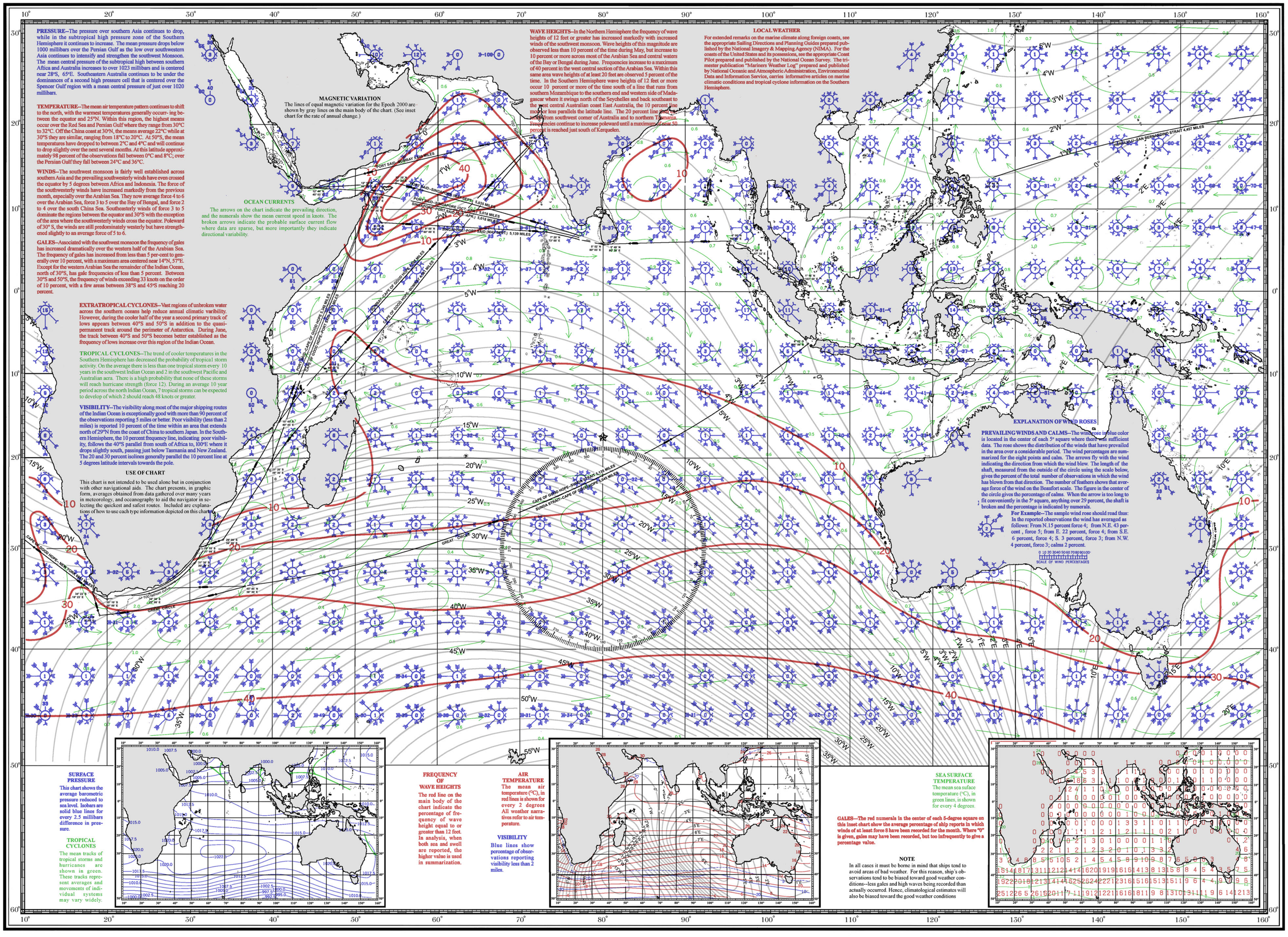
PILOT CHART OF THE INDIAN OCEAN

JUNE



PRESSURE--The pressure over southern Asia continues to drop, while in the subtropical high pressure zone of the Southern Hemisphere it continues to increase. The mean pressure drops below 1000 millibars over the Persian Gulf as the low over southwestern Asia continues to intensify and strengthen the southwest Monsoon. The mean central pressure of the subtropical high between southern Africa and Australia increases to over 1023 millibars and is centered near 28°S, 65°E. Southeastern Australia continues to be under the dominances of a second high pressure cell that is centered over the Spencer Gulf region with a mean central pressure of just over 1020 millibars.

TEMPERATURE--The mean air temperature pattern continues to shift to the north, with the warmest temperatures generally occurr- ing between the equator and 25°N. Within this region, the highest means occur over the Red Sea and Persian Gulf where they range from 30°C to 32°C. Off the China coast at 30°N, the means average 22°C while at 30°S they are similar, ranging from 18°C to 20°C. At 50°S, the mean temperatures have dropped to between 2°C and 4°C and will continue to drop slightly over the next several months. At this latitude approximately 98 percent of the observations fall between 0°C and 8°C; over the Persian Gulf they fall between 24°C and 36°C.

WINDS--The southwest monsoon is fairly well established across southern Asia and the prevailing southwesterly winds have even crossed the equator by 5 degrees between Africa and Indonesia. The force of the southwesterly winds have increased markedly from the previous month, especially over the Arabian Sea. They now average force 4 to 6 over the Arabian Sea, force 3 to 5 over the Bay of Bengal, and force 2 to 4 over the south China Sea. Southeasterly winds of force 3 to 5 dominate the regions between the equator and 30°S with the exception of the area where the southwesterly winds cross the equator. Poleward of 30° S, the winds are still predominately westerly but have strengthened slightly to an average force of 5 to 6.

GALES--Associated with the southwest monsoon the frequency of gales has increased dramatically over the western half of the Arabian Sea. The frequency of gales has increased from less than 5 per-cent to generally over 10 percent, with a maximum area centered near 14°N, 57°E. Except for the western Arabian Sea the remainder of the Indian Ocean, north of 30°S, has gale frequencies of less than 5 percent. Between 30°S and 50°S, the frequency of winds exceeding 33 knots on the order of 10 percent, with a few areas between 38°S and 45°S reaching 20 percent.

EXTRATROPICAL CYCLONES--Vast regions of unbroken water across the southern oceans help reduce annual climatic varibility. However, during the cooler half of the year a second primary track of lows appears between 40°S and 50°S in addition to the quasi-permanent track around the perimeter of Antarctica. During June, the track between 40°S and 50°S becomes better established as the frequency of lows increase over this region of the Indian Ocean.

TROPICAL CYCLONES--The trend of cooler temperatures in the Southern Hemisphere has decreased the probability of tropical storm activity. On the average there is less than one tropical storm every 10 years in the southwest Indian Ocean and 2 in the southwest Pacific and Australian aera. There is a high probability that none of these storms will reach hurricane strength (force 12). During an average 10 year period across the north Indian Ocean, 7 tropical storms can be expected to develop of which 2 should reach 48 knots or greater.

VISIBILITY--The visibility along most of the major shipping routes of the Indian Ocean is exceptionally good with more than 90 percent of the observations reporting 5 miles or better. Poor visibility (less than 2 miles) is reported 10 percent of the time within an area that extends north of 29°N from the coast of China to southern Japan. In the Southern Hemisphere, the 10 percent frequency line, indicating poor visibility, follows the 40°S parallel from south of Africa to, 100°E where it drops slightly south, passing just below Tasmania and New Zealand. The 20 and 30 percent isolines generally parallel the 10 percent line at 5 degrees latitude intervals towards the pole.

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.

WAVE HEIGHTS--In the Northern Hemisphere the frequency of wave heights of 12 feet or greater has increased markedly with increased winds of the southwest monsoon. Wave heights of this magnitude are observed less than 10 percent of the time during May, but increase to 10 percent or more across most of the Arabian Sea and central waters of the Bay or Bengal during June. Frequencies increase to a maximum of 40 percent in the west central section of the Arabian Sea. Within this same area wave heights of at least 20 feet are observed 5 percent of the time. In the Southern Hemisphere wave heights of 12 feet or more occur 10 percent or more of the time south of a line that runs from southern Mozambique to the southern end and western side of Madagascar where it swings north of the Seychelles and back southeast to the west central Australian coast East Australia, the 10 percent line broad from southwest corner of Australia and to northern Tasmania. Frequencies continue to increase poleward until a maximum of near 50 percent is reached just south of Kerguelen.

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.

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