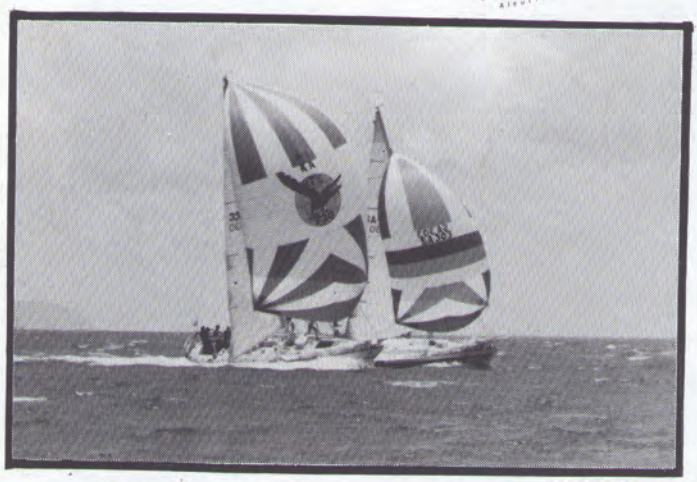
OFFSHORE

NUMBER 56 OCTOBER/NOVEMBER 1980 80c*



HAWAII

"THE BIGGEST COMPLAINT I HAVE AGAINST THE COMPUTER, IS THAT THE DAMN THING ISN'T WATERPROOF."

The quote is from Pete Lawson, navigation advisor to the successful America's Cup defender, Freedom.

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MIS 8

OFFSHORE

Number 56 **October/November 1980**

Cover: This month's cover symbolises the growth in the number of international offshore events departing from Australian waters. The Commodore of the CYCA, Kerry Roxburgh, and the Commodore of the late Club do Rio de Janeiro, Helio Barroso, tango for the camera on 'A' Marina at a ceremony announcing plans for the race (photograph by Young and Richardson). Above the rhythmic Commodores, Dynamite and Nyamba take part in this year's Hawaii series (photograph by Sandy Peacock).

CONTENTS

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LOOK AT FACTS

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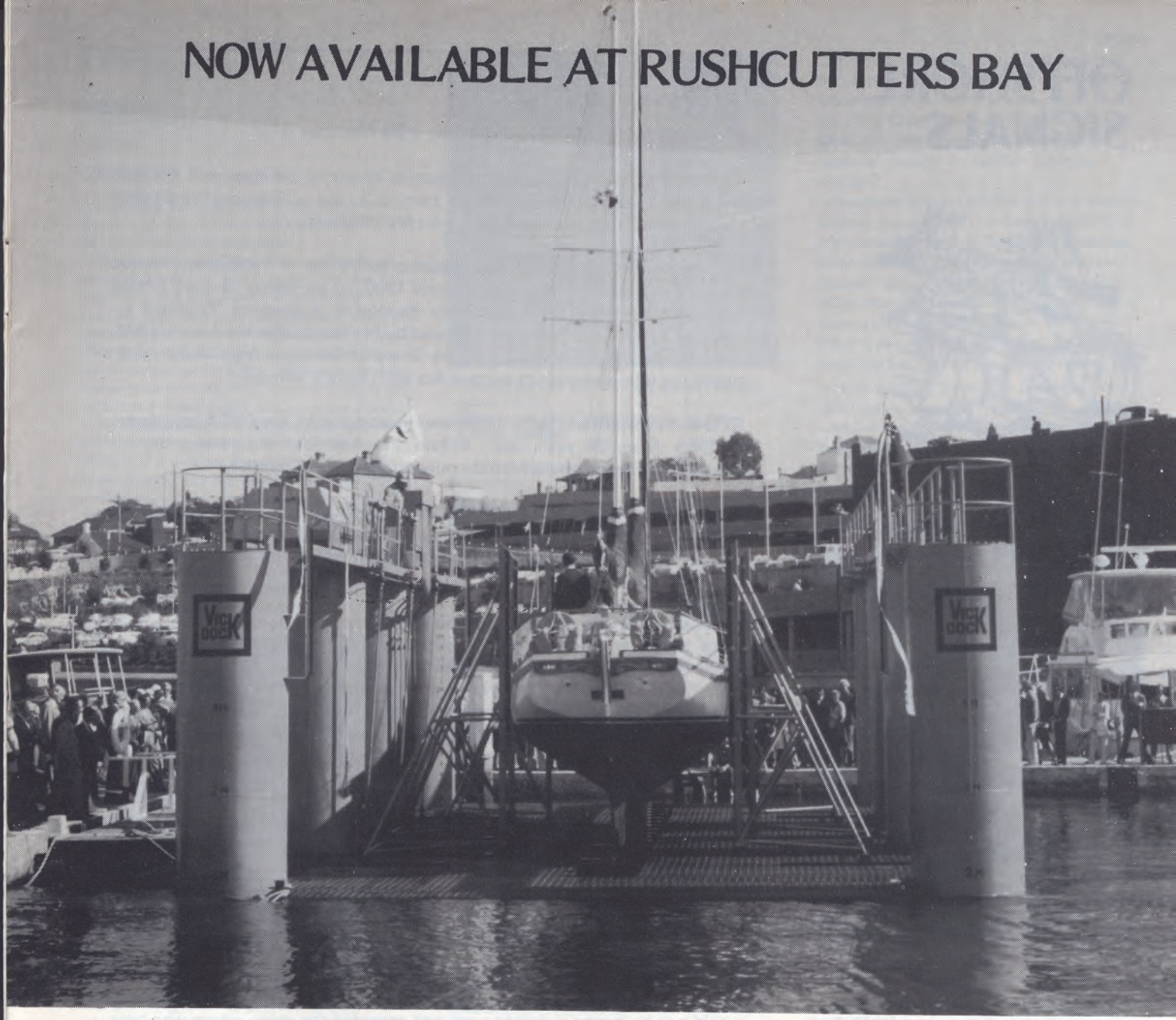

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OFFSHORE SIGNALS

ACE MARINE PHOTOGRAPHICS

David Goode

Letters

The Secretary,
CYCA, Rushcutters Bay, NSW.
1 September 1980

Dear Sir,

The following gentlemen have been elected Flag Officers of the Royal Yacht Club of Victoria for the 1980/81 season.

Commodore, Mr. J.E.R. Manton
Vice Commodore, Mr. R.W. Spencer
Rear Commodore, Mr. L. Fallshaw
Club Captain, Mr. M.M. Anderson

May I also take this opportunity to ask that you inform any of your members who may be visiting Melbourne in their yachts prior to racing from Port Phillip Bay that we would welcome the opportunity to assist them with the facilities of the Club should the need arise.

We would appreciate reasonable notice being given on these occasions to assist us in any forward planning that may be necessary.

D.G. Gilbert,
Secretary

David Goode, Life Member

To all racing sailors, David Goode must be known as the man with the gun. Since 1965, he has hardly missed starting a race – first, on the CYCA's starting vessel, Bess, and, since 1967, on MV Offshore.

Born in Adelaide, where he was admitted to the Bar in 1948, David moved to Sydney in 1956, and it was not until 1960, on the first of January of that year, that he first sailed with Tony Baddon in a Bluebird. Proposed by Tony as a CYCA Member, and seconded by Bill Psaltis, David joined in 1963. By 1965 he had been elected to the Board of Directors from which he resigned the following year to become Assistant Sailing Secretary.

At David's instigation, radio skeds were introduced by the CYCA as long ago as 1966. Now, 25 years later, Britain and America are following up this necessity for radio communication only after a Fastnet disaster.

Another first for David Goode was the introduction of a tape recorder, in 1969, to deal with multiple finishers when there is too much action for the pen to record accurately – another innovation which was adopted by other clubs many years later.

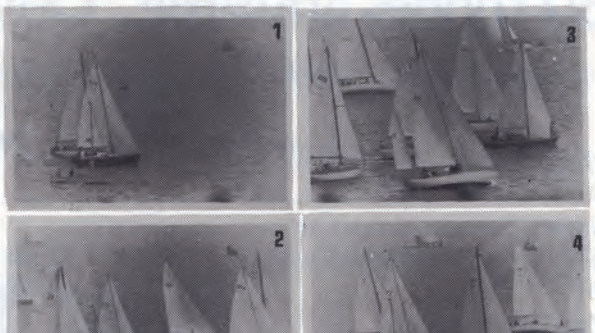
His services to yachting have been so vast that to mention a few will suffice. Since 1965, he has been a continuous member of the Sailing Committee; he was on the YA Committee from 1966-68 and the Offshore Racing Committee from 1966-74; from 1966-73 he was on the Safety Inspectors Committee; and since 1974 has been a member of the YA Appeals Committee. He has spent 20 years with the RANSA Race Committee and the Regatta Committee.

David's rapport with Sydney Radio and the Water Police has, over the years, been of great assistance; on many occasions he has alerted the fire brigade about both marine and bush fires, and he has assisted in the apprehension of thieves and the rescue and recovery of vessels.

Each year David starts the first MHYC race as guest starter, their season commencing a week before that of the CYCA.

It would not be fitting not to mention the services of David's wife, Nancy, who has continuously, since 1968, served on the committe boat. David would not be happy if thanks were not accorded the many others who have assisted on MV Offshore over the years.

John Hawley



1.) Angela and Amanda make a good star
2.) Bess is sandwiched between Lass O Lus
and Southerly, the latter having been force
over onto the wrong side of the starter's bo
3.) Zilvergeest, Corroboree, Patience, Lass
Luss, Weatherly and Carousel get away.
4.) Southerly is preparing to start again wh
Rival, Matika, Moonbird, Anitra and Joy
follow the leaders. (Our thanks to Alan
Campbell for these photographs reminisce
of David Goode's early days on starter's
duty; they were taken from Wolseley Roa
Point Piper with a 600mm telephoto lens
by Alan Campbell (ca. 1967).

Letters *(continued)*

The Editor,
Offshore, CYCA
29/9/80

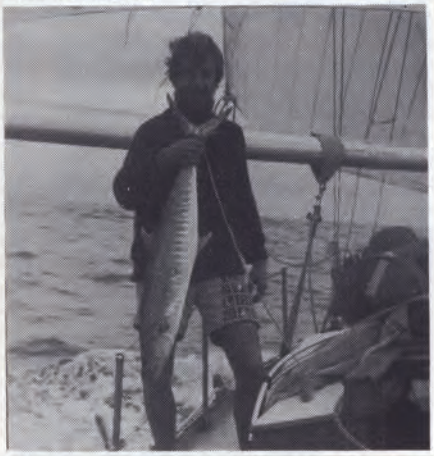
Dear Sir,

You may be interested in the story of Caprice of Huon's restoration and recent trip to the Barrier Reef and return.

In July last year Caprice fell victim of an explosion and fire which caused damage to her decks and coachouse. After nearly 12 months and extensive refitting she was launched again, better than ever, with a new coachouse and deck and a new and more comfortable layout inside. We hope she will never again have a petrol or gas mishap, as she now has a diesel engine and a metho stove.

We departed Sydney for the Reef the day after the start of the Sydney – Brisbane Race and arrived in Mooloolabah four days later. From there we travelled north inside Fraser Island to Bundaburg, Great Keppel Island, Island Head Creek and then through the Whitsunday Islands to Bowen, which we found a particularly safe and friendly harbour.

We departed Bowen mid-July, and island hopped our way south against the SE trade winds, which blow almost constantly from April to August.



One of the highlights of the return journey was travelling up The Narrows, inside Curtis Island near Gladstone, where we had to assist Caprice across one shallow point with the help of ropes, winches, and mangrove trees.

We spent a few days at Round Hill Head, which is a delightful spot in a southeasterly. We swam with the sharks at Double Island Point but had to depart with haste at 2.00 a.m. one morning when a fresh northerly whipped up a swell which caused us to be thrown from our bunks.

We spent a few enjoyable days in Mooloolabah whilst waiting for a strong southeaster to abate. Departing Mooloolabah, we set as spinnaker and arrived in Sydney three days and three hours later, having had northerly winds for three days.

We would like to thank the yacht clubs we visited along our route for their hospitality, and in particular, the Mooloolabah Yacht Club.

Our only regret is that it will be a few years before we can again go north to the Great Barrier Reef.

Yours sincerely,
Ed and Joe Earl

Above: Caprice of Huon ast sunset, Double Island Point.
Below left: Spanish mackerel near Great Keppel Isladnd.

The Editor,
Offshore Magazine,
CYCA.

Dear Sir, **Reflecting on Safety for '80**

It's not particularly easy for me to be totally impartial when passing comment on our '1980 New Regs for Hobart', being neither a Safety Committe buff, radar operator, organiser, rescue man or Sailing Committee member. As a plain sailing enthusiast, one wonders where the hell it's going to stop.

For the 'regulators', probably nothing could have been more timely than the 1978 Fastnet disaster – especially following the exceedingly high retirement rate in the 1977 Hobart Race. But the fact remains that, in the '77 Hobart, no yacht was in significant trouble (contrary to press reports), and in the '78 Fastnet Race, no Admiral's Cup yacht was involved in tragedy such as befell many of the ill-equipped non-Cup yachts.

AYF safety standards are, I believe, the most stringent in the yacht racing world and have been so for many years. It seems to me that our regulators guard this position jealously, and for 1980, the Sydney-Hobart Race becomes Category I, EPIRBs are mandatory, and radar reflectors must be worn as per CYCA Special Regulation No. 135.

Whilst almost anyone with a sense of self-preservation would welcome the introduction of EPIRBs to yacht racing and the change from Category II to Category I, the mandatory wearing of radar reflectors instils, in myself, mild bewilderment.

Presumably the reasoning behind the Category II to Category I change was the premise that the Hobart Race is, in fact *"a race of long distance and well offshore, where yachts must be completely self-sufficient for extended periods of time, capable of withstanding heavy storms and prepared to meet serious emergencies without the expectation fo outside assistance."*

The changes ivolved in its becoming a Category I race are, indeed, small and insignificant in a yacht owner's total budget. The only differences I could find were Rule 6.21 regarding cockpit volume, a medical kit requiring high-powered laxettes, Rule 11.62 requiring 12 red parachute flares (extra cost, $200.00), and Rule 14.5 regarding fuel capacity (which is totally inadequate anyway).

Regarding the cockpit rule, I might raise, in passing, the concern expressed by members of the previous Sailing Committee about the since deceased Apollo's rather generous cockpit which, when carefully measured, failed Rule 6.21 by some nine cubic feet. Apollo travelled the world with this cockpit, filled it periodically, but never endangered herself or her crew by its 'excess' volume – in fact, in spite of the rule, it probably saved two lives.

Whilst the cockpit rule encourages open-transom yachts and flush-deck yachts, it totally defeats the desired ambition of preventing crew from parting company with their yacht in extreme conditions. To work in Apollo's 'illegal' cockpit, with the top life line at shoulder height, was, to say the least, a reassurance not found in latter-day flat deckers and, I feel, is a thing to be encouraged rather than legislated against.

Our other new regulation for 1980 is the introduction of radar reflectors to the 'it shall be worn' category (as opposed to the 'recommended only' category). I quote CYCA Regulation 135, Radar Reflectors: *"During all Category I races, a radar reflector shall be carried no lower than 4m above DWL by all competing yachts while racing. Octahedral reflectors shall have a minimum diagonal measurement of 18" (46cm); other forms of reflector shall have an equivalent radar visibility."*

This all looks extremely impressive in print, but I wonder how much thought was directed to the practical implementation of such a regulation and, more important, its usefulness.

My immediate thoughts upon learning of this regulation were:

1. Where are we going to put it?
2. What happens when we lose it?
3. Which one is best?
4. What the hell do we want it for?
5. Who was the dimwit who introduced this regulation?

As for 1., it's all vey nice saying you've got to carry one, but where *do* you carry one on a modern racing yacht with a bendy rig without destroying the reflector or your sails? Carried anywhere on the mast and shrouds, it will itself either tear sails or, perhaps some would hold more important, it will be destroyed itself by flogging sails or by 'whiplash'. From experience, backstays are no good either, with the reflector gyrating wildly until it self-destructs. There's no room at the masthead. So there's no place at all!

As for 2. (above), if we do put it somewhere and it falls down (like it's going to do in a large percentage of cases), what happens to our safety status? Upon arriving in Hobart, are we to be penalised, disqualified, or do we

(continued next page)

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have to file a declaration announcing our lack of ingenuity in securing this device, or should we carry unlimited spares to avoid this dilemma?

As for 3. (above), to decide which one is best is, 'fortunately', left to the wisdom of the owners. From experience, all kit-form reflectors have a nasty habit of disassembling themselves at the slightest provocation or upon contact with mast and rigging.

What is meant in the Regulation by *"other forms of reflector shall have an equivalent radar visibility"*? As there are no standards for reflectors, no available data about their performance and, more important, no specification as to what radar wavelength they should be equally visible to, I find the choices boundless.

I would suggest to the discerning yachtsman that the best radar reflector available in the circumstances would be a large aluminium spar set in the deck, supported by plenty of stainless rigging, from which areas of Dacron can be hung, the latter which, when wet, has excellent reflective properties.

As to 4., the question "What do we want it for?" is not meant to be overly critical, for it would be foolish to assume that shipping does not have trouble locating small craft on radar. More important, whilst racing, the average yacht will have at least four people on deck at all times maintaining vigilence (unlike large ships) and detecting ships at sea is not difficult. In really foul weather, the gyrating reflector will be of no use anyway (if it hasn't self-destructed) and if set at 4m above DWL, it will be below wave crest height Heavy rain will 'fog' the radar, and in dense fog, wet sails are the best reflector. More improtant again, how may ships at sea maintain a radar watch? Upon questionning a well-known sea captain, it was stated that many ships do not even use radar at sea, and some shipping lines do not even have radar!

Another thought comes to mind. Surely a reflector would be of primary use when our mast parts company with the vessel and we're being looked for by shipping and military aircraft. It's not going to be much use if the reflector is keeping Davey Jones company and we've no other metal reflector to sit on our spinnaker pole or broomstick.

Criticism comes easily, but surely we should be encouraging proper use of the equipment already specified instead of yearly introducing new regulations for their own sake, which smacks of political party 'achievement' for Hansard's benefit! Let's hope more care and practical thought will be used before introducing next year's round of new safety regs.

Yours sincerely,

D. H. van Woerden

New Penta Base magazine

Penta Base is an independent limited Coast Station operated by Derek and Jeanine Barnard of Gosford Chrysler Marine. It was originally Penta Fishing Club, formed in 1976 to provide a 27MHz Harbour Mobile service, the name originating from the Chrysler Corporation's emblem of a penta star. Since 1978 it has been a Limited Coast Station on HF and VHF bands, and it now has some 550 Members. Operated by Derek and Jeanine Barnard, the club provides a radio service for its members, but it has done a lot more than that in recent years. Derek Barnard has acted in the capacity of radio relay man for a large number of ocean passage races conducted by the CYCA and other yacht clubs; with his excellent radio set-up he is often able to maintain communications when no one else can; he recently escorted Ragamuffin all the way across the Pacific to Hawaii, conducting a nightly sked, and it was Derek who was able to hear the very weak signals from Impetuous when she was dismasted coming back from the Pan Am Clipper Cup series, and he was able to co-ordinate her rescue. Nothing is too much trouble for Derek Barnard, a fact that won him a 'gong' in the last Honours List for his services to th boating public.

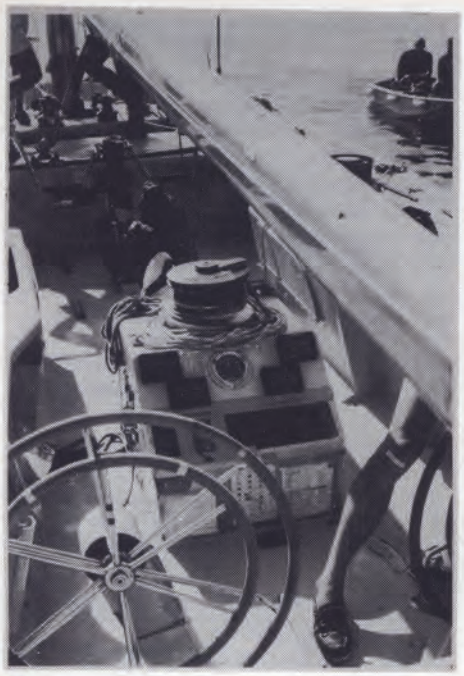
Penta Base is entirely self-supporting and it relies on the generosity of its members to provide the necessary funds to keep up its excellent service. All new members are welcome, and those who do join find that they use the service for everything from radio coverage on trips to getting messages to and from the mainland from their favourite retreats from Broken Bay to the Whitsundays. The basic fee is $5, although most members would undoubtedly feel more generous considering the tremendous amount of service Derek and Jeanine give. Membership also entitles you to receive the new Penta Base Magazine, an annual which is full of useful information about radio, installations, maritime radio services. search and rescue, and the current edition has a two-colour guidemap of Brisbane Water. Write or phone Derek and Jeanine Barnard, Penta Base, 339 Main Street, Gosford, NSW 2250 (telephone [043] 244 644). Or pick up a complimentary copy of *Beacon* from the office and fill out the Membership Application form on the back page and post it with your donation.

Now it's Sydney-Rio

Rio is the latest addition to the list of exotic destinations for ocean races starting from Australian shores. CYCA Commodore Kerry Roxburgh recently announced that on Australia Day, in January 1982, the first Sydney-Rio Race will be held in conjunction with the *Iate Club do Rio de Janeiro*. The Commodores of the respective Clubs exchanged burgees at a ceremony at the CYCA which was given added colour by a Brazilian band and samba dancers.

The Sydney-Rio Race will be a challenging 8000 nautical mile race around Cape Horn to Rio and has taken two years to organise and plan with Brazilian and Australian authorities, according to Race promoter, John Williams. Interest in yachting has grown recently in Brazil which won its first gold medal in yachting at the Moscow Olympics. However, surrounding the Race is the prospect of development of trade, tourism and relations between the two countries. Trade betweeen Australia and Brazil has increased, and there are several agricultural and scientific projects currently being developed. With the planned introduction by Aerolineas Argentinas of a new direct service over the South Pole via Auckland and Buenos Aires, trade and tourism between Australia and South America will receive a boost. With the Middle East crisis, it will provide Australians an alternative route to Europe with colourful stopovers in South America.

The Mayor of Rio, Mr. Julio Continho, has agreed to come to Sydney in 1982 to start the race. It is understood that Mr. Continho will be inviting Sydney's new Lord Mayor, Doug Sutherland, to Rio for the finish of the Race.



Halsey Herreshoff, navigator of Freedom, is pictured above in front of the console which contained the H-P computer (inside the panel at the right). Wind and current readouts are at the top, and an HP-41C hand-held calculator, for mid-race computation of statistics, is at mid left. Picture at the left shows where console was located.

Computer helps 'Freedom' Defend America's Cup

Skipper Dennis Conner and navigator Halsey Herreshoff of 'Freedom', the 12 metre that retained the America's Cup for the New York Yacht Club this year, used electronic sensors and radio signals to determine distance, speed and position, plus a desktop computer to recommend course changes. The system they employed was the Hewlett-Packard 9825A desktop computer integrated with the boat's instrumentation. The H-P 9825A takes data from the instruments' sensors, along with position data supplied by the navigator, and recommends the course to take to the next turning mark or the finish line. It keeps track of wind speed, current and course. The H-P 9825A is perhaps one reason why 'Freedom' defeated the other two would-be American entries, 'Courageous' and 'Clipper', and was selected by the New York Yacht Club for the defence of the Cup against 'Australia'.

The HP9825 performs dead reckoning, using the information on true and apparent wind, boat speed, heading, from four sensors located at various places on the twelve. It analyses this data and determines, for instance, the correct time to tack.

A feature on the HP 9825 that is often used is its special function keys. When the navigator wants to know the distance to the next marker, he presses the appropriate key, and the computer flashes the answer on the display screen.

The program that does all this was planned by Pete Lawson of New Haven, Connecticut who, along with Herreshoff, is one of the most heralded navigators in the country — navigator, not computer programmer. For the America's Cup defence in 1977, Lawson wrote some programs when he saw that "the computers they were putting on twelves had about 60 percent reliability."

"This time," Lawson says, "I decided to use off-the-shelf hardware, rather than spend a lot of time 'soldering wires'."

Lawson says he looked at computers made by several manufacturers and then decided on the HP 9825. He says the support he would receive from a manufacturer was a deciding factor.

"The biggest complaint I have against the 9825," the sailor says, "is that the damn thing isn't waterproof."

The desktop computer that was connected to sensors and installed aboard 'Freedom' was shielded from the sea by a plastic bag and sits below decks within reach of navigator Herreshoff. The Rochester data displays, located on the starboard and port sides, are liquid crystal, supposedly easier to read in the glare.

Every two to four seconds, the sensors feed data to the computer about boat speed, apparent wind speed, apparent wind angle and magnetic compass heading. This is the information the navigator needs in order to get where he wants to go the fastest. But he also must know where he is.

In order to determine the location of the twelve, LORAN was used.

The position data was manually entered into the computer by the navigator. The HP 9825 advised the distance to the next marker or finish line and the optimum compass course to the line.

It is likely that in the future the HP 9825 and the LORAN signals will be interfaced, circumventing the need for the navigator to enter position data as he does now.

The Hewlett-Packard 9825A is available from any of the Australian H-P offices.

For further information contact Hewlett-Packard Australia Pty Ltd, 31-41 Joseph Street, Blackburn, Victoria. Telephone 89-6351. Branches in Adelaide, 272-5911; Brisbane, 229-1544; Perth, 386-5455; Canberra, 80-4244 and Sydney, 887-1611. Also in Auckland and Wellington, New Zealand.

World Half Ton Cup Series, 1981

From the Royal Akarana Yacht Club, New Zealand:

The Royal Akarana Yacht Club, which is the major Ocean Racing Club in New Zealand had offered to conduct the World Half Ton Cup contest in November, 1981. However, the Steering Committee appointed to organise the event has now recommended that the RAYC does NOT hold the contest for the reasons set out below:

1. The economic climate in New Zealand and world-wide will discourage many owners from involvement in expensive challenges.
2. The type of yachts needed under the present IOR Rules to compete seriously in these international series have a low re-sale value. This problem is being investigated by the ORC, but in the meantime the excessive depreciation puts this type of yachting beyond the means of the average yachtsman.
3. The high cost of transporting yachts perhaps half way round the world is a further expense which cannot be faced by many yachtsmen without financial assistance. The growth of container shipping has virtually eliminated cheap transport as "Deck Cargo".
4. The timing of contests works against the countries in the southern hemisphere. If they hold the contest in February or March (probably the ideal months), this is either too soon after previous series or too near the next.
   More suitable timing would be, for instance:
   Northern hemisphere — August/September 1979; southern hemisphere — February/March 1981; northern hemisphere — August/September 1982.
   Alternative contest in the north in 1980 and 1981 should be discouraged so that those owners wishing to have world class competition would be under some pressure to go south.
5. New Zealand only has a population of three million. However, New Zealand-owned yachts, in spite of their geographical problems and the expense involved, have won three Quarter Ton Cups, three Half Ton Cups, three One Ton Cups and three Southern Cross Cups over the last decade. They have also sent challengers to many other contests.
   No other country can claim such an outstanding record. It is strongly urged that yachting administrators must consider ways of re-arranging Level Rating contests so that New Zealand, or any other rather remote country, can expect to receive support from overseas commensurate with the contribution they have made to international yachting.
6. A return to the old system where the holders of the Cup retain it until it has been won from them (subject to a three-year limit) would perhaps be a solution. It would compel some overseas yachtsmen to overcome the difficulties and mount challenges.
   At present it is too easy to just wait for the Cup to return automatically to a more convenient venue. *(next page)*

OFFSHORE Signals

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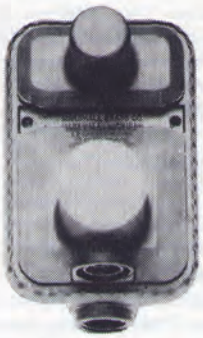
7. The lack of support for the World Quarter Ton Series to be held by Panmure Yachting and Boating Club in November, 1980 highlights the problems.

It is with great regret that the RAYC has come to this decision. We have corresponded with a number of yacht designers and others in New Zealand, Australia, U.S.A., U.K., France and Belgium. We have also had discussions with yachting administrators in several countries and the concensus of opinion has been that there is unlikely to be much overseas interest in a series to be held in New Zealand in November, 1981.

LP Gas Safety Equipment



The dreaded fear of explosion due to LP gas leak is common but can be overcome by installing the correct equipment.

The regulator fitted to your gas cylinder is virtually the heart of your LP gas system. It is an automatic device with working parts which move continuously. The basic function of the regulator is to take high and inlet pressure from the gas cylinder and reduce it to a safe and consistent low outlet to the appliance.

For example, normal cylinder pressure can vary depending on the outside temperature from a high of 250 pounds per square inch (psi) to a low of 7psi. Whatever the pressure, the regulator's job is to reduce it to 6.35 ounces, or 11 inches water column (WC) outlet pressure, and supply fuel downstream at this pressure in whatever volume required to efficiently operate each appliance as the demand is made.

However, a two-stage regulator, recommended for the marine use, does the forementioned function in two stages. The first stage, or high-pressure regulator, reduces the cylinder pressure to approximately 10 to 13psi and sends it along to the second stage low pressure regulator which then reduces it to 11 inches WC or 6.35 ounces psi.

Because cylinder pressure is reduced in two stages and because the second stage received a consistent rather than varied inlet pressure, the regulator does not have to work as hard. The result is a more efficient, safer system with less chance of irksome problems such as pilot outage, freeze up, etc.

The CONTROL 4 SENSOR (leak detector) should be installed underneath the actual gas appliance. This sensitive detector will sound an alarm if the concentration of gas in the air reaches a quarter to one half of one percent. At the same time, if connected to CONTROL 3 (high pressure shutoff through solenoid), the solenoid will activate the high pressure, shutoff valve and automatically shut off the gas supply at the cylinder. The CONTROL 3 shutoff valve should be fitted behind the regulator.

If your LPG system is equipped with 2 STAGE REGULATOR, CONTROL 3 pressure shutoff and CONTROL 4 leak detector (Sensor) you have the ultimate in total control and protection.

In operation the CONTROL 4 is connected to your 12 volt battery and draws only 0.085 amps. When activated will draw five amps for less than 10 seconds and 0.085 amps to continually operate the warning signal.

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Personal rescue light

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More Trivia

We were, relatively, inundated with eager entries in last month's Trivia Twizzlers competition — needless to say from the same tight circle of naval (sic) contemplators. First in was not best dressed — in fact, last in was, and congratulations are due to Chris 'Giant' Hatfield for finally scoring the two bottles of Jarman's Brut champagne. Very fine entries were also received from 'Mouth' Kellett, who was dazzling in the completeness of his entry — too complete, in fact, inasmuch as he discovered an extra 'centreboarder' in the 1977 Hobart. Michael Spies missed only one half a question, according Sir Francis Chichester the honour of 'doubling' the Observer Single-handed Trans-Atlantic Race (as did Jenny May). Ray 'Blade' Hollingsworth had an excellent entry with only one error, although he did lose out on the gold oak-leaf cluster because of atrocious spelling. Duncan van Woerden missed one and one-third questions, his spelling was impeccable and his penmanship compulsively neat.

It would appear that the CYCA brains trus Trivia consists of David Kellett, C Hatfield, Duncan van Woerden, Michael Sp Jenny May, Ray Hollingsworth, with a hangers-on, such as Chris Messenger. Don' shy; how about a few more triers in month's competition. Two bottles of the cellent Jarmans Brut to the winner of following questions (one entry per pers first entry received in the office (marked w the time of receipt and initialled by a mem of the office staff) is the winner).

ANSWERS TO TRIVIA TWIZZLERS AUGUST/SPETEMBER 1980

1. Kurrewa IV, set in 1957 (3-18-38-39).
2. Helsal, in 1974 (36-49-30).
3. Flyer, a Dutch yacht, a 65ft S&S.
4. Heaths Condor.
5. B195, Hecate, Silver Shamrock, Smir-Noff-Agen, Swuzzlebubble.
6. Pathfinder (S&S), Runaway (J. Lidgard Wai-Anaiwa (Dick Carter).
7. Four. New Zealand (1967, 1971), USA (1972, 1977), Hong Kong (1973), and United Kingdom (1969).
8. United Kingdom. The team was Prospec of Whitby, Quailo III, Superstar of Hamble.
9. Wathara II.
10. Bird Islet record, set 30/3/73 (11-01- (11-01-54), Flinders Islet set on 24/9/ (11-48-17.2), Broken Bay — Flinders I set 11/12/75 (18-14-39.6).
11. Three. Natelle II (1976), Shenandoah (1977) and Vanguard (1978).
12. The double winner is Eric Tabarly, in 1964 and 1976. The famous yachtsma who won in 1972 was the late Alain Co in the trimaran Manurewa, who defeat the massive 128ft Vendredi Treize.

Bonus question. Steve 'Shifty' Old (witho CB).

October/November Twizzlers.

1. Who was the first owner/skipper to win both a Fastnet Race and a Hobart Race?
2. Which boats finished first and second in the 1972 Admiral's Cup series?
3. Which was the top-scoring individual boat in the 1973 Admiral's Cup?
4. Which Australian navigator sailed on both the 1962 and 1965 Sydney-Hobart line honours winners, Ondine and Stormvogel?
5. He has won a Sydney-Hobart Race, he has won an Olympic gold medal and an Etchell World Championship. Who is he?
6. World 18-footer champion Iain Murray has competed in one Sydney-Hobart Race. On which boat did he sail?
7. How many former World One Ton Cup Champions have sailed in the Sydney-Hobart Race, and which which yachts are they?

(next pag

(continued from previous page)

8. Who won the first Whitbread Round-The-World Race in 1973?
9. One Australian-designed-and-built yacht has raced for two different countries under two different names in the Admiral's Cup. What were the two countries, and what were the yacht's names?
10. How many Hobart Races has the former British Prime Minister, Edward Heath, competed in?
11. Which was the first Victorian boat to be placed in the Sydney-Hobart Race? (Hint: it was since 1962.)
12; Which boat took line honours in the 1973 Fastnet Race and compted in the 1979 Sydney-Hobart Race?

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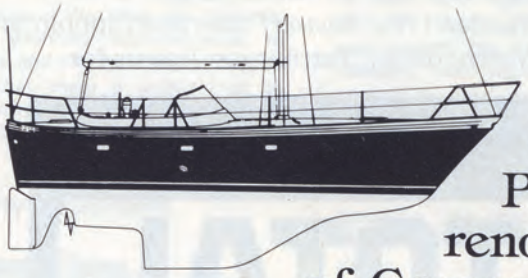

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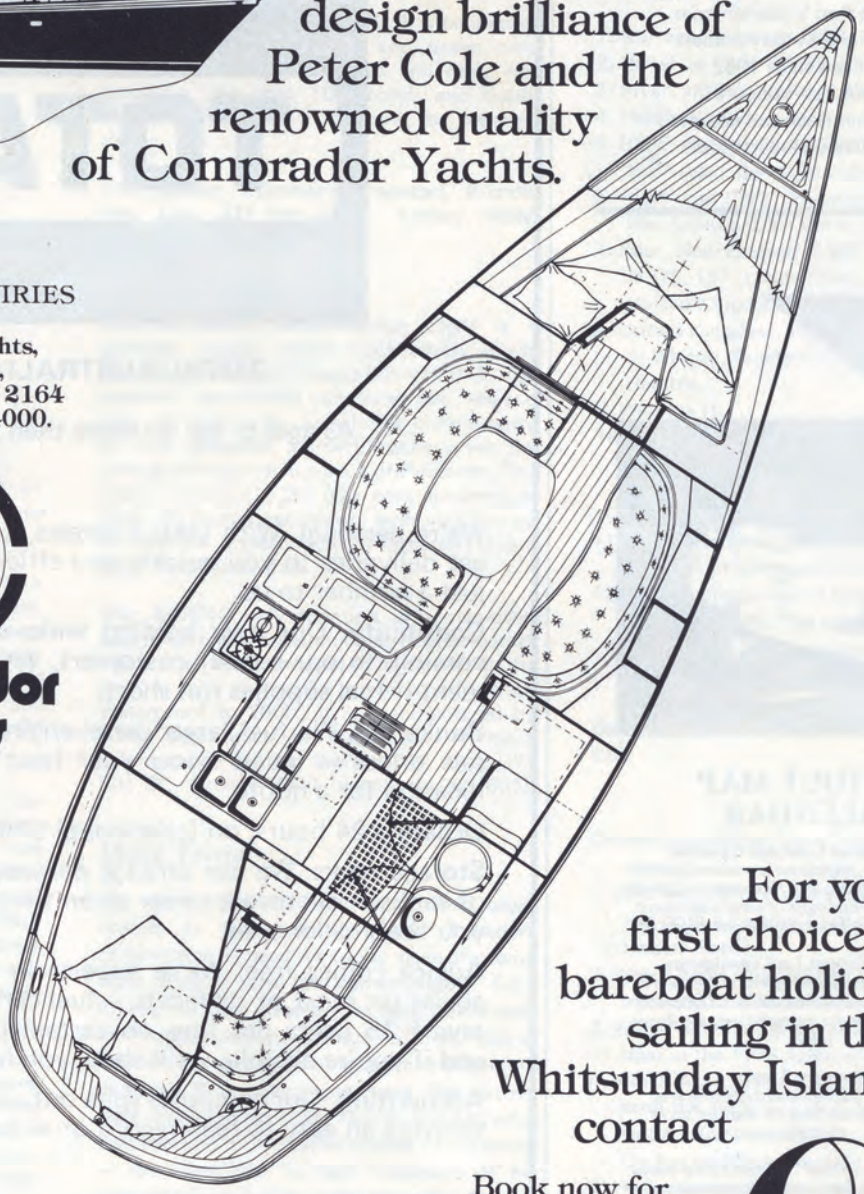

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SANDY PEACOCK

1980 PAN AM CLIPPER CUP SERIES

with Sandy Peacock

It might be a good idea for another country to win the next Pan Am Clipper Cup in 1982, because this superb big-boat series is starting to look suspiciously like a benefit concert for Australian ocean racing prestige. The series was again very well run by the Waikiki Yacht Club and confirmed the feeling of 1978 that Hawaii is the world's best venue for offshore racing, but it would have been a lot more engrossing if the Australian No. 1 team had been pushed harder.

In the 1978 series Australia and New Zealand were looking a fairly even bet after four races, and the final race (the Around-the-State 775-miler) became the decider. 'Magic Pudding's' memorable win in that race headlined a good team effort and Australia's win was a well-earned one. This time our No. 1 team of 'Ragamuffin', 'Challenge' and 'Sweet Caroline' was simply the best prepared, best sailed and best navigated in the fleet. They led the pointscore all the way and although the top American team (US red) stayed theoretically within reach, the Aussies would have had to really bomb the long race to lose the series.

'Ragamuffin' won the Around-the-State Race with consistent boat speed through the fresh-light-fresh-light conditions and obviously some good thinking from Syd Fischer, Dick Hammond and guest tactician Lowell North back in the beer-garden, because never have I heard so many crews complain so much about such weird wind-traps and holes in a long race. But as Fischer observed after the series, it's funny how good crews do well in lousy long races. Have a look at the Australian performances in that race (crews with a fair sprinkling of old Sydney-Hobart salts) and the point becomes pretty clear. 'Rags' was first overall, 'Sweet Caroline' was fourth, and 'Nyamba' was fifth after a great effort from Peter Green's crew. 'Moonshadow', the surprise packet of the series, was seventh, 'Challenge' ninth, 'Impetuous' 11th and 'Satin Sheets' 13th.

In this race 'Ragamuffin' was two places ahead of 'Shockwave', the ugly but fast new Davidson 46-footer from New Zealand, and with the race counting for triple points it was enough to make 'Rags' the top scoring yacht of the series. 'Shockwave' was a very close second on the final points and in retrospect, her tussle with 'Rags' was the highlight of the programme. I say in retrospect because the first four races were very much dominated by that lovely maxi, 'Windward Passage', which has seen her 14th birthday but seems to get faster every year (possibly because they add more sail to her every year). With the help of her age allowance, an extra two feet on the boom and clear air at the starts courtesy of 'Siska' and 'Mistress Quickly', her rivals in the maxi class, 'Passage' blasted around the courses and obviously liked the fresh Hawaiian northeast trades. She had overall plac-

was pushed back to 12th in the long race and finished third in the series.

The overall placings 'Rags' recorded were 10-4-4-4-1 (and 7-3-1-3-1 among the team yachts), which speak for themselves. 'Shockwave's' 6-5-7-6-3 overall results were also very consistent. If 'Shockwave' had been launched in time for the New Zealand team trials, she would undoubtedly have earned selection in the No. 1 team instead of the No. 2, and that would have tightened up the team's competition a whole lot. But unfortunately for everyone else, the Australian No. 1 team was just too good all round.

In the two key classes as far as the teams competition was concerned, 'Ragamuffin' won class B with 'Challenge' a close second ('Shockwave' was third), and 'Sweet Caroline' won class C.

By the way, the Clipper Cup is not necessarily the Clipper Cup. It depends which Clipper Cup you're talking about. To explain: the series is called the Pan Am Clipper Cup but the actual Clipper Cup trophy goes to the top scoring individual boat (i.e., 'Rags') and the winning team collects the King Kamehameha trophy. Logically it should be the other way round of course, because this is basically a teams event. This year, incidentally, the 33 team yachts made up just over half the total fleet.

Australian ocean racing is certainly enjoying a boom at present, after wins in the Admiral's Cup, the Southern Cross Cup and now the second Clipper Cup series in succession. But all the talk in Hawaii about being world offshore champions and favourites for next year's Admiral's Cup was a bit silly. There's not really any such thing as world champion status in offshore racing — there's just the best team at each particular series. And while the Clipper Cup is probably the most enjoyable series of the lot, we have to be objective about the IOR standard there. For instance, only the Australian and US No. 1 teams in Hawaii would rate as serious Admiral's Cup teams. And no matter what anyone says, while 'Sweet Caroline' and 'Challenge's' fractional rigs worked well in the steady trades of Hawaii, the fact remains that mastheads will dominate

Sardinia.

Since nobody appears to be making any startling design breakthroughs at the moment the real interest this coming summer will be in the performance of the new generation of fractional rigged Admiral's Cuppers. Designers, Davidson and Dubois firmly believe that their fractionals have developed to the point now where they'll be efficient over a full range of weather, though they still must be suspect in light, sloppy conditions.

Although the Clipper Cup is still not a true international competition, that takes nothing away from the Australian No. 1 team's good boat handling in Hawaii. 'Rags' deserved her overall win and 'Sweet Caroline' and 'Challenge' did well to finish one point apart in fourth and fifth place. 'Challenge' was actually the second best boat of the series. She did beat 'Shockwave' in class B, and would have finished the series with a better point-score if she hadn't dropped a lot of places in race three with a forestay failure a mile from the finish.

The second-placed US team comprised the 36ft Farr boat 'Carrie Ann V', which did well in the 1978 series as a One Tonner but now rates higher, and two hot 1980 designs fron Ron Holland. 'Tomahawk' (41ft, rating 31.5) and 'Shenandoah' (40ft, rating 30.9) are near-sisterships from California. 'Tomahawk' did particularly well in the three inshore triangles but wasn't as well up in the two longer races; she finished the series in eighth place overall (one ahead of 'Shenandoah') and third in class C. This was the Two Tonners' class, and despite some good boat-for-boat battles in class A and B, it had easily the most depth in the fleet.

It was those good results of seventh, 11th and 13th in the long race that pulled the Australian No. 2 team of 'Moonshadow', 'Impetuous' and 'Satin Sheets' up into third place for the series, from a low-profile position after the first four races. Since 'Moonshadow' was kept out of race three by a spreader failure the team's result was quite a reasonable achievement. Next in the team standings came the Kiwi No. 1 team ('Brother Dominic', 'Country Boy', 'Anticipation') and No. 2 team ('Shockwave', 'Darth

Above: Satin Sheets, Impetuous and To hauk (US Red Team) reach into the bott mark in race 2 (the first of the inshore angles). Below: Nyamba and Dynar reaching hard into the bottom mark, rac Immediately below: Nyamba is starting of the famous masthead two-tonner rou ups. Next below: the helmsman has lost

Next, it's Satin Sheet's turn to round u lose control of the kite, a few seconds Nyamba.

Best action of the series was the kit at the bottom mark (here, race 4, t triangle).

Vader', 'Snow White II'), and they were followed by the Australian No. 3 team, Canada, Hawaii, Japan and the US white and blue teams.

The Australian No. 3 team was an 11th-hour synthesis which the race organisers thought was a very good idea but which didn't impress the AYF or ORCA quite as much. On this issue the Australian yachties in Hawaii seemed to be divided between the selected-teams-only camp and the more-the-merrier camp. The team notably didn't include 'Mary Muffin', which was the official Australian reserve for the series. For that matter it didn't include 'Siska' either. It did include Peter Green's 'Nyamba' mob, who had a quiet first four races then sailed an almost hole-proof course in the long race. It included 'Dynamite 2', which retired from the long race for various reasons. And it included 'Gold Coast Express', which everyone knows about by now so there's no point in stating that she's a fast little brand new Davidson fractional One Tonner owned by a Gold Coast syndicate and sailed well in Hawaii by her crew. She's an exciting looking boat and she blitzed everyone in class D in every race.

The memories the Australian crews brought home from Clipper Cup 1980 were of steady Honolulu trades, warm waters, good start lines and courses and endless hospitality. On the debit side there were a few cases of excessive sunburn, and things called scripts which entitled one to queue for a couple of hours at the yacht club bar. Anyone who is contemplating Clipper Cup 1982 is advised to get fit first and don't bother packing the wet weather gear. Prospective navigators should get hold of Dick Hammond, David Hocking and Co., buy them a drink or two, and ask them about wind traps to windward of large volcanoes as well as to leeward.

1980 CLIPPER CUP RESULTS

Team pointscore:

1. Australia No. 1, 2886 points
2. US red, 2664
3. Australia No. 2, 2615
4. New Zealand No. 1, 2587
5. New Zealand No. 2, 2474
6. Australia No. 3, 2449
7. Canada, 2369
8. Hawaii, 2360
9. Japan, 2282
10. US white, 2254

Individual pointscore:

1. 'Ragamuffin' (Aust. No. 1) 964
2. 'Shockwave' (NZ No. 2) 962
3. 'Windward Passage' (private entry) 949
4. 'Sweet Caroline' (Aust. No. 1) 940
5. 'Challenge' (Aust. No. 1) 939
6. 'Zamazaan' (US blue) 931
7. 'Anticipation' (NZ No. 1) 904
8. 'Tomahawk' (US red) 895
9. 'Shenandoah' (US red) 877
10. 'Moonshadow' (Aust. No. 2) 874

Class pointscores:

Maxis (65.0-70.0)

1. 'Windward Passage', 994
2. 'Mistress Quickly', 992
3. 'Siska', 984

Class A (35.4-65.0)

1. 'Zamazaan' (US blue) 990
2. 'Anticipation' (NZ No. 1) 988
3. 'Mile High' (Hawaii) 971

Class B (32.5-35.3)

1. 'Ragamuffin' (Aust. No. 1) 992
2. 'Challenge' (Aust. No. 1) 989
3. 'Shockwave' (NZ No. 1) 988

Class C (28.1-32.4)

1. 'Sweet Caroline' (Aust. No. 1) 993
2. 'Moonshadow' (Aust. No. 2) 965
3. 'Tomahawk' (US red) 964

Class D (20.0-28.0)

1. 'Gold Coast Express' (Aust. No. 3) 1000
2. 'Raider' (Hawaii) 976
3. 'Tida' (Japan) 972

Race results:

	Overall	Team yachts
Race 1 (Around Oahu, 100 miles, triple points)	'Mistress Quickly' 'Siska' 'Windward Passage'	'Challenge' 'Anticipation' 'Shockwave'
Race 2 (30 mile Olympic triangle, single points)	'Windward Passage' 'Anticipation' 'Challenge'	'Anticipation' 'Challenge' 'Ragamuffin'
Race 3 (30 mile Olympic triangle, single points)	'Windward Passage' 'Mistress Quickly' 'Siska'	'Ragamuffin' 'Anticipation' 'Zamazaan'
Race 4 (30 mile Olympic triangle, single points)	'Unchu' 'Windward Passage' 'Challenge'	'Unchu' 'Challenge' 'Ragamuffin'
Race 5 (Around-the-State, 775 miles, quadruple points)	'Ragamuffin' 'Zamazaan' 'Shockwave'	'Ragamuffin' 'Zamazaan' 'Shockwave'

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BIGGLES' COLUMN

The large new fleet of Admiral's Cup hopefuls built in Australia has attracted a lot of attention both locally and overseas, but no one seems to have any clear idea of what is fuelling this upsurge in construction of Division One racing yachts. Is it the sweet smell of success from the 1979 Admiral's Cup, or something more mundane? *Modern Boating and Seacraft* magazine suggests that the demise of level rating racing in Australia may be partly responsible — that and the fact that a minimum rating (30.0') Admiral's Cupper is not all that much more expensive than, say, a 1-tonner (that is, not if 20 or 30 grand does not make you blink).

Bob Ross and Sandy Peacock, writing in *Australian Sailing* magazine, referred to the phenomenon as 'the IOR Explosion' and went on to speculate on the success of IOR measures to stabilise the Rule and outlaw extreme design trends. Well, I cannot see where the Rule has stabilised at all if the continuing stream of bulletins from the Offshore Racing Council is any guide. A stable rule, in any case, is not ORC policy, and as for extreme design trends, all that has happened really is an adjustment in perspective, the observer's that is.

What we thought of as an extreme design a couple of years ago we have since been conditioned to think of as normal. The fact is, the cruiser/racer has disappeared forever from top-class ocean racing, to be replaced by what we used to refer to, with a slight curl of the lip, as 'the ultra-light-displacement, stripped-out G.T. ocean racer', fancy rig and all. Any return to the heavy, under-rigged type of boat would be greeted with as big an outcry as that which accompanied the introduction of the early ULDBs back in 1977 and probably from the same people. After all, no Ferrari driver would accept a Mack truck as a replacement.

Because of the development nature of the IOR the latest boats are not expected to survive as competitive designs for more than one season, maybe two, and some are being built that way. These days, the money that was once lavished on hulls, such as that superb example of the shipwright's art, 'Koomooloo', now goes into highly engineered hardware, hydraulics, rigs and sails.

That could all change with the introduction of scantling allowance, a development which is just around the corner and one which could make the latest IOR designs just as obsolete as the IOR 1200 series (stability regulations) and the Displacement Length Factor made some of their forerunners.

* * *

Meanwhile, another area which has been active in Australia for the past year is at the top end of the IOR rating scale, the maxi yacht. Three have been launched in Australia in the last 18 months or so and the latest example of the breed is Jack Rooklyn's new 'Apollo' which has been setting some sort of construction speed record out at Aquacraft. The plans only received final approval in July, but at the time of writing in September, hull plating was complete and turnover planned for October 4th. A launch date of November 10th is the goal and 1980 Sydney-Hobart line honours is the first competitive target.

An aluminium 70-footer designed by Ben Lexcen, the new 'Apollo' hull looks very business like and has fast, graceful stern lines, a result which can only be attained when IOR measurement is not the sole design consideration. All of the drawings were done by John King and the sail plan was given a tweak in the computer by Bourke Sawyer of Watts Sails, who will supply the racing wardrobe of 20 sails.

An interesting feature of the layout is the positioning of the auxiliary diesel ahead of the mast, driving through a conventional shaft 20 feet long. Although shorter overall and of lighter displacement than 'Ballyhoo', with which she is already being compared, the new 'Apollo' carries a masthead rig six feet taller and a proportionally larger sail area. Alspar is building the rig which will be almost identical in design to that of 'Bumblebee 4'.

* * *

In Hawaii at the Pan-American Clipper Cup series, Dick Gooch did yet another phenomenal job of organisation and was rewarded with a very successful regatta. Australia defended the team's trophy successfully against an increased number and quality of entries and, as ever, the toughest part of sailing in Hawaii is the social programme, particularly if, like me, you are easily led astray.

Effectively, the programme lasted from July 28th for three weeks during which time the usual Islands' hospitality was lavished on all visitors, foreign or American, participating crew or spectators of which there were many. The latter probably had the toughest role of all, facing a bar which opened early in the morning and remained open until long after the last crew member had retired hurt. I know that my own liver was relieved to escape to sea each race day.

Even on the water not everyone took themselves too seriously. The all-girl crew of the Class C yacht 'Ruffian' crossed the line topless for the start of the big race, to the consternation of the other competitors in Class C and the disappointment of the crews who had started earlier. Everyone revelled in the sailing and social conditions, and quite a few crewmen stayed on after the series many of them sailing or flying on to San Francisco for the St. Francis Yacht Club's big regatta in September.

You will have read in detail of the success of the Aussie boats in Hawaii both as teams and as individual entries. This has led to suggestions in some quarters that the competition must have been poor, but you can forget that. The competition was there, all right, particularly in Class C; what made the Australian 'A' team so successful was that it consistently sailed to Admiral's Cup or SORC competition standards while the others were not consistent about it. You just did not see 'Challenge', 'Ragamuffin' or 'Sweet Caroline' when they were not perfectly trimmed for speed, had the right sail up and were going in the right tactical direction.

Amongst the others the big surprise was 'Nyamba'. Peter Green and his crew probably had 'Nyamba' going as well as she has ever gone (apologies to Gilbert), and they put in their strongest effort where it counted, in the long race. 'Nyamba' finished the Round-The-State Race second in class behind 'Sweet Caro-

(continued on page 24)

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Is there a case for control of hull integrity?

by Gordon Marshall
with an introduction by the
CYCA Commodore,
K.C.D. Roxburgh

Our race officers are currently very concerned about the loss of yachts, there being two currently listed as missing — Charleston, which disappeared without trace on passage from Hobart to Sydney intending to compete in last year's Southern Cross Cup Series, and Smackwater Jack, which went missing while racing from Hobart to New Zealand after last year's Hitachi Sydney-Hobart Race.

In both cases the yachts were reportedly sailing in storm conditions, and one must assume that they experienced difficulties in such an environment. I suspect we will never really know what problems these two boats encountered.

These cases and others have prompted the CYCA to form a sub-committee of the Sailing Committee to research the trend towards light design and the effect this might have upon hull integrety.

The Committee is chaired by our Rear-Commodore, Gordon Marshall, and he has chosen a very complete and experienced group of Members, including Joe Ward, Mike Fletcher, Alan Payne and Peter Joubert, to join with him in researching this subject.

The Sub-committee has the full support of the Club's Board of Directors and has been charged with the responsibility of making decision towards protecting the safety of our active racing Members and the reputation of our Club. I am confident that they well apply themselves responsibly in this arduous task, and I seek the co-operation of all Club Members, and others with an interest in our sport, to assist these committeemen in the pursuit of their enquiries.

K.C.D. Roxburgh,
Commodore

Back in 1977 the CYCA elected to research the problem of a trend towards diminishing stability in the then current design of yachts, and as a result of these efforts a limiting benchmark has been set and adopted internationally. It is pleasing to note that this design problem has now been controlled; it has ceased to be of significant concern, and there is no evidence, in the recent designs, of any immediate problems.

This was not achieved without some criticism of our Club; I am sure all Members will remember the traumas and complaints we faced at the time we implemented the controls. It seems unfortunate, therefore, that we are now about to be thrust into a similar scenario, this time in relation to hull integrity. There was early indication that the Offshore Racing Council, the world body controlling our sport, intended to legislate on the subject. We are now advised that this is not to be and, at very best, that they may merely some recommendations. The Sailing Committee feels that the situation is sufficiently urgent to warrant positive action, and we have made recommendations to the Club's Board of Directors.

So here we are, back where we started in 1977, charged with the onerous task of deciding whether our sport is off on a wrong tack, and if so, doing something about it. We might well ask, "Why us?"

There is no answer to that question, other than that we are a responsible yachting body with a lot of experience, and we should pick up the burdon. This we have done, and whilst at first sight we thought the task seemed better suited to other more august bodies, we have fortunately uncovered what might well be a source of the problem.

Early this year we received copies of minutes of a meeting of the International Technical Committee, an arm of the Offshore Racing Council. These dealt with 'scantlings', which gets to the root of our concern; the ITC had enlisted the aid of the American Bureau of Shipping. This highly respected organisation had done a good deal of work for the ITC, and in its submission recommending scantling standards, they said *"As we have no studies available dealing directly with pressures on sailing vessels, we have chosen to use the existing knowledge on bottom plating of planing vessels."*

This may have seemed a somewhat innocuous statement had we not been aware of some work being done by one of our Club Members, Peter Joubert. Peter is Professor of Mechanical Engineering at the University of Melbourne, an active ocean racer and a designer of many yachts racing in our waters.

He has documented a number of cases in which yachts have been subjected to storm conditions and survived; these give sufficient evidence of likely stresses to enable one to get a fairly clear picture of the hull loads they were subjected to. This information has been compiled into a paper which was submitted to the Society of Naval Architects and Marine Engineers in New York. Their response was an enthusiastic request to publish it. They have commented as follows: *"This is an excellent approach and one which ties together theoretical studies with actual practice, and the type of paper that this reviewer would certainly like to see published more frequently."*

To summarise Peter Joubert's findings, and at the risk of oversimplification, it might be said that whilst 'hull pressures on planing vessels' may cover the design requirements for yachts sailing in relatively sheltered waters, when a yacht encounters storm conditions and attempts to go to windward, it certainly goes beyound the realms of 'planing'. It virtually becomes a 'plunging' yacht as distinct from a planing one, and the resulting peak of load may be up to four times greater.

(next page)

A case for control of hull integrity?
(continued from previous page)

The Sub-committee presently has no al alternative but to suspect that some designers may be overlooking the need to provide for the circumstance of storm sailing, yet the clear-cut provisions for Category I ocean racing are *"... where yachts must be completely self-sufficient for extended periods of time, capable of withstanding heavy storms and prepared to meet serious emergencies without the expectation of outside assistance."*

It therefore has become clear to the Sub-committee that, in answer to the question posed in the title of this article, we must say "Yes, there is a case for control of hull integrety." In the meantime, however, much work will need to be done in translating that opinion into a workable proposition. Present thinking suggests that probably 12 months' notice of implementation will be necessary, and that initially only Category I races will be affected.

Interested parties might do well to study Peter's paper, which is reproduced in this issue of Offshore.

Strength of bottom plating of yachts

by P.N. Joubert

There are no studies available dealing directly with pressures on the bottom plating of yachts. By analysing the loads required to deform or cause failure in bottom plating, it is possible to gain some idea of the values of these pressures. Seven cases of yachts which suffered either deformations or failures are examined. It is concluded that bottom pressures on yachts of 40' LOA may be greater than 17psi, but yachts desighed to withstand pressures of 21psi should not suffer failures.

Introduction

In a report to the International Technical Committee of the Offshore Racing Council dated 30 October 1979, which deals with the problem of scantlings for ocean racing yachts, the authors of the report, the American Bureau of Shipping, state "As we have no studies available dealing directly with pressures on sailing vessels we have chosen to use the existing knowledge on bottom pressures of planing vessels." They then applied these planing-derived pressures (see Appendix I) to the design of the bottom plating. The view taken in this paper is opposite to that expressed and stems from practical experience of failures of bottom plating in ocean racing yachts. By examining a number of such failures, a better idea of bottom plating loadings may be obtained.

Examples of failure of bottom plating

Case 1

In November 1968, the yacht Odin, while beating to windward in the Tasman Sea near the Tasmanian coast, in winds of 45–65 knots, suffered large-scale denting of the bottom plating. The deformed area was located just forward of the main saloon and on one side of the vessel between the keel and the waterline.

Case 2

In December 1970, the yacht Pacha, while beating to windward in the Tasman Sea near the Tasmanian coast, in winds of 45–65 knots, suffered large-scale deformation of the bottom plating over an area which extended aft from the forward station to amidships and laterally from the keel to the waterline on one side.

Case 3

In December 1968, the yacht Boomerang VII, while beating to windward in eastern Bass Strait in winds of 34–45 knots, suffered large-scale internal delamination of the foam-sandwich-constructed bottom plating. The damaged area extended from station 10 to station 5 and from the keel to above the waterline.

Case 4

In December 1970, the yacht Destiny II, while beating to windward in the same Sydney-Hobart Yacht Race as Pacha (Case 2), suffered a transverse crack in the plywood bottom plating at a position where a strong bulkhead was joined to the skin.

Case 5

In the One Ton World Series held in New Zealand in 1977, the yacht variously called Pioneer Sound, B195, and Magic Pudding, while beating to windward in a fresh breeze, suffered a bottom failure in the form of a transverse crack in the bottom skin, under the main bulkhead.

Case 6

The same yacht, after it had been strengthened with additional ribs and while competing in the 1977 Sydney-Hobart Race, suffered a further failure in the bottom panels. On this occasion the wind strength was 40–50 knots and at the time of the failure the yacht was beating to windward. A longitudinal crack opened up in the skin; its length was close to 36". The yacht retired from the race.

Case 7

The aluminium yacht Mary Blair, while beating to windward in a gale in Banks Strait off the northeast point of Tasmania in 1972 suffered extensive deformation of the bottom plating. The deformed area extended over the same portion of the hull as with Pacha (Case 2).

These 'failures' in the engineering sense (which includes deformations) all occurred while the yachts were beating to windward. They were undoubtedly due to impact loads resulting from the yacht becoming partially airborne as it left the crest of an approaching wave and falling into the following trough, a vertical distance (unmeasured) of possibly 10 feet or greater.

It is suggested that these impact loads are well in excess of those experienced while planing. A vessel designed to the latter criteria may well suffer bottom plating failure if forced to beat windward in a gale.

The loads on the bottom plating for the seven cases under study can be calculated from a knowledge of the construction in each case.

Calculation of bottom plating loads

A brief description of the six vessels is given in Table 1.

Case 1, Odin

The bottom plating of 3/16ths thick mild steel is supported by frames at 18" centres and stringers at 12" centres. However, in the deformed region one stringer was missing between adjacent frames giving a panel size of 18"x 24" Hence we have a case where, under the same load, part of the structure failed but the other parts did not. This will establish the upper and lower limits between which the actual load must lie.

Since there was no permanent deformation of the frames or longitudinal stringers, an approximate and conservative value for the loading of the plating can be found from the analysis of Timoshenko and Woinowsky-Krieger.[1] On page 245 [of this reference] Table 56 gives (where a and b are the dimensions of the plate):

$$M_{max} = \text{factor } pl^2$$

where p is the uniformly distributed load per unit area (pressure); [ℓ] is the spacing of the stringers (the shorter distance of a or b) and the factor depends on the aspect-ratio of the plate. M_{max} is the maximum moment per unit of width.

Table 1.

Case No	Yacht	LOA	Displacement	Construction	Designer	Remarks
1	Odin	39ft	20,000lbs	Steel	T.& M. Halvorsen	Sistership to Freya which was three-times winner of the Hobart Race.
2	Pacha	54ft	31,000lbs	Aluminium alloy	Nicholson	Winner of the 1979 Hobart Race.
3	Boomerang VII	42ft	15,000lbs	sandwich of foam and fibreglass	Joubert	Second in the 1968 Hobart Race.
4	Destiny II	42ft	15,000lbs	Plywood and oregon pine	Joubert	Sistership of Boomerang VII
	Pioneer Sound (B195, Magic Pudding)	37ft	9,000lbs	Softwoods	Peterson	Best performed yacht 1978 Pan Am Clipper Cup Series, Hawaii.
7	Mary Blair	41ft	24,000lbs	Aluminium alloy	Warwick Hood	Sailed unscathed through cyclone in 1971 Brisbane to Gladstone Race.

The yield point of mild steel may be taken as 40,000 psi and stress =

$$\sigma_{max} = \frac{6M_{max}}{t^2}$$

where t is the plate thickness. Therefore, for the panel measuring 18"x12", the load to give deformation is found as follows:

$$40{,}000 = \frac{6 \times 0.0757 \times p \times 12^2}{(0.1875)^2}$$

Thus, p = 21 psi (this panel did not deform). For the deformed panel the failing load is:

$$40{,}000 = \frac{6 \times 0.0690 \times p \times 18^2}{(0.1875)^2}$$

$$p = 10.5 \text{ psi}$$

(Note: this figure can be shown to be low. See 'discussion', paragraph (II) at the end of this paper.

The obvious conclusion in this case is that load was between 10.5 and 21 psi.

Case 2, Pacha

Yachting World (April 1969) shows drawings and details of this aluminium yacht. The 3/16" thick bottom plating had stringers spaced at 15" and frames at about 24". When the yacht was slipped after the Sydney-Hobart Race, permanent deflections of the plating were measured and found to be up to 2" maximum, in the centre of the panels.

The yield point for aluminium is not so sharply defined as that for mild steel. However, since the permanent deformation was considerable, a value for the 0.2% proof stress of 34,000 psi may be taken as being a reasonable one.

$$\text{Then } p = \frac{34{,}000 \times 0.1875^2}{6 \times 0.0780 \times 15^2}$$

$$= 11.3 \text{ psi}$$

Case 3, Boomerang VII

This yacht was one of the first to be built in Australia using foam sandwich construction. The fibreglass skins of random glass mat bonded with polyester resin were 3/16" in thickness. The plastic foam core was of 3" thick Daycell (PVC foam) with a shear strength of 100 psi. The inner and outer skins were joined at regular intervals with fibreglass webs, spaced at 12" between longitudinals and 21" between transverse webs. Thus the core was divided into cells. Bulkheads were arranged at particular stations along the hull. In the original design, top-hat section ribs were called for at each 21" spaced station. However, the builder, who was also the owner, thumping his fist against the stiff hull surface, decided to delete these items.

Hence, the panel dimension between the bulkheads where failure occurred was 42". The fine width of this panel may be treated as infinite initially and a 42" length of skin of unit width considered.

As shown by Vidosic[2] on page 531 [of that reference], the maximun shear force per unit width can be stated as follows:

$$V_{max} = \frac{p\ell}{2}$$

and for the present situation Plantema[3] indicates that the nominal shear stress on the core is reasonably accurate. Thus:

$$\tau_{max} = \frac{V_{max}}{t} = \frac{p\ell}{2t}$$

But the failure initiated as a shear failure in the core followed by the delamination between the core and the skins. For this particular brand of foam the manufacturer gave the ultimate shear strength as:

$$\tau_{max} = 100 \text{ psi}$$

$$\therefore p = \frac{2t\tau_{max}}{\ell}$$

$$= \frac{2 \times 3 \times 100}{42}$$

$$= 14 \text{ psi}$$

The same case was analysed using the ready prepared graphs of the Engineering Science Data Unit No. 77003[4].

In the analysis, using their notation,

$$a = 54" \text{ and } b = 42".$$

The face stiffness parameter

$$B = \left| \frac{1}{E_1 t_1} + \frac{1}{E_2 t_2} \right|^{-1},$$

$$= \frac{Et}{2}$$

Then

$$\frac{Bh}{G_{cy} b^2} = \frac{6.3.3}{32.G_{cy}.42^2} = 0.0024$$

(assuming, for want of better informati that

$$\frac{E}{G_{cy}} = 15.$$

that is, Youngs' modulus for the fibregl skin is 15 times the shear modulus of t foam core, which is a conservative assum tion.

From Figure 7 [of the previous reference] can be seen that, the quantity

$$\frac{Bh}{G_{cy} b^2}$$

is relatively insensitive to variation in assum values of E/G_{cy}.

For the isotropic material

$$\frac{G_{cy}}{G_{cx}} = 1.$$

The graphs, Figure 7 and Figure 8, th give:

$$\frac{q_{cx} d}{pb} = 0.41; \qquad \frac{q_{cy} d}{pb} = 0.48;$$

$$q_{cx} = 5.40p; \qquad q_{cy} = 6.32p.$$

giving failure in the larger side as exp ted.

If the allowable $q_{cy} = 100$ psi, then p 18.5 psi.

Case 4, Destiny II

This yacht was a multi-chine plywood skinned version of the 'Wombat' design, similar in shape to Boomerang VII. The marine grade plywood was ½" thick and supported 1¼"x 1¼" oregon pine stringers spaced at 12" centres. Frames measuring 3"x 1", or bulkheads, were spaced at 31" centres. The distance between the keel and the first chine was 36" at station 6 where failure occurred.

The transverse failure suggests that the bottom panels were deflecting between the transverse frames (of frames and bulkheads), hence this larger panel (made up of the plywood skin and longitudinal stringers) needs to be considered in the bending formula. The panel dimensions would thus be 21"x 36". The rupture stress for the plywood is about 10,000 psi while the crushing stress for the oregon in compression is 7000 psi.

Since the plywood has about half the veneers orientated in the wrong direction, its stiffness is reduced to about half that of the oregon stringer. Therefore, in calculating the moment of inertia and position of the neutral axis, a 6" width of plywood was assumed to be effective. The distance $\bar{y}_{skin}$ from the neutral axis to the edge of the skin was found to be

$$\bar{y}_{skin} = 0.55"$$

$$\text{and } \bar{y}_{stringer} = 1.02"$$

and the moment of inertia about the neutral axis can be shown from

$$I_{NA} = 1.05 \text{ ins}^4$$

Using the analysis of Vidosic[2] for a 12" wide strip without edge support

$$M_{max} = \frac{p\ell^2}{12},$$

$$\text{and } \sigma_{max} = \frac{M_{max} \cdot \bar{y}_{stringer} \cdot \text{width}}{I_{NA}}$$

$\bar{y}$ stringer was used since failure initiated in compression. This gives

$$p = \frac{12\sigma \cdot I_{NA}}{12\ell^2 \cdot \bar{y}_{stringer}}$$

$$= \frac{7000 \times 1.05}{21^2 \times 1.02}$$

$$= 16.3 \text{ psi}$$

Once the stringer had failed in compression, the skin structure would be reduced in effectiveness until finally the split occurred in the outer fibres of the plywood.

Case 5, Pioneer Sound (B195, Magic Pudding)

This yacht was skinned with Australian softwoods. Four layers of 1/8" thick veneers were used. The inner layer was of red cedar and the remaining layers were of King Billy pine. The veneers were arranged diagonally between layers and glued together to form a moulded plywood skin. Spruce stringers were spaced at 14" centres. One bulkhead was positioned a further 5ft aft.

The main loadings occurred in the bottom panels of this 5ft section, as evidenced by the failure, and thus the linear bending theory is applied to this area. This is a crude assumption because of the large curves in the panel over the 5ft length, and a very low result was to be expected of the analysis.

Since the outer veneer cracked in a direction at 45° to the grain and the crack was transverse, a rupture of, say, 2000 psi would be a realistic value. Then,

$$p = \frac{2000 \times 0.5^2}{6 \times 0.083 \times 60^2}$$

$$= 0.3 \text{ psi}$$

which is a very low result (see Discussion, par. IV, at the end of this paper).

Case 6

The same yacht as in Case 5 was fitted with extra spruce ribs in the forward section spaced at 15" centres. The skin panel was reduced in size to 15"x 14", but failure again occurred, and the linear theory now gives:

$$p = \frac{2000 \times 0.5^2}{6 \times 0.059 \times 14^2}$$

$$= 7.2 \text{ psi.}$$

(See Discussion, par. VI at the end of this paper, from which the conclusion can be drawn that the bottom load must have been greater than 7.2 psi but less than 28 psi.)

Case 7, Mary Blair

The skin thickness of Mary Blair was 3/16". Longitudinal stringers were spaced at 12" centres and frames at 48" centres except in the fore part of the yacht where the spacing was reduced to 24". The maximum measured deformation was about 3⅛". Hence by the linear bending analysis and referring to Case 2, we get:

$$p = \frac{34{,}000 \times 0.1875^2}{6 \times 0.0829 \times 12^2}$$

$$= 16 \text{ psi}$$

(See Discussion below.)

Discussion

(I) The stress-strain characteristic of mild steel shows a sharply defined yield point compared to aluminium alloy. Therefore, it provides a good case for determining bottom plating loads.

(II) The linear bending theory of Timoshenko assumes flat panels and deformations of the same size as the plate thickness. Larger deformations involve higher loadings than calculated by this theory. These higher loads arise from membrane stresses in the plate. The larger plate which deformed on Odin contained measurable curvature so the value of 10.5 psi calculated for the uniformly distributed load is conservative. As well, the deformation in the centre of the panel was about 3/8" and thus membrane stresses would be present. The loading should be increased accordingly. The smaller panels which did not deform were closer to being flat so the pressure calculated for deformation would be more accurate.

(III) The deformations suffered by Pacha (up to 2") were so large that membrane stresses would have played a larger part in the process than the stesses due to bending. Therefore, the answer calculated by the linear bending theory is far too low. Since the yield point of the particular grade of aluminium used is not known (it could be as low as 20,000 psi) the calculated result would have wider uncertainty than that for Case 1.

(IV) Once the skin had failed in the catastrophic sense, that is, ruptured rather than deformed, it is possible to determine a failing load. However, this load may not be the greatest one imposed by the sea upon the bottom plating as was true in the cases under study. The loads calculated for cases 3, 4, 5 and 6 involve such catastrophic failures.

(V) The first calculation for Boomerang VII neglects the finite width of the panel, whereas the second alternative calculation includes such an effect. Therefore, the higher value resulting from the second calculation is likely to be more correct.

Again, the calculation of bottom pressure for Destiny II is liable to be somewhat conservative as the fine width of the panel has been neglected.

(VI) Case 5, Pioneer Sound, showed a very low result, but the answer from linear theory is incorrect because of significant double curvature effects. These effects add considerably to the strength and thus the load required for failure. Further, since the bottom plating was largely unstiffened, it would buckle initially. Stresses in the plating thereafter would be due to membrane effects as well as from bending.

After Pioneer Sound had been stiffened, it still suffered a catastrophic failure (Case 6), but this time the calculation is more meaningful because of the reduced panel size and the lesser effects due to curvature. This yacht was again strengthened by doubling the number of stringers. With the panel size now reduced to 15"x 7", it suffered no further failures. The pressure to fail a bottom panel was now increased to 28 psi. However, ill luck followed Pioneer Sound; it was later burnt to the waterline.

The first stiffening of Pioneer Sound (panel size 15"x 14", t=½) brought its construction very close to that of a yacht Charleston, which disappeared in a gale which blew in eastern Bass Strait during December 1979. Charleston, with a panel size of 17½"x 12" and a softwood skin of thickness 9/16" would have suffered ultimate failure at a uniformly distributed pressure of 10 psi according to this analysis.

(VII) For Mary Blair, the permanent deformations of 3/8" were more than twice the skin thickness, so membrane stresses should be added to the calculated loading. The value of 16 psi is, therefore, a conservative one.

Conclusion

Bottom panel loads on yachts beating to windward in a seaway develop pressures greater than 17 psi. However, on the basis of this sparse evidence, it would seem that yachts

(next page)

Bottom plating of yachts

(continued from previous page)

designed to withstand pressures of 21 psi should not suffer such failures.

Pressures calculatied for planing vessels are far too low and should not be used in design of bottom panels for yachts.

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Acknowledgement Most useful discussion with my colleagues, L.K. Stevens and K.C. Brown, who are more knowledgeable on structural matters.

Biggles' Column

(continued from page 15)

line' and fifth overall, having given some hot new boats and crews a sailing lesson.

The most significant pointer to the increasing importance of the series in North American eyes was the attendance of many of the U.S.A.'s professional yachting 'establishment'. Lowell North steered on 'Ragamuffin'; Chris Bouzaid, who is now President of Hood Sailmakers Inc., shared the helm of 'Moonshadow' with Jock Sturrock (a pretty formidable combination that); Buzz Betcher was on 'Checkmate'; Bourke Sawyer steered 'Shenandoah'; "Commodore" Tomkins was on 'Zamazaan', initially with Andy Rose who was temporarily unemployed at Newport and at the Bar, legal variety that is.

Many of the faces normally to be seen at SORC, the Onion Patch, Cowes and occasionally at the Southern Cross Cup were in evidence. Peter Bowker was calling the shots on 'Mistress Quickly' along with Syd Brown, while Don Vaughn, Rob Sterling and Mike Farley were all on 'Windward Passage'.

'Passage' had a very successful series marred by a bizarre incident following a crew dinner in which co-owner Fritz Johnson was shot in the stomach by a local denizen he had bested at the pool table. Brother Mark Johnson flew out to Hawaii to take charge, the boat continued to race, and within 12 hours of the shooting the crew were wearing T-shirts emblazoned, "At sailing we're hot but at pool we're shot". Fritz was in a serious condition for a while but improved enough to put in a shaky appearance at the prize-giving.

(continued on page 26)

(continued from previous page)

$$APSLC = \frac{GSDA}{VHAI - VHA - V + FA - FAI}$$

Use APSLC for APSL from Here

Use VHA+V for VHA from here

For boats with hull dates 1980 and before:

Where AGQ > .15 LBG

Add lesser of 0 or $2(VHA+V) - \frac{GD}{2} - Y$ to AOCP

For boats with hull dates 1981 onward:

The lesser of (0.0 or .15LBG-Y) shall be added to AOC.

Biggles' Column *continued from page 24)*

A marine court of enquiry held in the beer tent into the 'Condor' wreck, presided over by the Hon. P. Bowker and attended by some more or less upright citizens of the sea. Documantary evidence was brought forward, much of it borrowed from Playboy, which purported to demonstrate that the geographical position of a certain reef had been tampered with.

One witness was denied a hearing because he was too obviously sober and actual eyewitness evidence was not acceptable because the presiding judge had already made up his mind and did not want to be confused by facts. In the final judgement the court exonerated the 'Condor' crew on the grounds that the offending reef had been shifted 25 miles out of position, probably by the fiendish Chinese.

One of the 'Ragamuffin' crew telephoned Tony Ellis at around 2 a.m. to say he was in jail, had no money and could Tony come down right away and bail him out, then hung up without giving further details. Ace, who had gone to bed somewhat the worse for wear, responded generously. Collecting his available cash and traveller's cheques he spent hours in a taxi touring the Honolulu area police stations looking for the wayward crew member only to discover him in his hotel bed some hours later. Ace was not amused until several Budweisers loosened up his sense of humour.

SAFETY SEMINAR

with David Kellett

This column has been introduced to help members understand their safety equipment and uses. In future issues I hope to present reports on equipment, interesting anecdotes, and give a generalised run-down on the equipment required aboard our offshore yachts.

I would like to point out to all those competing in the next Sydney-Hobart Race and other CYCA Category 1 races that Emergency Position Indicating Radio Beacons (EPIRB) and radar reflectors are compulsory equipment, with the radar reflector having to be hoisted a minimum of four metres above the deck level for the duration of the race.

On 28th June this year, the Offshore Safety Committee of the Yachting Association of NSW carried out an exercise offshore in an attempt to satisfactorily recommend types of equipment for the offshore yachtsman. The equipment tested included the available lights for attachment to danbuoys and radar reflectors immediately available on the market.

Using the vessels M.V. Marabou and M.V. Colour Seven, tests were carried out five miles offshore in a northwest wind gusting 30 knots with the sea condition being confused and choppy. Visibility could be considered excellent with little to no cloud cover. Tests were undertaken after 7p.m. with a full moon.

Three types of radar reflectors were tested:
1. a standard triangular reflector
2. a cylindrical reflector
3. a string of pie eidhses.

The reflectors were hoisted to a height of approximately 12 feet from water level at intervals and were tested at mile intervals until neither Colour Seven nor the reflectors were detectable.

Between one and five miles the reflectors illustrated slightly different qualities but nevertheless enhanced the characteristics of the timber Colour Seven vessel. The observers did not draw any conclusions until a position of five miles when the standard triangular reflector when hoisted did not improve the ability to locate Colour Seven on the radar screen, the pie dishes reflected an occasional image and the cylindrical reflector gave a fairly regular image.

At six miles the images were visible but weaker. At seven miles the standard triangular had no image at all, as did the pie dishes; however, the cylindrical reflector did give a very faint occasional image.

Ten lights were tested, deployed from the stern of Colour Seven with six observers at deck height (approximately four feet above water level) and two observers at Pilot House level (approximately eight feet above water level) on Marabou.

Out of the 10 tested, one leaked and one didn't work, leaving an assortment of strobe lights, fixed lights and flashing lights. The first test at a one mile intervals showed most lights virtually useless. The only light that could be seen without too much difficulty was the fixed white light. The flashing could not be seen effectively because of sea conditions and the strobe with brighter but slower flashes could only be seen approximately every 20 seconds.

Tested over a half-mile range, the fixed white lights proved effective but were still very difficult to locate, even using a radar bearing for general visual direction and aided by a dark horizon. When placed against shore lights the effectiveness of all these lights must be doubted. Observers at deck level had far less effectiveness than the observers in the pilot house, a difference of four feet, so looking for a person overboard should be done from the most elevated point on the boat.

The fixed white light proved to be the most effective in the conditions in which it was used. The strobes were only effective if elevated above sea level. At a one-mile range, the chance of finding a person using any of the lights would be very slim, unless the position of that yachtsman was accurrately confirmed.

The test concluded that price does not necessarily prove to be a good guide line with respect to the effectiveness of safety equipment.

Next issue I will delve into EPIRBs. Until then, remember, "The greatest bilge pump in the world is a frightened man with a bucket". ►

The Saga of the Navigator's Apprentice

a narrative which, like a pleasant cruise, occasionally wanders off the beaten track

by Hedley Watson

The breeze blew steadily from the northeast as 'Weatherly' headed north on starboard tack, reeling in the miles towards Port Nearly.

First Mate Bob Cheerful had the helm, and Frank Eager was continuing his study of the art of position fixing. His Master, Bill Weatherly, held forth earnestly, as he bent over the chart, laying off the course being steered. "It is important," he said, "that your course line be marked on the chart on a coasting voyage like this, as it is an easy matter to be set inshore, and the course line is our early warning system. This is particularly so in the present case, when the best course we can sail is converging slowly on the coast. I've said before that the navigator's best friend is his eye, and certainly our sense of distance is our best warning if we get too close to potential danger. With a converging course, however, our natural defences are down, as it were, because we *expect* our distance off to decrease."

He ran his finger up the chart, just off the coast. "See how the 10 metre line stays clear of all dangers. By watching the depth sounder, we can ensure that we tack at the right time, whether we can see the shore or not. Now then young fellow," he continued, "let's consider the lunch menu."

Frank received this suggestion with great cordiality being of an age when three meals a day barely held body and soul together. As breakfast had been light and a little hurried because of sailing at that time, they resolved to have a substantial midday meal. Bob Cheerful was consulted as to his preference, and the popular vote was for lamb chops and gravy, with boiled potatoes and peas. Frank was delegated to handle the potatoes and peas while Bob volunteered to man the galley stove when he was relieved from his helm duties.

While all this proceeded, the ketch was herself proceeding in fine style, sails drawing fully, plunging along with just the occasional spray along the weather deck.

Bill took a set of compass bearings to fix their position again, and read the log and depth sounder. The hour was 1045, just 60 minutes after his previous fix. His computation told him that the adverse current was less than a half-knot, as his distance made good over the ground was only slightly less than the distance recorded on the log. His bearings put him on the course line, and his position was confirmed by the echo sounder. He extended the course line to the 10 metre line and measured the distance to go with his dividers. "Three miles," he said to himself. "I'll let her go another half-hour, and then tack out for half an hour. Then I'll be able to tack back on to starboard in nice time for lunch."

He communicated those decisions to Bob and, the breeze remaining steady from the NE, in a half-hour's time 'Weatherly' changed her course to gain more sea room.

Bill's manoeuvre allowed the crew to eat their lunch without being disturbed. First Mate Bob proved to be a dab hand in the galley, and his efforts were pronounced first class. The gravy was mopped up with bread and the whole washed down with excellent coffee.

By 1.30 p.m. all had been cleared away, and with Bill on the wheel, it fell upon Frank to perform the function of navigator. Bob Cheerful had gone to his bunk, to make sure he was rested for the night watches ahead. Bill allowed Frank to fix their position undisturbed. They had a good offing at this time, so any errors would be somewhat less than serious, and easily remedied.

Frank handled the hand-bearing compass with confidence, and at 2.00 p.m. soon had three bearings of landmarks ashore – a hill and two points of land. He took care to use points of land which fell away abruptly to the sea rather than those which sloped away gradually, so that he could the more easily identify on the chart the actual spot which he had observed.

He wrote down his bearings on the chart, as he had seen Bill do, then applied the compass error thus:

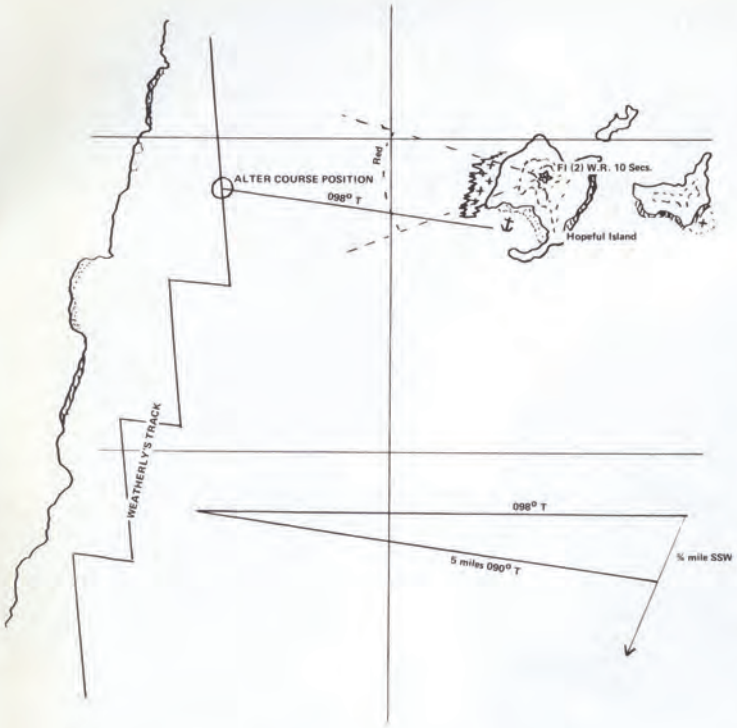
Point Low	205° comp.	Dark Hill	263° comp.	High Point	308
Variation	+10° E	+	10° E	+	10
=	215° True	=	273° T	=	318

'Weatherly' was constructed of timber, thus non magnetic, and Frank had been careful to stand away from other sources of magnetic interference as he took his bearings, these being the standing rigging of galvanised steel and the instruments and loudspeaker which were located close to the companionway. He was confident then that little, if any, magnetic deviation had affected his bearings.

In fact, his bearings crossed admirably, and were confirmed by log reading and depth sounding once more, so he returned to the deck feeling perhaps six inches taller than normal, and believed Bill at the wheel. Bill took the opportunity to make a round of the deck and check the running and standing rigging. All appeared well, so he retired below to listen to the weather forecast on the radio, and to plan the voyage for the night hours.

Some 10 miles ahead, and another 10 miles offshore lay the Hopeful Islands, a group of three delightful isles which 'Weatherly' had often visited. There was good anchorage, well protected from the prevailing NE breeze, but open to a southerly. The weather forecast, however, was fair, so Bill was considering a short visit on their way. Their arrival would be after dark, but a pleasant night would ensue, and in the morning some fishing and swimming, even a stroll ashore, would brighten the voyage. Mind made up, he turned to the chart again to calculate the tacking point. The set running more strongly offshore, it behoved them to make their northing on the coast, altering course just at the right time to lay the islands nicely.

Bill knew from the earlier bearings that at three to four miles offshore the set was running to the SSW. at half a knot.



He estimated that further offshore it would reach one knot. To over-estimate would mean too great an allowance and bring the ketch in on the reefs that fringed the NW coast of the island, instead of to the anchorage (see sketch).

On a vacant part of the chart, he drew in the true course possible on a port tack – in this case due east. He made the line five miles long to represent the five knots speed of the boat. Then from the eastern end of the line he drew in the current to the SSW. for three-quarters of a mile. This done, he completed the triangle with a line that represented (he hoped) the course that would be made good over the ground while they made their easting to the island. The angle to the meridian measured, he transferred the line across the chart, drawing it in reverse from their anchorage destination across to the coast. Now he knew that he should tack on to port when that line was reached, not before, or he would be fighting the strong set offshore, and not earlier, as he would have overlaid the mark.

He woke Bob Cheerful then to acquaint him with the change of plans. Bob checked the chartwork, and agreed with his skipper's calculations and, the watch changing, they continued their steady progress up the coast.

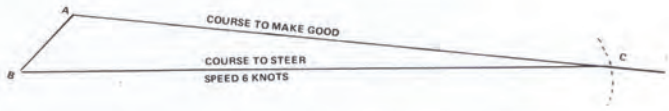
As the afternoon wore on, the breeze showed a tendency to back towards the north until suddenly, without a great deal of warning, it shifted abruptly into due north and freshened to about 15 knots. "Blast!" complained Bill. "Now we've overlaid the island. I would have tacked half an hour ago if I had known this was coming. Bring her about, quickly, now!".

His two companions had beaten him to it, though, and the helm was already over and the sheets changing before he had finished the order.

"Take the wheel, Bob, and keep her hard on port tack until I can reset the course. Come with me, Frank." Bill led the way below.

"Notice," he said, "that we can now lay the island with eased sheets, but we must allow for the current also. This is how it's done. We are here (he marked the spot) and we wish to be here." He drew the line from their position to the anchorage. "To allow for the set, I draw it in now, away from our position, and then I step off our speed from there to the course line. When I join these two points, there is our course to steer, 070° True".

This is what Bill did.



AC = Course to make good.
AB = Current SSW. @ ¾ knot.
BC = Speed through water = 6 knots (sheets eased).
BC = Also the course to steer = 070°

This means that if 070° True is steered, then the course from A to the anchorage will be made good.

Frank returned to the deck and relayed the course to Bob, then set about trimming the sails to the new heading. The little craft was fairly flying now, loving the easing of the sheets. Six knots and more were showing on the speed indicator, and the islands ahead were soon showing clearly, despite the gathering gloom. Hopeful Island light was soon visible, showing two bright flashes every 10 seconds. Frank took a bearing of the light and drew it on the chart, making their progress according to the log. He read the description of the lights which stated Gp. F1.(2)WR 10 secs, and saw how the arc of the light which showed red (R) shone over the reefs of the SW. point.

It was clear to him that so long as the light showed white, they would be clear of the reefs and that the appearance of the red light would be a good warning.

By the time the anchorage was close, it had grown dark, so that only the bulk of the island, supporting its flashing beacon could be made out. Now however, they came under the lee of the land, so that the sea flattened and the breeze deteriorated into fitful puffs which headed them whichever way they turned. Bill had anticipated this, it being a common occurrence in land locked bays such as this, and started the engine. The sails came down quickly, and were neatly furled. The anchor was prepared, and they crept slowly in, Bill noting by eye the relation of the encompassing headlands and watching the depth sounder as it displayed the quickly reducing depths.

In six metres, the anchor was let go, and a good scope veered. Navigation lights out, and the anchor light hoisted, Bill took what bearings he could in the darkness, and marked their position on the chart. Their ground tackle had been checked and all shackles moused before they left port. There was plenty of chain on the bottom and he was mainly concerned that the anchor was holding well on the bottom.

This being to his satisfaction, the trio retired below, to dine and yarn before turning in for the night.

To be continued

Nautilus

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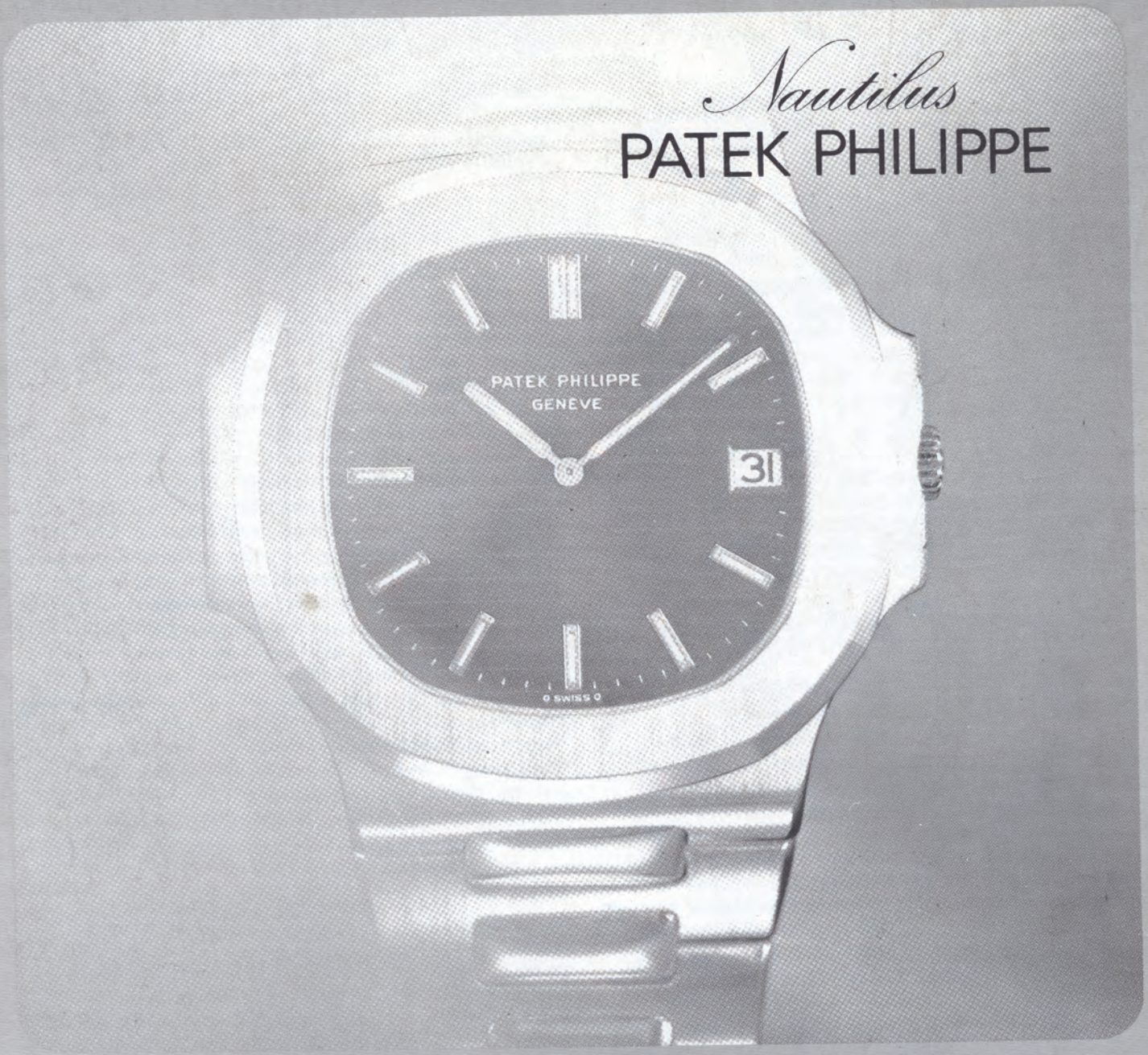

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