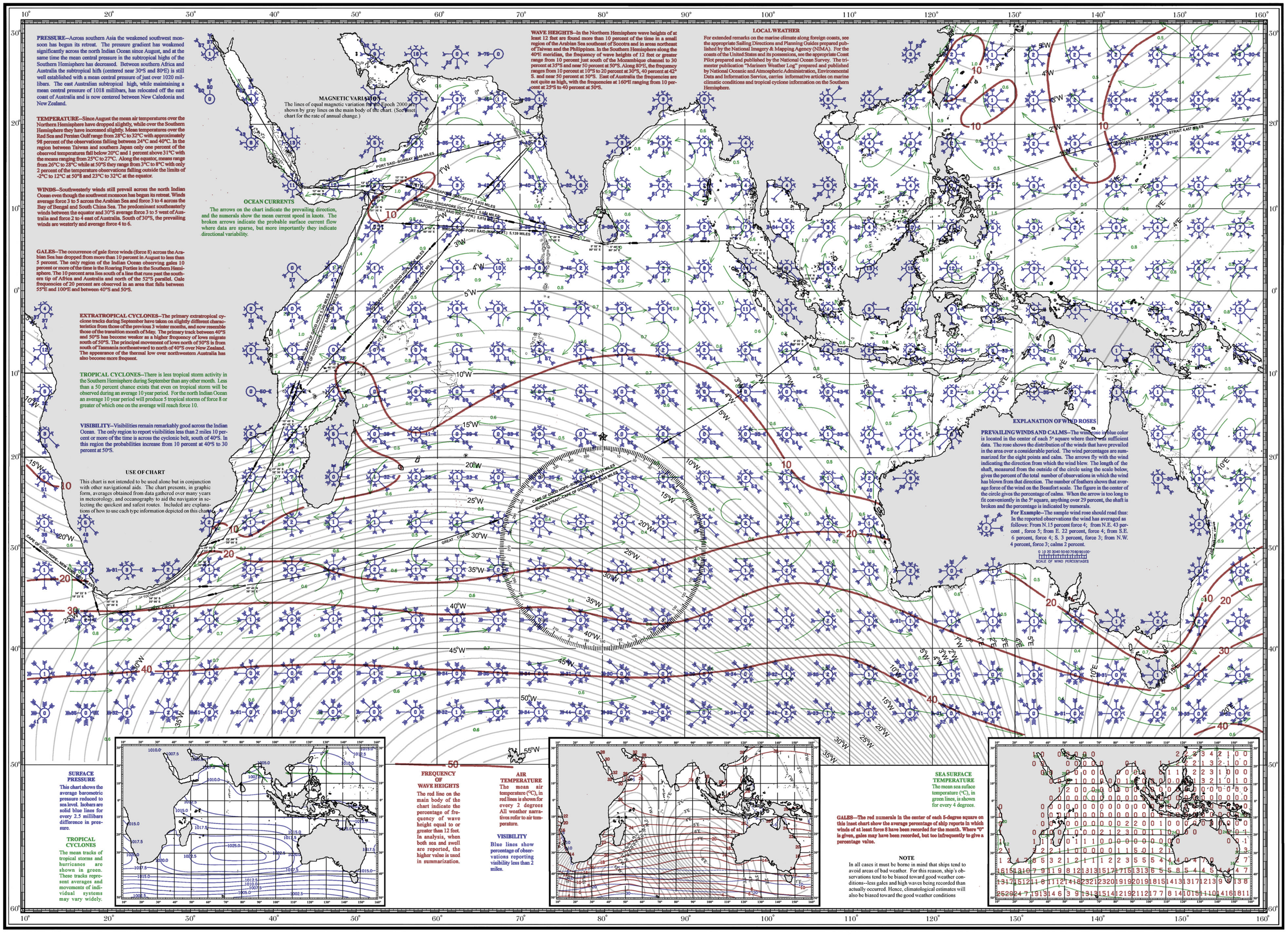
PILOT CHART OF THE INDIAN OCEAN

SEPTEMBER



PRESSURE—Across southern Asia the weakened southwest monsoon has begun its retreat. The pressure gradient has weakened significantly across the north Indian Ocean since August, and at the same time the mean central pressure in the subtropical highs of the Southern Hemisphere has decreased. Between southern Africa and Australia the subtropical hifh (centered near 30°S and 80°E) is still well established with a mean central pressure of just over 1020 millibars. The east Australian subtropical high, while maintaining a mean central pressure of 1018 millibars, has relocated off the east coast of Australia and is now centered between New Caledonia and New Zealand.

TEMPERATURE—Since August the mean air temperatures over the Northern Hemisphere have dropped slightly, while over the Southern Hemisphere they have increased slightly. Mean temperatures over the Red Sea and Persian Gulf range from 28°C to 32°C with approximately 98 percent of the observations falling between 24°C and 40°C. In the region between Taiwan and southern Japan only one percent of the observed temperatures fall below 20°C and 1 percent above 31°C with the means ranging from 25°C to 27°C. Along the equator, means range from 26°C to 28°C while at 50°S they range from 3°C to 8°C with only 2 percent of the temperature observations falling outside the limits of -2°C to 12°C at 50°S and 23°C to 32°C at the equator.

WINDS—Southwesterly winds still prevail across the north Indian Ocean even though the southwest monsoon has begun its retreat. Winds average force 3 to 5 across the Arabian Sea and force 3 to 4 across the Bay of Bengal and South China Sea. The predominant southeasterly winds between the equator and 30°S average force 3 to 5 west of Australia and force 2 to 4 east of Australia. South of 30°S, the prevailing winds are westerly and average force 4 to 6.

GALES—The occurrence of gale force winds (force 8) across the Arabian Sea has dropped from more than 10 percent in August to less than 5 percent. The only region of the Indian Ocean observing gales 10 percent or more of the time is the Roaring Forties in the Southern Hemisphere. The 10 percent area lies south of a line that runs past the southern tip of Africa and Australia and north of the 52°S parallel. Gale frequencies of 20 percent are observed in an area that falls between 55°E and 100°E and between 40°S and 50°S.

EXTRATROPICAL CYCLONES—The primary extratropical cyclone tracks during September have taken on slightly different characteristics from those of the previous 3 winter months, and now resemble those of the transition month of May. The primary track between 40°S and 50°S has become weaker as a higher frequency of lows migrate south of 50°S. The principal movement of lows north of 50°S is from south of Tasmania northeastward to north of 40°S over New Zealand. The appearance of the thermal low over northwestern Australia has also become more frequent.

TROPICAL CYCLONES—There is less tropical storm activity in the Southern Hemisphere during September than any other month. Less than a 50 percent chance exists that even on tropical storm will be observed during an average 10 year period. For the north Indian Ocean an average 10 year period will produce 5 tropical storms of force 8 or greater of which one on the average will reach force 10.

VISIBILITY—Visibilities remain remarkably good across the Indian Ocean. The only region to report visibilities less than 2 miles 10 percent or more of the time is across the cyclonic belt, south of 40°S. In this region the probabilities increase from 10 percent at 40°S to 30 percent at 50°S.

USE OF CHART

This chart is not intended to be used alone but in conjunction with other navigational aids. The chart presents, in graphic form, averages obtained from data gathered over many years in meteorology, and oceanography to aid the navigator in selecting the quickest and safest routes. Included are explanations of how to use each type information depicted on this chart.

MAGNETIC VARIATION

The lines of equal magnetic variation for the Epoch 2000 are shown by gray lines on the main body of the chart. (See inset chart for the rate of annual change.)

OCEAN CURRENTS

The arrows on the chart indicate the prevailing direction, and the numerals show the mean current speed in knots. The broken arrows indicate the probable surface current flow where data are sparse, but more importantly they indicate directional variability.

WAVE HEIGHTS—In the Northern Hemisphere wave heights of at least 12 feet are found more than 10 percent of the time in a small region of the Arabian Sea southeast of Socotra and in areas northeast of Taiwan and the Philippines. In the Southern Hemisphere along the 40°E meridian, the frequency of wave heights of 12 feet or greater range from 10 percent just south of the Mozambique channel to 30 percent at 35°S and near 50 percent at 50°S. Along 80°E, the frequency ranges from 10 percent at 10°S to 20 percent at 30°S, 40 percent at 42° S. and near 50 percent at 50°S. East of Australia the frequencies are not quite as high, with the frequencies at 160°E ranging from 10 percent at 25°S to 40 percent at 50°S.

LOCAL WEATHER

For extended remarks on the marine climate along foreign coasts, see the appropriate Sailing Directions and Planning Guides prepared published by the National Imagery & Mapping Agency (NIMA). For the coasts of the United States and its possessions, see the appropriate Coast Pilot prepared and published by the National Ocean Survey. The trimester publication "Mariners Weather Log" prepared and published by National Oceanic and Atmospheric Administration, Environmental Data and Information Service, carries informative articles on marine climatic conditions and tropical cyclone information on the Southern Hemisphere.

EXPLANATION OF WIND ROSES

PREVAILING WINDS AND CALMS—The wind rose in blue color is located in the center of each 5° square where there was sufficient data. The rose shows the distribution of the winds that have prevailed in the area over a considerable period. The wind percentages are summarized for the eight points and calm. The arrows fly with the wind indicating the direction from which the wind blew. The length of the shaft, measured from the outside of the circle using the scale below, gives the percent of the total number of observations in which the wind has blown from that direction. The number of feathers shows that average force of the wind on the Beaufort scale. The figure in the center of the circle gives the percentage of calms. When the arrow is too long to fit conveniently in the 5° square, anything over 29 percent, the shaft is broken and the percentage is indicated by numerals.

For Example—The sample wind rose should read thus: In the reported observations the wind has averaged as follows: From N.15 percent force 4; from N.E. 43 percent , force 5; from E. 22 percent, force 4; from S.E. 6 percent, force 4; S. 3 percent, force 3; from N.W. 4 percent, force 3; calms 2 percent.

0 10 20 30 40 50 60 70 80 90 100
SCALE OF WIND PERCENTAGES

SURFACE PRESSURE

This chart shows the average barometric pressure reduced to sea level. Isobars are solid blue lines for every 2.5 millibars difference in pressure.

TROPICAL CYCLONES

The mean tracks of tropical storms and hurricanes are shown in green. These tracks represent averages and movements of individual systems may vary widely.

FREQUENCY OF WAVE HEIGHTS

The red line on the main body of the chart indicate the percentage of frequency of wave height equal to or greater than 12 feet. In analysis, when both sea and swell are reported, the higher value is used in summarization.

AIR TEMPERATURE

The mean air temperature (°C), in red lines is shown for every 2 degrees All weather narratives refer to air temperature.

VISIBILITY

Blue lines show percentage of observations reporting visibility less than 2 miles.

GALES—The red numerals in the center of each 5-degree square on this inset chart show the average percentage of ship reports in which winds of at least force 8 have been recorded for the month. Where "0" is given, gales may have been recorded, but too infrequently to give a percentage value.

NOTE

In all cases it must be borne in mind that ships tend to avoid areas of bad weather. For this reason, ship's observations tend to be biased toward good weather conditions--less gales and high waves being recorded than actually occurred. Hence, climatological estimates will also be biased toward the good weather conditions

SEA SURFACE TEMPERATURE

The mean sea suface temperature (°C), in green lines, is shown for every 4 degrees.