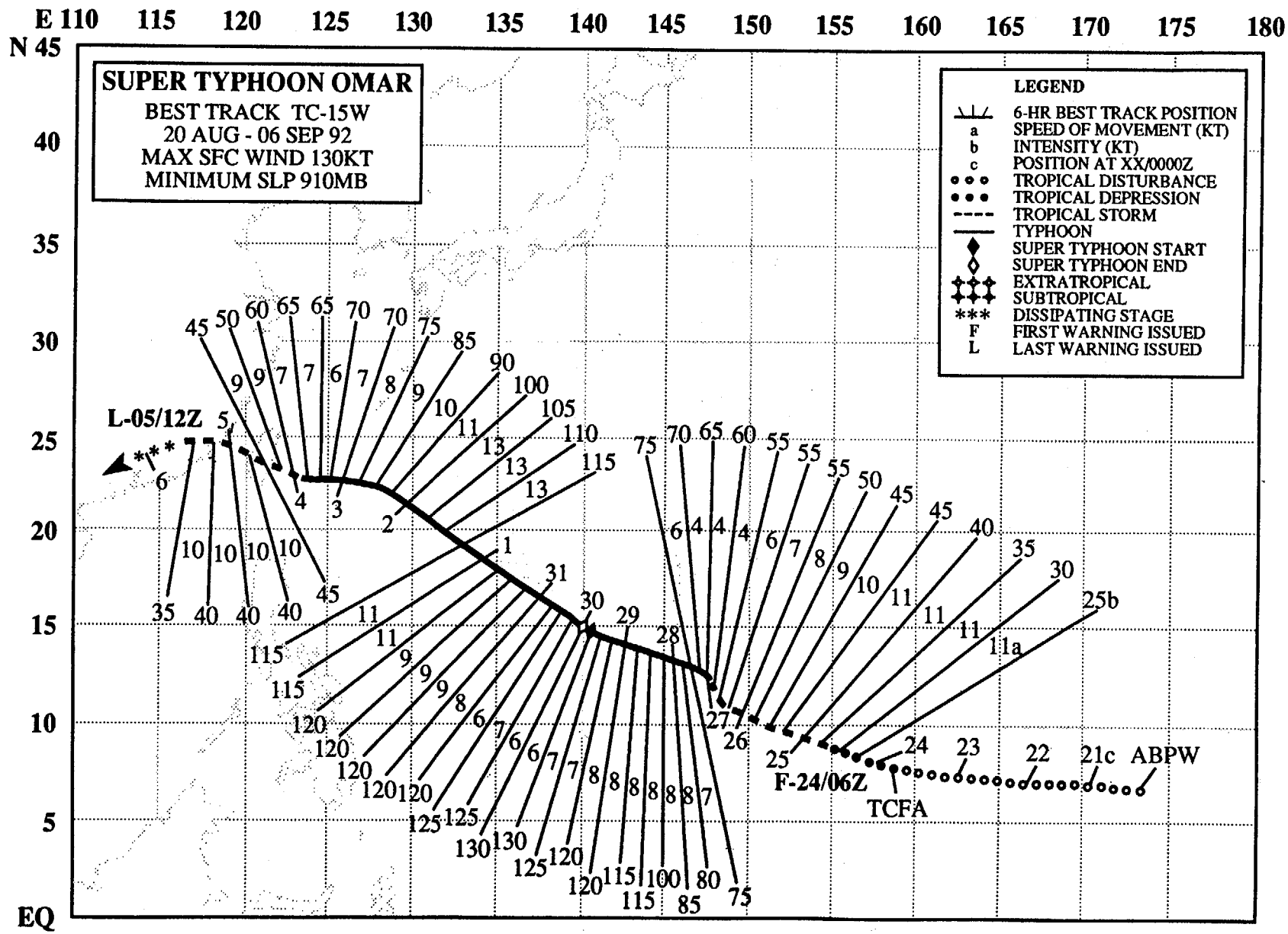
SUPER TYPHOON OMAR
BEST TRACK TC-15W
20 AUG - 06 SEP 92
MAX SFC WIND 130KT
MINIMUM SLP 910MB
LEGEND
6-HR BEST TRACK POSITION
a SPEED OF MOVEMENT (KT)
b INTENSITY (KT)
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
L-05/12Z
F-24/06Z
TCFA
ABPW
E 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180
N 45 40 35 30 25 20 15 10 5 EQ

SUPER TYPHOON OMAR (15W)

I. HIGHLIGHTS

The second super typhoon of 1992, Omar became the seventh of the eight tropical cyclones to develop in August. The tropical disturbance that became Omar was first noted over the southern Marshall Islands, at a time when Mark (13W) was weakening along the south coast of China, Kent (11W) had dissipated in the Sea of Japan, and Lois (12W) and Nina (14W) were east of Japan. Later, after moving steadily west-northwestward and intensifying, Omar wreaked havoc on Guam as it rapidly intensified immediately prior to passing directly over the island with 105 kt (54 m/sec) sustained winds. After traversing Guam, Omar continued onward into the Philippine Sea where it briefly attained super typhoon intensity. Omar then steadily weakened, passing over Taiwan as a tropical storm, and dissipated over southeastern China.

II. TRACK AND INTENSITY

Based on persistent convection, the tropical disturbance that was to become Omar was first mentioned in the 200600Z August Significant Tropical Weather Advisory. During the next three days, which included the dissipation of Kent (11W) and Mark (13W), and the approaching of the extratropical transitions of Lois (12W) and Nina (14W), the monsoon trough began to reestablish itself in a more normal location, extending across the northern Philippine Islands, east-southeastward into the Caroline Islands. While this major synoptic pattern readjustment was taking place, the tropical disturbance had developed sufficiently to warrant the issuing of a Tropical Cyclone Formation Alert at 232100Z. Intensification continued, and JTWC issued the first warning at 240600Z. Coincident with Omar becoming a tropical depression 750 nm (1390 km) east-southeast of Guam and the southwesterly low-level flow deepening across the western Caroline Islands, Polly (16W) began to develop 200 nm (370 km) to the west of Guam. After Omar was upgraded to a tropical storm on the warning at 250000Z, the rate of intensification decreased due to upper tropospheric wind shear from the extensive outflow of Polly (16W), which was also intensifying. At about the same time, Omar (Figure 3-15-1) began to slow in forward speed. This slowing of development and forward motion continued until early on 27 August when Tropical Storm Omar stalled.

If the strong vertical wind shear created by Polly's proximity continued, or increased, there was a possibility that Omar's upper and lower circulation centers could decouple and further weaken the tropical cyclone. However, the circulation held together, drifted northwestward, and began to intensify. Omar (Figure 3-15-2) was upgraded to typhoon intensity at 270600Z, and 12 hours later at about 271800Z began a period of rapid intensification which lasted for the next 12 to 18 hours. By the evening of 27 August, Omar began to accelerate towards Guam. Gale force sustained winds, began to buffet Guam at 272300Z about the time that a visible eye appeared on satellite imagery. This was followed by the onset of destructive winds, in excess of 50 kt (26 m/sec), which commenced at 280300Z and lasted for 16 hours. These sustained winds rose steadily until they peaked at 105 kt (54 m/sec) with gusts to 130 kt (67 m/sec) in the western half of the eye wall (Figure 3-15-3). As the eye passed across the island, the eastern half of the eye wall followed, battering Guam with torrential rain again and strong winds from the opposite direction (Figure 3-15-4). While Omar's eye passage coincided with one of the highest astronomical tides of August (Figure 3-15-5), the storm surge was not as high as expected. Apparently the rapidly changing wind direction that occurred with eye passage limited the fetch and kept the inundation to a lower level than anticipated. Some low-lying areas on Guam suffered total

wave runup as high as 10 feet on the north shore (Figure 3-15-6). In addition, the typhoon dropped over a foot of rain on the northern half of the island with a maximum of 18 inches (460 mm) measured at the National Weather Service Observatory at Taguac (WMO 91217).

After mauling Guam, Omar continued to intensify as it moved across the Philippine Sea, and, at 291800Z, briefly attained super typhoon intensity (Figure 3-15-7). Then a gradual weakening trend set in. On 4 September, Omar passed across Taiwan as a tropical storm and, on 5 September, it moved into southeastern China and dissipated.

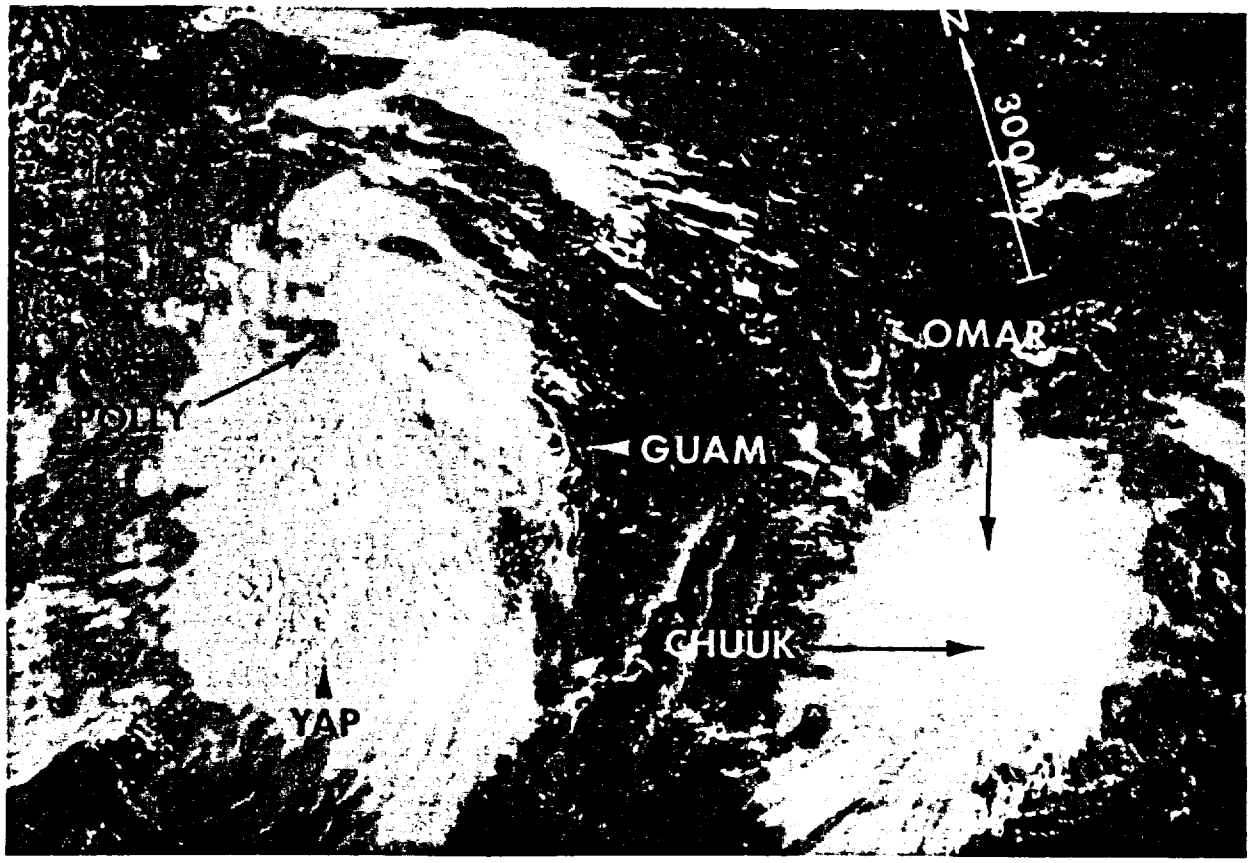

Figure 3-15-1. Omar Passes north of Chuuk as Polly (14W) consolidates to the west of Guam (242320Z August DMSP visual imagery).

III. FORECAST PERFORMANCE

Overall mean errors for the JTWC track forecasts were 75, 160, and 270 nm (135, 300, and 500 km) for 24, 48 and 72 hours, respectively. This was 20% better than the climatology-persistence (CLIPER) baseline for skill at all forecast time intervals. With regard to intensity, the JTWC 24-hour forecasts were representative of events, except for a brief period when they were consistently 20 to 40 kt (37 to 74 m/sec) low for a day and a half before Omar struck Guam.

IV. IMPACT

Typhoon Omar was the most damaging typhoon to strike Guam since Typhoon Pamela in 1976. On Guam, Omar caused an estimated $457 million of damage, destroyed or severely damaged over 2158 homes leaving nearly 3000 people homeless in temporary shelters until a 200-tent "city" could be erected. Omar almost completely disabled the island-wide power distribution system which in turn caused the water pumping system to fail. Long term mitigation measures such as the erection of concrete power poles limited their damage. Over 400 wooden poles and 20 to 30 concrete poles were destroyed and the damage was limited to approximately $16 million. Because they could not sortie, two of the Navy's fast supply ships, USS Niagara Falls and USS White Plains, went aground in Apra Harbor after they broke their moorings. Finally, Omar interrupted communications, and ground and air transportation. Although 200 individuals received emergency treatment for typhoon-related injuries, there were no typhoon-inflicted deaths. The efforts of a joint task force, formed to coordinate the civilian and military relief efforts, in addition to airlift and volunteer efforts, both organized and grassroots, were instrumental in getting the debris cleaned up and the island community back on its feet in only a few weeks.

Omar's passage across Taiwan resulted in two deaths, at least 12 people were injured, a major interruption of electrical power, and flooding. Later, as the tropical cyclone dissipated over southeastern China, torrential rains led to localized flooding as far west as the Hong Kong New Territories.

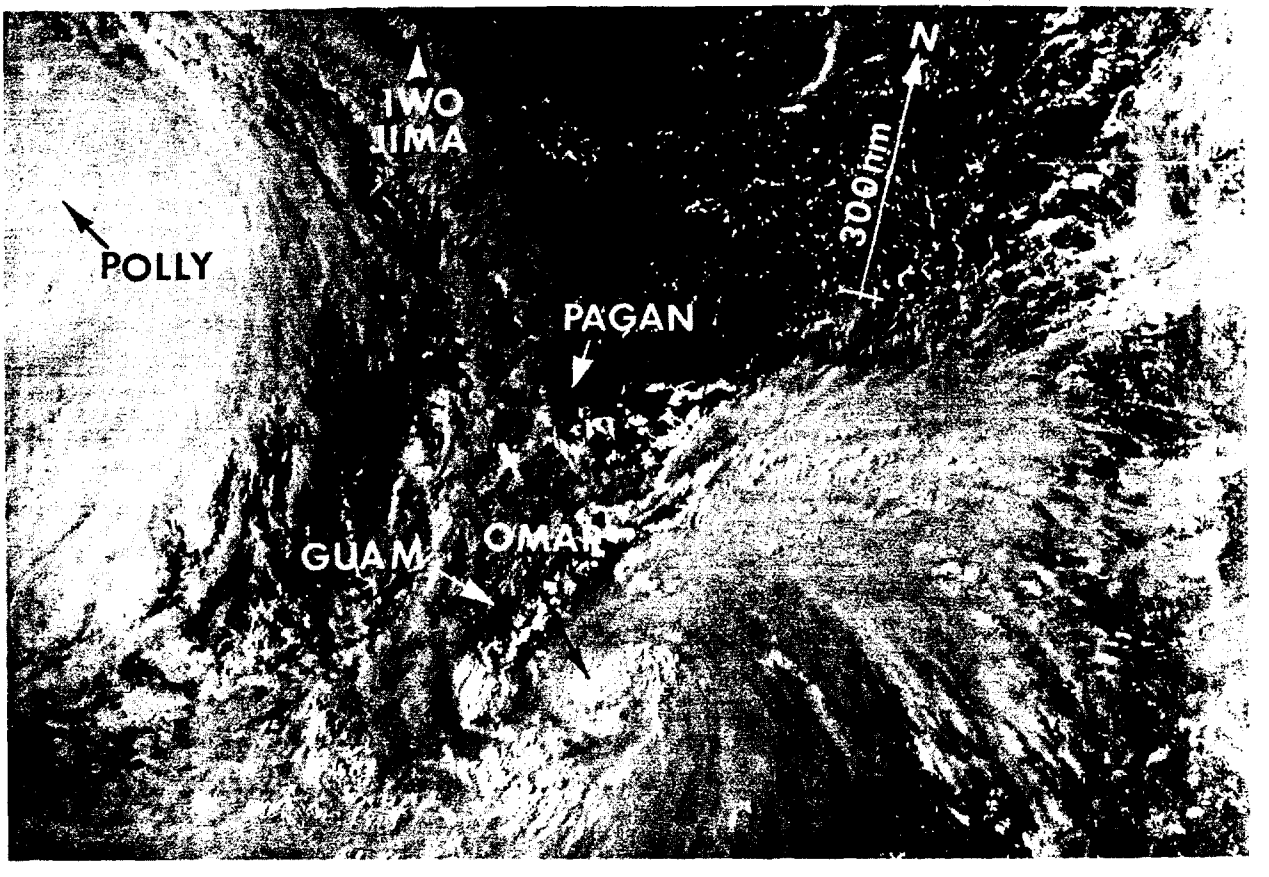

Figure 3-15-2. Omar's convection begins to coil tightly as the typhoon starts to accelerate toward Guam. The outflow across Omar from Polly (16W) to the northwest is starting to weaken (270709Z August DMSP visual imagery).

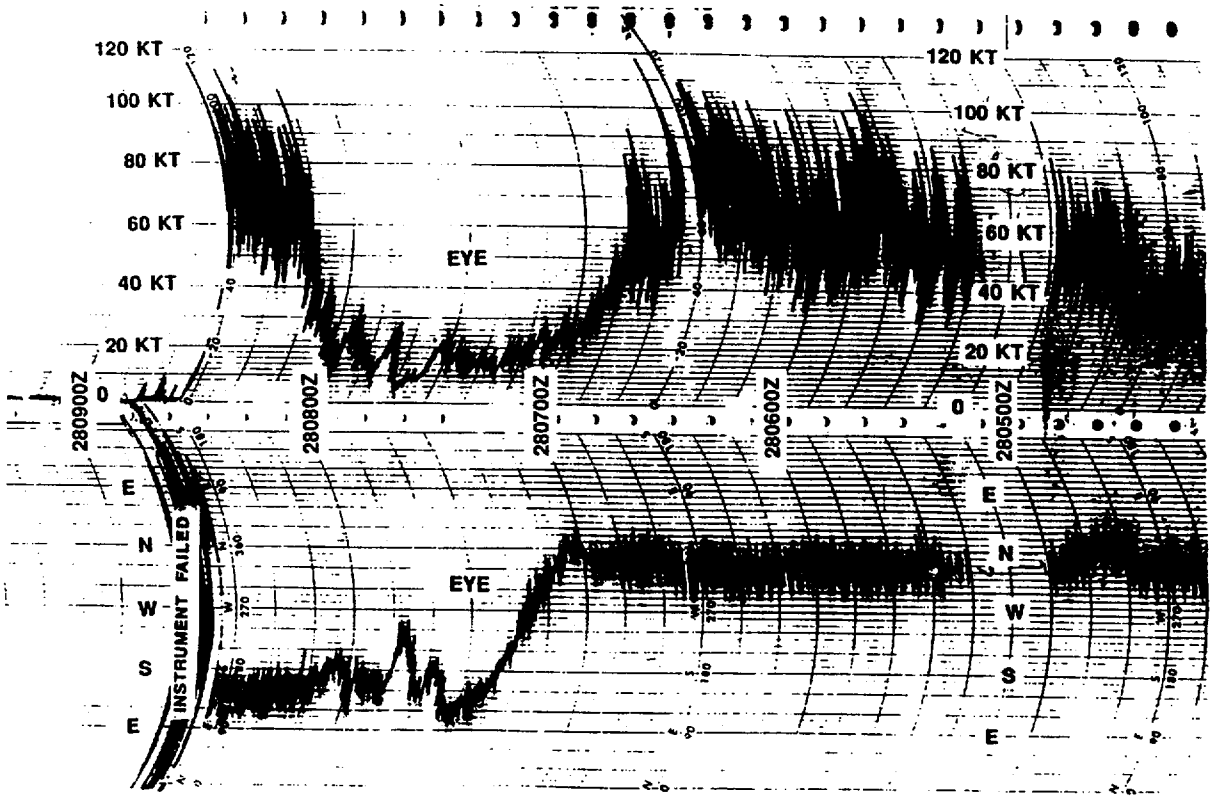

Figure 3-15-3. Wind speed and direction record of Typhoon Omar's passage over NOCD, Agana, Guam on 28 August. Note the wind instrument failed shortly after it entered the eye wall for a second time.

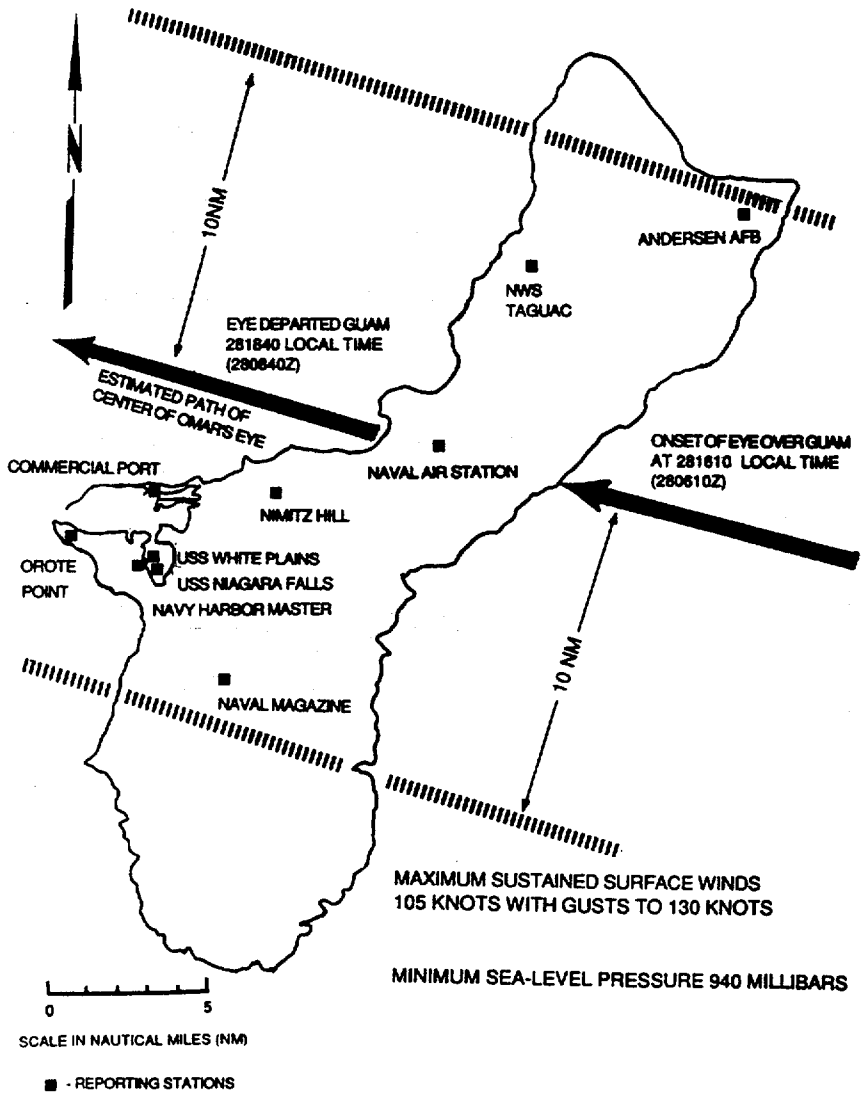

Figure 3-15-4. The geometric center of Omar's 20 nm (37 km) diameter eye with a minimum sea-level pressure of 940 mb tracked across the center of Guam on 28 August.

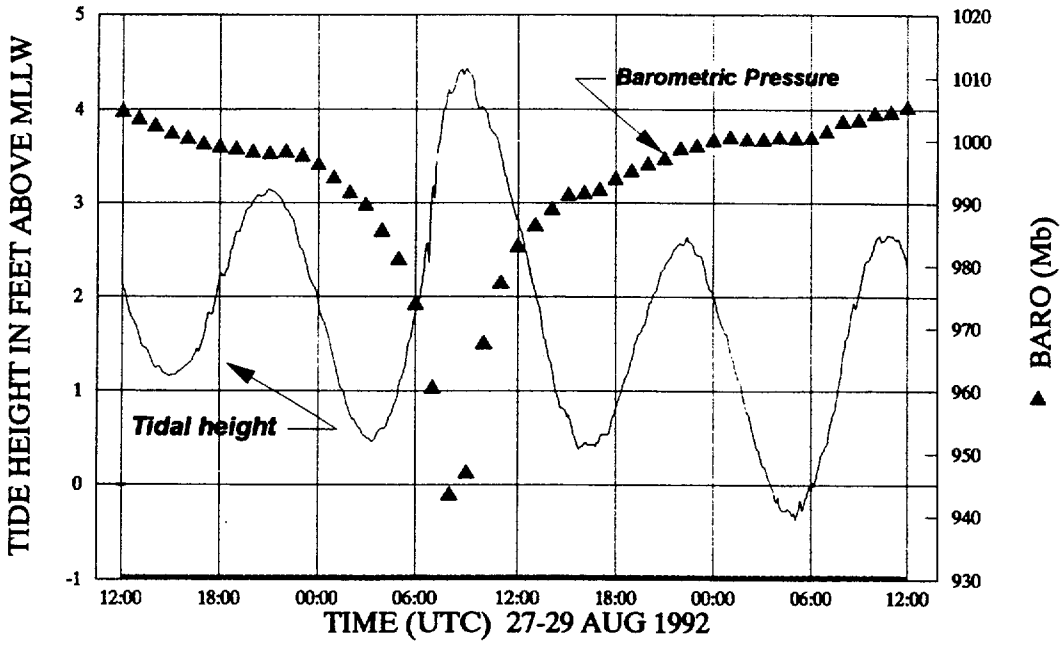

Figure 3-15-5. The NOAA-National Ocean Service (NOS) tide station record of Typhoon Omar's passage over Apra Harbor on the western side of Guam. The eye passage coincided with one of the highest astronomical tides of August (Record courtesy of NOAA/NOS Pacific Operations Section).

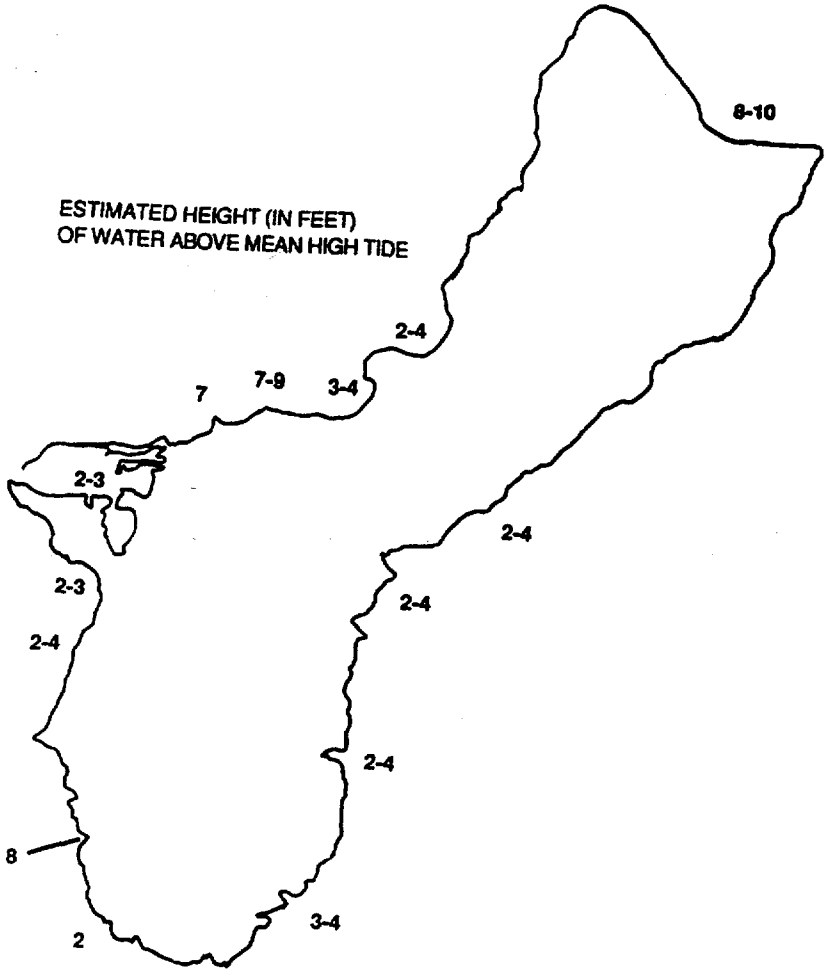

Figure 3-15-6. Maximum "storm surge" heights (which include astronomical tide, hydrostatic effects, and winds driven wave effects) at selected locations on Guam as estimated following Omar's passage.

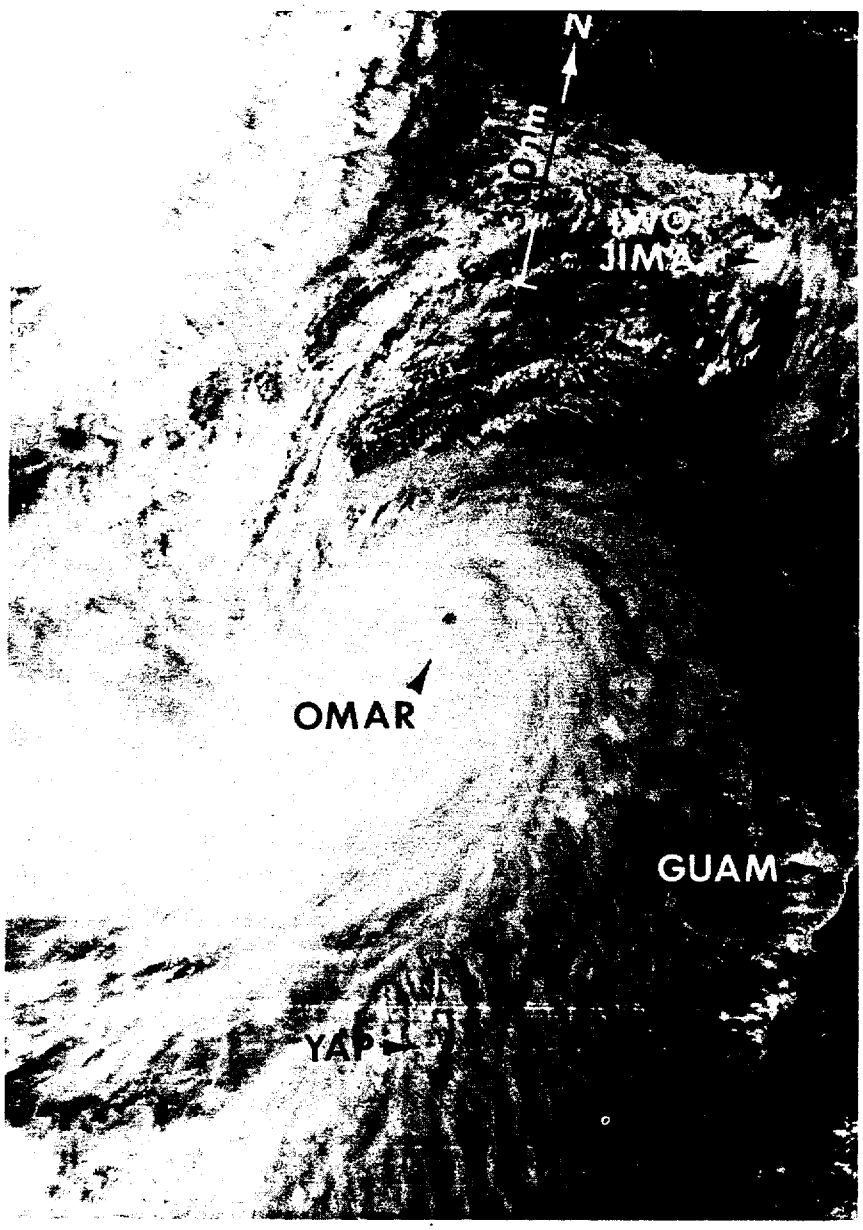

Figure 3-15-7. Omar with an 18 nm (33 km) diameter eye is still packing maximum sustained surface winds of 120 kt (62 m/sec) winds two day after peaking at 130 kt (67 m/sec) (310535Z August NOAA visual imagery).