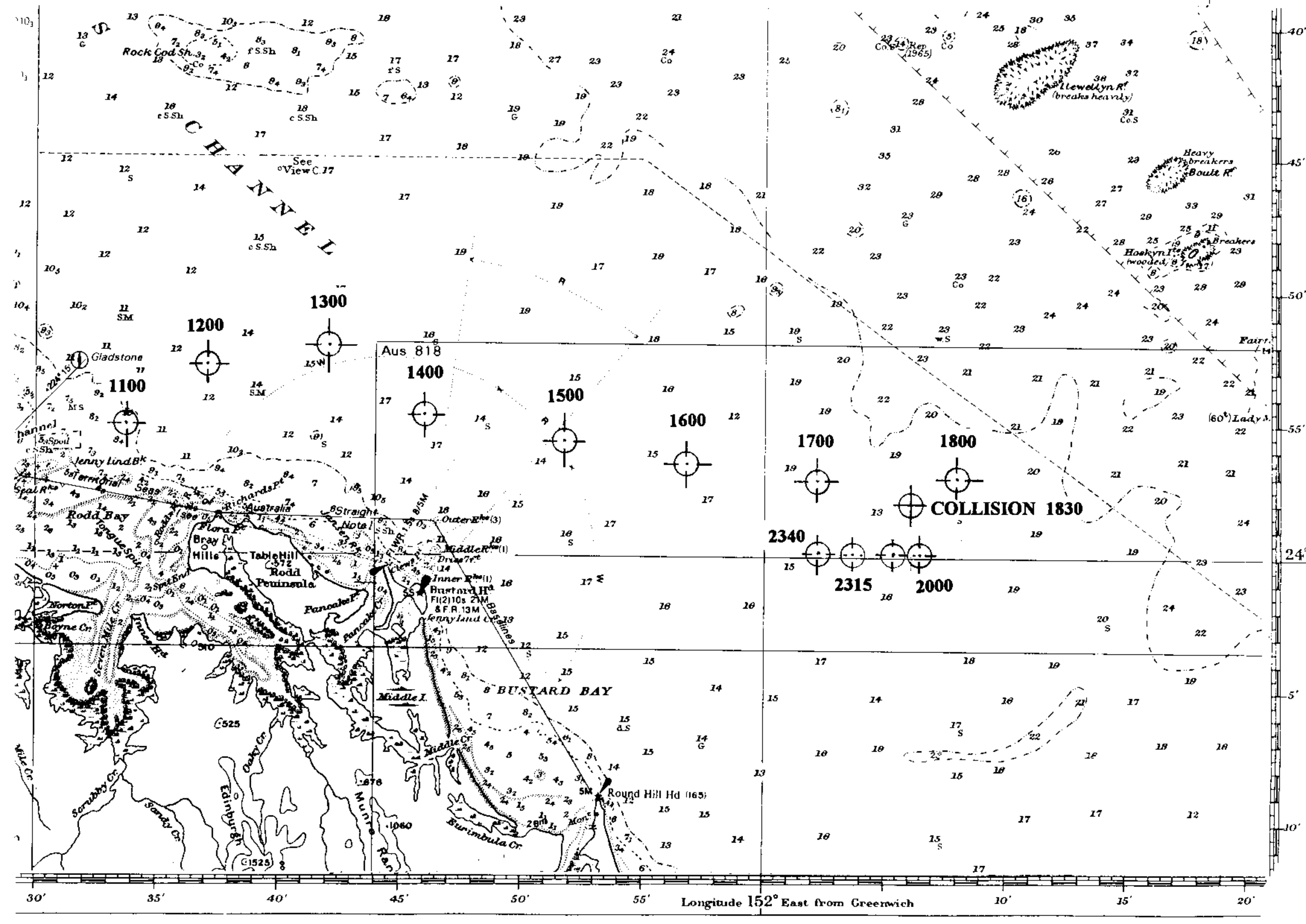
The fairway buoy was cleared at about 1000 and with the wind from the South-East at about 15 knots, Champers proceeded on a starboard tack, with main and No 2 genoa sails set. Both sails were white. In order to make southing, the skipper sailed as close hauled to the wind as possible, which was about 30 degrees. On the starboard tack, with the sails trimmed out to port, and with the yacht heeled over about 30 degrees, the view from the cockpit was masked by the sails from a point very fine on the port bow to about one point forward of the port beam.

As the yacht was close hauled and as the wind direction was varying somewhat, the steering required regular, if not constant, attention. The cockpit, therefore, was never left unattended for periods of more than 10 minutes.

Positions, obtained from the Global Positioning System (GPS), were plotted hourly, and occasionally cross-bearing fixes were obtained to verify the GPS positions. For a time, between 1300 and 1400, course was changed on to the port tack. From 1400 course was maintained on the starboard tack, on a heading of 110 degrees magnetic (121 degrees true); the course made good being about 100 degrees true and the speed approximately 5 knots.

During the morning the weather was fine, but after midday it deteriorated, with patches of drizzle reducing visibility. The wind varied slightly in direction, between South-East and South-South-East, and occasionally veered to the South. The seas were about 1 to 1.5m.

Towards late afternoon, daylight faded rapidly and although sunset was not until 1741, the navigation lights - sidelights, located forward on the pulpit lower rail, and stern light - were exhibited at about 1730.



CHANNEL
Rock Cod Sh.
Llewellyn Rf (breaks heavily)
Heavy breakers Boult Rf
Hoskyn I. (wooded)
Breakers
Aus 818
1100
1200
1300
1400
1500
1600
1700
1800
COLLISION 1830
2000
2315
2340
Gladstone
Jenny Lind Bk
Rodd Bay
Tongue Spit
Richards Pt
Australia
Flora Pt
Bray Hills
Table Hill
Rodd Peninsula
Straight
Outer Rk
Middle Rk
Inner Rk
Bustard Hd
Fl(2)10s 21M
& F.R.13M
Baselines
BUSTARD BAY
Middle I.
Round Hill Hd (165)
Eurimbula Cr.
Seven Mile Cr.
Inner Hd
Pancake Pt
Norton Pt
Boyne Cr.
Edinburgh
Munro Ra
Oaky Cr.
Scrubby Cr.
Sandy Cr.
Mile Cr.
See View C.17
Longitude 152° East from Greenwich
30′
35′
40′
45′
50′
55′
10′
15′
20′
24°

Shortly before 1800, the skipper decided that too much sail was being carried and they reefed in the mainsail to the third reef point. With no reefing, the head of the genoa was considered to be about 4 to 5m from the masthead, and with three reefs the head of the main about 5 to 6m from the masthead.

At 1800 the position (by GPS) was plotted on the chart, after which tactics for the night's sailing were discussed. It was decided to remain on the present course for a further two hours before changing to a port tack, to head down for Hervey Bay, inshore of Fraser Island. The crew member then went to bed, the skipper keeping the watch.

A number of other vessels were noted to be around at this time; three fishing vessels broad on the starboard bow and two fishing vessels abaft the port beam. Two "pleasure craft" had crossed astern earlier, heading in for the coast. Another light, glimpsed almost right ahead, was also thought to be that of a fishing vessel.

Sometime before 1830, the skipper left the cockpit and went into the main cabin to look at the chart and to check his calculations. After about 10 minutes, and at a time the skipper placed as 1830, the yacht ran into something. Climbing immediately back into the cockpit the skipper was confronted with a ship's bow towering above him.

The Champers had bounced back off the ship, to a distance he estimated as being about 7m, but was still inside the ship's beam and he realised that the yacht would be struck again.

The yacht had been spun around, so that it was headed in the same direction as the ship, and the skipper tried, unsuccessfully, to manoeuvre away from the ship's side. The port side of the yacht then scraped down the starboard side of the ship as it passed by, a quantity of scale and paint from the side of the ship falling on to the yacht's deck. Standing in the cockpit, the skipper looked up to see if he could see anyone at the ship's siderail, which was well above his head, but could not see anyone.

The skipper noted that the hull of the ship, which he thought was a small "bulk" type ship, was painted black above the load water line and a red/rusty colour below the load water line. As the Champers cleared the stern of the ship, the skipper could see the top of the ship's rudder clear of the water, but did not see the tips of the propeller blades.

The force of the initial impact had caused the forestay mounting to carry away, which caused the mast to collapse over the side. Once clear of the stern of the ship, the skipper tried to contact it on VHF channel 16 and also on 2182 kHz, but received no response, the ship continuing in a North-Westerly direction.

The crew-member, aroused by the collision, then tried to call first Gladstone and then Round Hill Air Sea Rescue (ASR) Stations on VHF 16, calling each station a number of times.

Receiving no response, the crew-member then made a "PAN PAN PAN" call on VHF 16, the yacht's position being given as 24° 00'S 152° 06'E. This call was answered by the Agnes Water Fishing Club Base and was also heard by the fishing vessel Star Track.

While the crew-member was making the calls, the skipper carried out an inspection for damage. In addition to the dismasting, it was found that the bow had been damaged, although not to the extent to immediately endanger the yacht. As the mast was too heavy to be pulled aboard, the skipper started the engine and attempted to motor towards Pancake Creek, immediately to the West of Bustard Head, but aborted this through fear of fouling the propeller with the wires and ropes trailing over the side.

Agnes Water Fishing Club Base relayed information of the incident to the Bundaberg Police and to Round Hill Air Sea Rescue, the latter taking over responsibility for coordinating response.

At 1948, when it had been ascertained that Champers was unable to secure the mast alongside and, therefore, required assistance, Star Track was requested to go to its aid.

After recovering its fishing gear, Star Track headed for the position provided by Round Hill ASR (23° 58'S 152° 06'E) and arrived at Champers at about 2130.

Champers was taken in tow, after which a line was made fast to the mast. The skipper of Champers then cut the rigging, releasing the mast, allowing it to be hauled, along with the main boom and sails, on board the Star Track.

At 2320 the skipper of Champers started the engine and headed back to Gladstone, where eventually the yacht underwent repairs. Samples of the scale from the unidentified ship were retained by the skipper and were subsequently provided to the Inspector.

Voyage of the Antares

The 106m, 5031 tons deadweight Russian tanker Antares arrived at the Brisbane Pilot at 0100 on 31 August and was all fast on the berth at 0730. A part cargo of tallow was loaded throughout the day and was completed at about 2000, after which the Master advised the Chief Mate that he would not be required for stations on departure and could, therefore, go to bed. The ship sailed for Port Alma at 2335, at a draught of 5.8m forward and 6m aft.

Antares is operated on a three bridge-watch system, the three deck officers working four hours on, eight hours off. One seaman is also allocated to each watch, to act as lookout and to steer the ship as necessary, steering normally being conducted in the automatic mode.

During the morning of 1 September, No 3 cargo tanks were deballasted, in preparation for loading at Port Alma, adjusting the draught for arrival Port Alma to 4.8m forward and 6.2m aft. At this draught the rudder and propeller would be submerged 1.7m.

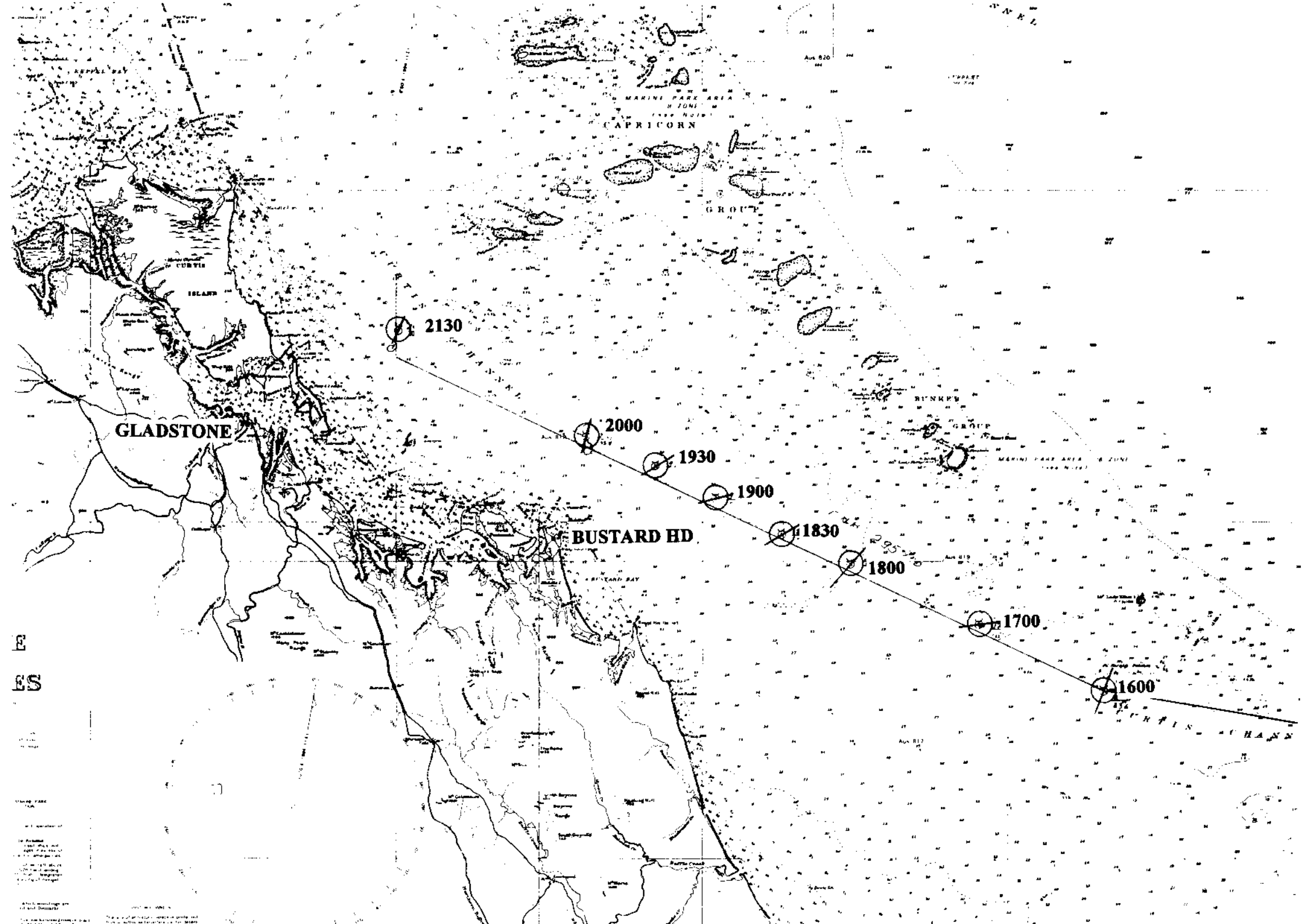
The deballasting operation was carried out by the pumpman, the Chief Mate going to bed after breakfast until noon. After lunch, the Chief Mate busied himself in paperwork, concerning loading at Port Alma. At 1555, in a position south of Herald Patches at the southern end of the Curtis Channel, the Antares was brought on to a heading of 295 degrees true and gyro, a course that would take the ship to a position North-East of Gladstone. From plotted positions the ship was making good a speed of 12.8 knots.

At 1600, entries were recorded in the log book as wind 170 degrees at 8m/sec (17 knots), sky overcast, visibility good. The Chief Mate took over the navigational watch.

The Chief Mate maintained his watch in the wheelhouse, using the port radar on the 16 and 8 mile ranges, for early warning of shipping and for navigational purposes, plotting the ship's position every 30 minutes. The port side VHF set was switched on and tuned to channel 16. The lookout moved from bridgewing to bridgewing, reporting ships as he saw them.

As the watch progressed visibility closed in, the low cloud threatening rain. At about 1740 the Chief Mate switched on the navigation lights.

At 1800, the Chief Mate plotted the ship's position on the chart - Lady Musgrave Island bearing 042 degrees at 12.1 miles. A number of fishing vessels were in the area, both to port and starboard, observed both visually and on the radar.


GLADSTONE
BUSTARD HD
2130
2000
1930
1900
1830
1800
1700
1600

On the port side, one fishing vessel was about 15 degrees on the bow at 4 to 5 miles distance, another at about 45 to 50 degrees on the bow. Those on the starboard side were well to the east. Evening meal time on board was from 1800 to 1830 and at 1800 the Master took over the watch from the Chief Mate and a seaman relieved the lookout. The wind at this time was recalled as being 150 degrees 15 knots.

The Chief Mate returned to the bridge at 1810 and the lookout at 1815. Apart from the fishing vessels that he had observed at 1800, there were no other ships visible, or indicated on the radar.

At 1830 the Chief Mate plotted the ship's position on the chart - Round Hill Head bearing 239 degrees at 15.5 miles (24° 01.1'S 152° 08'E). At this time the fishing vessel that had been at 15 degrees on the port bow was now bearing about seven points on the port bow, all the other fishing vessels were now abaft the beam. There were no other lights visible and no other ship targets, other than the fishing vessels, on the radar. The night had become very dark, with the visibility at about four miles.

At a time he recalled as being about 1845, the Chief Mate heard what might have been a weak urgency call, with the single word PAN, on VHF channel 16, the voice being that of a woman or a child. This call was followed only by static noise, and although the Chief Mate tried adjusting the tuning of the VHF, he received no further message, either then or later during his watch.

No lights other than those of the fishing vessels, were reported to the Chief Mate by the lookout, nor did the lookout report anything that might have indicated that Antares might have hit something, or passed very close to a small boat.

At 2000, when the ship was in position 015 degrees 9.1 miles from Bustard Head, the Third Mate took over the watch from the Chief Mate.

At approximately 2100, the ship passed to seaward of the Gladstone fairway buoy, at about 8.5 miles distance.

Antares anchored at the Port Alma pilot boarding ground at 0040 on 2 September, the pilot boarding at daylight. At Port Alma the ship loaded a further part cargo of tallow, sailing at a draught of 6.25m forward and 6.86m aft. During the stay at Port Alma the Master was advised by the ship's agent of the yacht Champers collision. Both he and the Chief Mate examined the ship's side plating, but could see no obvious signs of contact that might indicate that the Antares might have been involved in the collision. He suggested to the Agent that the relevant departmental inspector should also examine the hull, but the Government Surveyor, who resided in Gladstone, was not contacted.

Analysis

The Champers was involved in a collision with an unidentified vessel, described as being of small tanker or bulk carrier type.

Exhaustive checks of known shipping movements (ships arriving and sailing from ports, Naval shipping, Queensland Coast and Torres Strait Pilot) failed to establish the presence of any vessel other than the Antares, that may have been in the area at the time.

Initially, it is necessary to consider both the time and position of the collision, and how the Antares and the Champers may have been at, or near the position of collision at the appropriate time.

Time

From the statements and information provided, there are two possible times at which the collision might have occurred - about 1800 and about 1830.

According to the skipper, he had gone into the cabin to obtain an 1830 check on the yacht's position, but had not had time to do so before the collision occurred. He, therefore, placed the time of collision at about 1830.

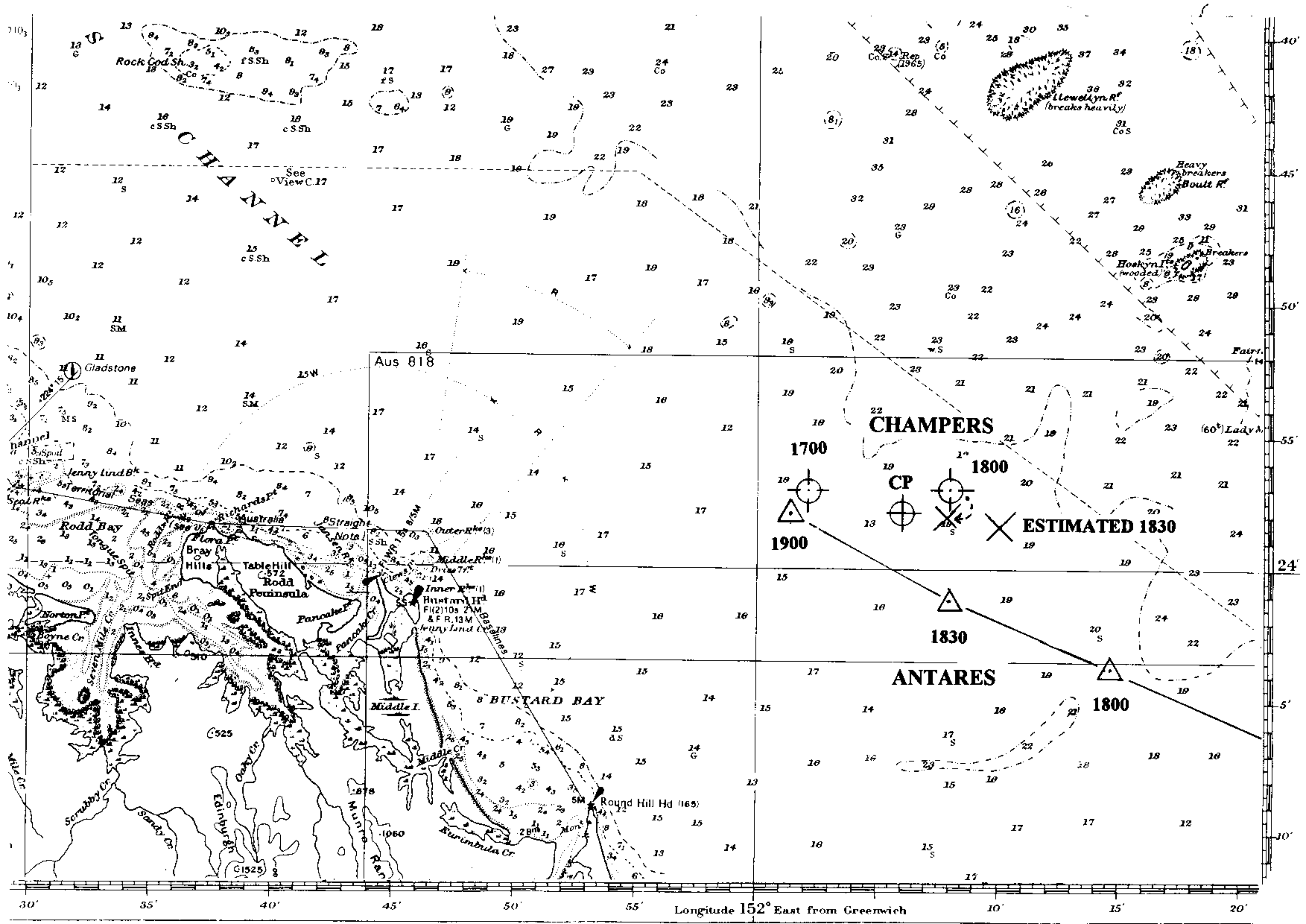
The Chief Mate of the Antares initially placed the time at which he heard a weak, single word PAN on VHF 16 at about 1815. Later, however, after some consideration, he amended the time to 1845. This later time is consistent with the time of collision as considered by the skipper, allowing time for damage appraisal and the calls to Gladstone and Round Hill.

The PAN PAN PAN Urgency broadcast was logged at the Agnes Waters Fishing Club Base at 1830, the time reportedly being referenced by the Channel 7 TV weather bulletin. The first call to Gladstone (ASR) was reportedly noted at Agnes Water Fishing Club Base as being at 1805, which would indicate the time of collision as being close to 1800.

However, information on times of VHF radio transmissions provided by Round Hill ASR, Gladstone ASR, Bundaberg Police, and the fishing vessel Star Track, all tends to support the PAN PAN PAN message being broadcast after 1830. It is considered that the collision most probably occurred at about 1830.

Position

Chart Aus 366 is based on the Australian Geodetic Datum as against the World Geodetic Datum. However, the difference between the two in that area, is only about 0.1 nautical miles, with the main shift in latitude, not longitude. Therefore there should be very little discrepancy between positions obtained by GPS and by land-based datum.


CHANNEL
Rock God Sh.
See View C.17
Gladstone
Aus 818
Jenny Lind Bk
Rodd Bay
Richards Pt
Australia
Flora Pt
Bray Hills
Table Hill 572
Rodd Peninsula
Pancake Pt
Pancake Cr.
Outer Rks
Middle Rk
Inner Rk
Bustard Hd
Fl(2)10s 21M & F.R.13M
Middle I.
BUSTARD BAY
Round Hill Hd (165)
Seven Mile Cr.
Norton Pt
Boyne Cr.
Scrubby Cr.
Sandy Cr.
Oaky Cr.
Edinburgh
Munro Ran.
Middle Cr.
Eurimbula Cr.
Llewellyn Rf (breaks heavily)
Boult Rf
Heavy breakers
Hoskyn Is (wooded)
Breakers
Fairf.
Lady M.
CHAMPERS
1700
1800
CP
ESTIMATED 1830
1900
1830
ANTARES
1800
24°
Longitude 152° East from Greenwich

Champers' positions were obtained by GPS and were considered by the skipper to be accurate. The accuracy of GPS is plus or minus 100m.

Study of the chart in use by Champers shows a reasonably steady course of 100 degrees from 1400 to 1700. Projecting this course line from 1700 indicates that Champers' position at 1800 should have been 23° 58' South 152° 08' East, as against the 23° 57' South 152° 08' East as plotted on the chart. Allowing a reduction in speed at 1800 to 4 knots, due to the shortening of the main sail, the estimated position for 1830 is 23° 58.3' South 152° 10' East.

However, the position given in the Urgency broadcast was 24° South 152° 06' East, although once communications were established with Round Hill ASR Squadroom the latitude was amended to 23° 58' South. To have reached this position from the 1800 position, Champers would have had to virtually reverse course shortly after 1800.

Positions plotted from the yacht's GPS at 2000, 2100, 2315 and 2340 are all very close to the 24° South parallel of latitude, two miles south of the position given for the collision and indicating a westerly set while lying stopped. After contact was made with the shore at about 1830, the skipper of Champers attempted, for a short period only, to motor towards Pancake Creek, 20 miles to the West. This attempt at motoring would account only for a small westerly move away from the collision point, not the shift to the more southerly latitudes of the positions after the collision.

The discrepancy between the two positions would be explained, if the Champers had altered course and run for about 30 minutes on the port tack on a southerly course to a position 24° South 152° 07' East, close to that given in the original PAN message. But, the Champers' skipper stated that he maintained his course on the starboard tack.

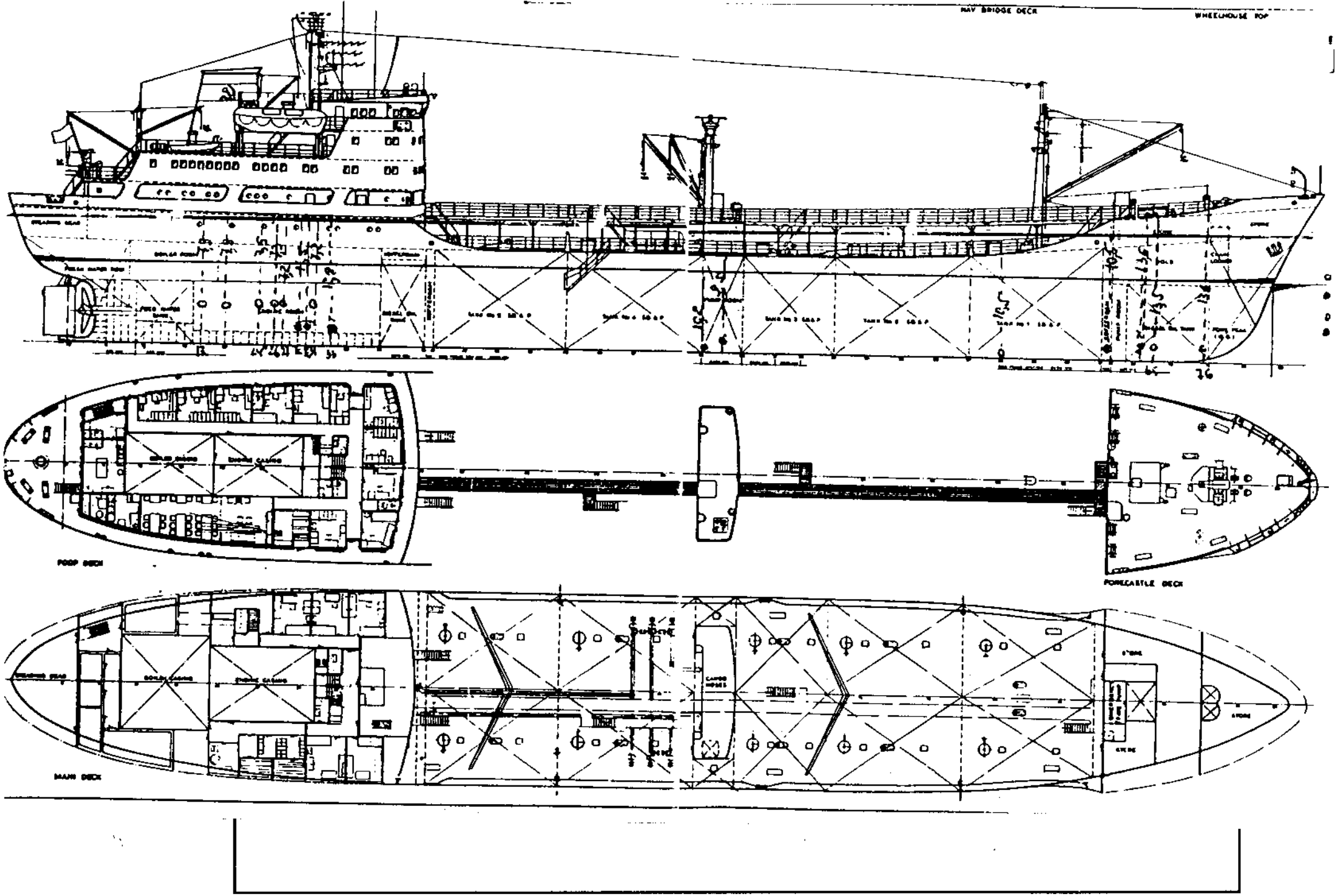
The Inspector can see no reason why the skipper should conceal a change of tack, as he would have nothing to gain by doing so.

Accepting Champers did not alter onto the port tack at the time the mainsail was reefed, it is considered that for some undetermined reason, the GPS aboard Champers was not providing accurate positions and that, at best, the position can be stated as being about 20 miles east of Bustard Head.

Antares

The Chief Mate of Antares was fixing the ship's position utilising single radar bearing and distance of prominent points. The prominent points used are radar conspicuous and at 15 miles distance an accuracy of 450 to 500m can be expected.

At 1800, Antares was making good a speed of 12.8 knots and was in position by radar 222 degrees


NAV BRIDGE DECK
WHEELHOUSE TOP
POOP DECK
FORECASTLE DECK
MAIN DECK

12.1 miles from Lady Musgrave Island, or, 24° 03.7' South 152° 14.7' East. The adjusted position of Champers at that time was 23° 58' South 152° 08' East. At 1800 Champers and Antares were 8.5 miles apart.

At 1830 the Chief Mate of Antares plotted the ship's position, by radar, as Round Hill bearing 239 degrees at 15.5 miles, or 24° 01' South 152° 08' East. In the position estimated for 1830, Champers would have been bearing 035 degrees, 12 degrees abaft Antares' starboard beam, at a distance of 3.5 miles.

From the plotted positions of the two vessels it would seem that Antares was not the ship involved. This is supported by the skipper's definite impression that the ship was of a larger size than Antares (see Attachments 3 and 4), leading to the supposition that there was another, unidentified, ship in the area. However, no other ships were known to have been in the area, or known to have reason to be in the area at the time of the collision. No ships had sailed from either Gladstone or Bundaberg; no ships were lying at anchor off either of those two ports; and no ships were due at either of those two ports for a number of days.

Ships travelling North or South between other ports, or from southern ports to the inner route of the Great Barrier Reef, keep to seaward of the Bunker and Capricorn groups of reefs. To deviate inside these reefs would increase the distance to be travelled and the weather and forecast weather for the area was such as to make a deviation illogical. Fishing vessels operating in the area reported seeing only one commercial ship - Antares.

Also the evidence of the Antares' Officers was that, from their observations of their radar screen, no other large ships were in the area at that time, only a number of fishing vessels. It is, therefore, considered reasonable to discount the presence of another ship.

Subsequent to the collision, Antares was inspected at Townsville (4 September), Sydney (13 November) and Melbourne (28 November). At Townsville and Sydney, Antares was deep laden and lying port side alongside, therefore, the starboard side could not be inspected for signs of collision contact. However, in Sydney, samples of paint and scale were taken from the ship's port and starboard sides, abreast of No 1 cargo tanks.

The inspection in Melbourne took place three months after the incident and, given the intervening period, the visual inspection was inconclusive.

The samples of scale and paint taken from the ship's side and the sample of scale obtained from the skipper of Champers were examined by the Australian Federal Police Forensic Department. Both samples were found to contain a thin layer of a black bitumastic substance, which matched under spectrum test

(Attachment 1). The report from the laboratory (Attachment 2) opined that "the scientific evidence indicates that the scale found on Champers could have come from the ship Antares".

The scale found on Champers was found to contain black paint, a topside paint as against boot-topping. Had the ship with which Champers collided been riding high in the water, it is more probable that red boot-topping paint would have been scraped off.

Whether or not Antares was the ship involved in the collision is not absolutely certain.

There are significant discrepancies in the times of radio messages and the plotted positions on the navigation charts distance Antares from the incident. However, with the scale sample test results and the absence of other shipping in the area, it is considered that, on the balance of probabilities, Antares was the ship with which Champers collided.
It should be noted
(Submission pg. 24) that the Master, Chief Mate and lookout deny that any collision took place.

Reconstruction

Based on the probability that Antares was the ship involved, and the acceptance that Champers did not alter on to the port tack at 1800, then it is considered that Champers was further south than the GPS indicated, and that the two vessels must have been proceeding on very close to reciprocal tracks.

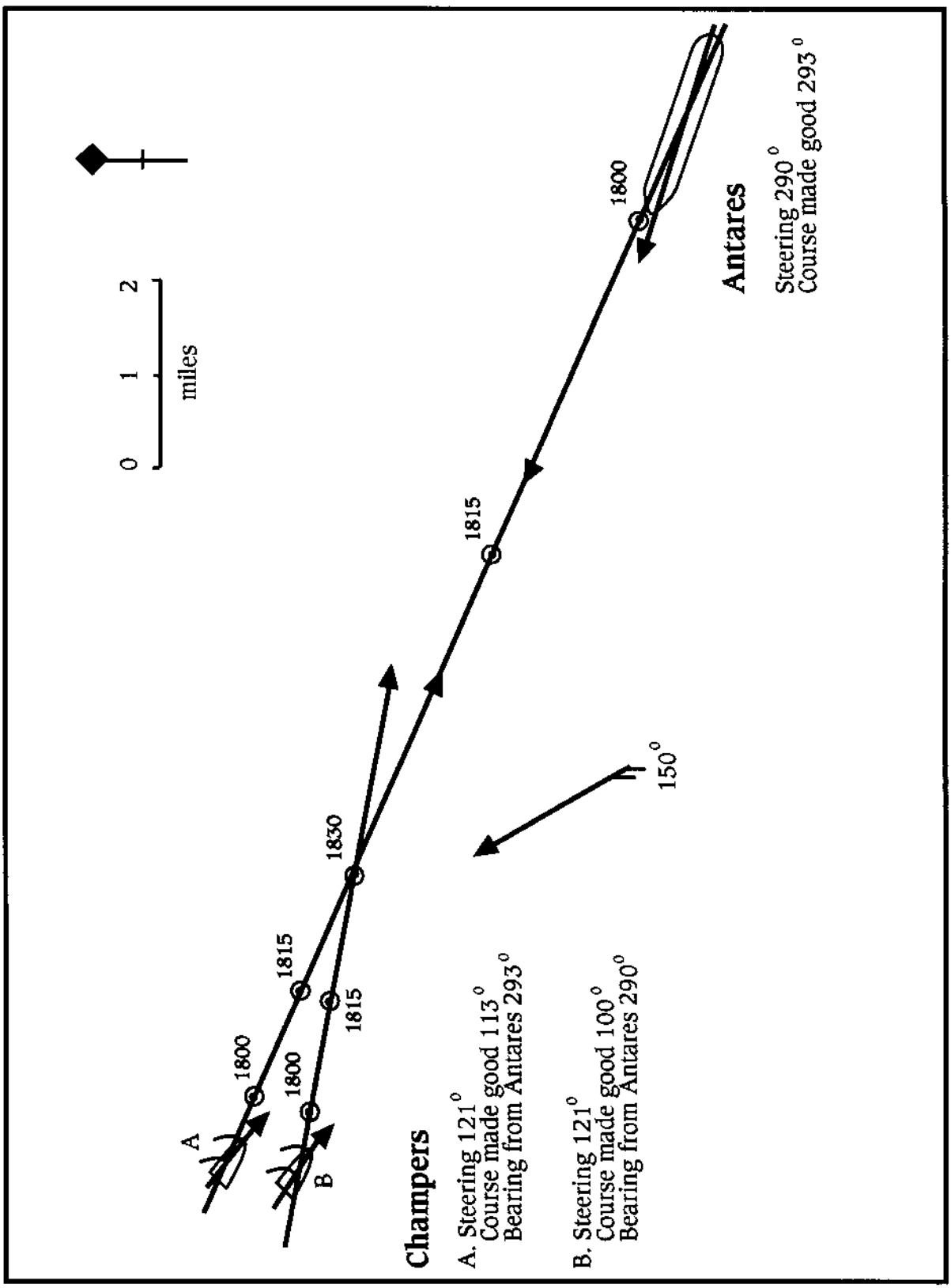
Antares

The movements of Antares, before and up to the time of the collision, can be reconstructed from the navigation chart and from the course recorder chart (Attachment 5) and are consistent with the evidence given by the Master and Chief Mate. A swing to port, to about 265 degrees at 1838, was attributed by both the Master and the Chief Mate to a recurring, intermittent fault in the autopilot. There was evidence of a similar occurrence at 1345.

The course line drawn on the chart was 295 degrees. From the course recorder chart, at 1805 the course being steered was adjusted from 292 to 290 degrees (to bring the ship back to the charted course line). From the chart, between 1805 and 1830, Antares made good a course of 293 - in other words, the ship was experiencing a three-degree set.

Champers

Champers was steering 110 degrees Magnetic, 121 degrees True, which is consistent with being close hauled on the starboard tack, 30 degrees off the wind, which was from 150 degrees. During the afternoon the course made good had been 100 degrees.



Reconstruction of collision

The reciprocal course to that made good by Antares is 113 degrees, (A in diagram on previous page) while if Champers approached Antares from right ahead, on a steady bearing of 290 degrees, the course required to be made good by Champers would have been 100 degrees (B in diagram on previous page). Had Champers approached on Antares' port bow, it would not have passed down the starboard side of Antares after a bow contact.

If on the other hand, Champers had changed to the port tack at 1800, it would have made good a course of about 200 degrees true. In this case, its track would have been crossing that of Antares at almost 90 degrees and it would have been on a steady bearing of about 2 points on Antares' starboard bow. Also, the sails would have been on the starboard side and therefore Antares' lights should have been clearly visible to the skipper, at about 50 degrees on the port bow.

However, the Inspector can see no reason why the skipper should conceal a change of tack and it is considered that between 1805 and 1830, Champers was making good a course of between 100 and 113 degrees, that it had Antares about 10 degrees on the port bow, and was from between right ahead to three degrees on the starboard bow of Antares.

It seems that, if for no other reason, given the weather conditions, the position of Champers' lights and the absence of a radar reflector, Champers was not seen by those on the bridge of Antares. With Champers on the starboard tack, Antares was obscured from view from Champers cockpit.

Consideration of actions

Champers

The skipper considered that he was away from the cockpit for about 10 minutes. In good, clear conditions with no close shipping this may not be an unduly long period, but in reduced visibility it is not a safe practice.

The skipper was aware that there was a considerable blind sector on the port bow, but he failed to look to ensure that there were no vessels within that blind sector before going into the cabin, although at about 1800 there were other vessels in the area and a light (assumed to be a fishing vessel) almost right ahead. At 10 minutes before the collision the separating distance would have been only 2.67 miles.
It is considered that the skipper failed to keep a proper lookout, particularly in the known blind sector caused by the sails.

Antares

There were two people on the bridge of Antares - the officer of the watch and a seaman lookout. The officer of the watch was keeping an eye on the radar screen and also looking out through the bridge front windows. He stated that he saw no small

echoes on the radar screen, or any lights, other than those of the fishing vessels.

The fibreglass yacht would provide only a small radar target and a relatively weak echo return, which would most probably have been intermittent as the yacht rose and fell to the sea and swell. Any echo might also have been obscured by the heading marker, as Antares was yawing one and a half degrees either side of the set heading.

Champers' port sidelight should have been visible at a minimum distance of one mile, a distance that would have been closed in 3.5 minutes at the combined approach speed of 16.8 knots. However, it was stated the sidelight was not seen from the bridge of Antares.

The Officer plotted the ship's position at 1830, and therefore for a short period before that time his attention would have been directed at the radar, and for a short period afterwards in plotting the position at the chart table. It is, therefore, not improbable that he might have failed to see the red sidelight.

The tops of Champers' white sails should have been visible to a height of 2.7m above the forecastle head, only 74m from those on the bridge, at the time of impact, and should even have been visible shortly before. With the seaman lookout standing on the port bridge wing, the hull of the yacht, rubbing down the starboard side, would initially be concealed from his view, but more than half the width of the yacht would have been visible to him as it passed just forward of the bridge.

It is surprising that the seaman, who was on dedicated lookout duty, not only failed to see the red sidelight, but also, on a small ship the size of Antares, neither saw nor heard anything.

The combined visual and radar lookout conducted by the Chief Mate and seaman proved inadequate in that it failed to pick up the presence of the Champers.

Other considerations

Radar reflectors

Champers carried no radar reflectors. Had a radar reflector been carried at the masthead this would have increased the likelihood of detection by ships' radars.

Masthead lights

The navigation lights carried by Champers are those required by the International Regulations for Preventing Collisions at Sea (COLREGS) - port and starboard sidelights and stern light. As Champers is less than 12m in length the range required of these lights is one mile.

The sidelights are located on the lower rail of the bow pulpit and are, therefore, about 1.3m above the

water. In the wind and sea conditions of 1 September, it is likely salt water spray would have splashed over the sidelights, which would have reduced their effective range. When the yacht was in a trough between waves, the lights would have been obscured completely. These conditions would have made Champers very difficult to see.

It is worthy of note that the minimum visual distance of one mile, required by the COLREGS, will be closed in four minutes by a vessel steaming at 15 knots, and in only 2.4 minutes by a vessel, such as a container ship, steaming at 25 knots.

Under the provisions of Rule 25 of the COLREGS, a sailing vessel of less than 20m in length may carry the sidelights in a combined lantern, at or near the masthead. Alternatively, a sailing vessel may exhibit, in addition to the normal sidelights and stern light, two all-round lights in a vertical line, at or near the top of the mast, the upper one red and the lower one green. Either of these two alternatives would have helped to make Champers more visible out on the open sea.

Antares - VHF

The Chief Mate of Antares heard a single, weak "PAN", broadcast on VHF 16, but he was unable to hear anything further. He heard no calls to his ship, or to other stations, on VHF 16 during his watch.

The VHF equipment on board Antares was technically in compliance with international requirements and was approved by the Registry USSR. The starboard set was installed in 1981 and the port one in 1988. According to the Master, the starboard side VHF set did not work well and was unreliable, the port side set only had a range of about 10 miles.

A number of shore stations and fishing vessels called Antares by name, on VHF 16, none of which were reportedly heard by Antares. It is considered that the VHF equipment aboard Antares, by virtue of its reported poor operational efficiency, was deficient for the purpose for which it was intended under the SOLAS Convention.

Conclusions

It is considered that:

1 Although the ship with which Champers collided was unidentified at the time and, although the evidence of the positions and the skipper's observations indicate the contrary, on the balance of probabilities Antares was the ship with which Champers collided.

2 The combined visual and radar lookout by the Chief Mate and seaman on board the Antares proved inadequate, in that it failed to pick up the presence of Champers.

3 The skipper of Champers failed to keep a proper look-out, particularly in the known blind sector on the port bow caused by the yacht's sails.

4 Had Champers carried a radar reflector at the masthead, this would have increased the likelihood of the yacht's detection by ships' radars.

5 The carriage of the lights provided for by either 25(b) or 25(c) of the COLREGS would have increased the likelihood of visual detection of Champers.

6 The VHF equipment on board Antares was deficient for the purposes for which it was intended under the SOLAS Convention.

Submissions

Submissions received under Regulation 16(4) of the Navigation (Marine Casualty) Regulations.

In accordance with regulation 16(3) of the Navigation (Marine Casualty) Regulations copies of the report were provided to the Master and Chief Mate of Antares and the skipper of Champers.

A joint written submission was received from the Master and Chief Mate of Antares and the text has been amended where considered appropriate.

The Master and Chief Mate did not agree with the analysis and the conclusions concerning Antares based on that analysis. They proposed that the analysis should have been focused on the collision position, 23° 58'S : 152° 06'E. This position was 104 degrees 3.7 miles from Champers 1700 position, indicating a collision time of 1745. They argued that a collision at this time would be in keeping with the times of the radio messages as noted by Agnes Water Fishing Base.

At 1745 Antares was in position 24° 05'S : 152° 17.6'E, 123 degrees 12.9 miles from the collision position.

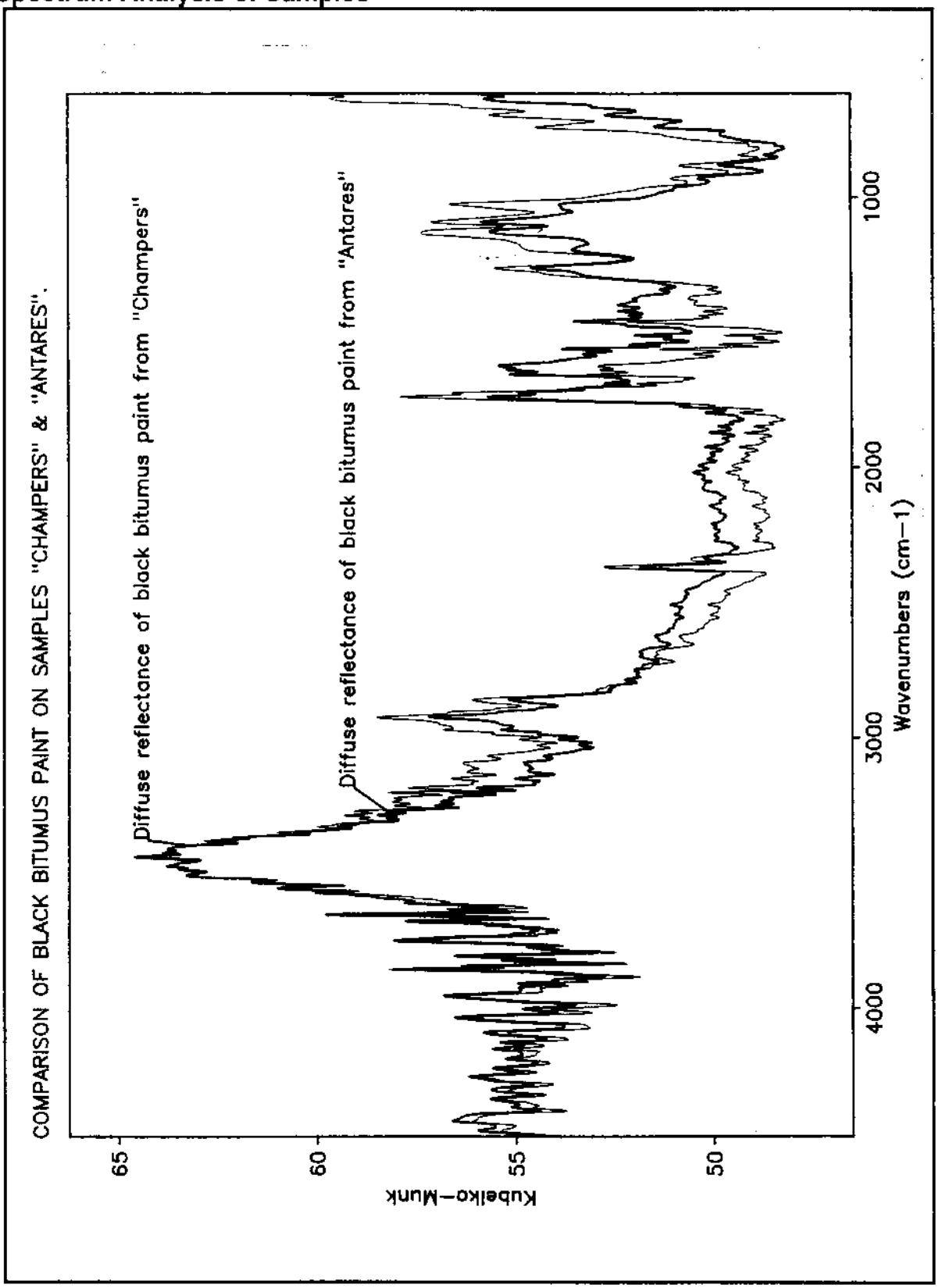
Initially, the Chief Mate placed the time of hearing the weak PAN call on VHF at 1815, but later changed this to 1845. However, in the submission he said that he had maybe made a mistake and that he considered the time of hearing the signal was 1815.

It is accepted that this provides strong argument in favour of Antares not being the ship involved in the collision. However, both the Master and Chief Mate stated during interview that no other large ships were indicated as being in the area, either on the 8-mile or 16-mile ranges of the radar. Had another ship been 13 miles ahead of Antares it should have been indicated on the 16-mile range of the radar and, in accordance with good seamanship, would have been monitored by the Watch Officer, in order to ascertain which way it was proceeding. Also, a collision at 1745 would not account for Champers' positions of 1800 and from 2000 onwards.

If the collision occurred at 1745 as suggested, Antares would have passed within two miles of the dismasted Champers at about 1840 and should have been clearly visible to the skipper.

Attachment 1

Spectrum Analysis of Samples



Attachment 2

Forensic Report

INTERIM REPORT

ITEMS SUBMITTED FOR EXAMINATION

Item 1 "Sample of scale collected from deck of "Champers" by owner".

Item 2 "Sample of scale/black paint from "Antares"".

Item 3 "Sample of boot toppings paint from "Antares"".

REASON FOR SUBMISSION:- "Suspected collision between yatch "Champers" and Russian tanker "Antares". A comparison of scale/paint from the two vessels was requested.

The following report details the examination I have conducted, the findings revealed and information relating to other aspects and avenues of analysis which may be pursued. This interim report is submitted to you for your information and consideration.

EXAMINATION:- The items were removed from the signed and unsealed packages, weighed and visually examined for features of identity. The fragments were broken and viewed in cross section in order to evaluate paint layer sequences and thicknesses. Various phenomenon were recorded by means of photography and hand written notes.

A standard chemical test for lead was applied to the red film. Details of the test are described in the appendix.

The infra-red absorbency spectra of the black films were collected in order in order to discriminate at the molecular level between organic materials with similar appearance.

RESULTS:-

Item 1 comprised of approximately 2.72 grams of material, most of which appeared to be hydrated ferric oxide ($Fe_2O_3.H_2O$ rust). The exterior aspect of the fragments exhibited a four layer sequence of Orange : Black : Reddish Orange : Black. The thick black layer felt pliant when pressed with a needle. The thickness of the layers were estimated to be approximately 34um, 136um, 114um, 68um. (1um = micrometre 1 x 10^{-6} metres). A test for lead was applied to the chip and a positive result was observed. A sample of the 136um layer was excised and examined with infra-red spectroscopy (see attached).

Item 2 comprised of approximately 3.69 grams of material which appeared similar to that of item 1. A four layer sequence of Orange : Black : Reddish Orange : Black was observed. The thicknesses of the layers were estimated to be approximately 68um, 68um, 170um, 45um. The 170um black layer felt pliant when pressed with a needle. A chemical test for lead was applied to material from the orange layer and a strong positive result was observed. A sample of the black film was excised and examined with infra red spectroscopy (see attached).

Item 3 comprised of approximately 0.34 grams of sample. A reddish brown loose film was noted on a black layer. The under surface of the black layer exhibited striations. A metal or rust layer was not apparent in the samples. A test for lead was applied however a negative response was recorded. The black film was pressed with a needle and observed to be brittle and thin.

SUMMARY AND OPINION:-

The examination of Items 1 and 2 revealed a number of macroscopic similarities and the infra-red spectra of the black "bitumus" layers revealed a very close correlation. Although on face value it appears very likely the scale samples have a common origin, such an opinion can not be substantiated in the absence of "population data". It seems reasonable, however to state that the scientific evidence indicates that the scale found on "Champers" could have come from the ship "Antares".

BACKGROUND INFORMATION:-

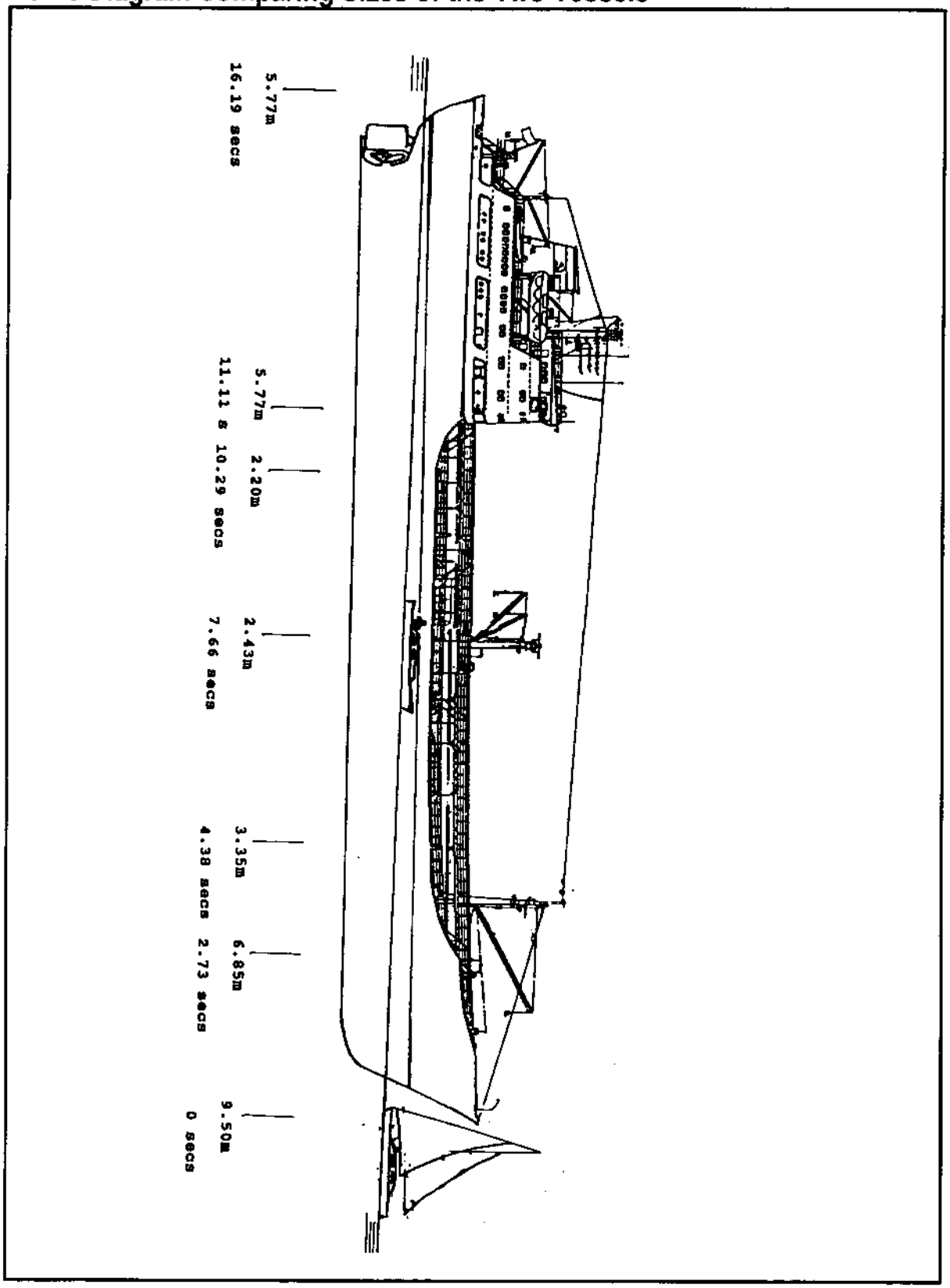
Attached is a 1987 reference relating to the painting of ships from the book "Paint and surface coatings, theory and practice" by R Lambourne, Ellis Harwood series in Applied Science and Industrial Technology.

FURTHER ANALYSIS:-

Samples of scale should be collected from as many ships as possible to evaluate the likelihood of finding similar coating sequence from the population.

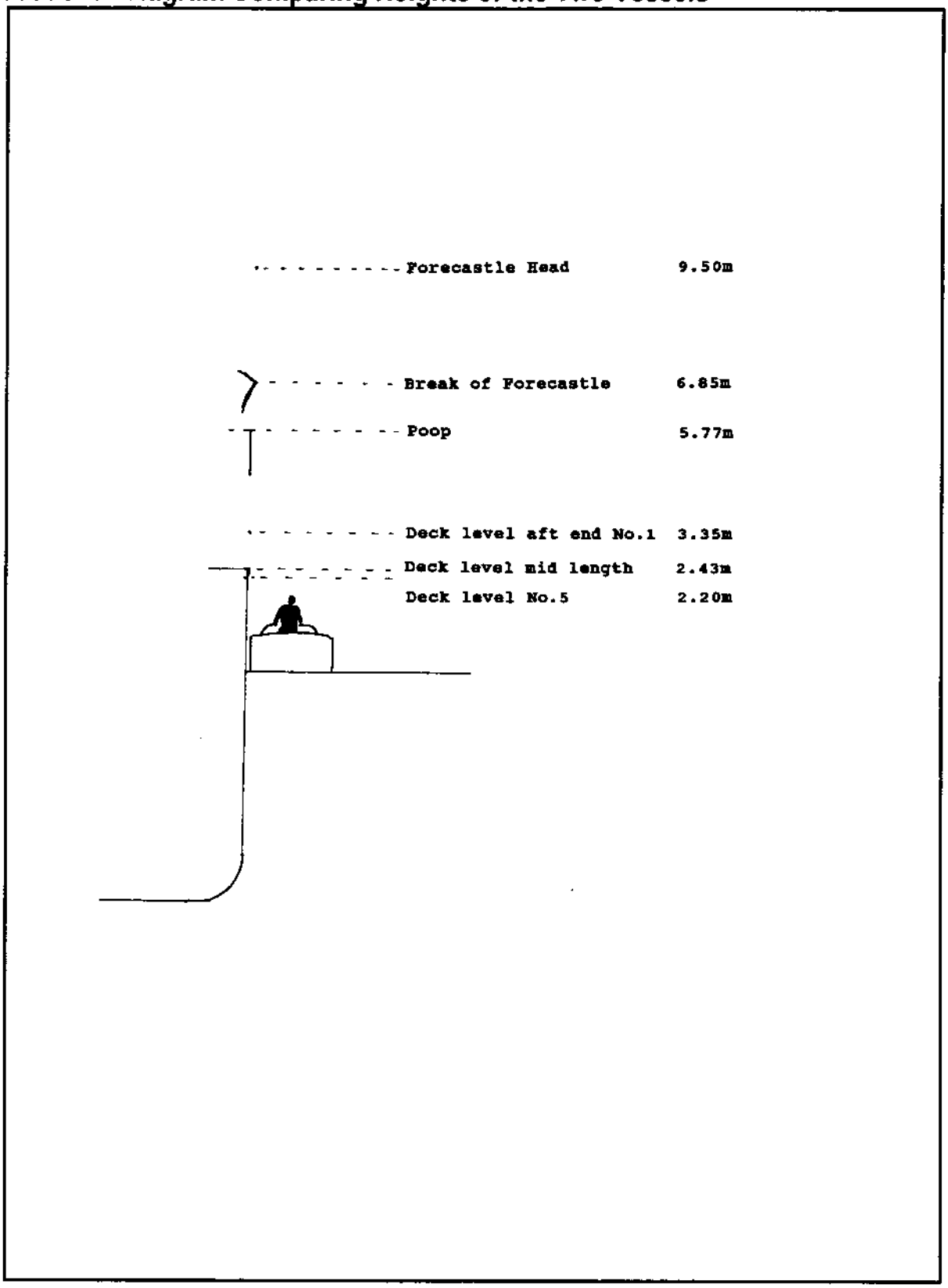
Attachment 3

Profile Diagram Comparing Sizes of the Two Vessels



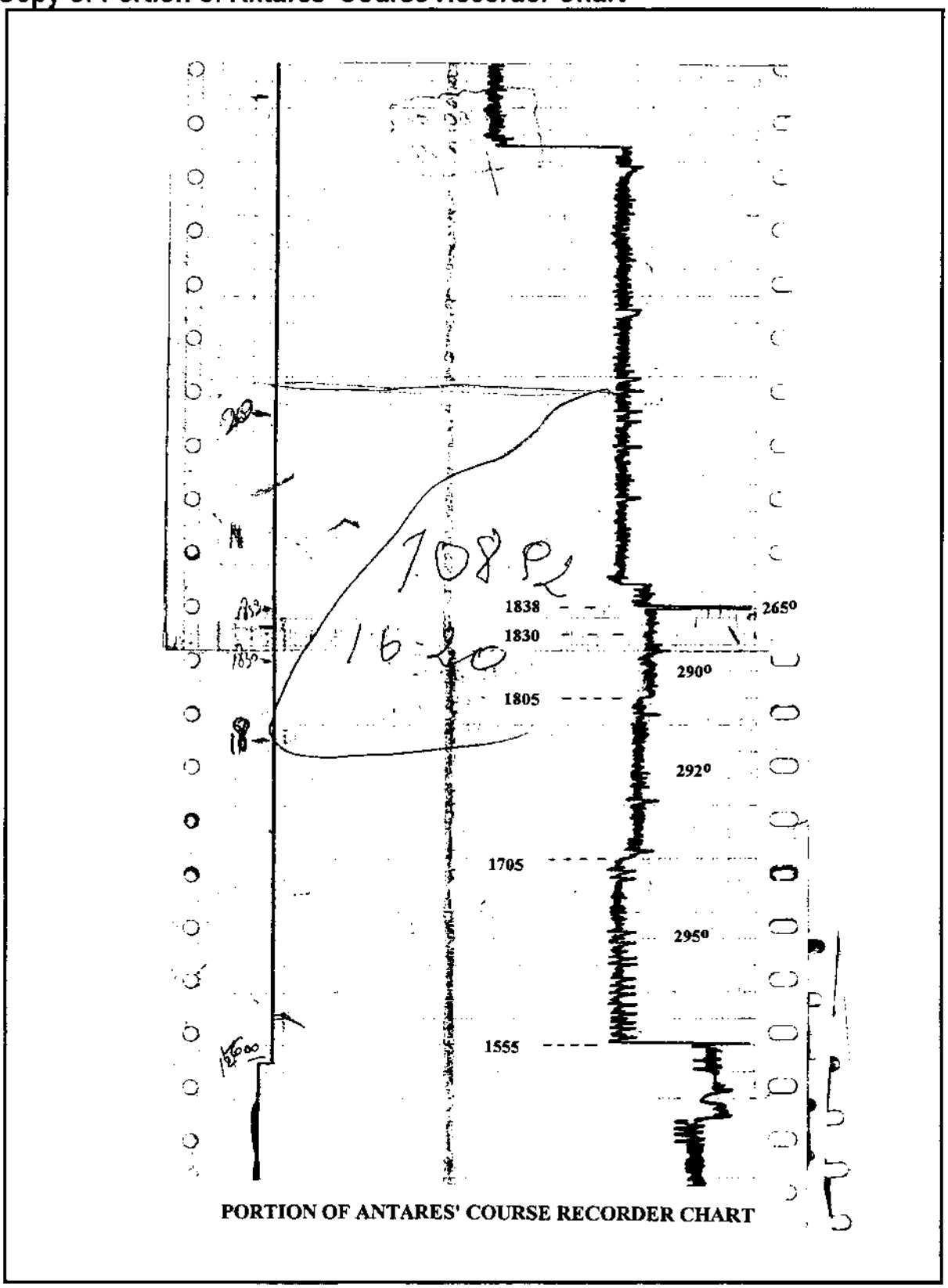
Attachment 4

Sectional Diagram Comparing Heights of the Two Vessels



Attachment 5

Copy of Portion of Antares' Course Recorder Chart



PORTION OF ANTARES' COURSE RECORDER CHART

Attachment 6

Particulars of the Two Vessels

CHAMPERS

Type (Design)	Northshore 38 - cruiser/racer
Construction	Fibreglass
Length	11.582m
Beam	3.505m
Freeboard	0.8m
Masts	1
Mast height	15.19m above deck

ANTARES

Type	Vegoil tanker
Built	1970
Port of Registry	Novorossiysk, CIS
Owner	Novorossiysk Shipping Co.
Length	106.07m
Breadth	15.44m
Moulded Depth	7.9m
Gross tonnage	3468
Nett tonnage	1606
Summer deadweight	5031 tons (5111 tonnes)
Main engine	B&W 2SA 5 cylinder
Power	2133 kW
Speed	13.5 knots (ballast)
Crew	27 - Russian