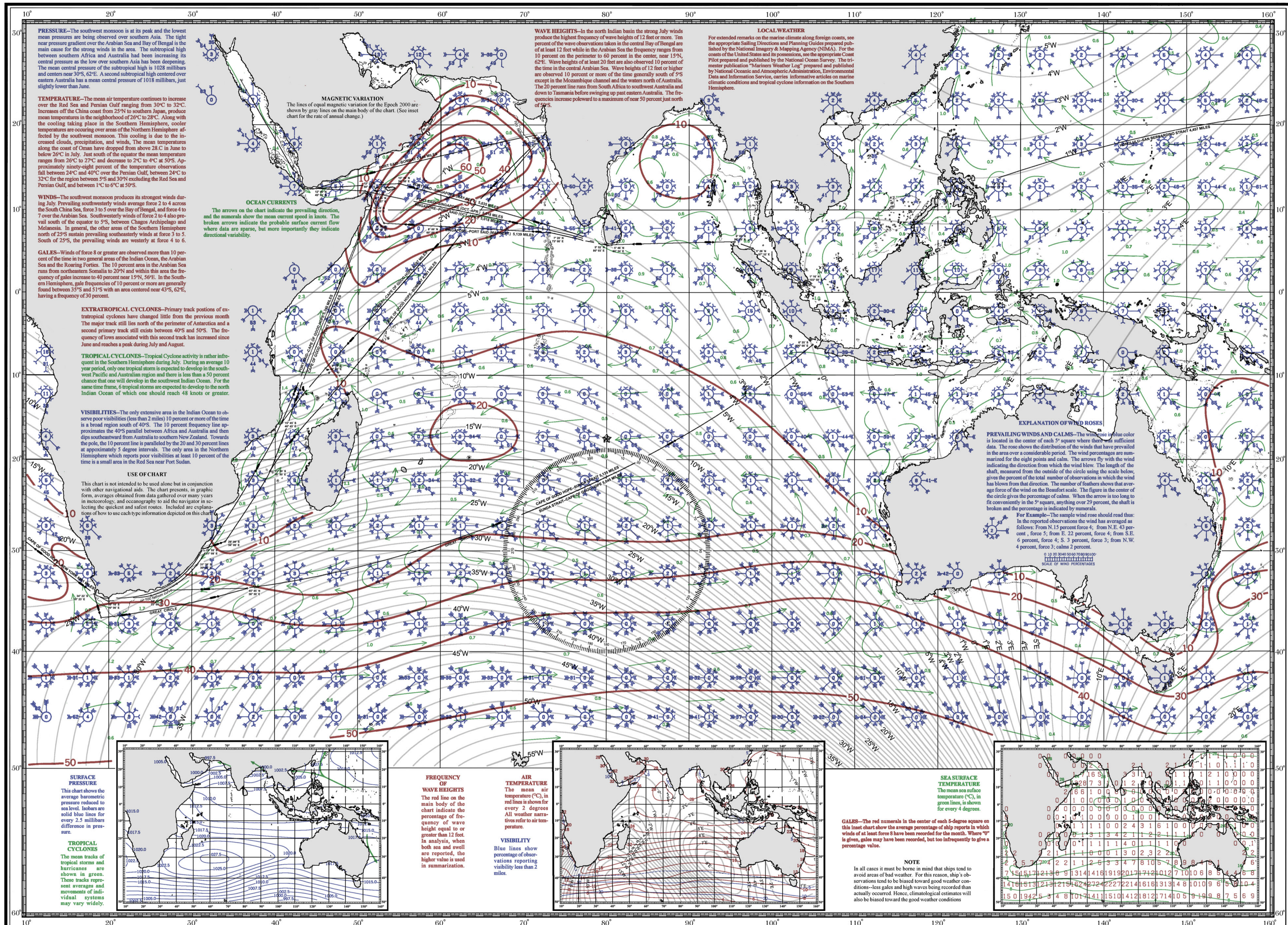




PILOT CHART OF THE INDIAN OCEAN

JULY



PRESSURE—The southwest monsoon is at its peak and the lowest mean pressures are being observed over South Asia. The tight near pressure gradient over the Arabian Sea and Bay of Bengal is the main cause for the strong winds in the area. The subtropical high between southern Africa and Australia had been increasing its central pressure as the low over southern Asia has been deepening. The mean central pressure of the subtropical high is 1028 millibars and centers near 30°S, 62°E. A second subtropical high centered over eastern Australia has a mean central pressure of 1018 millibars, just slightly lower than June.

TEMPERATURE—The mean air temperature continues to increase over the Red Sea and Persian Gulf ranging from 30°C to 32°C. Increases off the China coast from 25°N to southern Japan, produce mean temperatures in the neighborhood of 26°C to 29°C. Along with the cooling taking place in the Southern Hemisphere, cooler temperatures are occurring over areas of the Northern Hemisphere affected by the southwest monsoon. This cooling is due to the increased clouds, precipitation, and winds. The mean temperatures along the coast of Oman have dropped from above 28°C in June to below 26°C in July. Just south of the equator the mean temperature ranges from 26°C to 27°C and decrease to 2°C to 4°C at 50°S. Approximately ninety-eight percent of the temperature observations fall between 24°C and 40°C over the Persian Gulf, between 24°C to 32°C for the region between 5°S and 30°N excluding the Red Sea and Persian Gulf, and between 1°C to 6°C at 50°S.

WINDS—The southwest monsoon produces its strongest winds during July. Prevailing westerly winds average force 2 to 4 across the South China Sea, force 3 to 5 over the Bay of Bengal, and force 4 to 7 over the Arabian Sea. Westerly winds of force 2 to 4 also prevail south of the equator to 5°S, between Chagos Archipelago and Melanesia. In general, the other areas of the Southern Hemisphere north of 25°S sustain prevailing southeasterly winds at force 3 to 5. South of 25°S, the prevailing winds are westerly at force 4 to 6.

GALES—Winds of force 8 or greater are observed more than 10 percent of the time in two general areas of the Indian Ocean, the Arabian Sea and the Roaring Forties. The 10 percent area in the Arabian Sea runs from northeastern Somalia to 20°N and within this area the frequency of gales increase to 40 percent near 15°N, 56°E. In the Southern Hemisphere, gale frequencies of 10 percent or more are generally found between 35°S and 51°S with an area centered near 43°S, 62°E, having a frequency of 30 percent.

EXTRATROPICAL CYCLONES—Primary track positions of extratropical cyclones have changed little from the previous month. The major track still lies north of the perimeter of Antarctica and a second primary track still exists between 40°S and 50°S. The frequency of lows associated with this second track has increased since June and reaches a peak during July and August.

TROPICAL CYCLONES—Tropical Cyclone activity is rather infrequent in the Southern Hemisphere during July. During an average 10 year period, only one tropical storm is expected to develop in the southwest Pacific and Australian region and there is less than a 50 percent chance that one will develop in the southwest Indian Ocean. For the same time frame, 6 tropical storms are expected to develop to the north Indian Ocean of which one should reach 48 knots or greater.

VISIBILITIES—The only extensive area in the Indian Ocean to observe poor visibilities (less than 2 miles) 10 percent or more of the time is a broad region south of 40°S. The 10 percent frequency line approximates the 40°S parallel between Africa and Australia and then dips southward from Australia to southern New Zealand. Towards the pole, the 10 percent line is paralleled by the 20 and 30 percent lines at approximately 5 degree intervals. The only area in the Northern Hemisphere which reports poor visibilities at least 10 percent of the time is a small area in the Red Sea near Port Sudan.

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 of 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.

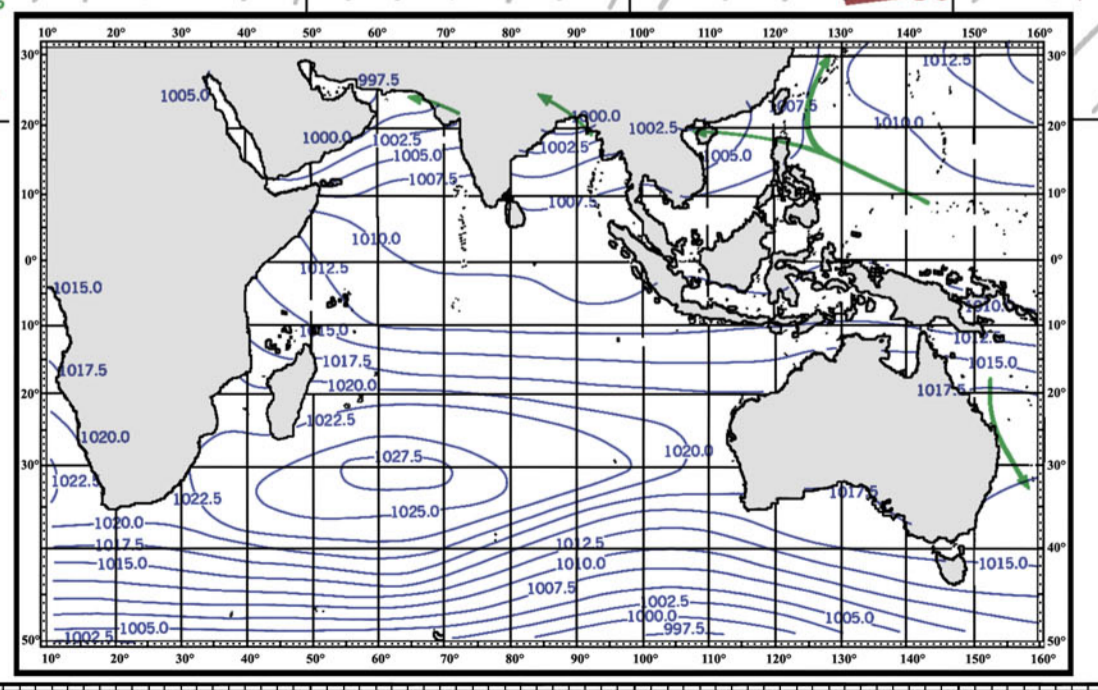
WAVE HEIGHTS—In the north Indian basin the strong July winds produce the highest frequency of wave heights of 12 feet or more. Ten percent of the wave observations taken in the central Bay of Bengal are of at least 12 feet while in the Arabian Sea the frequency ranges from 10 percent on the perimeter to 60 percent in the center, near 15°N, 62°E. Wave heights of at least 20 feet are also observed 10 percent of the time in the central Arabian Sea. Wave heights of 12 feet or higher are observed 10 percent or more of the time generally south of 5°S except in the Mozambique channel and the waters north of Australia. The 20 percent line runs from South Africa to southwest Australia and down to Tasmania before swinging up past eastern Australia. The frequencies increase poleward to a maximum of near 50 percent just north of 5°S.

LOCAL WEATHER
For extended remarks on the marine climate along foreign coasts, see the appropriate Sailing Directions and Planning Guides prepared and 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; calm 2 percent.

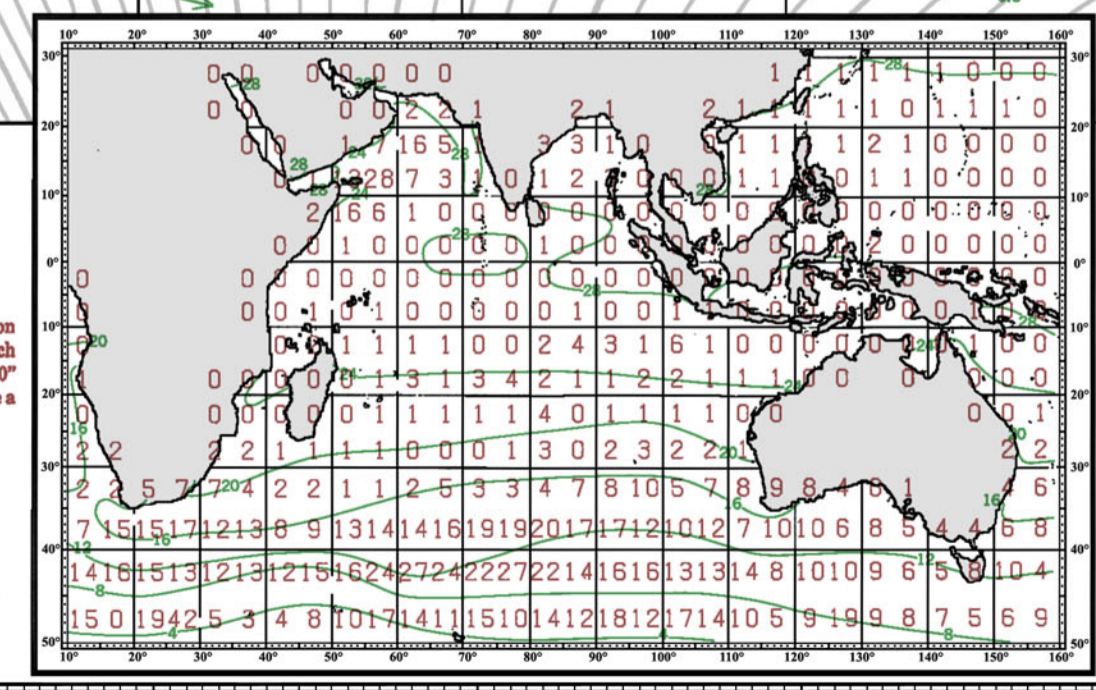


FREQUENCY OF WAVE HEIGHTS
The red line on the main body of the chart indicates the percentage of wave height equal to or greater than 12 feet. In analysis, when both sea and swell are reported, the higher value is used in summarization.

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.

SEA SURFACE TEMPERATURE
The mean sea surface temperature (°C), in green lines, is shown for every 4 degrees.



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.