PILOT CHART OF THE INDIAN OCEAN

MARCH

PRESSURE--By March, the equatorial trough has shifted north and is nearly centered over the equator with a mean central pressure just under 1010 millibars. Also, a flattening and elongation of the subtropical high has taken place. The central pressure of the subtropical high is still over 1020 millibars and now extends from 55°E to 105°E, more than in size since February. The influence of the Siberean High along the south Asian coast has diminished and the pressure gradient has become relatively weak. The hot weather season of the northeast monsoon has begun.

TEMPERATURE--The mean air temperature has increased slightly over the tropical regions of 20°S to 20°N, to around 28°C. Ninety-eight percent of the temperatures observed in this region fall between 24°C and 32°C. At 30°N, the mean temperatures range from 18°C to 20°C over the Red Sea and Persian Gulf to 10°C over the Pacific Ocean. At this latitude, one percent of the percent of the temperatures fall below 12°C and one percent above 24°C over the Red Sea and below 4°C and above 20°C over the Pacific Ocean. In the Southern Hemisphere along the 50th parallel the mean temperatures run from 5°C to 6°C with 98 percent of the temperatures falling between 3°C and 8°C.

WINDS--North of 10°N, the prevailing winds are out of the north or northwest and average force 2 to 4. Ten degrees either side of the equator, the average winds drop to force 1 to 3 vary somewhat in direction. In the Southern Hemisphere between 10°S and 35°S, the prevailing winds are from the east or southeast at force 2 to 4, while south of 35°S, they average force 4 to 6 and are predominately westerly.

GALES--The main region of gale activity during March is confined to the cyclonic belt of the Roaring Forties. Ten percent of the observations in this region report force 8 or higher winds.

EXTRATROPICAL CYCLONES--The warm-season pattern of primary storm tracks persists during March. Travelling lows are confined mainly between 50°S and 70°S, moving west to east across the unbroken waters off Antarctica. A weak secondary track still appears across New Zealand although few fully developed lows penetrate the region between the two subtropical Australian highs. The strong quasi-permanent thermal low is still present over northwestern Australia.

TROPICAL CYCLONES--With the northward movement of the sun, the temperatures over the Bay of Bengal and Arabia Sea begin to increase, but they are still not warm enough to spawn much tropical cyclone activity. During March in this region, only one tropical storm can be expected to develop every ten years. Sea temperatures are still warm enough in the Southern Hemisphere however, to spawn an average 2.5 tropical storms per year in the southwest Indian Ocean of which 0.8 should reach hurricane strength (force 12). For an average year, the number of tropical storms in the southwest Pacific and Australian area is expected to be 3.7 of which 1.3 should reach hurricane strength.

VISIBILITY--Most regions of the Indian Ocean continue to provide good visibilities for the mariner. A region along the Asian coast from Hong Kong to Japan reports poor visibilities (less than 2 miles) 10 percent of the time. South of 40°S, in the Southern Hemisphere's cyclonic belt, poor visibilities are also observed 10 percent of the) time. Frequencies increase to 20 percent south of 45°8 and 30 percent south of 50°8.

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--An area extending from northwest of the Philippines to north of Taiwan and an area northeast of Micronesia are the only two regions in the Northern Hemisphere covered by this chart where wave heights of 12 feet or higher are observed 10 percent or more of the time. In the Southern Hemisphere, wave heights of at least 12 feet are encountered 10 percent of the time at 20°S. The frequency continues to increase towards the Pole until a maximum of near 50 percent is reached just south of 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

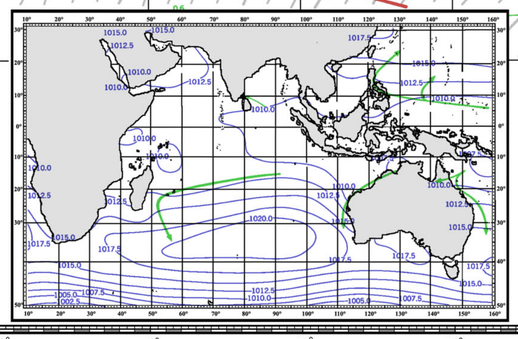
PREVAILING WINDS AND CALMS--The wind rose in blue color is located in the center of each 5° square where there was sufficient data. The rose shows the distribution of the winds that have prevailed in the area over a considerable period. The wind percentages are summarized for the eight points and calm. 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

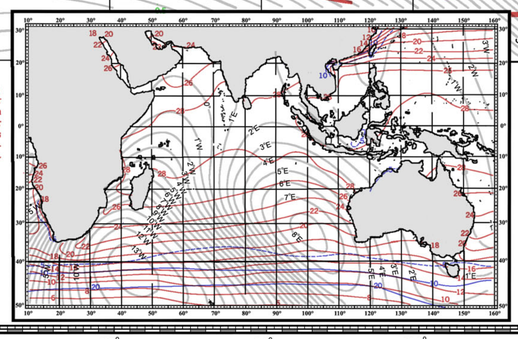
The red line on the main body of the chart indicate the percentage of frequency of wave height equal to or greater than 12 feet. In analysis, when both sea and swell are reported, the higher value is used in summarization.

AIR TEMPERATURE

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

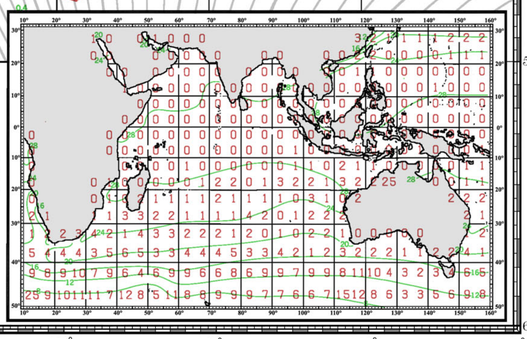
VISIBILITY

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



SEA SURFACE TEMPERATURE

The mean sea suface tomperature (°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