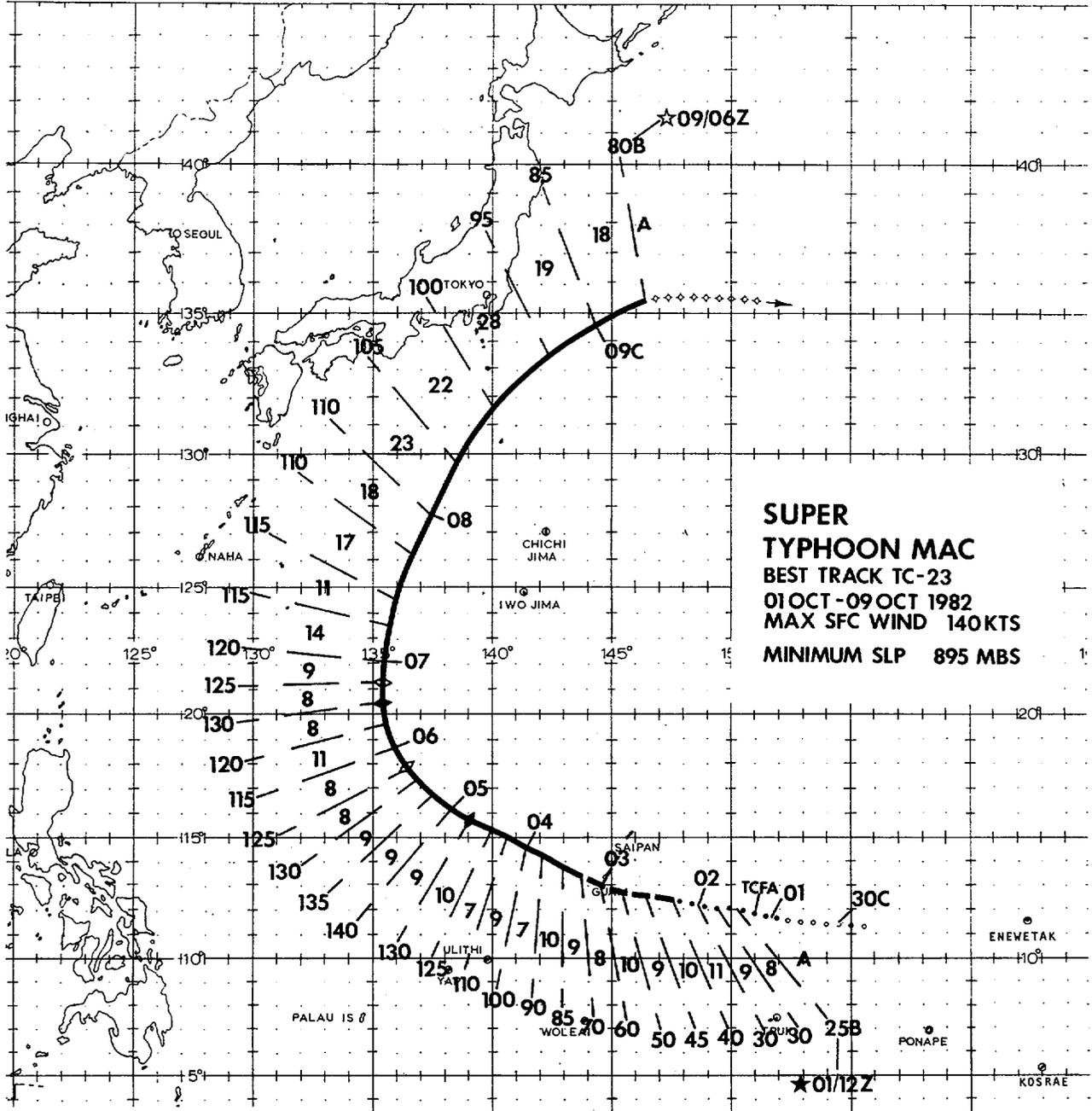


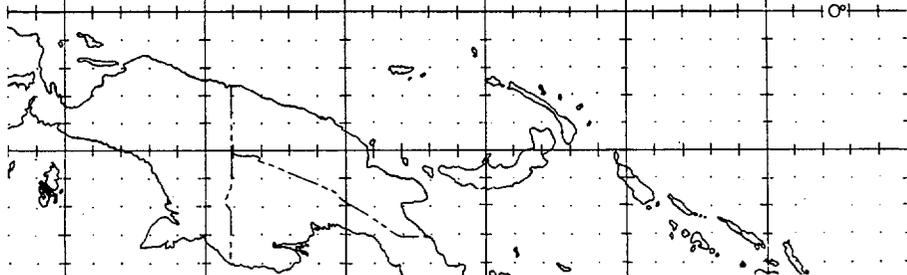
120° 125° 130° 135° 140° 145° 150° 155° 160° 165°



**SUPER
TYPHOON MAC**
BEST TRACK TC-23
01 OCT - 09 OCT 1982
MAX SFC WIND 140 KTS
MINIMUM SLP 895 MBS

LEGEND

- 06 HOUR BEST TRACK POSIT
- A SPEED OF MOVEMENT
- B INTENSITY
- C POSITION AT XX/0000Z
- ○ ○ TROPICAL DISTURBANCE
- ○ ○ TROPICAL DEPRESSION
- TROPICAL STORM
- TYPHOON
- ◆ SUPER TYPHOON START
- ◇ SUPER TYPHOON END
- ○ ○ EXTRATROPICAL
- ○ ○ DISSIPATING STAGE
- ★ FIRST WARNING ISSUED
- ★ LAST WARNING ISSUED



SUPER TYPHOON MAC (23)

Super Typhoon Mac was spawned to the east of Ponape (WMO 91348) in an area which had been under close scrutiny by the Joint Typhoon Warning Center for several days. A persistent surface circulation, with an associated upper-level anticyclone, was closely monitored beginning on 28 September. No signs of significant development were evident until satellite imagery on 1 October revealed that the convective pattern was more conducive to intensification and the upper-level outflow signature was supportive of sustained further growth of the disturbance. Based upon this evidence, a Tropical Cyclone Formation Alert was issued at 010635Z. Further intensification was rapid; the first warning on Tropical Depression 23 was issued at 011200Z after nearby shipboard observations indicated that the surface pressure was as low as 1003 mb and that surface winds had risen to 25 kt (13 m/sec).

Because of Tropical Depression 23's location (near 12N 150E), it became apparent that the system presented a significant threat to the island of Guam. During its formative stages, Mac had moved somewhat erratically but had tracked generally west-northwestward under the influence of steering currents associated with the southern periphery of the subtropical ridge. Initially, numerical forecast fields indicated there would be no change in this steering flow over the next three days and Mac was predicted to continue on a west-northwest course. During this period, rapid intensification was expected due to favorable upper- and lower-level conditions: the relatively small upper-level anticyclone over the system was in close proximity to strong upper-level outflow channels; and at the surface, there was a massive area of inflow from the west with virtually no competition from other circulation centers in the area (Figure 3-23-1).

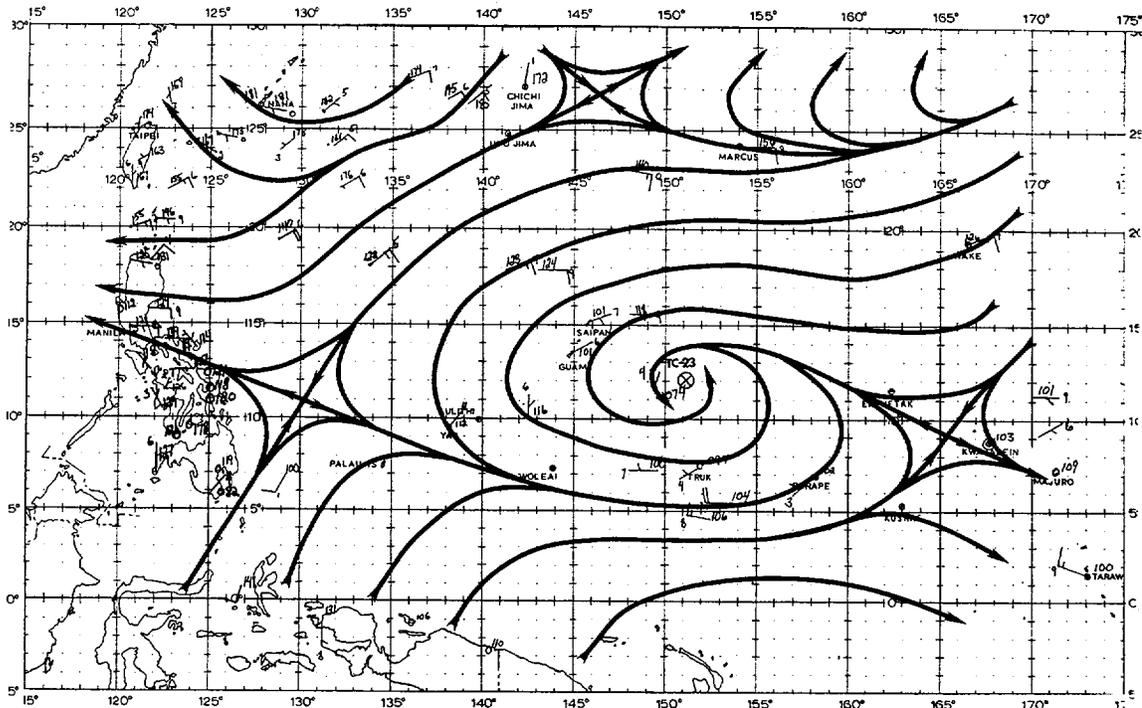


Figure 3-23-1. 011200Z October surface analysis.
Wind speeds are in knots.

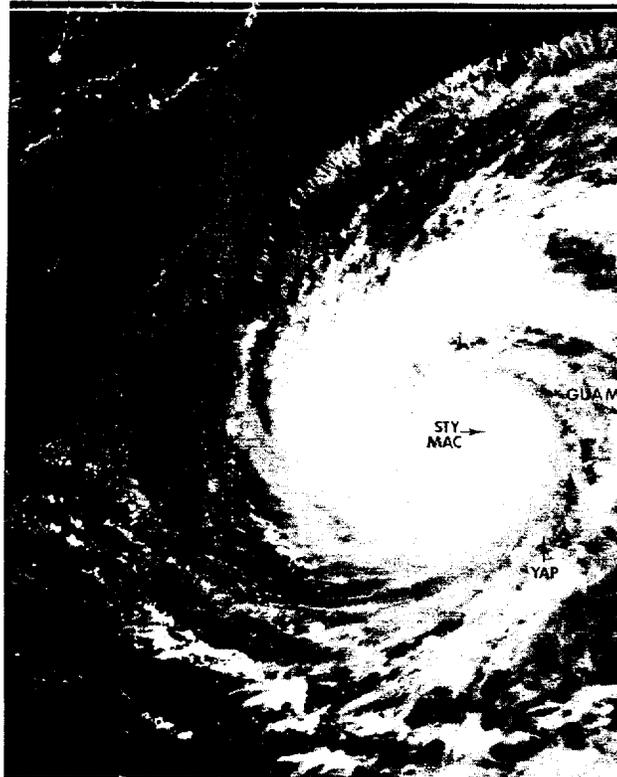


Figure 3-23-2. Super Typhoon Mac is shown 11 hours after maximum intensity, 050640Z October (NOAA 7 visual imagery).

Initial forecasts proved accurate as Mac passed 10 nm (19 km) southwest of Guam at 030000Z. Although maximum sustained winds within Mac were estimated to be 60 kt (31 m/sec) at closest point of approach to Guam, the highest sustained winds recorded at Nimitz Hill (24 nm (44 km) from Mac's center) were just 30 kt (15 m/sec). Guam experienced little structural or equipment damage because of the fortunate combination of adequate advance warning and preparation, and the compact wind radii associated with Mac. However, crop damage was extensive in the southern part of the island due to the heavy rains and relatively high winds experienced there; the Government of Guam Department of Agriculture estimated damages at 1.5 million dollars.

Mac continued to intensify rapidly after passing Guam. In two days, from the 3rd to the 5th, Mac more than doubled its intensity from 60 kt (31 m/sec) to 140 kt (72 m/sec) (Figure 3-23-2). Figure 3-23-3 shows the trends of various meteorological parameters over Mac's lifetime. The 700 mb data and minimum sea level pressure (MSLP) were derived from reconnaissance aircraft data. Items of particular note include: the dewpoint depression of 28°C, one of the largest ever recorded in a tropical cyclone; the redevelopment to super typhoon strength, only the sixth recorded instance since 1958; the correspondence of the MSLP trends and intensity peaks; and the relatively smooth intensity trend as presented by Dvorak analyses.

During its period of rapid intensification, Mac began to assume a more northwesterly track in response to a developing weakness in the subtropical ridge near the Ryukyu Islands. On 5 and 6 October, after having attained super typhoon strength, Mac turned sharply north-northeastward and accelerated. Beginning with forecasts issued on 4 October, which keyed on the break in the subtropical ridge, JTWC anticipated this movement quite well. Because of a deep westerly flow which extended well to the south of the main islands of Japan, Mac never posed a threat to Japan even though it

appeared to be right on course toward Tokyo until 8 October.

Once embedded in the mid-latitude westerly flow, Mac accelerated to a maximum forward speed of 28 kt (52 km/hr) but lost little of its intensity. Two days after its recurvature, Mac's intensity had dropped only 30 kt (15 m/sec), i.e. from 125 to 95 kt (64 to 49 m/sec); although Mac remained intense, it rapidly lost its tropical characteristics and transitioned into an extratropical system on 9 October.

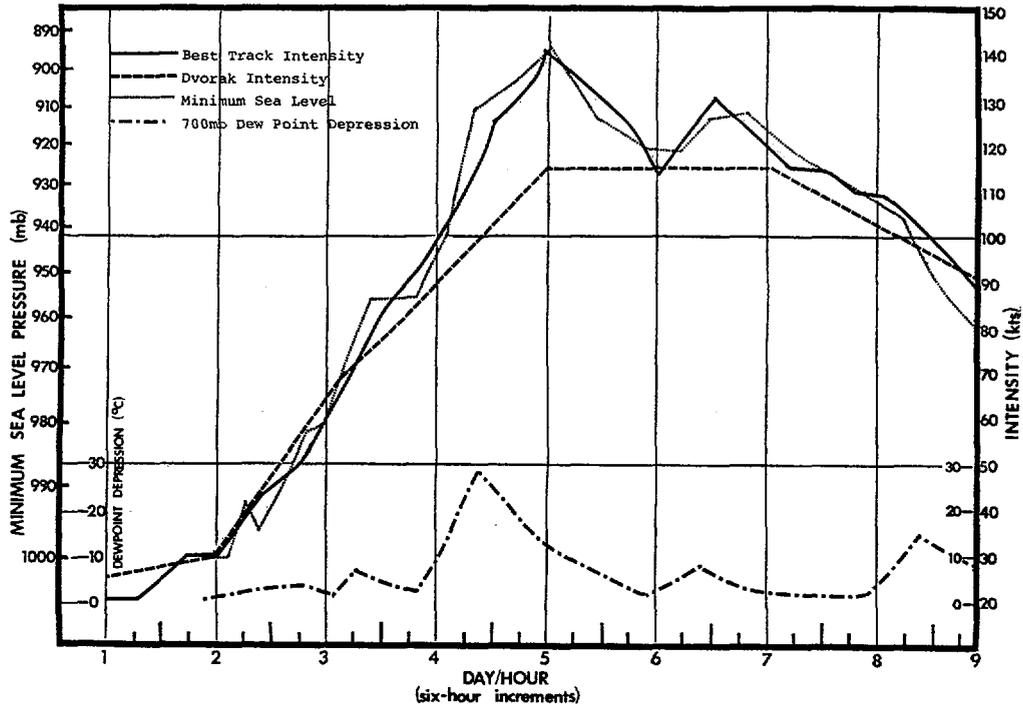


Figure 3-23-3. Comparisons of best track intensities, Dvorak intensity estimates, minimum sea level pressures, and 700 mb dewpoint depressions for the first eight days of Mac's existence.