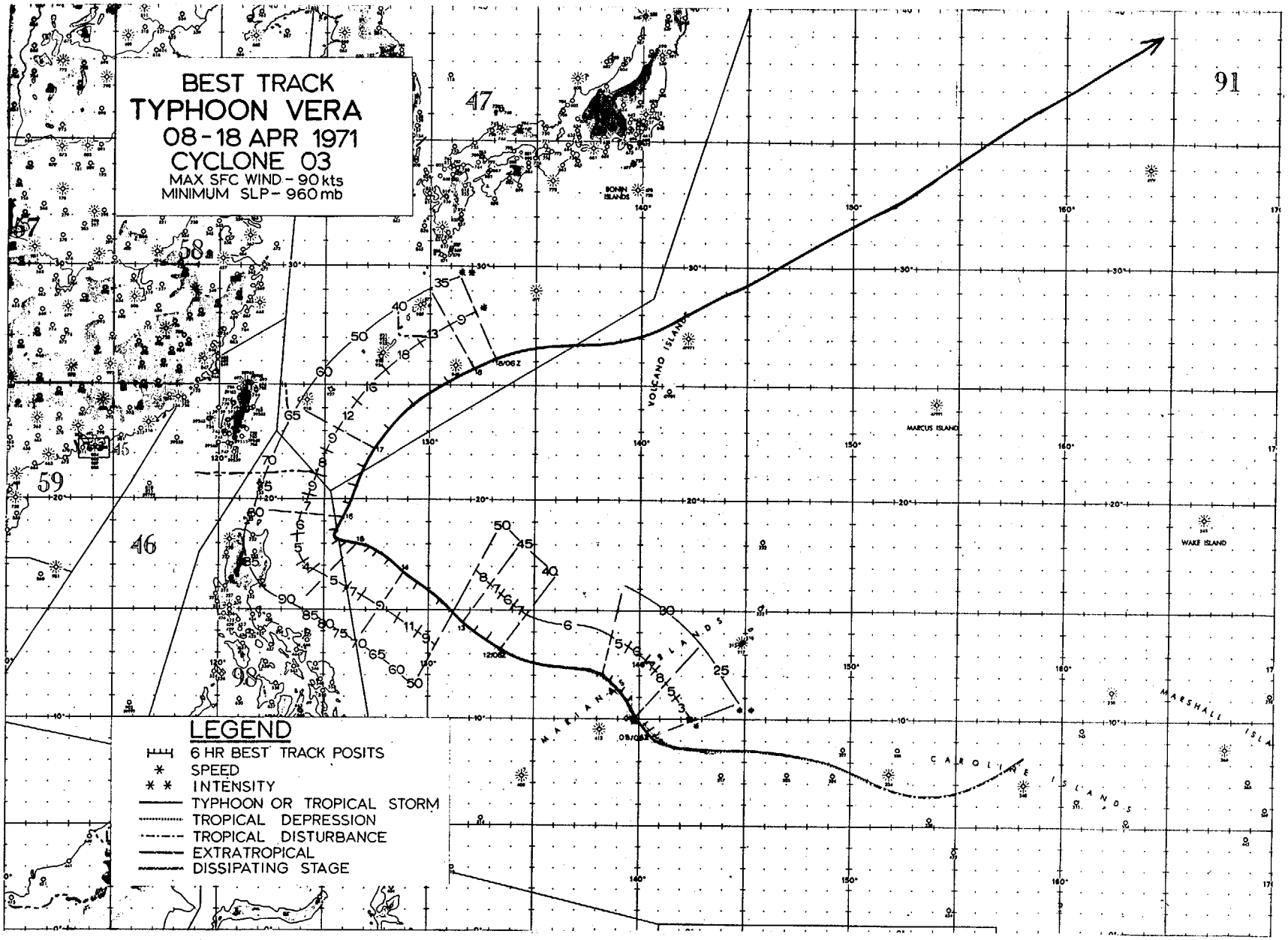
# CHAPTER 5

# INDIVIDUAL TYPHOONS OF 1971

NOTES:

1. All dates accompanying tracks are for 0000GMT unless otherwise denoted.

2. See last page of this chapter for definition of units and terms appearing herein.


BEST TRACK
TYPHOON VERA
08-18 APR 1971
CYCLONE 03
MAX SFC WIND - 90 kts
MINIMUM SLP - 960 mb
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
VOLCANO ISLANDS
MARCUS ISLAND
WAKE ISLAND
MARIANA ISLANDS
CAROLINE ISLANDS
MARSHALL ISLA
15/06Z
12/06Z
08/06Z
91

# VERA

A weak circulation on April 3rd was detected by island surface reports in the central Carolines marking the beginning stages of the season's first typhoon. The system drifted slowly into the Philippine Sea (Figure 5-1) becoming a tropical storm on the 12th while maintaining a west-northwest course of 8 kt. By early morning of the 14th, Vera developed sustained winds of 65 kt and began to slow in forward speed as she approached a weakness in the subtropical ridge. Taking a temporary westerly excursion at 5 kt, the typhoon reached its peak intensity of 90 kt approximately 250 n mi west of Escarpada Point on Luzon during the 15th (Figure 5-2). Early the following morning, Vera's course shifted abruptly to a northward drift as the high cell south of the Bonin Island chain strengthened. Her forward speed gradually increased on the 17th, and she diminished to tropical storm force that afternoon. Shifting to a northeast course, the storm paralleled the Ryukyu Island chain and accelerated to 18 kt becoming extratropical as she encountered the westerlies merging with a frontal zone south of Japan on the 18th.

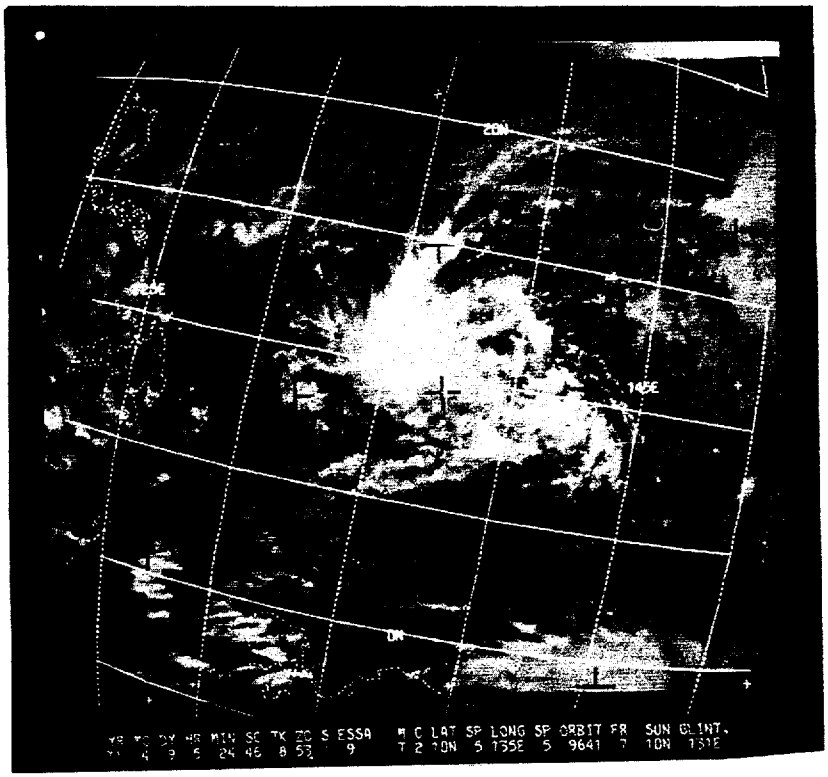



FIGURE 5-1. ESSA-9 PHOTO OF VERA AS A TROPICAL DEPRESSION ON 9 APRIL.

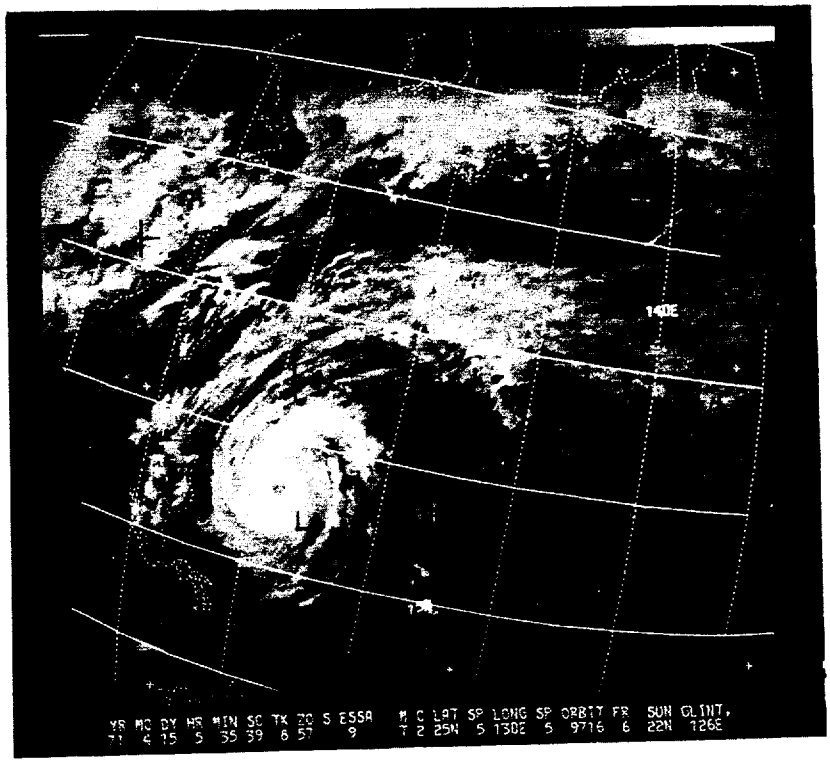



FIGURE 5-2. VERA EAST OF LUZON AS SEEN BY ESSA-9 ON 15 APRIL.

TYPHOON VERA
EYE FIXES FOR CYCLONE NO. 3
08 APR - 18 APR 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 070523Z | 6.0N 142.0E | SATELIT--- | STG B | | | | | | | | | | HVY CLD MASS TO N LTL CONV ACTIVITY | |
| 2 | 080200Z | 9.0N 140.8E | 54-P------ | ----- | ---- | 30 | 1008 | ---- | --/-- | ---- | ----- | -- | -- | BROAD WIND CNTR- | |
| 3 | 080426Z | 7.0N 141.0E | SATELIT--- | STG B | | | | | | | | | | BRT CLD MASS TO W | |
| 4 | 081206Z | 10.0N 141.8E | VQ-P-30--- | 340M | ---- | 20 | 1005 | ---- | 25/25 | ---- | ----- | -- | -- | NO RDR PRES | |
| 5 | 081600Z | 10.0N 141.6E | VQ-P-15--- | 310M | ---- | 18 | 1006 | ---- | 25/25 | ---- | ----- | -- | -- | BAND TO NORTH | |
| 6 | 082215Z | 9.9N 139.6E | 54-P- 1--- | 700MB | 12 | 12 | ---- | 3082 | 13/12 | ---- | ----- | -- | -- | NO ORGANIZ ON RDR | |
| 7 | 090345Z | 11.2N 139.0E | 54-P- 5--- | 700MB | 28 | 30 | 1001 | 3079 | 13/-- | ---- | ----- | -- | -- | FB N AND W-SPIRAL BAND OF SC IN CNT | |
| 8 | 090525Z | 10.0N 141.0E | SATELIT--- | STG B | | | | | | | | | | 2ND CNTR 130NM NW | |
| 9 | 090955Z | 11.2N 139.0E | VQ-P- 3--- | 400M | 28 | 20 | 1001 | ---- | 26/23 | ---- | ----- | -- | -- | NO RADAR PRES | |
| 10 | 091615Z | 11.6N 139.6E | VQ-P- 3--- | 400M | ---- | 18 | 1000 | ---- | 25/22 | ---- | ----- | -- | -- | NO ORGANIZ ON RDR | |
| 11 | 100340Z | 12.0N 137.9E | 54-P-20--- | 500M | 20 | 25 | 998 | 3051 | 13/12 | ---- | ----- | -- | -- | POORLY DEF CNTR | |
| 12 | 110527Z | 9.5N 131.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 13 | 120126Z | 13.0N 134.1E | 54-P- 5--- | 700MB | 40 | 40 | 994 | 3015 | 13/13 | ---- | ----- | -- | -- | FIX AT SFC WIND CNTR - WEAK BANDS | |
| 14 | 120400Z | 13.2N 133.4E | 54-P- 5--- | 700MB | 36 | 35 | 991 | 3002 | 13/12 | CIRC | | 8 | -- | WIND CNTR - VERY LTL RDR ORGANIZ | |
| 15 | 120625Z | 13.5N 133.8E | SATELIT--- | STG C | | | | | | | | | | | |
| 16 | 120944Z | 13.4N 133.2E | VQ-P-15--- | 500M | 26 | 30 | 986 | ---- | 26/23 | ---- | ----- | -- | -- | CNTR POORLY DEF | |
| 17 | 121525Z | 13.9N 132.5E | VQ-P- 5--- | 500M | 45 | 40 | 987 | 2990 | 26/23 | CIRC | | 55 | -- | CNTR POORLY DEF | |
| 18 | 122230Z | 13.7N 131.9E | 54-R- 8--- | ----- | 48 | 35 | ---- | ---- | --/-- | CIRC | | 25 | -- | EYE OPEN SW QUAD | 13.8N 133.0E |
| 19 | 122315Z | 14.3N 131.7E | 54-P- 5--- | 700MB | 48 | 45 | 992 | 2990 | 13/10 | CIRC | | 30 | -- | WC WEAK-OPEN W | |
| 20 | 130330Z | 14.6N 131.2E | 54-P- 3--- | 700MB | 70 | 50 | 989 | 2987 | 12/09 | CIRC | | 35 | -- | WC REFORMING ALL QUADS-MDT FBS | |
| 21 | 130533Z | 15.0N 130.5E | SATELIT--- | STG C+ | | | | | | | | | | FNTL BAND TO NE | |
| 22 | 131018Z | 15.5N 130.7E | VQ-P- 5--- | 500M | ---- | 45 | 980 | ---- | 26/23 | CIRC | | 29 | -- | OPEN NE QUAD | |
| 23 | 131502Z | 16.2N 129.9E | VQ-P- 5--- | 500M | ---- | 55 | 981 | ---- | 27/23 | ELIP | E-W | 38X28 | 22 | WEST SEMIC POORLY ORGANIZED | |
| 24 | 132200Z | 16.5N 128.8E | 54-P- 3--- | 700MB | 50 | ---- | 978 | 2871 | 15/13 | CIRC | | 40 | -- | EYE OPEN NE QUAD SFC CNTR WELL DEF | |
| 25 | 140400Z | 17.2N 128.1E | 54-P- 5--- | 700MB | 60 | 60 | ---- | 2868 | 18/12 | CIRC | | 40 | -- | WK CLOSED WC | |
| 26 | 140628Z | 18.0N 128.0E | SATELIT--- | STG X | DIA | 3 | CAT 4.0 | | | | | | | RAGGED EYE CLSD WC-STG FBS | |
| 27 | 140959Z | 17.7N 127.6E | VQ-R-10--- | 500M | ---- | 60 | ---- | ---- | --/22 | CIRC | | 35 | -- | STORM WELL DEVEL- | 16.7N 126.8E |
| 28 | 141530Z | 17.9N 127.0E | VQ-R-10--- | 500M | ---- | 65 | ---- | ---- | --/23 | CIRC | | 40 | -- | WC OPEN SE QUAD | 19.0N 127.0E |
| 29 | 142210Z | 18.0N 126.7E | 54-P- 5--- | 700MB | 85 | ---- | 960 | 2755 | 11/06 | CIRC | | 35 | -- | CLSD WC | |
| 30 | 150400Z | 18.1N 126.1E | 54-P- 5--- | 700MB | 75 | 65 | 964 | 2783 | 16/08 | CIRC | | 35 | -- | CLSD WC | |
| 31 | 150536Z | 18.0N 126.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | | |
| 32 | 151006Z | 18.1N 125.7E | VQ-R- 8--- | 310M | ---- | 45 | ---- | ---- | --/-- | CIRC | | 21 | -- | CLSD WC | 19.2N 125.2E |
| 33 | 151602Z | 18.7N 125.7E | VQ-P- 5--- | 700MB | ---- | 80 | 964 | 2786 | 17/10 | CIRC | | 30 | 11 | CLSD WC | |
| 34 | 152200Z | 18.9N 125.8E | 54-P- 5--- | 700MB | 75 | 60 | 968 | 2812 | 17/11 | CIRC | | 35 | -- | CLSD WC | |
| 35 | 160130Z | 19.4N 125.9E | 54-P- 8--- | 700MB | 85 | ---- | 972 | 2835 | 16/12 | CIRC | | 35 | -- | CLSD WC | |
| 36 | 160400Z | 19.8N 126.1E | 54-P- 4--- | 700MB | 75 | 50 | 971 | 2835 | 16/11 | CIRC | | 35 | -- | CLSD WC | |
| 37 | 160634Z | 20.0N 126.5E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | | |
| 38 | 160950Z | 20.4N 126.3E | VQ-P- 5--- | 320M | 80 | 75 | 974 | ---- | 25/22 | CIRC | | 45 | -- | WC OPEN SW QUAD | |
| 39 | 161242Z | 20.8N 126.4E | VQ-P- 7--- | 340M | 70 | 70 | 979 | ---- | 27/24 | CIRC | | 60 | -- | WC OPEN SW SEMIC | |
| 40 | 161534Z | 21.3N 126.6E | VQ-P-10--- | 700MB | ---- | 55 | 980 | 2940 | 17/09 | CIRC | | 60 | 5 | WC OPEN SW SEMIC WEAK FB ACTIVITY | |
| 41 | 162200Z | 21.9N 127.0E | 54-P- 2--- | 700MB | 65 | 55 | 985 | 2963 | 16/13 | ---- | ----- | -- | -- | NO WC | |

TYPHOON VERA

EYE FIXES FOR CYCLONE NO. 3

08 APR - 18 APR 71

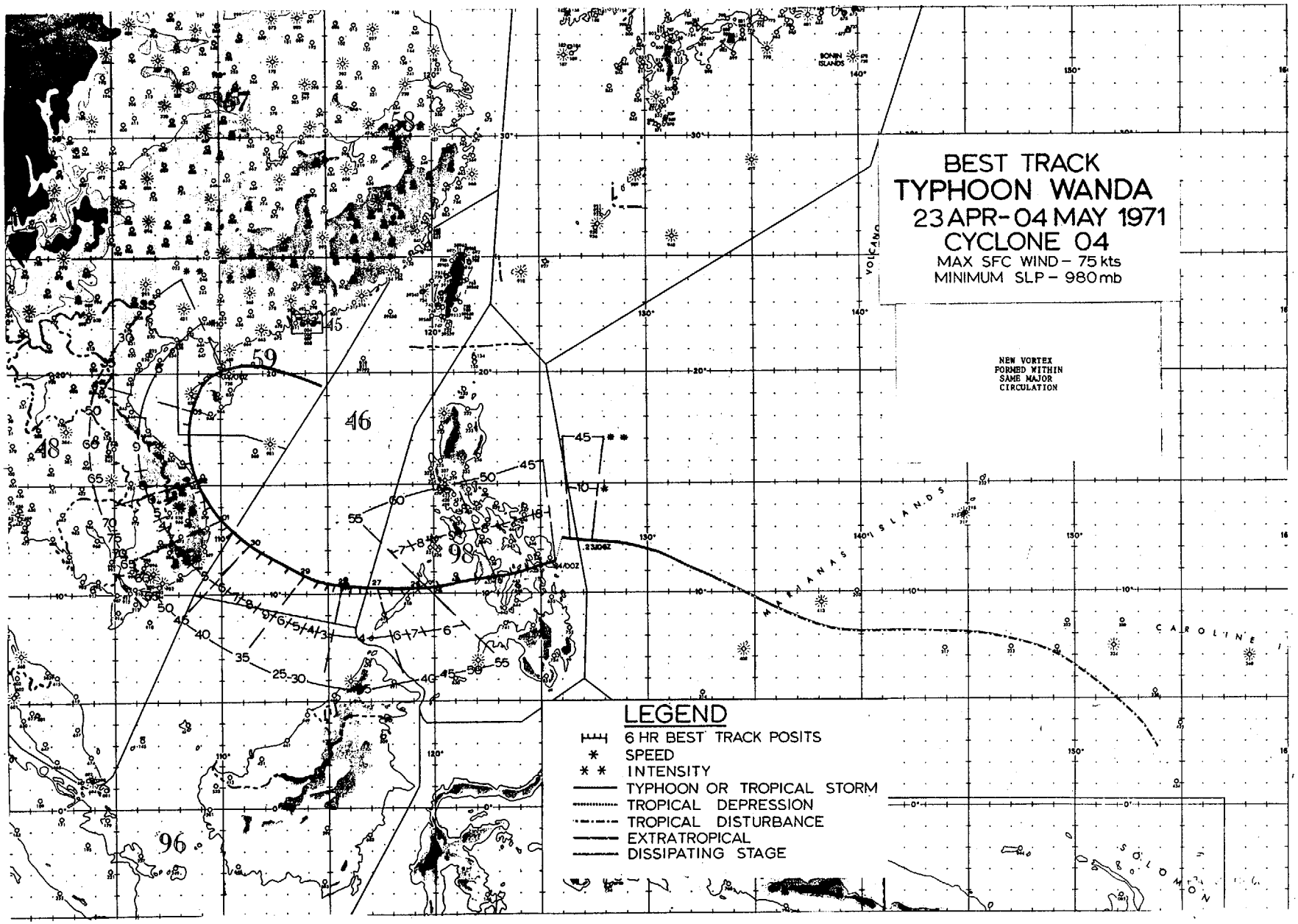
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 170400Z | 22.8N 127.7E | 54-P- 5--- | 700MB | 75 | 70 | 984 | 2944 | 16/14 | ---- | ----- | -- | -- | NO WC-RDR POOR APPEARS WEAKER | |
| 43 | 170537Z | 23.0N 127.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 44 | 171011Z | 24.0N 128.6E | VQ-P- 8--- | 400M | ---- | 60 | 985 | ---- | 24/19 | ---- | ----- | -- | -- | NO WC - MDT FRS | |
| 45 | 171605Z | 25.0N 130.5E | VQ-P- 5--- | 700MB | ---- | 35 | 994 | 2950 | 10/09 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 46 | 172200Z | 25.7N 131.9E | 54-P-10--- | 700MB | 45 | ---- | 998 | 3008 | 10/09 | ---- | ----- | -- | -- | NO RDR PRES | |
| 47 | 180445Z | 26.0N 132.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 48 | 180515Z | 26.0N 132.6E | 54-P- 2--- | 700MB | 30 | 35 | 997 | 3027 | 14/14 | ---- | ----- | -- | -- | FLAT PRESS GRAD NO RDR PRES | |

TYPHOON VERA

0600Z 8 APR TO 0600Z 18 APR

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 080600Z | 9.2N 140.5E | 25 | 9.0N 140.0E | 30 | 32 | 5 | 9.5N 134.2E | 50 | 320 | 20 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 081200Z | 9.5N 140.3E | 25 | 9.5N 140.0E | 30 | 18 | 5 | 9.9N 136.1E | 45 | 198 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 081800Z | 9.7N 140.1E | 25 | 9.5N 140.0E | 30 | 13 | 5 | 9.8N 137.7E | 40 | 128 | 10 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 090000Z | 10.1N 139.8E | 25 | 10.0N 139.3E | 30 | 30 | 5 | 10.8N 135.3E | 40 | 182 | 10 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 090600Z | 10.7N 139.5E | 30 | 11.1N 138.5E | 30 | 63 | 0 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 091200Z | 11.4N 139.1E | 30 | 11.4N 138.5E | 30 | 35 | 0 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 091800Z | 11.7N 138.7E | 30 | 12.0N 138.4E | 30 | 25 | 0 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 100000Z | 11.9N 138.2E | 30 | 12.3N 138.4E | 25 | 27 | -5 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 120600Z | 13.4N 133.3E | 40 | 13.0N 133.6E | 40 | 30 | 0 | 12.8N 130.3E | 50 | 134 | 0 | 13.4N 127.1E | 50 | 239 | -25 | --.- --.- | -- | -- | -- |
| 121200Z | 13.6N 132.7E | 40 | 13.6N 132.9E | 45 | 12 | 5 | 15.3N 130.5E | 50 | 19 | -10 | 17.0N 129.0E | 50 | 98 | -30 | 18.8N 128.1E | 30 | 146 | -50 |
| 121800Z | 14.0N 132.2E | 45 | 14.1N 132.2E | 45 | 6 | 0 | 15.8N 130.2E | 50 | 52 | -15 | 17.6N 129.0E | 50 | 116 | -35 | --.- --.- | -- | -- | -- |
| 130000Z | 14.4N 131.6E | 45 | 14.5N 131.7E | 50 | 8 | 5 | 16.6N 129.8E | 60 | 69 | -10 | 18.6N 128.4E | 60 | 114 | -30 | 20.5N 128.0E | 40 | 141 | -40 |
| 130600Z | 14.9N 131.1E | 50 | 14.8N 131.0E | 55 | 8 | 5 | 16.4N 129.0E | 60 | 78 | -15 | 18.3N 127.5E | 60 | 87 | -30 | --.- --.- | -- | -- | -- |
| 131200Z | 15.6N 130.4E | 60 | 15.5N 130.4E | 60 | 6 | 0 | 17.4N 128.3E | 70 | 51 | -10 | 19.3N 126.6E | 60 | 87 | -25 | 21.3N 125.1E | 40 | 81 | -30 |
| 131800Z | 16.2N 129.4E | 65 | 16.4N 129.5E | 60 | 13 | -5 | 18.8N 127.0E | 60 | 48 | -25 | 21.0N 125.3E | 40 | 144 | -45 | --.- --.- | -- | -- | -- |
| 140000Z | 16.6N 128.6E | 70 | 16.9N 128.7E | 65 | 19 | -5 | 19.5N 126.3E | 50 | 90 | -40 | 22.1N 124.7E | 40 | 186 | -40 | 24.9N 123.4E | 25 | 267 | -40 |
| 140600Z | 17.3N 128.0E | 75 | 17.5N 128.0E | 65 | 12 | -10 | 20.2N 125.9E | 50 | 132 | -40 | 22.9N 124.3E | 35 | 218 | -40 | --.- --.- | -- | -- | -- |
| 141200Z | 17.8N 127.5E | 80 | 18.0N 127.5E | 70 | 12 | -10 | 20.6N 125.6E | 60 | 143 | -25 | 23.4N 124.1E | 45 | 205 | -25 | 26.2N 123.0E | 25 | 356 | -20 |
| 141800Z | 18.0N 127.0E | 85 | 18.4N 127.0E | 70 | 24 | -15 | 20.7N 125.4E | 60 | 126 | -25 | 22.9N 124.3E | 45 | 160 | -20 | --.- --.- | -- | -- | -- |
| 150000Z | 18.0N 126.5E | 90 | 18.9N 126.6E | 85 | 54 | -5 | 21.5N 125.0E | 75 | 146 | -5 | 23.8N 124.3E | 60 | 189 | -5 | 28.4N 125.6E | 35 | 381 | 0 |
| 150600Z | 18.0N 126.0E | 90 | 18.2N 125.9E | 85 | 13 | -5 | 19.9N 123.9E | 90 | 130 | 15 | 22.8N 122.8E | 80 | 281 | 20 | --.- --.- | -- | -- | -- |
| 151200Z | 18.2N 125.6E | 85 | 18.2N 125.6E | 85 | 0 | 0 | 20.0N 123.7E | 90 | 157 | 20 | 23.1N 122.8E | 80 | 356 | 30 | --.- --.- | -- | -- | -- |
| 151800Z | 18.6N 125.5E | 85 | 18.8N 125.4E | 85 | 13 | 0 | 20.7N 123.7E | 85 | 172 | 20 | 23.9N 123.3E | 75 | 415 | 35 | --.- --.- | -- | -- | -- |
| 160000Z | 19.2N 125.9E | 80 | 19.5N 125.7E | 85 | 21 | 5 | 21.0N 125.2E | 80 | 129 | 15 | 23.8N 125.3E | 70 | 386 | 35 | --.- --.- | -- | -- | -- |
| 160600Z | 19.7N 126.2E | 75 | 20.0N 126.0E | 80 | 21 | 5 | 23.1N 126.9E | 70 | 55 | 10 | 26.9N 129.7E | 50 | 183 | 15 | --.- --.- | -- | -- | -- |
| 161200Z | 20.7N 126.4E | 70 | 20.6N 126.4E | 80 | 6 | 10 | 24.2N 127.3E | 65 | 104 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 161800Z | 21.4N 126.7E | 65 | 21.7N 126.6E | 75 | 19 | 10 | 25.4N 128.1E | 60 | 146 | 20 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 170000Z | 22.1N 127.2E | 65 | 22.2N 127.0E | 70 | 13 | 5 | 25.9N 129.0E | 50 | 167 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 170600Z | 23.2N 127.9E | 60 | 23.1N 127.8E | 70 | 8 | 10 | 26.6N 131.8E | 50 | 71 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 171200Z | 24.2N 129.2E | 50 | 24.4N 128.9E | 65 | 20 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 171800Z | 25.2N 130.8E | 40 | 25.5N 130.9E | 55 | 19 | 15 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 180000Z | 25.7N 132.1E | 35 | 25.9N 132.5E | 40 | 25 | 5 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |
| 180600Z | 26.1N 133.0E | 35 | 26.1N 133.0E | 35 | 0 | 0 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 15NM | 106NM | 204NM | 229NM | 19NM | 122NM | 204NM | 229NM |
| AVERAGE RIGHT ANGLE ERROR | 12NM | 61NM | 133NM | 189NM | 15NM | 81NM | 133NM | 189NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 17KTS | 29KTS | 32KTS | 5KTS | 17KTS | 29KTS | 32KTS |
| AVERAGE BIAS OF WIND ERROR | 2KTS | -4KTS | -13KTS | -32KTS | 2KTS | -1KTS | -13KTS | -32KTS |
| NUMBER OF FORECASTS | 25 | 21 | 17 | 6 | 33 | 25 | 17 | 6 |


BEST TRACK
TYPHOON WANDA
23 APR-04 MAY 1971
CYCLONE 04
MAX SFC WIND - 75 kts
MINIMUM SLP - 980 mb
NEW VORTEX FORMED WITHIN SAME MAJOR CIRCULATION
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
MARIANAS ISLANDS
CAROLINE
SOLOMON

## WANDA

Wanda, followed by Amy and Babe, heralded the greatest outbreak of tropical-storm activity in any spring on record. Her genesis can be traced back as far as the central Carolines on April 15th. Drifting west-northwest for a period of over a week, the diffuse system began to take character and strengthen into a tropical storm on the 23rd, 150 n mi east of Samar in the central Philippines. A new vortex formed south of the original one and Wanda tracked across the island near the Leyte Gulf with winds of 50 to 60 kt. The storm passed over the Visayas and into the Sulu Sea, crossing Palawan Island the afternoon and evening of the 26th.

A peak gust of 84 kt was observed at Tacloban City, however, this may have been due to channeled winds between the islands of Samar and Leyte. The typhoon left 56 dead in the Philippines with 39 reported missing. Damage to public and private property was estimated near 700,000 dollars (U.S.).

Upon entering the South China Sea, Wanda slowed in forward speed to 3-4 kt for a 24-hour period and weakened to a depression (Figure 5-3). At this point the chances for her to regain strength were considered slight. Surprisingly, during the evening of the 29th, Wanda regained her tropical storm status. In the meantime the storm had swung to a northwesterly course as it rounded the southeastern periphery of the subtropical ridge which was extending across the northern South China Sea.

Continuing to intensify, typhoon force was attained less than 60 n mi off the Vietnam coast southeast of Qui Nhon, as Wanda began to recurve in response to a trough in the westerlies coming off the Tibetan Plateau. Reaching a peak intensity of 75 kt, the typhoon paralleled the coastline (Figure 5-4) for 30 hours on May 1st and 2nd, the eye barely touching ashore near Quang Ngai.

Wanda weakened to tropical-storm force upon leaving the Vietnamese coast line and struck Hainan Island on the 3rd with winds of 45 kt. Coming under the influence of the westerlies, the system quickly assumed extratropical characteristics. The remains of the system drifted on an easterly course and dissipated some 36 hours later in the northern South China Sea.

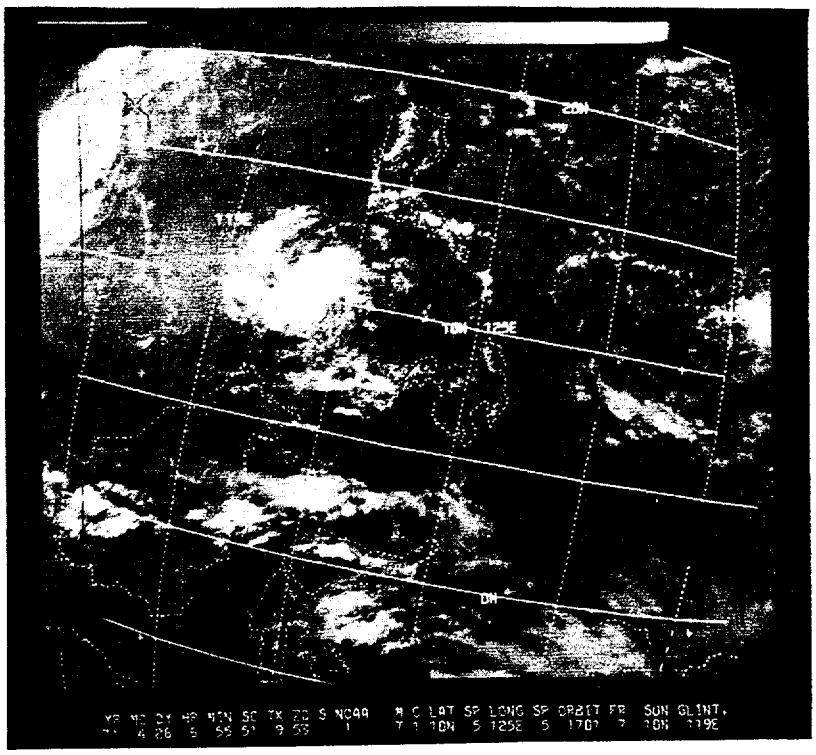



FIGURE 5-3. WANDA AS A MINIMAL TROPICAL STORM WEST OF THE CENTRAL PHILIPPINES ON 26 APRIL.

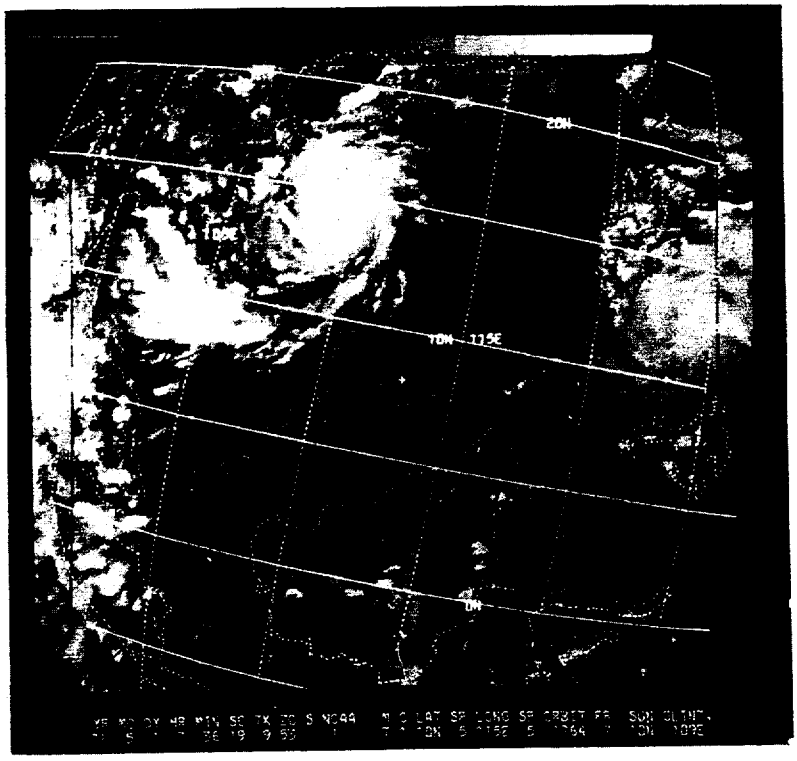



FIGURE 5-4. NOAA-1 VIEW OF TYPHOON WANDA ALONG THE SOUTH VIETNAM COAST ON 1 MAY. DISTURBANCE OVER THE PHILIPPINES IS THE FORMATIVE STAGES OF TROPICAL STORM BABE.

Typhoon Wanda was the first significant storm in more than 20 years to affect the coast of Vietnam during April or May. At Chu Lai maximum winds of 35 kt with gusts to 63 kt were reported. Landing Zone "English" sustained 50-kt winds and gusts were estimated near 70 kt. Maximum rainfall amounts of 7.5 inches and 8.25 inches were reported at Landing Zone "English" and Duc Pho respectively. Over 23 people were killed in the Quang Ngai province and over 10,000 homes and buildings were partly or completely destroyed.

TYPHOON WANDA
EYE FIXES FOR CYCLONE NO. 4
23 APR - 04 MAY 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 230303Z | 12.2N 127.9E | 54-P- 5--- | 700MB | 40 | 45 | 991 | 2993 | 12/11 | ---- | ----- | -- | -- | WC FRMG NW QUAD 700 CNTR 14NM SE | |
| 2 | 230608Z | 12.0N 127.8E | SATELIT--- | STG H | | | | | | | | | | FIRST SAT BLTN | |
| 3 | 231010Z | 12.4N 126.6E | VQ--- 3--- | ----- | ---- | 40 | ---- | ---- | --/-- | CIRC | | 10 | 5 | WC OPEN SE QUAD | 12.3N 127.8E |
| 4 | 231410Z | 12.4N 126.1E | VQ-P- 3--- | 700MB | 50 | ---- | 993 | 3060 | 16/10 | ELIP | E-W | 16X13 | 5 | WC OPEN SE QUAD | |
| 5 | 231550Z | 12.4N 126.0E | VQ-P- 3--- | 700MB | 34 | ---- | 993 | 3060 | 15/10 | CIRC | | 8 | -- | WC OPEN SE QUAD | |
| 6 | 240100Z | 11.2N 125.6E | 54-P-10--- | 500MB | 45 | ---- | ---- | 2720 | +2/-2 | CIRC | | 12 | -- | CLOSED WC | |
| 7 | 240400Z | 11.3N 125.3E | 54-P- 1--- | 500MB | 50 | 40 | ---- | ---- | --/-- | CIRC | | 6 | -- | CLOSED WC | |
| 8 | 240702Z | 11.5N 125.0E | SATELIT--- | STG C+ | | | | | | | | | | INTENSIFYING | |
| 9 | 241017Z | 11.1N 124.5E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 12 | -- | CLOSED WC | 11.4N 125.4E |
| 10 | 241544Z | 11.1N 123.8E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 19 | -- | WC OPEN NW QUAD RDR PRES BCMG WKR | 11.7N 123.7E |
| 11 | 242200Z | 10.8N 123.2E | 54-P- 5--- | 500MB | 50 | ---- | ---- | ---- | -1/-3 | CIRC | | 15 | -- | WC OPEN SE | |
| 12 | 250335Z | 10.6N 122.2E | 54-P- 2--- | 500MB | 85 | ---- | ---- | ---- | -1/-2 | ELIP | E-W | 20X13 | 10 | CLOSED WC | |
| 13 | 250756Z | 10.5N 122.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | | |
| 14 | 251000Z | 10.6N 121.4E | VQ-R- 1--- | ----- | 35 | ---- | ---- | ---- | --/10 | CIRC | | 18 | 10 | CLSD WC- RDR PRES GOOD - MDT FB W | 9.8N 121.8E |
| 15 | 251252Z | 10.7N 120.9E | VQ-P- 1--- | 700MB | 39 | ---- | 991 | 3078 | 16/10 | ELIP | E-W | 18X14 | -- | CLSD WC | |
| 16 | 251538Z | 10.6N 120.5E | VQ-P- 1--- | 700MB | 50 | ---- | 980 | 3063 | 17/14 | CIRC | | 20 | 11 | WC OPEN NW QUAD | |
| 17 | 252200Z | 10.2N 120.0E | 54-P- 2--- | 700MB | 50 | 60 | 989 | 2999 | 16/11 | CIRC | | 12 | -- | WC OPEN NW QUAD | |
| 18 | 260357Z | 10.3N 119.6E | 54-P- 1--- | 500MB | 26 | 50 | ---- | ---- | -2/-3 | ---- | ----- | -- | 6 | RDR PRES POOR | |
| 19 | 260655Z | 10.0N 119.5E | SATELIT--- | STG B | | | | | | | | | | WEAKENING | |
| 20 | 261000Z | 10.3N 118.9E | VQ-R-15--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STORM DISORG | 9.9N 119.0E |
| 21 | 261535Z | 10.6N 118.1E | VQ-P- 5--- | 420M | ---- | 40 | 999 | ---- | 26/22 | ---- | ----- | 25X20 | -- | WC OPEN E | |
| 22 | 262200Z | 10.2N 117.6E | 54-P- 5--- | 700MB | 35 | ---- | 993 | 3060 | 17/15 | CIRC | | 35 | -- | WC POORLY DEF | |
| 23 | 270400Z | 10.2N 117.1E | 54-P- 5--- | 700MB | 26 | 30 | 999 | 3115 | 13/11 | ---- | ----- | -- | -- | NO WC | |
| 24 | 270749Z | 12.0N 115.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 25 | 270935Z | 10.2N 116.8E | VQ-P- 5--- | 700MB | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | WIND CNTR 7NM DIA | |
| 26 | 271555Z | 10.2N 116.2E | VQ-P- 5--- | 700MB | 27 | ---- | 997 | ---- | 14/14 | CIRC | | 14 | -- | NO WC | |
| 27 | 272145Z | 10.5N 115.9E | 54-P- 3--- | 700MB | ---- | 25 | 1000 | 3088 | 11/09 | ---- | ----- | -- | -- | CNTR DEF BY SC | |
| 28 | 280653Z | 11.5N 115.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 29 | 281041Z | 10.7N 114.4E | VQ-P- 5--- | 400M | ---- | 20 | 1003 | ---- | 27/24 | ---- | ----- | -- | -- | THIN FB SPIRALING INTO CNTR | |
| 30 | 282215Z | 10.8N 114.2E | 54-P- 5--- | 400M | 35 | 30 | 999 | ---- | 26/24 | ---- | ----- | -- | -- | RDR PRES POOR | |
| 31 | 290742Z | 12.5N 113.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 32 | 291703Z | 12.0N 112.1E | VQ-P- 5--- | 700MB | 32 | ---- | 999 | 3109 | 14/12 | ---- | ----- | -- | -- | WIND EYE 5NM DIA | |
| 33 | 292215Z | 12.1N 111.6E | 54-P- 3--- | 700MB | 50 | 45 | 1000 | 3060 | 12/11 | ---- | ----- | -- | -- | 700 CNTR 15NM N | |
| 34 | 300400Z | 12.4N 111.2E | 54-P- 3--- | 700MB | 52 | 50 | 996 | 3057 | 14/11 | CIRC | | 20 | 10 | WC OPEN S SEMIC | |
| 35 | 300720Z | 12.5N 111.0E | VQ-R- 2--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 15 | -- | WELL ORGANIZED | 12.1N 111.4E |
| 36 | 300745Z | 12.6N 111.0E | VQ-P- 5--- | 400M | ---- | 45 | 993 | ---- | 26/23 | CIRC | | 15 | -- | WC OPEN NW QUAD | |
| 37 | 300819Z | 13.0N 111.1E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | | |
| 38 | 301016Z | 12.8N 110.8E | VQ-P- 5--- | 320M | ---- | 35 | 993 | ---- | 26/26 | CIRC | | 25 | -- | WC OPEN W | |
| 39 | 301248Z | 12.8N 110.6E | VQ-P- 8--- | 300M | ---- | 45 | 996 | ---- | 26/23 | CIRC | | 25 | -- | WELL ORGANIZED | |
| 40 | 301600Z | 13.1N 110.5E | 54-P- 1--- | 700MB | 50 | ---- | 980 | 2951 | 14/11 | CIRC | | 35 | -- | WC OPEN N-SE | |
| 41 | 301900Z | 13.1N 110.4E | 54-P- 1--- | 700MB | 50 | ---- | 980 | 2951 | 14/09 | CIRC | | 35 | -- | CLSD WC | |
| 42 | 302200Z | 13.2N 110.3E | 54-P- 1--- | 700MB | 50 | ---- | 982 | 2923 | 14/11 | CIRC | | 32 | -- | CLSD WC | |
| 43 | 010123Z | 13.9N 109.9E | VQ-P- 5--- | 400M | ---- | 70 | 985 | ---- | 26/22 | CIRC | | 20 | 14 | CLSD WC | |
| 44 | 010355Z | 13.9N 109.7E | VQ-P- 3--- | 700MB | 43 | 65 | 987 | 2993 | 18/09 | CIRC | | 28 | 6 | WC OPEN SW QUAD | |
| 45 | 010642Z | 14.0N 109.6E | VQ-P- 2--- | 700MB | 77 | ---- | 981 | 2978 | 19/11 | ELIP | N-S | 21X16 | 10 | WC TOPS 20K FT | |
| 46 | 010741Z | 14.0N 109.5E | SATELIT--- | STG X | DIA | 2 | CAT 0.5 | | | | | | | | |

TYPHOON WANDA
EYE FIXES FOR CYCLONE NO. 4
23 APR - 04 MAY 71

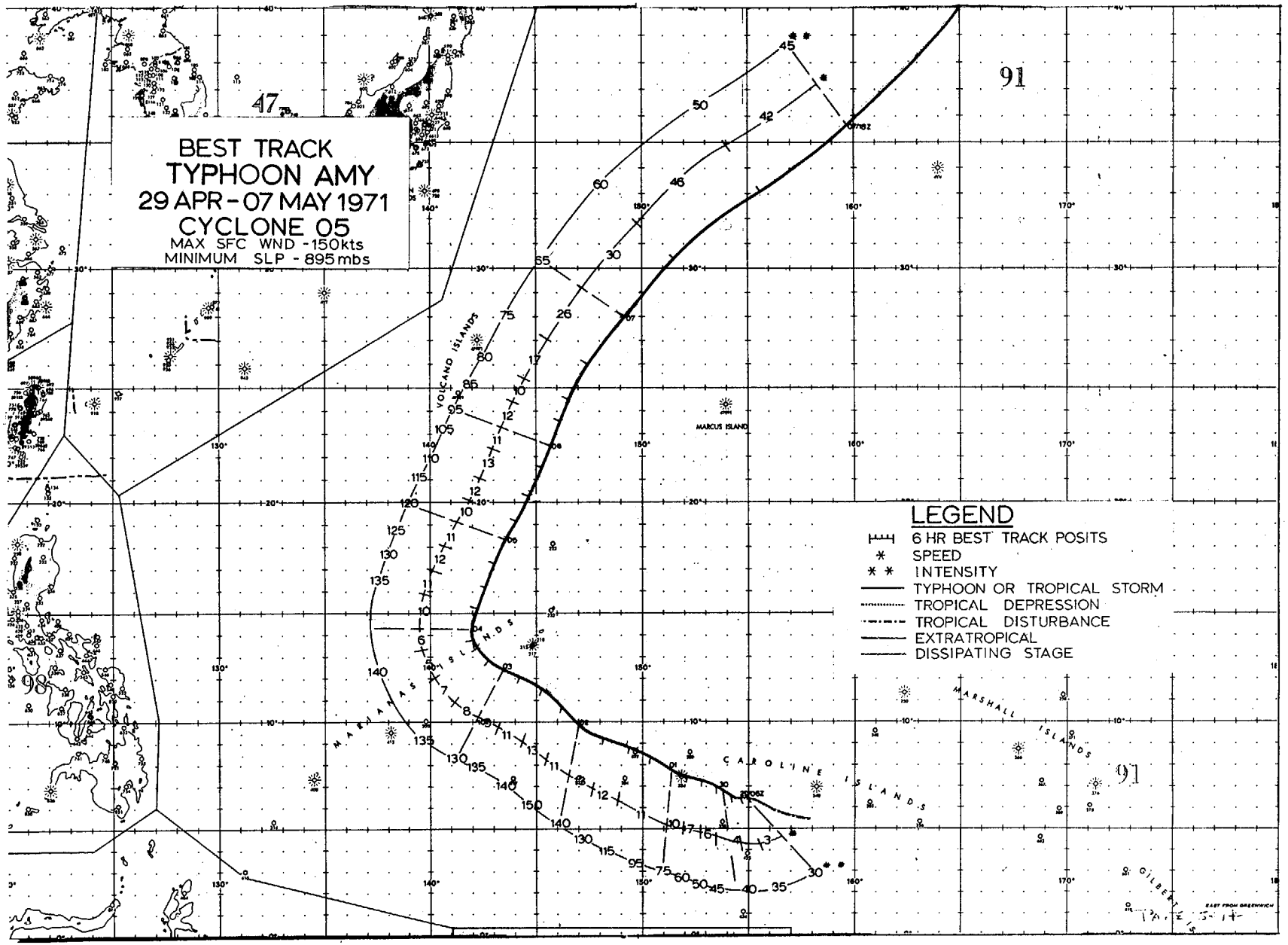
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 011000Z | 14.4N 109.5E | 54-P- 3--- | 700MB | 50 | 70 | 980 | 2914 | 17/10 | CIRC | | 20 | -- | CLSD WC | |
| 48 | 011300Z | 14.5N 109.4E | 54---------- | 700MB | 52 | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | FIX BSD ON FL WND | |
| 49 | 011530Z | 14.5N 109.4E | ---------- | ----- | ---- | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | RDR SITE 118NM NW | |
| 50 | 011855Z | 14.8N 109.2E | VQ-R- 8--- | ----- | ---- | ---- | ---* | ---- | --/-- | ELIP | E-W | 30X22 | -- | CLSD WC - EYE OVR LND - INTENSE FBS | 14.9N 109.7E |
| 51 | 012217Z | 15.1N 108.8E | VQ-R- 8--- | ----- | ---- | ---- | ---* | ---- | --/-- | ELIP | SE-NW | 44X32 | -- | CLSD IRREG WC | 14.9N 109.7E |
| 52 | 020047Z | 15.4N 108.9E | VQ-R- 5--- | ----- | ---- | ---- | ---* | ---- | --/-- | ELIP | NE-SW | 27X20 | -- | CLSD WC | 14.7N 109.7E |
| 53 | 020404Z | 15.8N 108.8E | 54-P- 1--- | 700MB | 41 | 65 | 976 | 2951 | 16/12 | CIRC | | 38 | -- | CLSD WC | |
| 54 | 020700Z | 16.2N 108.8E | 54-P- 1--- | 700MB | 52 | 70 | 987 | 2951 | 16/12 | CIRC | | 30 | -- | CLSD WC | |
| 55 | 020835Z | 16.0N 109.0E | SATELIT--- | STG X | DIA | 2. | CAT 3.0 | | | | | | | | |
| 56 | 021000Z | 16.6N 108.9E | 54-P- 1--- | 700MB | 50 | 65 | 986 | 2981 | 16/12 | CIRC | | 40 | -- | CLSD WC | |
| 57 | 021329Z | 17.3N 108.9E | VQ-R-10--- | ----- | 27 | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | WC OPEN S SEMIC | 16.7N 110.3E |
| 58 | 021600Z | 17.6N 108.6E | VQ-R- 3--- | 500M | 26 | ---- | ---* | ---- | --/-- | CIRC | | 32 | -- | EYE WEAKENING | 16.5N 108.9E |
| 59 | 021920Z | 18.0N 108.7E | VQ-R- 4--- | 800M | 29 | ---- | ---* | ---- | --/-- | ELIP | E-W | 39X25 | -- | EYE RAGGED | 16.6N 108.8E |

TYPHOON WANDA

0600Z 23 APR TO 0000Z 4 MAY

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 230600Z | 12.4N 127.4E | 45 | 12.2N 127.5E | 45 | 13 | 0 | 11.5N 124.5E | 30 | 39 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 231200Z | 12.5N 126.4E | 45 | 12.3N 126.2E | 55 | 17 | 10 | 12.3N 122.0E | 30 | 158 | -20 | 12.3N 117.8E | 35 | 223 | -25 | 12.8N 113.8E | 50 | 318 | 5 |
| 240000Z | 11.3N 125.8E | 45 | 11.4N 125.6E | 45 | 13 | 0 | 12.5N 124.4E | 30 | 134 | -25 | 12.7N 122.4E | 30 | 205 | -25 | 13.1N 119.4E | 35 | 212 | 0 |
| 240600Z | 11.2N 125.1E | 45 | 11.7N 125.0E | 40 | 30 | -5 | 11.8N 122.1E | 30 | 66 | -25 | 12.3N 119.1E | 35 | 120 | -15 | --.- ---.- | -- | -- | -- |
| 241200Z | 11.1N 124.4E | 50 | 11.2N 124.3E | 35 | 8 | -15 | 11.2N 121.2E | 30 | 36 | -30 | 11.5N 118.1E | 40 | 77 | -5 | 12.3N 115.2E | 50 | 145 | 15 |
| 241800Z | 10.9N 123.7E | 50 | 11.1N 123.5E | 35 | 17 | -15 | 11.2N 120.5E | 35 | 42 | -25 | 11.6N 117.3E | 45 | 85 | 5 | --.- ---.- | -- | -- | -- |
| 250000Z | 10.8N 122.9E | 55 | 10.9N 122.9E | 40 | 6 | -15 | 10.7N 119.8E | 40 | 18 | -15 | 10.9N 116.8E | 50 | 51 | 15 | 11.4N 113.8E | 60 | 132 | 25 |
| 250600Z | 10.7N 122.1E | 55 | 10.8N 121.8E | 45 | 19 | -10 | 10.7N 118.3E | 55 | 58 | 5 | 11.1N 115.1E | 65 | 119 | 30 | --.- ---.- | -- | -- | -- |
| 251200Z | 10.6N 121.2E | 60 | 10.6N 121.1E | 50 | 6 | -10 | 10.6N 117.8E | 60 | 50 | 15 | 11.1N 114.8E | 70 | 116 | 35 | 12.0N 111.9E | 70 | 208 | 45 |
| 251800Z | 10.5N 120.4E | 60 | 10.6N 120.2E | 55 | 13 | -5 | 10.7N 116.7E | 65 | 74 | 25 | 11.4N 113.5E | 70 | 171 | 35 | --.- ---.- | -- | -- | -- |
| 260000Z | 10.4N 119.8E | 55 | 10.3N 119.8E | 60 | 6 | 5 | 10.4N 116.5E | 65 | 49 | 30 | 11.2N 113.4E | 70 | 149 | 35 | 12.7N 110.5E | 70 | 234 | 35 |
| 260600Z | 10.3N 119.2E | 50 | 10.3N 119.1E | 55 | 6 | 5 | 10.4N 116.3E | 65 | 37 | 30 | 11.3N 113.2E | 70 | 143 | 40 | --.- ---.- | -- | -- | -- |
| 261200Z | 10.3N 118.6E | 45 | 10.4N 118.5E | 50 | 8 | 5 | 10.5N 115.7E | 60 | 54 | 25 | 11.4N 113.0E | 65 | 134 | 40 | 12.7N 110.5E | 65 | 129 | 25 |
| 261800Z | 10.3N 117.9E | 40 | 10.5N 117.8E | 50 | 13 | 10 | 11.0N 115.0E | 60 | 82 | 25 | 11.9N 112.4E | 65 | 147 | 30 | --.- ---.- | -- | -- | -- |
| 270000Z | 10.2N 117.3E | 35 | 10.3N 117.2E | 50 | 8 | 15 | 10.5N 114.4E | 60 | 82 | 25 | 11.4N 111.8E | 65 | 134 | 30 | 12.8N 109.4E | 65 | 120 | 20 |
| 270600Z | 10.2N 116.9E | 35 | 10.2N 116.9E | 35 | 0 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 271200Z | 10.3N 116.6E | 35 | 10.1N 117.2E | 30 | 37 | -5 | 10.3N 116.8E | 30 | 101 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 271800Z | 10.3N 116.2E | 35 | 10.0N 116.0E | 30 | 21 | -5 | 10.3N 114.8E | 30 | 27 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 280000Z | 10.4N 115.8E | 35 | 10.4N 115.7E | 30 | 6 | -5 | 11.3N 113.8E | 30 | 32 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 280600Z | 10.5N 115.5E | 30 | 10.7N 115.1E | 30 | 26 | 0 | 11.9N 113.1E | 30 | 42 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 281200Z | 10.5N 115.1E | 25 | 10.7N 114.3E | 25 | 48 | 0 | 11.2N 111.8E | 25 | 42 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 281800Z | 10.7N 114.6E | 35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290000Z | 10.8N 114.0E | 35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290600Z | 11.2N 113.2E | 35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 11.6N 112.4E | 40 | 11.7N 112.1E | 40 | 19 | 0 | 13.0N 110.0E | 40 | 42 | -15 | 14.7N 107.6E | 30 | 106 | -45 | --.- ---.- | -- | -- | -- |
| 291800Z | 11.9N 111.9E | 40 | 12.0N 111.9E | 40 | 6 | 0 | 13.3N 109.9E | 40 | 31 | -20 | 14.7N 107.9E | 30 | 75 | -40 | --.- ---.- | -- | -- | -- |
| 300000Z | 12.3N 111.4E | 45 | 12.2N 111.5E | 45 | 8 | 0 | 13.6N 109.4E | 50 | 42 | -15 | 15.0N 107.5E | 30 | 87 | -40 | --.- ---.- | -- | -- | -- |
| 300600Z | 12.6N 111.0E | 50 | 12.5N 111.1E | 50 | 8 | 0 | 13.8N 109.3E | 55 | 21 | -15 | 15.2N 107.3E | 30 | 99 | -35 | --.- ---.- | -- | -- | -- |
| 301200Z | 12.8N 110.7E | 55 | 12.8N 110.6E | 55 | 6 | 0 | 14.2N 108.9E | 50 | 31 | -25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301800Z | 13.1N 110.4E | 60 | 13.1N 110.3E | 55 | 6 | -5 | 14.4N 108.7E | 40 | 37 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 010000Z | 13.4N 110.1E | 65 | 13.4N 110.1E | 70 | 0 | 5 | 17.8N 109.6E | 70 | 159 | 0 | 22.2N 113.9E | 50 | 365 | 5 | --.- ---.- | -- | -- | -- |
| 010600Z | 14.0N 109.6E | 70 | 14.2N 109.6E | 70 | 12 | 0 | 17.9N 109.1E | 70 | 115 | 5 | 22.0N 112.0E | 45 | 254 | 10 | --.- ---.- | -- | -- | -- |
| 011200Z | 14.4N 109.4E | 75 | 14.5N 109.4E | 70 | 6 | -5 | 16.9N 108.9E | 70 | 6 | 10 | 20.5N 110.6E | 45 | 103 | 15 | --.- ---.- | -- | -- | -- |
| 011800Z | 14.8N 109.2E | 70 | 14.7N 109.3E | 70 | 8 | 0 | 16.8N 108.9E | 70 | 61 | 20 | 20.1N 110.2E | 45 | 36 | 20 | --.- ---.- | -- | -- | -- |
| 020000Z | 15.2N 109.0E | 70 | 15.3N 108.8E | 65 | 13 | -5 | 17.4N 108.2E | 65 | 69 | 20 | 20.9N 110.0E | 45 | 42 | 20 | --.- ---.- | -- | -- | -- |
| 020600Z | 16.0N 108.8E | 65 | 16.0N 108.6E | 65 | 11 | 0 | 19.0N 108.6E | 60 | 18 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 021200Z | 16.9N 108.8E | 60 | 16.9N 108.9E | 65 | 6 | 5 | 20.0N 110.8E | 45 | 100 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 021800Z | 17.8N 108.7E | 50 | 17.9N 108.6E | 60 | 8 | 10 | 22.0N 110.2E | 30 | 130 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 030000Z | 18.4N 108.8E | 45 | 18.8N 108.7E | 55 | 25 | 10 | 22.9N 111.1E | 25 | 171 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 030600Z | 18.9N 108.9E | 35 | 19.6N 109.9E | 45 | 70 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 031200Z | 19.5N 109.1E | 30 | 19.9N 110.1E | 40 | 61 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 031800Z | 19.9N 109.6E | 25 | 19.9N 109.5E | 30 | 6 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 040000Z | 20.2N 110.1E | 25 | 20.6N 109.9E | 25 | 26 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 13NM | 59NM | 145NM | 184NM | 16NM | 67NM | 134NM | 187NM |
| AVERAGE RIGHT ANGLE ERROR | 8NM | 30NM | 81NM | 70NM | 8NM | 36NM | 68NM | 62NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 18KTS | 25KTS | 18KTS | 5KTS | 17KTS | 26KTS | 21KTS |
| AVERAGE BIAS OF WIND ERROR | -0KTS | -2KTS | -1KTS | 18KTS | 0KTS | -1KTS | 5KTS | 21KTS |
| NUMBER OF FORECASTS | 35 | 32 | 19 | 7 | 40 | 36 | 24 | 8 |


BEST TRACK
TYPHOON AMY
29 APR - 07 MAY 1971
CYCLONE 05
MAX SFC WND - 150kts
MINIMUM SLP - 895mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
VOLCANO ISLANDS
MARIANAS ISLANDS
CAROLINE ISLANDS
MARSHALL ISLANDS
MARCUS ISLAND
GILBERT IS.
EAST FROM GREENWICH

As Wanda was emerging from the central Philippines, synoptic reports and NOAA-1 satellite pictures began to show the embryo of Amy becoming evident on the 26th in the Truk-Ponape area of the central Carolines. The system remained quasi-stationary for three days and, during the evening of the 29th, attained tropical storm strength. The storm commenced to drift toward the Truk Islands while aircraft reconnaissance during late afternoon of the 30th detected evidence of an eye on their radar screens (Figure 5-5).

By daybreak of the 1st, the eye crossed Moen in the Truk Islands with the weather station reporting 65 kt with peak gusts to 98 kt and a minimum pressure of 974.8 mb. The storm continued to intensify as it crossed Namonuito Atoll on a west-northwest track completely destroying the weather station on the atoll (Figure 5-6).

To illustrate the gradient which existed at this time, the last report from Namonuito on the 1st at 0700 GMT indicated a sustained wind of 45 kt from the northeast and sea level pressure of 989.7 mb. A reconnaissance aircraft in the eye of Amy at that time, some 30 n mi southeast of the station, measured 958 mb and maximum winds of 115 kt. In other words, a 32 mb difference existed between the two points or approximately 1 mb per mile.

There was 80% damage in the Truk district including the Hall Islands and Namonuito Atoll as well as equal damage to all structures in the Truk Islands with over 2,250 homes demolished and thousands made homeless (Figures 5-7 and 5-8). A total of 4.5 million dollars damage was sustained in the private and public sectors. One death and several injuries were reported. An additional one million dollars was lost in damage to crops, small businesses, boats, equipment, etc. Hardest hit of the Truk district was Namonuito Atoll. Inspection of damage at Namonuito depicted a scene as if the atoll had been struck by fire. Little foilage was left and bark was stripped from the few remaining trees.

On request of the High Commissioner of the Trust Territories, the Truk district was declared a disaster area by President Nixon.

After a 1000 GMT aircraft fix of the storm over Namonuito Atoll on the 1st, a period of 15 hours elapsed without an aircraft penetration of the eye. On the next penetration fix at 0100 GMT on the 2nd, with Amy positioned

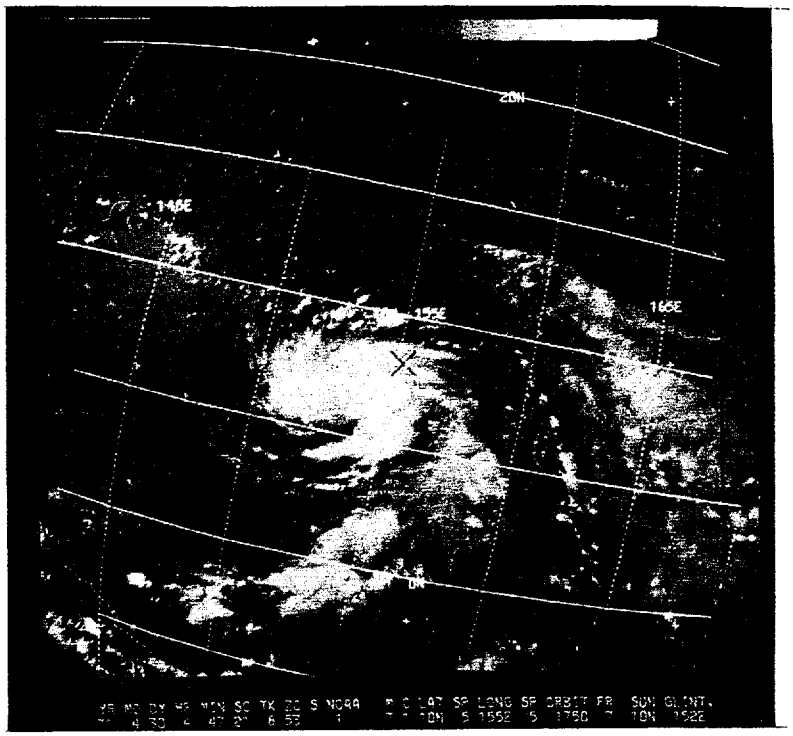



FIGURE 5-5. NOAA-1 PHOTO OF TROPICAL STORM AMY EAST OF TRUK ON 30 APRIL.

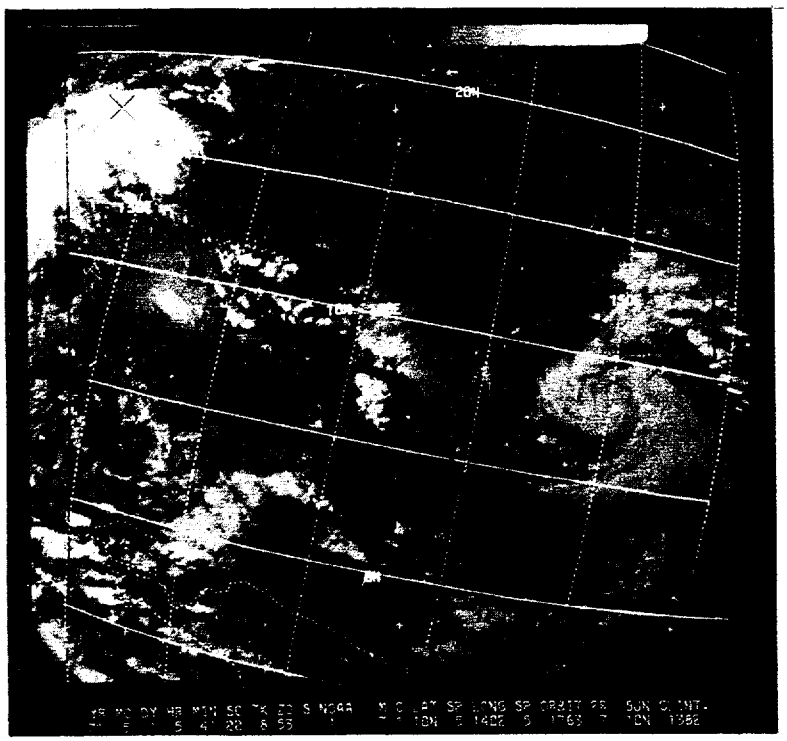



FIGURE 5-6. AMY, GAINING STRENGTH, AFTER PASSAGE OF THE TRUK ISLANDS AS SEEN BY NOAA-1 ON 1 MAY.

250 n mi southeast of Guam, a dropsonde reading indicated Amy had deepened explosively from 950 to 899 mb--a rate of 3.4 mb per hour (Figure 5-9).

During the afternoon Amy reached her peak with a minimum pressure of 895 mb and maximum sustained winds of 150 kt concentrated around a tight circular eye 10 n mi in diameter.

The eye of the typhoon came under surveillance of the radars at Mount Santa Rosa and Andersen AFB about this time. The center tracked south of Guam during the next 12 hours with closest point of approach at 84 n mi on a 208° radial from Apra Harbor.

Amy began to slow in response to the approach of a trough in the westerlies and the weakening of the subtropical ridge line. A slow drift to the northwest occurred about 120 n mi west of Guam on the 3rd. The typhoon then commenced to track northeast at 11 kt west of the Marianas Islands with maximum winds of 120 kt.

Highest winds reported on Guam were 51 kt with a gust to 68 kt (2112 GMT) at Fleet Weather Central (Elev. 600 ft), while Andersen AFB on the northern end of the island sustained winds of 36 kt (1623 GMT) with gusts to 60 kt (2358 GMT). A total rainfall of 15.26 inches was recorded at the National Weather Service Office during the passage of Amy. Minimum sea level pressure observed on the island was at Fleet Weather Central with 998.2 mb.

Damage on Guam amounted to over 900,000 dollars in public and private property damage. On Rota severe crop damage occurred, including destruction of a sea wall as well as damage to bulk storage tanks and feeder pipelines which were washed away at the oil storage yards. In the northern Marianas, minor damage was sustained mostly to the copra and banana trees. The weather station on Pagan reported a maximum wind of 28 kt with gusts to 47 kt.

Amy continued on a northeast course passing the northernmost island of the Marianas, Maug, on the evening of the 5th (Figure 5-10). At a forward speed in excess of 20 kt, she kept a northeast heading through the 6th weakening to minimal typhoon strength. By the 7th Amy decreased to tropical storm intensity and accelerated to greater than 40 kt in forward speed. After crossing the 35th parallel, the storm was overtaken by a cold front early on the 8th.

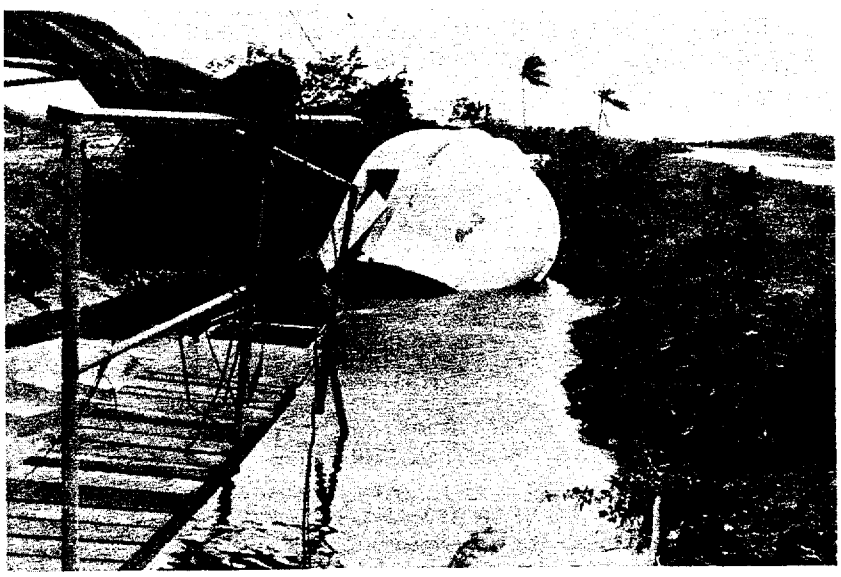


FIGURE 5-7. TRUK'S RAWINSONDE RADOME RESTS IN DRAINAGE DITCH AFTER PASSAGE OF AMY. (THE RADOME, WHICH HAD BEEN REMOVED FROM THE WEATHER STATION'S ROOF AND PLACED ON THE GROUND WHILE AWAITING SERVICING, WAS SEVERELY DAMAGED WHEN IT WAS BLOWN AGAINST A STONE WALL ENROUTE TO ITS FINAL RESTING PLACE IN A DRAINAGE DITCH.)--COURTESY PACIFIC REGION, NATIONAL WEATHER SERVICE.

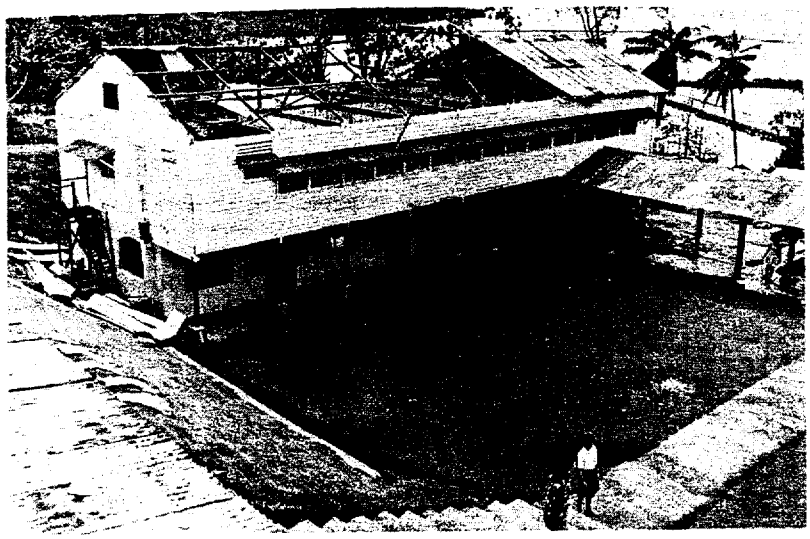


FIGURE 5-8. DAMAGE TO BUILDINGS ON MOEN ISLAND IN THE TRUK GROUP--COURTESY PUBLIC INFORMATION OFFICE, TRUST TERRITORY OF THE PACIFIC ISLANDS.

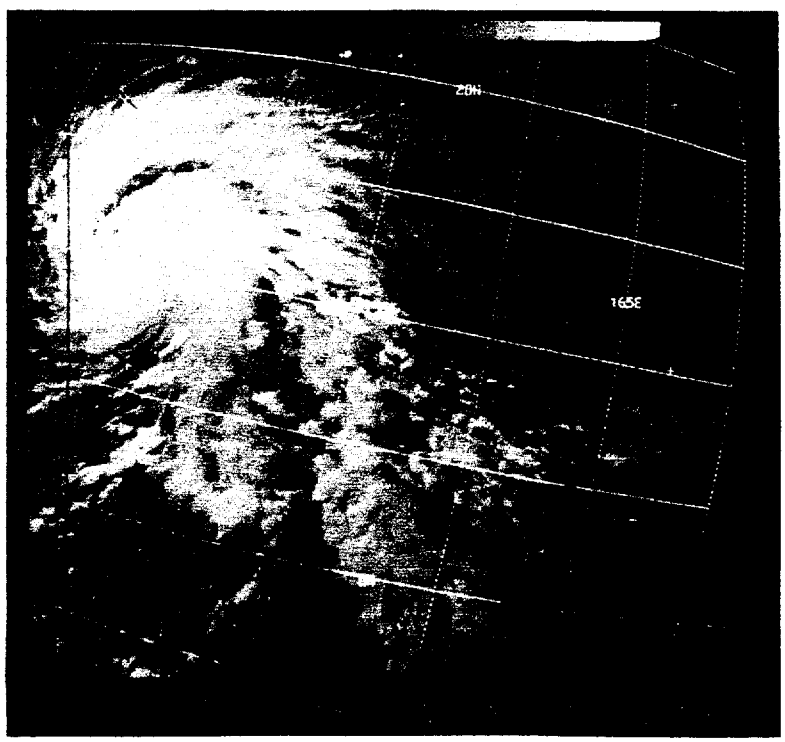



FIGURE 5-9. NOAA-1 VIEW OF SUPER TYPHOON AMY 250 N MI SOUTHEAST OF GUAM ON 2 MAY.

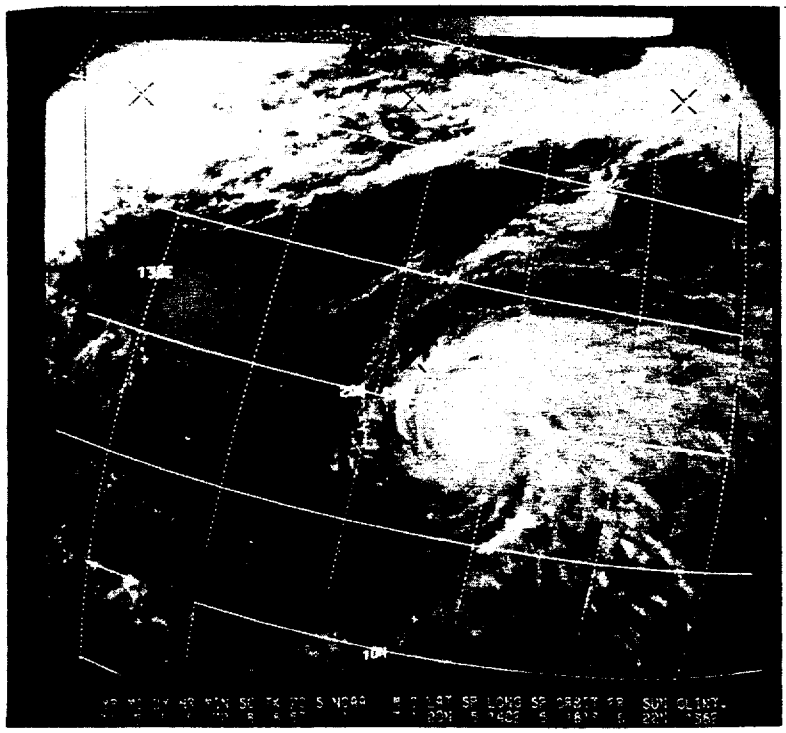



FIGURE 5-10. TYPHOON AMY AS PHOTOGRAPHED BY NOAA-1 ON 5 MAY.

TYPHOON AMY
EYE FIXES FOR CYCLONE NO. 5
29 APR - 07 MAY 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 280454Z | 7.5N 153.0E | SATELIT--- | STG B | | | | | | | | | | LRG CONV CLD MASS | |
| 2 | 290130Z | 6.5N 155.2E | VQ-P----- | ----- | ---- | 25 | 1005 | ---- | --/-- | ---- | ----- | -- | -- | INVESTIGATE FIX | |
| 3 | 290357Z | 6.0N 155.0E | SATELIT--- | STG X | DIA | 4 | CAT 2.0 | | | | | | | MORE INTENSE | |
| 4 | 291747Z | 6.7N 154.4E | VQ-R- 6--- | 400M | ---- | ---- | ---- | ---- | --/-- | CIRC | | 13 | 5 | STG FBS ALL QUADS | 6.1N 153.7E |
| 5 | 292147Z | 6.4N 153.7E | VQ-P-15--- | ----- | ---- | 48 | 996 | ---- | 27/25 | CIRC | | 17 | 5 | BRKS IN WC | |
| 6 | 300400Z | 6.7N 153.6E | 54-P- 5--- | ----- | 38 | 35 | 995 | 3048 | 28/25 | CIRC | | 20 | -- | CLSD WC - STORM WELL DEFINED | |
| 7 | 300447Z | 6.5N 153.5E | SATELIT--- | STG C+ | | | | | | | | | | LTL WKR THAN YSTY | |
| 8 | 301000Z | 7.1N 153.1E | 54-P- 5--- | 700MB | 48 | ---- | 988 | 3050 | 16/12 | CIRC | | 20 | -- | CLSD WC | |
| 9 | 301554Z | 7.2N 152.1E | VQ-P- 5--- | 700MB | 45 | ---- | ---- | ---- | 14/10 | ELIP | E-W | 20 | 6 | HVY FBS E-SW | |
| 10 | 302104Z | 7.4N 151.7E | VQ-P- 5--- | 700MB | 58 | 60 | 982 | ---- | 16/09 | CIRC | | 30 | -- | EYE OVER TRUK IS. | |
| 11 | 010400Z | 8.1N 150.7E | 54-P-10--- | 700MB | 100 | 100 | 961 | 2768 | 15/11 | CIRC | | 20 | 8 | CLSD WC - STORM ORGANIZ RAPIDLY | |
| 12 | 010541Z | 8.0N 150.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | SML CIRC EYE VIS | |
| 13 | 010700Z | 8.4N 150.2E | 54-P- 8--- | 700MB | 135 | 130 | 958 | 2740 | 15/10 | ELIP | NE-SW | 20X18 | -- | CLSD WC | |
| 14 | 011000Z | 8.5N 149.7E | 54-P- 5--- | 700MB | 115 | ---- | 950 | 2661 | 20/15 | ELIP | N-S | 15X20 | -- | CLSD WC-STG FBS | |
| 15 | 011502Z | 9.2N 148.7E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | -- | CLSD WC | 9.9N 148.0E |
| 16 | 020100Z | 9.9N 146.9E | 54-P- 2--- | 700MB | 135 | 130 | 899 | 2200 | 25/07 | CIRC | | 10 | 5 | CLSD WC | |
| 17 | 020400Z | 10.3N 146.5E | 54-P- 2--- | 700MB | ---- | 140 | 896 | 2169 | 29/09 | CIRC | | 8 | 5 | SEV TURB SSW QUAD | |
| 18 | 020445Z | 10.0N 146.5E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | SML CIRC EYE VIS | |
| 19 | 020600Z | 10.7N 146.3E | 54-P- 2--- | 700MB | ---- | 140 | 895 | 2170 | 29/09 | CIRC | | 8 | -- | CLSD WC-TOPS 35K | |
| 20 | 020840Z | 11.2N 145.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 21 | 020915Z | 11.3N 145.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 22 | 020945Z | 11.4N 145.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 23 | 021015Z | 11.5N 145.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 24 | 021045Z | 11.6N 145.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 25 | 021112Z | 11.7N 145.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 26 | 021145Z | 11.8N 145.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 27 | 021209Z | 11.5N 145.3E | 54-P- 1--- | 700MB | 125 | ---- | 900 | 2190 | 29/11 | CIRC | | 10 | -- | CLSD WC-CONT LTNG | |
| 28 | 021215Z | 11.9N 145.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 29 | 021245Z | 11.7N 145.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 30 | 021325Z | 11.7N 145.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 31 | 021402Z | 11.8N 145.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 32 | 021432Z | 11.8N 145.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 33 | 021501Z | 11.9N 144.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 34 | 021537Z | 11.9N 144.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 35 | 021600Z | 11.9N 144.7E | 54-P- 1--- | 700MB | 120 | ---- | 910 | 2292 | 21/09 | ELIP | NE-SW | 12X10 | -- | AXIS OF ELLIPSE ROTATING RAPIDLY | |
| 36 | 021605Z | 12.0N 144.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 37 | 021631Z | 12.0N 144.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 38 | 021704Z | 12.0N 144.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 39 | 021803Z | 12.0N 144.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 40 | 021815Z | 12.0N 144.3E | 54-P- 1--- | 700MB | 125 | ---- | ---- | 2387 | 22/09 | CIRC | | 8 | 2 | CLSD WC | |
| 41 | 021900Z | 12.0N 144.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 42 | 022000Z | 12.1N 144.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 43 | 022100Z | 12.2N 144.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 44 | 022150Z | 12.2N 144.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 45 | 022231Z | 12.3N 143.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 46 | 022255Z | 12.3N 143.8E | 54-R- 2--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 20 | -- | CLSD WC | 12.4N 144.6E |
| 47 | 022330Z | 12.3N 143.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |

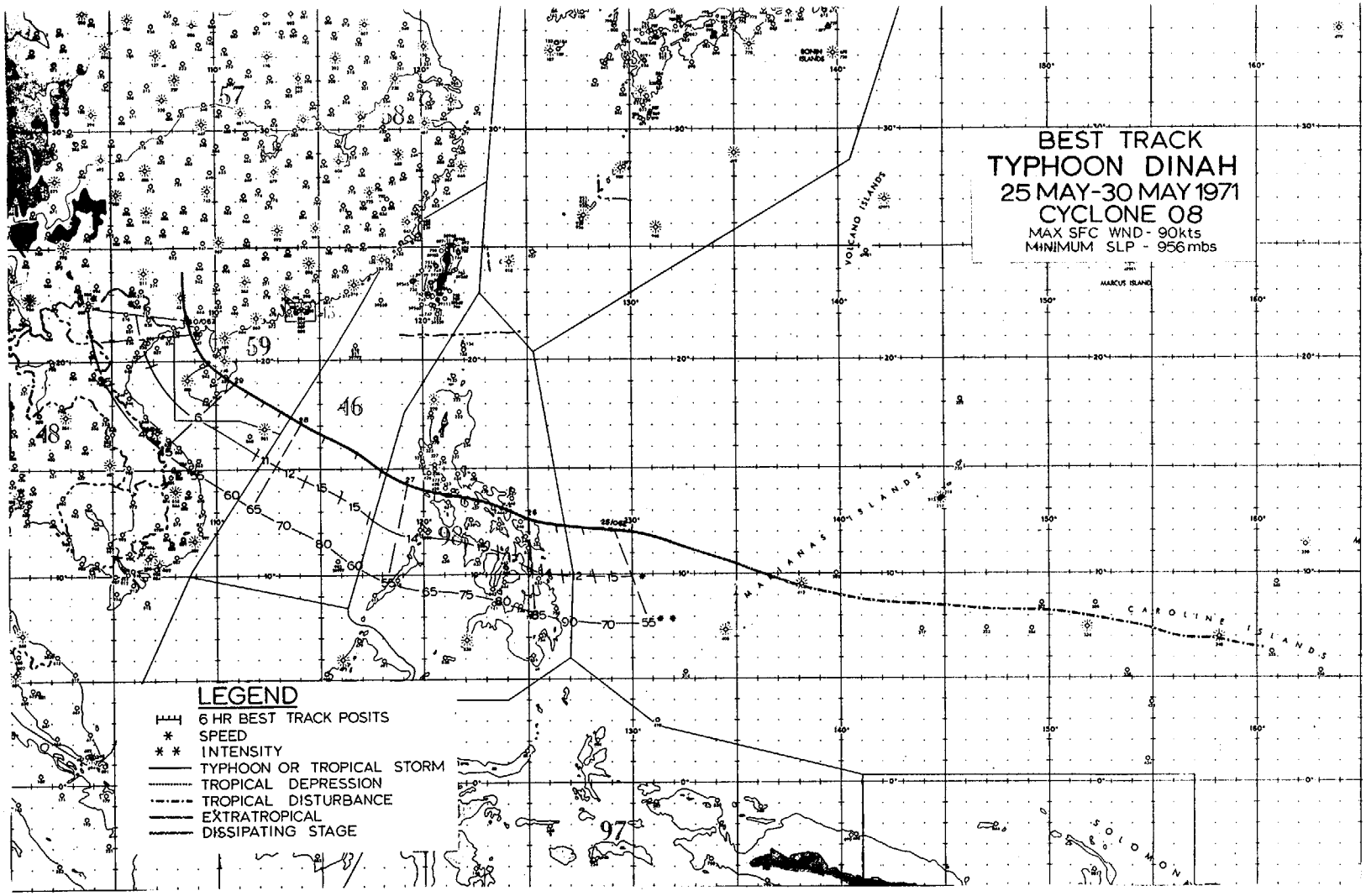
TYPHOON AMY
EYE FIXES FOR CYCLONE NO. 5
29 APR - 07 MAY 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 030002Z | 12.4N 143.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 49 | 030200Z | 12.6N 143.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 50 | 030400Z | 12.6N 143.0E | 54-P- 2--- | 700MB | 115 | 140 | 915 | 2387 | 21/13 | CIRC | | 15 | -- | SFC CNTR UNDER WC | |
| 51 | 030400Z | 12.7N 143.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 52 | 030430Z | 12.7N 143.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 53 | 030500Z | 12.8N 143.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 54 | 030534Z | 12.5N 143.0E | SATELIT--- | STG X | DIA | 4 | CAT 3.5 | | | | | | | SML CIRC EYE VIS | |
| 55 | 030544Z | 12.8N 143.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 56 | 030610Z | 12.8N 142.8E | VQ-P- 3--- | 700MB | 115 | ---- | 906 | 2365 | 20/17 | CIRC | | 8 | -- | CLSD WC | |
| 57 | 030710Z | 12.9N 142.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 58 | 030755Z | 13.0N 142.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 59 | 030845Z | 13.0N 142.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 60 | 030927Z | 13.1N 142.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 61 | 031000Z | 13.3N 142.5E | 54-P- 2--- | 700MB | 90 | ---- | 919 | 2323 | 20/12 | CIRC | | 14 | -- | CLSD WC | |
| 62 | 031027Z | 13.3N 142.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 63 | 031132Z | 13.4N 142.4E | 54-P- 2--- | 700MB | 105 | ---- | 903 | 2280 | 23/13 | CIRC | | 14 | -- | CLSD WC | |
| 64 | 031255Z | 13.4N 142.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 65 | 031415Z | 13.5N 142.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 66 | 031555Z | 13.7N 141.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 67 | 031600Z | 13.6N 142.0E | 54-P- 2--- | 700MB | 120 | ---- | 901 | 2213 | 21/12 | CIRC | | 14 | 8 | CLSD WC-STARS VIS | |
| 68 | 071118Z | 32.5N 155.0E | VQ-P-15--- | 700MB | 65 | 57 | ---- | 2954 | 14/10 | ---- | ----- | -- | -- | NO CLSD CIRC | |
| 69 | 031920Z | 13.7N 141.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT SANTA ROSA RDR | 13.5N 144.9E |
| 70 | 032200Z | 14.0N 141.9E | VQ-R- 3--- | ----- | ---- | ---- | ---- | ---- | --/-- | CONC | - | 43X13 | -- | BOTH WC CLSD | |
| 71 | 040426Z | 15.1N 142.1E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | -- | WC OPEN S | 14.6N 141.1E |
| 72 | 040438Z | 15.0N 142.0E | SATELIT--- | STG X | DIA | 3 | CAT 4.0 | | | | | | | SML CIRC EYE VIS | |
| 73 | 040447Z | 15.1N 142.1E | VQ-P- 5--- | 700MB | 142 | ---- | 907 | 2451 | 21/11 | CIRC | | 15 | -- | WC OPEN S | |
| 74 | 040915Z | 15.7N 142.4E | 54-P------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | PRELIM FIX | |
| 75 | 041000Z | 15.9N 142.4E | 54-P- 1--- | 700MB | 90 | ---- | ---- | 2274 | 20/09 | CIRC | | 12 | 5 | CLSD WC - TOPS 30 | |
| 76 | 041300Z | 16.4N 142.4E | 54-P- 1--- | 700MB | 110 | ---- | 919 | 2341 | 20/13 | ELIP | E-W | 20X13 | 10 | WC OPEN ESE | |
| 77 | 041600Z | 16.8N 142.9E | 54-P- 1--- | 700MB | 130 | ---- | ---- | 2377 | 18/11 | CIRC | | 20 | 10 | WC OPEN SE | |
| 78 | 041900Z | 17.5N 143.1E | 54-P- 2--- | 700MB | 110 | ---- | 906 | 2365 | 21/14 | CIRC | | 20 | -- | WC OPEN S QUAD | |
| 79 | 042140Z | 18.0N 143.4E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | -- | CLSD WC | 17.5N 143.8E |
| 80 | 050053Z | 18.4N 143.6E | VQ-P-10--- | 300M | ---- | 120 | 934 | ---- | 26/22 | CIRC | | 22 | -- | WC OPEN SE QUAD | |
| 81 | 050345Z | 18.9N 144.1E | VQ-P- 8--- | 700MB | 115 | ---- | 940 | 2652 | 22/11 | CIRC | | 20 | 6 | WC OPEN S QUAD | |
| 82 | 050532Z | 19.0N 144.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.5 | | | | | | | | |
| 83 | 051000Z | 19.9N 144.4E | 54-P- 3--- | 700MB | 115 | ---- | 942 | 2551 | 17/10 | CIRC | | 28 | 7 | CLSD WC-THIN CI | |
| 84 | 051253Z | 20.0N 144.1E | ---R------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 30 | -- | COMM ACFT RDR FIX | |
| 85 | 051600Z | 21.0N 144.9E | 54-P- 1--- | 700MB | 100 | ---- | 952 | 2624 | 15/09 | ELIP | SE-NW | 40X25 | -- | CLSD WC-THICK CI | |
| 86 | 052215Z | 21.3N 145.5E | 54-P-18--- | 700MB | 90 | ---- | 954 | 2685 | 15/13 | CIRC | | 10 | -- | WC POORLY DEF | |
| 87 | 060100Z | 22.6N 145.6E | 54-P- 8--- | 700MB | 65 | ---- | ---- | 2829 | 13/11 | ---- | ----- | -- | -- | SML PART OF WC | |
| 88 | 060400Z | 23.3N 146.0E | 54-P-10--- | 700MB | 80 | 70 | 957 | 2722 | 16/13 | ---- | ----- | -- | -- | NNW OF 700 CNTR NO ORGANIZ ON RDR | |
| 89 | 060435Z | 22.5N 145.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | LRG RAGGED EYE | |
| 90 | 061000Z | 24.3N 146.3E | VQ-P- 8--- | 400M | ---- | 65 | 960 | ---- | 25/22 | ---- | ----- | -- | -- | WEAK 25NM DIA WC | |
| 91 | 061555Z | 25.7N 147.2E | VQ-P- 6--- | 700MB | ---- | 65 | 964 | 2859 | 17/12 | CIRC | | 25 | -- | NO WC | |
| 92 | 062228Z | 27.4N 148.9E | 54-P- 5--- | 700MB | 75 | 50 | 980 | 2880 | 14/10 | ---- | ----- | -- | -- | NO RDR PRFS-700 CNTR 37 NM NE | |
| 93 | 070321Z | 29.2N 150.4E | 54-P- 3--- | 700MB | 72 | 55 | 984 | 2938 | 13/12 | ---- | ----- | -- | -- | 700 CNTR 40NM NE | |
| 94 | 070525Z | 30.0N 152.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | 700 CLD TOPS 6K | |

0600Z 29 APR TO 1200Z 7 MAY

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | | | 48 HOUR FORECAST | | | | | | 72 HOUR FORECAST | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | | ERRORS | | | | | | ERRORS | | | | | | ERRORS | | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 290600Z | 6.5N 154.9E | 30 | 6.5N 154.8E | 25 | 6 | -5 | 7.2N 153.8E | 35 | 25 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 6.5N 154.7E | 35 | 6.7N 154.3E | 25 | 27 | -10 | 7.1N 152.3E | 35 | 36 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291800Z | 6.6N 154.3E | 40 | 6.8N 153.8E | 25 | 32 | -15 | 7.2N 151.8E | 40 | 24 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300000Z | 6.7N 153.8E | 40 | 6.5N 153.5E | 50 | 21 | 10 | 7.1N 151.3E | 65 | 36 | -10 | 8.3N 149.3E | 85 | 161 | -55 | 9.6N 146.8E | 95 | 256 | -30 |
| 300600Z | 6.9N 153.5E | 45 | 6.7N 153.4E | 50 | 13 | 5 | 7.3N 151.3E | 65 | 80 | -30 | 8.4N 149.2E | 85 | 219 | -65 | --.- ---.- | -- | -- | -- |
| 301200Z | 7.2N 152.9E | 50 | 7.1N 152.9E | 55 | 6 | 5 | 8.5N 151.2E | 70 | 108 | -45 | 9.9N 148.5E | 85 | 211 | -55 | 10.8N 145.5E | 95 | 243 | -40 |
| 301800Z | 7.3N 152.2E | 60 | 7.4N 151.9E | 55 | 19 | -5 | 8.8N 149.4E | 70 | 71 | -60 | 9.7N 146.3E | 85 | 181 | -50 | --.- ---.- | -- | -- | -- |
| 010000Z | 7.7N 151.3E | 75 | 7.8N 151.4E | 70 | 8 | -5 | 8.9N 148.8E | 80 | 117 | -60 | 9.9N 145.7E | 90 | 197 | -40 | 10.6N 142.2E | 100 | 222 | -40 |
| 010600Z | 8.3N 150.4E | 95 | 8.3N 150.5E | 95 | 6 | 0 | 10.0N 147.5E | 120 | 82 | -30 | 11.5N 143.8E | 120 | 97 | -15 | --.- ---.- | -- | -- | -- |
| 011200Z | 8.8N 149.4E | 115 | 8.8N 149.5E | 105 | 6 | -10 | 10.5N 145.8E | 125 | 67 | -15 | 11.8N 142.1E | 125 | 96 | -15 | 12.7N 138.1E | 125 | 334 | -8 |
| 011800Z | 9.3N 148.3E | 130 | 9.5N 148.1E | 110 | 17 | -20 | 11.4N 143.7E | 125 | 50 | -10 | 12.5N 139.5E | 125 | 165 | -15 | --.- ---.- | -- | -- | -- |
| 020000Z | 9.9N 147.1E | 140 | 9.9N 147.1E | 140 | 0 | 0 | 11.7N 142.6E | 150 | 67 | 20 | 12.7N 138.1E | 150 | 235 | 10 | 13.3N 134.0E | 150 | 625 | 30 |
| 020600Z | 10.7N 146.3E | 150 | 10.7N 146.3E | 145 | 0 | -5 | 13.5N 142.9E | 150 | 42 | 15 | 14.3N 138.5E | 150 | 227 | 15 | --.- ---.- | -- | -- | -- |
| 021200Z | 11.5N 145.3E | 140 | 11.5N 145.5E | 150 | 12 | 10 | 13.8N 141.8E | 150 | 38 | 10 | 14.4N 137.4E | 150 | 318 | 20 | 14.6N 132.9E | 100 | 753 | -10 |
| 021800Z | 12.0N 144.3E | 135 | 12.2N 144.3E | 140 | 12 | 5 | 13.9N 139.8E | 140 | 128 | 0 | 14.4N 134.7E | 150 | 509 | 25 | --.- ---.- | -- | -- | -- |
| 030000Z | 12.4N 143.5E | 130 | 12.4N 143.6E | 135 | 6 | 5 | 13.8N 139.9E | 135 | 114 | -5 | 14.3N 135.5E | 140 | 520 | 20 | 14.5N 130.7E | 145 | 974 | 30 |
| 030600Z | 12.8N 142.8E | 135 | 12.8N 142.7E | 135 | 6 | 0 | 13.8N 138.9E | 135 | 211 | 0 | 14.3N 134.5E | 140 | 622 | 25 | --.- ---.- | -- | -- | -- |
| 031200Z | 13.4N 142.3E | 140 | 13.4N 142.3E | 135 | 0 | -5 | 15.2N 139.8E | 145 | 172 | 15 | 16.1N 136.6E | 150 | 523 | 40 | 16.6N 132.9E | 150 | 900 | 70 |
| 031800Z | 13.8N 142.0E | 140 | 13.8N 141.8E | 140 | 12 | 0 | 15.3N 139.5E | 150 | 237 | 25 | 16.2N 136.3E | 150 | 594 | 45 | --.- ---.- | -- | -- | -- |
| 040000Z | 14.3N 141.8E | 140 | 14.0N 141.9E | 145 | 19 | 5 | 15.1N 141.2E | 150 | 237 | 30 | 16.3N 139.0E | 150 | 529 | 55 | 17.1N 135.3E | 150 | 1013 | 80 |
| 040600Z | 15.3N 142.2E | 135 | 15.3N 142.1E | 140 | 6 | 5 | 19.1N 144.1E | 130 | 6 | 15 | 22.4N 148.2E | 110 | 139 | 25 | --.- ---.- | -- | -- | -- |
| 041200Z | 16.2N 142.6E | 130 | 16.3N 142.5E | 140 | 8 | 10 | 20.1N 145.2E | 125 | 30 | 15 | 23.4N 150.1E | 100 | 211 | 20 | 25.7N 157.3E | 75 | 449 | 20 |
| 041800Z | 17.4N 143.0E | 125 | 17.1N 143.1E | 135 | 19 | 10 | 20.6N 145.7E | 120 | 61 | 15 | 23.5N 150.3E | 90 | 213 | 15 | --.- ---.- | -- | -- | -- |
| 050000Z | 18.4N 143.5E | 120 | 18.4N 143.6E | 130 | 6 | 10 | 22.3N 147.0E | 115 | 73 | 20 | 25.5N 153.0E | 80 | 243 | 15 | --.- ---.- | -- | -- | -- |
| 050600Z | 19.2N 144.1E | 115 | 19.2N 144.3E | 120 | 11 | 5 | 22.8N 148.0E | 100 | 117 | 15 | 25.9N 154.0E | 75 | 299 | 15 | --.- ---.- | -- | -- | -- |
| 051200Z | 20.3N 144.7E | 110 | 20.2N 144.6E | 115 | 8 | 5 | 24.5N 147.3E | 95 | 45 | 15 | 29.3N 152.0E | 65 | 299 | 15 | --.- ---.- | -- | -- | -- |
| 051800Z | 21.5N 145.2E | 105 | 21.4N 145.2E | 110 | 6 | 5 | 25.6N 148.3E | 85 | 49 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 060000Z | 22.5N 145.7E | 95 | 22.4N 145.7E | 100 | 6 | 5 | 27.2N 148.4E | 75 | 71 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 060600Z | 23.7N 146.1E | 85 | 23.7N 146.4E | 95 | 16 | 10 | 29.2N 149.5E | 60 | 126 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 061200Z | 24.7N 146.5E | 80 | 24.7N 146.5E | 90 | 0 | 10 | 29.8N 149.4E | 50 | 181 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 061800Z | 26.0N 147.5E | 75 | 26.1N 147.4E | 80 | 8 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 070000Z | 28.0N 149.4E | 65 | 27.8N 149.5E | 70 | 13 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 070600Z | 30.4N 151.5E | 60 | 30.2N 151.2E | 60 | 20 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 071200Z | 33.1N 155.8E | 50 | 33.2N 156.0E | 55 | 12 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 11NM | 97NM | 296NM | 577NM | 11NM | 97NM | 296NM | 577NM |
| AVERAGE RIGHT ANGLE ERROR | 7NM | 51NM | 188NM | 339NM | 7NM | 51NM | 188NM | 339NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 18KTS | 29KTS | 40KTS | 6KTS | 18KTS | 29KTS | 40KTS |
| AVERAGE BIAS OF WIND ERROR | 2KTS | -3KTS | 2KTS | 13KTS | 2KTS | -3KTS | 2KTS | 13KTS |
| NUMBER OF FORECASTS | 33 | 30 | 23 | 10 | 34 | 30 | 23 | 10 |


BEST TRACK
TYPHOON DINAH
25 MAY-30 MAY 1971
CYCLONE 08
MAX SFC WND - 90kts
MINIMUM SLP - 956mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
VOLCANO ISLANDS
MARIANAS ISLANDS
CAROLINE ISLANDS
SOLOMON
MARCUS ISLAND

## DINAH

The incipient stages of Dinah were revealed on the 20th of May when a 700-mb circulation was induced from the mid-Pacific trough in the vicinity of Ponape Island. The system was followed by aircraft reconnaissance and satellite pictures for several days as it crossed through the western Carolines. By the 26th satellite pictures showed the Dinah system to have gained considerable organization. The fact that Dinah was in the process of developing rapidly was verified by the Liberian freighter MV KONKAR RESOLUTE which crossed near the center and reported 60 kt from the north-northwest and a minimum pressure of 988 mb.

The storm continued to intensify to 90 kt before striking the northern coast of Samar on the morning of the 26th. She traversed the central Philippines and exited near Lubang Island (Figure 5-11). A maximum gust of 93 kt was reported at Legaspi City in southern Luzon and a minimum pressure of 979.2 mb was recorded at Tayabas. Dinah left in her wake 13 dead and 44 missing in addition to 6,500 homes destroyed.

Emerging into the South China Sea, Dinah briefly dropped below typhoon strength for a 12-hour period before intensifying up to 80 kt. North of the Paracel Islands she diminished to tropical storm force (Figure 5-12) before striking eastern Hainan with 45 kt. Dinah dissipated rapidly after entering southern China west of the Luichow Peninsula on the 30th.

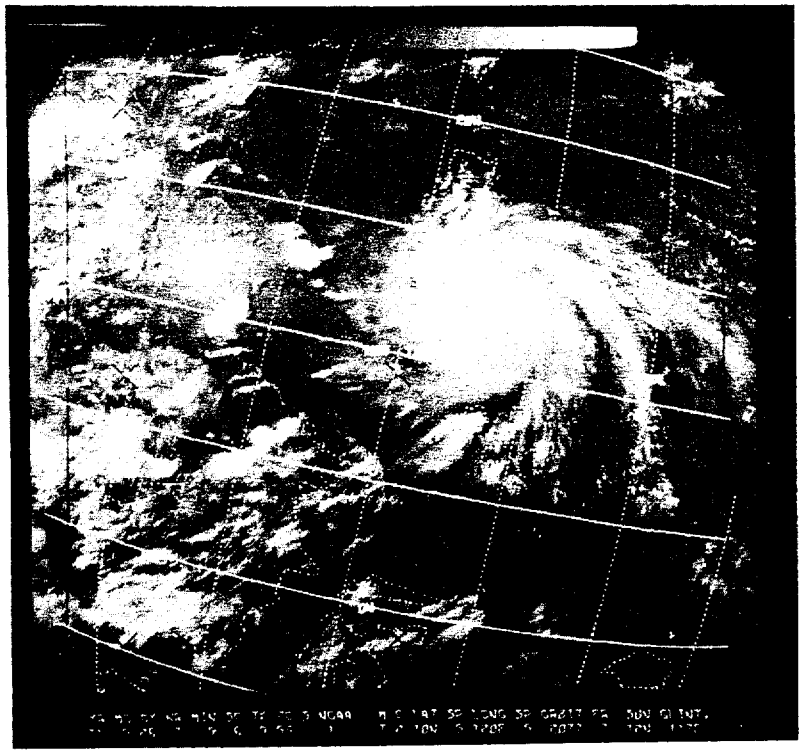


FIGURE 5-11. NOAA-1 VIEW OF TYPHOON DINAH ON 26 MAY OVER SOUTHEASTERN LUZON.

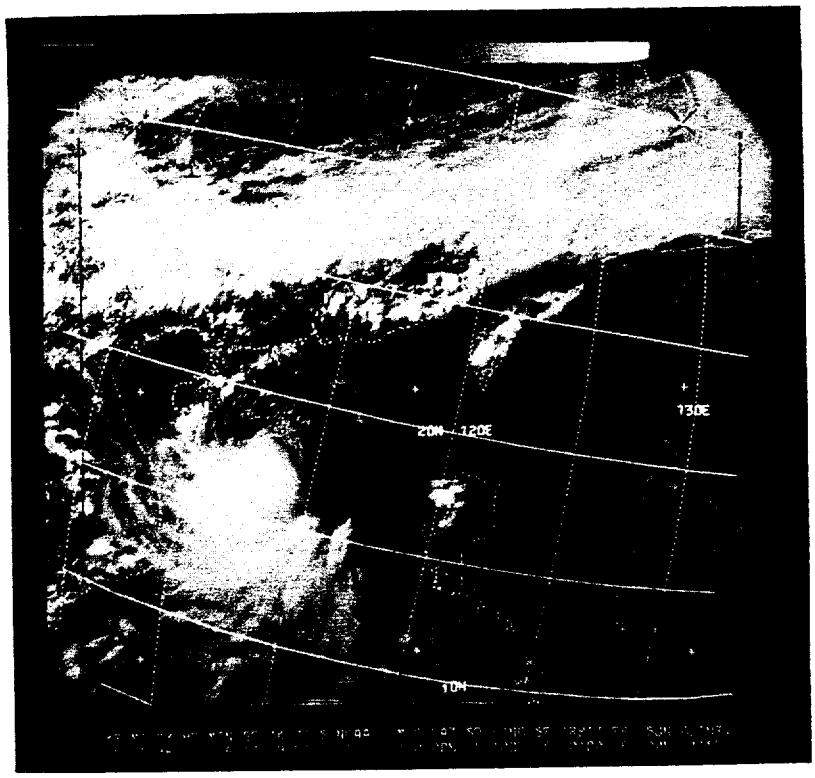



FIGURE 5-12. DINAH, WEAKENED TO TROPICAL STORM STATUS, LOCATED SOUTHEAST OF HAINAN ISLAND AS SEEN BY NOAA-1 ON 28 MAY.

TYPHOON DINAH
EYE FIXES FOR CYCLONE NO. 8
25 MAY - 30 MAY 71

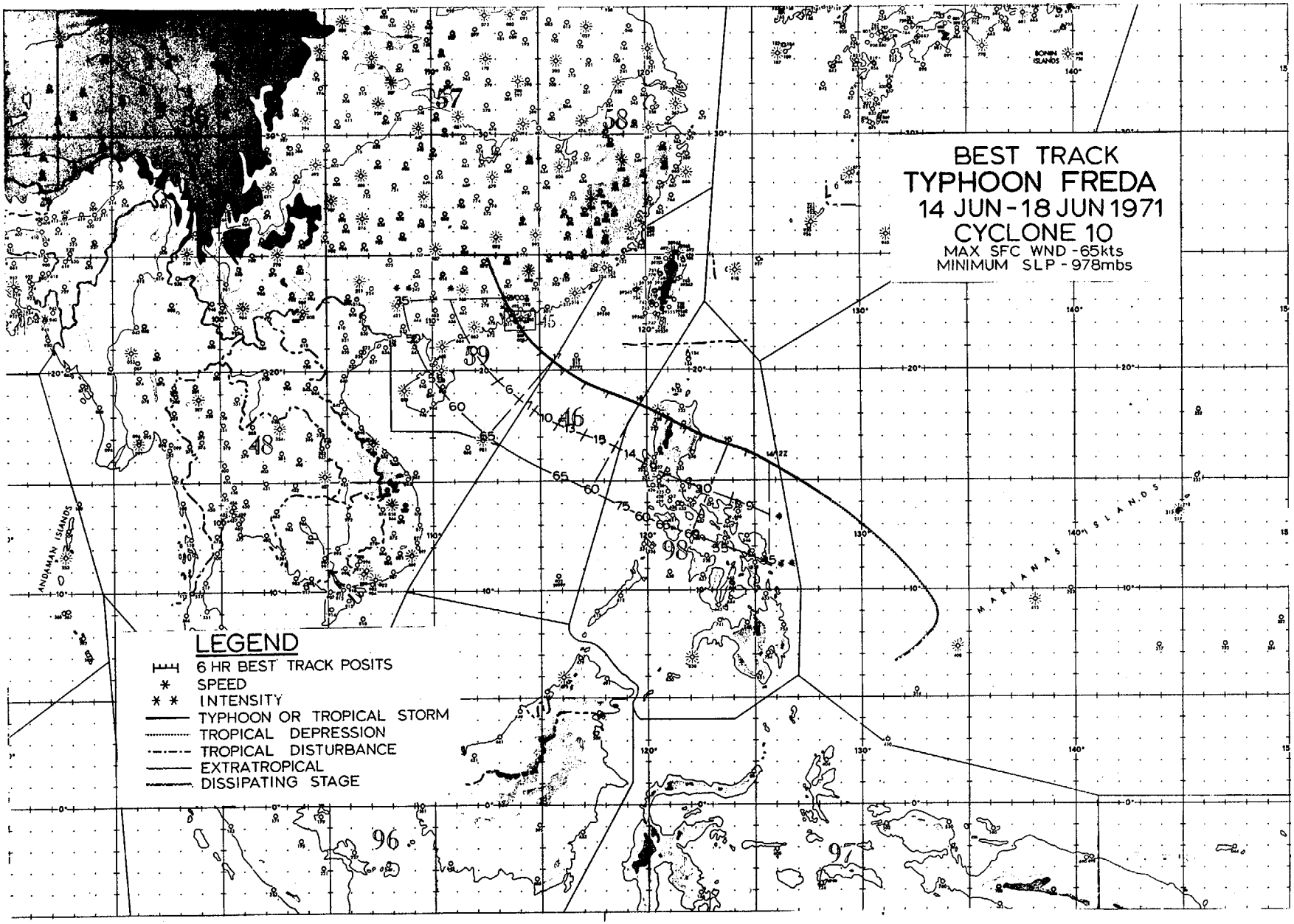
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 210433Z | 7.0N 153.0E | SATELIT--- | STG B | | | | | | | | | | FIRST SAT BLTN | |
| 2 | 220528Z | 10.0N 147.0E | SATELIT--- | STG B | | | | | | | | | | LITTLE CHG | |
| 3 | 230622Z | 9.0N 141.0E | SATELIT--- | STG C | | | | | | | | | | MORE INTENSE | |
| 4 | 240525Z | 10.5N 134.5E | SATELIT--- | STG C | | | | | | | | | | LITTLE CHG | |
| 5 | 250615Z | 12.0N 128.5E | SATELIT--- | STG C+ | | | | | | | | | | MORE INTENSE | |
| 6 | 250912Z | 12.3N 128.4E | VQ-R-15--- | ----- | 40 | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STRM INTENSIFYING | 11.8N 127.2E |
| 7 | 251630Z | 12.2N 126.7E | 54-P- 3--- | 700MB | 85 | ---- | 972 | 2841 | 15/07 | CIRC | | 7 | -- | CLSD WC | |
| 8 | 252200Z | 12.4N 125.5E | 54-P- 5--- | 700MB | 70 | 90 | 920 | 2771 | 18/13 | ELIP | N-S | 7X 5 | -- | CLSD WC | |
| 9 | 260030Z | 12.6N 124.9E | 54-P- 5--- | 700MB | 60 | 80 | 965 | 2786 | 18/13 | ELIP | N-S | 7X 5 | -- | CLSD WC | |
| 10 | 260040Z | 12.1N 125.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | CATANDUANES RDR | 14.0N 124.3E |
| 11 | 260355Z | 13.0N 124.0E | VQ-P- 5--- | 700MB | 85 | ---- | 956 | 2810 | 15/10 | CIRC | | 8 | 6 | WC OPEN NW | |
| 12 | 260405Z | 12.5N 124.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | CATANDUANES RDR | 14.0N 124.3E |
| 13 | 260510Z | 13.0N 123.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 14 | 260610Z | 13.1N 123.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 15 | 260700Z | 13.2N 123.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 16 | 260709Z | 12.5N 123.5E | SATELIT--- | STG X | DIA | 4 | CAT 3.5 | | | | | | | INTENSIFYING | |
| 17 | 260711Z | 13.3N 123.2E | VQ-R- 5--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 8 | -- | CLSD WC | 13.2N 124.0E |
| 18 | 260800Z | 13.1N 123.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 19 | 260910Z | 13.3N 123.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 20 | 260932Z | 13.4N 122.8E | VQ-P- 5--- | 700MB | 75 | ---- | 967 | 2804 | 14/09 | CIRC | | 8 | 3 | WC OPEN N | |
| 21 | 261300Z | 13.6N 121.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ADCC RDR | |
| 22 | 261400Z | 13.7N 121.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ADCC RDR | |
| 23 | 261600Z | 14.0N 120.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ADCC RDR | |
| 24 | 261720Z | 14.2N 120.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ADCC RDR | |
| 25 | 261728Z | 13.7N 120.7E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | WK WC SE QUAD | 13.7N 119.9E |
| 26 | 261855Z | 13.8N 120.5E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | 3 | WC WK-OPEN SW | 13.6N 120.2E |
| 27 | 262010Z | 13.8N 120.2E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | -- | WC REFORMING | 13.5N 119.9E |
| 28 | 262145Z | 14.0N 119.7E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 8 | -- | WC OPEN S QUAD | 14.4N 119.1E |
| 29 | 270115Z | 14.3N 119.0E | 54-P- 3--- | 700MB | 50 | 55 | 978 | 3008 | 16/12 | CIRC | | 30 | -- | STG ELSW - STG FB WC POORLY DEFINED - OPEN W QUAD | |
| 30 | 270400Z | 14.6N 118.3E | 54-P- 3--- | 700MB | 50 | 60 | 994 | 2999 | 16/13 | CIRC | | 30 | -- | SAME AS 0115Z RMK | |
| 31 | 270700Z | 15.0N 117.8E | 54-P- 5--- | 700MB | 65 | 60 | 994 | 2975 | 15/12 | CIRC | | 25 | -- | CLSD WC-STRONGER | |
| 32 | 270803Z | 15.0N 117.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 33 | 271000Z | 15.5N 117.1E | 54-P- 2--- | 700MB | 75 | 85 | 978 | 2874 | 19/17 | ELIP | NE-SW | 15X10 | -- | CLSD WC-MDT FBS | |
| 34 | 271530Z | 16.2N 115.8E | 54-P- 5--- | 700MB | 75 | ---- | ---- | 2951 | 19/14 | ELIP | NE-SW | 15X10 | -- | WC OPEN W QUAD | |
| 35 | 280355Z | 17.5N 113.4E | VQ-P-10--- | 700MB | ---- | 75 | 985 | 3045 | 28/24 | CIRC | | 30 | -- | TEMPS AT 950MB | |
| 36 | 280706Z | 17.5N 113.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 37 | 281015Z | 17.8N 112.7E | 54-P- 5--- | 700MB | 40 | 65 | 995 | 3027 | 18/13 | ---- | ----- | -- | -- | WC S QUAD | |
| 38 | 281300Z | 18.1N 112.3E | 54-P-20--- | 700MB | 35 | ---- | 997 | 3045 | 16/14 | ---- | ----- | -- | -- | MSLP DOUBTFUL | |
| 39 | 281600Z | 18.2N 111.8E | 54-R-15-10 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | POOR RDR PRES | 18.1N 112.0E |
| 40 | 290800Z | 18.0N 109.0E | SATELIT--- | STG C | | | | | | | | | | | |

TYPHOON DINAH

0600Z 25 MAY TO 0600Z 30 MAY

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 250600Z | 12.1N 129.2E | 55 | 12.1N 129.0E | 60 | 12 | 5 | 13.5N 124.1E | 100 | 39 | 20 | 14.6N 120.1E | 60 | 128 | 0 | --.- ---.- | -- | -- | -- |
| 251200Z | 12.1N 127.6E | 70 | 12.5N 127.8E | 65 | 27 | -5 | 13.8N 122.8E | 85 | 48 | 10 | 15.1N 119.0E | 65 | 139 | -15 | 17.1N 115.5E | 65 | 186 | 10 |
| 251800Z | 12.2N 126.4E | 90 | 12.2N 126.5E | 80 | 6 | -10 | 13.1N 122.0E | 65 | 91 | 0 | 15.1N 118.4E | 60 | 202 | -10 | --.- ---.- | -- | -- | -- |
| 260000Z | 12.5N 125.2E | 85 | 12.4N 125.0E | 80 | 13 | -5 | 13.5N 120.1E | 60 | 67 | 5 | 15.4N 116.4E | 65 | 170 | 0 | 17.4N 113.4E | 65 | 168 | 20 |
| 260600Z | 13.2N 123.5E | 80 | 13.2N 123.5E | 80 | 0 | 0 | 15.2N 118.6E | 65 | 47 | 5 | 17.5N 115.4E | 65 | 131 | 5 | --.- ---.- | -- | -- | -- |
| 261200Z | 13.6N 122.0E | 75 | 13.6N 122.2E | 80 | 12 | 5 | 15.8N 117.5E | 70 | 46 | -10 | 18.5N 114.4E | 70 | 116 | 15 | 21.5N 112.5E | 60 | 188 | 20 |
| 261800Z | 13.8N 120.6E | 65 | 13.8N 120.6E | 70 | 0 | 5 | 16.5N 115.6E | 75 | 23 | 5 | 20.0N 112.9E | 65 | 116 | 15 | --.- ---.- | -- | -- | -- |
| 270000Z | 14.2N 119.2E | 55 | 14.2N 119.1E | 70 | 6 | 15 | 16.7N 114.2E | 80 | 30 | 15 | 19.9N 111.7E | 70 | 75 | 25 | 23.4N 110.8E | 25 | 172 | -10 |
| 270600Z | 14.8N 117.9E | 60 | 14.7N 117.8E | 70 | 8 | 10 | 17.6N 113.3E | 75 | 13 | 15 | 21.1N 111.4E | 60 | 119 | 20 | --.- ---.- | -- | -- | -- |
| 271200Z | 15.8N 116.7E | 80 | 15.7N 116.6E | 80 | 8 | 0 | 18.9N 112.4E | 80 | 48 | 25 | 22.6N 110.9E | 45 | 177 | 10 | --.- ---.- | -- | -- | -- |
| 271800Z | 16.5N 115.2E | 70 | 16.4N 115.3E | 80 | 8 | 10 | 19.9N 111.7E | 70 | 84 | 20 | 23.7N 115.6E | 45 | 407 | 10 | --.- ---.- | -- | -- | -- |
| 280000Z | 17.2N 114.1E | 65 | 17.2N 114.1E | 80 | 0 | 15 | 21.1N 111.7E | 65 | 139 | 20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 280600Z | 17.7N 113.1E | 60 | 17.8N 113.1E | 75 | 6 | 15 | 21.7N 111.2E | 55 | 146 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 281200Z | 18.1N 112.4E | 55 | 17.9N 112.4E | 65 | 12 | 10 | 20.4N 109.9E | 45 | 34 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 281800Z | 18.5N 111.6E | 50 | 18.5N 111.5E | 60 | 6 | 10 | 21.4N 109.4E | 40 | 56 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290000Z | 18.9N 110.9E | 45 | 19.1N 110.8E | 55 | 13 | 10 | 22.4N 109.2E | 30 | 75 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290600Z | 19.4N 110.3E | 40 | 19.5N 109.3E | 50 | 57 | 10 | 22.9N 107.3E | 25 | 89 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 19.9N 109.6E | 35 | 19.4N 109.2E | 50 | 37 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291800Z | 20.5N 109.1E | 35 | 19.6N 108.7E | 45 | 58 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300000Z | 21.2N 108.8E | 35 | 19.8N 108.3E | 35 | 88 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300600Z | 21.9N 108.5E | 35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 19NM | 63NM | 162NM | 178NM | 19NM | 63NM | 162NM | 178NM |
| AVERAGE RIGHT ANGLE ERROR | 15NM | 47NM | 100NM | 95NM | 15NM | 47NM | 100NM | 95NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 8KTS | 11KTS | 11KTS | 16KTS | 8KTS | 11KTS | 11KTS | 16KTS |
| AVERAGE BIAS OF WIND ERROR | 6KTS | 9KTS | 7KTS | 11KTS | 6KTS | 9KTS | 7KTS | 11KTS |
| NUMBER OF FORECASTS | 20 | 17 | 11 | 4 | 20 | 17 | 11 | 4 |


BEST TRACK
TYPHOON FREDA
14 JUN - 18 JUN 1971
CYCLONE 10
MAX SFC WND - 65kts
MINIMUM SLP - 978mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
ANDAMAN ISLANDS
MARIANAS ISLANDS
BONIN ISLANDS

## FREDA

Changes in the large-scale circulation over the western Pacific during June caused a readjustment of the subtropical ridge resulting in a strong high cell positioned over the Ryukyu Islands. This synoptic situation largely controlled the formation and movement of all storms from mid-June to mid-July.

Freda was the first in a succession of six storms to cross the Philippine archipelago in a period of less than four weeks. The first signs of the pre-storm system appeared west of the Palau Islands on the 12th. Aircraft reconnaissance located the system two days later as a weak tropical storm which had drifted to a position 300 miles east of central Luzon.

Heading on a west-northwest track (Figure 5-13), Freda intensified to 65 kt just before she struck near Palanan Point on northeastern Luzon on the afternoon of the 15th. Gusts of 80 kt were reported at Vigan on the western coast when the center was emerging back out to sea, while 8.15 inches of rain fell at Baguio. Damage was considerable over northern Luzon but no estimates are available.

Moving into the South China Sea (Figure 5-14), the storm remained near minimal typhoon strength and began to bend toward the northwest. Freda's center passed 50 n mi south of Pratas Island and struck the mainland between Macau and Hong Kong with maximum sustained winds of 50-55 kt. Wind gusts of 70 kt were experienced at Tate's Cairn and up to 103 kt at the Royal Observatory which also registered a minimum pressure of 984.3 mb.

A total of seven deaths were attributed to Freda--five of which occurred in Luzon, the other two in Hong Kong.

One of the remarkable features associated with Freda were the comments by reconnaissance crews of the lack of a wall cloud around the eye, while she generated sustained winds of typhoon force. Fett (1968) described similar circumstances for typhoon Billie in 1967.

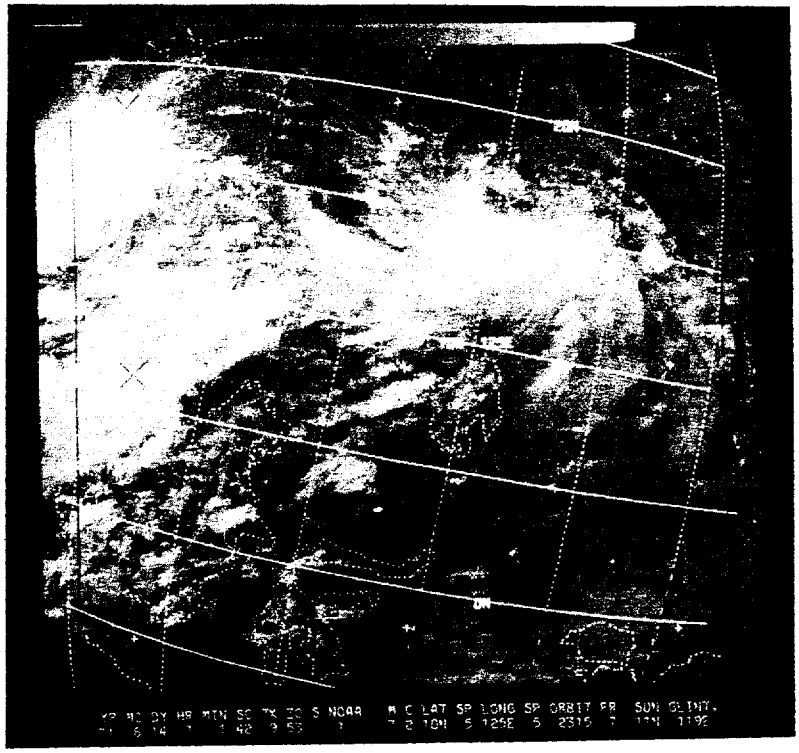


FIGURE 5-13. NOAA-1 CAMERAS PHOTOGRAPH FREDA AS A TROPICAL STORM EAST OF LUZON ON 14 JUNE.

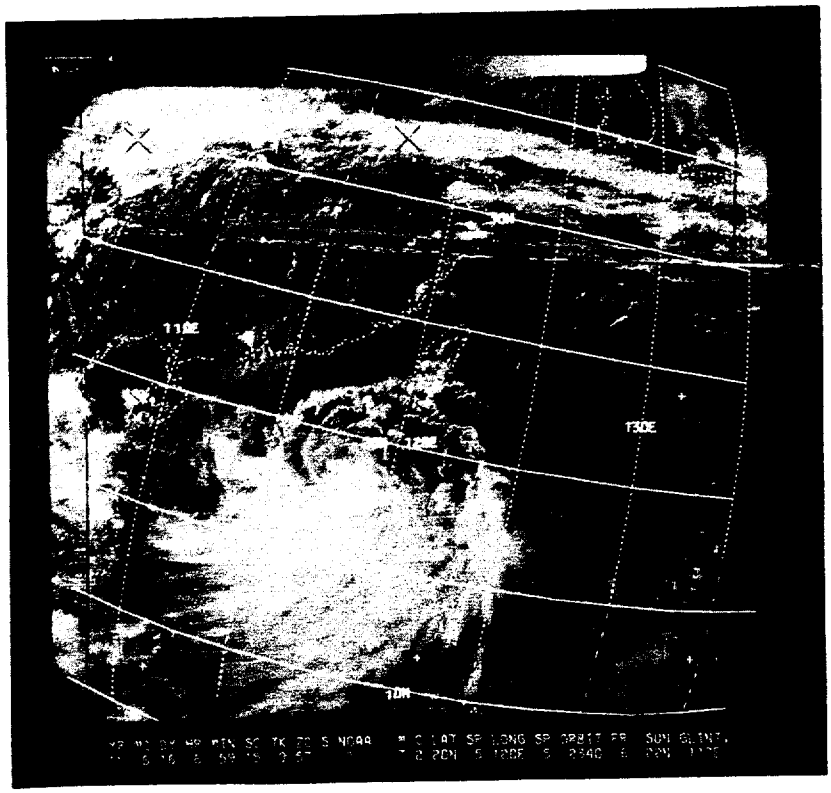



FIGURE 5-14. TYPHOON FREDA IN THE NORTHERN SOUTH CHINA SEA AS VIEWED BY NOAA-1 ON 16 JUNE.

TYPHOON FREDA

EYE FIXES FOR CYCLONE NO. 10

14 JUN - 18 JUN 71

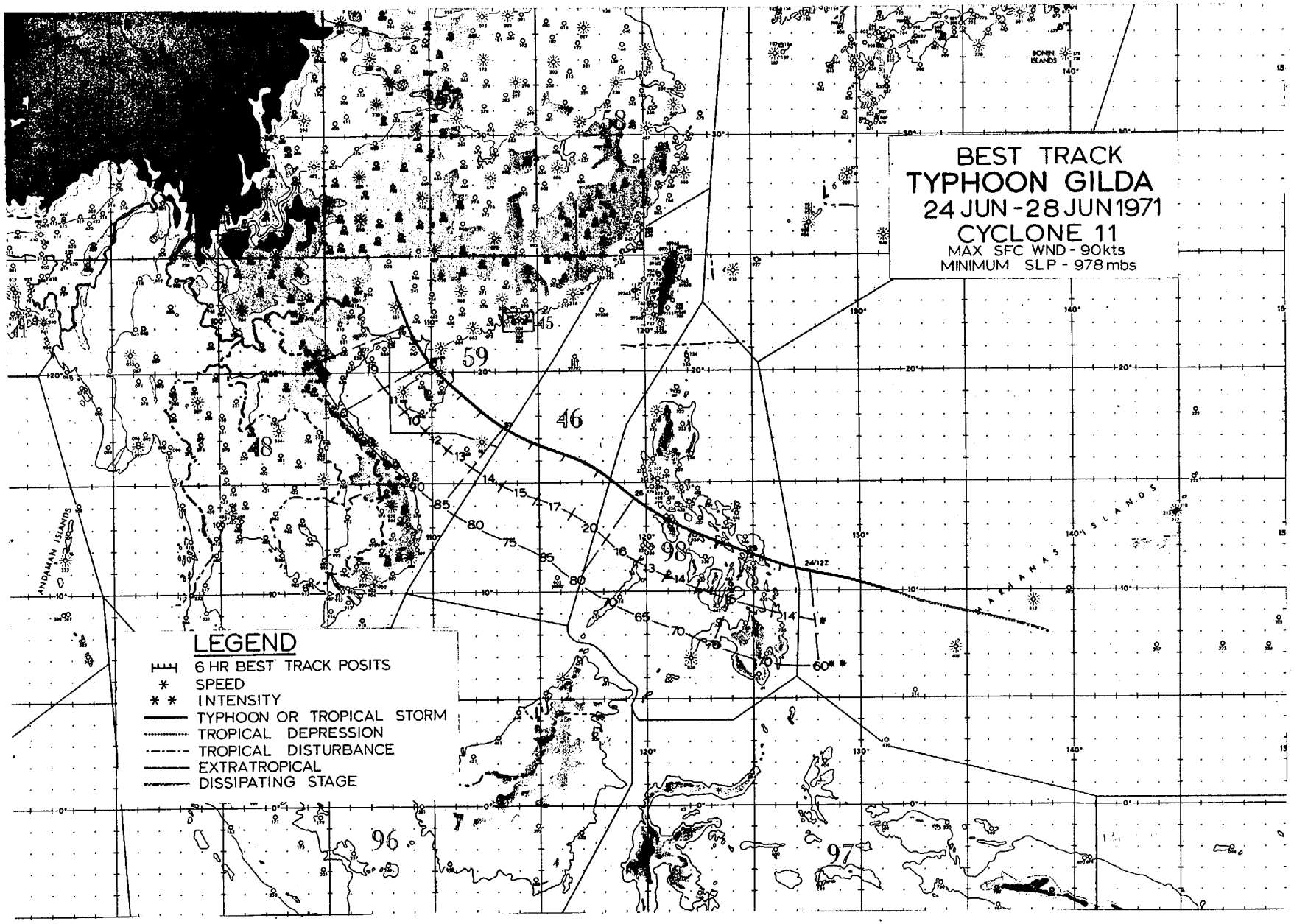
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 110515Z | 8.7N 133.5E | VQ-P- 5--- | 700MB | 27 | 25 | 1006 | 3112 | 13/12 | ---- | ----- | -- | -- | RDR PRES POOR | |
| 2 | 120708Z | 8.0N 132.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 3 | 140701Z | 15.5N 126.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 4 | 140734Z | 15.5N 126.4E | VQ-P- 8- 5 | 400M | ---- | 40 | 1001 | ---- | 26/23 | ELIP | E-W | 50X27 | -- | WC OPEN N SEMIC | |
| 5 | 141915Z | 16.5N 124.7E | VQ-P- 5--- | 400M | ---- | 60 | 993 | ---- | 26/23 | ELIP | E-W | 55 | -- | WC OPEN N SEMIC | |
| 6 | 142210Z | 16.4N 124.0E | VQ-P-20--- | 400M | ---- | 50 | 994 | ---- | 26/23 | ---- | ----- | -- | -- | WC OPEN NE SEMIC | |
| 7 | 150110Z | 16.7N 123.6E | 54-P- 5--- | 700MB | 55 | 70 | 987 | 2987 | 12/11 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 8 | 150400Z | 16.8N 123.0E | 54-P- 1--- | 700MB | 50 | ---- | 986 | 2975 | 14/12 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 9 | 150637Z | 17.1N 122.7E | 54-P- 1--- | 700MB | 42 | 60 | 985 | 2978 | 15/12 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 10 | 150800Z | 16.5N 122.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | EYE NOT VISIBLE | |
| 11 | 151014Z | 17.3N 122.4E | VQ-P- 3--- | 700MB | 75 | 65 | 990 | 2975 | 16/15 | CIRC | | 10 | -- | POOR RDR PRES | |
| 12 | 151319Z | 17.3N 121.8E | VQ-P-10--- | 700MB | 55 | ---- | ---- | ---- | 15/13 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 13 | 151603Z | 17.6N 121.3E | VQ-P- 8--- | 700MB | 50 | ---- | 993 | 2978 | 11/09 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 14 | 152200Z | 17.6N 119.9E | 54-P-11-10 | 500MB | 40 | ---- | 993 | ---- | 00/-3 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 15 | 160300Z | 18.7N 118.9E | 54-P- 6- 5 | 700MB | 50 | 65 | 988 | 2996 | 15/10 | ---- | ----- | -- | -- | WC FORMING SE | |
| 16 | 160659Z | 18.5N 117.5E | SATELIT--- | STG C+ | | | | | | | | | | LESS INTENSE | |
| 17 | 161010Z | 19.3N 117.6E | VQ-P- 3--- | 400M | 65 | 70 | ---- | 2986 | 26/21 | CIRC | | 25 | -- | WC OPEN N QUAD STG FBS S SEMIC | |
| 18 | 161300Z | 19.6N 116.9E | VQ-P- 5--- | 400M | 45 | 50 | 989 | ---- | 27/24 | CIRC | | 35 | 5 | WC OPEN NW | |
| 19 | 161530Z | 19.9N 116.4E | VQ-P- 5--- | 400M | 65 | 65 | 988 | ---- | 27/24 | ---- | ----- | -- | -- | WC OPEN N-STG FBS | |
| 20 | 161800Z | 19.8N 116.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | HK RDR-POOR FIX | 22.3N 114.2E |
| 21 | 162100Z | 20.2N 116.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | HK RDR-POOR FIX | 22.3N 114.2E |
| 22 | 162200Z | 20.1N 115.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | HK RDR-POOR FIX | 22.3N 114.2E |
| 23 | 170030Z | 20.4N 115.5E | 54-P- 1--- | 700MB | 58 | 55 | 978 | 2920 | 16/10 | CIRC | | 10 | -- | NO RDR PRES - 700 CNTR 4NM N | |
| 24 | 170626Z | 20.8N 115.0E | VQ-P- 5--- | 550M | ---- | 60 | 984 | ---- | 27/22 | ELIP | E-W | 50X26 | 12 | RDR PRES FAIR | |
| 25 | 170753Z | 20.0N 114.5E | SATELIT--- | STG X | DIA | 2 | CAT 2.5 | | | | | | | EYE NOT VISIBLE | |
| 26 | 170930Z | 21.3N 114.7E | VQ-R-12--- | ----- | ---- | 45 | ---- | ---- | --/25 | CIRC | | 32 | 10 | CLSD WC-STRONGER | 21.0N 116.2E |
| 27 | 171105Z | 21.4N 114.8E | VQ-R-25--- | ----- | ---- | 52 | ---- | ---- | --/24 | CIRC | | 35 | 7 | WC OPEN NE QUAD | 21.1N 115.6E |

TYPHOON FREDA

1200Z 14 JUN TO 0000Z 18 JUN

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 141200Z | 15.9N 125.6E | 45 | 16.0N 125.8F | 40 | 13 | -5 | 17.7N 123.0F | 50 | 69 | -10 | 19.1N 120.0E | 60 | 166 | -5 | 20.2N 116.8E | 70 | 155 | 15 |
| 141800Z | 16.3N 124.7E | 55 | 16.4N 124.9F | 50 | 13 | -5 | 18.3N 121.1E | 55 | 30 | -20 | 19.6N 118.0F | 60 | 109 | -5 | --.- ---.- | -- | -- | -- |
| 150000Z | 16.7N 123.8E | 60 | 16.7N 123.8F | 50 | 0 | -10 | 18.3N 119.8E | 55 | 13 | -5 | 19.9N 116.3E | 65 | 49 | 0 | 21.6N 113.6E | 70 | 97 | 35 |
| 150600Z | 17.1N 122.8E | 65 | 16.8N 122.7F | 70 | 19 | 5 | 18.1N 118.8E | 50 | 61 | -15 | 19.8N 115.5E | 65 | 64 | 5 | --.- ---.- | -- | -- | -- |
| 151200Z | 17.5N 121.8E | 60 | 17.3N 122.0F | 60 | 17 | 0 | 18.4N 118.3E | 50 | 99 | -15 | 20.1N 115.0F | 60 | 90 | 5 | --.- ---.- | -- | -- | -- |
| 151800Z | 17.8N 121.0E | 75 | 17.5N 120.9F | 50 | 19 | -25 | 19.0N 117.1E | 55 | 82 | -10 | 20.9N 113.9E | 65 | 78 | 15 | --.- ---.- | -- | -- | -- |
| 160000Z | 18.5N 119.7E | 60 | 17.8N 119.5F | 45 | 43 | -15 | 19.6N 115.8E | 55 | 49 | -10 | 21.6N 113.2E | 65 | 96 | 30 | --.- ---.- | -- | -- | -- |
| 160600Z | 19.0N 118.3E | 65 | 18.8N 118.3F | 65 | 12 | 0 | 20.9N 114.0F | 85 | 62 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161200Z | 19.6N 117.1E | 65 | 19.4N 117.1F | 70 | 12 | 5 | 21.7N 113.1F | 80 | 73 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161800Z | 20.0N 116.1E | 65 | 20.1N 115.9F | 70 | 13 | 5 | 22.8N 111.9E | 40 | 111 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170000Z | 20.4N 115.6E | 65 | 20.4N 115.5F | 75 | 6 | 10 | 22.8N 112.8F | 50 | 36 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170600Z | 20.8N 115.1E | 60 | 20.7N 115.1F | 70 | 6 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 171200Z | 21.5N 114.4E | 55 | 21.3N 114.5F | 65 | 13 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 171800Z | 22.2N 113.8E | 50 | 21.8N 113.9F | 65 | 25 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 180000Z | 23.2N 113.3E | 35 | 22.7N 113.2F | 35 | 30 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 16NM | 62NM | 93NM | 126NM | 16NM | 62NM | 93NM | 126NM |
| AVERAGE RIGHT ANGLE ERROR | 11NM | 38NM | 32NM | 28NM | 11NM | 38NM | 32NM | 28NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 8KTS | 15KTS | 9KTS | 25KTS | 8KTS | 15KTS | 9KTS | 25KTS |
| AVERAGE BIAS OF WIND ERROR | 0KTS | -3KTS | 6KTS | 25KTS | 0KTS | -3KTS | 6KTS | 25KTS |
| NUMBER OF FORECASTS | 15 | 11 | 7 | 2 | 15 | 11 | 7 | 2 |


BEST TRACK
TYPHOON GILDA
24 JUN - 28 JUN 1971
CYCLONE 11
MAX SFC WND - 90kts
MINIMUM SLP - 978 mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
ANDAMAN ISLANDS
BONIN ISLANDS
MARIANAS ISLANDS
24/12Z

## GILDA

Gilda developed to tropical storm force 300 miles east of Leyte on June 24th. Her origin dates back to a circulation noted on the synoptic charts on the 18th south of Yap. During the next four days the system took a west-northwest intercept course with the central Philippines (Figure 5-15).

Reaching typhoon force just before striking Samar the morning of the 25th, she crossed Masbate Island, the Sibuyon Sea, Mindoro and crossed back to sea near Lubang Island. Maximum wind gusts of 90 kt were reported at Romblon in the Sibuyon Sea, while a maximum rainfall amount of 7.44 inches fell at Borongon. One person was reported killed and over 790 homes were destroyed.

Gilda did not drop below typhoon force during her transit through the Philippines, and emerged into the South China Sea with winds of 85 kt on the 26th. Shifting to a more northwesterly track at 15 kt, the typhoon struck northeastern Hainan Island (Figure 5-16) 36 hours later with winds of 90 kt. Gilda moved ashore on mainland China, west of the Luichow peninsula, as a tropical storm on the 28th finally dissipating in the interior.

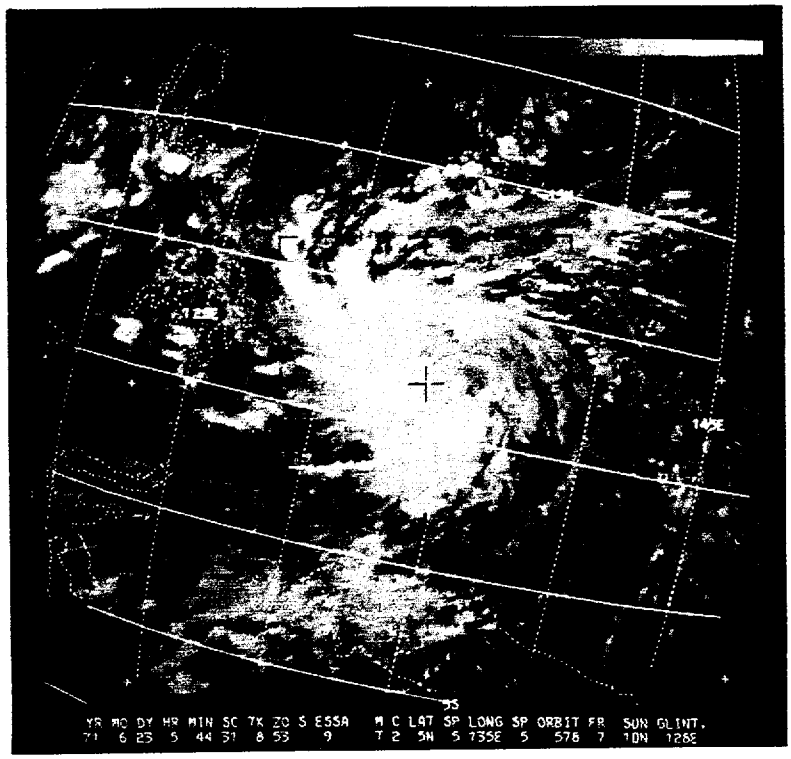



FIGURE 5-15. THE FORMATIVE STAGES OF TROPICAL STORM GILDA IN THE SOUTHERN PHILIPPINE SEAS AS SIGHTED BY ESSA-9 ON 23 JUNE.

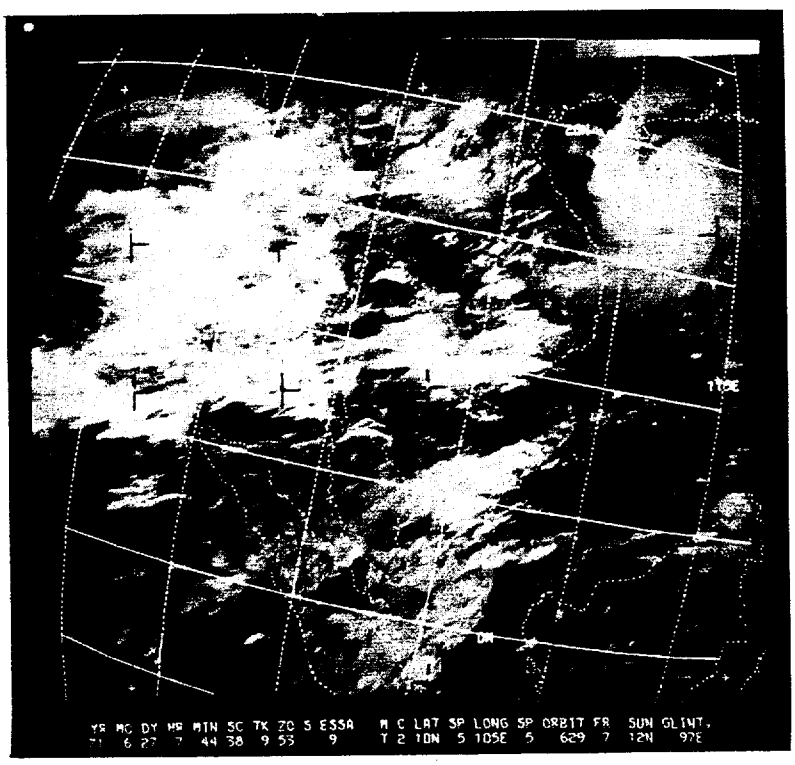



FIGURE 5-16. ESSA-9 PHOTO OF TYPHOON GILDA EAST OF HAINAN ISLAND ON 27 JUNE.

TYPHOON GILDA
EYE FIXES FOR CYCLONE NO. 11
24 JUN - 28 JUN 71

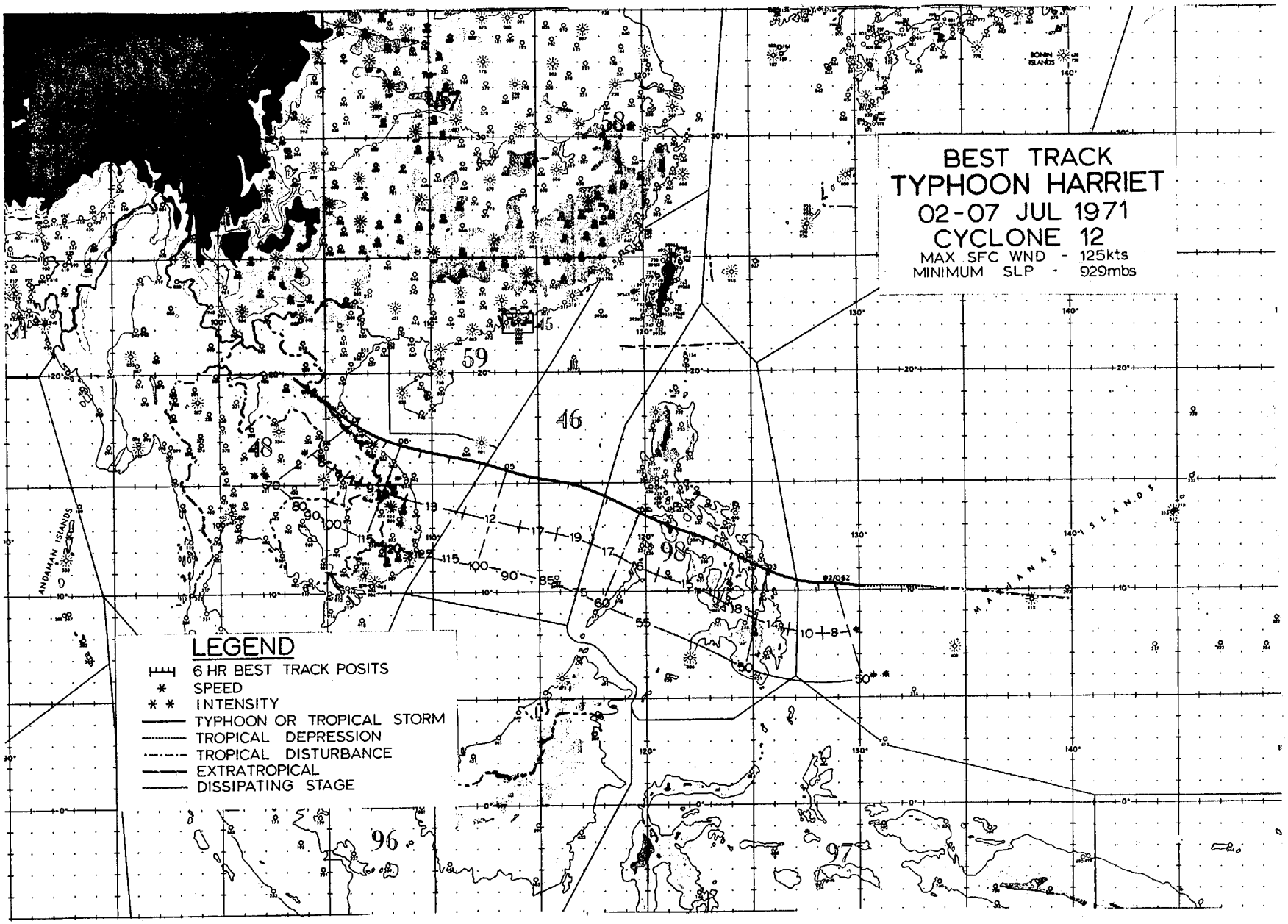
| FIX NO. | TIME | POSIT | UNIT-METHOD-ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 220634Z | 8.0N 138.0E | SATELIT---- | STG B | | | | | | | | | | | |
| 2 | 230230Z | 9.1N 134.4E | VQ-P-15---- | 500M | ---- | 15 | 1005 | ---- | 26/23 | CIRC | | 30 | -- | NO WC | |
| 3 | 230545Z | 8.5N 134.5E | SATELIT---- | STG C | | | | | | | | | | BETTER ORGANIZED | |
| 4 | 240030Z | 9.3N 130.7E | 54-P-15---- | 700MB | 30 | 25 | 1001 | 3057 | 08/07 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 5 | 240200Z | 10.1N 130.6E | 54-P------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 6 | 240644Z | 11.5N 128.5E | SATELIT---- | STG C | | | | | | | | | | STRONGER | |
| 7 | 241245Z | 11.0N 127.4E | 54-P- 5---- | 500M | 55 | ---- | 985 | 2978 | 14/-- | ELIP | E-W | 18X10 | 5 | FBS FORMING | |
| 8 | 241600Z | 11.2N 127.1E | 54-P- 8---- | 700MB | 68 | ---- | 986 | 2966 | 15/11 | ELIP | N-S | 15X12 | 5 | WC RAGGED | |
| 9 | 242215Z | 11.4N 125.2E | 54-P- 2---- | 700MB | 80 | ---- | ---- | ---- | 16/10 | CIRC | | -- | 10 | STG FBS E-SW | |
| 10 | 250100Z | 11.8N 124.5E | 54-P- 1---- | 700MB | 78 | 50 | ---- | ---- | 14/11 | CIRC | | -- | 10 | WC POORLY DEF | |
| 11 | 250415Z | 12.1N 124.0E | 54-P- 1---- | 700MB | 70 | 70 | ---- | ---- | 09/08 | ---- | ----- | -- | -- | NEG WC | |
| 12 | 250547Z | 12.5N 123.5E | SATELIT---- | STG X | DIA | 3 | CAT 2.0 | | | | | | | STRONGER | |
| 13 | 250720Z | 12.3N 122.8E | VQ-P-15---- | 700MB | 30 | ---- | 991 | 3084 | 14/10 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 14 | 251400Z | 13.0N 121.8E | LND RDR---- | | | | | | | ---- | ----- | -- | -- | UNK SITE | |
| 15 | 251622Z | 13.2N 121.3E | 54-P- 5---- | 500MB | 50 | ---- | ---- | ---- | 00/-4 | CIRC | | 20 | -- | WC OPEN NW | |
| 16 | 251923Z | 13.9N 120.4E | 54-P- 3-12 | 500MB | 50 | ---- | ---- | ---- | 00/-3 | CIRC | | 18 | 10 | CLSD WC | |
| 17 | 252115Z | 13.8N 120.2E | 54-P- 2---- | 500MB | 75 | ---- | ---- | ---- | -1/-6 | CIRC | | 10 | 10 | CLSD WC-FBS E | |
| 18 | 252250Z | 14.0N 119.7E | SHP RDR---- | | | | | | | ---- | ----- | -- | -- | AN/SPS-30 RDR | |
| 19 | 260000Z | 14.4N 119.4E | SHP RDR---- | | | | | | | ---- | ----- | -- | -- | AN/SPS-30 RDR | |
| 20 | 260100Z | 14.6N 118.9E | SHP RDR---- | | | | | | | ---- | ----- | -- | -- | AN/SPS-30 RDR | |
| 21 | 260110Z | 14.5N 119.2E | 54-P- 3---- | 700MB | 90 | ---- | ---- | ---- | 19/12 | CIRC | | 10 | -- | CLSD WC-STG FBS | |
| 22 | 260400Z | 15.1N 118.4E | 54-P- 3- 2 | 700MB | 90 | 100 | ---- | 2900 | 18/10 | CIRC | | 15 | -- | WC OPEN NW | |
| 23 | 260650Z | 15.3N 118.0E | SATELIT---- | STG X | DIA | 2 | CAT 2.5 | | | | | | | LITTLE CHG | |
| 24 | 261014Z | 16.1N 116.4E | VQ-R- 5- 1 | 700MB | ---- | 70 | 984 | 2987 | 17/12 | CIRC | | 12 | 2 | WC OPEN N | |
| 25 | 261248Z | 16.4N 116.1E | VQ-R- 5- 3 | 700MB | ---- | ---- | 987 | 2996 | 15/11 | CIRC | | 18 | 6 | WC OPEN S QUAD | |
| 26 | 262300Z | 17.3N 113.5E | VQ-R- 3- 1 | 700MB | 70 | 75 | ---- | 2874 | 19/11 | CIRC | | 15 | 5 | WC OPEN W | |
| 27 | 270100Z | 17.6N 113.1E | VQ-R- 3- 1 | 700MB | 80 | 85 | 975 | 2868 | 19/11 | CIRC | | 20 | 5 | RDR PRES | |
| 28 | 270400Z | 17.9N 112.7E | VQ-R- 3- 1 | 700MB | 90 | 90 | ---- | 2859 | 18/15 | CIRC | | 20 | -- | WC OPEN S-NW | |
| 29 | 270655Z | 18.4N 112.1E | VQ-R- 5- 5 | 300M | ---- | 65 | ---- | ---- | --/16 | ---- | ----- | -- | -- | WC OPEN N | |
| 30 | 270745Z | 18.5N 112.0E | SATELIT---- | STG X | DIA | 3 | CAT 3.0 | | | | | | | RAGGED EYE | |
| 31 | 271000Z | 18.9N 111.4E | VQ-R- 3- 5 | 330M | ---- | 65 | ---- | ---- | --/-- | CIRC | | 12 | -- | ONLY FRAGMENTS OF WC-HVY FBS E-S | 19.1N 113.0E |
| 32 | 271130Z | 19.2N 111.1E | VQ-R-10- 5 | 300M | ---- | 60 | ---- | ---- | --/-- | ---- | ----- | -- | -- | NEG WC | |
| 33 | 272100Z | 20.0N 110.4E | ---------- | ----- | ---- | ---- | 974 | ---- | --/-- | ---- | ----- | -- | -- | PSG OVR LND STN | |

TYPHOON GILDA

1200Z 24 JUN TO 0600Z 28 JUN

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 241200Z | 10.9N 127.7E | 60 | 10.9N 127.6E | 55 | 6 | -5 | 13.5N 122.3E | 60 | 43 | -5 | 16.4N 118.3E | 70 | 121 | -5 | 19.4N 115.6E | 75 | 244 | -15 |
| 241800Z | 11.3N 126.2E | 70 | 11.3N 126.7E | 65 | 29 | -5 | 13.4N 122.5E | 60 | 99 | -10 | 15.9N 118.9E | 65 | 247 | -15 | --.- ---.- | -- | -- | -- |
| 250000Z | 11.8N 124.8E | 70 | 11.7N 124.8E | 65 | 6 | -5 | 14.3N 119.5E | 65 | 6 | -15 | 17.8N 115.9E | 75 | 150 | -10 | 21.3N 113.8E | 75 | 228 | 15 |
| 250600Z | 12.2N 123.3E | 70 | 12.2N 123.6E | 65 | 18 | -5 | 15.1N 118.5E | 70 | 47 | -15 | 18.8N 115.2E | 80 | 174 | -10 | --.- ---.- | -- | -- | -- |
| 251200Z | 12.8N 122.1E | 65 | 12.8N 121.9E | 60 | 12 | -5 | 16.4N 117.2E | 75 | 58 | 0 | 20.3N 114.3E | 80 | 186 | -10 | --.- ---.- | -- | -- | -- |
| 251800Z | 13.4N 120.8E | 70 | 13.3N 120.9E | 60 | 8 | -10 | 16.8N 116.8E | 75 | 120 | -5 | 20.5N 114.2E | 80 | 208 | 0 | --.- ---.- | -- | -- | -- |
| 260000Z | 14.3N 119.4E | 80 | 14.4N 119.8E | 65 | 24 | -15 | 17.9N 115.8E | 75 | 145 | -10 | 21.8N 113.7E | 70 | 231 | 10 | --.- ---.- | -- | -- | -- |
| 260600Z | 15.5N 117.8E | 85 | 15.5N 118.0E | 85 | 12 | 0 | 19.5N 114.5E | 90 | 151 | 0 | 23.1N 113.7E | 65 | 277 | 20 | --.- ---.- | -- | -- | -- |
| 261200Z | 16.3N 116.2E | 75 | 16.5N 116.1E | 80 | 13 | 5 | 20.7N 113.4E | 80 | 156 | -10 | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 261800Z | 16.8N 114.7E | 80 | 17.2N 115.1E | 80 | 33 | 0 | 21.1N 112.4E | 80 | 131 | 0 | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 270000Z | 17.4N 113.3E | 85 | 17.4N 113.3E | 80 | 0 | -5 | 20.5N 109.1E | 60 | 39 | 0 | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 270600Z | 18.2N 112.2E | 90 | 18.1N 112.3E | 90 | 8 | 0 | 22.0N 109.4E | 40 | 34 | -5 | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 271200Z | 19.0N 111.3E | 90 | 19.3N 111.1E | 85 | 21 | -5 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 271800Z | 19.7N 110.6E | 80 | 20.2N 110.2E | 60 | 37 | -20 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 280000Z | 20.5N 109.8E | 60 | 20.4N 110.2E | 60 | 23 | 0 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 280600Z | 22.1N 108.8E | 45 | 22.0N 108.9E | 50 | 8 | 5 | --.- --.- | -- | -- | -- | --.- --.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 16NM | 86NM | 199NM | 236NM | 16NM | 86NM | 199NM | 236NM |
| AVERAGE RIGHT ANGLE ERROR | 10NM | 62NM | 143NM | 180NM | 10NM | 62NM | 143NM | 180NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 6KTS | 10KTS | 15KTS | 6KTS | 6KTS | 10KTS | 15KTS |
| AVERAGE BIAS OF WIND ERROR | -4KTS | -6KTS | -3KTS | 0KTS | -4KTS | -6KTS | -3KTS | 0KTS |
| NUMBER OF FORECASTS | 16 | 12 | 8 | 2 | 16 | 12 | 8 | 2 |


BEST TRACK
TYPHOON HARRIET
02-07 JUL 1971
CYCLONE 12
MAX SFC WND - 125kts
MINIMUM SLP - 929mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
ANDAMAN ISLANDS
BONIN ISLANDS
MARIANAS ISLANDS

## HARRIET

Harriet's incipient stages trace to a formative circulation in the equatorial trough in the vicinity of Yap while Gilda was traversing the South China Sea. By the 30th the circulation began to move westward reaching tropical storm force midway between the Leyte Gulf and the Palau Islands.

Accomplishing landfall in the Leyte Gulf near Tacloban around noon on the 3rd packing 50-kt winds, Harriet cut through the central Philippine Islands at a rate of 15 kt. After crossing Mindoro Island 24 hours later, further development was evident as the Manila Weather Bureau radar began to detect an eye. Typhoon force was gained in a matter of hours as she moved out to sea (Figure 5-17). Harriet continued on a west-northwest heading while the central pressure dropped in a 24-hour period between the 4th and 5th to 929 mb* which was measured by reconnaissance aircraft south of the Paracel Islands. Maximum winds estimated at this time were 125 kt (Figure 5-18). The occurrence of such rapid deepening is a rather rare event in the South China Sea. Fortunately, Harriet began to slow and weaken before reaching the Vietnam coast. By the morning of the 7th winds dropped to near 70 kt as the storm made landfall.

Moving into the DMZ, the typhoon literally washed out the war on Vietnam's northern front. Harriet, preceeded by day-long rains and high winds in the northern provinces, blotted out ground fighting and heavily cut into U.S. air strikes. A maximum 24-hour rainfall of 10.16 inches fell at Camp Evans which also registered sustained winds of 45 kt and gusts to 61 kt in the typhoon's southern quadrant.

In her aftermath, Harriet left one dead in the Philippines and four persons killed, 14 reported missing in Vietnam. Thua-thien Province in Vietnam suffered over 2,500 houses and buildings partly or completely destroyed.

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*Pressure of 921 recorded at 051310Z considered in error as recomputation from minimum 700-mb height checks at 932 mb.

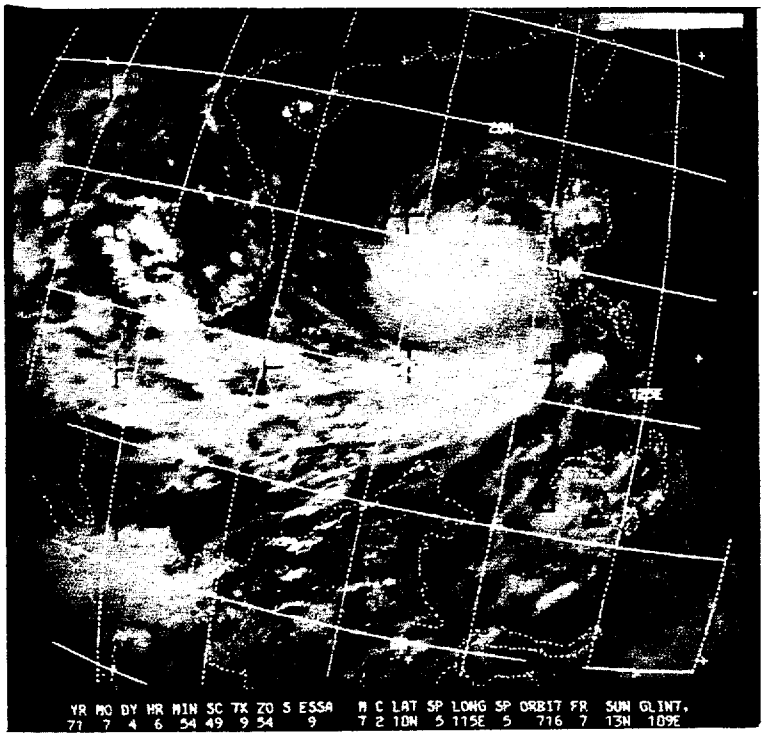



FIGURE 5-17. ESSA-9 VIEW OF TYPHOON HARRIET WEST OF LUZON ON 4 JULY.

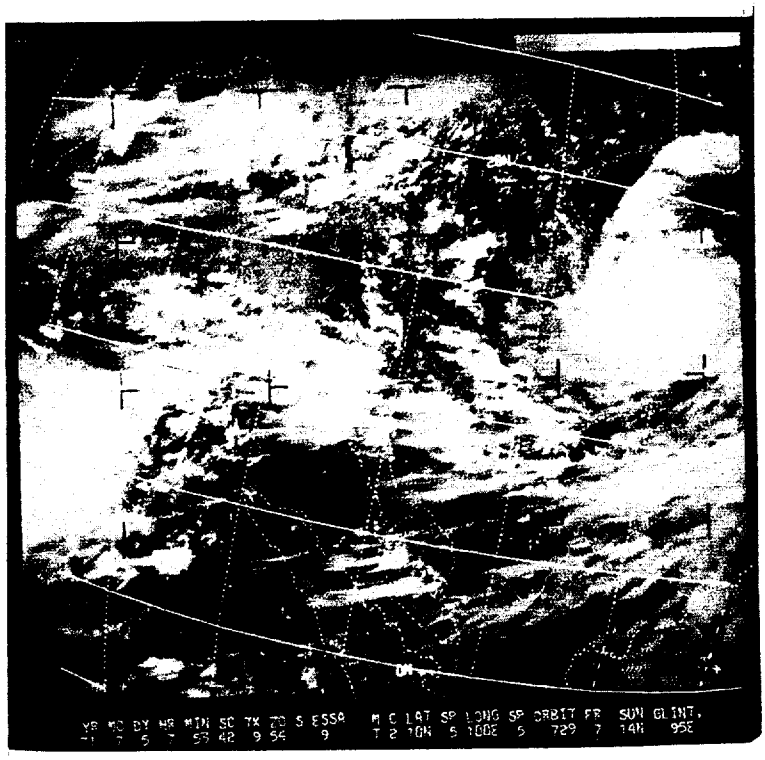



FIGURE 5-18. TYPHOON HARRIET ON 5 JULY IS PHOTOGRAPHED BY ESSA-9.

TYPHOON HARRIET

EYE FIXES FOR CYCLONE NO. 12

02 JUL - 07 JUL 71

| FIX NO. | TIME | POSIT | UNIT-METHOD-ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL T1/T0 | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 300459Z | 10.5N 136.0E | SATELIT--- | STG B | | | | | | | | | | HVY BAND ABT CNTR | |
| 2 | 010447Z | 11.3N 131.4E | 54-P------ | ----- | ---- | 25 | 1001 | ---- | --/-- | ---- | ----- | -- | -- | INVESTIGATIVE FLT | |
| 3 | 010554Z | 10.0N 132.5E | SATELIT--- | STG B | | | | | | | | | | STRONGER | |
| 4 | 020400Z | 10.1N 129.2E | 54-P- 3--- | 700MB | ---- | 70 | 994 | 3030 | 12/-- | ---- | ----- | -- | -- | WC FORMING | |
| 5 | 021000Z | 10.4N 128.5E | 54-P- 3- 3 | 700MB | 50 | 70 | 991 | 3005 | 13/11 | CIRC | | 20 | 10 | WC CLSD-700 CNTR 14 NM NW-HVY FBS | |
| 6 | 021520Z | 10.4N 127.3E | VQ-P- 3- 5 | 700MB | 45 | 50 | 996 | 3051 | 24/22 | CIRC | | 17 | 3 | WC OPEN S-HVY FBS | |
| 7 | 022115Z | 10.7N 126.4E | VQ-P- 2--- | 700MB | 45 | ---- | 991 | 3011 | 14/10 | ELIP | NE-SW | 26X11 | 5 | WC OPEN NW | |
| 8 | 030400Z | 11.5N 124.4E | 54-P- 5--- | 500MB | 40 | ---- | ---- | ---- | -5/-5 | ---- | ----- | -- | -- | POORLY DEF-SFC CNTR 20 NM S | |
| 9 | 030650Z | 11.8N 123.8E | 54-P- 5--- | 500MB | 55 | ---- | ---- | ---- | -4/-6 | ---- | ----- | -- | -- | NO RADAR PRES | |
| 10 | 031005Z | 12.2N 123.8E | 54-P-10--- | 500MB | 50 | ---- | ---- | ---- | -5/-6 | ---- | ----- | -- | -- | NO RADAR PRES | |
| 11 | 031230Z | 12.6N 122.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UKN SITE | |
| 12 | 031315Z | 12.8N 122.2E | 54-P-10--- | 500MB | 50 | ---- | ---- | ---- | 00/-2 | CIRC | | 8 | -- | POORLY DEF-RDR PRES IMPROVING | |
| 13 | 031330Z | 12.7N 122.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UKN SITE | |
| 14 | 031430Z | 12.9N 121.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | UKN SITE | |
| 15 | 031615Z | 12.8N 121.6E | 54-P- 1--- | 500MB | 60 | ---- | ---- | ---- | +2/-1 | CIRC | | 6 | -- | RDR PRES POOR | |
| 16 | 031900Z | 13.0N 120.6E | 54-P- 0--- | 500MB | 50 | ---- | ---- | ---- | -1/-2 | ---- | ----- | -- | -- | VERY POOR PRES | |
| 17 | 032210Z | 13.1N 120.4E | VQ-R- 4--- | ----- | 55 | 50 | ---- | ---- | --/10 | ELIP | N-S | 20X11 | 5 | WC S SEMIC | 13.9N 119.8E |
| 18 | 040127Z | 13.7N 119.4E | VQ-P-10--- | 700MB | ---- | 55 | 980 | 2960 | 18/09 | CIRC | | 33 | 5 | CLSD WC-HVY FBS | |
| 19 | 040404Z | 14.2N 118.5E | 54-P- 4- 7 | 700MB | 70 | 90 | 972 | 2935 | 18/09 | CIRC | | 25 | 10 | CLSD WC-HVY FBS | |
| 20 | 040655Z | 15.0N 117.5E | SATELIT--- | STG X | DIA | 4 | CAT 3.5 | | | | | | | | |
| 21 | 040711Z | 14.4N 117.9E | 54-P- 3--- | 700MB | 70 | 90 | 976 | 2896 | 17/10 | CIRC | | 30 | 5 | CLSD WC-700 MB CNTR 10NM W | |
| 22 | 041002Z | 14.8N 117.0E | 54-P- 3--- | 700MB | 90 | 100 | 974 | 2877 | 17/10 | ELIP | E-W | 30X20 | 5 | WC OPEN N-700 CNTR 4NM W | |
| 23 | 041301Z | 15.0N 116.9E | 54-P- 3--- | 700MB | 90 | ---- | 974 | 2868 | 17/11 | ELIP | E-W | 35X20 | 5 | WC OPEN N-MDT FBS | |
| 24 | 041523Z | 15.2N 115.4E | VQ-R- 3--- | ----- | ---- | 100 | ---- | ---- | --/25 | CIRC | | 18 | 15 | CLSD WC | 15.2N 114.5E |
| 25 | 042210Z | 15.3N 113.9E | VQ-P- 5- 2 | 400M | ---- | 100 | ---- | ---- | 27/21 | CIRC | | 23 | 9 | CLSD WC | |
| 26 | 050200Z | 15.6N 113.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 15.0N 110.4E |
| 27 | 050300Z | 15.8N 112.7E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.1N 110.5E |
| 28 | 050400Z | 15.8N 112.7E | 54-P- 1- 5 | 700MB | 75 | 100 | 947 | 2399 | 19/15 | CIRC | | 15 | 15 | CLSD WC-V INTENSE | |
| 29 | 050400Z | 16.0N 112.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.4N 110.5E |
| 30 | 050700Z | 15.9N 111.9E | 54-P- 1- 5 | 700MB | 85 | 100 | 937 | 2539 | 19/11 | CIRC | | 20 | -- | CLSD WC | |
| 31 | 050700Z | 16.1N 111.8E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.8N 110.9E |
| 32 | 050735Z | 16.0N 111.5E | SATELIT--- | STG X | DIA | 3 | CAT 3.5 | | | | | | | STRONGER | |
| 33 | 050800Z | 16.1N 111.6E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.6N 111.1E |
| 34 | 050900Z | 16.2N 111.4E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.7N 111.0E |
| 35 | 050915Z | 16.0N 111.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 36 | 050945Z | 16.1N 111.5E | 54-P- 1- 3 | 700MB | 100 | 120 | 929 | 2484 | 24/11 | CIRC | | 12 | -- | CLSD WC-TOPS 25K | |
| 37 | 051000Z | 16.2N 111.3E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.5N 111.1E |
| 38 | 051100Z | 16.3N 111.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.6N 110.9E |
| 39 | 051145Z | 16.1N 111.1E | LND RDR--- | | | | | | | ---- | ----- | 17 | -- | DANANG RDR | 16.0N 108.2E |
| 40 | 051200Z | 16.3N 110.8E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.7N 110.8E |
| 41 | 051245Z | 16.2N 110.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 42 | 051300Z | 16.3N 110.6E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.9N 110.7E |
| 43 | 051310Z | 16.2N 110.8E | VQ-P- 7- 3 | 700MB | 120 | ---- | 921 | 2499 | 23/15 | CIRC | | 15 | 8 | CLSD WC-TOPS 28K | |
| 44 | 051343Z | 16.3N 110.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 45 | 051400Z | 16.4N 110.4E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.7N 110.6E |

TYPHOON HARRIET
EYE FIXES FOR CYCLONE NO. 12
02 JUL - 07 JUL 71

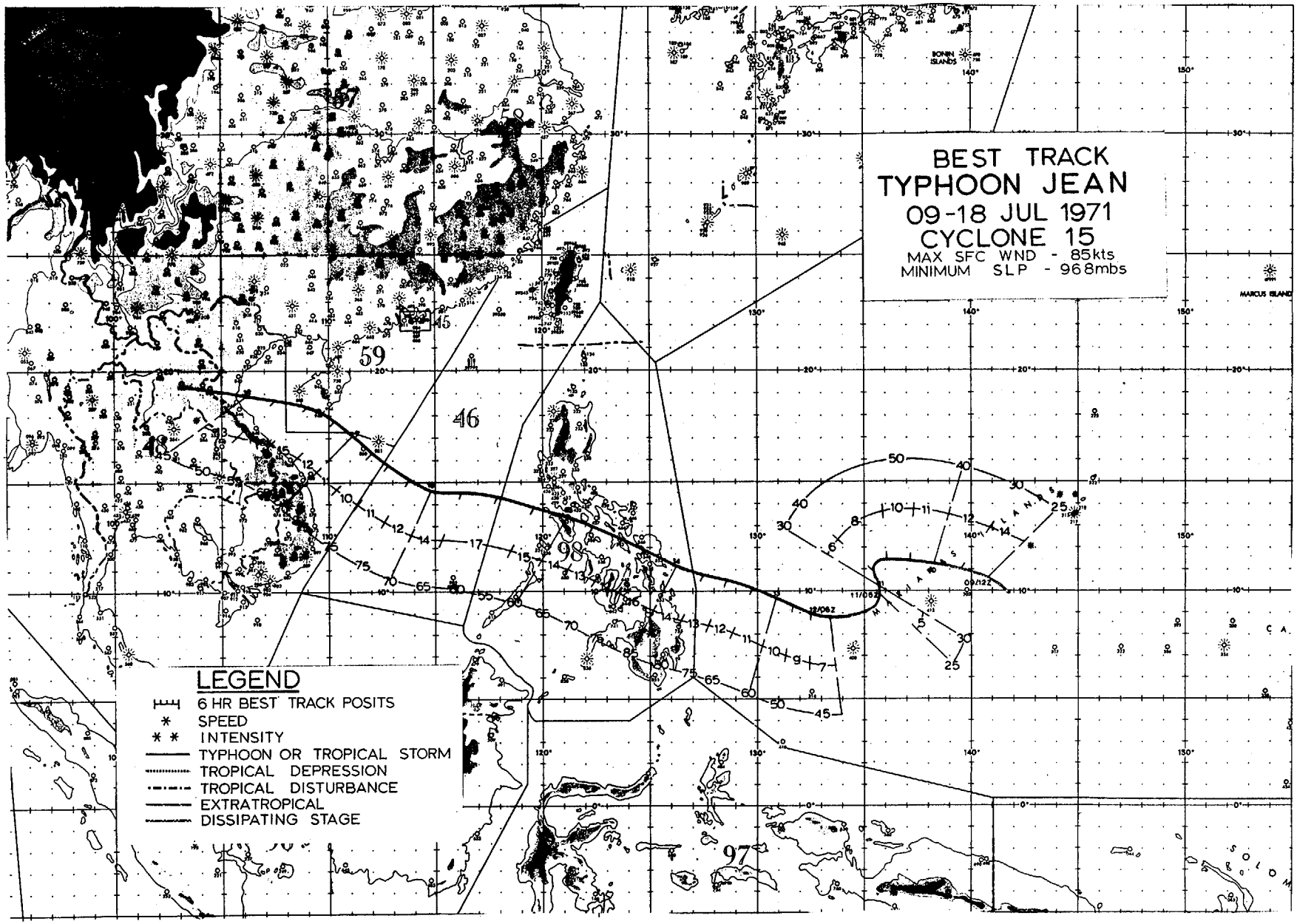
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 0514 5HZ | 16.4N 110.4E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 47 | 0515 00Z | 16.4N 110.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 13.9N 110.5E |
| 48 | 0515 45Z | 16.4N 110.1E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 49 | 0516 00Z | 16.3N 110.0E | VQ-R- 3- 3 | ----- | 75 | ---- | ---- | ---- | --/20 | CIRC | | 15 | 8 | CLSD WC TOPS 46K | |
| 50 | 0516 00Z | 16.4N 109.6E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.1N 110.5E |
| 51 | 0517 00Z | 16.5N 109.7E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.3N 110.5E |
| 52 | 0518 00Z | 16.4N 109.5E | VQ-R- 3--- | ----- | 55 | 60 | ---- | ---- | --/25 | CIRC | | 14 | 6 | CLSD WC | 16.2N 110.7E |
| 53 | 0518 00Z | 16.5N 109.6E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.5N 110.5E |
| 54 | 0519 00Z | 16.5N 109.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.6N 110.6E |
| 55 | 0520 00Z | 16.6N 109.0E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.8N 110.5E |
| 56 | 0520 24Z | 16.7N 109.3E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX | |
| 57 | 0521 00Z | 16.6N 109.2E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.8N 110.4E |
| 58 | 0522 30Z | 16.7N 108.8E | VQ-P- 5--- | 700MB | ---- | ---- | 924 | 2496 | 24/13 | CIRC | | 20 | 7 | WC OPEN NW | |
| 59 | 0522 46Z | 16.6N 109.0E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | UKN SITE | |
| 60 | 0523 00Z | 16.6N 108.8E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 14.9N 110.3E |
| 61 | 0523 15Z | 16.6N 108.9E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | UKN SITE | |
| 62 | 0600 00Z | 16.7N 108.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS ORISKANY | 15.2N 110.4E |
| 63 | 0600 25Z | 16.8N 108.6E | VQ-P- 3- 1 | 700MB | ---- | ---- | 933 | 2600 | 22/12 | CIRC | | 20 | 6 | WC OPEN NW | |
| 64 | 0601 15Z | 16.6N 108.6E | LNU RDR--- | | | | | | | CIRC | | 12 | -- | POOR FIX-DANANG | 16.0N 108.2E |
| 65 | 0602 15Z | 16.6N 108.6E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 66 | 0603 00Z | 16.7N 108.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | | 15.5N 110.5E |
| 67 | 0603 28Z | 16.7N 108.1E | VQ-P- 3- 1 | 700MB | ---- | 80 | 937 | 2452 | 20/12 | CIRC | | 18 | -- | WC OPEN W | |
| 68 | 0604 00Z | 16.6N 108.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX | 15.3N 110.6E |
| 69 | 0604 15Z | 16.7N 108.2E | LNU RDR--- | | | | | | | ---- | ----- | 15 | -- | UKN SITE | |
| 70 | 0611 45Z | 17.0N 107.6E | SA-P- 1- 1 | 500MB | 75 | ---- | ---- | ---- | -3/-7 | CIRC | | 12 | 4 | CLSD WC | |
| 71 | 0706 55Z | 19.5N 108.0E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | --X ? | -- | USS MIDWAY APT | |
| 72 | 0708 00Z | 19.5N 105.1E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | REMNANTS OF STORM | |

# TYPHOON HARRIET

## 0600Z 2 JUL TO 0000Z 7 JUL

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 020600Z | 10.2N 128.8E | 50 | 10.0N 129.0E | 50 | 17 | 0 | 10.8N 125.1E | 75 | 80 | 25 | 12.3N 121.4E | 70 | 221 | -5 | --.- ---.- | -- | -- | -- |
| 021200Z | 10.3N 128.1E | 50 | 10.5N 128.2E | 60 | 13 | 10 | 11.5N 124.4E | 70 | 111 | 20 | 13.6N 121.4E | 70 | 301 | -15 | 15.7N 118.4E | 70 | 432 | -55 |
| 021800Z | 10.5N 127.1E | 50 | 10.6N 126.9E | 60 | 13 | 10 | 12.1N 123.2E | 65 | 121 | 10 | 14.4N 120.4E | 65 | 333 | -25 | --.- ---.- | -- | -- | -- |
| 030000Z | 10.8N 125.7E | 50 | 10.8N 126.0E | 60 | 18 | 10 | 12.7N 122.5E | 60 | 164 | 0 | 15.2N 119.4E | 65 | 340 | -35 | 16.9N 115.9E | 75 | 412 | -40 |
| 030600Z | 11.7N 124.1E | 50 | 11.7N 124.0E | 60 | 6 | 10 | 14.6N 120.1E | 60 | 111 | -15 | 16.7N 116.5E | 75 | 245 | -40 | --.- ---.- | -- | -- | -- |
| 031200Z | 12.5N 122.8E | 50 | 12.6N 122.6E | 60 | 13 | 10 | 15.9N 117.9E | 70 | 102 | -15 | 18.1N 113.4E | 80 | 182 | -45 | 20.6N 110.7E | 80 | 276 | -10 |
| 031800Z | 12.9N 121.3E | 55 | 12.9N 120.9E | 60 | 23 | 5 | 15.7N 115.7E | 75 | 65 | -15 | 18.4N 112.2E | 80 | 187 | -40 | --.- ---.- | -- | -- | -- |
| 040000Z | 13.5N 119.8E | 60 | 13.4N 120.0E | 60 | 13 | 0 | 16.0N 115.3E | 75 | 108 | -25 | 18.5N 112.1E | 80 | 221 | -35 | 21.4N 110.5E | 70 | 324 | 0 |
| 040600Z | 14.3N 118.2E | 75 | 14.4N 118.0E | 70 | 13 | -5 | 17.5N 113.1E | 80 | 106 | -35 | 20.7N 110.7E | 80 | 277 | -20 | --.- ---.- | -- | -- | -- |
| 041200Z | 15.0N 116.4E | 85 | 15.2N 116.6E | 85 | 17 | 0 | 18.8N 111.9E | 90 | 165 | -35 | 22.1N 110.4E | 50 | 340 | -40 | --.- ---.- | -- | -- | -- |
| 041800Z | 15.2N 114.7E | 90 | 15.5N 114.7E | 90 | 18 | 0 | 19.4N 110.3E | 80 | 178 | -40 | 23.2N 109.0E | 40 | 372 | -40 | --.- ---.- | -- | -- | -- |
| 050000Z | 15.5N 113.5E | 100 | 15.4N 113.4E | 95 | 8 | -5 | 17.3N 108.3E | 100 | 43 | -15 | 19.8N 104.8E | 60 | 143 | -10 | --.- ---.- | -- | -- | -- |
| 050600Z | 15.9N 112.3E | 115 | 15.9N 112.4E | 100 | 6 | -15 | 18.0N 108.3E | 95 | 70 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 051200Z | 16.2N 110.9E | 125 | 16.3N 111.0E | 115 | 8 | -10 | 18.7N 107.2E | 115 | 97 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 051800Z | 16.5N 109.6E | 120 | 16.5N 109.6E | 115 | 0 | -5 | 18.9N 105.5E | 90 | 124 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 060000Z | 16.7N 108.7E | 115 | 16.9N 108.6E | 120 | 13 | 5 | 19.2N 105.3E | 90 | 98 | 20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 060600Z | 16.9N 107.9E | 100 | 16.8N 107.8E | 110 | 8 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 061200Z | 17.1N 107.5E | 90 | 16.9N 107.5E | 95 | 12 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 061800Z | 17.3N 106.9E | 80 | 17.1N 106.9E | 80 | 12 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 070000Z | 17.8N 106.2E | 70 | 17.3N 106.6E | 50 | 38 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 13NM | 109NM | 264NM | 361NM | 13NM | 109NM | 264NM | 361NM |
| AVERAGE RIGHT ANGLE ERROR | 10NM | 67NM | 154NM | 184NM | 10NM | 67NM | 154NM | 184NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 7KTS | 19KTS | 29KTS | 26KTS | 7KTS | 19KTS | 29KTS | 26KTS |
| AVERAGE BIAS OF WIND ERROR | 1KTS | -6KTS | -29KTS | -26KTS | 1KTS | -6KTS | -29KTS | -26KTS |
| NUMBER OF FORECASTS | 20 | 16 | 12 | 4 | 20 | 16 | 12 | 4 |


BEST TRACK
TYPHOON JEAN
09-18 JUL 1971
CYCLONE 15
MAX SFC WND - 85kts
MINIMUM SLP - 968mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
MARCUS ISLAND

## JEAN

As Jean came onto the scene, the Philippines and Vietnam became the target of July's second typhoon. From her incipient stage, a weak circulation southeast of Guam on the 9th, Jean spent her nine-day lifetime describing a track similar to Gilda and Harriet's.

Attaining 50-kt winds on the 10th, Jean weakened to depression status and described an erratic track for a 24-hour period, while the center showed a southward displacement. Regaining tropical storm strength north of the Palau Islands on the 11th, Jean commenced on a west-northwest track gradually increasing in forward speed (Figure 5-19).

The United Kingdom vessel SIMON BURN passed near the center the morning of the 13th reporting force-10 winds (48-55 kt), very high seas and a minimum sea level pressure of 987 mb.

Attaining typhoon strength that afternoon about 270 n mi east of Leyte, Jean reached a peak of 85 kt a few hours before striking Samar the following day. Jean cut across the central Philippines on the 14th and 15th with her winds dropping below typhoon strength as she emerged into the South China Sea near Lubang Island.

Highest winds reported in the archipelago were 65 kt at Catbalogan located on the western coast of Samar while gusts of 70 kt were measured at Virac on Catanduanes. Winds up to 38 kt were also experienced in high and exposed areas of the greater Manila area. Over 7 inches of rain fell in a two-day period in Samar. No reports of casualties and damage are available; however, low-lying areas of Manila encountered local flooding.

Regaining typhoon winds over open water about 24 hours later (Figure 5-20), the storm changed course to a northwesterly heading as she approached a weakness in the subtropical ridge. Skirting southern Hainan Island on the 17th, Jean's winds dropped to storm status. Bending back to a westerly course across the Gulf of Tonkin, the storm struck shore near Vinh on the Indochina coast on the 18th. The system dissipated over the mountainous terrain of Laos later that day.

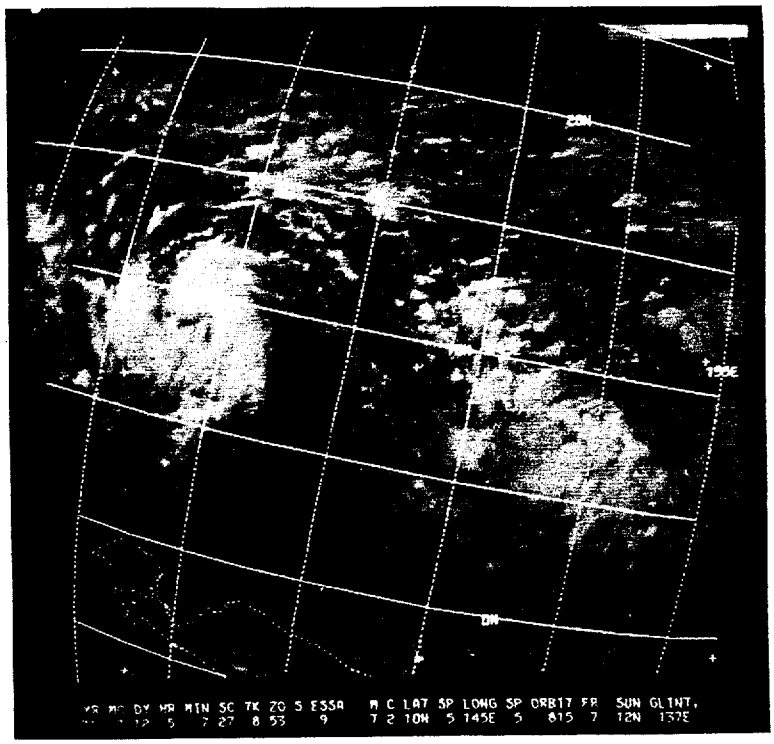



FIGURE 5-19. TROPICAL STORM STAGE OF JEAN AS SEEN ON 12 JULY BY ESSA-9.

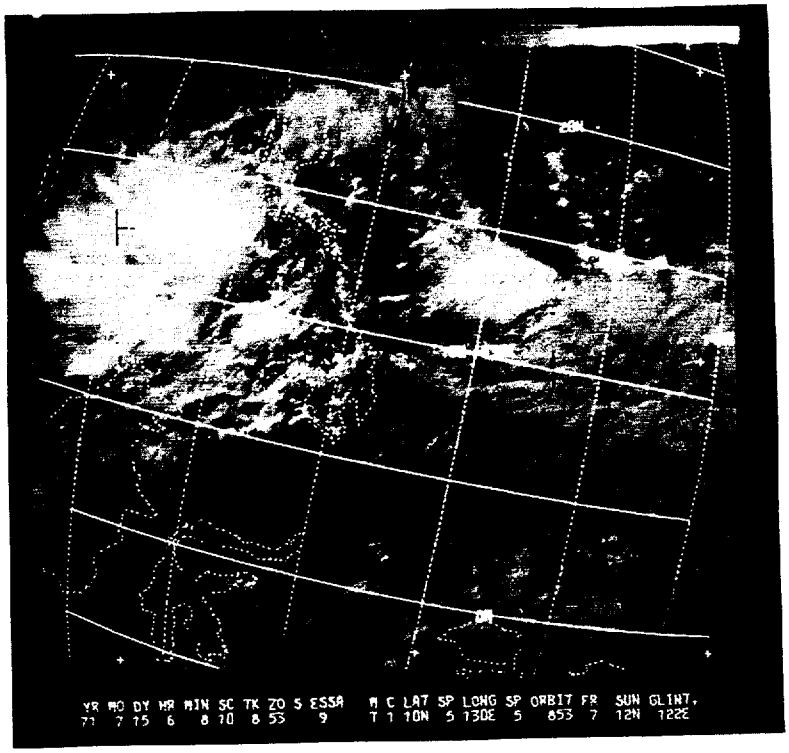



FIGURE 5-20. AS A MINIMAL TYPHOON, JEAN IS SIGHTED BY ESSA-9 ON 15 JULY AFTER CROSSING THE PHILIPPINES.

TYPHOON JEAN

EYE FIXES FOR CYCLONE NO. 15

09 JUL - 18 JUL 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 090602Z | 10.5N 138.5E | SATELIT--- | STG B | | | | | | | | | | FIRST SAT BLTN | |
| 2 | 100139Z | 11.2N 137.8E | VQ-P- 3--- | 300M | 45 | 45 | 1003 | ---- | 27/23 | CIRC | | 20 | -- | NO WC-WK FBS | |
| 3 | 100345Z | 11.3N 137.4E | VQ-P- 3--- | 300M | 60 | 60 | 1005 | ---- | 26/22 | CIRC | | 18 | -- | WC OPEN E | |
| 4 | 101000Z | 11.3N 136.7E | 54-P- 5- 3 | 700MB | 49 | 35 | 998 | 3063 | 11/07 | ---- | ----- | -- | -- | WC FORMING | |
| 5 | 101545Z | 11.2N 135.3E | 54-P- 2-15 | 700MB | 50 | ---- | 1001 | 3070 | 09/08 | ---- | ----- | -- | -- | RDR PRES POOR | |
| 6 | 110425Z | 10.0N 136.0E | 54-P- 1-19 | 700MB | 40 | 20 | 1001 | 3072 | 09/08 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 7 | 110609Z | 10.0N 135.0E | SATELIT--- | STG B | | | | | | | | | | BANDS TO S | |
| 8 | 120159Z | 8.9N 134.0E | VQ-P- 5-40 | 300M | ---- | 45 | 998 | ---- | 27/25 | ---- | ----- | -- | -- | WC OPEN SW | |
| 9 | 120507Z | 9.0N 137.0E | SATELIT--- | STG C+ | | | | | | | | | | STRONGER | |
| 10 | 121033Z | 8.9N 132.9E | 54-P-15--- | 700MB | 34 | ---- | 993 | 3024 | 12/11 | CIRC | | 10 | -- | POORLY DEFINED | |
| 11 | 121540Z | 9.2N 132.0E | 54-P-20--- | 700MB | 42 | ---- | 993 | 3005 | 13/11 | ---- | ----- | -- | -- | NO WC | |
| 12 | 122229Z | 9.5N 131.2E | VQ-R- 8--- | 700MB | ---- | ---- | ---* | ---- | --/-- | CIRC | | 5 | 2 | WC OPEN N | 10.0N 131.4E |
| 13 | 130304Z | 9.8N 130.2E | VQ-R- 5- 3 | 700MB | ---- | ---- | ---* | ---- | --/-- | CIRC | | 5 | 4 | CLSD WC | 10.6N 130.1E |
| 14 | 130606Z | 10.0N 129.0E | SATELIT--- | STG C+ | | | | | | | | | | LITTLE CHG | |
| 15 | 131000Z | 10.5N 129.2E | 54-P- 5--- | 700MB | 65 | 75 | 986 | 2987 | 18/12 | CIRC | | 18 | -- | WC OPEN SW-N | |
| 16 | 131600Z | 10.6N 127.9E | 54-P- 5- 4 | 700MB | 40 | ---- | 983 | 2951 | 16/13 | CIRC | | 25 | 10 | CLSD WC | |
| 17 | 131751Z | 10.7N 127.5E | 54-P- 5- 4 | 700MB | 35 | ---- | 984 | 2932 | 16/12 | CIRC | | 25 | -- | CLSD WC | |
| 18 | 132200Z | 11.0N 126.8E | 54-P- 3- 2 | 700MB | 80 | 85 | 977 | 2899 | 18/12 | ELIP | E-W | 30X25 | -- | CLSD WC | |
| 19 | 140425Z | 11.5N 124.6E | VQ-R-10--- | 700MB | 45 | 50 | ---* | ---- | --/-- | ---- | ----- | -- | -- | NO WC-MDT FBS | |
| 20 | 140505Z | 11.8N 124.8E | VQ-P-10--- | 700MB | ---- | ---- | 968 | 2819 | 14/11 | ---- | ----- | -- | -- | NO WC | |
| 21 | 140705Z | 12.0N 125.0E | SATELIT--- | STG X | DIA | 2 | CAT 2.0 | | | | | | | STRONGER | |
| 22 | 140708Z | 12.0N 124.8E | VQ-P- 2--- | 700MB | 105 | ---- | 983 | 3001 | 17/12 | ---- | ----- | -- | -- | NO WC | |
| 23 | 140935Z | 12.2N 124.2E | VQ-P- 5--- | 700MB | 86 | ---- | 984 | 2996 | 16/15 | ---- | ----- | -- | -- | NO WC | |
| 24 | 141315Z | 12.6N 123.4E | 54-P- 1-40 | 500MB | 55 | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | NO WC | |
| 25 | 141600Z | 12.7N 123.1E | 54-R- 5-45 | 500MB | 55 | ---- | ---* | ---- | --/-1 | ---- | ----- | -- | -- | NO WC | 12.3N 123.0E |
| 26 | 141820Z | 12.6N 122.2E | 54-R-10-40 | 500MB | 40 | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | FBS BGNG TO FORM | 12.6N 121.3E |
| 27 | 141900Z | 12.7N 121.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ADCC RDR | 15.2N 120.0E |
| 28 | 142222Z | 13.8N 120.8E | VQ-R-15--- | 300M | ---- | ---- | ---* | ---- | --/-- | CIRC | | 11 | 3 | CLSD WC | 13.5N 119.5E |
| 29 | 150121Z | 13.5N 119.6E | VQ-R- 3--- | 300M | ---- | ---- | ---* | ---- | --/-- | CIRC | | 8 | -- | CLSD WC | 14.0N 119.2E |
| 30 | 150345Z | 13.4N 118.9E | VQ-R-10--- | 300M | ---- | ---- | ---* | ---- | --/-- | CIRC | | 8 | 2 | WC OPEN W-MANY WATERSPOUTS NE | 13.7N 118.8E |
| 31 | 150608Z | 13.0N 118.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.5 | | | | | | | | |
| 32 | 150759Z | 13.6N 118.7E | 54-R-15--- | 700MB | 55 | ---- | ---* | ---- | --/-- | CIRC | | 30 | 18 | MDT FBS | 14.0N 119.7E |
| 33 | 151015Z | 14.1N 118.4E | 54-P- 3- 5 | 700MB | 55 | 45 | 982 | 2981 | 15/11 | CIRC | | 10 | -- | NO WC-SFC CNTR 25 NM NE | |
| 34 | 151300Z | 14.4N 117.6E | 54-P- 3--- | 700MB | 110 | ---- | 989 | 2972 | 15/11 | CIRC | | 8 | 10 | WC OPEN N | |
| 35 | 151555Z | 14.4N 116.8E | 54-P- 3- 5 | 700MB | 100 | ---- | 985 | 2957 | 15/11 | CIRC | | 10 | 8 | WC OPEN E | |
| 36 | 152200Z | 14.6N 115.2E | 54-P- 1- 9 | 700MB | 50 | 70 | 983 | 2940 | 13/12 | ELIP | E-W | 30X20 | 5 | POOR RDR PRES | |
| 37 | 152230Z | 14.5N 114.9E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 38 | 152330Z | 14.5N 114.8E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 39 | 160030Z | 14.3N 114.9E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 40 | 160130Z | 14.3N 114.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 41 | 160230Z | 14.3N 114.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 42 | 160330Z | 14.4N 114.4E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | |
| 43 | 160400Z | 14.7N 114.5E | 54-P- 1- 9 | 700MB | 60 | 70 | 979 | 2905 | 16/13 | CIRC | | 40 | 5 | WC OPEN NW | |
| 44 | 160706Z | 15.0N 114.0E | SATELIT--- | STG X | DIA | 2 | CAT 2.5 | | | | | | | MAIN CLD MASS SW | |
| 45 | 161025Z | 15.5N 113.2E | VQ-P- 5--- | 240M | ---- | 110 | 977 | ---- | 27/26 | CIRC | | 18 | 6 | WC OPEN N-SST 29C | |
| 46 | 161300Z | 15.7N 112.4E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | 15.2N 109.8E |
| 47 | 161315Z | 15.8N 112.7E | VQ-P- 5--- | 260M | ---- | 100 | 977 | ---- | 27/25 | CIRC | | 22 | 6 | WC OPEN E-NW | |
| 48 | 161330Z | 15.8N 112.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | 15.1N 109.9E |

TYPHOON JEAN
EYE FIXES FOR CYCLONE NO. 15
09 JUL - 18 JUL 71

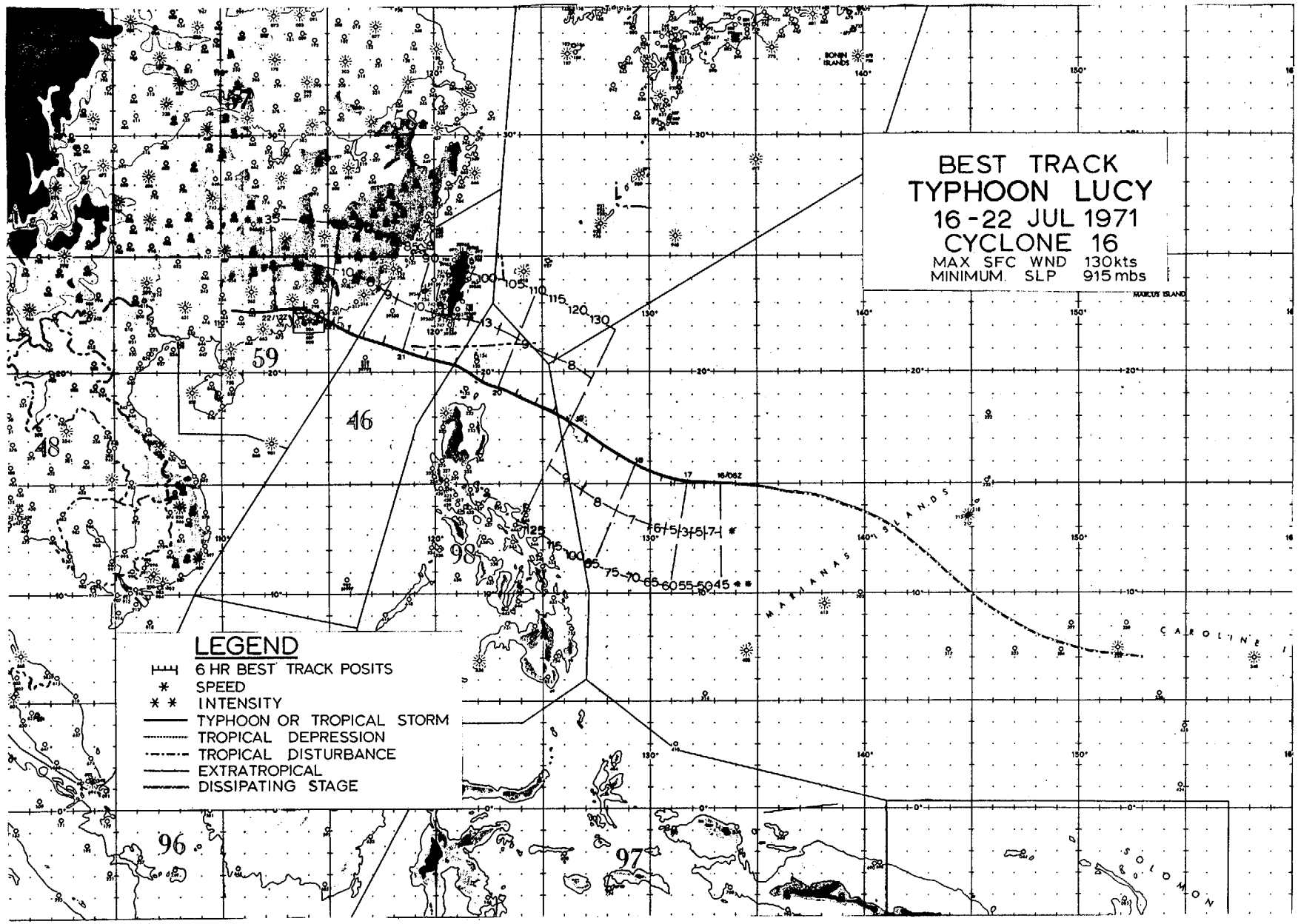
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 161400Z | 15.8N 112.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | 15.0N 109.9E |
| 50 | 161430Z | 15.8N 112.5E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | USS HORNE | 14.8N 109.9E |
| 51 | 161500Z | 16.0N 112.2E | VO-W- 5--- | 700MB | ---- | 90 | ---- | ---- | --/13 | ELIP | E-W | 18X13 | A | WC OPEN NW | 16.7N 112.9E |
| 52 | 161900Z | 16.6N 111.8E | D4-P- 1- 9 | 700MB | 50 | ---- | 9/5 | 2896 | 16/12 | ---- | ----- | -- | -- | NFG RADAR PRFS | |
| 53 | 162200Z | 16.7N 111.4E | D4-P-10--- | 700MB | 52 | ---- | 9/0 | 2896 | 15/12 | ---- | ----- | -- | -- | NFG RADAR PRFS | |
| 54 | 170100Z | 17.1N 111.5E | D4-P- 2-2A | 700MB | 58 | 65 | ---- | ---- | --/-- | ---- | ----- | -- | -- | NFG RADAR PRFS | |
| 55 | 170528Z | 17.2N 110.2E | VO-W-15-12 | ----- | ---- | ---- | ---- | ---- | --/-- | ELIP | N-S | 12X 8 | -- | V POOR RDR PRFS | 16.1N 110.1E |
| 56 | 170614Z | 17.5N 110.0E | SATELLI--- | STG A | DIA | 3 | CAT 3.0 | | | | | | | EYE FAINTLY VSBL | |
| 57 | 170700Z | 18.1N 110.1E | VO-W- 5- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 12 | -- | EXC RDR PRES | 16.6N 110.0E |

TYPHOON JEAN

1200Z 9 JUL TO 0000Z 18 JUL

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 091200Z | 10.5N 140.8E | 25 | 10.2N 137.0E | 30 | 224 | 5 | 11.8N 132.4E | 55 | 219 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 091800Z | 11.0N 139.4E | 30 | 10.5N 136.0E | 30 | 202 | 0 | 12.0N 132.0E | 55 | 210 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 100000Z | 11.2N 138.2E | 40 | 11.0N 138.0E | 45 | 17 | 5 | 13.4N 133.6E | 70 | 222 | 40 | --.- ---.- | -- | -- | -- | 15.0N 121.7E | 100 | 618 | 40 |
| 100600Z | 11.3N 137.1E | 50 | 11.5N 137.1E | 50 | 12 | 0 | 13.6N 133.0E | 85 | 276 | 60 | 14.8N 127.3E | 100 | 501 | 55 | --.- ---.- | -- | -- | -- |
| 101200Z | 11.3N 136.1E | 50 | 11.7N 136.5E | 50 | 33 | 0 | --.- ---.- | -- | -- | -- | 14.8N 127.6E | 100 | 453 | 55 | 15.0N 121.5E | 110 | 503 | 35 |
| 101800Z | 10.9N 135.4E | 40 | 11.5N 135.0E | 50 | 43 | 10 | --.- ---.- | -- | -- | -- | 13.5N 125.2E | 100 | 461 | 50 | --.- ---.- | -- | -- | -- |
| 110000Z | 10.3N 135.7E | 30 | 11.1N 134.2E | 50 | 100 | 20 | --.- ---.- | -- | -- | -- | 12.2N 125.5E | 90 | 345 | 30 | 13.5N 120.0E | 80 | 387 | -5 |
| 110600Z | 9.8N 135.7E | 25 | 10.0N 136.0E | 25 | 21 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 120600Z | 8.8N 133.3E | 45 | 9.0N 133.7E | 45 | 26 | 0 | 9.7N 131.8E | 60 | 120 | -5 | 11.5N 128.2E | 70 | 200 | -5 | --.- ---.- | -- | -- | -- |
| 121200Z | 9.0N 132.6E | 45 | 8.9N 132.6E | 50 | 6 | 5 | 9.3N 129.3E | 60 | 77 | -15 | 11.0N 125.6E | 80 | 139 | 10 | 13.8N 120.5E | 70 | 153 | 10 |
| 121800Z | 9.3N 131.8E | 50 | 9.2N 131.7E | 50 | 8 | 0 | 10.5N 127.6E | 70 | 19 | -10 | 12.6N 122.8E | 75 | 29 | 10 | --.- ---.- | -- | -- | -- |
| 130000Z | 9.7N 130.8E | 60 | 9.7N 131.0E | 55 | 12 | -5 | 11.1N 127.4E | 75 | 71 | -10 | 13.1N 122.8E | 70 | 100 | 10 | 15.4N 117.5E | 75 | 163 | 5 |
| 130600Z | 10.1N 129.8E | 65 | 10.1N 129.8E | 65 | 0 | 0 | 11.9N 125.5E | 80 | 41 | 5 | 14.1N 120.7E | 70 | 66 | 15 | --.- ---.- | -- | -- | -- |
| 131200Z | 10.5N 128.8E | 75 | 10.6N 128.8E | 70 | 6 | -5 | 12.5N 124.4E | 75 | 41 | 5 | 14.8N 119.1E | 70 | 78 | 10 | 16.8N 114.2E | 85 | 104 | 10 |
| 131800Z | 10.8N 127.5E | 80 | 11.0N 127.7E | 75 | 17 | -5 | 13.1N 123.1E | 75 | 42 | 10 | 15.4N 117.8E | 75 | 107 | 10 | --.- ---.- | -- | -- | -- |
| 140000Z | 11.2N 126.2E | 85 | 11.3N 126.5E | 80 | 19 | -5 | 13.3N 121.7E | 70 | 35 | 10 | 15.7N 116.8E | 80 | 133 | 10 | 17.3N 112.1E | 85 | 53 | 15 |
| 140600Z | 11.9N 124.8E | 75 | 12.0N 124.7E | 80 | 8 | 5 | 14.5N 119.5E | 75 | 42 | 20 | 16.6N 114.5E | 85 | 101 | 10 | --.- ---.- | -- | -- | -- |
| 141200Z | 12.4N 123.7E | 70 | 12.4N 123.7E | 80 | 0 | 10 | 14.9N 118.8E | 80 | 67 | 20 | 16.8N 113.8E | 90 | 87 | 15 | 18.3N 108.8E | 90 | 13 | 35 |
| 141800Z | 12.9N 122.4E | 65 | 12.8N 122.7E | 75 | 18 | 10 | 15.3N 118.0E | 80 | 114 | 15 | 17.0N 113.4E | 90 | 90 | 15 | --.- ---.- | -- | -- | -- |
| 150000Z | 13.4N 121.1E | 60 | 13.9N 120.7E | 75 | 38 | 15 | 16.1N 115.8E | 85 | 107 | 15 | 17.5N 111.0E | 95 | 26 | 25 | 18.8N 107.0E | 85 | 52 | 40 |
| 150600Z | 13.8N 119.6E | 55 | 13.5N 118.6E | 75 | 61 | 20 | 16.2N 114.6E | 85 | 84 | 10 | 17.7N 110.3E | 90 | 6 | 25 | --.- ---.- | -- | -- | -- |
| 151200Z | 14.2N 117.9E | 60 | 14.5N 118.1E | 75 | 21 | 15 | 16.3N 113.2E | 85 | 43 | 10 | 17.7N 109.3E | 90 | 53 | 35 | --.- ---.- | -- | -- | -- |
| 151800Z | 14.5N 116.2E | 65 | 14.7N 116.3E | 75 | 13 | 10 | 16.3N 111.7E | 90 | 17 | 15 | 17.7N 107.7E | 90 | 67 | 40 | --.- ---.- | -- | -- | -- |
| 160000Z | 14.6N 114.8E | 70 | 14.8N 114.8E | 75 | 12 | 5 | 16.7N 110.1E | 90 | 67 | 20 | 18.3N 106.3E | 80 | 43 | 35 | --.- ---.- | -- | -- | -- |
| 160600Z | 15.1N 113.7E | 75 | 14.8N 114.1E | 75 | 29 | 0 | 15.9N 109.4E | 80 | 125 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161200Z | 15.7N 112.8E | 75 | 15.5N 112.8E | 80 | 12 | 5 | 16.4N 108.0E | 80 | 136 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161800Z | 16.3N 112.0E | 75 | 16.2N 111.9E | 80 | 8 | 5 | 17.4N 107.8E | 80 | 85 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170000Z | 17.1N 111.2E | 70 | 16.8N 111.0E | 70 | 21 | 0 | 19.2N 107.6E | 60 | 86 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170600Z | 17.8N 110.3E | 65 | 17.3N 110.1E | 70 | 32 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 171200Z | 18.5N 108.9E | 55 | 18.4N 109.9E | 60 | 57 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 171800Z | 18.8N 107.5E | 50 | 19.6N 108.0E | 55 | 55 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 180000Z | 19.0N 106.1E | 45 | 20.3N 107.3E | 50 | 103 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 25NM | 84NM | 154NM | 227NM | 39NM | 98NM | 154NM | 227NM |
| AVERAGE RIGHT ANGLE ERROR | 18NM | 63NM | 67NM | 51NM | 22NM | 74NM | 67NM | 51NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 14KTS | 24KTS | 22KTS | 6KTS | 17KTS | 24KTS | 22KTS |
| AVERAGE BIAS OF WIND ERROR | 4KTS | 10KTS | 23KTS | 21KTS | 5KTS | 13KTS | 23KTS | 21KTS |
| NUMBER OF FORECASTS | 28 | 22 | 20 | 9 | 32 | 24 | 20 | 9 |


BEST TRACK
TYPHOON LUCY
16-22 JUL 1971
CYCLONE 16
MAX SFC WND 130kts
MINIMUM SLP 915mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
MARIANAS ISLANDS
CAROLINE
SOLOMON
BONIN ISLANDS
MARCUS ISLAND
16/06Z
59
46
48
98
96
97

## LUCY

The second super typhoon of the year showed her early signs of origin on 11 July as a circulation in the equatorial trough near the Truk Islands. After a five-day journey which brought the system into the Philippine Sea, Lucy became a tropical storm at a point 750 miles east of Manila.

While typhoon Jean was churning the waters of the South China Sea, aircraft reconnaissance measurements noted a steady reduction in Lucy's central pressure once she became a typhoon on the 17th. Thirty hours later a dropsonde reading in the eye indicated Lucy had bottomed out at 915 mb the morning of the 19th and that super typhoon level (130 kt) had been reached (Figure 5-21).

On a west-northwest track of 8-9 kt, the typhoon headed for the Luzon Straits. Navigating the straits, Lucy weakened slightly and passed 50 miles south of the Bataan Islands on the afternoon of the 20th. The Philippine Weather Bureau station at Basco registered a maximum sustained wind of 103 kt during Lucy's passage.

The circulation associated with the typhoon had grown to a diameter of 600 n mi by this time. Manila, located 300 miles to the south, came under strong southwesterly winds of 16 to 25 kt with gusts to 30 kt.

Lucy did not only buffet northern and central Luzon with destructive strong winds but dumped heavy rains causing severe flooding and landslides. Baguio city, during this period, reported a 24-hour rainfall total of 14.92 inches.

In Taiwan, highest winds reported were at Lanyu with 64 kt and gusts to 85 kt. Rainfall was considerably less in Taiwan with a maximum 24-hour amount of 4.97 inches measured at Taitung. Casualty reports in Taiwan listed two persons killed and five missing.

Lucy weakened to tropical storm force as she continued on her westerly course for the South China mainland (Figure 5-22). Striking the coast 15 miles northeast of Hong Kong, gusts of 80 kt were measured at Tate's Cairn in the colony while a minimum pressure of 977.9 mb was observed at the Royal Observatory. The storm continued to weaken as she moved inland and finally dissipated in the interior north of the Luichow peninsula.

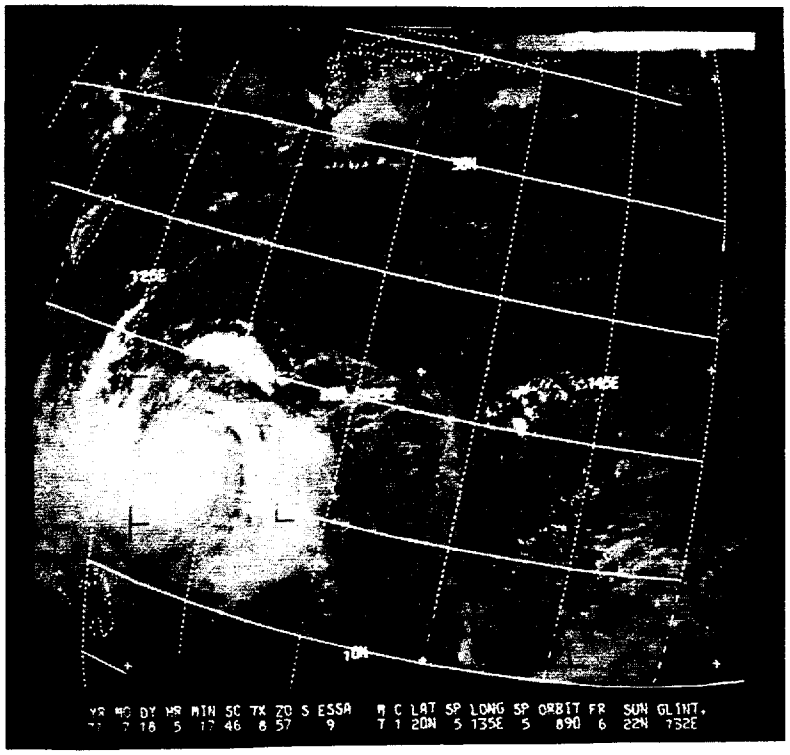



FIGURE 5-21. LUCY, LESS THAN A DAY FROM DEVELOPING TO A SUPER TYPHOON, AS SEEN BY ESSA-9 IN THE PHILIPPINE SEA ON 18 JULY.

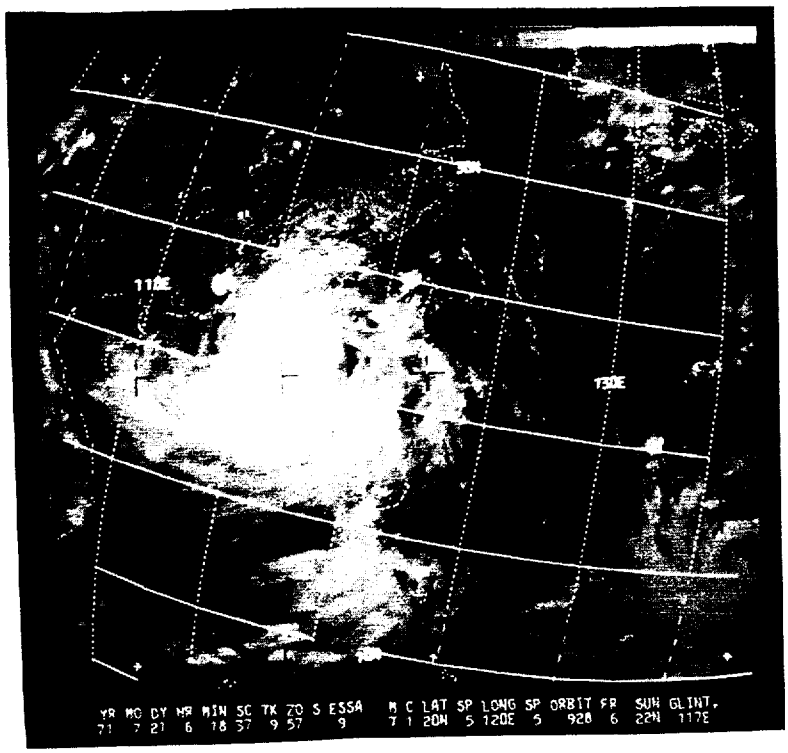



FIGURE 5-22. WEAKENED BY HER TRANSIT OF THE LUZON STRAITS, LUCY IS SEEN EAST OF HONG KONG ON 21 JULY. DISTURBANCE IN THE LOWER RIGHT PORTION OF THE ESSA-9 PHOTO IS TROPICAL STORM NADINE.

TYPHOON LUCY
EYE FIXES FOR CYCLONE NO. 16
16 JUL - 22 JUL 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 110509Z | 7.0N 152.0E | SATELIT--- | STG B | | | | | | | | | | BANDS TO S | |
| 2 | 120507Z | 8.0N 148.0E | SATELIT--- | STG B | | | | | | | | | | LITTLE CHG | |
| 3 | 130411Z | 13.0N 145.0E | SATELIT--- | STG B | | | | | | | | | | POORLY ORGANIZED | |
| 4 | 140509Z | 13.0N 142.0E | SATELIT--- | STG B | | | | | | | | | | LITTLE CHG | |
| 5 | 150412Z | 13.0N 140.0E | SATELIT--- | STG B | | | | | | | | | | LITTLE CHG | |
| 6 | 160511Z | 15.0N 132.5E | SATELIT--- | STG C+ | | | | | | | | | | STRONGER | |
| 7 | 161108Z | 15.0N 132.5E | 54-P- 3- 7 | 700MB | 75 | ---- | 972 | 2966 | 14/11 | CIRC | | 30 | -- | WC FORMING W | |
| 8 | 161545Z | 15.1N 132.1E | 54-P- 5- 7 | 700MB | 50 | ---- | 980 | 2966 | 13/08 | CIRC | | 35 | -- | WC OPEN F-N | |
| 9 | 162236Z | 15.1N 131.8E | 54-P- 5--- | 700MB | 55 | 55 | 981 | 2923 | 15/09 | CIRC | | 65 | -- | CLSD WC | |
| 10 | 170415Z | 15.2N 131.4E | 54-P- 1-19 | 700MB | 50 | 60 | 979 | 2883 | 12/07 | ---- | ----- | -- | -- | NO WC-SFC WIND CNTR 6NM DIA | |
| 11 | 170610Z | 15.5N 131.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | MORE INTENSE | |
| 12 | 171000Z | 15.5N 131.0E | 54-P- 1- 9 | 700MB | 70 | 65 | 963 | 2819 | 15/10 | CIRC | | 40 | -- | WC POORLY DEF-700 CNTR 5NM SE | |
| 13 | 171607Z | 15.6N 130.1E | 54-P- 5- 3 | 700MB | 60 | ---- | 961 | 2752 | 14/06 | CIRC | | 30 | -- | CLSD WC-STG FBS | |
| 14 | 171810Z | 15.9N 129.9E | 54-P------ | 700MB | ---- | ---- | ---- | 2707 | 15/-- | ---- | ----- | -- | -- | | |
| 15 | 172100Z | 16.1N 129.0E | 54-P- 5--- | 700MB | 70 | 75 | ---- | 2707 | 15/08 | CIRC | | 35 | -- | CLSD WC-STG FBS | |
| 16 | 180428Z | 16.7N 128.3E | VQ-R-10--- | 300M | ---- | 75 | ---- | ---- | --/25 | CIRC | | 25 | 8 | CLSD WC | 15.8N 129.1E |
| 17 | 180517Z | 16.0N 128.0E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | | |
| 18 | 180632Z | 16.4N 128.4E | VQ-R------ | 300M | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | 90KT SFC WIND OBS 80NM N OF CNTR | 17.5N 128.2E |
| 19 | 180910Z | 16.6N 128.2E | VQ-P- 5- 3 | 700MB | 120 | 115 | 929 | 2509 | 21/13 | CIRC | | 23 | 8 | CLSD WC | |
| 20 | 181600Z | 17.0N 127.4E | 54-P- 5--- | 700MB | 110 | ---- | 915 | 2356 | 23/15 | CIRC | | 20 | 8 | CLSD WC | |
| 21 | 181745Z | 17.2N 127.2E | 54-P------ | 700MB | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 22 | 182200Z | 17.8N 126.6E | 54-P- 2--- | 700MB | 95 | 110 | 918 | 2368 | 22/13 | CIRC | | 20 | 7 | CLSD WC-FIX OVR VISUAL CIRC CNTR | |
| 23 | 190600Z | 18.3N 125.5E | 54-P- 2- 2 | 700MB | 110 | 115 | 912 | 2295 | 19/11 | CIRC | | 30 | 10 | CLSD WC-TOPS 30K | |
| 24 | 190616Z | 18.2N 125.2E | SATELIT--- | STG X | DIA | 5 | CAT 4.0 | | | | | | | | |
| 25 | 190737Z | 18.4N 125.3E | 54-P------ | 700MB | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 26 | 191000Z | 18.6N 125.0E | 54-P- 2- 2 | 700MB | 105 | 110 | 920 | 2356 | 18/12 | CIRC | | 30 | 10 | CLSD WC-TOPS 30K | |
| 27 | 191600Z | 19.0N 124.4E | VQ-R- 5- 5 | 300M | ---- | ---- | ---- | ---- | --/-- | CIRC | | 60 | -- | CLSD WC-PSBL CONC EYE+INDISTINCT | 18.0N 124.6E |
| 28 | 192050Z | 19.1N 123.4E | VQ-R- 5- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CONC | - | 60X11 | 4 | CLSD OUTER WC | 17.9N 123.8E |
| 29 | 200100Z | 19.5N 122.8E | 54-P- 5--- | 700MB | 95 | 120 | 935 | 2512 | 17/13 | CONC | - | 15X45 | 10 | CLSD OUTER WC TOPS INNER WC 15K | |
| 30 | 200300Z | 19.6N 122.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 31 | 200400Z | 19.5N 122.3E | 54-P- 2- 1 | 700MB | 105 | 120 | 937 | 2530 | 17/11 | CIRC | | 15 | 2 | CLSD WC-OUTER WC DISSIPATED | |
| 32 | 200400Z | 19.7N 122.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 33 | 200500Z | 19.8N 122.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 34 | 200500Z | 19.8N 122.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | REP PHIL RDR | |
| 35 | 200530Z | 19.9N 122.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 36 | 200540Z | 20.0N 122.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | REP PHIL RDR | |
| 37 | 200600Z | 19.9N 122.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 38 | 200700Z | 20.0N 122.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 39 | 200700Z | 19.9N 122.4E | 54-P- 2--- | 700MB | 105 | 110 | 937 | 2505 | --/-- | ELIP | NE-SW | 45X30 | 10 | INNER WC WEAKENED | |
| 40 | 200710Z | 20.0N 122.0E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | EYE VISIBLE | |
| 41 | 200900Z | 20.3N 121.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 42 | 200900Z | 20.1N 121.8E | 54-P- 5--- | 700MB | 95 | 110 | 939 | 2566 | --/-- | CIRC | | 40 | 10 | INNER WC GONE-RDR PRES CHG RAPIDLY | |

TYPHOON LUCY
EYE FIXES FOR CYCLONE NO. 16
16 JUL - 22 JUL 71

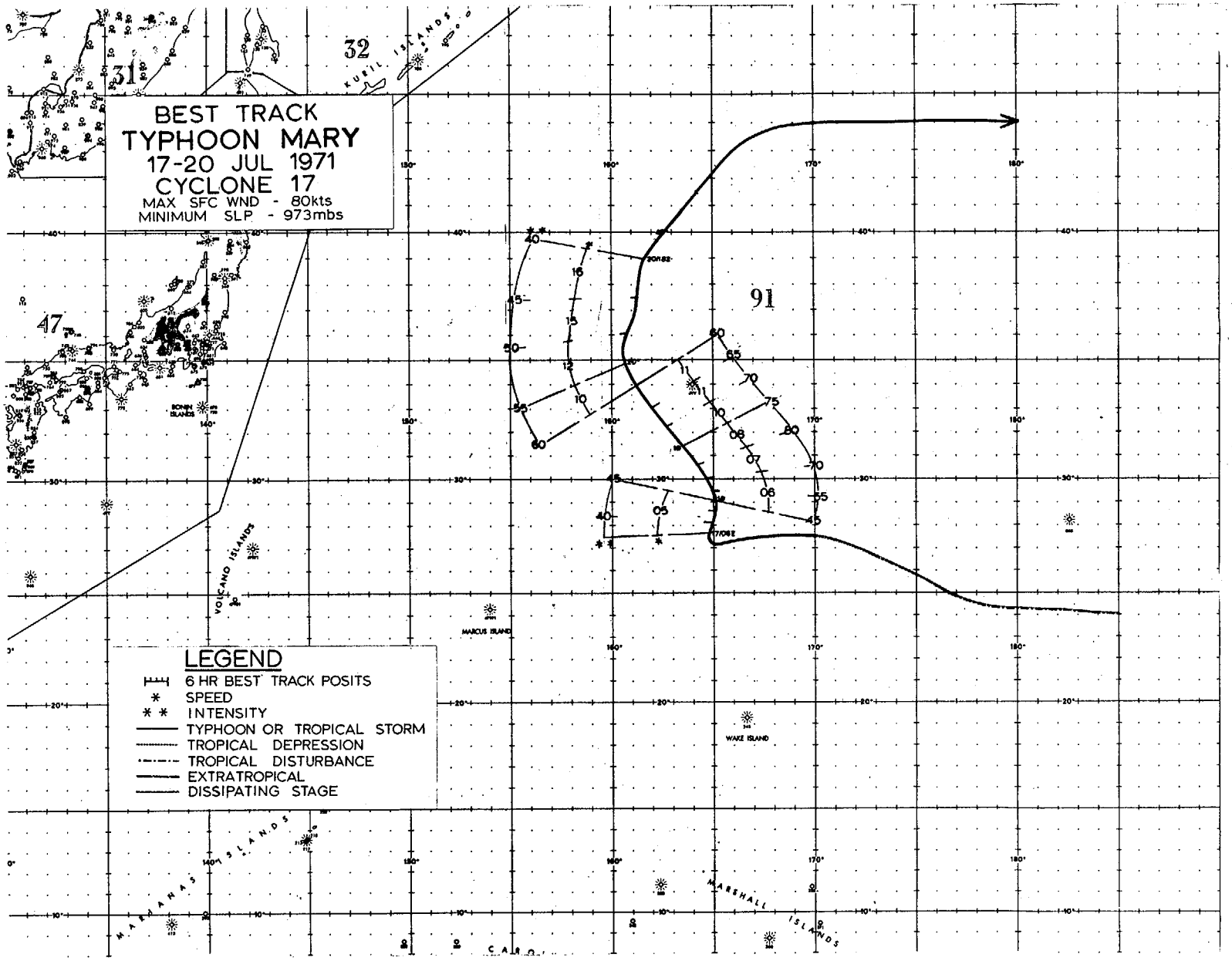
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 201100Z | 20.3N 121.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 44 | 201200Z | 20.5N 121.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 45 | 201300Z | 20.5N 120.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 46 | 201538Z | 20.6N 120.0E | 54-P- 2--- | 500MB | 75 | ---- | 952 | ---- | +3/-5 | CIRC | | 20 | 10 | WC OPEN N | |
| 47 | 201652Z | 20.8N 120.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 48 | 201800Z | 20.6N 119.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 49 | 201900Z | 20.7N 119.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 50 | 201900Z | 20.7N 119.5E | 54-P- 2--- | 500MB | 90 | ---- | 945 | ---- | +3/-6 | CIRC | | 25 | 10 | POOR RDR PRES | |
| 51 | 202000Z | 20.9N 119.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 52 | 202000Z | 20.5N 119.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | REP PHIL RDR | |
| 53 | 202100Z | 20.9N 119.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 54 | 202115Z | 20.9N 119.1E | 54-P- 2--- | 500MB | 100 | ---- | 953 | ---- | +2/ 0 | CIRC | | 30 | 3 | WC CLSD | |
| 55 | 202200Z | 20.9N 119.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 56 | 210000Z | 20.8N 118.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 57 | 210100Z | 20.9N 118.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 58 | 210200Z | 21.0N 118.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 59 | 210300Z | 21.2N 118.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 60 | 210400Z | 21.3N 118.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 61 | 210500Z | 21.4N 117.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 62 | 210500Z | 21.3N 117.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 63 | 210600Z | 21.1N 117.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 64 | 210618Z | 21.0N 117.0E | SATELIT--- | STG X | DIA | 4 | CAT 3.5 | | | | | | | EYE NOT VISIBLE | |
| 65 | 210618Z | 21.0N 117.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 66 | 210630Z | 21.2N 117.4E | 54-P-30--- | 500MB | ---- | ---- | ---- | ---- | --/-- | CIRC | | 25 | 8 | RDR PRES POOR | 20.7N 117.5E |
| 67 | 210700Z | 21.1N 116.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-VHHH | 22.3N 114.2E |
| 68 | 211200Z | 21.2N 116.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-VHHH | 22.3N 114.2E |
| 69 | 211500Z | 21.5N 116.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-VHHH | 22.3N 114.2E |
| 70 | 211800Z | 21.8N 115.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 71 | 212100Z | 22.0N 115.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 72 | 212200Z | 22.0N 115.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 73 | 212300Z | 22.1N 115.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 74 | 220000Z | 22.2N 115.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 75 | 220100Z | 22.2N 114.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FAIR FIX | |
| 76 | 220200Z | 22.4N 114.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FAIR FIX-VHHH | 22.3N 114.2E |
| 77 | 220300Z | 22.6N 114.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-VHHH | 22.3N 114.2E |
| 78 | 220400Z | 22.6N 114.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 79 | 220500Z | 22.7N 114.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |

TYPHOON LUCY

0600Z 16 JUL TO 1200Z 22 JUL

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 160600Z | 15.0N 133.2E | 45 | 15.2N 133.3E | 30 | 13 | -15 | 16.0N 129.5E | 50 | 109 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161200Z | 15.1N 132.5E | 50 | 15.1N 132.4E | 60 | 6 | 10 | 16.1N 128.1E | 100 | 151 | 30 | 18.2N 123.5E | 120 | 264 | 5 | 21.2N 119.0E | 100 | 356 | -20 |
| 161800Z | 15.1N 132.0E | 55 | 15.1N 131.8E | 60 | 12 | 5 | 16.2N 128.0E | 100 | 115 | 25 | 18.1N 123.8E | 120 | 192 | -5 | --.- ---.- | -- | -- | -- |
| 170000Z | 15.1N 131.7E | 60 | 15.1N 131.7E | 65 | 0 | 5 | 15.6N 129.7E | 80 | 29 | -5 | 16.7N 126.7E | 95 | 72 | -30 | 18.6N 123.0E | 115 | 48 | 5 |
| 170600Z | 15.2N 131.2E | 65 | 15.3N 130.8E | 70 | 24 | 5 | 16.4N 127.2E | 95 | 80 | -5 | 18.4N 123.2E | 115 | 131 | -15 | --.- ---.- | -- | -- | -- |
| 171200Z | 15.3N 130.6E | 70 | 15.5N 130.8E | 70 | 17 | 0 | 16.2N 128.8E | 85 | 63 | -30 | 17.5N 125.8E | 95 | 91 | -25 | 19.6N 122.3E | 105 | 87 | 5 |
| 171800Z | 15.6N 129.9E | 75 | 15.7N 129.9E | 80 | 6 | 5 | 17.2N 126.6E | 100 | 31 | -25 | 18.8N 123.4E | 110 | 21 | -5 | --.- ---.- | -- | -- | -- |
| 180000Z | 15.9N 129.3E | 85 | 16.0N 129.2E | 90 | 8 | 5 | 17.4N 126.0E | 110 | 26 | -15 | 19.1N 123.1E | 120 | 21 | 10 | 21.0N 120.3E | 115 | 100 | 20 |
| 180600Z | 16.4N 128.6E | 100 | 16.5N 128.3E | 100 | 18 | 0 | 17.9N 125.0E | 115 | 37 | -15 | 19.7N 122.2E | 120 | 6 | 15 | --.- ---.- | -- | -- | -- |
| 181200Z | 16.8N 127.9E | 115 | 16.8N 127.8E | 115 | 6 | 0 | 18.7N 124.7E | 130 | 6 | 10 | 20.8N 121.6E | 120 | 41 | 20 | 22.5N 119.2E | 110 | 156 | 30 |
| 181800Z | 17.4N 127.1E | 125 | 17.2N 127.2E | 120 | 13 | -5 | 18.9N 124.4E | 130 | 40 | 15 | 20.6N 121.8E | 120 | 123 | 25 | --.- ---.- | -- | -- | -- |
| 190000Z | 17.8N 126.2E | 125 | 17.9N 126.4E | 130 | 13 | 5 | 19.7N 123.4E | 140 | 33 | 30 | 21.5N 120.6E | 125 | 121 | 35 | 23.4N 118.0E | 100 | 178 | 40 |
| 190600Z | 18.3N 125.5E | 130 | 18.3N 125.5E | 130 | 0 | 0 | 20.0N 122.5E | 140 | 21 | 35 | 21.9N 120.0E | 125 | 138 | 40 | --.- ---.- | -- | -- | -- |
| 191200Z | 18.6N 124.7E | 120 | 18.7N 124.7E | 125 | 6 | 5 | 20.7N 121.8E | 115 | 48 | 15 | 22.6N 119.1E | 100 | 153 | 25 | 24.7N 116.5E | 60 | 246 | 20 |
| 191800Z | 19.0N 123.7E | 115 | 19.1N 124.1E | 125 | 23 | 10 | 20.9N 121.4E | 115 | 101 | 20 | 22.9N 118.7E | 100 | 173 | 30 | --.- ---.- | -- | -- | -- |
| 200000Z | 19.4N 122.9E | 110 | 19.6N 123.0E | 120 | 13 | 10 | 21.3N 119.7E | 100 | 69 | 10 | 23.0N 116.3E | 90 | 83 | 30 | --.- ---.- | -- | -- | -- |
| 200600Z | 19.8N 122.2E | 105 | 19.7N 122.0E | 115 | 13 | 10 | 21.0N 118.5E | 100 | 53 | 15 | 22.2N 114.9E | 95 | 65 | 50 | --.- ---.- | -- | -- | -- |
| 201200Z | 20.4N 121.0E | 100 | 20.2N 121.4E | 110 | 25 | 10 | 21.6N 117.8E | 100 | 67 | 25 | 22.8N 114.2E | 85 | 94 | 50 | --.- ---.- | -- | -- | -- |
| 201800Z | 20.7N 119.6E | 95 | 20.8N 119.8E | 110 | 13 | 15 | 22.2N 115.8E | 100 | 24 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 210000Z | 21.0N 118.5E | 90 | 21.0N 118.6E | 105 | 6 | 15 | 22.2N 114.8E | 90 | 13 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 210600Z | 21.3N 117.6E | 85 | 21.3N 117.5E | 100 | 6 | 15 | 22.5N 113.4E | 85 | 23 | 40 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 211200Z | 21.5N 116.6E | 75 | 21.6N 116.6E | 95 | 6 | 20 | 22.7N 112.3E | 40 | 13 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 211800Z | 21.8N 115.8E | 70 | 21.5N 115.9E | 95 | 19 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 220000Z | 22.3N 115.0E | 60 | 22.2N 115.0E | 90 | 6 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 220600Z | 22.6N 113.8E | 45 | 22.7N 114.0E | 65 | 13 | 20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 221200Z | 22.8N 112.5E | 35 | 22.9N 112.8E | 35 | 18 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 12NM | 52NM | 105NM | 167NM | 12NM | 52NM | 105NM | 167NM |
| AVERAGE RIGHT ANGLE ERROR | 7NM | 20NM | 44NM | 69NM | 7NM | 20NM | 44NM | 69NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 9KTS | 20KTS | 24KTS | 22KTS | 9KTS | 20KTS | 24KTS | 22KTS |
| AVERAGE BIAS OF WIND ERROR | 8KTS | 10KTS | 15KTS | 16KTS | 8KTS | 10KTS | 15KTS | 16KTS |
| NUMBER OF FORECASTS | 26 | 22 | 17 | 7 | 26 | 22 | 17 | 7 |


BEST TRACK
TYPHOON MARY
17-20 JUL 1971
CYCLONE 17
MAX SFC WND - 80kts
MINIMUM SLP - 973mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
KURIL ISLANDS
VOLCANO ISLANDS
MARCUS ISLAND
WAKE ISLAND
MARIANAS ISLANDS
MARSHALL ISLANDS
31
32
47
91

## MARY

Mary developed from a circulation induced from an upper tropospheric low in the mid-Pacific trough. Tracing back to a position south of Midway Island on 11 July, the system drifted westward to a location halfway between Wake and Ocean Station Victor before aircraft reconnaissance identified it as a tropical storm on the 17th.

With Jean in the South China Sea and Lucy in the Philippine Sea, Mary increased the simultaneous storm count in the western Pacific to three.

Mary began to take a northward course later on the 17th as she rounded the southeastern periphery of a high cell situated north of the western Hawaiian Islands. The small size of Mary, the uncertainty of forward acceleration, coupled with the storm's position being outside the FWC APT coverage area on the 18th shed uncertainty as to her location. However, a valuable and timely piece of information was relayed to Guam by NESS at Suitland, based on the position of Mary on their geostationary ATS-1 satellite picture. With this information a reconnaissance aircraft was vectored toward Mary and found that she had achieved typhoon strength (Figure 5-23 and 5-24).

Remaining at minimal typhoon strength for 24 hours, Mary passed 150 n mi west of Ocean Station Victor on the 20th and diminished to storm status as she headed northward. By morning of the 21st Mary was beyond the range of reconnaissance aircraft as she accelerated to a rate of 16 kt. By that afternoon satellite data indicated that cooler air had entered the storm as she headed northeast and was becoming extratropical.

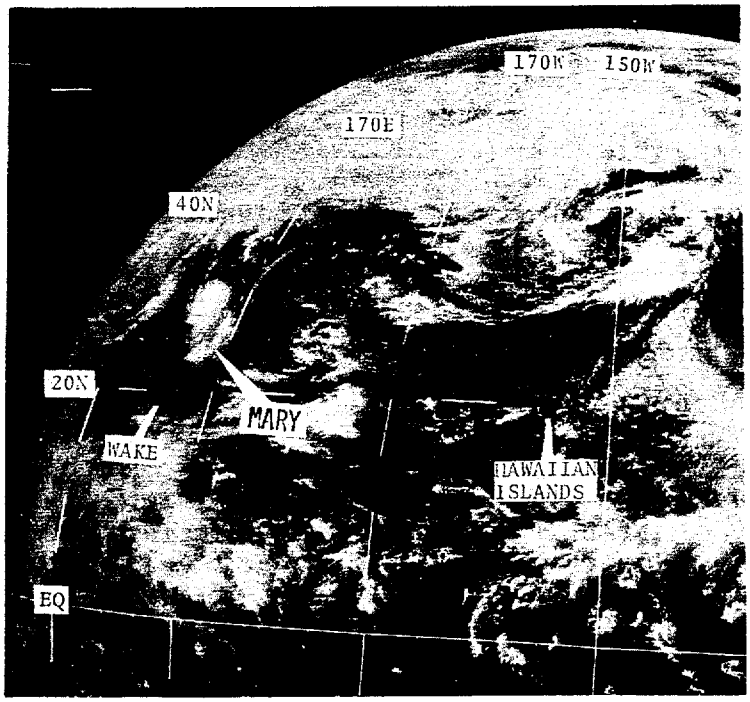



FIGURE 5-23. ATS-1 GEOSTATIONARY SATELLITE PRESENTATION OF MARY AS A NEWLY-FORMED TYPHOON NORTH OF WAKE ISLAND.

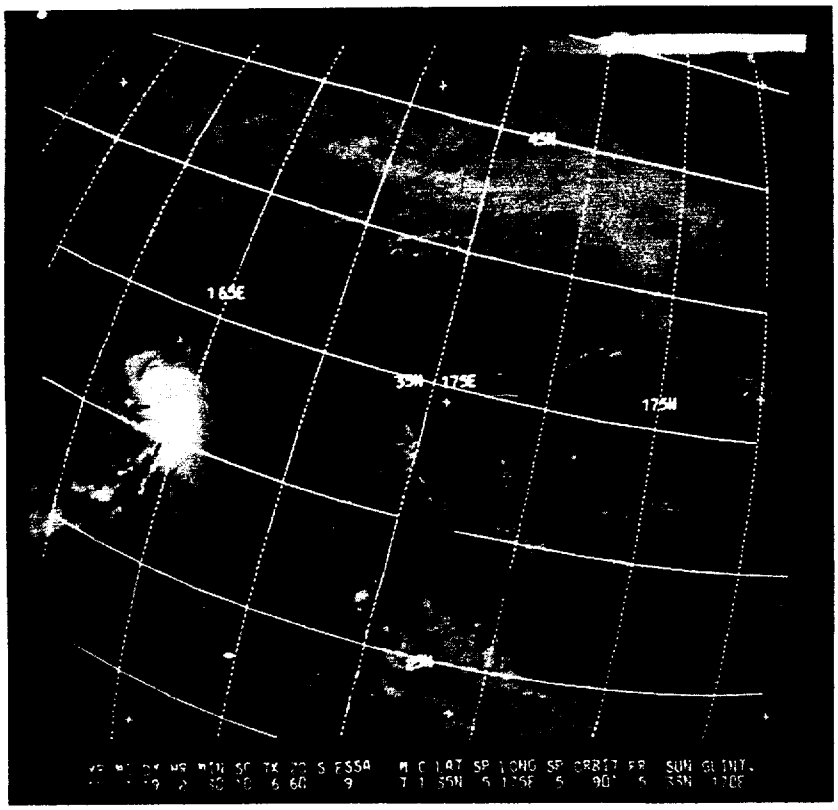



FIGURE 5-24. TYPHOON MARY ON 19 JULY AS SIGHTED BY ESSA-9 SOUTH OF OCEAN STATION VICTOR.

TYPHOON MARY
EYE FIXES FOR CYCLONE NO. 17
17 JUL - 20 JUL 71

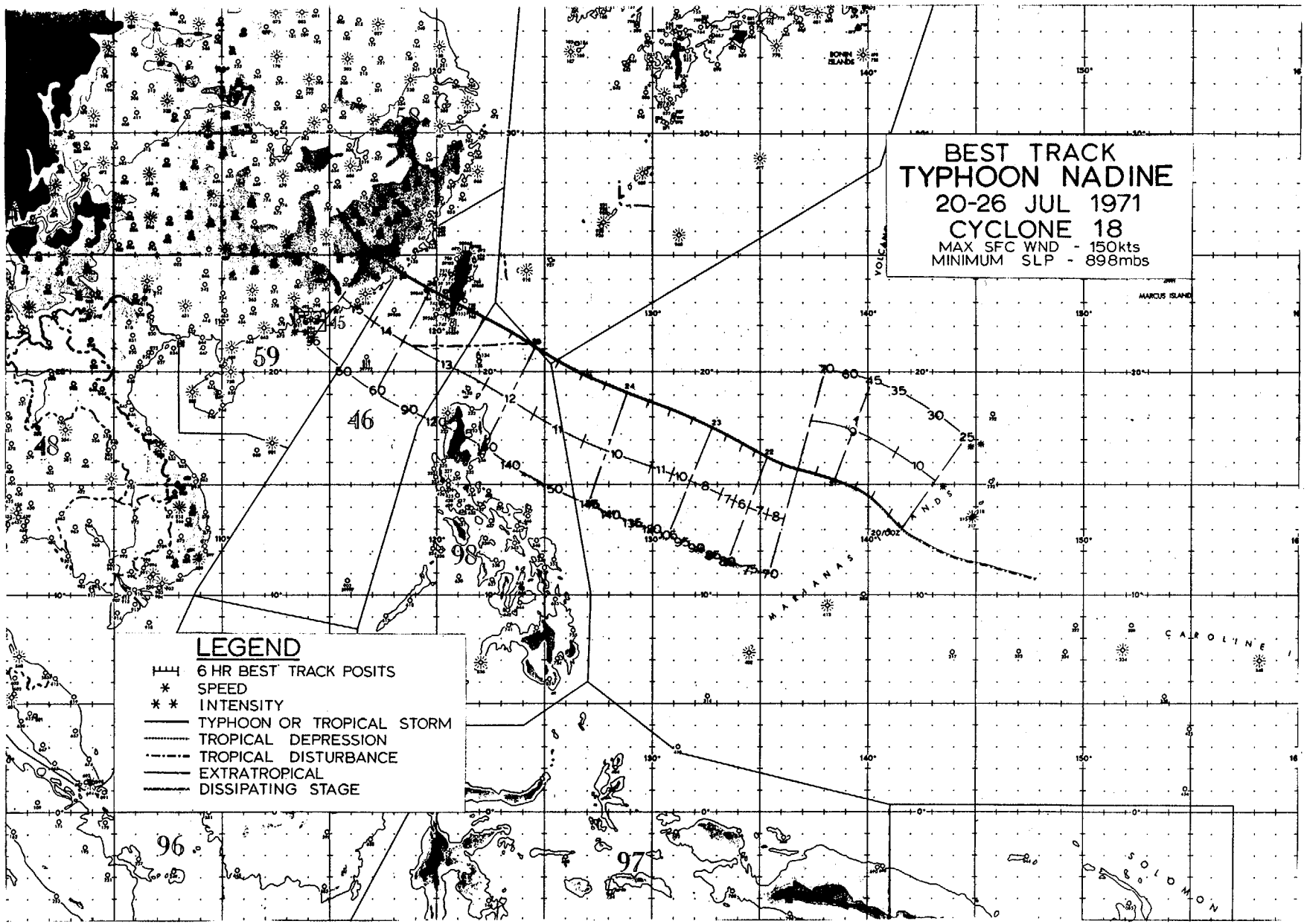
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 130220Z | 24.0N 179.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 2 | 160320Z | 27.5N 169.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 3 | 170030Z | 27.2N 165.0E | 54-P-25- 3 | 700MB | 35 | 45 | 998 | 3109 | 11/08 | ---- | ----- | -- | -- | | |
| 4 | 170227Z | 27.5N 165.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 5 | 172335Z | 29.3N 165.3E | 54-P- 6--- | 700MB | 40 | 35 | 1000 | 3082 | 14/12 | ELIP | N-S | 30X20 | -- | | |
| 6 | 180200Z | 29.3N 165.1E | 54-P-10--- | 700MB | 40 | 45 | 994 | 2988 | 16/13 | ELIP | N-S | 30X20 | -- | | |
| 7 | 180326Z | 29.5N 165.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 8 | 181120Z | 30.0N 164.9E | VQ-P-15--- | 700MB | 60 | ---- | 978 | 2886 | 16/10 | CIRC | | 15 | -- | | |
| 9 | 181605Z | 30.5N 164.2E | 54-P- 3- 2 | 700MB | 70 | ---- | 973 | 2789 | 14/09 | CIRC | | 17 | 7 | | |
| 10 | 182200Z | 31.1N 163.7E | 54-P- 7--- | 700MB | 85 | 70 | 976 | 2871 | 14/11 | CIRC | | 15 | -- | | |
| 11 | 190000Z | 31.4N 163.7E | 54-P------- | 700MB | ---- | ---- | ---- | 2865 | --/-- | ---- | ----- | -- | -- | | |
| 12 | 190205Z | 31.9N 163.2E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 13 | 190230Z | 31.5N 163.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | | |
| 14 | 190400Z | 31.6N 163.3E | 54-P- 8--- | 700MB | 65 | ---- | 976 | 2868 | 14/13 | CIRC | | 15 | -- | | |
| 15 | 191021Z | 32.9N 162.3E | VQ-R-10--- | 300M | ---- | ---- | ---- | ---- | --/-- | CIRC | | 20 | 5 | | 32.0N 162.2E |
| 16 | 191531Z | 33.6N 161.4E | VQ-P- 6--- | 700MB | 46 | ---- | 979 | 2966 | 17/11 | CIRC | | 20 | -- | | |
| 17 | 192142Z | 34.6N 160.9E | 54-P-10- 2 | 700MB | 45 | 45 | 979 | 2923 | 13/10 | CIRC | | 20 | -- | | |
| 18 | 200300Z | 35.5N 160.7E | 54-P-10- 2 | 500MB | 57 | 40 | 967 | ---- | -1/-4 | CIRC | | 20 | -- | | |
| 19 | 200328Z | 36.0N 160.0E | SATELIT--- | STG C | | | | | | | | | | | |
| 20 | 201000Z | 36.9N 161.3E | 54-P- 8--- | 500MB | 40 | ---- | 987 | ---- | -1/-1 | ---- | ----- | -- | -- | | |
| 21 | 201410Z | 38.3N 161.3E | 54-P- 5--- | 500MB | 40 | ---- | 988 | ---- | -2/-2 | ---- | ----- | -- | -- | | |
| 22 | 210235Z | 41.0N 164.0E | SATELIT--- | STG C | | | | | | | | | | | |

TYPHOON MARY

0600Z 17 JUL TO 1800Z 20 JUL

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 170600Z | 27.6N 164.8E | 40 | 28.3N 163.6E | 45 | 76 | 5 | 30.9N 158.7E | 55 | 334 | 0 | 33.7N 157.1E | 55 | 299 | -15 | --.- ---.- | -- | -- | -- |
| 171200Z | 28.1N 165.0E | 40 | 28.4N 162.2E | 45 | 148 | 5 | 31.4N 158.0E | 55 | 353 | -15 | 34.5N 157.4E | 55 | 245 | -10 | --.- ---.- | -- | -- | -- |
| 171800Z | 28.6N 165.1E | 40 | 28.7N 161.5E | 45 | 189 | 5 | 31.4N 158.0E | 55 | 320 | -25 | 34.9N 157.5E | 55 | 192 | -5 | --.- ---.- | -- | -- | -- |
| 180000Z | 29.0N 165.1E | 45 | 29.3N 165.2E | 45 | 19 | 0 | 31.1N 162.2E | 50 | 74 | -25 | 33.5N 160.8E | 45 | 84 | -10 | --.- ---.- | -- | -- | -- |
| 180600Z | 29.6N 165.0E | 55 | 29.7N 164.5E | 45 | 27 | -10 | 32.3N 161.3E | 50 | 76 | -20 | 34.8N 161.3E | 45 | 81 | -5 | --.- ---.- | -- | -- | -- |
| 181200Z | 30.1N 164.7E | 70 | 30.1N 164.8E | 50 | 5 | -20 | 32.3N 163.2E | 50 | 73 | -15 | 35.0N 162.4E | 40 | 158 | -5 | --.- ---.- | -- | -- | -- |
| 181800Z | 30.7N 164.2E | 80 | 30.7N 163.9E | 70 | 15 | -10 | 33.1N 161.9E | 65 | 59 | 5 | 36.0N 162.9E | 55 | 192 | 15 | --.- ---.- | -- | -- | -- |
| 190000Z | 31.4N 163.6E | 75 | 31.2N 163.5E | 70 | 13 | -5 | 33.8N 162.3E | 60 | 99 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 190600Z | 32.2N 162.8E | 70 | 31.8N 163.2E | 65 | 31 | -5 | 34.5N 162.3E | 55 | 120 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 191200Z | 33.0N 162.0E | 65 | 33.0N 162.0E | 55 | 0 | -10 | 38.0N 166.3E | 25 | 238 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 191800Z | 33.9N 161.2E | 60 | 34.1N 161.3E | 50 | 13 | -10 | 38.5N 167.1E | 20 | 249 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 200000Z | 34.9N 160.8E | 55 | 35.0N 160.7E | 50 | 8 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 200600Z | 36.1N 160.8E | 50 | 36.1N 160.8E | 40 | 0 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201200Z | 37.5N 161.3E | 45 | 36.3N 161.5E | 35 | 72 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201800Z | 39.1N 161.8E | 40 | 39.3N 162.1E | 35 | 18 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 42NM | 181NM | 179NM | 0NM | 42NM | 181NM | 179NM | 0NM |
| AVERAGE RIGHT ANGLE ERROR | 35NM | 126NM | 108NM | 0NM | 35NM | 126NM | 108NM | 0NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 8KTS | 14KTS | 9KTS | 0KTS | 8KTS | 14KTS | 9KTS | 0KTS |
| AVERAGE BIAS OF WIND ERROR | -6KTS | -11KTS | -5KTS | 0KTS | -6KTS | -11KTS | -5KTS | 0KTS |
| NUMBER OF FORECASTS | 15 | 11 | 7 | 0 | 15 | 11 | 7 | 0 |


BEST TRACK
TYPHOON NADINE
20-26 JUL 1971
CYCLONE 18
MAX SFC WND - 150kts
MINIMUM SLP - 898mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
MARCUS ISLAND
VOLCANO
MARIANAS
CAROLINE
SOLOMON
59
46
48
98
96
97

As typhoon Lucy was reaching super typhoon strength in the Philippine Sea, another circulation destined to be Nadine, formed southeast of Guam on July 16th.

During her formative stages the pre-Nadine system dumped 6.05 inches of rain on Guam over a three-day period as she passed into the Philippine Sea causing [illegible] flooding on the island. Evidence that Nadine was on her way to intensification was provided by the AMERICAN CHARGER which reported northerly winds at 47 kt about 75 n mi due west of the center at 2200 GMT July 20th. Nadine took a track slightly northward of Lucy's as the ridge began to build across to the north dictating a west-northwest course of 8-10 kt.

Quickly reaching typhoon force (Figures 5-25 and 5-26), Nadine began to grow both in size and strength. The central pressure began to plummet rapidly and gale force winds began to spread. At her height the minimum pressure reported by reconnaissance aircraft was 898 mb some 300 n mi northeast of Luzon on the 24th. Maximum winds at this time of 150 kt were packed around Nadine's 20 n mi diameter eye. 100-kt winds spread some 100 n mi from the center while gale force winds encompassed the western Philippine Sea in excess of 300 n mi from the typhoon's eye.

As Nadine approached Taiwan, gales were felt as far south as Manila which reported gusts to 33 kt. The Philippine Weather Bureau station on Basco in the Luzon Straits measured wind gusts of 127 kt (probably due to channeling in the straits) as Nadine's center passed 100 n mi to the northwest.

The poor weather and low ceilings over Luzon caused by Nadine may have contributed to the crash of a Pan American cargo aircraft. Bound from Guam to Manila, the jet crashed into a mountain side 17 miles northeast of Manila on July 25th with the loss of four crew members.

Nadine's eye landed on the southeastern coast of Taiwan between Hsinkong and Taitung in the early morning of July 26th. The typhoon brought torrential rain over southeastern Taiwan with 12.07 inches recorded at Hengehan during her passage. Lanyu recorded maximum winds of 95 kt and gusts to 99 kt. The toll in Taiwan due to the typhoon amounted to 28 killed with an additional 25 missing. Over 1,250

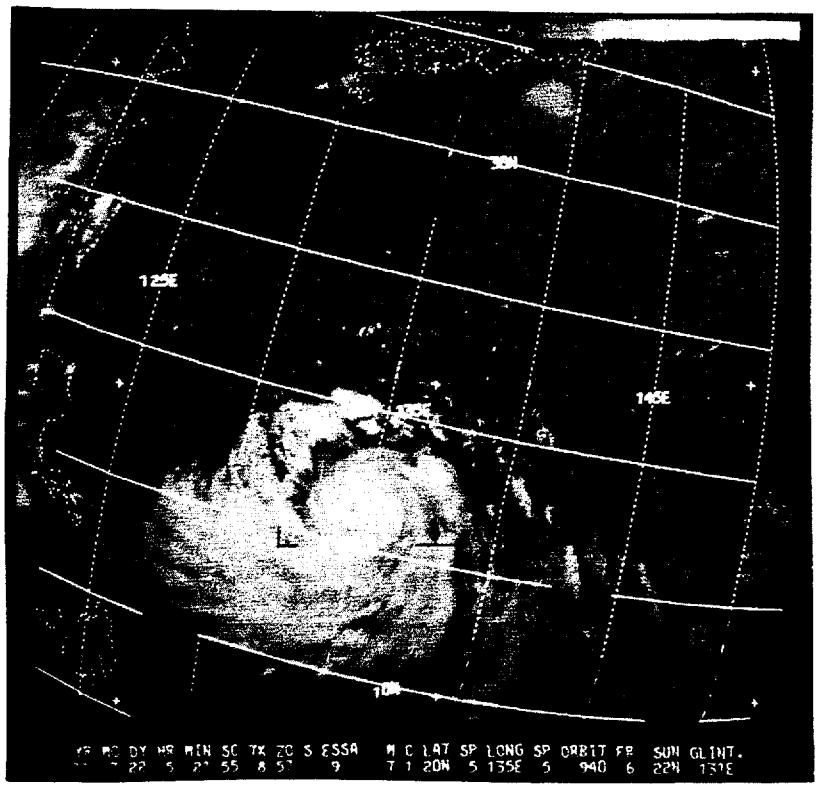



FIGURE 5-25. NADINE AS A RECENTLY DEVELOPED TYPHOON IN THE PHILIPPINE SEA ON 22 JULY.

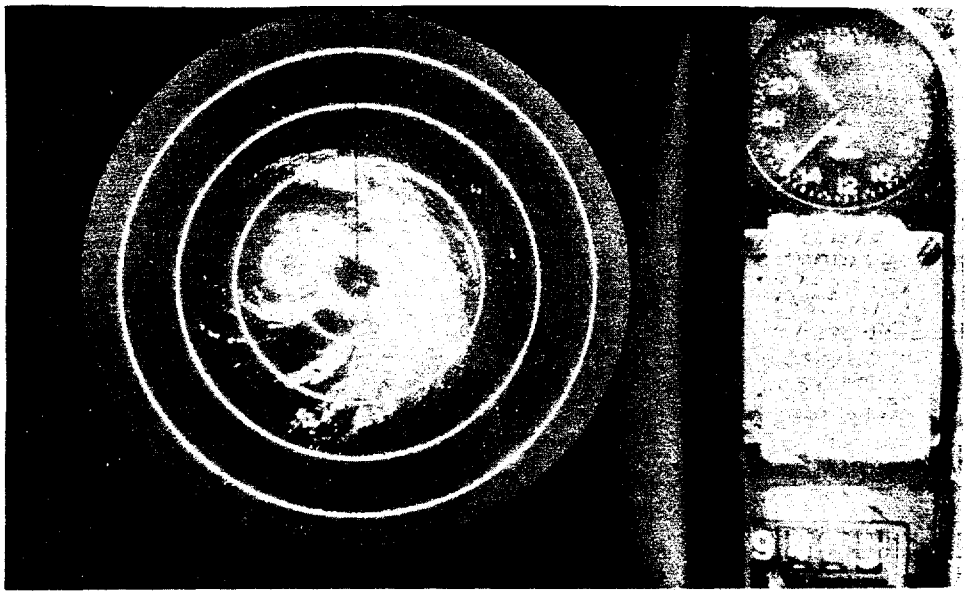


FIGURE 5-26. APS-20 RADARSCOPE PICTURE OF NADINE TAKEN FROM NAVY RECONNAISSANCE AIRCRAFT (VQ-1) AT 2137 GMT 23 JULY (RANGE MARKS ARE AT 50 N MI INTERVALS).

homes were totally destroyed and some 2,180 dwellings were badly damaged. In addition, the Liberian tanker WARWICK TRADER drug anchor and became lodged in the soft sand off the southwestern coast of Taiwan.

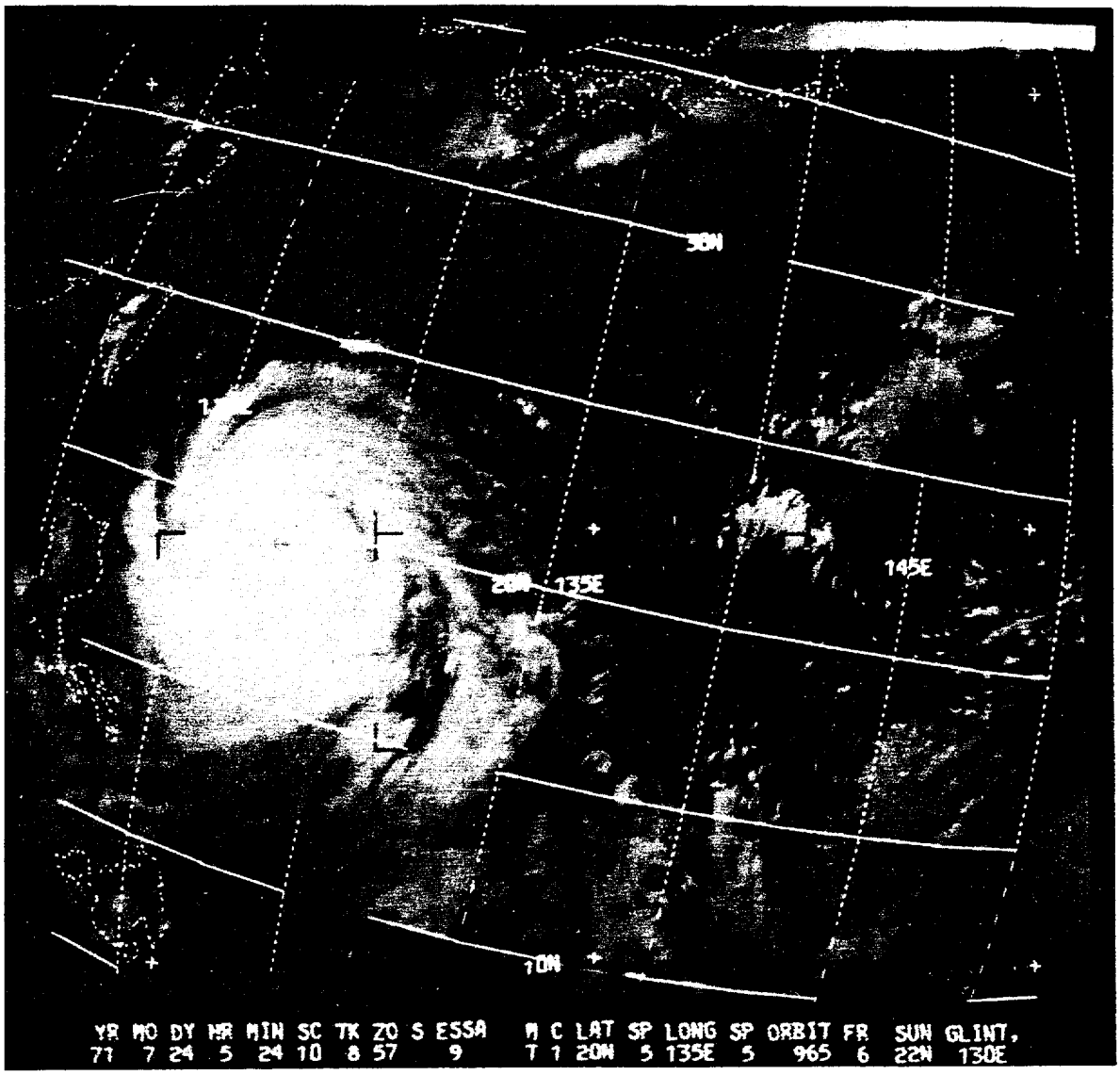



FIGURE 5-27. ESSA-9 VIEW OF NADINE AT HER PEAK AS A SUPER TYPHOON ON 24 JULY.

TYPHOON NADINE
EYE FIXES FOR CYCLONE NO. 18
20 JUL - 26 JUL 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 190421Z | 12.0N 145.0E | SATELIT--- | STG R | | | | | | | | | | FIRST BLTN | |
| 2 | 192315Z | 12.9N 141.0E | 54-P------ | 700MB | ---- | 20 | ---- | ---- | --/-- | ---- | ----- | -- | -- | BROAD CIRCULATION | |
| 3 | 200300Z | 13.3N 141.3E | 54-P- 2-10 | 700MB | 35 | 35 | 1006 | 3103 | 10/10 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 4 | 200515Z | 14.0N 140.0E | SATELIT--- | STG C | | | | | | | | | | MORE INTENSE | |
| 5 | 200935Z | 14.5N 140.7E | 54-P- 2-10 | 700MB | 15 | ---- | 1001 | 3057 | 10/10 | ---- | ----- | -- | -- | POORLY ORGANIZED | |
| 6 | 201600Z | 14.6N 139.8E | 54-P- 5-10 | 700MB | 30 | ---- | 1003 | 3048 | 09/09 | ---- | ----- | -- | -- | WC FORMING W | |
| 7 | 202200Z | 15.1N 138.8E | 54-P- 5- 5 | 700MB | 46 | 30 | 1000 | 3072 | 12/09 | ---- | ----- | -- | -- | 700 CNTR 10NM W | |
| 8 | 210340Z | 15.6N 137.8E | VQ-P- 5--- | 300M | ---- | 70 | 991 | ---- | 27/24 | CIRC | | 45 | -- | NO WC | |
| 9 | 210423Z | 16.0N 137.0E | SATELIT--- | STG C+ | | | | | | | | | | MORE INTENSE | |
| 10 | 211006Z | 15.6N 137.0E | 54-P- 6- 4 | 700MB | 70 | ---- | 983 | 2905 | 11/09 | CIRC | | 35 | -- | WC OPEN S-W | |
| 11 | 211555Z | 15.9N 136.1E | VQ-P- 5--- | 700MB | 60 | ---- | 977 | 2950 | 17/11 | ELIP | E-W | 44X34 | -- | WC OPEN N | |
| 12 | 212120Z | 16.0N 135.7E | 54-P- 5--- | 700MB | 65 | 75 | 977 | 2844 | 12/07 | ELIP | SE-NW | 40 | -- | NO WC | |
| 13 | 220322Z | 16.4N 135.0E | 54-P- 5--- | 700MB | 70 | 65 | ---- | 2810 | 13/09 | ELIP | SE-NW | 30X20 | -- | WC FORMING E | |
| 14 | 220522Z | 16.5N 134.5E | SATELIT--- | STG X | DIA | 2 CAT 3.0 | | | | | | | | EYE VISIBLE | |
| 15 | 221543Z | 17.1N 133.7E | VQ-P-10--- | 700MB | ---- | ---- | 953 | 2743 | 20/11 | CIRC | | 23 | -- | CLSD WC-HVY FBS | |
| 16 | 222150Z | 17.5N 133.1E | 54-P- 5- 5 | 700MB | 90 | 100 | 950 | 2652 | 19/14 | CIRC | | 30 | -- | WC OPEN W 700 MB CNTR 4 NM S | |
| 17 | 230310Z | 17.7N 132.4E | 54-P- 5- 5 | 700MB | 93 | 120 | 939 | 2557 | 19/15 | CIRC | | 30 | -- | CLSD WC | |
| 18 | 230617Z | 19.0N 132.0E | SATELIT--- | STG X | DIA | 3 CAT 4.0 | | | | | | | | EYE VISIBLE | |
| 19 | 231000Z | 18.3N 131.1E | 54-P- 5- 2 | 700MB | 115 | ---- | 920 | 2387 | 23/16 | CIRC | | 20 | -- | CLSD WC | |
| 20 | 231132Z | 18.4N 130.8E | 54-P------ | 700MB | ---- | ---- | ---- | 2356 | 25/10 | ---- | ----- | -- | -- | | |
| 21 | 231515Z | 18.5N 130.3E | 54-P- 5- 2 | 700MB | 125 | ---- | 907 | 2289 | 25/16 | CIRC | | 25 | -- | CLSD WC-STG FBS | |
| 22 | 232202Z | 19.1N 129.2E | VQ-P- 5--- | 270M | 145 | 140 | 903 | ---- | 28/25 | CIRC | | 20 | 9 | CLSD WC | |
| 23 | 240301Z | 19.3N 128.2E | VQ-R- 3- 7 | ------ | 122 | 120 | ---- | ---- | --/-- | CIRC | | 20 | 9 | CLSD WC | 20.0N 127.7E |
| 24 | 240525Z | 19.5N 127.5E | SATELIT--- | STG X | DIA | 4 CAT 4.0 | | | | | | | | CIRC EYE VSBL | |
| 25 | 241029Z | 19.9N 127.1E | 54-P- 3- 3 | 700MB | 100 | ---- | 898 | 2185 | 21/12 | CIRC | | 20 | -- | CLSD WC | |
| 26 | 241200Z | 20.0N 126.7E | 54-P------ | 700MB | ---- | ---- | 900 | 2210 | --/-- | ---- | ----- | -- | -- | | |
| 27 | 241500Z | 20.2N 126.2E | 54-P- 3- 3 | 700MB | 100 | ---- | 904 | 2243 | 19/13 | CIRC | | 20 | -- | CLSD WC | |
| 28 | 242215Z | 20.9N 124.9E | VQ-P- 7- 3 | 700MB | 80 | 100 | 919 | 2240 | 20/16 | ELIP | N-S | 35X25 | 10 | CLSD WC-STG FBS | |
| 29 | 250100Z | 21.1N 124.3E | VQ-P- 1- 4 | 700MB | 75 | 85 | 923 | 2243 | 21/16 | ELIP | SE-NW | 25X20 | 8 | CLSD WC-TOPS 25K | |
| 30 | 250300Z | 21.4N 124.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 31 | 250345Z | 21.5N 124.0E | VQ-P- 1- 4 | 700MB | 80 | 100 | 925 | 2246 | 21/16 | ELIP | NE-SW | 40X25 | 10 | WC OPEN NW | |
| 32 | 250400Z | 21.6N 123.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 33 | 250500Z | 21.8N 123.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 34 | 250600Z | 21.8N 123.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 35 | 250623Z | 22.0N 123.0E | SATELIT--- | STG X | DIA | 4 CAT 4.0 | | | | | | | | EYE SMALLER | |
| 36 | 250659Z | 22.2N 123.5E | 54-P- 2- 3 | 700MB | 89 | ---- | 927 | 2454 | 21/14 | ELIP | N-S | 25X20 | 7 | CLSD WC | |
| 37 | 250700Z | 22.0N 123.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 38 | 250800Z | 22.2N 123.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 39 | 250900Z | 22.3N 123.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 40 | 250954Z | 22.3N 122.7E | VQ-P- 2- 3 | 330M | 100 | 105 | 930 | ---- | 26/24 | ELIP | N-S | 34X22 | 7 | WC OPEN NW | |
| 41 | 251000Z | 22.5N 122.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 42 | 251100Z | 22.4N 122.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 43 | 251200Z | 22.5N 122.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 44 | 251213Z | 22.4N 122.2E | VQ-R- 2- 8 | ----- | 50 | ---- | ---- | ---- | --/-- | ELIP | N-S | 25X22 | 6 | WC OPEN SE | 21.8N 121.4E |
| 45 | 251300Z | 22.4N 122.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 46 | 251400Z | 22.5N 121.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 47 | 251500Z | 22.6N 121.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 48 | 251600Z | 22.5N 121.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 49 | 251630Z | 22.7N 121.5E | 54-P- 5- 8 | 400MB | 30 | ---- | 938 | ---- | -6/-7 | CIRC | | 20 | -- | RAGGED WC | |

TYPHOON NADINE
EYE FIXES FOR CYCLONE NO. 18
20 JUL - 26 JUL 71

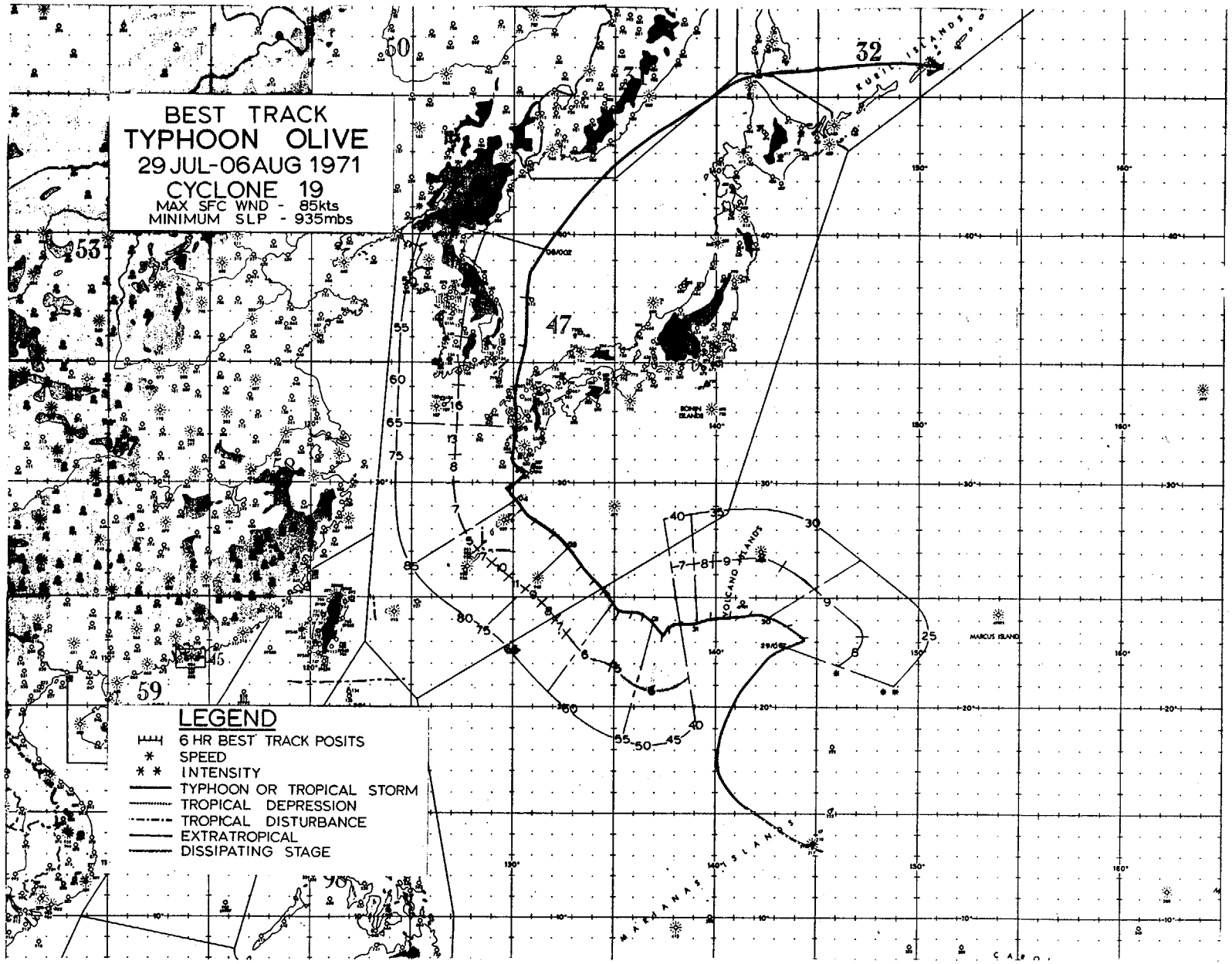
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 251700Z | 22.8N 121.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 51 | 251800Z | 22.9N 121.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 52 | 251900Z | 22.9N 121.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 53 | 251900Z | 22.9N 121.1E | 54-P- 3- 7 | 400MB | 60 | ---- | ---- | ---- | -7/-9 | CIRC | | 30 | -- | POORLY DEFINED | |
| 54 | 252100Z | 22.9N 120.5E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | EST SFC POSIT | |
| 55 | 252300Z | 23.4N 119.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 56 | 260000Z | 23.6N 119.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 57 | 260100Z | 23.8N 119.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 58 | 260200Z | 24.0N 119.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 59 | 260500Z | 24.2N 118.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |

TYPHOON NADINE

0000Z 20 JUL TO 1200Z 26 JUL

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 200000Z | 13.0N 141.7E | 25 | 12.9N 141.5E | 25 | 13 | 0 | 13.4N 139.6E | 50 | 125 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 200600Z | 13.7N 140.9E | 30 | 13.3N 141.1E | 30 | 27 | 0 | 14.3N 139.2E | 55 | 113 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201200Z | 14.3N 140.2E | 30 | 14.9N 140.4E | 30 | 38 | 0 | 17.2N 137.6E | 60 | 101 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201800Z | 14.8N 139.4E | 35 | 15.1N 139.7E | 30 | 25 | -5 | 17.0N 136.8E | 65 | 80 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 210000Z | 15.2N 138.5E | 45 | 15.3N 138.5E | 30 | 6 | -15 | 16.5N 134.7E | 70 | 39 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 210600Z | 15.4N 137.6E | 60 | 15.6N 137.4E | 65 | 17 | 5 | 17.0N 133.3E | 95 | 91 | 10 | 18.4N 129.4E | 125 | 144 | 5 | --.- ---.- | -- | -- | -- |
| 211200Z | 15.7N 136.8E | 70 | 15.7N 136.7E | 75 | 6 | 5 | 16.6N 133.1E | 100 | 64 | 10 | 17.9N 129.6E | 120 | 80 | -15 | 19.6N 126.3E | 130 | 33 | -20 |
| 211800Z | 15.9N 136.0E | 75 | 16.0N 135.7E | 75 | 18 | 0 | 17.0N 132.1E | 105 | 81 | 10 | 18.4N 128.6E | 125 | 77 | -15 | --.- ---.- | -- | -- | -- |
| 220000Z | 16.2N 135.3E | 80 | 16.3N 134.8E | 80 | 29 | 0 | 17.3N 131.2E | 110 | 93 | 5 | 18.8N 127.7E | 130 | 70 | -15 | 20.6N 124.4E | 130 | 32 | 0 |
| 220600Z | 16.5N 134.8E | 85 | 16.6N 134.7E | 85 | 8 | 0 | 18.1N 131.7E | 105 | 13 | -15 | 19.4N 128.7E | 125 | 45 | -25 | --.- ---.- | -- | -- | -- |
| 221200Z | 16.8N 134.2E | 90 | 17.0N 134.0E | 90 | 17 | 0 | 18.5N 130.9E | 115 | 6 | -20 | 19.7N 127.9E | 130 | 63 | -20 | 20.9N 124.2E | 130 | 143 | 10 |
| 221800Z | 17.2N 133.5E | 95 | 17.2N 133.5E | 95 | 0 | 0 | 18.6N 130.7E | 120 | 47 | -20 | 19.8N 127.6E | 130 | 114 | -10 | --.- ---.- | -- | -- | -- |
| 230000Z | 17.6N 132.8E | 105 | 17.8N 132.9E | 100 | 13 | -5 | 19.5N 130.3E | 125 | 82 | -20 | 20.8N 127.3E | 130 | 152 | 0 | 22.1N 124.1E | 130 | 256 | 10 |
| 230600Z | 18.0N 131.9E | 120 | 17.9N 132.1E | 110 | 13 | -10 | 19.2N 129.1E | 130 | 69 | -20 | 20.5N 125.9E | 130 | 155 | -5 | --.- ---.- | -- | -- | -- |
| 231200Z | 18.4N 130.9E | 135 | 18.5N 130.8E | 125 | 8 | -10 | 19.9N 127.4E | 140 | 34 | -10 | 21.1N 123.8E | 125 | 118 | 5 | 22.1N 120.1E | 110 | 244 | 15 |
| 231800Z | 18.8N 129.9E | 140 | 18.7N 129.9E | 135 | 6 | -5 | 20.5N 126.0E | 135 | 17 | -5 | 21.7N 122.0E | 120 | 91 | 30 | --.- ---.- | -- | -- | -- |
| 240000Z | 19.1N 128.9E | 145 | 19.3N 128.9E | 140 | 12 | -5 | 20.8N 125.0E | 140 | 29 | 10 | 22.1N 120.4E | 120 | 92 | 60 | --.- ---.- | -- | -- | -- |
| 240600Z | 19.4N 127.9E | 150 | 19.6N 127.7E | 150 | 16 | 0 | 21.1N 123.8E | 135 | 45 | 0 | 22.3N 119.4E | 115 | 126 | 65 | --.- ---.- | -- | -- | -- |
| 241200Z | 19.9N 126.8E | 150 | 20.0N 126.8E | 150 | 6 | 0 | 21.4N 122.8E | 130 | 68 | 10 | 22.5N 118.3E | 110 | 172 | 75 | --.- ---.- | -- | -- | -- |
| 241800Z | 20.5N 125.7E | 140 | 20.4N 125.6E | 150 | 8 | 10 | 21.9N 121.1E | 130 | 60 | 40 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 250000Z | 21.1N 124.6E | 130 | 20.9N 124.5E | 130 | 13 | 0 | 22.2N 119.8E | 105 | 78 | 45 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 250600Z | 21.8N 123.5E | 135 | 21.8N 123.7E | 125 | 11 | -10 | 24.0N 118.9E | 80 | 30 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 251200Z | 22.4N 122.2E | 120 | 22.6N 122.3E | 120 | 13 | 0 | 23.9N 117.3E | 65 | 78 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 251800Z | 22.9N 121.0E | 90 | 22.8N 121.3E | 105 | 18 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 260000Z | 23.5N 119.7E | 60 | 23.4N 119.6E | 70 | 8 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 260600Z | 24.2N 118.4E | 50 | 24.2N 118.6E | 55 | 11 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 261200Z | 25.2N 117.2E | 35 | 24.9N 117.8E | 50 | 37 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 13NM | 63NM | 107NM | 142NM | 15NM | 63NM | 107NM | 142NM |
| AVERAGE RIGHT ANGLE ERROR | 8NM | 34NM | 41NM | 36NM | 9NM | 34NM | 41NM | 36NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 5KTS | 15KTS | 25KTS | 35KTS | 5KTS | 15KTS | 25KTS | 35KTS |
| AVERAGE BIAS OF WIND ERROR | 0KTS | 3KTS | 10KTS | 27KTS | 0KTS | 3KTS | 10KTS | 27KTS |
| NUMBER OF FORECASTS | 24 | 23 | 14 | 5 | 27 | 23 | 14 | 5 |


BEST TRACK
TYPHOON OLIVE
29 JUL-06AUG 1971
CYCLONE 19
MAX SFC WND - 85kts
MINIMUM SLP - 935mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
KURIL ISLANDS
VOLCANO ISLANDS
MARIANAS ISLANDS
MARCUS ISLAND
BONIN ISLANDS

## OLIVE

Olive climaxed the most active July on record as another in a succession of circulations in the equatorial trough formed east of Guam on 24 July. After drifting over Guam the system took a northward bend due to the influence of a weak trough to the north. After commencing a northeast drift, the circulation began to grow in size but did not become better organized. By the 29th a rather complex cloud system was in evidence as viewed by satellite. As the subtropical ridge began to strengthen, the depression began to slowly intensify and start an erratic, meandering westerly track, reaching storm status early on the 31st (Figure 5-28). Switching to a northwest direction, Olive finally achieved typhoon force by mid-day of the 2nd. The typhoon reached her peak intensity of 85 kt some 48 hours later as she neared Yaku-Shima in the northern Ryukyus (Figure 5-29).

With the approach of a long-wave trough off the coast of China, the typhoon swung to a northerly track with her center driving through western Kyushu east of Nagasaki on the 5th. Crossing the Ryukyus, the highest winds and lowest pressure were reported at the Japanese Yaku-Shima station with 80 kt gusting to 119 kt and 938.7 mb respectively.

Torrential rains measuring up to 59.8 inches in the mountainous regions of Kyushu (Ebino, Miyazaki prefecture) accounted for numerous landslides and for 69 persons killed, 209 injured, and over 1,700 dwellings partly or completely destroyed. At sea the 7,935-ton motorship KAMO MARU was forced aground off Hesaki Lighthouse while the 975-ton SHINMEI MARU ran aground six miles west of Anami-o-shima.

Weakened considerably by her traverse of Kyushu, Olive entered the Sea of Japan as a tropical storm and paralleled the Korean coast before turning on a northeast course and becoming extratropical.

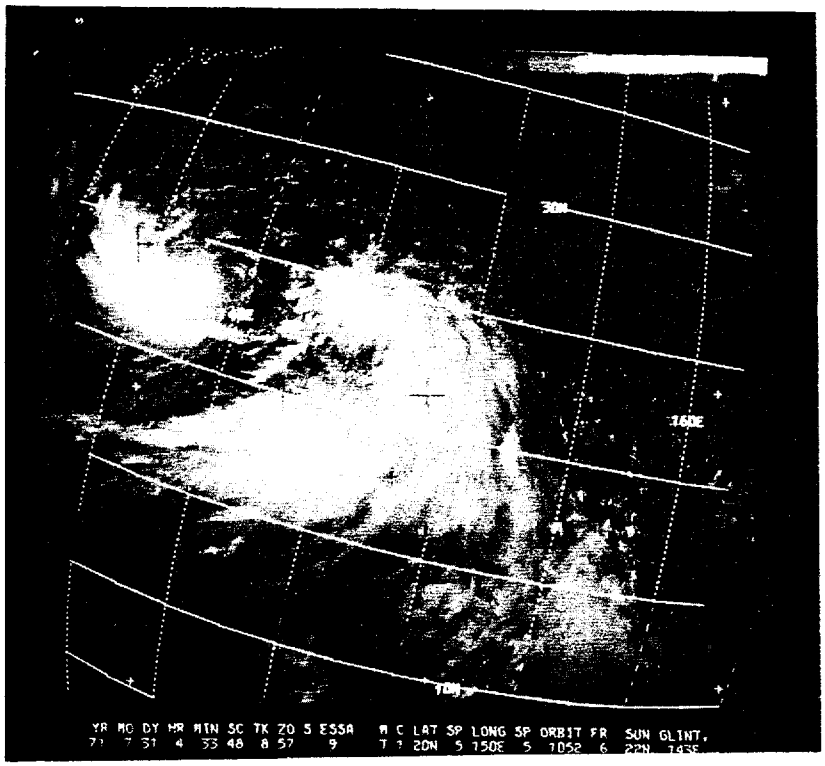



FIGURE 5-28. TROPICAL STORM OLIVE (LEFT) AS A MEMBER OF A LARGE CIRCULATION SYSTEM STRETCHING FROM WEST OF THE BONIN ISLAND GROUP TO MARCUS ISLAND - 31 JULY.

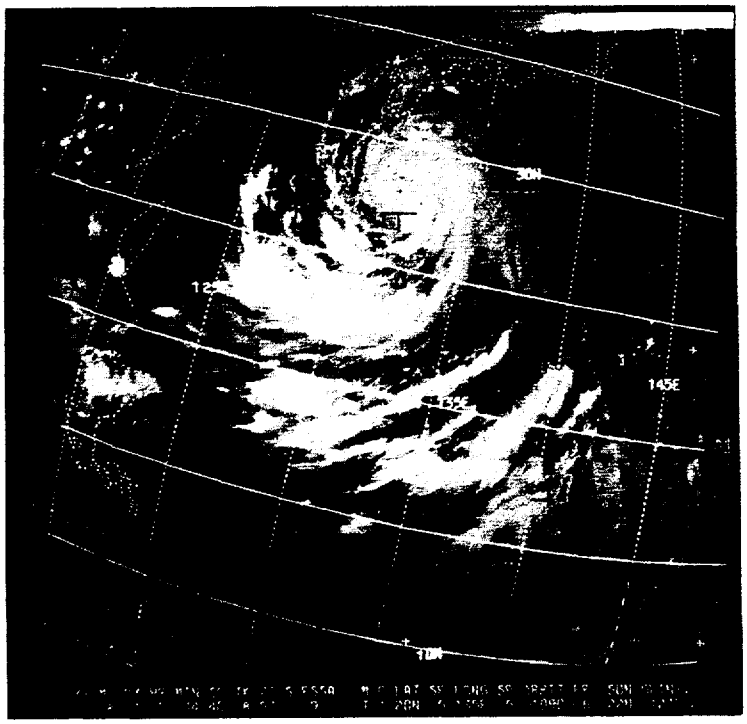



FIGURE 5-29. CAMERAS ABOARD ESSA-9 PHOTOGRAPH TYPHOON OLIVE NEAR THE RYUKYU CHAIN ON 3 AUGUST.

TYPHOON OLIVE
EYE FIXES FOR CYCLONE NO. 19
29 JUL - 06 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 270810Z | 16.6N 140.0E | --------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | C141 RDR FIX | |
| 2 | 290432Z | 22.5N 143.0E | SATELIT--- | STG C+ | | | | | | | | | | FIRST BLTN | |
| 3 | 291230Z | 23.2N 144.3E | 54-P-20-10 | 700MB | 35 | ---- | 996 | 3048 | 09/10 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 4 | 291500Z | 23.5N 143.5E | 54-P- 5-10 | 700MB | 40 | ---- | 994 | 3030 | 10/10 | ---- | ----- | -- | -- | 700MB CNTR FIX | |
| 5 | 292224Z | 23.8N 142.8E | VQ-P- 3- 2 | 360M | ---- | 30 | 990 | ---- | 27/23 | ---- | ----- | -- | -- | WIND EYE 2NM DIA | |
| 6 | 300430Z | 24.3N 141.7E | 54-P-15-10 | 700MB | 30 | ---- | 991 | 2990 | 11/11 | ---- | ----- | -- | -- | 700MB CNTR FIX NEG RDR PRES | |
| 7 | 300531Z | 24.5N 141.2E | SATELIT--- | STG C | | | | | | | | | | LESS INTENSE | |
| 8 | 300958Z | 24.0N 141.0E | 54-P- 5--- | 700MB | 26 | ---- | 987 | 2981 | 15/13 | ELIP | N-S | 20X10 | -- | WK CLSD WC-700 MB CNTR FIX | |
| 9 | 301121Z | 24.0N 140.8E | 54-P------ | 700MB | ---- | ---- | ---- | 2987 | --/-- | ---- | ----- | -- | -- | | |
| 10 | 301532Z | 23.7N 140.3E | VQ-R-25--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | EST POSIT | |
| 11 | 301630Z | 24.0N 140.1E | VQ-P-10- 5 | ----- | ---- | 40 | 986 | ---- | 26/24 | ---- | ----- | 25 | -- | WC OPEN S SEMIC | |
| 12 | 302130Z | 24.0N 139.4E | VQ-P-12- 8 | ----- | ---- | 40 | 987 | ---- | 27/25 | ---- | ----- | 20 | -- | WC OPEN N SEMIC | |
| 13 | 310400Z | 23.7N 138.5E | 54-P- 3- 5 | 700MB | 41 | 40 | 979 | 2935 | 19/15 | ---- | ----- | -- | -- | SFC CNTR WELL DEF -700 CNTR 10NM S | |
| 14 | 310434Z | 24.0N 137.5E | SATELIT--- | STG C+ | | | | | | | | | | STRONGER | |
| 15 | 310915Z | 23.9N 138.8E | 54-P- 2- 6 | 700MB | 40 | 40 | 979 | 2929 | 18/12 | ---- | ----- | -- | -- | POORLY DEF-700MB CNTR 21NM SW | |
| 16 | 311630Z | 23.1N 137.4E | 54-P- 8--- | 700MB | 30 | ---- | 976 | 2890 | 19/10 | ---- | ----- | -- | -- | NO WC-700 CNTR FX | |
| 17 | 312101Z | 23.6N 137.3E | 54-P- 8--- | 700MB | 45 | 40 | 978 | 2886 | 16/15 | ELIP | NE-SW | 20X 5 | -- | POORLY DEFINED | |
| 18 | 010517Z | 24.1N 136.7E | VQ-P- 2- 2 | 700MB | 58 | 60 | 971 | 2762 | 27/24 | ---- | ----- | -- | -- | WC OPEN NE-S | |
| 19 | 010533Z | 24.5N 136.0E | SATELIT--- | STG X | DIA | 2 | CAT 2.0 | | | | | | | STRONGER | |
| 20 | 010936Z | 24.5N 136.1E | VQ-P- 8- 2 | 700MB | 60 | 65 | 967 | 2737 | 27/25 | ---- | ----- | 30 | -- | WC OPEN NE | |
| 21 | 011600Z | 24.2N 135.4E | 54-P- 3- 2 | 700MB | 50 | ---- | 966 | 2807 | 16/16 | ELIP | N-S | 20X16 | -- | CLSD WC | |
| 22 | 012200Z | 24.7N 135.1E | 54-P- 2- 3 | 700MB | 60 | 65 | 966 | 2819 | 16/13 | ---- | ----- | 20 | -- | WC POORLY DEF | |
| 23 | 020421Z | 25.0N 134.2E | 54-P- 5--- | 700MB | 55 | 55 | 974 | 2847 | 12/10 | ---- | ----- | -- | -- | VERY POORLY DEF | |
| 24 | 020440Z | 25.0N 135.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | SML EYE VISIBLE | |
| 25 | 020628Z | 25.4N 134.5E | 54-P- 5--- | 700MB | 60 | 60 | ---- | 2716 | 15/11 | ELIP | E-W | 20X10 | -- | POORLY DEF-SFC CNTR 15NM ENE | |
| 26 | 020901Z | 25.6N 134.4E | 54-P- 5--- | 700MB | 60 | 70 | 957 | 2679 | 19/12 | ELIP | E-W | 40X20 | -- | POORLY DEF-SFC CNTR 5NM E | |
| 27 | 021300Z | 25.8N 133.5E | VQ-R-15-10 | ----- | ---- | ---- | ---- | ---- | --/25 | ---- | ----- | 25 | 8 | CLSD WC | |
| 28 | 021630Z | 26.3N 133.4E | VQ-P-13- 3 | 700MB | ---- | ---- | 960 | 2737 | 17/15 | ---- | ----- | 25 | 7 | CLSD WC | |
| 29 | 021817Z | 26.5N 133.4E | VQ-P- 8- 3 | 700MB | ---- | ---- | 961 | 2771 | 17/13 | ---- | ----- | 20 | 8 | CLSD WC-ROTATING 30 DEG/HR | |
| 30 | 030004Z | 27.2N 132.8E | 54-R------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | FST POSIT | |
| 31 | 030100Z | 27.3N 132.7E | 54-P- 3- 2 | 700MB | 70 | 80 | 948 | 2646 | 16/16 | ---- | ----- | 15 | 10 | CLSD WC-700MB CNTR 4NM NW | |
| 32 | 030200Z | 27.5N 132.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 33 | 030400Z | 27.7N 132.3E | 54-P- 2- 5 | 700MB | 70 | ---- | 945 | 2618 | 16/14 | ---- | ----- | 15 | 10 | CLSD WC-700 FIX | |
| 34 | 030500Z | 27.8N 132.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 35 | 030535Z | 28.0N 132.0E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | | |
| 36 | 030600Z | 28.0N 132.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 37 | 030653Z | 28.1N 131.9E | VQ-P- 2- 2 | 700MB | 70 | 75 | 945 | 2518 | 26/24 | ---- | ----- | 15 | 7 | CLSD WC | |
| 38 | 030700Z | 28.2N 131.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 39 | 030700Z | 28.1N 131.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 40 | 030700Z | 28.1N 132.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 41 | 030800Z | 28.4N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 42 | 030800Z | 28.4N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |

TYPHOON OLIVE
EYE FIXES FOR CYCLONE NO. 19
29 JUL - 06 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD-ACCY | FL1 LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL T1/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 030800Z | 28.2N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 44 | 030900Z | 28.3N 131.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 45 | 030900Z | 28.5N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 46 | 030900Z | 28.5N 131.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 47 | 030953Z | 28.3N 131.4E | VQ-P- 2- 2 | 700MB | ---- | 75 | 943 | 2536 | 27/25 | ---- | ----- | 14 | 7 | CLSD WC | |
| 48 | 031000Z | 28.4N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 49 | 031000Z | 28.5N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 50 | 031000Z | 28.5N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 51 | 031100Z | 28.5N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 52 | 031100Z | 28.4N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 53 | 031100Z | 28.5N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 54 | 031200Z | 28.4N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 55 | 031226Z | 28.5N 130.9E | VQ-P- 3- 2 | 700MB | ---- | ---- | 942 | 2646 | 19/16 | ELIP | N-S | 17X13 | 7 | CLSD WC | |
| 56 | 031300Z | 28.5N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 57 | 031300Z | 28.4N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 58 | 031300Z | 28.4N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 59 | 031400Z | 28.5N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 60 | 031400Z | 28.4N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 61 | 031500Z | 28.5N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 62 | 031500Z | 28.4N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 63 | 031500Z | 28.5N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 64 | 031600Z | 28.5N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 65 | 031600Z | 28.4N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 66 | 031600Z | 28.4N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 67 | 031625Z | 28.6N 130.6E | 54-P- 2- 2 | 700MB | 75 | ---- | 935 | 2554 | 19/16 | ---- | ----- | 18 | -- | CLSD WC | |
| 68 | 031700Z | 28.5N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 69 | 031700Z | 28.6N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 70 | 031700Z | 28.5N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 71 | 031800Z | 28.6N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 72 | 031800Z | 28.6N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 73 | 031900Z | 28.9N 130.5E | 54-P- 2- 2 | 700MB | 65 | ---- | 930 | 2536 | 18/16 | ---- | ----- | 16 | -- | CLSD WC | |
| 74 | 032000Z | 28.8N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 75 | 032030Z | 29.1N 130.4E | 54-P- 2--- | 700MB | 70 | ---- | ---- | 2545 | 18/16 | ---- | ----- | 12 | 10 | CLSD WC | |
| 76 | 032100Z | 29.0N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 77 | 032100Z | 29.1N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 78 | 032100Z | 28.9N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 79 | 032200Z | 29.0N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJTD | 35.7N 139.8E |
| 80 | 032300Z | 29.5N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 81 | 040000Z | 29.4N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 82 | 040000Z | 29.2N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 83 | 040100Z | 29.5N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 84 | 040100Z | 29.3N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 85 | 040115Z | 29.5N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | ITAZUKI RDR | 33.6N 130.4E |
| 86 | 040200Z | 29.5N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 87 | 040200Z | 29.5N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 88 | 040300Z | 29.7N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 89 | 040400Z | 29.7N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 90 | 040400Z | 29.6N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 91 | 040400Z | 30.0N 129.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 92 | 040422Z | 29.5N 130.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | | |

TYPHOON OLIVE
EYE FIXES FOR CYCLONE NO. 19
29 JUL - 06 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 93 | 040500Z | 29.6N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 94 | 040500Z | 29.7N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 95 | 040700Z | 29.6N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 96 | 040700Z | 29.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 97 | 040700Z | 29.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 98 | 040700Z | 29.7N 129.8E | 54-P- 0- 2 | 500MB | 45 | 65 | 940 | 2371 | 03/03 | ---- | ----- | 10 | 5 | WC OPEN NW QUAD | |
| 99 | 040800Z | 29.8N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 100 | 040800Z | 29.8N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 101 | 040800Z | 29.7N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 102 | 040900Z | 29.8N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 103 | 040900Z | 30.2N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 104 | 041000Z | 30.3N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 105 | 041000Z | 30.3N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 106 | 041000Z | 30.2N 130.4E | 54-P- 0- 5 | 700MB | ---- | ---- | 935 | 2357 | 20/19 | ---- | ----- | -- | -- | WC BREAKING UP | |
| 107 | 041000Z | 30.2N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 108 | 041000Z | 30.3N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 109 | 041100Z | 30.5N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 110 | 041100Z | 30.4N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 111 | 041100Z | 30.8N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 112 | 041130Z | 30.6N 130.2E | 54-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | EYE FILLING | |
| 113 | 041200Z | 30.7N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 114 | 041200Z | 30.5N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 115 | 041200Z | 30.6N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 116 | 041300Z | 30.7N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 117 | 041300Z | 30.8N 129.7E | 54-P- 0- 2 | 500MB | ---- | ---- | 945 | 2392 | 02/02 | ---- | ----- | -- | -- | NO WC | |
| 118 | 041400Z | 30.7N 129.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 119 | 041400Z | 30.7N 129.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 120 | 041500Z | 30.7N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 121 | 041500Z | 30.8N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 122 | 041500Z | 30.7N 129.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 123 | 041500Z | 30.0N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 124 | 041600Z | 30.8N 129.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 125 | 041600Z | 30.9N 129.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 126 | 041606Z | 30.7N 129.9E | VQ-R- 1--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 11 | -- | HOLE IN RDR PRES | 30.7N 128.8E |
| 127 | 041700Z | 31.0N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 128 | 041652Z | 31.1N 130.0E | VQ-P- 1- 2 | 700MB | ---- | ---- | 947 | 2600 | 20/13 | ---- | ----- | 14 | 3 | WC OPEN W SEMIC | |
| 129 | 041900Z | 31.2N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 130 | 042130Z | 31.7N 130.1E | VQ-P- 1- 9 | 700MB | ---- | ---- | 935 | 2554 | 17/13 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 131 | 050100Z | 32.7N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 132 | 050100Z | 32.6N 130.4E | 54-P- 2- 6 | 700MB | 93 | ---- | ---- | 2624 | 15/13 | ---- | ----- | -- | -- | NEG RDR PRES | |
| 133 | 050200Z | 33.0N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 134 | 050200Z | 32.4N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJTT | 35.5N 139.8E |
| 135 | 050300Z | 33.4N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 136 | 050410Z | 33.6N 130.2E | 54-P- 2- 4 | 700MB | 45 | ---- | ---- | 2719 | 17/15 | ---- | ----- | 10 | -- | POORLY DEFINED | |
| 137 | 050541Z | 34.0N 130.0E | SATELIT--- | STG X | DIA | 4 | CAT 2.0 | | | | | | | WEAKENING | |
| 138 | 050700Z | 34.3N 130.1E | 54-P- 3--- | 700MB | 65 | 35 | 972 | 2795 | 16/14 | ---- | ----- | 25 | -- | WK WC N AND SW | |
| 139 | 050900Z | 34.6N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 140 | 051000Z | 34.9N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 141 | 051000Z | 34.9N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 142 | 051000Z | 35.0N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |

TYPHOON OLIVE
EYE FIXES FOR CYCLONE NO. 19
29 JUL - 06 AUG 71

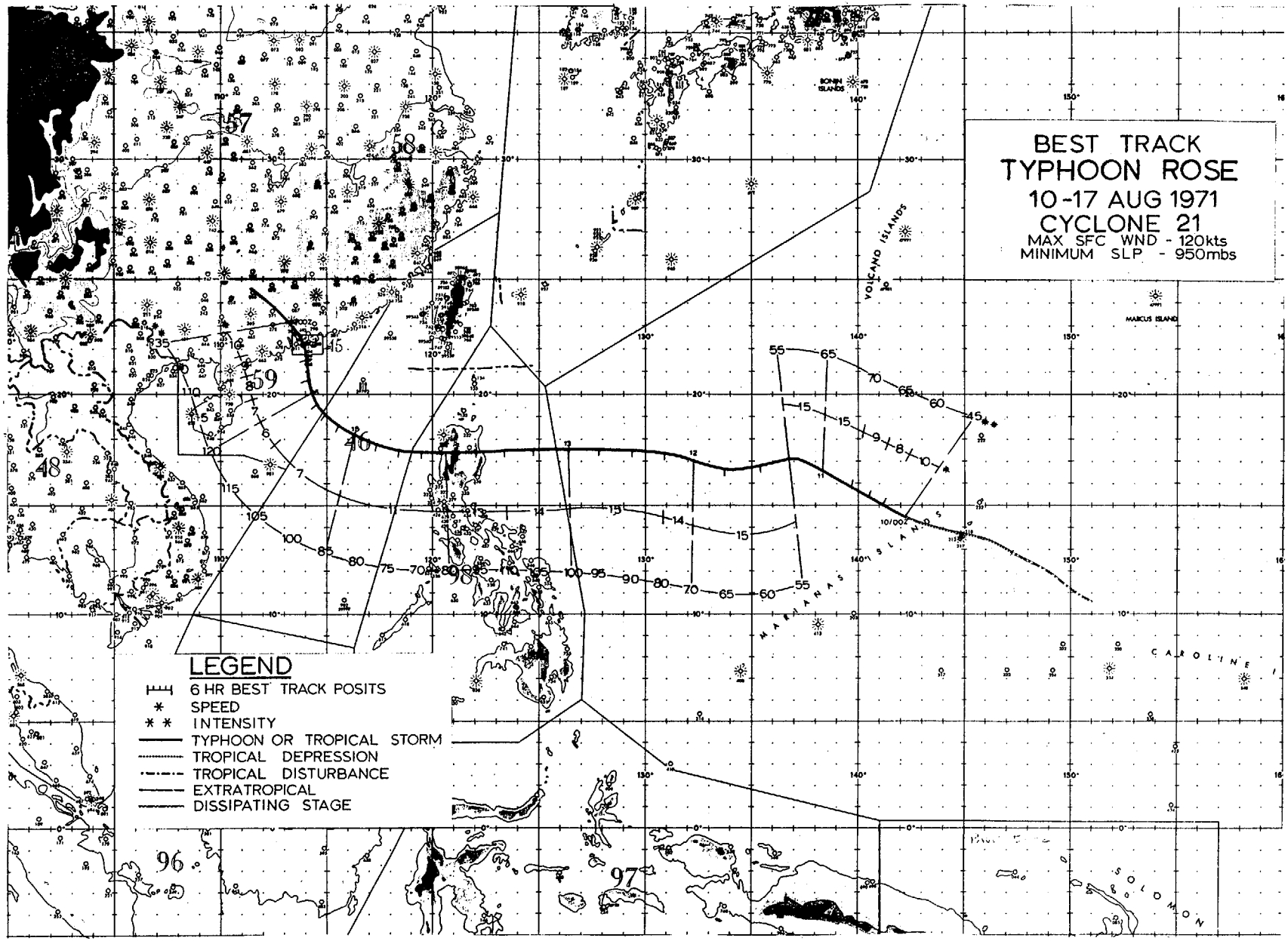
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 143 | 0510000Z | 35.3N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 144 | 0511000Z | 35.2N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 145 | 0512000Z | 35.7N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 146 | 0512000Z | 35.9N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 147 | 0512000Z | 35.7N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 148 | 0512000Z | 35.7N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 149 | 0513000Z | 36.0N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 150 | 0513000Z | 36.1N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 151 | 0514000Z | 36.2N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 152 | 0515000Z | 36.4N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 153 | 0515200Z | 36.5N 130.8E | VQ-P-25--- | 300M | ---- | 55 | 986 | ---- | 23/21 | ---- | ----- | -- | -- | NO WC | |
| 154 | 0516000Z | 36.8N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |

TYPHOON OLIVE

0600Z 29 JUL TO 0000Z 6 AUG

| | BEST TRACK | | WARNING | | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 290600Z | 22.8N 143.5E | 25 | 22.0N 142.0E | 30 | 96 | 5 | 23.2N 140.8E | 60 | 74 | 30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 23.2N 144.3E | 25 | 24.3N 143.6E | 30 | 76 | 5 | 25.7N 144.3E | 35 | 220 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291800Z | 23.7N 143.4E | 25 | 23.5N 143.5E | 30 | 13 | 5 | 23.8N 142.5E | 50 | 148 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300000Z | 24.0N 142.5E | 30 | 23.9N 142.7E | 30 | 12 | 0 | 25.1N 140.4E | 45 | 101 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300600Z | 24.2N 141.6E | 30 | 24.4N 141.6E | 30 | 12 | 0 | 25.9N 138.2E | 45 | 126 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301200Z | 24.0N 140.7E | 30 | 24.2N 140.6E | 30 | 13 | 0 | 25.8N 137.2E | 45 | 130 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301800Z | 24.0N 139.8E | 35 | 24.0N 139.9E | 40 | 5 | 5 | 24.5N 136.4E | 50 | 82 | 0 | 25.6N 133.1E | 60 | 139 | 0 | --.- ---.- | -- | -- | -- |
| 310000Z | 23.9N 139.1E | 40 | 24.0N 139.1E | 40 | 6 | 0 | 24.7N 135.9E | 45 | 72 | -10 | 25.7N 132.6E | 50 | 135 | -10 | 27.2N 129.5E | 60 | 175 | -15 |
| 310600Z | 23.8N 138.3E | 40 | 23.8N 138.2E | 40 | 5 | 0 | 24.2N 134.8E | 45 | 87 | -15 | 25.5N 131.6E | 50 | 162 | -10 | --.- ---.- | -- | -- | -- |
| 311200Z | 23.7N 137.8E | 45 | 23.8N 138.0E | 40 | 12 | -5 | 23.9N 136.2E | 45 | 34 | -15 | 24.5N 133.7E | 60 | 81 | -5 | 25.7N 131.4E | 70 | 168 | -15 |
| 311800Z | 23.4N 137.3E | 50 | 23.3N 137.3E | 40 | 6 | -10 | 23.6N 135.6E | 50 | 51 | -10 | 24.6N 133.2E | 60 | 108 | -5 | --.- ---.- | -- | -- | -- |
| 010000Z | 23.9N 136.9E | 55 | 23.7N 137.0E | 45 | 13 | -10 | 24.0N 134.7E | 55 | 49 | -5 | 25.3N 131.9E | 60 | 123 | -15 | 26.7N 129.7E | 60 | 158 | -25 |
| 010600Z | 24.3N 136.4E | 60 | 24.1N 136.5E | 55 | 13 | -5 | 24.6N 134.3E | 65 | 45 | 5 | 25.7N 131.4E | 75 | 135 | -5 | --.- ---.- | -- | -- | -- |
| 011200Z | 24.4N 135.9E | 60 | 24.6N 135.8E | 65 | 13 | 5 | 25.4N 132.9E | 75 | 69 | 10 | 26.6N 130.1E | 65 | 125 | -20 | 28.0N 128.0E | 60 | 187 | -25 |
| 011800Z | 24.4N 135.3E | 60 | 24.4N 135.2E | 65 | 5 | 5 | 25.2N 132.8E | 75 | 79 | 10 | 26.6N 130.1E | 65 | 139 | -20 | --.- ---.- | -- | -- | -- |
| 020000Z | 24.8N 134.9E | 60 | 24.7N 134.9E | 70 | 6 | 10 | 25.2N 132.9E | 70 | 120 | -5 | 26.5N 130.1E | 70 | 167 | -15 | 28.0N 128.0E | 70 | 288 | 5 |
| 020600Z | 25.3N 134.6E | 60 | 25.1N 134.1E | 70 | 30 | 10 | 26.1N 131.7E | 70 | 109 | -10 | 27.6N 129.1E | 70 | 144 | -15 | --.- ---.- | -- | -- | -- |
| 021200Z | 25.8N 134.1E | 65 | 25.9N 134.2E | 70 | 8 | 5 | 27.5N 132.3E | 75 | 87 | -10 | 29.0N 130.1E | 70 | 84 | -15 | 30.8N 128.4E | 70 | 307 | 15 |
| 021800Z | 26.4N 133.4E | 65 | 26.4N 133.3E | 70 | 5 | 5 | 28.3N 131.3E | 75 | 55 | -10 | 30.3N 129.7E | 70 | 49 | -5 | --.- ---.- | -- | -- | -- |
| 030000Z | 27.2N 132.8E | 75 | 26.9N 132.8E | 70 | 18 | -5 | 28.7N 131.0E | 70 | 55 | -15 | 30.7N 129.5E | 60 | 109 | -5 | --.- ---.- | -- | -- | -- |
| 030600Z | 27.9N 132.0E | 80 | 27.8N 132.1E | 80 | 8 | 0 | 30.4N 129.8E | 75 | 30 | -10 | 33.8N 128.7E | 55 | 70 | -5 | --.- ---.- | -- | -- | -- |
| 031200Z | 28.5N 131.1E | 85 | 28.7N 131.3E | 80 | 16 | -5 | 31.8N 128.9E | 65 | 110 | -20 | 35.8N 130.2E | 55 | 23 | 0 | --.- ---.- | -- | -- | -- |
| 031800Z | 28.9N 130.5E | 85 | 28.8N 130.4E | 80 | 8 | -5 | 32.1N 128.7E | 60 | 85 | -15 | 36.2N 130.7E | 50 | 78 | 0 | --.- ---.- | -- | -- | -- |
| 040000Z | 29.3N 130.2E | 85 | 29.4N 130.4E | 80 | 12 | -5 | 32.0N 128.8E | 65 | 79 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 040600Z | 29.9N 129.9E | 85 | 29.8N 129.8E | 75 | 8 | -10 | 32.2N 128.8E | 60 | 121 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 041200Z | 30.4N 130.3E | 85 | 30.5N 130.0E | 75 | 17 | -10 | 33.0N 129.5E | 60 | 165 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 041800Z | 31.1N 129.9E | 75 | 30.9N 129.8E | 75 | 13 | 0 | 33.3N 129.6E | 60 | 257 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 050000Z | 32.4N 130.3E | 65 | 32.1N 130.0E | 65 | 23 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 050600Z | 33.9N 130.1E | 60 | 34.0N 130.6E | 65 | 25 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 051200Z | 35.6N 130.6E | 55 | 35.6N 131.3E | 55 | 34 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 051800Z | 37.5N 130.7E | 50 | 37.5N 131.1E | 50 | 19 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 13NM | 94NM | 110NM | 214NM | 18NM | 98NM | 110NM | 214NM |
| AVERAGE RIGHT ANGLE ERROR | 10NM | 47NM | 71NM | 118NM | 13NM | 50NM | 71NM | 118NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 5KTS | 9KTS | 9KTS | 17KTS | 4KTS | 9KTS | 9KTS | 17KTS |
| AVERAGE BIAS OF WIND ERROR | -1KTS | -3KTS | -9KTS | -10KTS | -0KTS | -2KTS | -9KTS | -10KTS |
| NUMBER OF FORECASTS | 25 | 25 | 17 | 6 | 31 | 27 | 17 | 6 |


BEST TRACK
TYPHOON ROSE
10-17 AUG 1971
CYCLONE 21
MAX SFC WND - 120kts
MINIMUM SLP - 950mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
VOLCANO ISLANDS
MARIANAS ISLANDS
CAROLINE
SOLOMON
MARCUS ISLAND
BONIN ISLANDS

During her early life, Rose was in a class of midget typhoons having an area extent of 100-150 miles (Figure 5-30). Before her life cycle was spent, however, Rose had the distinction of being the most disasterous typhoon of the 1971 season.

A small circulation was evident in synoptic and satellite data as early as the 7th at a position north of Truk. On the evening of August 9th, the radars at Fleet Weather Central Guam and Andersen AFB, Guam detected a small circulation with spiraling convection passing just north of Guam. Aircraft investigation the following morning revealed a mini-storm with 35- to 40-kt winds. By the late afternoon, Rose coiled to minimum typhoon strength with no increase in size and set out on a westerly course at 14-15 kt for Luzon. Except for a 12-hour period during the late afternoon and evening of the 11th, Rose remained at typhoon strength as she navigated the Philippine Sea and gradually generated winds to 110 kt before striking Luzon.

It is noteworthy that, although Rose exhibited typhoon-force winds, the central pressures observed by reconnaissance aircraft were unusually high for the standard pressure-wind relationships used at JTWC (Takahasi, 1939). It is believed the small size and tight gradients associated with Rose were responsible for this anomaly.

Making landfall north of Palanan Point, Rose crossed the mountainous terrain of northern Luzon and emerged in the South China Sea as a minimal typhoon. While inland, the Philippine Weather Bureau station at Tuguegarao reported maximum winds of 75 kt and the barometer dipped to 986.5 mb during center passage.

Rose had been steered for several days by a strong high cell centered near Shanghai. This cell began to weaken significantly as Rose began her journey in the South China Sea. In response to the synoptic-scale changes, the typhoon shifted to a more northwesterly course and began to slow to 6-7 kt in forward movement later on the 15th. Aircraft reconnaissance reports indicated deepening was taking place before Rose crossed the no-fly zone as the central pressure dropped from 980 mb to 959 mb in ten hours during the 15th.

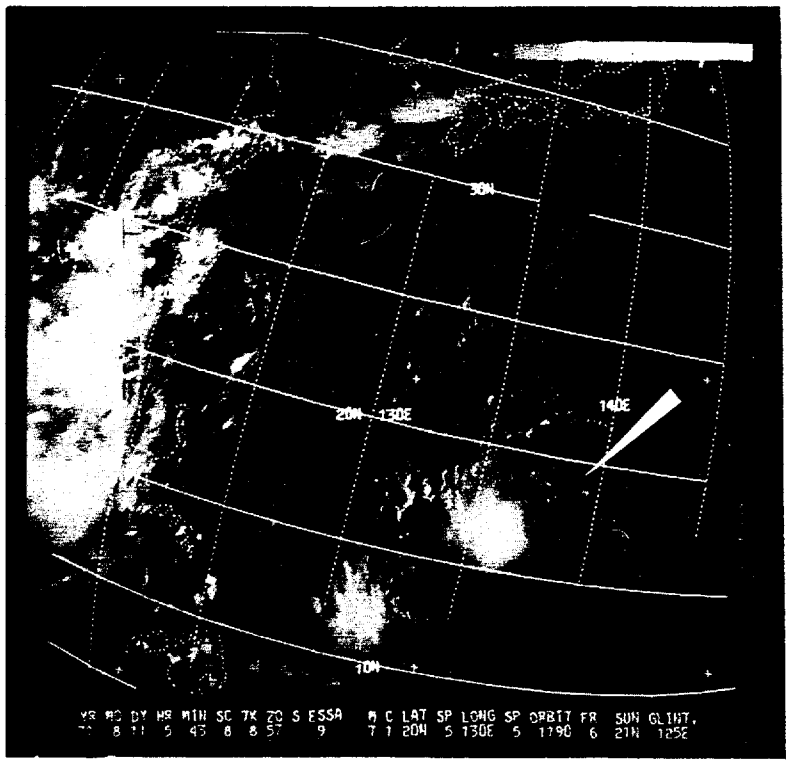



FIGURE 5-30. MINI-TYPHOON ROSE AS PHOTOGRAPHED BY ESSA-9 ON 11 AUGUST.

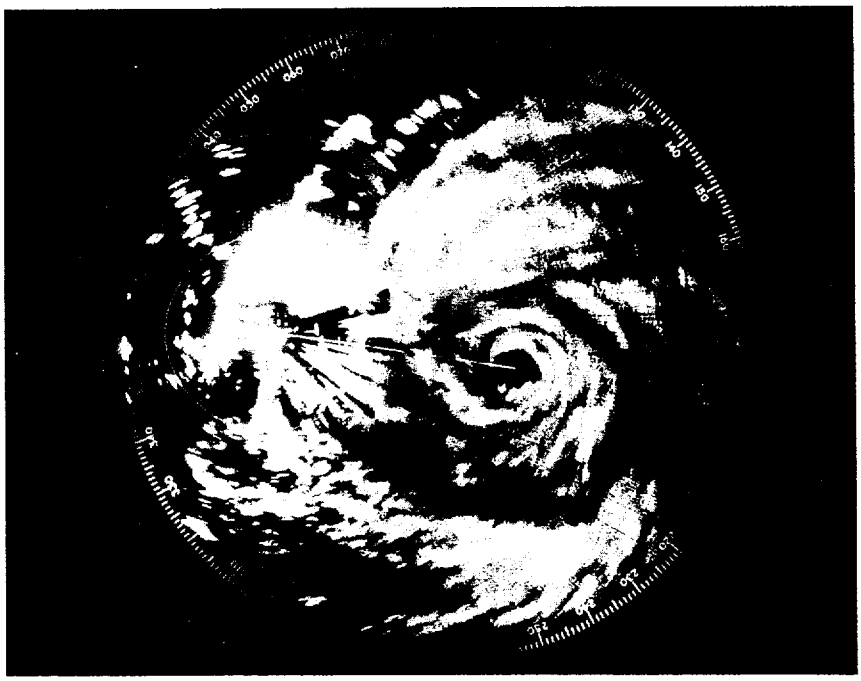


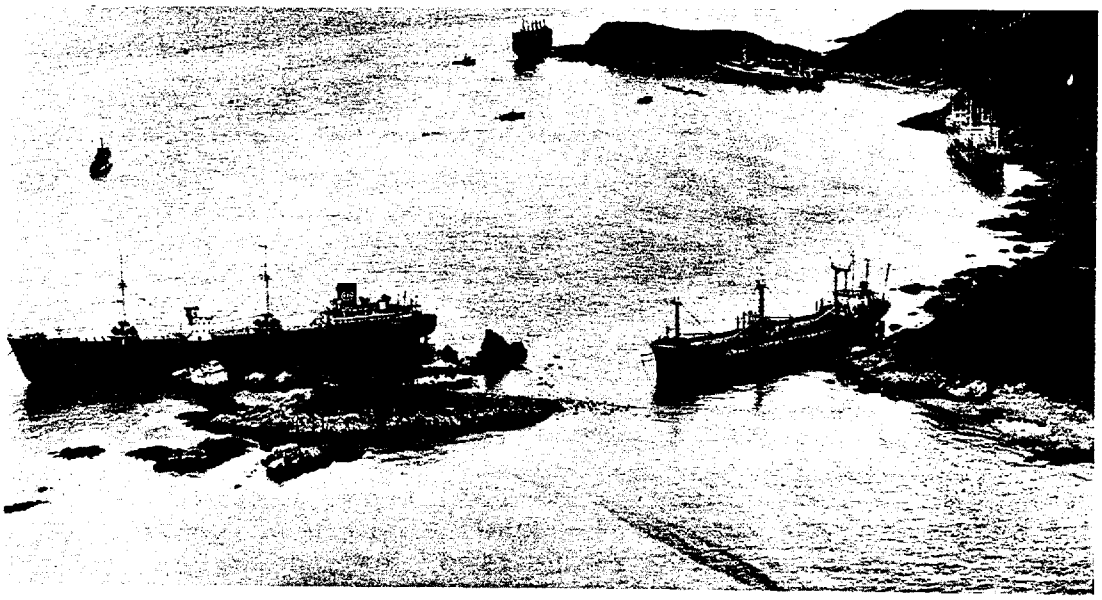
FIGURE 5-31. RADARSCOPE PICTURE OF ROSE TAKEN AT 0400 GMT 16 AUGUST 1971 FROM THE ROYAL OBSERVATORY'S RADAR (RANGE MARKS 40 N MI)--COURTESY ROYAL OBSERVATORY HONG KONG.

The eye of the storm began to appear on the radar at the Royal Observatory the afternoon of the 16th (Figures 2-15 and 5-31), while a ship report in the vicinity of the eye confirmed that the deepening trend had continued to 950 mb. The SS NUDDEA reported winds of 90-110 kt close to the center. Considering last reports from aircraft penetration of Rose and the continued deepening trend, the typhoon probably peaked near 120 kt at this time before weakening slightly when the eye arrived at Lantau Island off Hong Kong shortly after midnight of the 16th. Moving inland on the 17th, the storm weakened and dissipated northeast of Canton the following day.

Meteorological extremes measured within the colony showed a minimum pressure of 963.2 mb at Cheang Chau after midnight while a maximum gust of 121 kt was reported at the Royal Observatory. The 11.34 inches of rain which fell at the Observatory during the 24 hours of Rose's passage was the highest value ever recorded in one calendar day in August.

Typhoon Rose was probably one of the most intense and violent typhoons that has affected Hong Kong. Twenty-six ocean-going vessels went aground and two were sunk (Table 5-1). A total of 130 deaths was attributable to the typhoon and over 5,600 people were made homeless. Also in the harbor, some 300 small craft including 100 pleasure craft were sunk or damaged (Figure 5-32).

The Macao ferry FATSHAN capsized resulting in the loss of 88 crew members and is regarded as one of the worst maritime disasters in the colony's history.



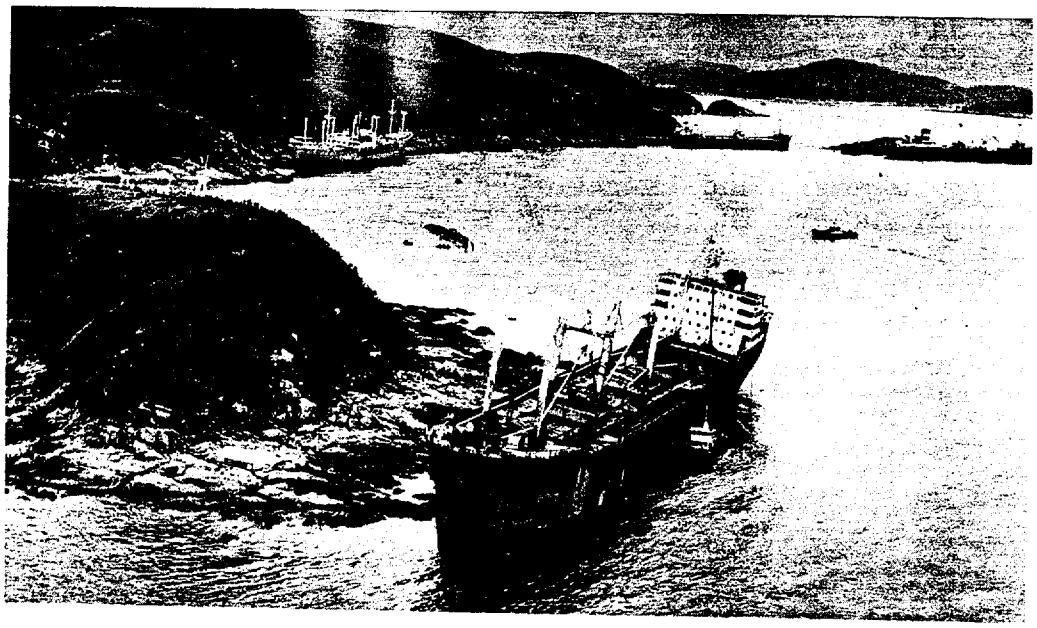


FIGURE 5-32. VICTIMS OF TYPHOON ROSE, FREIGHTERS RUN AGROUND ON LANTAO ISLAND, HONG KONG SURROUND THE CAPSIZED MACAO-HONG KONG FERRY, FATSHAN. (VESSELS AS SEEN IN THE TOP AND BOTTOM VIEWS INCLUDE THE FERNBANK, WINDFIELD TRADER, GALLANTRY, KOYOHO MARU AND KAOSHSIUNG--COURTESY THE SOUTH CHINA MORNING POST.

TABLE 5-1. LISTING OF VESSEL CASUALTIES INCURRED AT HONG KONG DURING TYPHOON ROSE*

| VESSEL | FLAG | TONNAGE |
|---|---|---|
| GREEN BAY | United States | 11,021 |
| FLYING DRAGON | United States | 8,243 |
| REGULUS | United States | --- |
| AMERICAN HAWK | United States | 7,909 |
| FATSHAN (Ferry) | British Commonwealth | 2,637 |
| RED SEA | British Commonwealth | 7,026 |
| DWARKA | British Commonwealth | 4,851 |
| HUNTSLAND | British Commonwealth | 9,353 |
| EASTERN CAPE | British Commonwealth | 6,205 |
| JADE LILY | British Commonwealth | 11,753 |
| SEA CORAL | British Commonwealth | 10,421 |
| LEE HONG (Ferry) | British Commonwealth | 1,127 |
| MACAU (Ferry) | British Commonwealth | 3,670 |
| KIM SENG | British Commonwealth | --- |
| GALLANTRY | Panama | 7,582 |
| MONRUBY | Panama | 5,312 |
| WINFIELD TRADER | Panama | 11,038 |
| KAOHSIUNG | Panama | 1,289 |
| TIEN HONG | Liberia | 12,417 |
| BILLY | Liberia | 8,705 |
| SHONAN MARU | Japanese | 2,116 |
| KYOHO MARU | Japanese | 2,998 |
| LAOSHAN | Somali | 10,087 |
| TAIPIENG | Somali | 5,676 |
| NURITH | Israel | 6,982 |
| COMANDANTE CAMILO CIENFUEGOS | Cuba | 9,735 |
| WORLD DALE | Greece | 15,729 |
| KOTA SENTOSA | Singapore | --- |
| JILIN | China | 6,804 |
| FERNBANK | Norway | 8,981 |
| GUIMARAS | Philippines | 3,555 |
| WATUDAMBO | Indonesia | 2,165 |
| TUNG THAI | Taiwan | 2,492 |
| WAH FAT | Taiwan | --- |
| ARISA | Taiwan | --- |

*SOURCE - 1. Casualty Returns, The Liverpool Underwriters' Association - Aug 1971.
2. Mariner's Weather Log, NOAA - Vol 16, No 1

TYPHOON ROSE
EYE FIXES FOR CYCLONE NO. 21
10 AUG - 17 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 080600Z | 11.3N 149.5E | 54-P------ | 700MB | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | INVESTIGATIVE FIX | |
| 2 | 090537Z | 12.5N 145.0E | SATELIT--- | STG B | | | | | | | | | | FIRST BLTN | |
| 3 | 091000Z | 13.6N 145.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 4 | 091100Z | 13.8N 144.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 5 | 091115Z | 13.9N 144.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 6 | 091140Z | 13.9N 144.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 7 | 091200Z | 13.9N 144.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 8 | 091210Z | 13.8N 144.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 9 | 091215Z | 14.0N 144.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 10 | 091240Z | 14.0N 144.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 11 | 091315Z | 13.8N 144.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 12 | 091340Z | 13.9N 144.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 13 | 091415Z | 13.9N 144.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-91218 | 13.6N 144.9E |
| 14 | 091420Z | 13.8N 144.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 15 | 091440Z | 13.9N 144.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FAIR FIX-91218 | 13.6N 144.9E |
| 16 | 091515Z | 14.2N 143.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR-91218 | |
| 17 | 091525Z | 13.9N 143.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 18 | 091655Z | 14.0N 143.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 19 | 092020Z | 14.2N 142.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FWC RDR | 13.5N 144.7E |
| 20 | 092215Z | 14.2N 142.4E | 54-P- 1- 2 | 700MB | 30 | 35 | 1000 | 3057 | 10/08 | ELIP | N-S | 20X15 | -- | WEAK EYE | |
| 21 | 100415Z | 14.9N 141.5E | VQ-R-25--- | ----- | ---- | 75 | ---- | ---- | --/-- | CIRC | | 10 | 4 | RADIUS 30KT WINDS | 14.4N 142.3E |
| 22 | 100444Z | 15.0N 141.5E | SATELIT--- | STG C | | | | | | | | | | 30 NM STRONGER | |
| 23 | 101016Z | 15.4N 140.8E | VQ-R- 8--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | 7 | WC OPEN E SEMIC | 15.0N 140.2E |
| 24 | 101715Z | 15.7N 139.9E | 54-P- 5- 5 | 700MB | 60 | ---- | 996 | 3030 | 18/12 | CIRC | | 15 | -- | WC OPEN E SEMIC | |
| 25 | 102010Z | 16.0N 139.2E | 54-P------ | 700MB | 60 | ---- | ---- | 3030 | 18/-- | ---- | ----- | -- | -- | | |
| 26 | 102200Z | 16.2N 138.8E | 54-P- 2- 3 | 700MB | 57 | 75 | 997 | 3048 | 18/11 | CIRC | | 12 | -- | WC OPEN NE-SE SFC CNTR 3NM S | |
| 27 | 110352Z | 17.0N 137.3E | VQ-P- 5--- | ----- | 50 | 45 | 999 | ---- | 28/23 | ---- | ----- | -- | -- | NO WC-SML WND EYE | |
| 28 | 110543Z | 17.0N 136.5E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | STRONGER | |
| 29 | 110624Z | 17.2N 136.6E | VQ-P- 5--- | ----- | ---- | 45 | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 30 | 110939Z | 16.9N 136.2E | VQ-P- 4- 2 | ----- | 45 | 40 | 997 | ---- | 32/25 | ---- | ----- | -- | -- | POORLY ORGANIZED | |
| 31 | 111030Z | 16.8N 134.0E | 54-P-10-10 | 700MB | 22 | ---- | 1001 | 3075 | 13/12 | ---- | ----- | -- | -- | NO WC-700MB FIX | |
| 32 | 112142Z | 16.9N 132.8E | 54-P-10-10 | 700MB | 30 | ---- | 1000 | 3088 | 10/12 | ---- | ----- | -- | -- | RDR PRES VRY POOR | |
| 33 | 120558Z | 17.5N 131.0E | VQ-P- 5--- | ----- | ---- | 80 | 980 | ---- | 27/25 | CIRC | | 3 | -- | NO WC-WIND EYE | |
| 34 | 120642Z | 17.5N 130.5E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | NO EYE VISIBLE | |
| 35 | 122335Z | 17.8N 126.5E | 54-P- 2- 3 | 700MB | 90 | 100 | 980 | 2957 | 18/13 | CIRC | | 20 | 5 | WEAK BRKN WC | |
| 36 | 130340Z | 17.6N 125.0E | 54-P- 2- 1 | 700MB | 75 | 100 | 970 | 2920 | 18/11 | CIRC | | 15 | 5 | WC OPEN N QUAD | |
| 37 | 130545Z | 18.0N 125.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | NO EYE VISIBLE | |
| 38 | 131000Z | 17.6N 123.9E | VQ-R- 2- 3 | ----- | ---- | ---- | ---- | ---- | --/26 | CIRC | | 20 | -- | NO WC | 18.0N 124.6E |
| 39 | 131315Z | 17.6N 123.2E | VQ-R- 5--- | ----- | ---- | 120 | ---- | ---- | 26/23 | CIRC | | 8 | -- | NO WC | 18.3N 122.9E |
| 40 | 131526Z | 17.6N 122.6E | VQ-R- 3--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | NO WC | 18.0N 123.7E |
| 41 | 131925Z | 17.4N 121.6E | 54-P-10--- | 500MB | ---- | ---- | ---- | ---- | -1/-4 | ---- | ----- | -- | -- | NO WC | |
| 42 | 132102Z | 17.3N 121.3E | 54-P-10--- | 500MB | 83 | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | NO WC | |
| 43 | 140002Z | 17.3N 120.6E | 54-P-10--- | 500MB | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | NO WC | |
| 44 | 140425Z | 17.5N 120.0E | 54-P- 1- 5 | 700MB | 60 | 65 | 987 | 2953 | 13/10 | CIRC | | 8 | -- | RDR PRES POOR | |
| 45 | 140644Z | 18.0N 119.5E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | RAGGED EYE | |
| 46 | 140945Z | 17.5N 119.0E | 54-P- 1- 4 | 700MB | 80 | 70 | 987 | 2951 | 14/10 | CIRC | | 30 | 12 | WC CLSD W BRKS | |
| 47 | 142144Z | 18.5N 116.4E | 54-P- 2--- | 700MB | 78 | ---- | 980 | 2917 | 16/13 | CIRC | | 30 | -- | CLSD WC-CS OVC | |
| 48 | 150032Z | 18.4N 116.3E | VQ-P- 5--- | 700MB | 77 | 45 | 980 | 2911 | 14/09 | CIRC | | 50 | -- | WC OPEN NE | |

TYPHOON ROSE
EYE FIXES FOR CYCLONE NO. 21
10 AUG - 17 AUG 71

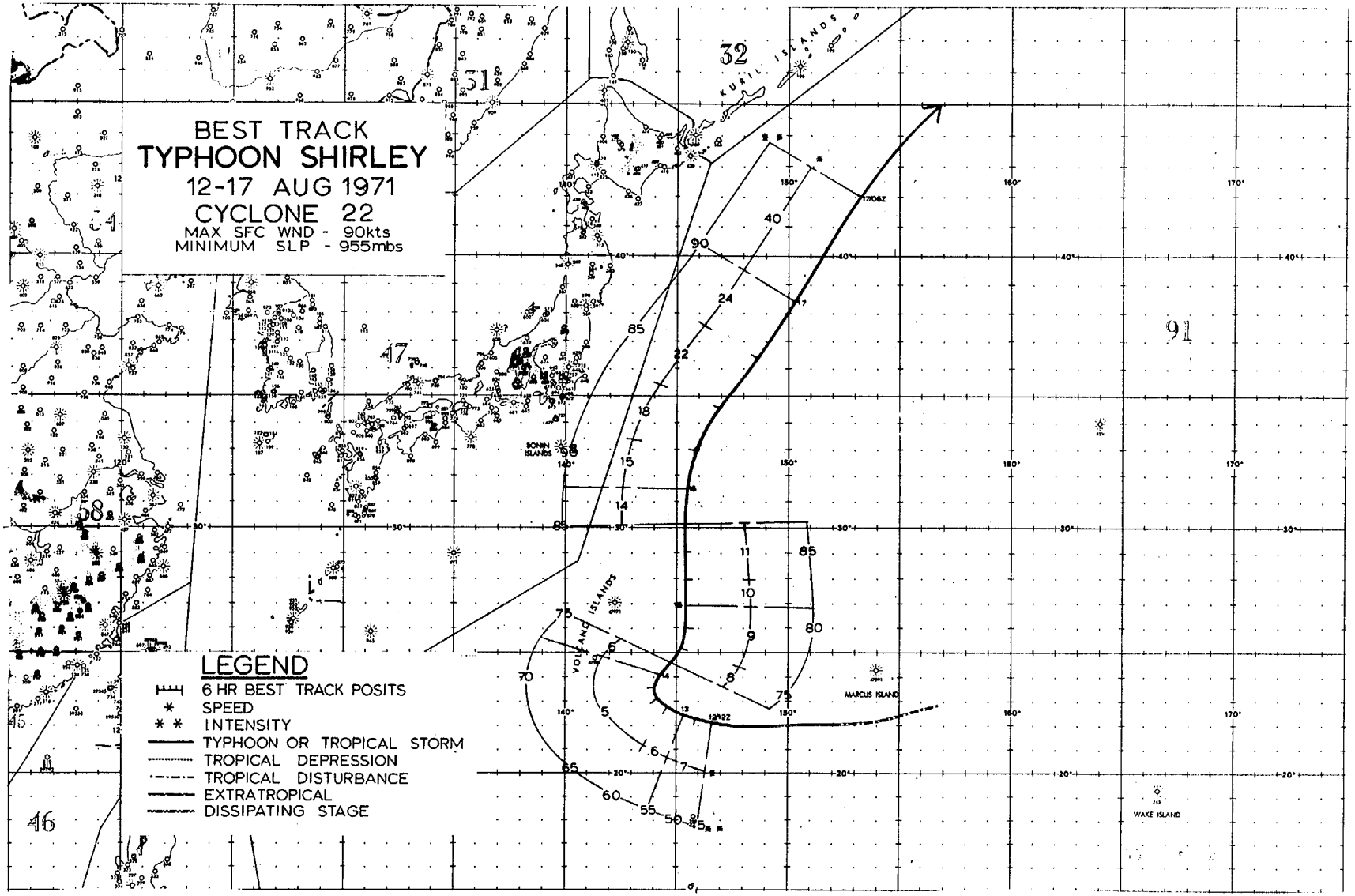
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 150303Z | 18.3N 115.9E | VQ-P- 1--- | 700MB | 72 | 60 | 980 | 2917 | 15/11 | CIRC | | 45 | -- | CLSD WC-CS OVC | |
| 50 | 150547Z | 18.5N 115.5E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | EYE ARLY VISIBLE | |
| 51 | 150720Z | 18.8N 115.5E | 54-P- 3- 3 | 700MB | 100 | 115 | 966 | 2798 | 19/12 | CIRC | | 25 | 4 | CLSD WC | |
| 52 | 151000Z | 19.0N 115.0E | 54-P- 3- 3 | 700MB | 100 | 130 | 962 | 2780 | 19/11 | CIRC | | 20 | 5 | CLASSIC RDR PRES | |
| 53 | 151300Z | 19.3N 114.6E | 54-P- 5- 5 | 700MB | 90 | ---- | 961 | 2768 | 19/11 | CIRC | | 25 | 5 | CLSD WC | |
| 54 | 151400Z | 19.2N 114.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 55 | 151500Z | 19.3N 114.8E | 54-P- 3- 3 | 700MB | 100 | ---- | 959 | 2746 | 19/14 | CIRC | | 25 | 5 | CLSD WC | |
| 56 | 151912Z | 19.6N 114.5E | VQ-R- 3- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 13 | -- | WC OPEN W | 18.9N 114.8E |
| 57 | 152100Z | 19.9N 114.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 58 | 152220Z | 19.9N 114.3E | VQ-R- 3- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | -- | WC OPEN S | 18.7N 114.6E |
| 59 | 160000Z | 20.2N 114.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 60 | 160015Z | 20.1N 114.1E | VQ-R- 7- 3 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | -- | WC OPEN W | 19.3N 115.2E |
| 61 | 160100Z | 20.5N 114.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 62 | 160200Z | 20.5N 114.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 63 | 160300Z | 20.6N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 64 | 160400Z | 20.8N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 65 | 160500Z | 20.8N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 66 | 160600Z | 20.9N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 67 | 160646Z | 21.0N 114.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.5 | | | | | | | RAGGED EYE | |
| 68 | 160700Z | 21.0N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 69 | 160900Z | 21.2N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |
| 70 | 161100Z | 21.4N 114.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-VHHH | 22.3N 114.2E |

TYPHOON ROSE

0000Z 10 AUG TO 0000Z 17 AUG

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 100000Z | 14.6N 142.2E | 45 | 14.3N 142.2E | 30 | 18 | -15 | 15.3N 138.2E | 45 | 72 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 100600Z | 15.1N 141.3E | 60 | 14.8N 141.1E | 65 | 21 | 5 | 16.5N 137.6E | 90 | 50 | 35 | 17.8N 134.3E | 110 | 194 | 30 | --.- ---.- | -- | -- | -- |
| 101200Z | 15.5N 140.5E | 65 | 15.5N 140.5E | 70 | 0 | 5 | 16.8N 136.8E | 95 | 86 | 35 | 18.1N 133.7E | 115 | 246 | 25 | 19.8N 130.7E | 130 | 433 | 60 |
| 101800Z | 15.9N 139.7E | 70 | 15.8N 139.8E | 70 | 8 | 0 | 17.0N 136.6E | 95 | 149 | 30 | 18.3N 133.2E | 115 | 303 | 20 | --.- ---.- | -- | -- | -- |
| 110000Z | 16.5N 138.3E | 65 | 16.3N 138.4E | 75 | 13 | 10 | 17.7N 134.5E | 100 | 130 | 30 | 19.3N 131.1E | 110 | 288 | 10 | 21.1N 128.3E | 120 | 482 | 60 |
| 110600Z | 17.1N 136.8E | 55 | 17.1N 136.8E | 60 | 0 | 5 | 19.0N 131.8E | 60 | 103 | -20 | 21.2N 128.3E | 60 | 283 | -45 | --.- ---.- | -- | -- | -- |
| 111200Z | 16.8N 135.3E | 60 | 17.4N 135.0E | 45 | 46 | -15 | 19.4N 131.0E | 30 | 141 | -60 | 21.3N 126.8E | 45 | 292 | -65 | 23.1N 123.0E | 60 | 413 | -15 |
| 111800Z | 16.8N 133.8E | 65 | 17.8N 134.6E | 40 | 75 | -25 | 19.9N 129.9E | 40 | 173 | -55 | 21.8N 125.7E | 50 | 335 | -45 | --.- ---.- | -- | -- | -- |
| 120000Z | 17.1N 132.3E | 70 | 16.9N 132.2E | 25 | 13 | -45 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 120600Z | 17.5N 130.9E | 80 | 17.5N 131.0E | 65 | 6 | -15 | 19.7N 126.3E | 80 | 143 | -25 | 22.0N 122.4E | 80 | 314 | 10 | --.- ---.- | -- | -- | -- |
| 121200Z | 17.6N 129.4E | 90 | 17.9N 129.4E | 70 | 18 | -20 | 20.1N 124.4E | 80 | 160 | -30 | 22.3N 120.3E | 80 | 295 | 5 | 24.8N 117.0E | 30 | 358 | -70 |
| 121800Z | 17.7N 127.9E | 95 | 18.5N 128.1E | 70 | 49 | -25 | 20.6N 123.3E | 80 | 205 | -15 | 23.0N 119.4E | 75 | 326 | -5 | --.- ---.- | -- | -- | -- |
| 130000Z | 17.7N 126.3E | 100 | 17.8N 126.4E | 95 | 8 | -5 | 19.2N 120.0E | 95 | 108 | 15 | 21.5N 115.7E | 90 | 193 | 5 | --.- ---.- | -- | -- | -- |
| 130600Z | 17.7N 124.9E | 105 | 17.7N 125.0E | 100 | 6 | -5 | 18.9N 119.1E | 85 | 87 | 15 | 21.0N 114.0E | 90 | 169 | -10 | --.- ---.- | -- | -- | -- |
| 131200Z | 17.6N 123.4E | 110 | 17.7N 123.4E | 95 | 6 | -15 | 19.4N 117.6E | 85 | 111 | 10 | 21.8N 112.7E | 80 | 206 | -25 | --.- ---.- | -- | -- | -- |
| 131800Z | 17.6N 122.0E | 95 | 17.7N 122.0E | 85 | 18 | -10 | 19.3N 116.7E | 85 | 90 | 5 | 21.9N 112.6E | 80 | 185 | -35 | --.- ---.- | -- | -- | -- |
| 140000Z | 17.6N 120.7E | 80 | 17.3N 120.8E | 60 | 8 | -20 | 19.3N 115.6E | 75 | 69 | -10 | 22.1N 111.6E | 40 | 196 | -80 | --.- ---.- | -- | -- | -- |
| 140600Z | 17.5N 119.5E | 70 | 17.0N 119.7E | 65 | 13 | -5 | 19.6N 115.0E | 80 | 69 | -20 | 22.3N 111.3E | 40 | 181 | -75 | --.- ---.- | -- | -- | -- |
| 141200Z | 17.7N 118.4E | 75 | 17.6N 118.7E | 70 | 18 | -5 | 18.6N 114.4E | 85 | 45 | -20 | 20.4N 111.0E | 85 | 178 | -25 | --.- ---.- | -- | -- | -- |
| 141800Z | 17.9N 117.3E | 80 | 17.7N 117.5E | 75 | 16 | -5 | 19.1N 113.6E | 85 | 66 | -30 | 20.9N 110.3E | 70 | 217 | -20 | --.- ---.- | -- | -- | -- |
| 150000Z | 18.3N 116.2E | 85 | 18.7N 116.0E | 80 | 26 | -5 | 21.0N 112.1E | 80 | 137 | -40 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 150600Z | 18.6N 115.6E | 100 | 18.0N 115.7E | 75 | 6 | -25 | 20.4N 112.3E | 75 | 96 | -40 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 151200Z | 19.1N 115.0E | 105 | 19.1N 114.7E | 100 | 17 | -5 | 21.1N 111.5E | 90 | 140 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 151800Z | 19.5N 114.5E | 115 | 19.4N 114.5E | 105 | 6 | -10 | 21.4N 112.0E | 90 | 118 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 160000Z | 20.0N 114.3E | 120 | 20.0N 114.1E | 100 | 11 | -20 | 22.3N 112.5E | 70 | 69 | 35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 160600Z | 20.6N 114.0E | 115 | 21.0N 113.9E | 95 | 25 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161200Z | 21.4N 114.0E | 110 | 21.5N 113.9E | 90 | 8 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161800Z | 22.3N 113.9E | 90 | 22.0N 113.9E | 85 | 18 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170000Z | 23.1N 113.4E | 35 | 23.1N 113.1E | 50 | 16 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 17NM | 109NM | 245NM | 422NM | 17NM | 109NM | 245NM | 422NM |
| AVERAGE RIGHT ANGLE ERROR | 13NM | 83NM | 152NM | 222NM | 13NM | 83NM | 152NM | 222NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 13KTS | 26KTS | 30KTS | 30KTS | 13KTS | 26KTS | 30KTS | 30KTS |
| AVERAGE BIAS OF WIND ERROR | -10KTS | -8KTS | -10KTS | -8KTS | -10KTS | -8KTS | -10KTS | -8KTS |
| NUMBER OF FORECASTS | 29 | 24 | 18 | 4 | 29 | 24 | 18 | 4 |


BEST TRACK
TYPHOON SHIRLEY
12-17 AUG 1971
CYCLONE 22
MAX SFC WND - 90kts
MINIMUM SLP - 955mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
KURIL ISLANDS
BONIN ISLANDS
VOLCANO ISLANDS
MARCUS ISLAND
WAKE ISLAND
17/06Z
12/12Z

## SHIRLEY

Forming from a disturbance caused by an upper-level circulation in the mid-Pacific trough, the first signs of Shirley's surface inducement came from the HAWAII BEAR on the 11th, which confirmed the existence of a circulation 300 n mi southwest of Marcus Island. Aircraft reconnaissance early on the 13th revealed the status of the system as a tropical storm with 55-kt winds and placed Shirley some 250 n mi southeast of Iwo Jima (Figure 5-33).

Situated in a weakness area in the subtropical ridge, the storm remained quasi-stationary for 12 hours before she shifted to a northerly course at 5 kt and acquired typhoon strength during the evening of the 13th.

Continuing on a northerly course along the western periphery of a high cell centered south of Ocean Station Victor, Shirley's forward movement gradually increased to 15 kt over the next four days (Figure 5-34). Maximum winds during her lifetime reached 90 kt on the 16th at a position 400 miles east-southeast of Tokyo.

As the westerlies began to take hold, she shifted course toward the northeast accelerating to 40 kt but retaining her intensity. Late on the 17th, Shirley transformed to extratropical characteristics east of Hokkaido.

Invaluable service was furnished by the Norweigen ship BONNEVILLE which responded to Fleet Weather Central Guam's request for three-hourly ship reports during the uncertain forecast period from the 12th to the 14th. Peak winds of 42 kt were experienced by the BONNEVILLE early in the morning of the 12th.

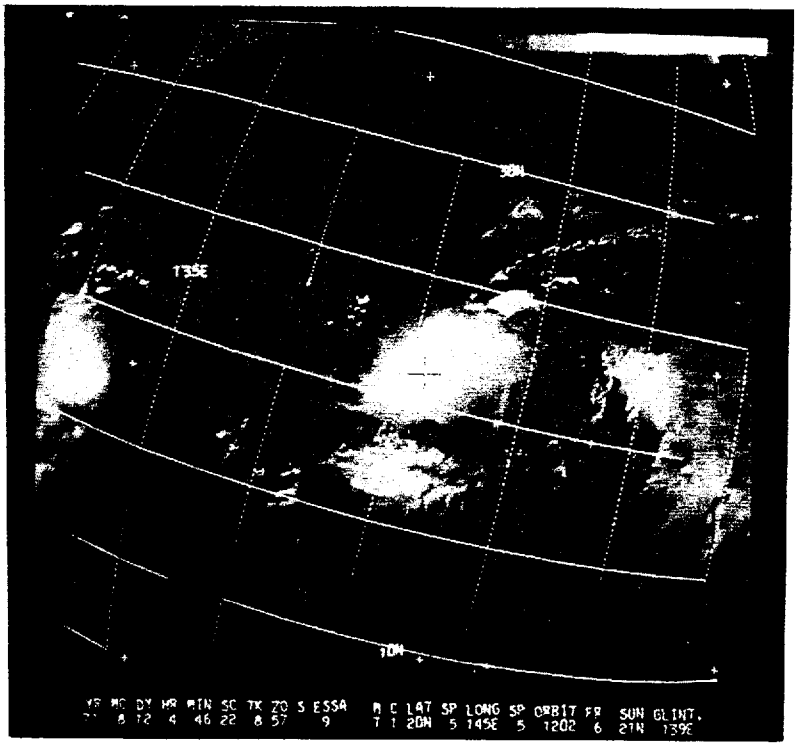



FIGURE 5-33. SHIRLEY AS A RECENTLY-DEVELOPED STORM BETWEEN MARCUS AND IWO JIMA ON 12 AUGUST. TROPICAL SYSTEM SEEN ON WESTERN PORTION OF ESSA-9 IS TYPHOON ROSE.

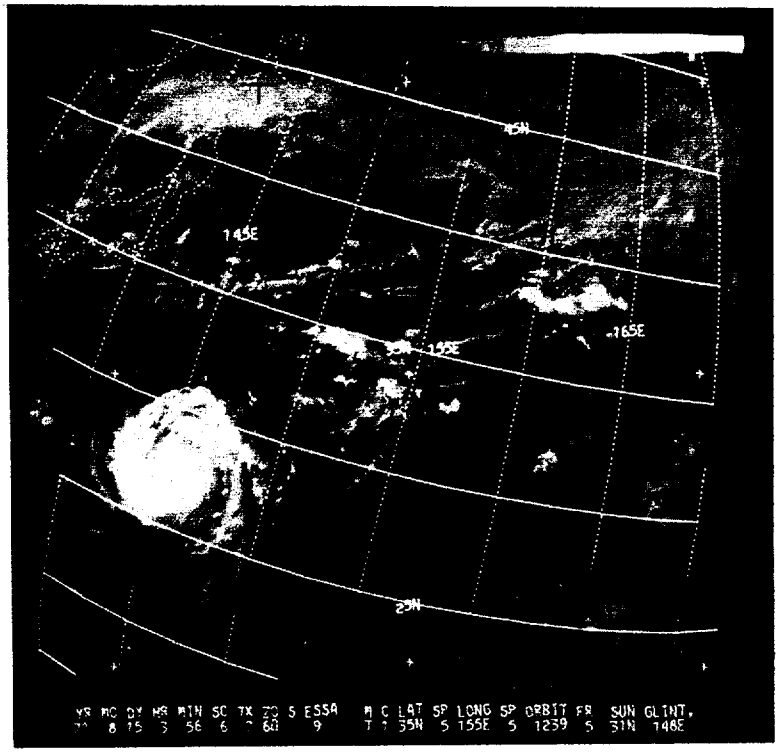



FIGURE 5-34. ESSA-9 SATELLITE VIEW OF TYPHOON SHIRLEY LOCATED EAST OF CHI CHI JIMA ISLAND ON 15 AUGUST.

TYPHOON SHIRLEY
EYE FIXES FOR CYCLONE NO. 22
12 AUG - 17 AUG 71

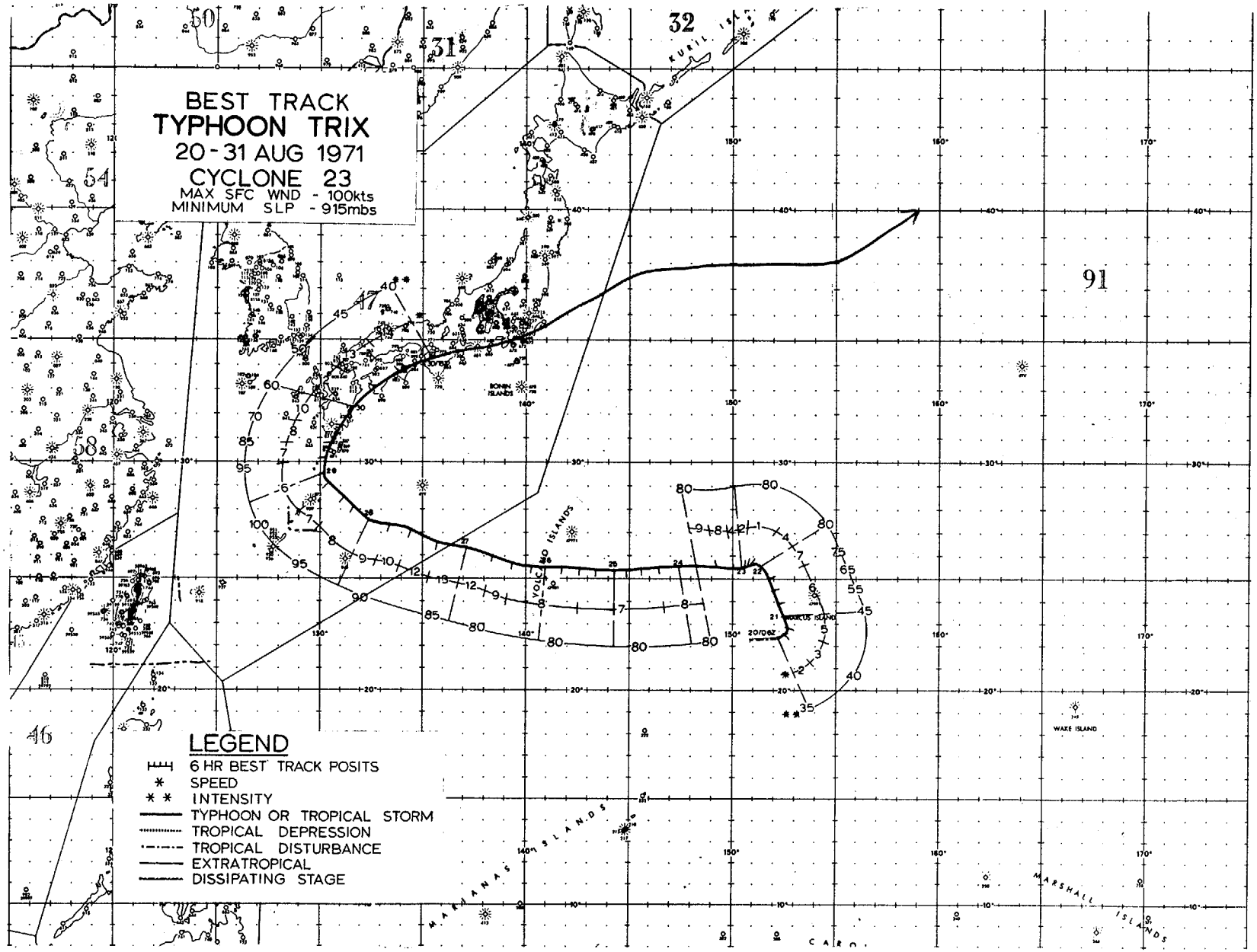
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 110348Z | 17.5N 150.5E | SATELIT--- | STG B | | | | | | | | | | FIRST BLTN | |
| 2 | 112330Z | 22.0N 148.9E | 54-P-30- 3 | 700MB | 23 | 20 | ---- | ---- | --/-- | ---- | ----- | -- | -- | CNTR DIA 15NM | |
| 3 | 120446Z | 21.5N 146.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | NO EYE VISIBLE | |
| 4 | 130000Z | 21.1N 144.1E | 54-P-10--- | 700MB | 20 | 25 | 1000 | 3097 | 12/10 | ---- | ----- | -- | -- | NO WC | |
| 5 | 130100Z | 22.6N 145.1E | 54-P- 6- 6 | 700MB | 45 | 75 | 992 | 3045 | 16/12 | ---- | ----- | 10 | -- | WC S AND SW QUAD | |
| 6 | 130350Z | 23.0N 144.0E | SATELIT--- | STG C+ | | | | | | | | | | LITTLE CHG | |
| 7 | 130400Z | 22.7N 144.8E | 54-P- 3- 5 | 700MB | 45 | 75 | 992 | 3021 | 16/12 | ---- | ----- | 10 | -- | WC S AND SW | |
| 8 | 131029Z | 22.3N 144.8E | VQ-R- 5-15 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 35 | 8 | WC OPEN NW | 22.6N 145.6E |
| 9 | 131120Z | 22.8N 144.5E | VQ-R------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | 24.6N 145.0E |
| 10 | 131550Z | 23.3N 144.1E | VQ-P-10- 5 | 700MB | ---- | 65 | 980 | 3008 | 15/12 | ---- | ----- | 30 | -- | WC OPEN N | |
| 11 | 132200Z | 24.1N 144.2E | 54-P- 5-10 | 700MB | 50 | 70 | 984 | 2947 | 13/11 | ---- | ----- | 30 | -- | WC OPEN NW | |
| 12 | 140425Z | 24.7N 144.9E | 54-P- 5--- | 700MB | 75 | 65 | 982 | 2908 | 10/08 | ---- | ----- | 35 | 3 | POORLY DEF - 700 CNTR 5NM W | |
| 13 | 140448Z | 25.0N 144.5E | SATELIT--- | STG C+ | | | | | | | | | | LITTLE CHG | |
| 14 | 141000Z | 24.8N 145.0E | 54-P- 3- 5 | 700MB | 60 | ---- | 975 | 2890 | 14/11 | ---- | ----- | 25 | -- | VERY POORLY DEF | |
| 15 | 141545Z | 25.7N 145.3E | 54-P- 3- 3 | 700MB | 65 | ---- | 974 | 2865 | 17/11 | ---- | ----- | 10 | 2 | WC OPEN NE | |
| 16 | 142220Z | 26.8N 145.1E | 54-P-10--- | 700MB | ---- | 65 | 969 | 2832 | 14/09 | ---- | ----- | 30 | -- | CLSD WC | |
| 17 | 150330Z | 27.6N 145.1E | 54-P-12--- | 700MB | 50 | 60 | 966 | 2804 | 14/10 | ---- | ----- | 10 | -- | CLSD WC | |
| 18 | 150356Z | 27.5N 145.5E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | SMALL EYE VSBL | |
| 19 | 151146Z | 28.7N 145.4E | VQ-R-10- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 16 | 8 | WC OPEN NE | 27.1N 143.8E |
| 20 | 151522Z | 29.7N 145.8E | VQ-R-10- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | 17 | -- | WC OPEN SW-ROTATT NE 200 DEG/6HR | 29.8N 144.8E |
| 21 | 152223Z | 31.1N 145.4E | 54-P- 6- 2 | 700MB | 85 | 90 | 958 | 2725 | 13/11 | ---- | ----- | 20 | 4 | OPEN NW SEMIC 700 CNTR 7NM N | |
| 22 | 160400Z | 32.1N 145.9E | 54-P- 2- 2 | 700MB | 85 | 90 | 958 | 2743 | 15/11 | ---- | ----- | 20 | 3 | SAME AS 04Z RMK | |
| 23 | 160455Z | 32.5N 146.0E | SATELIT--- | STG C+ | | | | | | | | | | LITTLE CHG | |
| 24 | 161010Z | 34.0N 146.4E | 54-P-14--- | 700MB | 40 | ---- | 966 | 2816 | 16/14 | ---- | ----- | 60 | -- | 700 WIND CNTR 15 NM N OF RDR CNTR | |
| 25 | 161215Z | 34.5N 147.3E | 54-P------ | 700MB | 45 | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | FL CNTR IS IN NE QUAD OF RDR CNTR | |
| 26 | 161600Z | 35.8N 148.7E | 54-P-20--- | 700MB | ---- | ---- | 966 | 2813 | 15/15 | ---- | ----- | 60 | -- | WC DISSIPATING | |
| 27 | 162241Z | 38.1N 149.9E | VQ-P-10- 5 | 700MB | ---- | 100 | 961 | 2807 | 19/18 | ---- | ----- | 16 | 7 | WC OPEN W | |
| 28 | 170400Z | 40.8N 152.5E | 54-P-10- 5 | 700MB | 78 | 100 | 955 | 2679 | 16/-- | ---- | ----- | -- | -- | NO WC | |
| 29 | 170402Z | 41.0N 152.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | RAGGED EYE | |
| 30 | 170700Z | 42.5N 153.8E | 54-P------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | BASED ON CLD CIRC | |

TYPHOON SHIRLEY

1200Z 12 AUG TO 0600Z 17 AUG

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 121200Z | 22.2N 146.7E | 45 | 22.0N 146.0E | 45 | 41 | 0 | 22.7N 140.7E | 60 | 200 | -5 | 24.2N 135.8E | 70 | 513 | -5 | 25.6N 130.7E | 75 | 802 | -10 |
| 121800Z | 22.3N 145.9E | 50 | 22.0N 144.7E | 45 | 69 | -5 | 22.9N 139.4E | 60 | 261 | -10 | 24.4N 134.5E | 70 | 591 | -10 | --.- ---.- | -- | -- | -- |
| 130000Z | 22.5N 145.2E | 55 | 22.5N 144.2E | 55 | 55 | 0 | 23.0N 139.7E | 70 | 260 | 0 | 24.2N 135.5E | 75 | 552 | -5 | 25.4N 131.4E | 80 | 824 | -10 |
| 130600Z | 22.8N 144.7E | 60 | 22.6N 144.5E | 70 | 16 | 10 | 23.1N 140.8E | 85 | 229 | 10 | 24.0N 136.6E | 95 | 527 | 10 | --.- ---.- | -- | -- | -- |
| 131200Z | 23.1N 144.3E | 65 | 22.8N 143.5E | 70 | 48 | 5 | 23.3N 139.9E | 80 | 310 | 5 | 24.3N 135.6E | 90 | 591 | 5 | 25.4N 131.4E | 100 | 967 | 10 |
| 131800Z | 23.6N 144.1E | 70 | 23.3N 144.2E | 70 | 19 | 0 | 23.3N 143.2E | 80 | 197 | 0 | 23.4N 138.9E | 90 | 526 | 5 | --.- ---.- | -- | -- | -- |
| 140000Z | 24.1N 144.3E | 70 | 24.1N 144.2E | 65 | 5 | -5 | 23.1N 144.0E | 70 | 238 | -10 | 23.0N 139.7E | 75 | 594 | -15 | 23.3N 135.3E | 85 | 1174 | -10 |
| 140600Z | 24.5N 144.7E | 75 | 24.6N 145.2E | 65 | 28 | -10 | 23.0N 143.7E | 65 | 305 | -20 | 23.0N 139.4E | 75 | 683 | -15 | --.- ---.- | -- | -- | -- |
| 141200Z | 25.2N 145.2E | 75 | 24.8N 145.0E | 65 | 26 | -10 | 24.4N 144.5E | 75 | 284 | -10 | 24.0N 141.5E | 85 | 687 | 0 | --.- ---.- | -- | -- | -- |
| 141800Z | 26.0N 145.3E | 80 | 26.0N 145.4E | 75 | 5 | -5 | 28.4N 145.5E | 85 | 102 | 0 | 31.8N 146.8E | 85 | 283 | 0 | --.- ---.- | -- | -- | -- |
| 150000Z | 26.9N 145.3E | 80 | 27.1N 145.3E | 80 | 12 | 0 | 30.1N 145.0E | 75 | 87 | -15 | 33.3N 148.4E | 45 | 311 | -45 | --.- ---.- | -- | -- | -- |
| 150600Z | 27.9N 145.3E | 85 | 28.0N 145.1E | 80 | 12 | -5 | 31.7N 145.3E | 60 | 78 | -30 | 34.2N 151.7E | 35 | 446 | -55 | --.- ---.- | -- | -- | -- |
| 151200Z | 29.1N 145.3E | 85 | 28.8N 145.3E | 75 | 18 | -10 | 32.2N 146.1E | 55 | 143 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 151800Z | 30.1N 145.3E | 85 | 29.9N 145.5E | 70 | 16 | -15 | 33.9N 148.0E | 50 | 146 | -35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 160000Z | 31.6N 145.5E | 90 | 31.5N 145.5E | 85 | 0 | -5 | 35.6N 151.0E | 55 | 166 | -35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 160600Z | 32.9N 145.9E | 90 | 32.5N 146.2E | 85 | 28 | -5 | 36.2N 152.3E | 50 | 324 | -40 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161200Z | 34.5N 146.9E | 85 | 33.3N 146.9E | 70 | 72 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 161800Z | 36.3N 148.6E | 85 | 36.2N 149.6E | 65 | 49 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170000Z | 38.3N 150.2E | 90 | 38.7N 150.1E | 80 | 24 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 170600Z | 41.6N 153.0E | 90 | 4 .0N 153.4E | 85 | 30 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 29NM | 208NM | 525NM | 942NM | 29 M | 208NM | 525NM | 942NM |
| AVERAGE RIGHT ANGLE ERROR | 18NM | 112NM | 321NM | 672NM | 18NM | 112NM | 321NM | 672NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 7KTS | 16KTS | 14KTS | 10KTS | 7KTS | 16KTS | 14KTS | 10KTS |
| AVERAGE BIAS OF WIND ERROR | -6KTS | -14KTS | -11KTS | -3KTS | -6KTS | -14KTS | -11KTS | -3KTS |
| NUMBER OF FORECASTS | 20 | 16 | 12 | 4 | 20 | 16 | 12 | 4 |


BEST TRACK
TYPHOON TRIX
20 - 31 AUG 1971
CYCLONE 23
MAX SFC WND - 100kts
MINIMUM SLP - 915mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
KURIL ISLANDS
BONIN ISLANDS
VOLCANO ISLANDS
MARIANAS ISLANDS
MARSHALL ISLANDS
WAKE ISLAND
20/06Z

# TRIX

A disturbance created by an upper-level circulation in the mid-Pacific trough gave birth to a surface circulation, later to be Trix, some 200 n mi southwest of Marcus Island on the 19th. By the following day, winds of tropical-storm force were being generated in the system.

A stationary short-wave trough in the westerlies over the Kuril Islands had broken down the subtropical ridge in the general longitude of the typhoon, thus providing little steering current to Trix. The storm drifted northward at 6-7 kt (Figure 5-35) attaining typhoon-force strength the night of the 21st 100 n mi west of Marcus Island.

On the 22nd the storm remained nearly stationary for 24 hours, then in response to strengthening of the ridge, Trix began a westward track on a heading that took her near Iwo Jima on the morning of the 26th. Winds of 35 kt with gusts to 45 kt were recorded on the island as the typhoon passed 40 n mi to the north.

The storm then took aim for the northern Ryukyus and began a slow intensification on the 27th. Prior to recurvature, Trix slowed to 8 kt (Figure 5-36) and her central pressure began to plummet some 30 mb in 24 hours--an unusual phenomena for a typhoon at such a relatively high latitude. About 30 miles south of Yaku-Shima Island aircraft reconnaissance measured a minimum pressure of 915 mb within a tight 8 n mi eye. In spite of the abnormally low pressure, maximum sustained winds did not appear to exceed the 100-kt level as determined by aircraft. Maximum-observed wind in the Ryukyus was reported by Yaku-Shima station with 66 kt gusting to 96 kt as the center of Trix passed 20 n mi to its west.

Following three weeks after Olive, Trix struck Kyushu at Cape Sata in the early morning of the 30th. She then paralleled the Japan coast line emerging from the Boso Peninsula as an extratropical system. The typhoon brought torrential rains to the Japanese islands with as much as 43 inches recorded in the mountainous terrain of Kyushu (Yangitake, Miyazaki prefecture). The huge rainfall flooded many rivers and streams and caused numerous landslides. In addition the weather halted the National Railways in Kyushu and paralyzed the nation's air and surface transport systems.

Fourty-four deaths were reported, over 1,000 dwellings were partially or completely destroyed and over 120,000 homes were flooded. A total of 50.6 million dollars (U.S.) was lost in damages sustained to the rice, fruit and vegetable crops. In addition, a series of tornadoes swept through the coastal part of Chiba City accounting for one death as the weakened extratropical stages of Trix passed back out to sea.

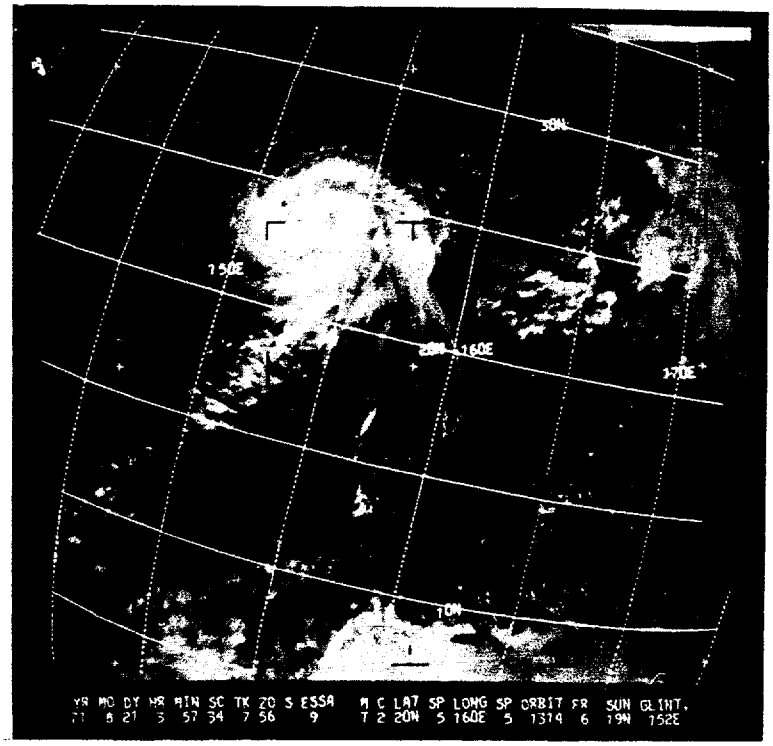



FIGURE 5-35. TRIX AS SIGHTED BY ESSA-9 WHILE A TROPICAL STORM JUST WEST OF MARCUS ISLAND ON 21 AUGUST.

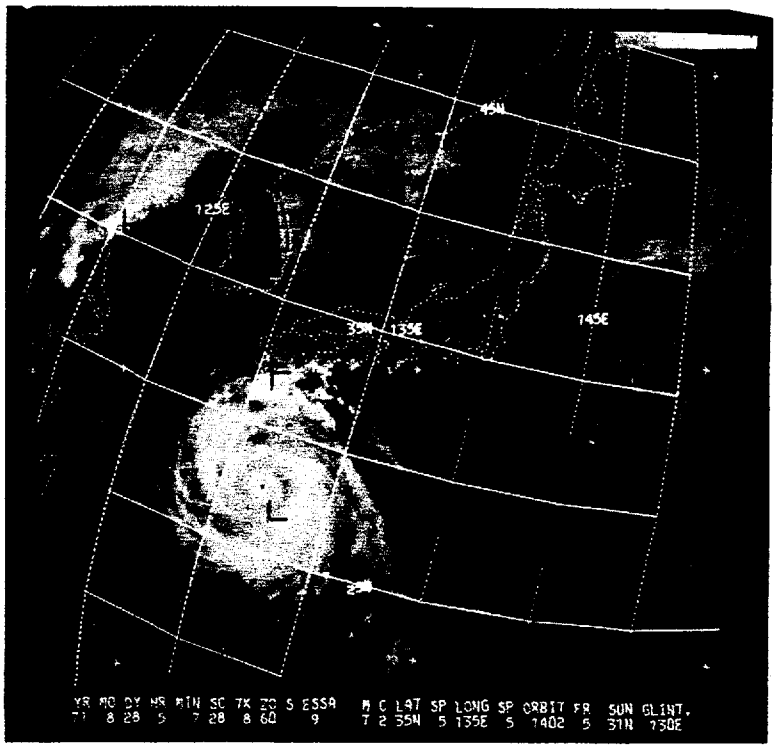



FIGURE 5-36. ESSA-9 PHOTO OF TYPHOON TRIX EAST OF THE RYUKYU CHAIN ON 28 AUGUST.

TYPHOON TRIX
EYE FIXES FOR CYCLONE NO. 23
20 AUG - 31 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200250Z | 22.4N 152.1E | 54-P- 7- 2 | 700MB | 38 | 35 | 996 | 3042 | 12/10 | CIRC | | 20 | -- | SPIRALING SC | |
| 2 | 200454Z | 22.5N 152.5E | SATELIT--- | STG C | | | | | | | | | | COMMA SHAPED CLD | |
| 3 | 202120Z | 23.1N 152.7E | 54-P-12--- | 700MB | 30 | 40 | 992 | 3002 | 11/09 | ---- | ----- | -- | -- | VISUAL SFC CNTR | |
| 4 | 202200Z | 23.1N 152.6E | 54-P-12--- | 700MB | 30 | 40 | 994 | 3000 | 11/09 | ---- | ----- | -- | -- | VISUAL SFC CNTR | |
| 5 | 210330Z | 23.6N 152.2E | 54-P-11--- | 700MB | 33 | 45 | 987 | 2984 | 13/10 | ---- | ----- | -- | -- | WC FORMING-700 CNTR 3NM NW | |
| 6 | 210358Z | 23.5N 152.0E | SATELIT--- | STG C | | | | | | | | | | BETTER ORGANIZED | |
| 7 | 211020Z | 24.3N 152.0E | VQ-P- 3--- | ----- | ---- | 45 | 985 | ---- | 26/23 | ELIP | SE-NW | 35X30 | -- | WC FORMING | |
| 8 | 211528Z | 24.7N 152.0E | VQ-P- 3--- | ----- | ---- | 65 | 978 | ---- | 27/23 | CIRC | | 30 | 10 | WC OPEN N | |
| 9 | 220200Z | 25.5N 151.1E | 54-P- 5--- | 700MB | 65 | 70 | 970 | 2841 | 14/12 | CIRC | | 30 | -- | WC OPEN NW-SFC CNTR 10NM SW | |
| 10 | 220410Z | 25.6N 151.0E | 54-P- 3--- | 700MB | 70 | 60 | 970 | 2841 | 17/13 | ELIP | NE-SW | 25X10 | -- | WC WEAKENING | |
| 11 | 220456Z | 25.5N 151.5E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | SMALL EYE VISIBLE | |
| 12 | 221930Z | 25.5N 150.6E | 54-P- 5--- | 700MB | 66 | 70 | 967 | 2813 | 15/10 | CIRC | | 20 | -- | WC OPEN W | |
| 13 | 222248Z | 25.8N 150.7E | 54-P------ | 700MB | ---- | ---- | ---- | 2792 | 14/-- | ---- | ----- | -- | -- | | |
| 14 | 230210Z | 25.3N 150.4E | 54-P-10--- | 700MB | 70 | 75 | 963 | 2780 | 14/10 | ELIP | NE-SW | 35X20 | -- | CLSD WC | |
| 15 | 230404Z | 25.5N 150.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | SMALL EYE VISIBLE | |
| 16 | 231105Z | 25.5N 149.1E | VQ-R- 8- 7 | ----- | ---- | ---- | ---- | ---- | --/-- | ELIP | E-W | 40X34 | 9 | CLSD WC | 26.0N 150.0E |
| 17 | 231545Z | 25.3N 148.4E | VQ-P- 6- 2 | 700MB | ---- | 80 | 967 | 2819 | 25/22 | CIRC | | 30 | -- | WC OPEN N | |
| 18 | 232145Z | 25.4N 147.0E | 54-P- 5- 5 | 700MB | 60 | ---- | 962 | 2771 | 15/11 | CIRC | | 25 | -- | WEAK RDR PRES | |
| 19 | 240320Z | 25.4N 146.8E | 54-P-10- 2 | 700MB | 75 | 65 | 961 | 2762 | 16/13 | CIRC | | 30 | -- | CLSD WC | |
| 20 | 240458Z | 25.5N 146.5E | SATELIT--- | STG X | DIA | 2 | CAT 2.5 | | | | | | | | |
| 21 | 241545Z | 25.3N 145.3E | VQ-P- 3- 3 | 700MB | ---- | ---- | 964 | 2795 | 13/09 | CIRC | | 32 | 10 | CLSD WC | |
| 22 | 242200Z | 25.2N 144.4E | 54-P- 5--- | 700MB | 65 | ---- | 959 | 2726 | 14/12 | CIRC | | 30 | -- | CLSD WC-FL CNTR | |
| 23 | 250406Z | 25.0N 144.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | EYE VISIBLE | |
| 24 | 250410Z | 25.2N 143.9E | 54-P- 5- 3 | 700MB | 85 | 80 | 962 | 2765 | 16/10 | CIRC | | 30 | -- | CLSD WC | |
| 25 | 250938Z | 25.8N 143.1E | VQ-R- 5- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 17 | 6 | POOR RDR PRES | 25.7N 144.2E |
| 26 | 251555Z | 25.6N 142.1E | VQ-P- 2- 4 | 700MB | ---- | ---- | 955 | 2804 | 18/14 | CIRC | | 22 | -- | HOLE IN SEA RETRN | |
| 27 | 252200Z | 25.4N 141.2E | 54-P- 2- 2 | 700MB | 43 | 75 | 963 | 2752 | 13/12 | CIRC | | 15 | 3 | WC OPEN W SEMIC-700 CNTR 1NM S | |
| 28 | 260300Z | 25.4N 140.5E | 54-P- 4- 2 | 700MB | 69 | 55 | 961 | 2749 | 13/10 | ---- | ----- | -- | -- | BCMG DISORG | |
| 29 | 260500Z | 25.5N 140.2E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | EYE FAINTLY VSBL | |
| 30 | 260950Z | 25.6N 139.7E | VQ-R- 2--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | 10 | WC OPEN N SEMIC | 26.1N 139.5E |
| 31 | 261520Z | 25.7N 138.6E | VQ-P- 3--- | 700MB | ---- | ---- | 967 | 2782 | 14/10 | CIRC | | 12 | 8 | WC OPEN NW SEMIC | |
| 32 | 262155Z | 26.2N 137.7E | 54-P- 2-13 | 700MB | 40 | 70 | 966 | 2783 | 15/13 | CIRC | | 20 | 3 | POORLY DEFINED-700 CNTR 5NM S | |
| 33 | 262345Z | 26.2N 137.6E | 54-P------ | 700MB | ---- | ---- | ---- | 2865 | 13/-- | ---- | ----- | -- | -- | | |
| 34 | 270206Z | 26.5N 136.5E | 54-P- 2-13 | 700MB | 60 | 90 | 960 | 2752 | 14/14 | CIRC | | 10 | 5 | POORLY DEFINED | |
| 35 | 270310Z | 26.5N 136.3E | 54-P- 2-18 | 700MB | 60 | 90 | 962 | 2752 | 14/13 | CIRC | | 10 | 5 | POORLY DEFINED | |
| 36 | 270559Z | 26.5N 136.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | EYE VSBL LTL CHG 700MB FIX | |
| 37 | 270933Z | 26.7N 135.3E | VQ-R- 5--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 12 | 8 | CLSD WC | 26.5N 134.8E |
| 38 | 271537Z | 27.3N 133.8E | VQ-P- 5--- | 700MB | ---- | ---- | 955 | 2697 | 17/13 | ELIP | N-S | 14X11 | 10 | CLSD WC | |
| 39 | 272130Z | 27.5N 132.0E | VQ-R- 8--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 13 | 10 | WC OPEN NE QUAD | 28.2N 132.1E |
| 40 | 272200Z | 27.5N 132.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 41 | 272300Z | 27.5N 132.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 42 | 280000Z | 27.6N 132.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 43 | 280100Z | 27.6N 132.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 44 | 280100Z | 27.6N 131.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 45 | 280125Z | 27.7N 132.2E | VQ-P- 5--- | 700MB | ---- | ---- | 953 | 2694 | 16/10 | CIRC | | 18 | 8 | WC OPEN NE QUAD | |

TYPHOON TRIX
EYE FIXES FOR CYCLONE NO. 23
20 AUG - 31 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 280200Z | 27.6N 132.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 47 | 280300Z | 27.7N 132.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 48 | 280357Z | 27.9N 131.9E | VQ-P- 3--- | 700MB | ---- | ---- | 953 | 2690 | 15/12 | CIRC | | 20 | 8 | CLSD WC | |
| 49 | 280400Z | 27.8N 132.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 50 | 280400Z | 27.7N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 51 | 280500Z | 27.9N 131.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 52 | 280500Z | 27.8N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 53 | 280507Z | 27.5N 132.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.5 | | | | | | | EYE VSBL LTL CHG | |
| 54 | 280600Z | 28.0N 131.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 55 | 280600Z | 28.1N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 56 | 280700Z | 28.1N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 57 | 280700Z | 28.1N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 58 | 280700Z | 28.3N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 59 | 280717Z | 28.2N 131.6E | 54-P- 1-14 | 700MB | 32 | 85 | 942 | 2591 | 16/12 | CIRC | | 25 | 5 | CLSD WC-700 CNTR ON WEDGE OF WC | |
| 60 | 280800Z | 28.3N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 61 | 280800Z | 28.2N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 62 | 280800Z | 28.4N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 63 | 280800Z | 28.2N 131.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 64 | 280900Z | 28.4N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 65 | 280900Z | 28.5N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 66 | 280900Z | 28.2N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 67 | 280937Z | 28.4N 131.4E | 54-P- 1- 9 | 700MB | 40 | 80 | 941 | 2566 | 17/14 | CIRC | | 20 | 5 | WC OPEN SF | |
| 68 | 281000Z | 28.5N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 69 | 281000Z | 28.2N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | OKINAWA RDR | |
| 70 | 281000Z | 28.7N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 71 | 281000Z | 28.5N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 72 | 281100Z | 28.7N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 73 | 281100Z | 28.6N 131.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 74 | 281100Z | 28.8N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 75 | 281200Z | 28.7N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 76 | 281200Z | 28.9N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 77 | 281200Z | 28.8N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 78 | 281300Z | 28.8N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 79 | 281300Z | 28.8N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 80 | 281300Z | 29.0N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 81 | 281300Z | 28.8N 131.0E | 54-P- 1- 9 | 700MB | 75 | ---- | 927 | 2536 | 18/15 | CIRC | | 20 | 5 | CLSD WC-FL FIX | |
| 82 | 281400Z | 29.0N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 83 | 281400Z | 29.1N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 84 | 281400Z | 28.9N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 85 | 281500Z | 29.2N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 86 | 281500Z | 29.0N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 87 | 281510Z | 29.0N 130.6E | 54-P- 1- 9 | 700MB | 65 | ---- | 936 | 2539 | 19/16 | CIRC | | 20 | 5 | CLSD WC-FL FIX | |
| 88 | 281600Z | 29.1N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 89 | 281800Z | 29.3N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 90 | 281800Z | 29.3N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 91 | 281800Z | 29.3N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 92 | 281900Z | 29.3N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 93 | 281900Z | 29.4N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 94 | 281900Z | 29.3N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |

TYPHOON TRIX
EYE FIXES FOR CYCLONE NO. 23

20 AUG - 31 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95 | 281920Z | 29.6N 130.3E | 54-P- 5- 5 | 700MB | 90 | ---- | 921 | 2414 | 24/13 | CIRC | | 10 | 5 | CLSD WC | |
| 96 | 282010Z | 29.4N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 97 | 282100Z | 29.4N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 98 | 282110Z | 29.4N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 99 | 282200Z | 29.5N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 100 | 282200Z | 29.4N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 101 | 282210Z | 29.4N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 102 | 282200Z | 29.5N 129.7E | 54-P- 5- 5 | 700MB | 105 | 65 | 916 | 2359 | 21/14 | CIRC | | 10 | 5 | CLSD WC | |
| 103 | 282300Z | 29.5N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 104 | 282300Z | 29.5N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 105 | 282300Z | 29.5N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 106 | 290002Z | 29.5N 130.1E | 54-P- 5- 5 | 700MB | 97 | 90 | 914 | 2377 | 22/14 | CIRC | | 10 | 5 | CLSD WC | |
| 107 | 290010Z | 29.6N 130.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 108 | 290100Z | 29.6N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 109 | 290100Z | 29.6N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 110 | 290105Z | 29.6N 130.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 111 | 290200Z | 29.7N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 112 | 290200Z | 29.8N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 113 | 290210Z | 29.7N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 114 | 290340Z | 29.8N 130.2E | VQ-P- 5--- | 700MB | ---- | 75 | 915 | 2402 | 21/14 | CIRC | | 11 | 3 | CLSD WC | |
| 115 | 290400Z | 29.9N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 116 | 290400Z | 29.9N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 117 | 290400Z | 30.0N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 118 | 290430Z | 29.9N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 119 | 290600Z | 30.2N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 120 | 290600Z | 30.3N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 121 | 290606Z | 30.2N 130.2E | SATELIT--- | STG X | DIA | 2 | CAT | 4.0 | | | | | | EYE VISIBLE | |
| 122 | 290642Z | 30.2N 130.1E | VQ-P- 1--- | 700MB | ---- | 75 | 916 | 2408 | 23/13 | CIRC | | 11 | 6 | CLSD WC | |
| 123 | 290900Z | 30.5N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 124 | 290900Z | 30.6N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 125 | 290900Z | 30.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 126 | 290925Z | 30.5N 130.2E | VQ-P- 1--- | 700MB | ---- | 65 | 918 | 2499 | 21/14 | CIRC | | 8 | 5 | CLSD WC | |
| 127 | 291000Z | 30.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 128 | 291000Z | 30.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 129 | 291000Z | 30.6N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 130 | 291000Z | 30.6N 130.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 131 | 291200Z | 30.7N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 132 | 291200Z | 30.6N 130.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 133 | 291200Z | 30.7N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 134 | 291200Z | 30.7N 130.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 135 | 291255Z | 30.8N 130.5E | VQ-R- 3--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | 5 | CLSD WC | 30.7N 129.9E |
| 136 | 291300Z | 30.8N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 137 | 291300Z | 30.7N 130.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 138 | 291300Z | 30.7N 130.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 139 | 291400Z | 30.9N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 140 | 291400Z | 30.9N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47909 | 28.4N 129.5E |
| 141 | 291500Z | 31.1N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 142 | 291500Z | 31.1N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 143 | 291500Z | 31.1N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 144 | 291600Z | 31.2N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |

TYPHOON TRIX
EYE FIXES FOR CYCLONE NO. 23
20 AUG - 31 AUG 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 145 | 291600Z | 31.2N 130.9E | VQ-R- 5--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 12 | -- | WC OPEN W SEMIC | 30.9N 130.2E |
| 146 | 291600Z | 31.2N 130.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 147 | 291700Z | 31.3N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 148 | 291700Z | 31.3N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 149 | 291700Z | 31.3N 130.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 150 | 291800Z | 31.4N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 151 | 291800Z | 31.4N 130.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 152 | 291850Z | 31.5N 131.0E | VQ-R- 8--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 15 | -- | WK WC E SEMIC | 30.8N 130.9E |
| 153 | 291900Z | 31.5N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 154 | 291900Z | 31.6N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 155 | 292000Z | 31.6N 131.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 156 | 292000Z | 31.7N 131.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 157 | 292100Z | 31.8N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 158 | 292100Z | 31.8N 131.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 159 | 292100Z | 31.8N 131.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 160 | 292200Z | 32.0N 131.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 161 | 292200Z | 31.9N 131.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 162 | 292210Z | 32.0N 131.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47854 | 32.1N 131.4E |
| 163 | 292210Z | 32.1N 131.4E | 54-P- 0-10 | 500MB | 45 | ---- | ---- | 2830 | 02/00 | CIRC | | 25 | -- | POORLY DEFINED | |
| 164 | 292300Z | 32.3N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJFF | 33.6N 130.4E |
| 165 | 292300Z | 32.1N 131.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47869 | 30.6N 131.0E |
| 166 | 292300Z | 32.1N 131.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 167 | 300100Z | 32.2N 131.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 168 | 300115Z | 32.5N 131.7E | 54-P-10--- | 500MB | 35 | ---- | ---- | 2840 | 00/01 | CIRC | | 25 | 5 | POORLY DEFINED | |
| 169 | 300200Z | 32.3N 131.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 170 | 300200Z | 32.3N 131.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 171 | 300300Z | 32.4N 132.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 172 | 300313Z | 32.8N 131.9E | 54-P- 1- 9 | 500MB | 35 | ---- | ---- | 2820 | 01/01 | CIRC | | 30 | -- | POORLY DEFINED | |
| 173 | 300400Z | 32.4N 132.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 174 | 300400Z | 32.5N 132.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47806 | 33.4N 130.3E |
| 175 | 300425Z | 32.4N 132.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 176 | 300500Z | 32.5N 132.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 177 | 300509Z | 33.0N 132.0E | SATELLI--- | STG C+ | | | | | | | | | | WEAKER | |
| 178 | 300700Z | 32.9N 133.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 179 | 300800Z | 33.0N 133.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 180 | 300800Z | 33.0N 133.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 181 | 300900Z | 33.2N 133.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 182 | 300900Z | 33.2N 133.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 183 | 300900Z | 32.5N 133.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 184 | 301000Z | 33.5N 133.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 185 | 301000Z | 34.1N 133.1E | 54-P- 3--- | 500MB | 42 | ---- | ---- | 2660 | 01/02 | ---- | ----- | -- | -- | 500MB WIND CNTR | |
| 186 | 301000Z | 33.5N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 187 | 301000Z | 33.4N 133.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 188 | 301100Z | 33.6N 133.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |
| 189 | 301100Z | 33.6N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 190 | 301100Z | 33.8N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 191 | 301200Z | 33.8N 133.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 134.2E |
| 192 | 301200Z | 33.7N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 193 | 301200Z | 33.6N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 194 | 301200Z | 33.8N 133.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.6E |

TYPHOON TRIX

EYE FIXES FOR CYCLONE NO. 23

20 AUG - 31 AUG 71

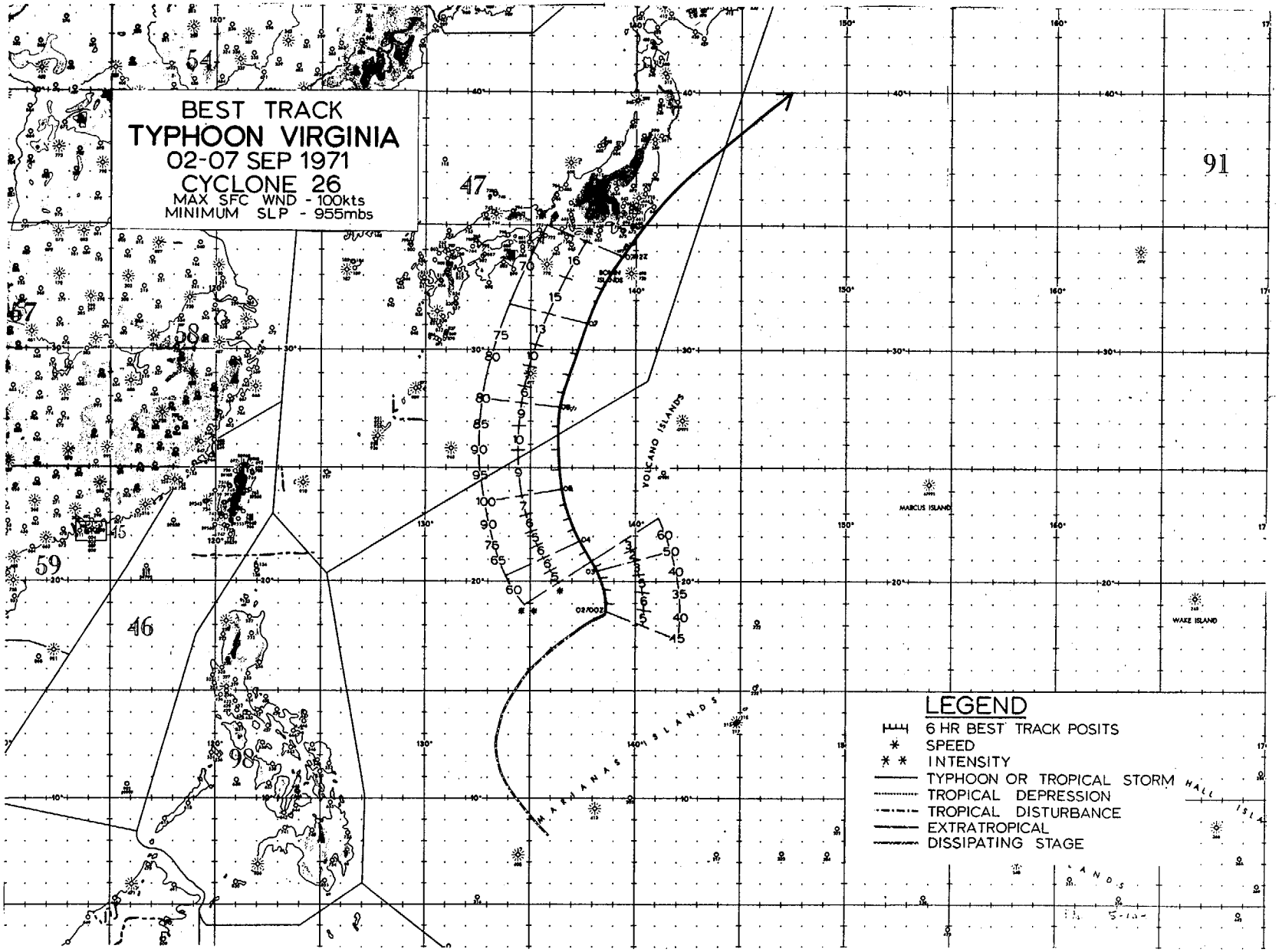
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 301300Z | 34.0N 134.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 139.2E |
| 196 | 301300Z | 33.9N 134.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 197 | 301300Z | 33.9N 134.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 198 | 301300Z | 34.0N 134.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 199 | 301300Z | 33.9N 134.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 200 | 301400Z | 34.1N 134.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 201 | 301400Z | 34.0N 134.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 202 | 301400Z | 34.1N 134.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 203 | 301500Z | 34.2N 134.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 204 | 301500Z | 34.1N 134.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 205 | 301500Z | 34.2N 134.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47791 | 35.5N 133.1E |
| 206 | 301500Z | 34.2N 134.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 207 | 301500Z | 34.2N 134.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47899 | 33.2N 139.2E |
| 208 | 301600Z | 34.4N 134.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 209 | 301600Z | 34.6N 134.3E | 54-P- 5--- | 500MB | 25 | ---- | ---- | 2675 | 01/02 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 210 | 301600Z | 34.5N 134.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 211 | 301600Z | 34.5N 134.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 212 | 301700Z | 34.5N 134.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 213 | 301700Z | 34.7N 134.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47792 | 34.3N 132.8E |
| 214 | 301800Z | 34.7N 134.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47773 | 34.6N 135.7E |
| 215 | 301800Z | 34.8N 134.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 216 | 302000Z | 34.3N 135.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 217 | 302100Z | 34.4N 135.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 218 | 302100Z | 34.5N 135.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 219 | 302226Z | 34.6N 135.4E | VQ-R- 5-10 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 8 | -- | POORLY DEFINED | 33.1N 133.4E |
| 220 | 310100Z | 34.3N 136.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 221 | 310200Z | 34.4N 137.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 222 | 310300Z | 34.5N 137.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |
| 223 | 310400Z | 34.7N 138.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47636 | 35.2N 137.0E |

TYPHOON TRIX

0600Z 20 AUG TO 0600Z 31 AUG

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 200600Z | 22.5N 152.2E | 35 | 22.4N 152.2E | 30 | 6 | -5 | 22.8N 151.8E | 35 | 69 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201200Z | 22.6N 152.4E | 40 | 22.4N 152.2E | 30 | 16 | -10 | 22.9N 151.7E | 35 | 91 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 201800Z | 22.8N 152.6E | 40 | 22.4N 152.2E | 30 | 33 | -10 | 23.0N 150.5E | 45 | 139 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 210000Z | 23.3N 152.6E | 45 | 23.3N 152.6E | 40 | 0 | -5 | 24.8N 152.2E | 50 | 64 | -30 | 26.9N 150.6E | 55 | 90 | -25 | 29.2N 148.7E | 60 | 237 | -20 |
| 210600Z | 23.9N 152.2E | 55 | 23.9N 152.1E | 45 | 5 | -10 | 25.8N 149.9E | 55 | 55 | -25 | 27.7N 147.0E | 65 | 219 | -15 | --.- ---.- | -- | -- | -- |
| 211200Z | 24.4N 152.0E | 65 | 24.3N 151.8E | 45 | 12 | -20 | 26.5N 150.3E | 55 | 60 | -25 | 28.7N 148.3E | 65 | 203 | -15 | 32.3N 147.6E | 65 | 430 | -15 |
| 211800Z | 25.0N 151.8E | 75 | 24.9N 151.8E | 60 | 6 | -15 | 26.9N 150.7E | 80 | 78 | 0 | 29.5N 149.6E | 85 | 256 | 5 | --.- ---.- | -- | -- | -- |
| 220000Z | 25.5N 151.3E | 80 | 25.5N 150.9E | 60 | 22 | -20 | 27.5N 149.1E | 70 | 146 | -10 | 29.9N 147.5E | 80 | 269 | 0 | 35.4N 150.2E | 45 | 683 | -35 |
| 220600Z | 25.6N 150.9E | 80 | 25.8N 150.9E | 70 | 12 | -10 | 27.6N 149.1E | 80 | 147 | 0 | 29.6N 147.6E | 80 | 258 | 0 | --.- ---.- | -- | -- | -- |
| 221200Z | 25.6N 150.8E | 80 | 25.7N 151.0E | 75 | 12 | -5 | 26.0N 150.2E | 85 | 65 | 5 | 27.1N 147.8E | 90 | 156 | 10 | 30.0N 146.0E | 90 | 325 | 10 |
| 221800Z | 25.6N 150.7E | 80 | 25.7N 151.0E | 80 | 17 | 0 | 26.3N 149.7E | 90 | 97 | 10 | 27.4N 147.4E | 90 | 183 | 10 | --.- ---.- | -- | -- | -- |
| 230000Z | 25.4N 150.5E | 80 | 25.8N 150.7E | 80 | 26 | 0 | 27.4N 149.3E | 90 | 157 | 10 | 29.4N 147.9E | 90 | 319 | 10 | 32.3N 147.6E | 75 | 533 | -5 |
| 230600Z | 25.3N 150.1E | 80 | 25.6N 150.7E | 80 | 37 | 0 | 26.3N 150.2E | 80 | 206 | 0 | 27.2N 149.5E | 80 | 346 | 0 | --.- ---.- | -- | -- | -- |
| 231200Z | 25.4N 149.2E | 80 | 25.5N 149.0E | 80 | 12 | 0 | 25.6N 144.8E | 90 | 52 | 10 | 27.2N 141.6E | 95 | 123 | 15 | 29.3N 139.5E | 95 | 215 | 15 |
| 231800Z | 25.4N 148.2E | 80 | 25.2N 148.0E | 80 | 16 | 0 | 25.9N 143.9E | 90 | 65 | 10 | 27.7N 141.0E | 95 | 138 | 15 | --.- ---.- | -- | -- | -- |
| 240000Z | 25.4N 147.4E | 80 | 25.6N 147.4E | 80 | 12 | 0 | 25.8N 144.4E | 85 | 37 | 5 | 26.5N 141.4E | 85 | 63 | 5 | 27.9N 138.7E | 90 | 119 | 5 |
| 240600Z | 25.4N 146.5E | 80 | 25.4N 146.4E | 80 | 5 | 0 | 25.4N 142.8E | 85 | 33 | 5 | 25.5N 139.3E | 90 | 43 | 10 | --.- ---.- | -- | -- | -- |
| 241200Z | 25.3N 145.7E | 80 | 25.3N 145.4E | 80 | 16 | 0 | 25.4N 141.7E | 85 | 54 | 5 | 25.6N 138.1E | 90 | 65 | 10 | 26.3N 134.7E | 90 | 49 | 0 |
| 241800Z | 25.3N 144.9E | 80 | 25.3N 145.0E | 80 | 5 | 0 | 25.4N 141.5E | 85 | 17 | 5 | 25.6N 137.9E | 90 | 32 | 10 | --.- ---.- | -- | -- | -- |
| 250000Z | 25.2N 144.2E | 80 | 25.2N 144.1E | 85 | 5 | 5 | 25.2N 140.5E | 85 | 32 | 5 | 25.6N 136.9E | 90 | 55 | 5 | 26.5N 133.5E | 90 | 88 | 0 |
| 250600Z | 25.3N 143.4E | 80 | 25.2N 143.7E | 85 | 17 | 5 | 25.2N 140.4E | 90 | 24 | 10 | 25.6N 136.9E | 95 | 92 | 10 | --.- ---.- | -- | -- | -- |
| 251200Z | 25.4N 142.7E | 80 | 25.2N 142.9E | 85 | 16 | 5 | 25.3N 139.6E | 95 | 29 | 15 | 25.7N 136.2E | 100 | 124 | 10 | 26.6N 133.2E | 100 | 168 | 5 |
| 251800Z | 25.5N 141.8E | 80 | 25.5N 141.8E | 85 | 0 | 5 | 25.5N 138.3E | 95 | 30 | 15 | 26.1N 134.8E | 100 | 104 | 10 | --.- ---.- | -- | -- | -- |
| 260000Z | 25.5N 141.0E | 80 | 25.4N 140.8E | 80 | 12 | 0 | 25.8N 137.0E | 85 | 42 | 0 | 26.4N 133.6E | 90 | 96 | 0 | 27.3N 130.2E | 95 | 137 | -5 |
| 260600Z | 25.5N 140.1E | 80 | 25.5N 140.0E | 80 | 5 | 0 | 25.8N 136.5E | 85 | 69 | 0 | 26.5N 133.1E | 85 | 121 | -10 | --.- ---.- | -- | -- | -- |
| 261200Z | 25.7N 139.3E | 80 | 25.6N 139.2E | 80 | 8 | 0 | 26.0N 135.7E | 85 | 92 | -5 | 26.7N 132.3E | 90 | 135 | -5 | 27.8N 129.1E | 90 | 186 | 5 |
| 261800Z | 26.0N 138.3E | 80 | 25.6N 138.2E | 80 | 24 | 0 | 26.3N 134.8E | 85 | 96 | -5 | 26.9N 131.3E | 90 | 144 | -10 | --.- ---.- | -- | -- | -- |
| 270000Z | 26.5N 137.1E | 85 | 26.0N 137.3E | 75 | 32 | -10 | 27.4N 134.0E | 70 | 86 | -20 | 29.3N 131.1E | 70 | 55 | -30 | 31.6N 129.3E | 65 | 122 | 5 |
| 270600Z | 26.7N 135.7E | 85 | 26.7N 135.9E | 80 | 11 | -5 | 28.3N 132.5E | 75 | 44 | -20 | 30.4N 130.1E | 70 | 19 | -25 | --.- ---.- | -- | -- | -- |
| 271200Z | 27.1N 134.5E | 90 | 26.9N 135.0E | 80 | 29 | -10 | 28.7N 132.0E | 75 | 47 | -20 | 30.7N 129.9E | 70 | 26 | -15 | 33.8N 129.0E | 65 | 243 | 20 |
| 271800Z | 27.3N 133.4E | 90 | 27.5N 133.5E | 80 | 13 | -10 | 29.8N 130.1E | 75 | 41 | -25 | 32.8N 129.0E | 70 | 131 | 0 | --.- ---.- | -- | -- | -- |
| 280000Z | 27.6N 132.4E | 90 | 27.8N 132.2E | 85 | 16 | -5 | 30.1N 128.5E | 75 | 88 | -25 | 32.7N 127.4E | 65 | 214 | 5 | --.- ---.- | -- | -- | -- |
| 280600Z | 28.1N 131.7E | 95 | 28.1N 131.7E | 85 | 0 | -10 | 30.2N 129.2E | 75 | 52 | -20 | 32.7N 128.3E | 65 | 217 | 15 | --.- ---.- | -- | -- | -- |
| 281200Z | 28.7N 131.1E | 95 | 28.7N 131.2E | 80 | 5 | -15 | 31.0N 129.2E | 70 | 64 | -15 | 34.4N 129.4E | 60 | 225 | 15 | --.- ---.- | -- | -- | -- |
| 281800Z | 29.2N 130.5E | 100 | 29.3N 130.4E | 80 | 8 | -20 | 32.0N 129.0E | 70 | 108 | 0 | 36.0N 130.8E | 55 | 249 | 15 | --.- ---.- | -- | -- | -- |
| 290000Z | 29.6N 130.1E | 100 | 29.7N 129.6E | 95 | 27 | -5 | 32.4N 129.0E | 75 | 132 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290600Z | 30.1N 130.2E | 95 | 30.0N 129.9E | 90 | 17 | -5 | 32.0N 129.4E | 70 | 174 | 20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 30.7N 130.4E | 85 | 30.8N 130.2E | 90 | 12 | 5 | 33.2N 130.3E | 70 | 183 | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291800Z | 31.4N 131.0E | 70 | 31.4N 130.9E | 80 | 5 | 10 | 34.3N 132.0E | 60 | 168 | 20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300000Z | 32.2N 131.6E | 60 | 32.5N 131.7E | 70 | 19 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300600Z | 33.1N 132.6E | 50 | 33.3N 132.3E | 65 | 19 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301200Z | 33.8N 133.9E | 45 | 33.7N 134.3E | 55 | 21 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301800Z | 34.2N 135.4E | 40 | 34.7N 135.2E | 50 | 31 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 15NM | 83NM | 149NM | 253NM | 15NM | 83NM | 149NM | 253NM |
| AVERAGE RIGHT ANGLE ERROR | 9NM | 51NM | 107NM | 200NM | 9NM | 51NM | 107NM | 200NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 7KTS | 13KTS | 10KTS | 10KTS | 7KTS | 13KTS | 10KTS | 10KTS |
| AVERAGE BIAS OF WIND ERROR | -3KTS | -3KTS | 1KTS | -1KTS | -3KTS | -3KTS | 1KTS | -1KTS |
| NUMBER OF FORECASTS | 43 | 39 | 32 | 14 | 43 | 39 | 32 | 14 |


BEST TRACK
TYPHOON VIRGINIA
02-07 SEP 1971
CYCLONE 26
MAX SFC WND - 100kts
MINIMUM SLP - 955mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
VOLCANO ISLANDS
MARIANAS ISLANDS
MARCUS ISLAND
WAKE ISLAND

## VIRGINIA

Aircraft reconnaissance located newly formed tropical storm Virginia some 500 n mi northwest of Guam on the afternoon of September 1st. Early signs of the system can be traced back on synoptic charts to a circulation which had its origin near the Palau Islands on August 30th. Drifting north and then northeast, satellite pictures showed increasing character to the cloudiness of the system before reconnaissance investigation.

Located between two high cells, the storm began to drift slowly northward under the influence of the eastern cell (Figure 5-37) and intensified to typhoon strength by the afternoon of the 4th. As Virginia passed 270 n mi west of Iwo Jima, central winds peaked at 100 kt. Rounding the periphery of the high cell centered north of Marcus Island (Figure 5-38), the typhoon shifted to a north-northeast course during the afternoon of the 6th. On this heading, Virginia's center skirted the Boso Peninsula of Japan during the night of September 7th. As she merged with a frontal zone off of northern Honshu, Virginia weakened to storm force and became extratropical the following day.

The strongest wind reported along the Japanese coast was 67 kt with gusts to 95 kt at the Chosi weather station. Virginia interacted with a weak frontal area along the southern coast of Honshu causing torrential rain (Up to 22 inches in a 24-hour period at Katsuma) to fall along the coast which triggered landslides and considerable flooding. Approximately 200 houses were totally or partially destroyed while over 13,800 dwellings were flooded. Hardest hit was the Chiba prefecture where 56 persons were reported killed by the landslides which buried numerous homes (Figures 39 and 40).

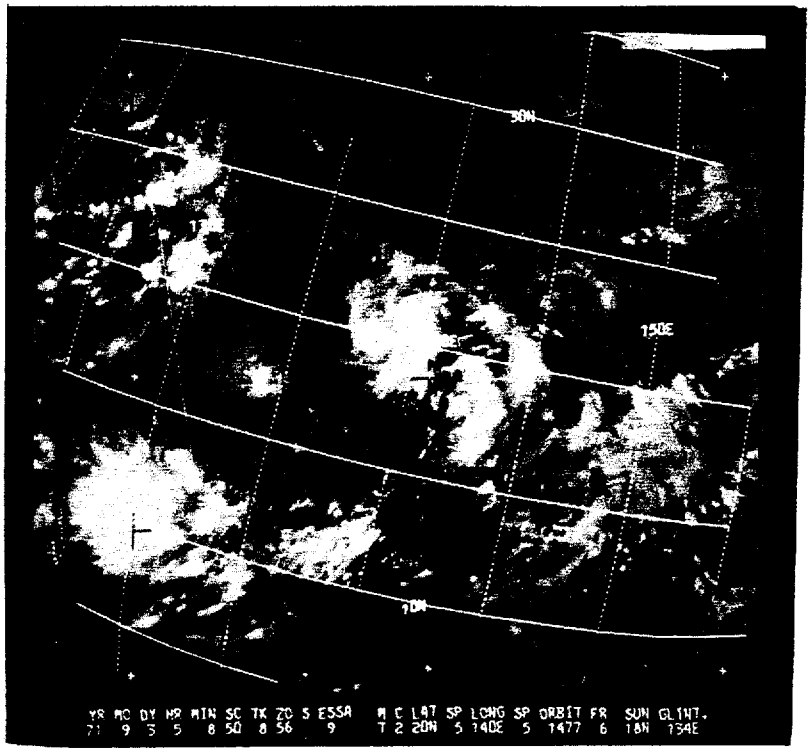



FIGURE 5-37. TROPICAL STORM VIRGINIA 300 N MI SOUTHWEST OF IWO JIMA ON 3 SEPTEMBER.

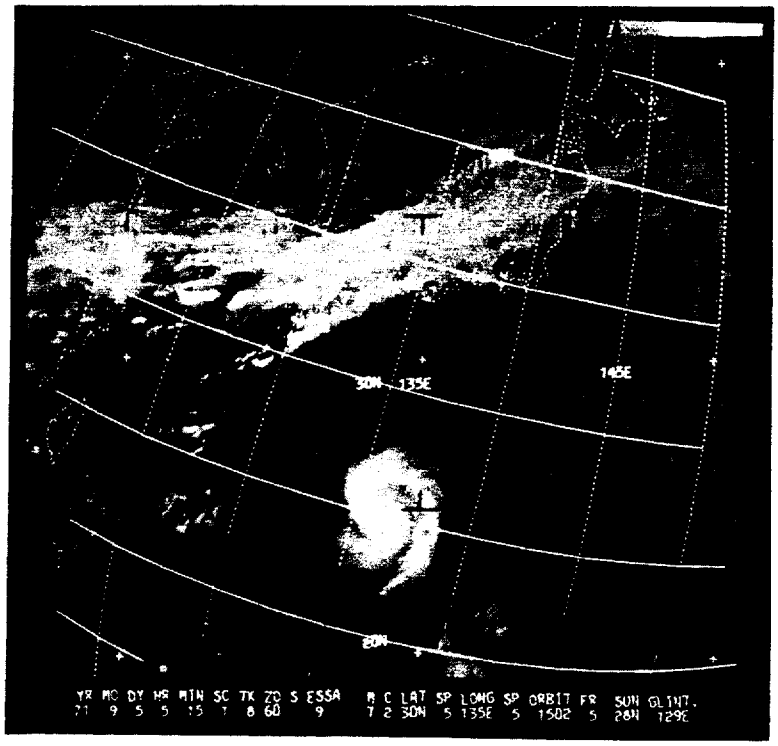



FIGURE 5-38. TYPHOON VIRGINIA AS VIEWED ON 5 SEPTEMBER BY ESSA-9.

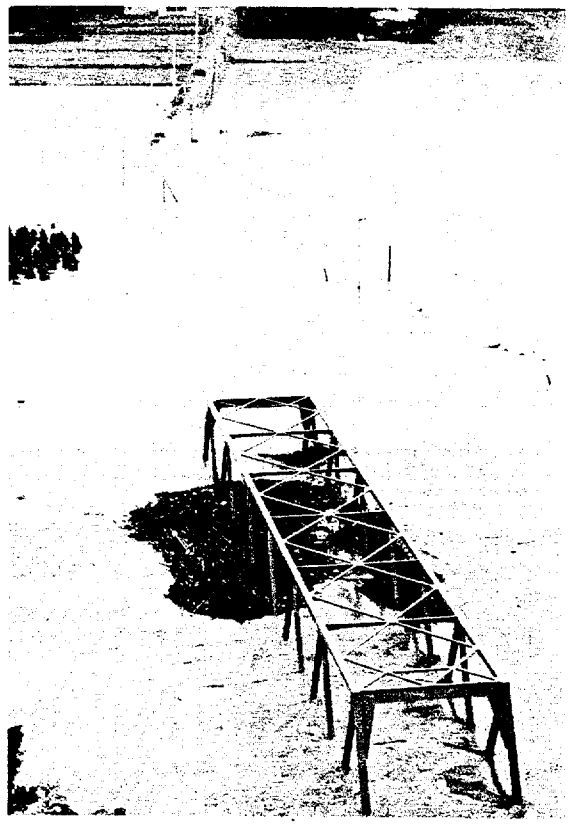


FIGURE 5-39. (LEFT) LANDSLIDES IN THE CHIBA PREFECTURE (BOSO PENINSULA, JAPAN) 8 SEPTEMBER RESULTING FROM TORRENTIAL RAINS OF TYPHOON VIRGINIA--COURTESY THE ASAHI SHIMBUN, TOKYO.
FIGURE 5-40. (RIGHT) FLOODS OVER THE BRIDGE 8 SEPTEMBER IN THE ISUMIGAWA IN THE CHIBA PREFECTURE (BOSO PENINSULA, JAPAN) RESULTING FROM TORRENTIAL RAINS OF TYPHOON VIRGINIA--COURTESY THE ASAHI SHIMBUN, TOKYO.

TYPHOON VIRGINIA
EYE FIXES FOR CYCLONE NO. 26
02 SEP - 07 SEP 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 300000Z | 9.5N 135.5E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | SFC ANAL POSIT | |
| 2 | 301200Z | 13.0N 133.0E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | SFC ANAL POSIT | |
| 3 | 010000Z | 17.0N 135.0E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | SFC ANAL POSIT | |
| 4 | 010618Z | 18.4N 138.0E | 54-P------- | 700MB | 45 | 30 | 1001 | 3082 | 11/-- | ---- | ----- | -- | -- | FDR.BNDS FRMG-700 CNTR 30NM E | |
| 5 | 010930Z | 18.4N 138.0E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | PIREP-APPNT CIRC | |
| 6 | 012240Z | 18.5N 138.6E | 54-P- 5- 5 | 700MB | 36 | 45 | 1006 | 3109 | 13/11 | ---- | ----- | -- | -- | MDT FB SE | |
| 7 | 020305Z | 18.7N 138.6E | 54-P- 5- 5 | 700MB | 40 | 50 | 1001 | 3091 | 12/11 | ---- | ----- | -- | -- | WC FRMG E QUAD | |
| 8 | 020410Z | 18.5N 139.0E | SATELIT--- | STG C | | | | | | | | | | FIRST BLTN | |
| 9 | 021029Z | 19.6N 138.5E | VQ-P-10--- | ----- | ---- | 22 | 1008 | ---- | 26/24 | CIRC | | 40 | -- | POORLY ORGANIZED | |
| 10 | 021534Z | 20.0N 138.3E | VQ-P- 8--- | 700MB | ---- | 35 | 1009 | ---- | 27/24 | CIRC | | 30 | -- | LRG CLD MASS TO F | |
| 11 | 022200Z | 18.8N 139.2E | 54-P- 5- 5 | 700MB | 50 | 50 | 1000 | 3051 | 13/08 | CIRC | | 15 | -- | WC NE QUAD-700 CNTR 5NM NE | |
| 12 | 030400Z | 19.0N 138.2E | 54-P- 5- 3 | 700MB | 57 | 60 | 992 | 3033 | 02/02 | CIRC | | 25 | -- | CLSD WC | |
| 13 | 030508Z | 19.5N 139.0E | SATELIT--- | STG C | | | | | | | | | | AFTTFR ORGANIZED | |
| 14 | 031131Z | 20.8N 138.1E | VQ-P- 5--- | ----- | ---- | 55 | 999 | ---- | 27/24 | ELIP | E-W | 21X16 | 5 | CLSD WC | |
| 15 | 031554Z | 21.2N 137.0E | VQ-P- 5--- | 700MB | ---- | ---- | 993 | 3072 | 16/09 | ELIP | E-W | 15X12 | 7 | CLSD WC | |
| 16 | 032140Z | 21.4N 137.5E | 54-P- 3- 3 | 700MB | 58 | 50 | 993 | 3008 | 13/10 | CIRC | | 20 | -- | WC OPEN F QUAD | |
| 17 | 040305Z | 22.1N 137.3E | 54-P- 6- 4 | 700MB | 60 | 50 | 990 | 3011 | 11/08 | CIRC | | 16 | 3 | WC OPEN NW-700 CNTR 4NM NNW | |
| 18 | 040607Z | 22.0N 137.0E | SATELIT--- | STG X | DIA | 2 | CAT 2.0 | | | | | | | | |
| 19 | 041000Z | 22.2N 137.1E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 6 | 4 | CLSD WC | 21.2N 137.4E |
| 20 | 041602Z | 23.1N 136.9E | VQ-R- 5-10 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 6 | 7 | CLSD WC | 23.0N 136.2E |
| 21 | 050210Z | 24.5N 136.4E | 54-P- 6- 2 | 700MB | 93 | 100 | ---- | 2691 | 15/10 | CIRC | | 12 | 3 | CLSD WC-700 CNTR 8NM NE | |
| 22 | 050408Z | 24.8N 136.5E | 54-P- 4- 4 | 700MB | 91 | ---- | 955 | 2707 | 17/12 | CIRC | | 8 | -- | CLSD WC | |
| 23 | 050515Z | 25.5N 136.0E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | | |
| 24 | 051625Z | 26.7N 136.0E | 54-P- 3- 3 | 700MB | 70 | 72 | 977 | 2882 | 17/10 | CIRC | | 8 | -- | WC OPEN W | |
| 25 | 052101Z | 27.3N 136.2E | 54-P- 3- 3 | 700MB | 70 | 55 | 984 | 2795 | 15/12 | CIRC | | 10 | -- | POORLY DEFINED | |
| 26 | 060310Z | 28.1N 136.3E | VQ-R- 3- 5 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | -- | WC OPEN E-SW | 27.1N 135.9E |
| 27 | 060610Z | 28.0N 136.5E | SATELIT--- | STG X | DIA | 3 | CAT 3.0 | | | | | | | EYE DIMLY VSBL | |
| 28 | 060940Z | 28.5N 136.8E | 54-P- 5- 5 | 700MB | 65 | ---- | 985 | 2795 | 15/-- | CIRC | | 20 | 10 | CLSD WC | |
| 29 | 061500Z | 29.4N 137.0E | 54-P- 3- 5 | 700MB | 80 | ---- | 969 | 2792 | 16/11 | CIRC | | 20 | -- | CLSD WC | |
| 30 | 061925Z | 30.3N 137.3E | 54-P- 3- 5 | 700MB | 70 | ---- | 970 | 2893 | 17/12 | CIRC | | 25 | 5 | WC OPEN NW | |
| 31 | 062155Z | 30.7N 137.5E | 54-P- 3- 3 | 700MB | 50 | 65 | 970 | 2893 | 17/11 | CIRC | | 25 | -- | WC OPEN NW | |
| 32 | 062200Z | 30.4N 137.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | MT FUJI | 35.3N 138.7E |
| 33 | 062300Z | 30.6N 138.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 34 | 070100Z | 31.4N 138.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 35 | 070100Z | 31.4N 137.0E | 54-P- 3- 3 | 700MB | 60 | 70 | 980 | 2932 | 20/11 | CIRC | | 25 | -- | POORLY DEFINED | |
| 36 | 070200Z | 31.6N 138.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 37 | 070300Z | 31.8N 138.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 38 | 070315Z | 31.9N 138.2E | 54-P- 3- 5 | 700MB | 45 | 55 | ---- | 2954 | 16/11 | CIRC | | 25 | -- | POORLY DEFINED | |
| 39 | 070400Z | 32.1N 138.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 40 | 070500Z | 32.3N 138.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 41 | 070517Z | 32.3N 138.5E | SATELIT--- | STG C+ | | | | | | | | | | | |
| 42 | 070600Z | 32.5N 138.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 43 | 070700Z | 32.6N 138.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 44 | 070715Z | 32.9N 138.6E | 54-P- 2- 3 | 700MB | 75 | 60 | 976 | 2896 | 16/13 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 45 | 070800Z | 33.0N 139.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 46 | 070900Z | 32.9N 139.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN RJTT | 35.5N 139.8E |

TYPHOON VIRGINIA
EYE FIXES FOR CYCLONE NO. 26
02 SEP - 07 SEP 71

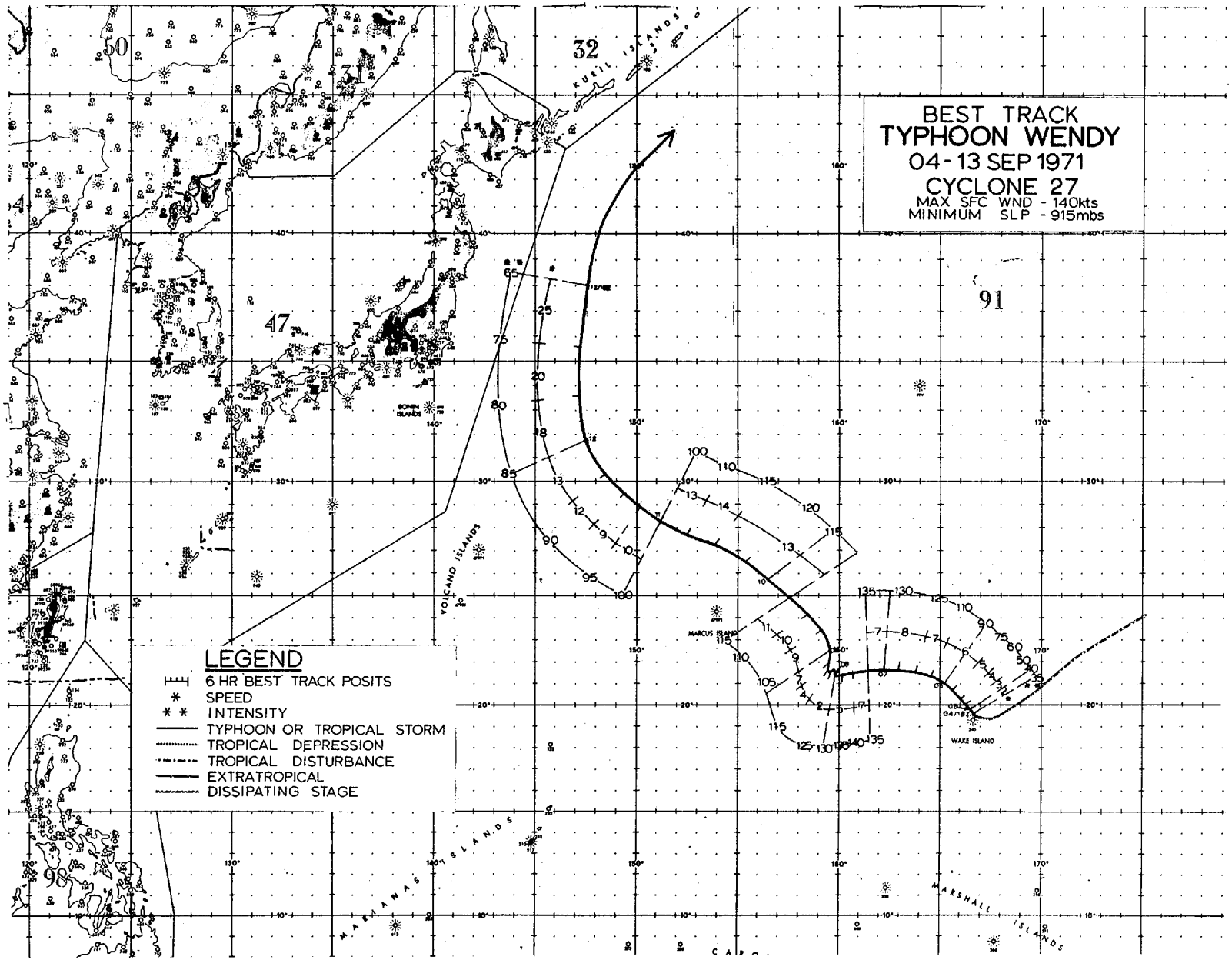
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 070915Z | 33.2N 138.8E | 54-P- 2- 3 | 700MB | 50 | 45 | 980 | 2935 | 16/13 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 48 | 071000Z | 33.4N 139.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 49 | 071100Z | 33.5N 139.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 50 | 071300Z | 34.0N 139.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47639 | 35.3N 138.7E |
| 51 | 071314Z | 34.3N 139.8E | 54-P- 1- 5 | 700MB | 78 | ---- | 978 | 2871 | 15/11 | CIRC | | 20 | 5 | CLSD WC | |
| 52 | 071536Z | 35.0N 140.4E | 54-P- 2- 5 | 700MB | 80 | ---- | 976 | 2868 | 15/10 | CIRC | | 20 | 5 | CLSD WC | |
| 53 | 080000Z | 37.2N 143.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47590 | 38.3N 140.9E |

TYPHOON VIRGINIA

0000Z 2 SEP TO 1200Z 7 SEP

| | BEST TRACK | | | WARNING | | | | | 24 HOUR FORECAST | | | | | 48 HOUR FORECAST | | | | | 72 HOUR FORECAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | |
| | POSIT | | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND |
| 020000Z | 18.6N | 138.5E | 45 | 18.5N | 138.5E | 45 | 6 | 0 | 18.6N | 138.9E | 55 | 115 | 5 | 20.0N | 140.3E | 55 | 199 | -5 | 23.8N | 141.6E | 55 | 279 | -5 |
| 020600Z | 19.1N | 138.5E | 40 | 18.8N | 138.7E | 45 | 21 | 5 | 20.3N | 139.3E | 55 | 64 | -5 | 22.7N | 139.8E | 55 | 151 | -10 | --.- | ---.- | -- | -- | -- |
| 021200Z | 19.7N | 138.4E | 35 | 19.4N | 139.0E | 30 | 38 | -5 | 21.5N | 139.7E | 40 | 106 | -20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 021800Z | 20.2N | 138.3E | 40 | 20.1N | 139.0E | 30 | 40 | -10 | 22.4N | 139.2E | 40 | 106 | -20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 030000Z | 20.4N | 138.2E | 50 | 19.7N | 138.7E | 50 | 50 | 0 | 21.8N | 137.9E | 55 | 33 | -5 | 24.5N | 136.9E | 55 | 32 | -45 | 27.2N | 136.0E | 55 | 34 | -25 |
| 030600Z | 20.6N | 138.2E | 60 | 19.0N | 137.9E | 60 | 97 | 0 | 18.9N | 134.4E | 80 | 253 | 15 | 19.7N | 131.1E | 90 | 427 | -5 | --.- | ---.- | -- | -- | -- |
| 031200Z | 20.9N | 137.9E | 60 | 20.9N | 138.0E | 60 | 6 | 0 | 22.0N | 136.0E | 70 | 69 | -5 | 23.3N | 133.3E | 75 | 221 | -15 | 25.0N | 130.3E | 75 | 421 | -5 |
| 031800Z | 21.3N | 137.7E | 60 | 21.2N | 137.4E | 60 | 18 | 0 | 22.4N | 135.1E | 75 | 106 | -15 | 23.7N | 132.5E | 85 | 272 | 0 | --.- | ---.- | -- | -- | -- |
| 040000Z | 21.8N | 137.3E | 60 | 21.5N | 137.3E | 60 | 18 | 0 | 22.5N | 135.2E | 65 | 119 | -35 | 23.7N | 132.6E | 70 | 311 | -10 | 25.7N | 129.8E | 75 | 525 | 5 |
| 040600Z | 22.3N | 137.1E | 65 | 22.2N | 136.9E | 60 | 13 | -5 | 23.3N | 134.9E | 65 | 126 | -30 | 24.4N | 132.8E | 70 | 309 | -10 | --.- | ---.- | -- | -- | -- |
| 041200Z | 22.8N | 136.9E | 75 | 22.2N | 136.9E | 60 | 36 | -15 | 23.2N | 135.3E | 65 | 165 | -25 | 24.4N | 133.2E | 70 | 334 | -10 | 26.0N | 130.6E | 75 | 651 | 5 |
| 041800Z | 23.4N | 136.7E | 90 | 23.3N | 136.7E | 60 | 6 | -30 | 24.8N | 135.1E | 65 | 133 | -20 | 26.4N | 132.5E | 70 | 324 | -5 | --.- | ---.- | -- | -- | -- |
| 050000Z | 24.1N | 136.5E | 100 | 24.2N | 136.3E | 60 | 12 | -40 | 27.2N | 135.1E | 60 | 70 | -20 | 31.3N | 138.8E | 40 | 57 | -30 | --.- | ---.- | -- | -- | -- |
| 050600Z | 24.9N | 136.4E | 95 | 25.0N | 136.3E | 100 | 8 | 5 | 28.3N | 135.9E | 90 | 37 | 10 | 33.7N | 139.5E | 60 | 95 | -10 | --.- | ---.- | -- | -- | -- |
| 051200Z | 25.8N | 136.3E | 90 | 25.8N | 136.1E | 95 | 11 | 5 | 28.9N | 136.1E | 75 | 42 | -5 | 34.7N | 140.8E | 50 | 88 | -20 | --.- | ---.- | -- | -- | -- |
| 051800Z | 26.8N | 136.2E | 85 | 26.9N | 136.4E | 85 | 12 | 0 | 31.0N | 138.2E | 60 | 83 | -15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 060000Z | 27.7N | 136.3E | 80 | 27.8N | 135.9E | 80 | 22 | 0 | 32.4N | 138.3E | 60 | 83 | -10 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 060600Z | 28.3N | 136.6E | 80 | 28.7N | 136.4E | 75 | 26 | -5 | 33.3N | 139.0E | 65 | 62 | -5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 061200Z | 28.9N | 136.9E | 80 | 29.0N | 136.7E | 70 | 12 | -10 | 33.6N | 139.5E | 50 | 13 | -20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 061800Z | 29.9N | 137.2E | 75 | 29.9N | 137.2E | 70 | 0 | -5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 070000Z | 31.1N | 137.7E | 70 | 31.1N | 137.8E | 60 | 5 | -10 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 070600Z | 32.4N | 138.4E | 70 | 32.7N | 138.9E | 55 | 31 | -15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 071200Z | 33.8N | 139.4E | 70 | 34.0N | 139.7E | 45 | 19 | -25 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 22NM | 94NM | 217NM | 382NM | 22NM | 94NM | 217NM | 382NM |
| AVERAGE RIGHT ANGLE ERROR | 17NM | 65NM | 152NM | 250NM | 17NM | 65NM | 152NM | 250NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 8KTS | 15KTS | 13KTS | 17KTS | 8KTS | 15KTS | 13KTS | 17KTS |
| AVERAGE BIAS OF WIND ERROR | -7KTS | -12KTS | -13KTS | -13KTS | -7KTS | -12KTS | -13KTS | -13KTS |
| NUMBER OF FORECASTS | 23 | 19 | 13 | 5 | 23 | 19 | 13 | 5 |


BEST TRACK
TYPHOON WENDY
04-13 SEP 1971
CYCLONE 27
MAX SFC WND - 140kts
MINIMUM SLP - 915mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
KURIL ISLANDS
VOLCANO ISLANDS
MARIANAS ISLANDS
MARSHALL ISLANDS
MARCUS ISLAND
WAKE ISLAND
BONIN ISLANDS

## WENDY

Destined to spend her entire life at sea, Wendy formed from a disturbance initiated by a circulation in the upper tropospheric mid-Pacific trough and was first noted by satellite on September 2nd east of Wake Island. This system drifted southwestward and became a tropical storm just north of Wake Island on the morning of the 4th (Figure 5-41). As the storm began a slow drift of 2-5 kt in a northwest direction during the next 24 hours, winds of typhoon force were acquired. The effects on Wake resulted in 6.24 inches of rainfall during Wendy's passage with a sustained wind of 42 kt measured on the 5th and a gust to 50 kt registered on the 6th.

Intensification of the typhoon proceeded at a rapid pace until late on the 7th when peak winds of 140 kt were reached. Reports from reconnaissance crews at this time described one of the largest and most panoramic eyes of the year--a circular, closed, wall cloud with colisium-like features encompassing an eye 40 n mi in diameter (Figure 5-42).

With Virginia skirting Japan, the subtropical ridge north of Marcus weakened considerably and began to rebuild east of Ocean Station Victor. As a reflection to this readjustment, Wendy began to stall for a 24-hour period on the 8th, then commenced a north and later northwest track. The area dominated by the storm's circulation began to spread at this time stretching over a vast region of some 900 n mi in diameter.

Wendy maintained her northwest track for two days before rounding the periphery of the ridge line. On the 11th she began a recurvature some 400 miles east of Japan (Figure 5-43). With a trough in the westerlies situated along the coast of Manchuria, the typhoon began to accelerate in forward speed from 16 kt on the 12th to 37 kt on the 13th. Dropping to storm strength and merging with a frontal system east of Hokkaido, Wendy ended her life as a tropical system on the 13th.

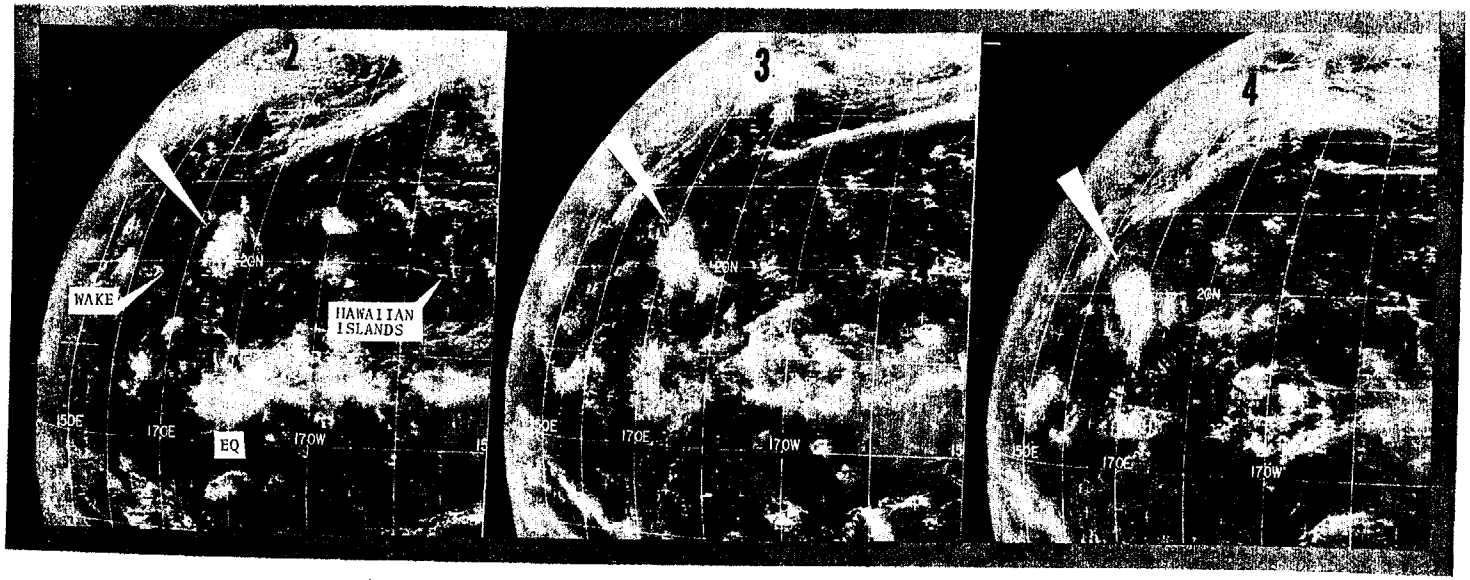
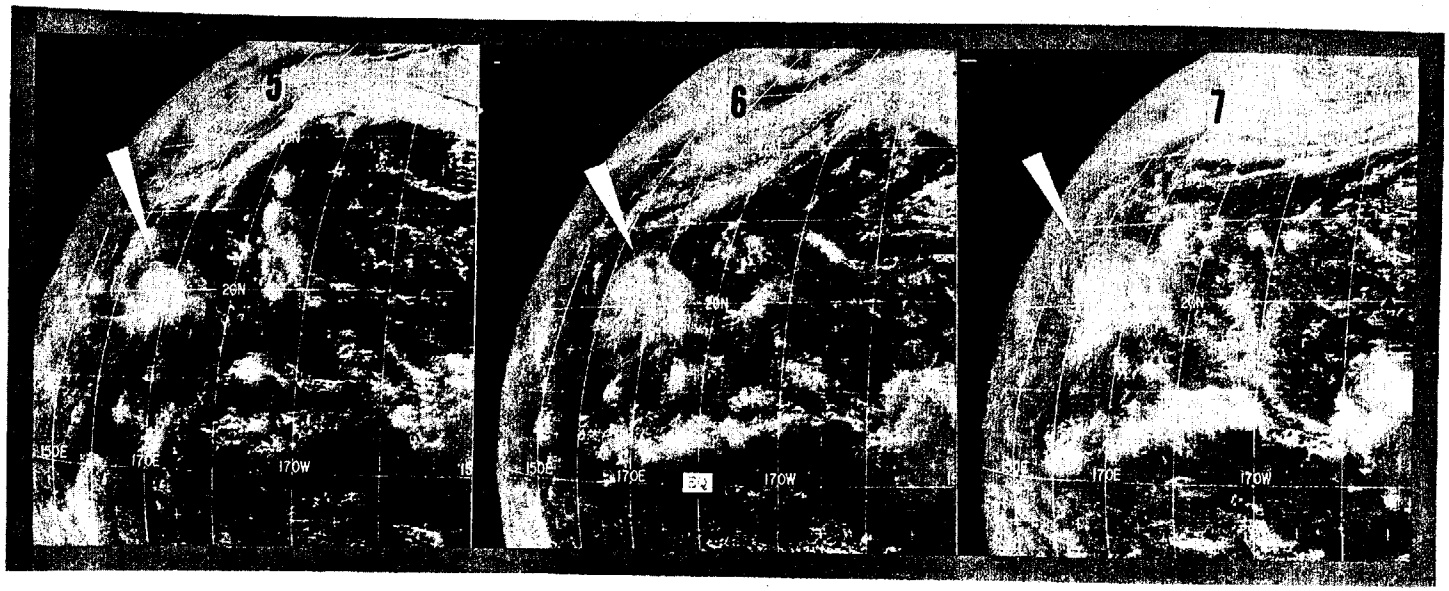



FIGURE 5-41. ATS-1 GEOSTATIONARY SATELLITE VIEW OF BIRTH AND DEVELOPMENT OF TYPHOON WENDY 2-7 SEPTEMBER.



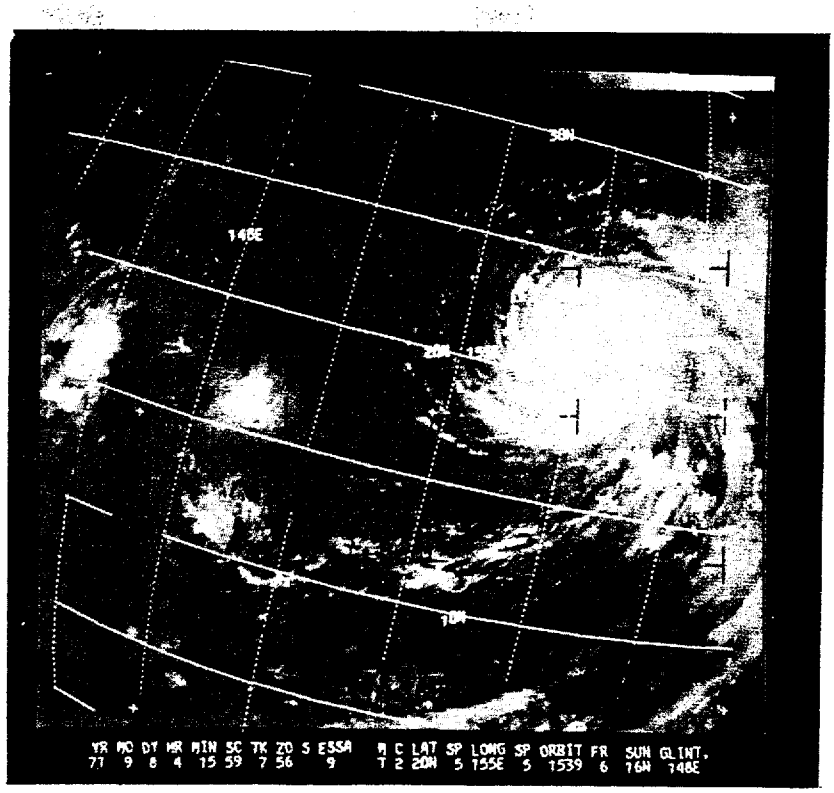



FIGURE 5-42. SUPER TYPHOON WENDY AT HER PEAK LOCATED BETWEEN MARCUS AND WAKE ISLAND AS VIEWED BY ESSA-9 ON 8 SEPTEMBER.

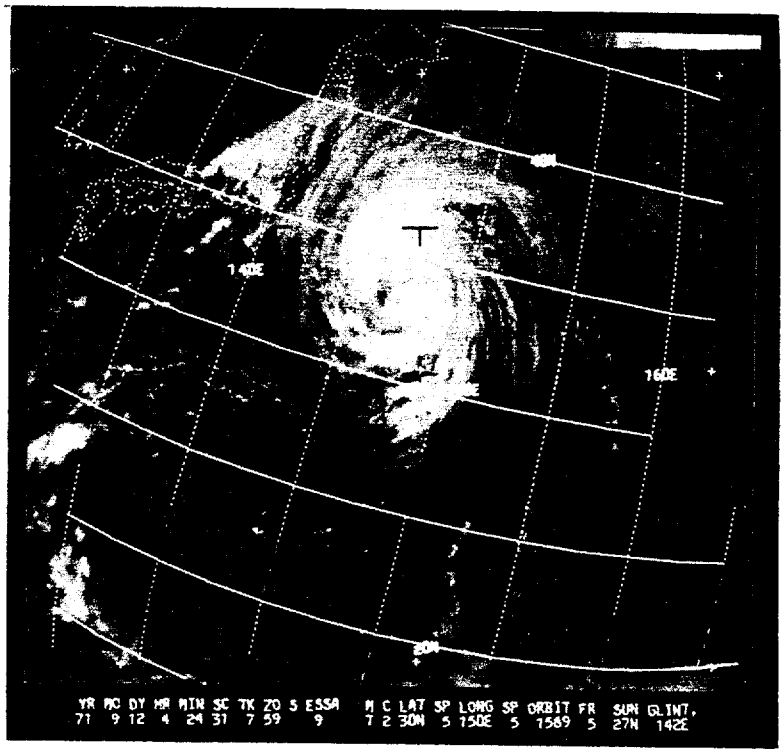



FIGURE 5-43. ESSA-9 SIGHTS TYPHOON WENDY WELL EAST OF JAPAN ON 12 SEPTEMBER.

TYPHOON WENDY
EYE FIXES FOR CYCLONE NO. 27
04 SEP - 13 SEP 71

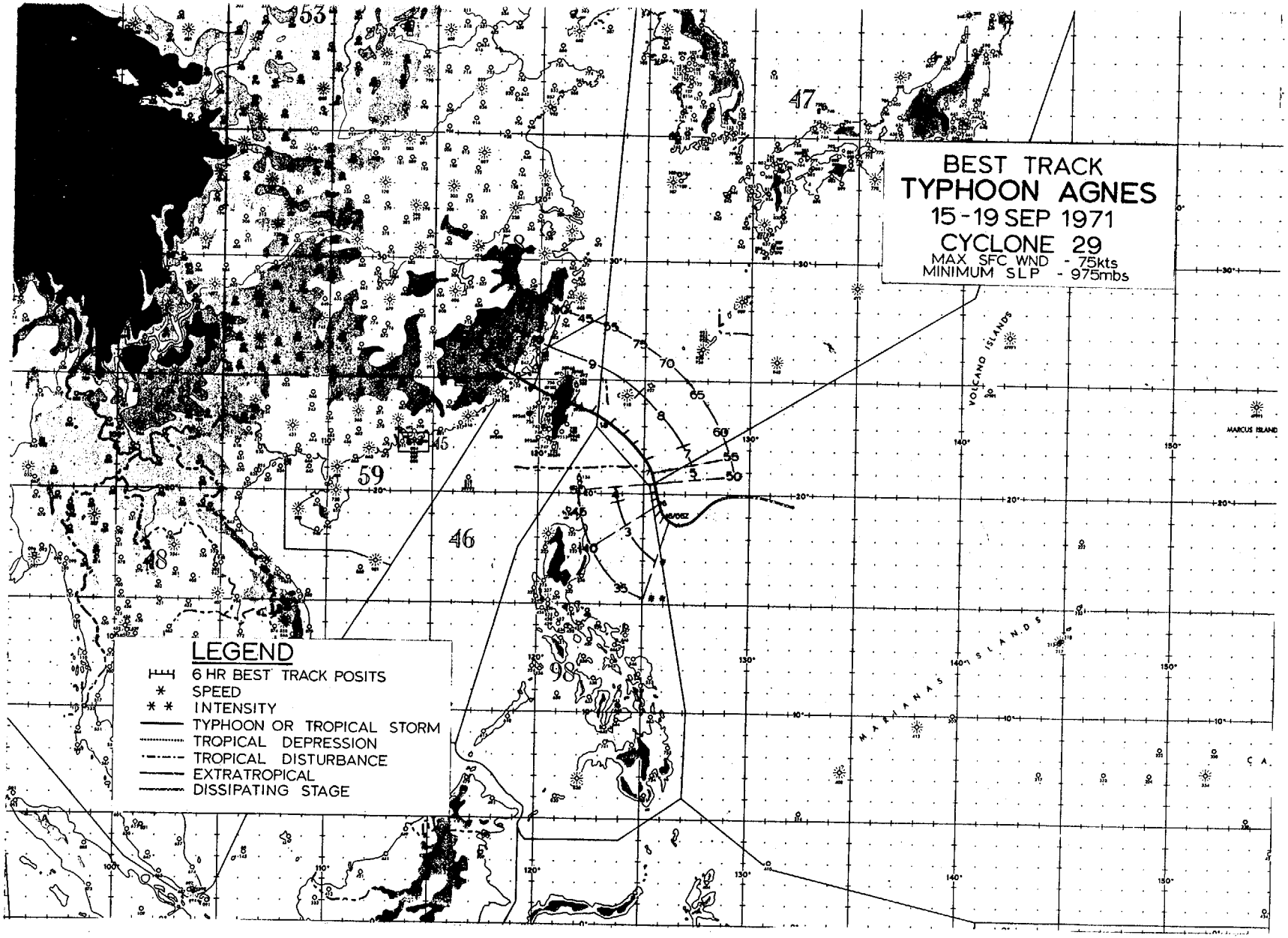
| FIX NO. | TIME | POSIT | UNIT-METHOD-ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 030313Z | 22.0N 170.0E | SATELIT--- | STG B | | | | | | | | | | FIRST BLTN | |
| 2 | 040404Z | 19.0N 167.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 3 | 042130Z | 19.7N 166.5E | 54-P- 2--- | 700MB | 40 | 40 | 992 | 3012 | 14/14 | ---- | ----- | -- | -- | LGT FB ACTIVITY | |
| 4 | 050315Z | 19.8N 166.0E | SATELIT--- | STG C+ | | | | | | | | | | MORE INTENSE | |
| 5 | 050510Z | 19.9N 166.4E | 54-P- 1- 1 | 700MB | 42 | 45 | 984 | 2954 | 12/09 | CIRC | | 20 | -- | STG FB E SEMIC | |
| 6 | 050810Z | 20.2N 166.3E | 54-P- 1- 3 | 700MB | 50 | 50 | 982 | 2944 | 13/07 | CIRC | | 25 | -- | WC FRMG E - 700 CNTR 3NM NW | |
| 7 | 051630Z | 20.6N 165.9E | 54-P- 3-12 | 700MB | 70 | ---- | 972 | 2816 | 20/17 | CIRC | | 20 | 5 | WC OPEN NW | |
| 8 | 052120Z | 20.7N 165.5E | 54-P- 2- 8 | 700MB | 70 | 75 | 972 | 2804 | 17/15 | CIRC | | 30 | 3 | WC OPEN NW-700 CNTR 8NM ESE | |
| 9 | 060352Z | 21.2N 164.9E | 54-P- 4- 1 | 700MB | 90 | 120 | 951 | 2682 | 16/07 | CIRC | | 30 | 5 | CLSD WC-700 CNTR | |
| 10 | 060414Z | 21.0N 165.0E | SATELIT--- | STG X | DIA | 2 CAT | 3.5 | | | | | | | MORE INTENSE | |
| 11 | 060910Z | 21.4N 164.1E | 54-P- 2- 2 | 700MB | 110 | ---- | 938 | 2566 | 17/08 | CIRC | | 10 | 7 | CLSD WC-FL FIX 2NM NW | |
| 12 | 061615Z | 21.4N 163.1E | 54-P- 4- 6 | 700MB | 75 | ---- | 926 | 2441 | 20/15 | CIRC | | 10 | 5 | CLSD WC | |
| 13 | 062130Z | 21.6N 162.7E | 54-P- 5- 5 | 700MB | 100 | 55 | 923 | 2408 | 19/14 | CONC | - | 20X 7 | 10 | BOTH WC CLSD | |
| 14 | 070320Z | 21.5N 161.8E | 54-P- 6- 6 | 700MB | 110 | 135 | 928 | 2413 | 16/10 | CONC | - | 30X10 | 10 | BOTH WC CLSD | |
| 15 | 070322Z | 21.2N 161.8E | SATELIT--- | STG X | DIA | 3 CAT | 4.0 | | | | | | | MORE INTENSE | |
| 16 | 071028Z | 21.6N 160.7E | 54-P- 2- 3 | 700MB | 95 | ---- | 915 | 2338 | 23/11 | CONC | - | 35X25 | 7 | BOTH WC CLSD | |
| 17 | 071630Z | 21.4N 160.5E | 54-P- 5- 5 | 700MB | 70 | ---- | 917 | 2362 | 21/-- | CIRC | | 35 | 3 | CLSD WC | |
| 18 | 072130Z | 21.3N 159.8E | 54-P- 5-10 | 700MB | 100 | ---- | ---- | ---- | 20/16 | CIRC | | 35 | -- | CLSD WC-SFC CNTR 17NM SW | |
| 19 | 080355Z | 21.5N 159.8E | 54-P-10- 3 | 700MB | 105 | ---- | 930 | 2463 | 17/13 | CIRC | | 35 | -- | CLSD WC-FL FIX | |
| 20 | 080416Z | 21.5N 159.8E | SATELIT--- | STG X | DIA | 3 CAT | 4.0 | | | | | | | LITTLE CHANGE | |
| 21 | 081117Z | 21.4N 159.6E | 54-P- 3--- | 700MB | 90 | ---- | 941 | 2530 | 14/10 | CIRC | | 40 | 8 | CLSD WC | |
| 22 | 081540Z | 21.7N 159.6E | 54-P- 3- 5 | 700MB | 85 | ---- | 940 | 2533 | 16/12 | CIRC | | 40 | 3 | WC OPEN NW-FL FIX | |
| 23 | 090002Z | 22.5N 159.6E | VQ-P- 8- 7 | ----- | ---- | 65 | 953 | ---- | 26/25 | CIRC | | 40 | 10 | WC OPEN NW | |
| 24 | 090323Z | 23.0N 159.0E | SATELIT--- | STG X | DIA | 3 CAT | 3.0 | | | | | | | LRG RAGGED EYE | |
| 25 | 090347Z | 23.1N 159.3E | VQ-P- 8- 7 | ----- | ---- | 80 | 951 | ---- | 27/25 | ELIP | NE-SW | 40X25 | 8 | WC OPEN W | |
| 26 | 091020Z | 24.0N 158.5E | 54-P- 2- 3 | 700MB | 76 | ---- | 948 | 2643 | 14/11 | CIRC | | 33 | -- | CLSD WC | |
| 27 | 091315Z | 24.5N 157.9E | 54-P----- | 700MB | ---- | ---- | 940 | 2573 | 16/-- | ---- | ----- | -- | -- | | |
| 28 | 091600Z | 24.5N 158.0E | 54-P- 2- 3 | 700MB | 80 | ---- | 936 | 2530 | 15/11 | ELIP | E-W | 45X30 | -- | CLSD WC-SML BKS | |
| 29 | 092155Z | 25.3N 156.7E | 54-P-10- 5 | 700MB | 100 | 65 | 916 | 2518 | 18/12 | ELIP | SE-NW | 35X30 | -- | CLSD WC | |
| 30 | 100300Z | 26.1N 156.1E | 54------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 31 | 100300Z | 26.1N 156.1E | 54-P-17- 3 | 700MB | 105 | 60 | 928 | 2490 | 17/13 | ELIP | SE-NW | 35X25 | 12 | CLSD WC | |
| 32 | 100422Z | 26.5N 155.5E | SATELIT--- | STG X | DIA | 3 CAT | 3.5 | | | | | | | LITTLE CHANGE | |
| 33 | 101050Z | 27.0N 154.1E | VQ-P- 2- 2 | 700MB | ---- | ---- | 922 | 2481 | 21/17 | CIRC | | 30 | 6 | CLSD WC | |
| 34 | 101540Z | 27.5N 153.2E | VQ-R- 8--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 25 | 12 | CLSD WC | 26.3N 153.2E |
| 35 | 102200Z | 27.9N 151.5E | 54-P- 6- 2 | 700MB | 75 | 80 | 933 | 2496 | 15/13 | CIRC | | 9 | -- | WC OPEN N | |
| 36 | 110325Z | 28.0N 150.5E | SATELIT--- | STG X | DIA | 4 CAT | 3.5 | | | | | | | | |
| 37 | 111015Z | 29.3N 149.8E | 54-P- 2- 3 | 700MB | 70 | ---- | 948 | 2646 | 16/13 | CIRC | | 25 | -- | WC OPEN NE-SW | |
| 38 | 111559Z | 30.0N 149.0E | 54-P-10- 3 | 700MB | 55 | ---- | 945 | 2609 | 17/14 | CIRC | | 30 | -- | WC OPEN S SEMIC | |
| 39 | 111805Z | 30.3N 148.4E | 54-P-15-10 | 700MB | 52 | ---- | 944 | 2618 | 18/16 | CIRC | | 30 | -- | WC OPEN S QUAD | |
| 40 | 120330Z | 32.9N 147.3E | VQ-R-30--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 41 | 120425Z | 33.0N 147.0E | SATELIT--- | STG X | DIA | 4 CAT | 3.0 | | | | | | | | |
| 42 | 120430Z | 33.3N 147.3E | VQ-P- 3- 7 | ----- | ---- | 85 | 952 | ---- | 26/24 | CIRC | | 27 | 5 | WC OPEN SW | |
| 43 | 121020Z | 34.8N 147.1E | VQ-P- 4--- | ----- | ---- | 55 | 951 | ---- | 26/26 | CIRC | | 25 | 8 | WC OPEN S | |
| 44 | 121501Z | 36.5N 147.0E | VQ-P- 8--- | 700MB | ---- | ---- | 956 | 2749 | 18/16 | CIRC | | 25 | -- | WC OPEN S | |
| 45 | 122200Z | 40.3N 148.3E | 54-P- 5- 5 | 700MB | 50 | 50 | 963 | 2762 | 15/12 | CIRC | | 25 | -- | NO WC | |

TYPHOON WENDY

1800Z 4 SEP TO 0000Z 13 SEP

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 041800Z | 19.6N 166.7E | 35 | 20.0N 166.0E | 30 | 46 | -5 | 20.0N 163.8E | 45 | 109 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 050000Z | 19.8N 166.5E | 40 | 19.7N 166.2E | 45 | 18 | 5 | 20.1N 163.3E | 70 | 119 | -20 | 20.8N 160.0E | 75 | 126 | -55 | 21.9N 157.3E | 80 | 143 | -50 |
| 050600Z | 20.0N 166.3E | 50 | 19.9N 166.4E | 50 | 8 | 0 | 20.0N 165.8E | 65 | 106 | -45 | 20.8N 163.8E | 75 | 142 | -60 | --.- ---.- | -- | -- | -- |
| 051200Z | 20.3N 166.0E | 60 | 20.3N 166.1E | 55 | 6 | -5 | 21.1N 164.7E | 70 | 55 | -55 | 21.5N 161.7E | 80 | 61 | -60 | 21.5N 158.3E | 90 | 67 | -85 |
| 051800Z | 20.7N 165.6E | 75 | 20.7N 165.8E | 65 | 11 | -10 | 21.3N 163.8E | 80 | 53 | -50 | 21.5N 160.4E | 90 | 21 | -45 | --.- ---.- | -- | -- | -- |
| 060000Z | 21.0N 165.2E | 90 | 20.7N 165.3E | 75 | 19 | -15 | 20.9N 162.7E | 100 | 54 | -30 | 20.9N 158.9E | 110 | 56 | -20 | 20.5N 154.2E | 120 | 313 | 15 |
| 060600Z | 21.3N 164.5E | 110 | 21.2N 164.6E | 110 | 8 | 0 | 21.8N 161.7E | 120 | 20 | -15 | 21.7N 157.4E | 130 | 128 | 5 | --.- ---.- | -- | -- | -- |
| 061200Z | 21.5N 163.8E | 125 | 21.5N 163.8E | 115 | 0 | -10 | 21.8N 160.0E | 135 | 38 | -5 | 21.5N 155.3E | 140 | 234 | 25 | 21.4N 150.1E | 140 | 485 | 30 |
| 061800Z | 21.6N 162.9E | 130 | 21.5N 162.8E | 120 | 8 | -10 | 21.4N 158.3E | 140 | 100 | 5 | 21.3N 153.1E | 140 | 357 | 25 | --.- ---.- | -- | -- | -- |
| 070000Z | 21.6N 162.1E | 130 | 21.5N 162.3E | 125 | 13 | -5 | 21.4N 158.2E | 140 | 89 | 10 | 21.3N 153.6E | 140 | 329 | 35 | 21.4N 149.0E | 140 | 484 | 25 |
| 070600Z | 21.6N 161.4E | 135 | 21.5N 161.4E | 130 | 6 | -5 | 21.5N 157.3E | 150 | 133 | 25 | 21.4N 152.7E | 145 | 371 | 40 | --.- ---.- | -- | -- | -- |
| 071200Z | 21.5N 160.6E | 140 | 21.5N 160.4E | 135 | 11 | -5 | 21.4N 156.2E | 150 | 184 | 35 | 21.6N 151.5E | 145 | 408 | 35 | 22.7N 146.9E | 140 | 465 | 25 |
| 071800Z | 21.3N 160.1E | 135 | 21.5N 159.8E | 140 | 21 | 5 | 21.4N 155.8E | 145 | 207 | 30 | 21.7N 151.2E | 145 | 395 | 30 | --.- ---.- | -- | -- | -- |
| 080000Z | 21.3N 159.8E | 130 | 21.2N 159.1E | 140 | 39 | 10 | 20.9N 155.3E | 145 | 247 | 40 | 21.5N 151.1E | 140 | 388 | 25 | 22.5N 147.4E | 135 | 400 | 35 |
| 080600Z | 21.5N 159.7E | 125 | 21.4N 159.6E | 135 | 8 | 10 | 21.2N 156.3E | 130 | 199 | 25 | 21.3N 152.9E | 130 | 337 | 10 | --.- ---.- | -- | -- | -- |
| 081200Z | 21.4N 159.5E | 115 | 21.4N 159.5E | 120 | 0 | 5 | 21.2N 157.6E | 120 | 179 | 10 | 21.1N 155.1E | 120 | 370 | 5 | 21.4N 151.7E | 120 | 499 | 30 |
| 081800Z | 21.8N 159.5E | 115 | 21.7N 159.4E | 120 | 8 | 5 | 21.7N 158.1E | 120 | 194 | 5 | 21.7N 155.6E | 120 | 396 | 10 | --.- ---.- | -- | -- | -- |
| 090000Z | 22.5N 159.4E | 105 | 22.3N 159.6E | 110 | 16 | 5 | 24.2N 158.6E | 105 | 145 | -10 | 25.9N 156.8E | 100 | 335 | 0 | 27.6N 154.3E | 100 | 429 | 15 |
| 090600Z | 23.3N 159.1E | 105 | 23.4N 159.2E | 105 | 8 | 0 | 25.5N 157.4E | 100 | 128 | -20 | 27.2N 154.9E | 100 | 268 | 5 | --.- ---.- | -- | -- | -- |
| 091200Z | 24.1N 158.4E | 110 | 24.1N 158.3E | 105 | 5 | -5 | 26.3N 154.8E | 115 | 72 | 0 | 28.1N 152.5E | 115 | 183 | 25 | 30.3N 150.5E | 105 | 352 | 30 |
| 091800Z | 24.9N 157.5E | 115 | 24.8N 157.8E | 115 | 17 | 0 | 27.3N 155.0E | 115 | 135 | 5 | 29.4N 152.3E | 110 | 206 | 20 | --.- ---.- | -- | -- | -- |
| 100000Z | 25.7N 156.5E | 115 | 25.5N 156.4E | 115 | 13 | 0 | 27.7N 152.4E | 120 | 77 | 20 | 30.5N 149.2E | 115 | 113 | 30 | --.- ---.- | -- | -- | -- |
| 100600Z | 26.5N 155.3E | 120 | 26.5N 155.7E | 110 | 21 | -10 | 29.3N 152.3E | 100 | 112 | 5 | 32.4N 150.6E | 80 | 187 | 0 | --.- ---.- | -- | -- | -- |
| 101200Z | 27.2N 153.9E | 115 | 27.2N 153.9E | 110 | 0 | -5 | 30.3N 150.0E | 100 | 57 | 10 | 33.6N 149.0E | 80 | 144 | 5 | --.- ---.- | -- | -- | -- |
| 101800Z | 27.7N 152.5E | 110 | 27.8N 152.8E | 110 | 17 | 0 | 31.1N 149.6E | 100 | 70 | 10 | 34.3N 149.1E | 80 | 233 | 15 | --.- ---.- | -- | -- | -- |
| 110000Z | 28.3N 151.1E | 100 | 28.0N 151.0E | 100 | 19 | 0 | 30.0N 146.0E | 95 | 135 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 110600Z | 28.9N 150.2E | 95 | 28.5N 149.6E | 100 | 39 | 5 | 30.8N 145.2E | 85 | 188 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 111200Z | 29.5N 149.4E | 90 | 29.3N 149.2E | 95 | 16 | 5 | 32.0N 146.9E | 80 | 210 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 111800Z | 30.4N 148.5E | 90 | 30.2N 148.8E | 95 | 20 | 5 | 33.8N 147.2E | 80 | 252 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 120000Z | 31.8N 147.6E | 85 | 31.3N 147.6E | 85 | 30 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 120600Z | 33.5N 147.1E | 80 | 33.7N 147.4E | 80 | 19 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 121200Z | 35.5N 147.2E | 75 | 35.3N 147.1E | 75 | 13 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 121800Z | 38.0N 147.6E | 65 | 37.5N 147.9E | 65 | 33 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 16NM | 126NM | 241NM | 364NM | 16NM | 126NM | 241NM | 364NM |
| AVERAGE RIGHT ANGLE ERROR | 9NM | 74NM | 160NM | 258NM | 9NM | 74NM | 160NM | 258NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 5KTS | 19KTS | 24KTS | 34KTS | 5KTS | 19KTS | 24KTS | 34KTS |
| AVERAGE BIAS OF WIND ERROR | -1KTS | -0KTS | 4KTS | 7KTS | -1KTS | -0KTS | 4KTS | 7KTS |
| NUMBER OF FORECASTS | 33 | 29 | 24 | 10 | 33 | 29 | 24 | 10 |


BEST TRACK
TYPHOON AGNES
15-19 SEP 1971
CYCLONE 29
MAX SFC WND - 75kts
MINIMUM SLP - 975mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
VOLCANO ISLANDS
MARIANAS ISLANDS
MARCUS ISLAND
53
47
45
59
46
48
98

## AGNES

The weak circulation which was to become Agnes had been followed on synoptic charts for close to a week in the west central Philippine Sea. On September 14th, satellite data and aircraft reconnaissance indicated signs of development, and by the following afternoon, September's third tropical storm had formed.

Guided by an extension of the subtropical ridge to the Ryukyus, Agnes slowly edged northward (Figure 5-44) and then shifted to a westerly course while she intensified to a typhoon on the 17th. Possible recurvature existed with a trough in the westerlies approaching the northern Yellow Sea at this time; however, its influence was not felt and Agnes followed the weak ridge making landfall on Taiwan between Hualein and Ilan early on the evening of the 18th (Figure 5-45). After crossing the Taiwan straits, Agnes arrived on the China mainland near Nanchang and dissipated as she moved inland.

Winds of 58 kt gusting to 78 kt were felt on the islands offshore of northeastern Taiwan while heavy rainfall produced by typhoon Agnes amounted up to 17.4 inches in 48 hours at Anpu in the mountainous terrain of the island. Flooding in Taipei was reported extremely serious as much of the lower areas of the city were badly flooded. Over 100 dwellings were partially or totally destroyed by the flooding; one person was reported killed and five others missing due to the typhoon.

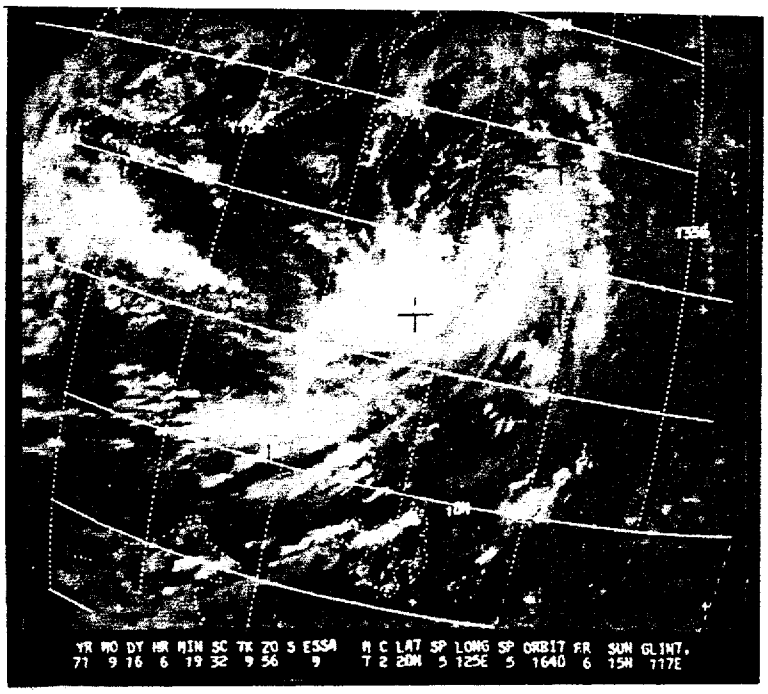



FIGURE 5-44. TROPICAL STORM AGNES NORTHEAST OF LUZON ON 16 SEPTEMBER.

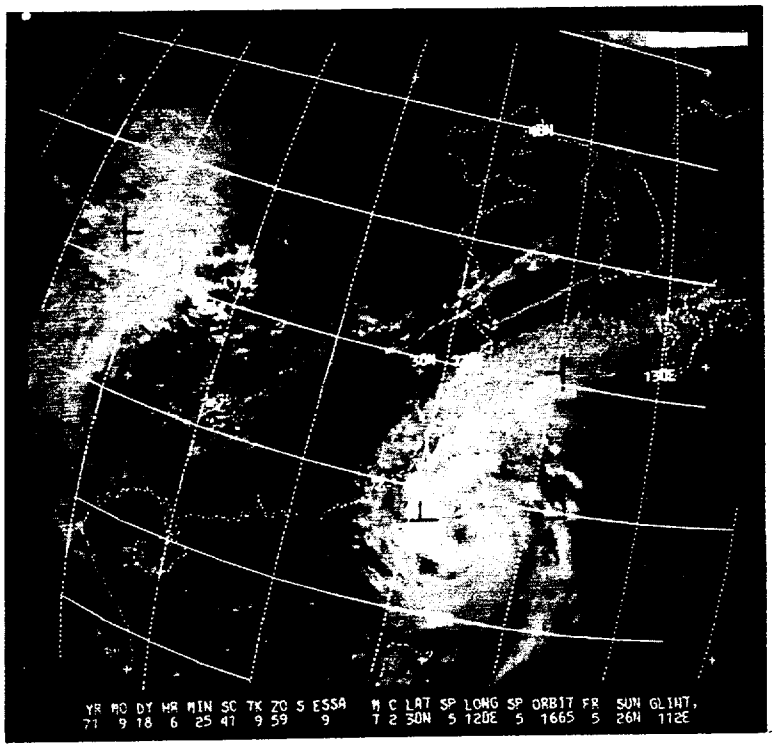



FIGURE 5-45. TYPHOON AGNES IS SIGHTED BY ESSA-9 ON 18 SEPTEMBER PRIOR TO LANDFALL ON TAIWAN.

TYPHOON AGNES
EYE FIXES FOR CYCLONE NO. 29
15 SEP - 19 SEP 71

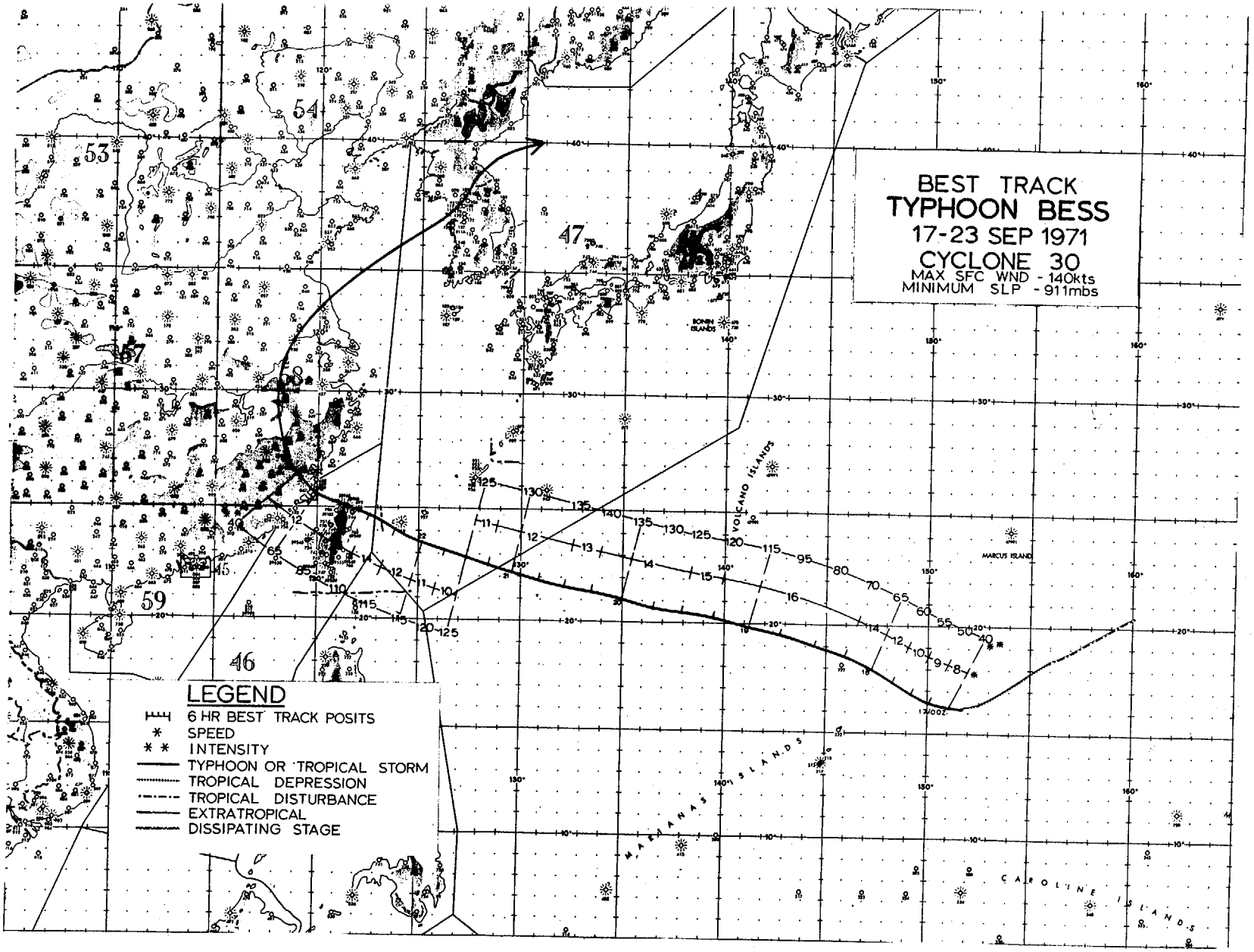
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1305192 | 16.0N 127.5E | SATELLI--- | STG H | | | | | | | | | | FIRST BLTN | |
| 2 | 1400182 | 16.0N 126.0E | SATELLI--- | STG R | | | | | | | | | | LESS ORGANIZED | |
| 3 | 1405532 | 19.5N 124.1E | VQ-P- 5-20 | ----- | ---- | 25 | 1000 | ---- | 25/25 | CIRC | | 35 | -- | NO ORGANIZ ON RDR | |
| 4 | 1500002 | 18.3N 127.0E | 54-P------- | 700MB | 35 | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | 700MB WIND CNTR | |
| 5 | 1505212 | 19.0N 126.5E | SATELLI--- | STG C | | | | | | | | | | BETTER ORGANIZED | |
| 6 | 1510302 | 19.1N 125.8E | 54-P- 5-15 | 700MB | 40 | ---- | 997 | 3027 | 08/08 | ---- | ----- | -- | -- | 700MB WIND CNTR | |
| 7 | 1521202 | 19.4N 125.8E | 54-P- 5- 5 | 700MB | 40 | 35 | 992 | 3005 | 08/08 | ---- | ----- | -- | -- | NO RDR PRES | |
| 8 | 1600202 | 21.5N 125.5E | SATELLI--- | STG C | | | | | | | | | | LITTLE CHANGE | |
| 9 | 1610002 | 19.4N 125.5E | 54-P- 2-28 | 700MB | 50 | 30 | 994 | 2987 | 09/08 | ---- | ----- | -- | -- | NO RDR PRES | |
| 10 | 1610002 | 20.3N 125.8E | VQ-P-16- 5 | ----- | ---- | 55 | 991 | ---- | 26/22 | CIRC | | 30 | -- | POORLY ORGANIZED | |
| 11 | 1621012 | 21.1N 125.0E | VQ-P-15- 5 | ----- | ---- | 40 | 987 | ---- | 26/25 | CIRC | | 45 | -- | MCMG MORE ORGANIZ | |
| 12 | 1704152 | 21.3N 125.2E | 54-P- 5-15 | 700MB | 40 | 35 | 989 | 2947 | 12/11 | ---- | ----- | -- | -- | NO WC-700MB CNTR | |
| 13 | 1705222 | 21.5N 125.0E | SATELLI--- | STG C+ | | | | | | | | | | SNM W STRONGER | |
| 14 | 1707002 | 21.7N 125.1E | 54-P- 5- 5 | 700MB | 45 | 40 | 980 | 2917 | 11/11 | ---- | ----- | -- | -- | SAME AS 04157 RMK | |
| 15 | 1710002 | 22.3N 124.7E | 54-P- 5- 5 | 700MB | 50 | 45 | 970 | 2905 | 12/09 | ---- | ----- | -- | -- | NO WC | |
| 16 | 1710402 | 22.5N 124.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 17 | 1719552 | 22.8N 124.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 46699 | 24.0N 121.6E |
| 18 | 1721002 | 23.2N 124.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 46699 | 24.0N 121.6E |
| 19 | 1722152 | 23.0N 123.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 123.3E |
| 20 | 1721202 | 23.3N 123.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 21 | 1723002 | 23.3N 123.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 22 | 1723252 | 23.0N 123.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | GOOD FIX-47927 | 24.8N 123.3E |
| 23 | 1801002 | 23.3N 123.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-47918 | 24.3N 124.2E |
| 24 | 1801052 | 23.1N 123.2E | VQ-P-15-10 | ----- | ---- | 70 | 961 | ---- | 27/23 | CIRC | | 40 | -- | NO WC-SST 85 DEG | |
| 25 | 1803002 | 23.8N 122.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 26 | 1803552 | 23.5N 123.1E | VQ-P- 5- 5 | ----- | ---- | 60 | 979 | ---- | 27/22 | CIRC | | 40 | -- | NO WC | |
| 27 | 1805552 | 23.5N 122.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47763 | 34.0N 131.5E |
| 28 | 1805302 | 23.3N 122.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 123.3E |
| 29 | 1805402 | 23.0N 122.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47763 | 34.0N 131.5E |
| 30 | 1806252 | 23.5N 122.5E | SATELLI--- | STG A | DIA | 3 | CAT | 4.0 | | | | | | STRONGER | |
| 31 | 1806342 | 23.7N 122.8E | VQ-P-10- 5 | 700MB | ---- | ---- | 978 | 2880 | 16/13 | CIRC | | 35 | -- | NO WC-SST 85 DEG | |
| 32 | 1807402 | 23.9N 122.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | FUCHU RDR | |
| 33 | 1808202 | 24.0N 122.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 34 | 1810302 | 23.8N 122.3E | 54-P- 5-15 | 400MB | 60 | ---- | ---- | ---- | -7/-9 | ---- | ----- | -- | -- | NO RDR PRES | |
| 35 | 1822002 | 24.0N 120.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |

TYPHOON AGNES

0600Z 15 SEP TO 0600Z 19 SEP

| | BEST TRACK | | WARNING | | | | | 24 HOUR FORECAST | | | | | 48 HOUR FORECAST | | | | | 72 HOUR FORECAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | |
| | POSIT | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND |
| 150600Z | 18.8N 126.3E | 35 | 18.2N | 126.4E | 30 | 36 | -5 | 18.2N | 124.2E | 40 | 128 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 151200Z | 19.0N 126.0E | 35 | 18.2N | 125.9E | 30 | 48 | -5 | 18.2N | 123.4E | 45 | 172 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 151800Z | 19.2N 125.8E | 40 | 18.8N | 125.7E | 30 | 25 | -10 | 18.7N | 123.3E | 45 | 165 | -5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 160000Z | 19.5N 125.7E | 40 | 19.4N | 125.6E | 30 | 8 | -10 | 20.3N | 124.0E | 45 | 86 | -10 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 160600Z | 19.8N 125.7E | 40 | 19.8N | 125.2E | 30 | 28 | -10 | 21.2N | 123.3E | 45 | 103 | -15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 161200Z | 20.1N 125.7E | 45 | 19.5N | 125.3E | 30 | 42 | -15 | 20.2N | 124.0E | 50 | 124 | -15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 161800Z | 20.4N 125.6E | 50 | 20.4N | 125.8E | 45 | 11 | -5 | 21.4N | 125.1E | 55 | 99 | -10 | 22.8N | 124.3E | 60 | 217 | 15 | --.- | ---.- | -- | -- | -- |
| 170000Z | 20.9N 125.4E | 55 | 21.3N | 124.7E | 45 | 46 | -10 | 23.9N | 122.7E | 55 | 58 | -15 | 27.0N | 122.5E | 60 | 200 | 20 | --.- | ---.- | -- | -- | -- |
| 170600Z | 21.6N 125.1E | 60 | 21.4N | 125.0E | 45 | 13 | -15 | 23.5N | 123.4E | 55 | 50 | -20 | 25.9N | 122.2E | 60 | 188 | 25 | --.- | ---.- | -- | -- | -- |
| 171200Z | 22.2N 124.6E | 65 | 22.5N | 124.5E | 45 | 19 | -20 | 24.9N | 123.7E | 60 | 124 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 171800Z | 22.7N 124.0E | 65 | 23.2N | 124.3E | 50 | 34 | -15 | 25.9N | 123.8E | 60 | 193 | 15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 180000Z | 23.1N 123.3E | 70 | 23.2N | 123.4E | 65 | 8 | -5 | 25.6N | 122.0E | 75 | 131 | 35 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 180600Z | 23.6N 122.5E | 75 | 23.7N | 122.7E | 70 | 12 | -5 | 26.8N | 122.4E | 65 | 216 | 30 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 181200Z | 24.1N 121.6E | 55 | 24.3N | 121.9E | 70 | 20 | 15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 181800Z | 24.3N 120.7E | 45 | 24.3N | 121.3E | 65 | 33 | 20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 190000Z | 24.7N 119.8E | 40 | 24.3N | 119.9E | 50 | 25 | 10 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 190600Z | 25.2N 118.8E | 35 | 25.1N | 118.8E | 40 | 6 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 24NM | 127NM | 201NM | 0NM | 24NM | 127NM | 201NM | 0NM |
| AVERAGE RIGHT ANGLE ERROR | 19NM | 94NM | 102NM | 0NM | 19NM | 94NM | 102NM | 0NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 11KTS | 13KTS | 20KTS | 0KTS | 11KTS | 13KTS | 20KTS | 0KTS |
| AVERAGE BIAS OF WIND ERROR | -5KTS | -0KTS | 20KTS | 0KTS | -5KTS | -0KTS | 20KTS | 0KTS |
| NUMBER OF FORECASTS | 17 | 13 | 3 | 0 | 17 | 13 | 3 | 0 |


BEST TRACK
TYPHOON BESS
17-23 SEP 1971
CYCLONE 30
MAX SFC WND - 140kts
MINIMUM SLP - 911mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
VOLCANO ISLANDS
MARCUS ISLAND
MARIANAS ISLANDS
CAROLINE ISLANDS

September's fourth typhoon developed from a disturbance associated with an upper tropospheric low that was first noted between Wake and Marcus Island by satellite on September 14th. The low aloft drifted southwestward and induced a circulation at the surface. (See Figure 5-46 for satellite view sequence of Bess.)

By the 17th, aircraft reconnaissance located Bess about 300 n mi east of the Marianas with associated maximum winds of 40 kt. Bess developed into a typhoon on September 18th passing near Agrihan Island that afternoon. On the morning of the 20th, Bess had intensified further to be the season's fifth super typhoon with maximum winds of 140 kt generated under her wall cloud encircling a 30 n mi eye (Figure 2-5). In the meantime, the typhoon's central pressure dipped to 906 mb* within a few hours.

With the subtropical ridge extending to the Ryukyu chain, Bess proceeded on a steady west-northwesterly track with forward speed gradually decreasing from 16 to 12 kt as she approached the southern Ryukyus. On the afternoon of the 22nd, the typhoon passed a few miles south of Ishigaki Jima and crossed directly over Younaguni Jima. Bess was measured at 91 kt gusting to 124 kt at the Japanese weather station on Younaguni Jima while Ishigaki Jima received 9.3 inches of rainfall during the typhoon's passage. The southern Ryukyu Islands reported two persons killed and more than 2,000 people made homeless. The islands were declared a major disaster area.

On the evening of September 22nd, Bess--the second typhoon to strike Taiwan during September--moved inland near Ilan which recorded a minimum sea level pressure of 955.5 mb. The eye of the storm, estimated at 40 n mi in diameter, passed over Taipei between 1420 and 1505 GMT. Highest sustained winds recorded were 108 kt at Pengchiayu and the maximum gust observed was 130 kt at Keelung. A storm surge of 9.9 ft was experienced at Tanshui on the island's northern coast during passage of the eye.

Bess emerged into the Taiwan Straits as a minimal typhoon in the early morning of the 23rd near Taoyuan and struck mainland China near Fuichow that afternoon.

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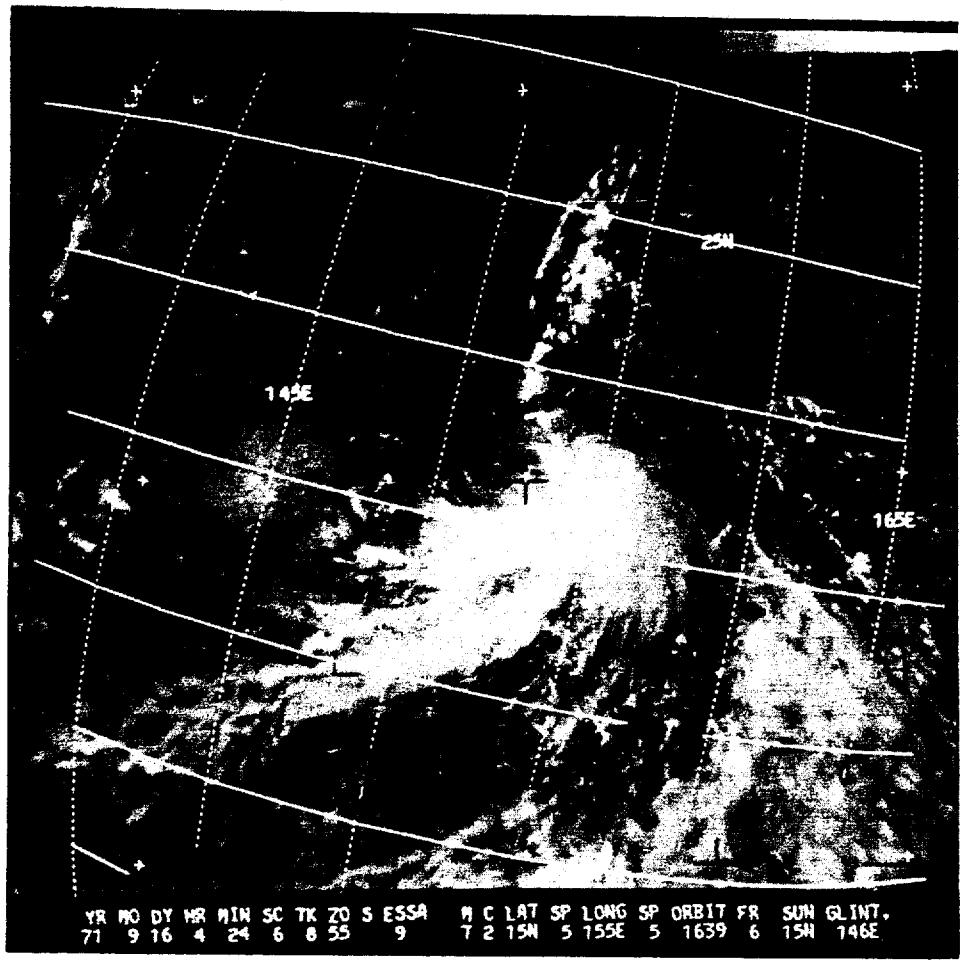
*Reduced from a minimum 700 mb height of 2268 m.

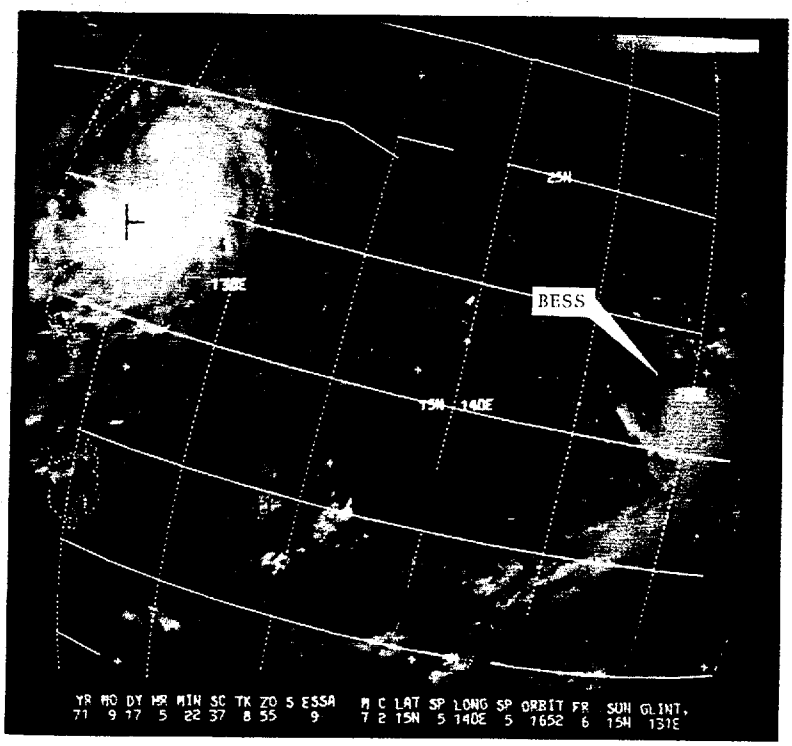
The storm weakened to depression status over land then, drifting northward, she recurved and crossed the Yellow Sea as an extratropical system.

Flooding in Taipei was extreme in places and all main roads branching out of Taipei were made temporarily impassable by the storm. The torrential rainfall in the mountainous terrain amounted to 18.7 inches at Alishan. The typhoon was also responsible for serious damage to rice, sugar cane and banana crops. In total, Bess accounted for 30 deaths with 6 reported missing and over 2,200 dwellings destroyed.

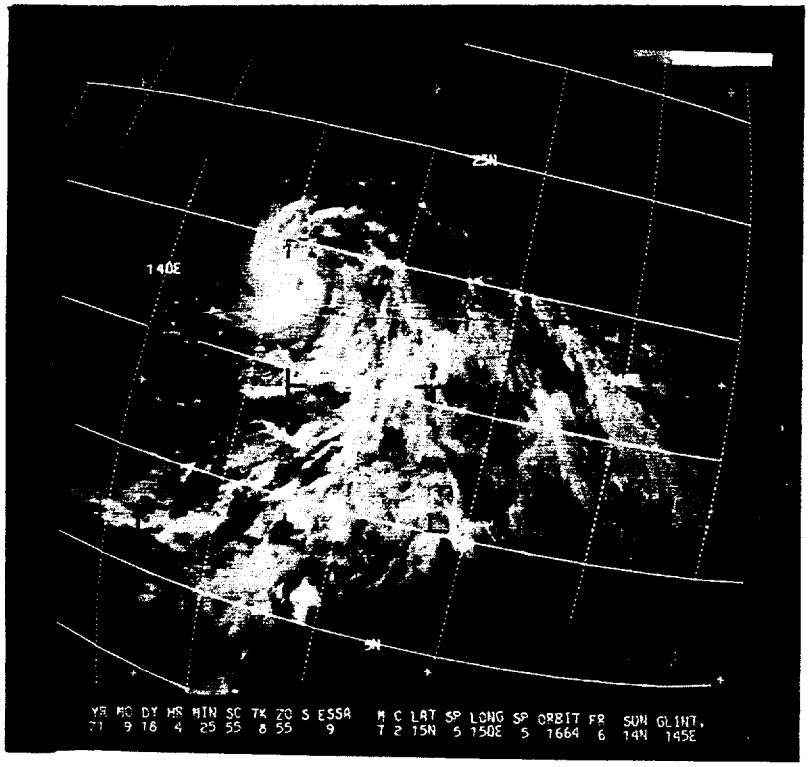
FIGURE 5-46. ESSA-9 VIEW SEQUENCE OF TYPHOON BESS.



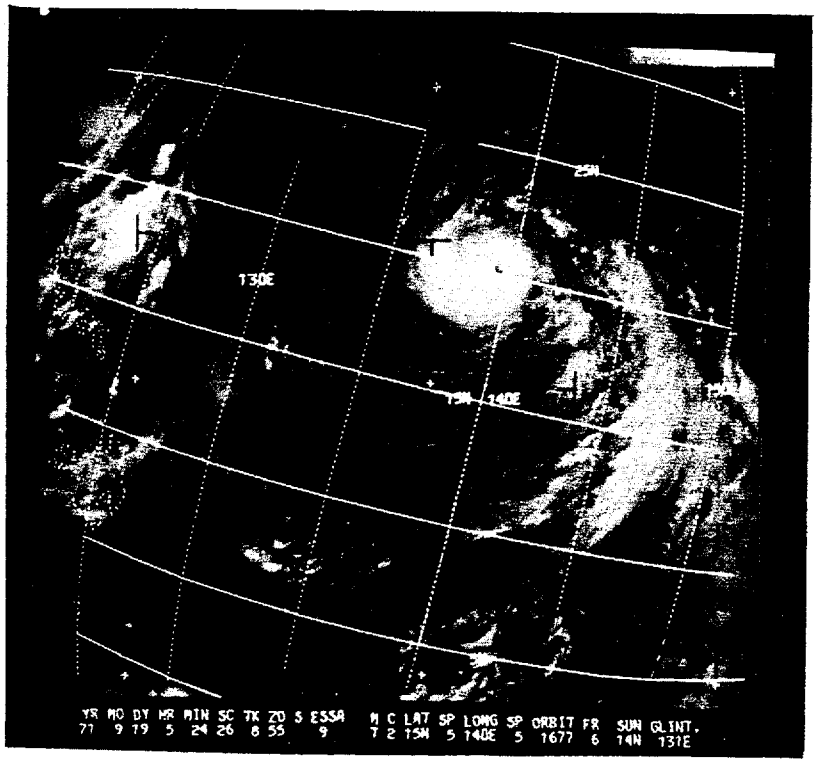

16 SEPTEMBER - TROPICAL DEPRESSION



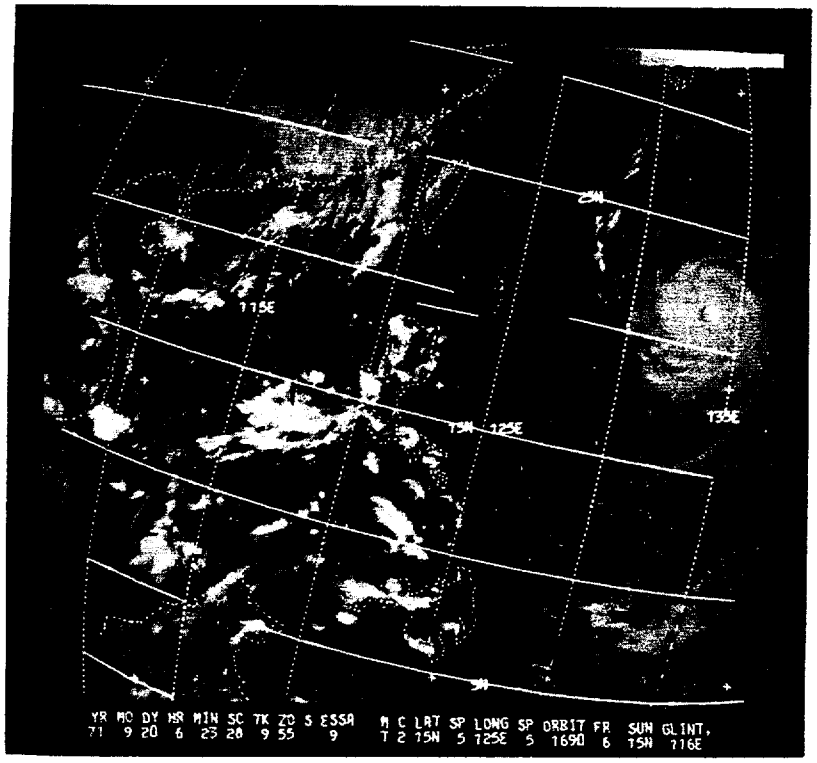

17 SEPTEMBER - TROPICAL STORM STAGE (AGNES IS SEEN ON WESTERN EDGE OF PHOTO.)



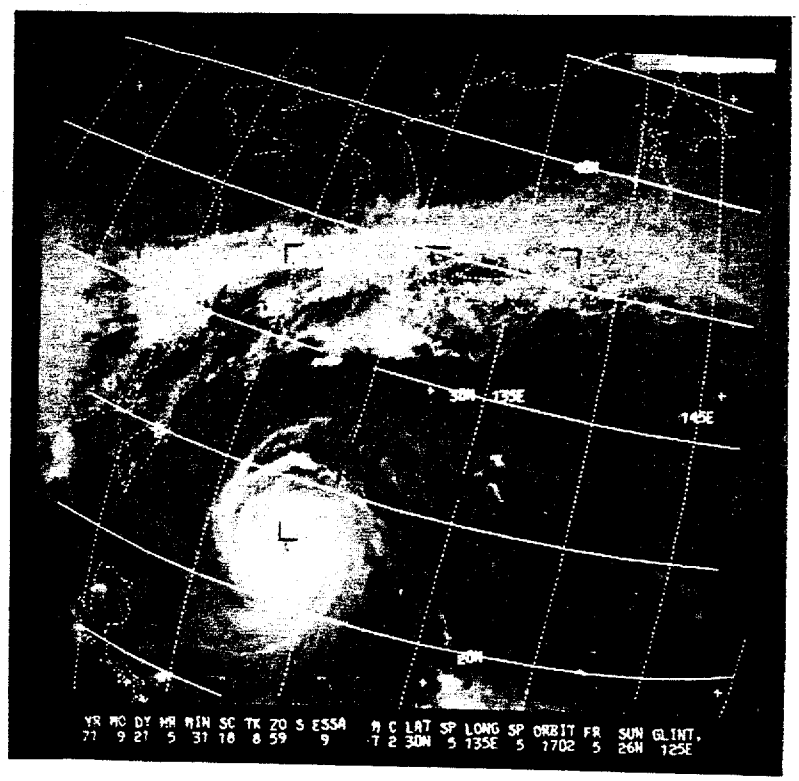

18 SEPTEMBER - TYPHOON STRENGTH 70 KT.



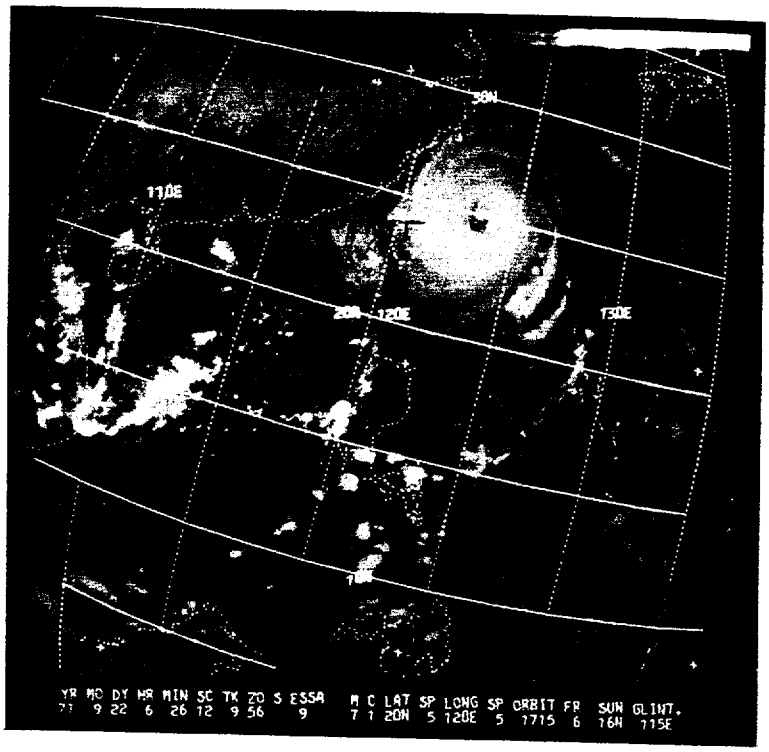

19 SEPTEMBER - TYPHOON STRENGTH 120 KT.




20 SEPTEMBER - SUPER TYPHOON STRENGTH (140 KT)




21 SEPTEMBER - TYPHOON STRENGTH (125 KT)




22 SEPTEMBER - TYPHOON STAGE (115 KT)

TYPHOON BESS
EYE FIXES FOR CYCLONE NO. 30
17 SEP - 23 SEP 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 160424Z | 18.0N 154.3E | SATELIT--- | STG B | | | | | | | | | | | |
| 2 | 162305Z | 16.3N 151.0E | 54-P-10--- | 700MB | 25 | 30 | 995 | 3033 | 12/12 | CIRC | | 15 | -- | POORLY DEFINED | |
| 3 | 170405Z | 17.1N 149.6E | 54-P- 5--- | 700MB | 43 | 50 | 987 | 2987 | 14/09 | CIRC | | 25 | -- | WC FRMG S SEMIC 700 CNTR 5NM NW | |
| 4 | 170522Z | 16.5N 150.0E | SATELIT--- | STG X | DIA | 3 | CAT 2.0 | | | | | | | | |
| 5 | 170955Z | 16.9N 149.2E | VQ-R- 3- 9 | ---- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 12 | 5 | WC FRMG E QUAD | 16.7N 148.8E |
| 6 | 171640Z | 17.2N 148.6E | VQ-P- 8--- | 700MB | ---- | ---- | 970 | 2941 | 16/12 | CIRC | | 12 | -- | ILL-DEFINED WC | |
| 7 | 172200Z | 17.8N 147.5E | 54-P-15--- | 700MB | 50 | 60 | 980 | 2899 | 14/12 | ---- | ---- | -- | -- | POORLY DEFINED | |
| 8 | 180345Z | 18.3N 146.6E | 54-P-15--- | 700MB | 55 | 65 | 974 | 2871 | 14/11 | ---- | ---- | -- | -- | POORLY DEFINED | |
| 9 | 180425Z | 18.2N 146.0E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | TREG SHAPED EYE | |
| 10 | 180954Z | 18.8N 144.9E | VQ-P- 2- 2 | ---- | ---- | 90 | 970 | ---- | 26/23 | CIRC | | 28 | -- | POORLY DEFINED | |
| 11 | 181550Z | 19.1N 143.3E | VQ-P- 1- 2 | 700MB | ---- | 100 | 954 | 2758 | 26/23 | CIRC | | 24 | 3 | CLSD WC | |
| 12 | 182230Z | 19.8N 141.5E | 54-P- 2- 3 | 700MB | 100 | 110 | 927 | 2499 | 21/11 | CIRC | | 22 | 7 | CLSD WC | |
| 13 | 190320Z | 20.0N 140.3E | 54-P- 4- 3 | 700MB | 105 | 120 | 910 | 2402 | 26/14 | CIRC | | 18 | 6 | CLSD WC-700 CNTR 7NM NNW | |
| 14 | 190524Z | 20.1N 139.6E | SATELIT--- | STG X | DIA | 3 | CAT 4.0 | | | | | | | EYE VISIBLE | |
| 15 | 190952Z | 19.1N 139.1E | VQ-R- 3- 8 | ---- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 19 | 6 | CLSD WC | 19.6N 140.6E |
| 16 | 191620Z | 20.6N 136.9E | VQ-P- 3- 2 | 700MB | ---- | ---- | 914 | 2346 | 21/11 | CIRC | | 18 | 7 | CLSD WC | |
| 17 | 192230Z | 21.0N 135.4E | 54-P- 5- 5 | 700MB | 110 | 120 | 924 | 2429 | 19/09 | CIRC | | 30 | 7 | CLSD WC | |
| 18 | 200623Z | 21.5N 133.5E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | EYE VISIBLE | |
| 19 | 201720Z | 21.7N 131.1E | VQ-R-15--- | ---- | ---- | ---- | ---- | ---- | --/-- | ---- | ---- | -- | -- | EST POSIT | 21.0N 132.9E |
| 20 | 201844Z | 21.9N 130.7E | VQ-P- 3--- | 700MB | ---- | ---- | 911 | 2369 | 19/14 | CIRC | | 30 | 6 | CLSD WC | |
| 21 | 202144Z | 22.1N 130.3E | VQ-P- 3--- | 700MB | ---- | ---- | 920 | 2384 | 19/11 | CIRC | | 30 | -- | CLSD WC | |
| 22 | 210110Z | 22.2N 129.6E | 54-P- 5- 5 | 700MB | 110 | ---- | ---- | ---- | 18/14 | CIRC | | 30 | 7 | CLSD WC | |
| 23 | 210349Z | 22.4N 129.0E | 54-P- 3- 5 | 700MB | 100 | 100 | ---- | ---- | 18/13 | CIRC | | 30 | 7 | CLSD WC | |
| 24 | 210531Z | 22.2N 128.8E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | EYE VISIBLE | |
| 25 | 210600Z | 22.6N 128.6E | 54-P- 3- 3 | 700MB | 100 | ---- | ---- | ---- | 18/12 | CIRC | | 30 | 7 | CLSD WC | |
| 26 | 210800Z | 22.5N 128.3E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | | |
| 27 | 210900Z | 22.8N 127.5E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 28 | 211000Z | 22.8N 127.5E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 29 | 210955Z | 22.8N 127.0E | 54-P- 5- 3 | 700MB | 100 | 80 | 921 | 2385 | 17/13 | ELIP | NE-SW | 24X20 | 12 | CLSD WC | |
| 30 | 211100Z | 22.7N 127.4E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 31 | 211240Z | 23.0N 127.0E | 54-P- 5- 4 | 700MB | 100 | ---- | ---- | ---- | 18/14 | CONC | - | 60X25 | 10 | CLSD WC-INNER EYE | |
| 32 | 211300Z | 22.7N 127.1E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 ELLIPTICAL 20X30 | 24.8N 125.3E |
| 33 | 211400Z | 22.7N 126.9E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 34 | 211500Z | 22.7N 126.8E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 35 | 211530Z | 22.9N 126.7E | 54-P- 5- 3 | 700MB | 100 | ---- | 926 | ---- | 17/11 | CIRC | | 80 | 6 | CLSD WC-INNER EYE DISSIPATING | |
| 36 | 211600Z | 22.8N 126.7E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 37 | 211800Z | 23.1N 126.2E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 38 | 211900Z | 23.2N 126.1E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 39 | 211949Z | 23.3N 126.0E | VQ-R-15--- | ---- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 18 | 6 | WC OPEN SE QUAD | 22.2N 126.2E |
| 40 | 212000Z | 23.3N 126.0E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 41 | 212000Z | 23.1N 125.8E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47918 | 24.3N 124.2E |
| 42 | 212200Z | 23.4N 125.5E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47918 | 24.3N 124.2E |
| 43 | 212210Z | 23.4N 125.6E | VQ-P- 5- 3 | 700MB | ---- | ---- | 944 | 2621 | 17/10 | ELIP | N-S | 25X15 | -- | CLSD WC | |
| 44 | 212300Z | 23.4N 125.2E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |
| 45 | 212300Z | 23.4N 125.3E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47918 | 24.3N 124.2E |
| 46 | 220000Z | 23.4N 125.0E | LND RDR--- | | | | | | | ---- | ---- | -- | -- | STN 47927 | 24.8N 125.3E |

TYPHOON BESS
EYE FIXES FOR CYCLONE NO. 30
17 SEP - 23 SEP 71

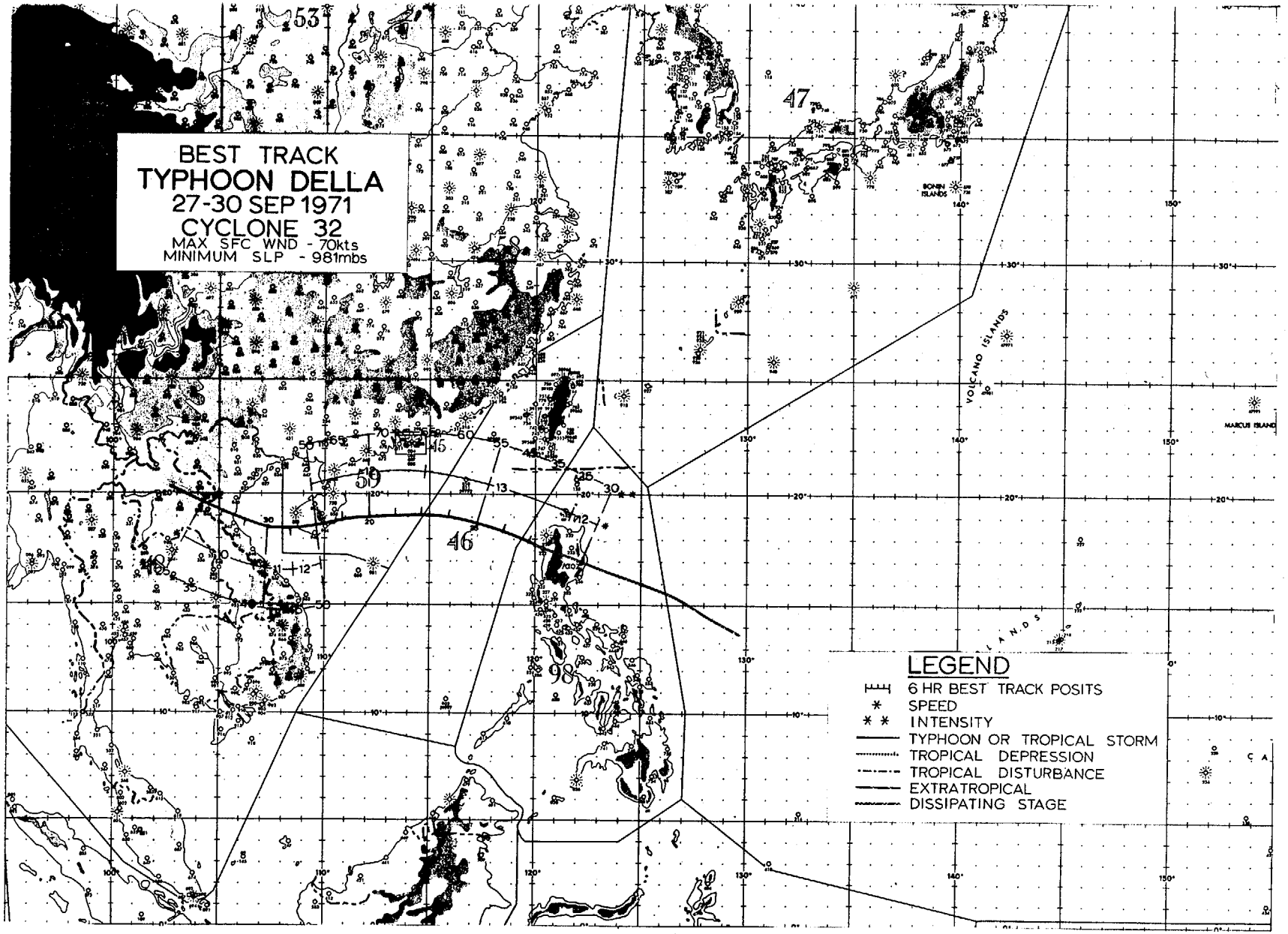
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 220000Z | 23.4N 125.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 48 | 220014Z | 23.5N 125.2E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 20 | 9 | | 22.5N 124.6E |
| 49 | 220130Z | 23.3N 124.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 50 | 220200Z | 23.6N 124.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 51 | 220200Z | 23.5N 124.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 52 | 220230Z | 23.5N 124.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 53 | 220300Z | 23.6N 124.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 46763 | 34.0N 131.5E |
| 54 | 220300Z | 23.6N 124.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 55 | 220300Z | 23.7N 124.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 56 | 220400Z | 23.7N 124.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 57 | 220400Z | 23.7N 124.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 58 | 220419Z | 23.8N 124.2E | 54-P- 3- 5 | 700MB | 110 | ---- | 943 | 2576 | 17/10 | CIRC | | 40 | -- | CLSD WC | |
| 59 | 220515Z | 23.7N 124.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 60 | 220600Z | 23.8N 123.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIPEI RDR | 25.0N 121.5E |
| 61 | 220600Z | 23.9N 124.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 62 | 220626Z | 24.8N 123.6E | SATELIT--- | STG X | DIA | 4 | CAT 4.0 | | | | | | | EYE VISIBLE | |
| 63 | 220700Z | 24.1N 123.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 64 | 220700Z | 24.0N 123.6E | 54-P- 3- 2 | 700MB | 120 | ---- | 940 | 2570 | 17/11 | CIRC | | 40 | -- | CLSD WC | |
| 65 | 220700Z | 23.9N 123.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | SUNGSHAN RDR | |
| 66 | 220800Z | 24.2N 123.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 67 | 220900Z | 24.3N 123.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 68 | 220900Z | 24.3N 123.2E | 54-P- 5- 5 | 700MB | 100 | ---- | 940 | 2585 | 17/10 | CIRC | | 40 | -- | CLSD WC-TOPS 35K | |
| 69 | 220900Z | 24.3N 123.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 70 | 221000Z | 24.5N 123.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | 24.8N 125.3E |
| 71 | 221000Z | 24.5N 123.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 72 | 221200Z | 24.3N 122.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47918 | 24.3N 124.2E |
| 73 | 221236Z | 25.0N 122.6E | VQ-R- 3-15 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | POOR RDR PRES | 24.9N 123.7E |
| 74 | 221240Z | 24.7N 122.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIPEI RDR | 25.0N 121.5E |
| 75 | 221300Z | 24.7N 122.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | | |
| 76 | 221300Z | 24.8N 122.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | TAIWAN RDR | |
| 77 | 221500Z | 25.0N 121.5E | ---------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | EYE POSIT TAIPEI | |
| 78 | 221627Z | 25.2N 121.3E | VQ-R- 3-20 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | V POOR RDR PRES | 25.8N 121.6E |

TYPHOON BESS

0000Z 17 SEP TO 0600Z 23 SEP

| | BEST TRACK | | WARNING | | | | | 24 HOUR FORECAST | | | | | 48 HOUR FORECAST | | | | | 72 HOUR FORECAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | | POSIT | WIND | DST | WIND | | POSIT | WIND | DST | WIND | | POSIT | WIND | DST | WIND | |
| 170000Z | 16.3N 150.9E | 40 | 16.4N 150.9E | 30 | 6 | -10 | | 17.1N 147.7E | 50 | 58 | -15 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 170600Z | 16.5N 150.0E | 50 | 16.7N 149.2E | 50 | 47 | 0 | | 18.1N 144.6E | 75 | 85 | 5 | | 19.6N 140.7E | 95 | 79 | -25 | | --.- ---.- | -- | -- | -- | |
| 171200Z | 16.9N 149.2E | 55 | 17.0N 148.8E | 60 | 24 | 5 | | 18.0N 144.8E | 85 | 64 | 5 | | 19.4N 141.0E | 100 | 186 | -25 | | 21.0N 137.6E | 110 | 308 | -20 | |
| 171800Z | 17.3N 148.3E | 60 | 17.2N 148.3E | 60 | 6 | 0 | | 18.1N 145.0E | 85 | 150 | -10 | | 19.3N 141.4E | 100 | 287 | -30 | | --.- ---.- | -- | -- | -- | |
| 180000Z | 18.0N 147.3E | 65 | 17.9N 147.1E | 65 | 13 | 0 | | 19.9N 143.4E | 80 | 124 | -35 | | 22.1N 140.4E | 100 | 306 | -35 | | 24.4N 138.1E | 110 | 484 | -20 | |
| 180600Z | 18.6N 146.0E | 70 | 18.4N 146.5E | 70 | 31 | 0 | | 20.4N 143.4E | 85 | 218 | -35 | | 22.4N 140.7E | 100 | 404 | -40 | | --.- ---.- | -- | -- | -- | |
| 181200Z | 19.0N 144.4E | 80 | 19.0N 144.3E | 90 | 6 | 10 | | 21.4N 139.2E | 110 | 90 | -15 | | 24.2N 135.6E | 120 | 247 | -15 | | 27.4N 133.6E | 125 | 434 | 0 | |
| 181800Z | 19.5N 142.8E | 95 | 19.2N 142.9E | 95 | 19 | 0 | | 21.4N 137.7E | 115 | 79 | -15 | | 24.1N 134.0E | 125 | 215 | -5 | | --.- ---.- | -- | -- | -- | |
| 190000Z | 19.9N 141.2E | 115 | 19.9N 141.2E | 110 | 0 | -5 | | 21.8N 135.0E | 125 | 42 | -10 | | 24.4N 130.6E | 125 | 142 | -5 | | 27.5N 127.9E | 125 | 283 | 10 | |
| 190600Z | 20.3N 139.5E | 120 | 20.2N 139.7E | 120 | 13 | 0 | | 22.1N 134.1E | 135 | 58 | -5 | | 24.9N 129.9E | 130 | 160 | 0 | | --.- ---.- | -- | -- | -- | |
| 191200Z | 20.5N 137.9E | 125 | 20.4N 138.2E | 125 | 18 | 0 | | 22.7N 133.0E | 130 | 82 | -5 | | 25.5N 129.3E | 120 | 190 | -5 | | 28.5N 126.6E | 110 | 312 | 0 | |
| 191800Z | 20.7N 136.5E | 130 | 20.8N 136.4E | 130 | 8 | 0 | | 22.8N 131.1E | 130 | 55 | 0 | | 25.3N 127.3E | 120 | 137 | 0 | | --.- ---.- | -- | -- | -- | |
| 200000Z | 21.1N 135.0E | 135 | 21.1N 135.0E | 125 | 0 | -10 | | 22.8N 129.3E | 110 | 39 | -20 | | 25.0N 124.6E | 100 | 94 | -15 | | 27.6N 120.7E | 85 | 125 | 20 | |
| 200600Z | 21.3N 133.5E | 140 | 21.4N 133.5E | 130 | 6 | -10 | | 22.7N 127.7E | 120 | 39 | -10 | | 24.4N 122.9E | 105 | 59 | -10 | | --.- ---.- | -- | -- | -- | |
| 201200Z | 21.6N 132.1E | 135 | 21.8N 131.8E | 130 | 20 | -5 | | 23.1N 126.0E | 115 | 72 | -10 | | 24.8N 121.1E | 90 | 82 | -20 | | --.- ---.- | -- | -- | -- | |
| 201800Z | 21.9N 130.9E | 130 | 22.1N 130.4E | 130 | 30 | 0 | | 23.5N 124.5E | 110 | 100 | -10 | | 25.3N 119.7E | 65 | 82 | -20 | | --.- ---.- | -- | -- | -- | |
| 210000Z | 22.2N 129.6E | 130 | 22.3N 129.8E | 125 | 13 | -5 | | 24.3N 126.2E | 110 | 77 | -5 | | 26.3N 123.0E | 95 | 166 | 30 | | --.- ---.- | -- | -- | -- | |
| 210600Z | 22.6N 128.4E | 130 | 22.5N 128.6E | 120 | 13 | -10 | | 24.7N 124.3E | 105 | 47 | -10 | | 27.0N 121.3E | 90 | 128 | 50 | | --.- ---.- | -- | -- | -- | |
| 211200Z | 22.9N 127.3E | 125 | 23.0N 127.2E | 115 | 8 | -10 | | 25.4N 122.7E | 100 | 42 | -10 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 211800Z | 23.2N 126.3E | 120 | 23.2N 126.3E | 115 | 0 | -5 | | 25.5N 121.9E | 100 | 45 | 15 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 220000Z | 23.5N 125.1E | 115 | 23.6N 125.3E | 110 | 12 | -5 | | 25.8N 121.4E | 90 | 76 | 25 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 220600Z | 24.0N 123.9E | 115 | 24.0N 123.9E | 105 | 0 | -10 | | 25.8N 119.4E | 75 | 42 | 35 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 221200Z | 24.7N 122.6E | 110 | 24.0N 122.6E | 100 | 6 | -10 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 221800Z | 25.1N 121.2E | 85 | 25.1N 120.7E | 80 | 27 | -5 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 230000Z | 25.6N 120.0E | 65 | 25.7N 120.2E | 75 | 12 | 10 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |
| 230600Z | 26.4N 119.0E | 40 | 26.2N 119.1E | 60 | 13 | 20 | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | | --.- ---.- | -- | -- | -- | |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 13NM | 77NM | 174NM | 324NM | 13NM | 77NM | 174NM | 324NM |
| AVERAGE RIGHT ANGLE ERROR | 7NM | 41NM | 96NM | 218NM | 7NM | 41NM | 96NM | 218NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 14KTS | 19KTS | 13KTS | 6KTS | 14KTS | 19KTS | 13KTS |
| AVERAGE BIAS OF WIND ERROR | -2KTS | -6KTS | -10KTS | -3KTS | -2KTS | -6KTS | -10KTS | -3KTS |
| NUMBER OF FORECASTS | 26 | 22 | 17 | 6 | 26 | 22 | 17 | 6 |


BEST TRACK
TYPHOON DELLA
27-30 SEP 1971
CYCLONE 32
MAX SFC WND - 70kts
MINIMUM SLP - 981mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
VOLCANO ISLANDS
MARCUS ISLAND

## DELLA

Della cut across northern Luzon on the 27th as an intensifying tropical depression. Early signs of her existence can be traced to the central Philippine Sea near 14N 130E on the 25th as evidenced by satellite and ship data (Figure 5-47). Emerging into the South China Sea, Della was steered on a westerly track by an extension of the subtropical ridge into South China. Della developed to minimal typhoon force late on the 28th bringing the month's total to five. After her transit of Hainan Island on the 29th (Figure 5-48), Della crossed the Gulf of Tonkin on the following day arriving ashore on the Vietnamese coast late in the day near Vinh. The remains of the storm dissipated shortly thereafter over northern Laos.

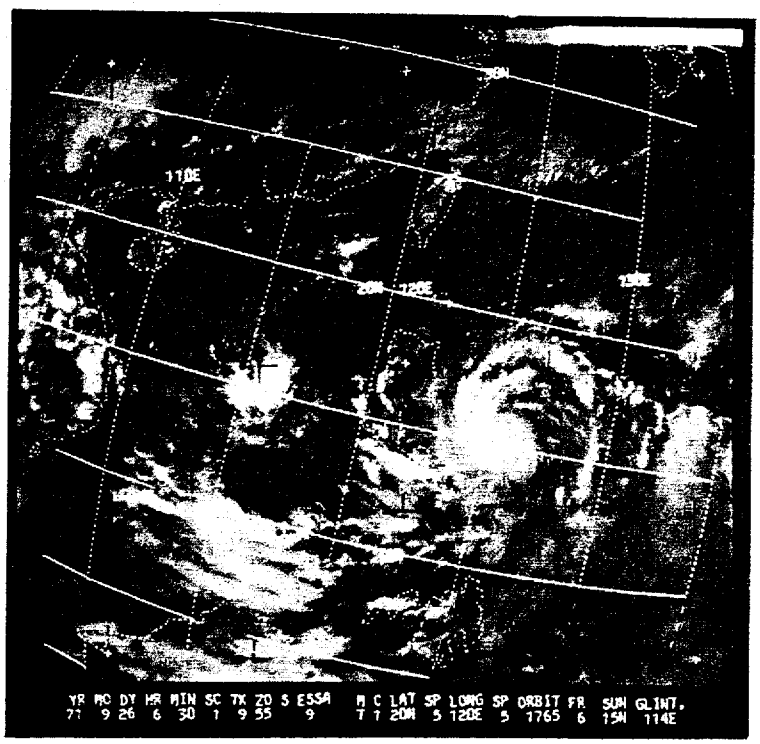



FIGURE 5-47. DELLA AS A DEVELOPING TROPICAL DEPRESSION EAST OF LUZON ON 26 SEPTEMBER.

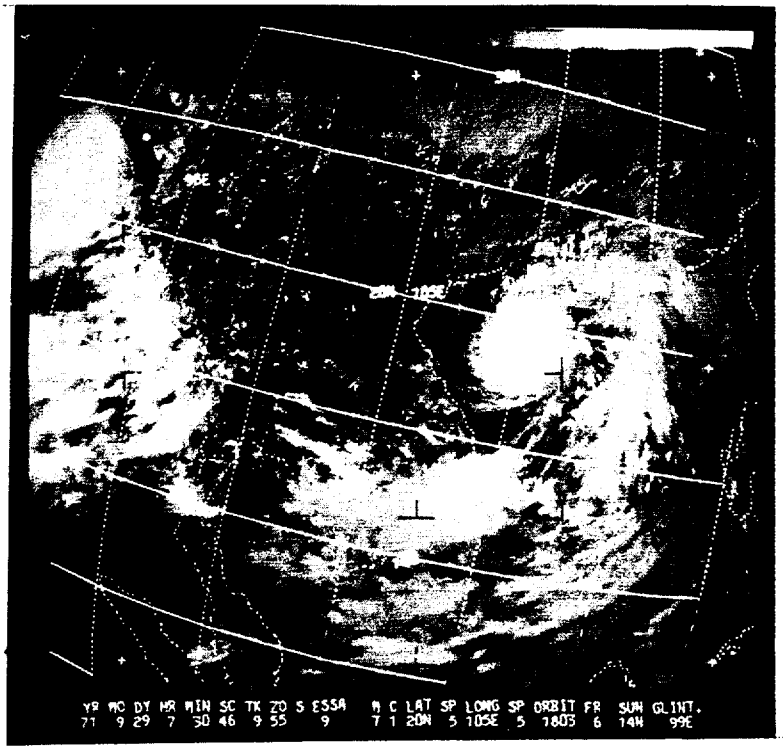



FIGURE 5-48. TYPHOON DELLA AS PHOTOGRAPHED BY ESSA-9 PRIOR TO LANDFALL ON HAINAN ISLAND ON 29 SEPTEMBER.

TYPHOON DELLA

EYE FIXES FOR CYCLONE NO. 32

27 SEP - 30 SEP 71

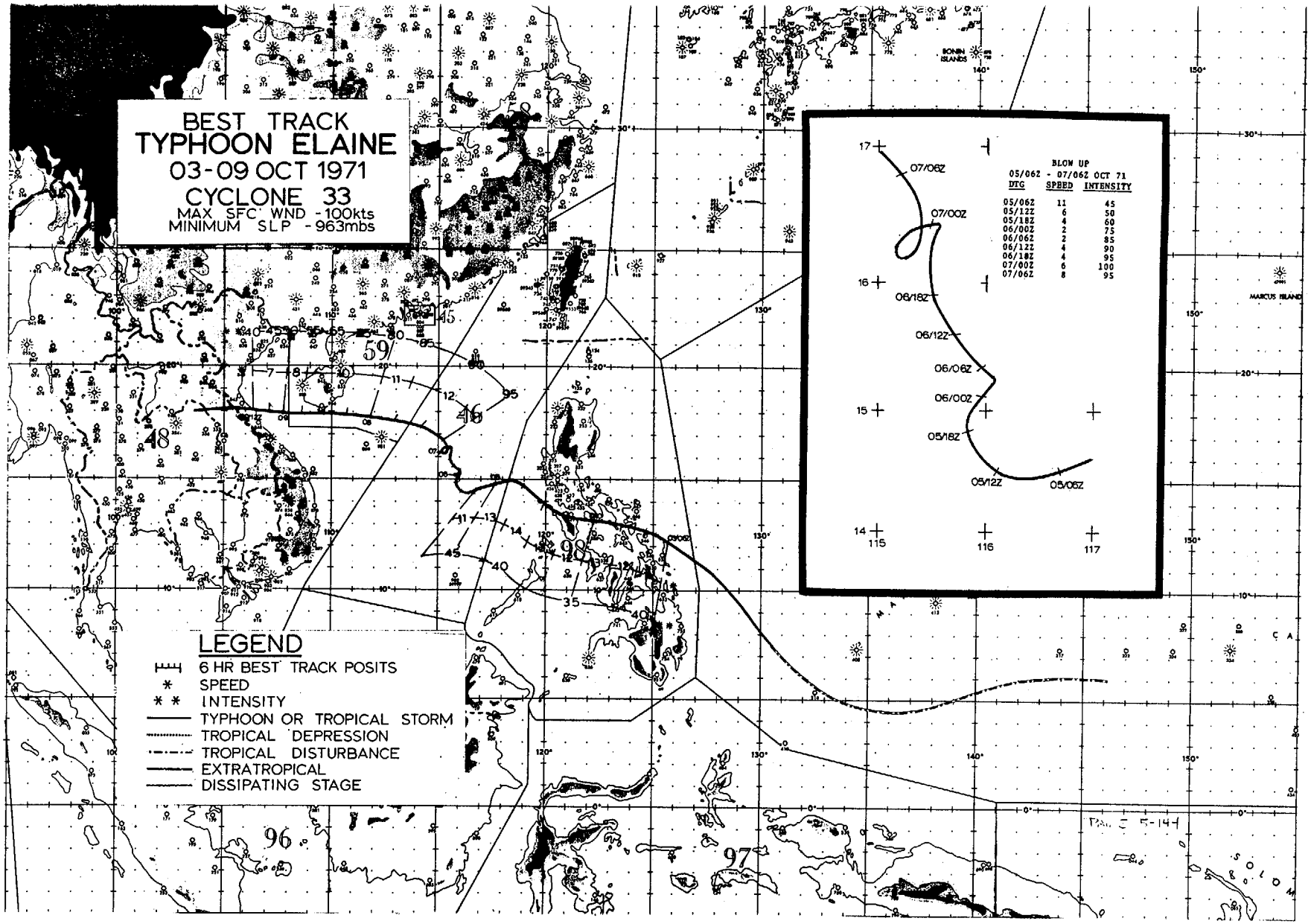
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 260630Z | 16.0N 124.5E | SATELIT--- | STG C | | | | | | | | | | FIRST BLTN | |
| 2 | 270533Z | 17.0N 121.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 3 | 271010Z | 17.0N 120.4E | S4-P- 4-15 | 500MB | 25 | ---- | ---- | ---- | -12/-8 | ---- | ----- | -- | -- | NO RDR PRES | |
| 4 | 271510Z | 17.6N 119.6E | S4-P- 5-10 | 500MB | 35 | ---- | ---- | ---- | -6/-8 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 5 | 272221Z | 18.7N 117.6E | VQ-P- 3- 4 | ----- | ---- | 60 | 993 | ---- | 26/24 | CIRC | | 20 | -- | WC FRMNG F SEMIC | |
| 6 | 280106Z | 18.9N 117.0E | VQ-W- 3-15 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 25 | -- | OPEN W SEMIC | 19.7N 117.3E |
| 7 | 280600Z | 19.0N 116.3E | VQ-P- 3- 5 | ----- | ---- | 70 | 994 | ---- | 27/23 | CIRC | | 30 | -- | BETTER ORGANIZED | |
| 8 | 280632Z | 19.0N 115.5E | SATELIT--- | STG X | DIA | 2 | CAT 3.0 | | | | | | | | |
| 9 | 281015Z | 19.0N 115.0E | S4-P- 4- 2 | 700MB | 65 | 65 | 987 | 2976 | 15/09 | CIRC | | 15 | -- | OPEN W-700 CNTR 2NM W | |
| 10 | 281305Z | 19.1N 114.3E | S4-P- 2- 5 | 700MB | 65 | ---- | 988 | 2993 | 15/10 | CIRC | | 20 | -- | CLSD WC | |
| 11 | 281600Z | 19.1N 113.8E | S4-P- 2- 2 | 700MB | 60 | ---- | 985 | 2957 | 14/08 | CIRC | | 25 | -- | OPEN W SEMIC | |
| 12 | 281810Z | 19.1N 113.3E | S4-P- 2- 2 | 700MB | 60 | ---- | 981 | 2932 | 15/12 | CIRC | | 25 | -- | OPEN W SEMIC | |
| 13 | 282330Z | 19.5N 112.2E | LNO RDR--- | | | | | | | ---- | ----- | -- | -- | FAIR FIX-VHMH | 22.3N 114.2E |
| 14 | 290300Z | 19.5N 111.5E | LNO RDR--- | | | | | | | ---- | ----- | -- | -- | POOR FIX-VHMH | 22.3N 114.2E |
| 15 | 290731Z | 19.0N 110.7E | SATELIT--- | STG X | DIA | 3 | CAT 3.5 | | | | | | | | |

TYPHOON DELLA

0000Z 27 SEP TO 1200Z 30 SEP

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 270000Z | 17.0N 122.2E | 30 | 16.6N 122.2E | 40 | 24 | 10 | 17.6N 117.8E | 45 | 79 | -10 | 18.5N 113.7E | 55 | 97 | -15 | 19.5N 109.7E | 60 | 149 | 20 |
| 270600Z | 17.4N 121.0E | 25 | 16.8N 121.1E | 35 | 36 | 10 | 17.8N 116.6E | 50 | 79 | -10 | 18.8N 112.6E | 60 | 97 | -5 | --.- ---.- | -- | -- | -- |
| 271200Z | 17.8N 119.8E | 35 | 17.1N 120.0E | 35 | 43 | 0 | 18.1N 115.6E | 65 | 82 | 0 | 19.0N 111.5E | 75 | 109 | 25 | 20.0N 107.5E | 60 | 136 | 25 |
| 271800Z | 18.4N 118.5E | 45 | 17.6N 119.2E | 40 | 62 | -5 | 18.8N 114.7E | 65 | 81 | -5 | 20.0N 110.6E | 70 | 153 | 25 | --.- ---.- | -- | -- | -- |
| 280000Z | 18.8N 117.2E | 55 | 18.8N 117.2E | 55 | 0 | 0 | 21.2N 112.4E | 75 | 127 | 5 | 22.0N 107.3E | 40 | 197 | 0 | --.- ---.- | -- | -- | -- |
| 280600Z | 19.0N 116.0E | 60 | 19.3N 115.9E | 65 | 19 | 5 | 20.9N 110.4E | 70 | 117 | 5 | 22.1N 105.9E | 35 | 192 | -5 | --.- ---.- | -- | -- | -- |
| 281200Z | 19.1N 114.6E | 65 | 19.2N 114.7E | 70 | 8 | 5 | 20.0N 110.2E | 70 | 85 | 20 | 20.8N 105.6E | 40 | 92 | 5 | --.- ---.- | -- | -- | -- |
| 281800Z | 19.1N 113.3E | 70 | 19.2N 113.3E | 70 | 6 | 0 | 19.8N 108.6E | 65 | 78 | 20 | 20.5N 104.4E | 30 | 49 | 5 | --.- ---.- | -- | -- | -- |
| 290000Z | 19.1N 112.1E | 70 | 19.1N 112.0E | 75 | 6 | 5 | 19.5N 107.0E | 55 | 49 | 15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 290600Z | 19.0N 110.9E | 65 | 19.6N 110.9E | 65 | 36 | 0 | 20.2N 106.3E | 50 | 78 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291200Z | 18.7N 109.6E | 50 | 19.1N 109.9E | 60 | 29 | 10 | 19.4N 105.2E | 45 | 6 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 291800Z | 18.5N 108.4E | 45 | 19.1N 108.7E | 60 | 40 | 15 | 19.7N 104.4E | 30 | 11 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300000Z | 18.7N 107.2E | 40 | 19.1N 107.8E | 50 | 41 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 300600Z | 18.9N 106.2E | 40 | 18.5N 106.8E | 45 | 42 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301200Z | 19.3N 105.2E | 35 | 18.5N 105.5E | 35 | 51 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 301800Z | 19.7N 104.2E | 25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 29NM | 78NM | 134NM | 142NM | 30NM | 73NM | 123NM | 142NM |
| AVERAGE RIGHT ANGLE ERROR | 21NM | 64NM | 82NM | 62NM | 22NM | 60NM | 78NM | 62NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 5KTS | 10KTS | 11KTS | 23KTS | 5KTS | 10KTS | 11KTS | 23KTS |
| AVERAGE BIAS OF WIND ERROR | 4KTS | 5KTS | 4KTS | 23KTS | 5KTS | 5KTS | 4KTS | 23KTS |
| NUMBER OF FORECASTS | 13 | 11 | 7 | 2 | 15 | 12 | 8 | 2 |


BEST TRACK
TYPHOON ELAINE
03-09 OCT 1971
CYCLONE 33
MAX SFC WND - 100kts
MINIMUM SLP - 963mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BLOW UP
05/06Z - 07/06Z OCT 71
DTG SPEED INTENSITY
05/06Z 11 45
05/12Z 6 50
05/18Z 4 60
06/00Z 2 75
06/06Z 2 85
06/12Z 4 90
06/18Z 4 95
07/00Z 6 100
07/06Z 8 95
07/06Z
07/00Z
06/18Z
06/12Z
06/06Z
06/00Z
05/18Z
05/12Z
05/06Z
BONIN ISLANDS
MARCUS ISLAND

## ELAINE

Elaine became the second storm to reach typhoon force in the South China Sea within a week. A circulation was detected in the equatorial trough near Woleai Atoll in the central Carolines on the 28th. By the 30th, signs of development began to appear in satellite pictures as the disturbance passed south of the Palau Islands. Subsequent aircraft investigation of the system revealed the pre-Elaine system was still of depression status two days later. However, the circulation did develop to minimal tropical-storm strength shortly before she skirted the northern coast of Samar Island the evening of the 3rd (Figure 5-49).

Crossing the central Philippines at a 13-kt forward speed, Elaine exited south of Lubang Island 24 hours later. Extensive crop damage was reported to have been caused during the typhoon's transit of the islands. Maximum winds of 50 kt were registered at the Virac station on Catanduanes Island, while up to 7.8 inches of rainfall was recorded at Calapan on Mindoro. Calapan also measured the lowest pressure at 981.8 mb.

As an extension of a quasi-stationary trough in the Sea of Japan began to erode the subtropical ridge over South China, Elaine began to slow and stall west of Luzon. As the weak steering currents persisted, the storm drifted in a general northwestward direction at 4 kt and intensified to 100 kt (Figure 5-50). By the 7th, the ridge began to rebuild and Elaine swung back to a westerly track skirting southern Hainan early on October 9th. Dropping to tropical-storm status, Elaine traversed the Gulf of Tonkin, driving ashore on the Vietnamese coast north of Dong Hoi. She very quickly weakened and later dissipated completely over Laos.

During the time frame when Elaine stalled in the South China Sea, the envelope of gale force winds expanded in size to 300 n mi in radius with 50-kt winds extending 200 n mi in the southern quadrant. An extensive westerly fetch existing for several days caused huge waves to strike the western coastal region of the northern Philippines. Close to 10,000 persons had to be evacuated from the shore areas. Destruction due to the heavy seas amounted to 2,400 homes completely demolished.

The heavy seas were also responsible for a number of maritime casualties. The Philippine inter-island passenger ship MV TACLOBAN was sunk in the Tablas Straits with three persons reported killed. The pump boat SARANEL was capsized by big waves off the coast of Siguigas Island in the

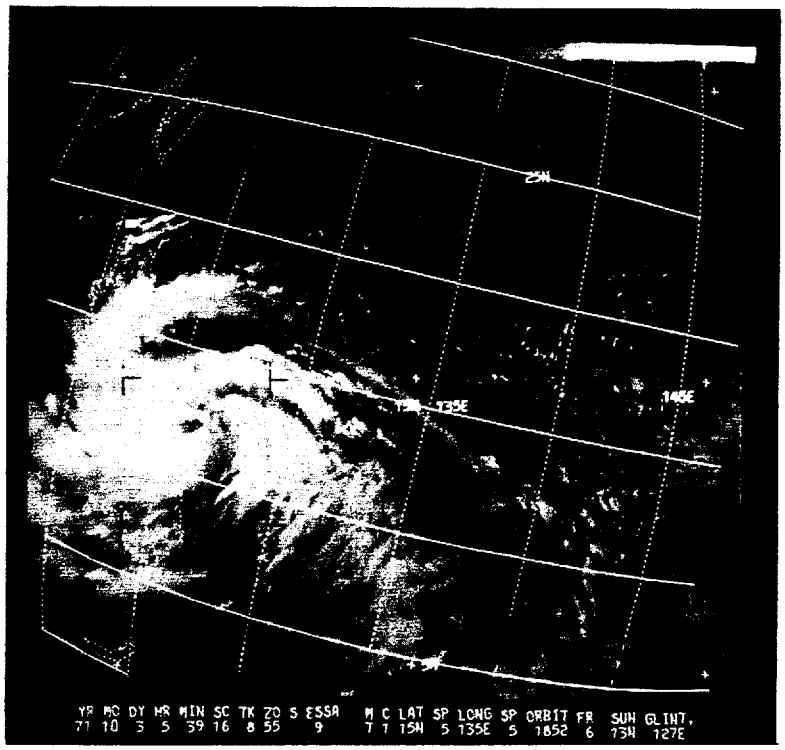



FIGURE 5-49. ELAINE ON 3 OCTOBER, VIEWED BY ESSA-9 AS THE TROPICAL STORM STRUCK SAMAR ISLAND IN THE CENTRAL PHILIPPINES.

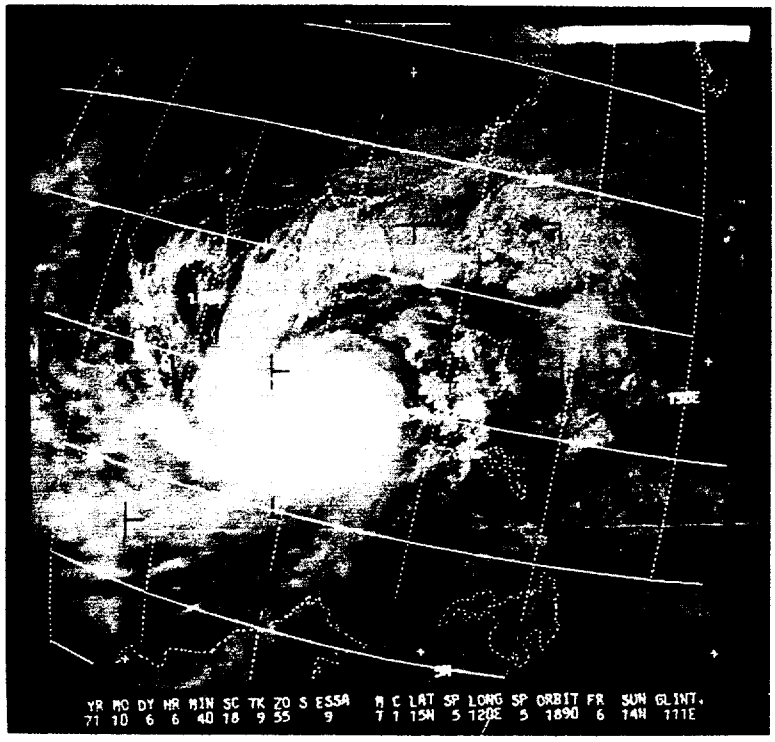



FIGURE 5-50. ESSA-9 PHOTO OF TYPHOON ELAINE ON 6 OCTOBER DURING HER QUASI-STATIONARY PERIOD WEST OF LUZON.

Mindano Sea with only four of its thirty passengers surviving. Immobilized south of the typhoon, the American ship STEEL VENDOR was run aground on the Loaita Bank in the South China Sea. In another incident, the sinking Panamanian tanker MV KEELUNG, some 240 n mi west of Manila, had to be abandoned by its crew in the heavy seas generated by Elaine.

TYPHOON ELAINE
EYE FIXES FOR CYCLONE NO. 33
03 OCT - 09 OCT 71

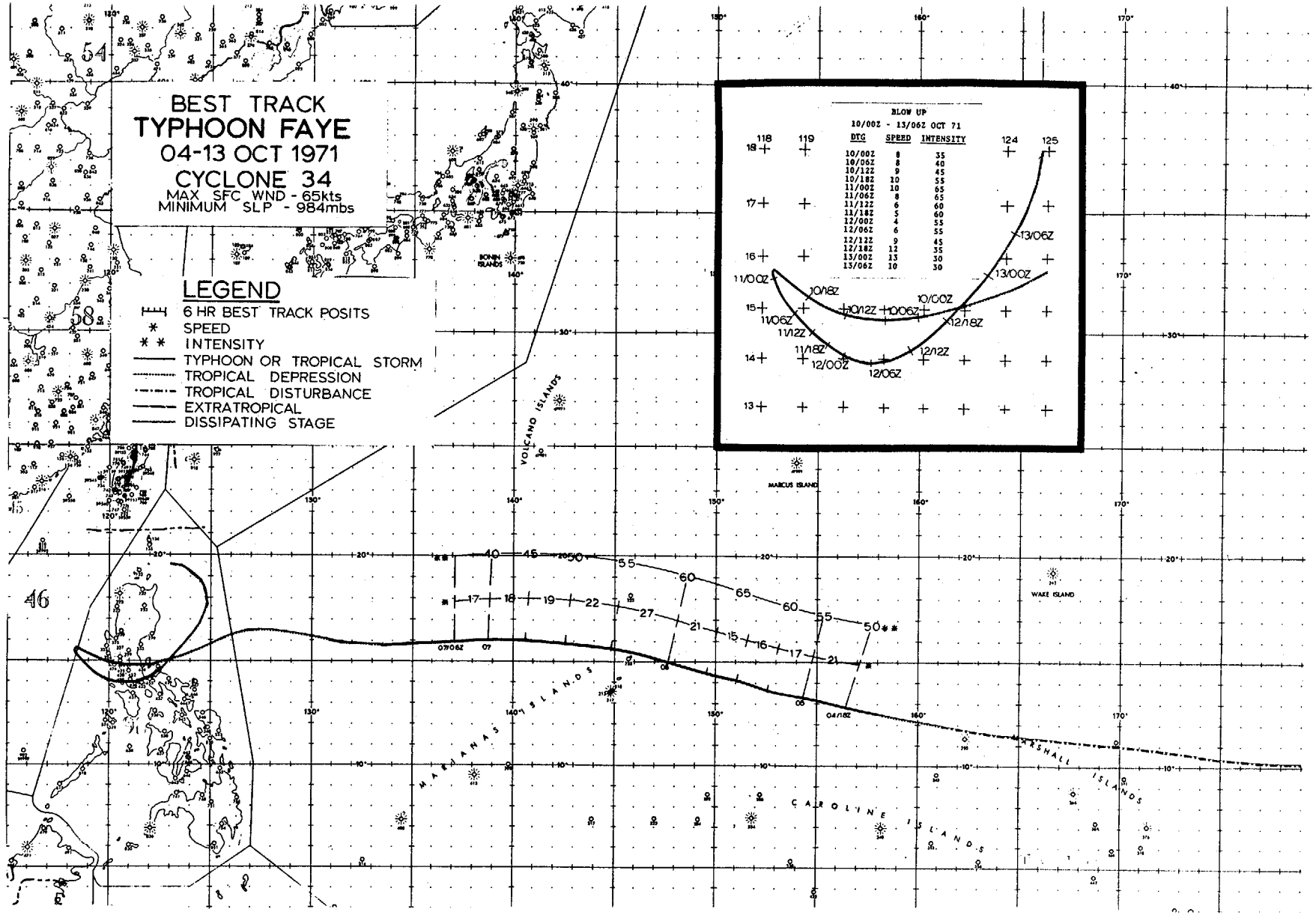
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 300630Z | 7.0N 135.0E | SATELIT--- | STG B | | | | | | | | | | FIRST BLTN | |
| 2 | 010537Z | 11.0N 134.0E | SATELIT--- | STG B | | | | | | | | | | LITTLE CHG | |
| 3 | 020632Z | 11.0N 130.0E | SATELIT--- | STG B | | | | | | | | | | | |
| 4 | 030539Z | 12.0N 126.0E | SATELIT--- | STG C+ | | | | | | | | | | STRONGER | |
| 5 | 031402Z | 12.0N 124.4E | VQ-P- 2-18 | 700MB | ---- | ---- | 993 | 3023 | 16/12 | ---- | ----- | -- | -- | RDR PRES V POOR | |
| 6 | 031557Z | 12.8N 124.3E | VQ-P- 3-12 | 700MB | ---- | ---- | 993 | 3039 | 14/11 | ---- | ----- | -- | -- | RDR PRES POOR | |
| 7 | 032200Z | 13.0N 122.7E | 54-P- 2-10 | 500MB | 44 | ---- | 981 | ---- | -6/-7 | ---- | ----- | -- | -- | NO RDR PRES | |
| 8 | 040300Z | 13.1N 121.3E | 54-P- 4--- | 500MB | 50 | ---- | 985 | ---- | -4/-7 | ---- | ----- | -- | -- | NO RDR PRES | |
| 9 | 040637Z | 13.0N 121.0E | SATELIT--- | STG X | DIA | 5 | CAT 2.0 | | | | | | | NO EYE VISIBLE | |
| 10 | 041015Z | 12.9N 120.2E | 54-P- 2-10 | 500MB | 18 | ---- | ---- | ---- | -7/-8 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 11 | 041614Z | 14.5N 119.5E | 54-P- 3-15 | 500MB | 40 | ---- | 991 | ---- | -6/-6 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 12 | 042213Z | 15.2N 117.9E | VQ-R-15--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 14 | -- | OPEN E SEMIC | 16.2N 117.5E |
| 13 | 050358Z | 14.5N 116.9E | VQ-P-10--- | ----- | ---- | 45 | 980 | ---- | 26/25 | CIRC | | 14 | -- | OPEN N AND S | |
| 14 | 050737Z | 14.5N 116.0E | SATELIT--- | STG X | DIA | 4 | CAT 2.0 | | | | | | | | |
| 15 | 051000Z | 14.4N 116.4E | 54-P- 2- 2 | 700MB | 45 | 50 | 963 | 2896 | 15/14 | CIRC | | 10 | -- | OPEN NW-NE-700 CNTR 5NM SW | |
| 16 | 051540Z | 14.4N 116.7E | 54-P- 2- 3 | 700MB | 70 | ---- | 975 | 2896 | 18/17 | CIRC | | 10 | -- | PORTION OF WC TO | |
| 17 | 052205Z | 15.0N 115.9E | 54-P- 2- 3 | 700MB | 40 | 75 | 969 | 2829 | 18/17 | CIRC | | 18 | -- | POOR RDR PRES-700 CNTR 5NM SE | |
| 18 | 060100Z | 15.1N 116.0E | 54-P- 3- 4 | 700MB | 55 | 85 | 974 | 2841 | 17/15 | CIRC | | 18 | -- | CLSD WC | |
| 19 | 060404Z | 15.1N 116.1E | 54-P- 2- 3 | 700MB | 72 | 120 | 968 | 2838 | 16/14 | CIRC | | 20 | -- | WC OPEN N | |
| 20 | 060640Z | 15.8N 116.0E | SATELIT--- | STG X | DIA | 5 | CAT 3.0 | | | | | | | FAINT EYE VISIBLE | |
| 21 | 060850Z | 14.8N 116.4E | VQ-P- 3-15 | ----- | ---- | 105 | ---- | ---- | 26/21 | CIRC | | 35 | -- | RDR PRES CONFUSED | |
| 22 | 061000Z | 15.4N 115.9E | VQ-P-10- 1 | 700MB | ---- | ---- | 977 | 2886 | 18/13 | CIRC | | 10 | -- | NO WC | |
| 23 | 061204Z | 15.3N 116.2E | VQ-R-10--- | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 10 | -- | OPEN N | 16.5N 117.0E |
| 24 | 061620Z | 16.0N 115.4E | 54-P- 2- 3 | 700MB | 75 | ---- | 960 | 2771 | 18/15 | ELIP | SE-NW | 50X30 | -- | OPEN SE-700 CNTR 4NM N | |
| 25 | 061830Z | 16.2N 115.4E | 54-P- 2- 4 | 700MB | 80 | ---- | 964 | 2777 | 16/14 | ELIP | SE-NW | 50X30 | -- | FAIR RDR PRES | |
| 26 | 062330Z | 16.4N 115.6E | 54-P- 2- 2 | 700MB | 85 | 100 | 957 | 2789 | 16/13 | CIRC | | 60 | -- | WC DSPTG-700 CNTR 14NM W | |
| 27 | 070130Z | 16.3N 115.2E | 54-P- 5-15 | 700MB | 40 | 85 | 963 | 2774 | 16/15 | CIRC | | 20 | -- | CLSD WC-700 CNTR 12NM NW | |
| 28 | 070400Z | 16.5N 115.3E | 54-P- 4--- | 700MB | 47 | 90 | 964 | 2786 | 19/17 | CIRC | | 15 | -- | WC OPEN SE-700 CNTR 9NM W | |
| 29 | 070739Z | 17.0N 115.0E | SATELIT--- | STG X | DIA | 5 | CAT 3.5 | | | | | | | LITTLE CHANGE | |
| 30 | 071043Z | 17.2N 114.6E | VQ-P-10--- | 700MB | ---- | ---- | 967 | 2847 | --/-- | ---- | ----- | -- | -- | V POOR RDR PRES 2ND CNTR 42NM SE | |
| 31 | 071300Z | 17.0N 114.6E | VQ-R-20--- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | WELL ORGANIZED | 18.2N 114.8E |
| 32 | 071557Z | 17.3N 113.4E | VQ-P-10--- | 700MB | ---- | ---- | 966 | 2829 | 18/13 | CIRC | | 40 | -- | HOLE IN RDR RETRN | |
| 33 | 072230Z | 17.2N 112.5E | 54-P- 8-15 | 700MB | 80 | ---- | ---- | 2810 | 18/16 | ---- | ----- | -- | -- | POOR FIX | |
| 34 | 080345Z | 16.8N 110.9E | 54-P-10-14 | 700MB | 80 | 65 | ---- | ---- | 14/11 | ---- | ----- | -- | -- | POOR FIX | |
| 35 | 080642Z | 18.0N 110.5E | SATELIT--- | STG X | DIA | 4 | CAT 3.0 | | | | | | | WEAKER | |
| 36 | 080645Z | 17.7N 110.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 37 | 081215Z | 17.9N 109.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 38 | 081315Z | 17.8N 109.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 39 | 081415Z | 17.9N 109.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 40 | 081445Z | 17.8N 109.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | DANANG RDR | 16.0N 108.2E |
| 41 | 090740Z | 18.0N 107.0E | SATELIT--- | STG C+ | | | | | | | | | | | |

TYPHOON ELAINE

0600Z 3 OCT TO 1200Z 9 OCT

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 030600Z | 12.1N 125.7E | 40 | 11.7N 124.4E | 30 | 80 | -10 | 13.6N 119.9E | 40 | 68 | 5 | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 031200Z | 12.6N 124.7E | 40 | 12.8N 124.5E | 45 | 17 | 5 | 14.8N 120.5E | 50 | 64 | 10 | 16.5N 116.3E | 70 | 120 | 20 | 18.1N 112.0E | 75 | 259 | -15 |
| 031800Z | 12.9N 123.6E | 35 | 12.9N 124.0E | 45 | 23 | 10 | 14.8N 120.4E | 50 | 81 | 10 | 16.5N 116.2E | 70 | 97 | 5 | --.- ---.- | -- | -- | -- |
| 040000Z | 13.1N 122.3E | 35 | 13.4N 122.5E | 45 | 21 | 10 | 15.2N 117.4E | 70 | 25 | 25 | 16.2N 113.5E | 75 | 158 | 0 | 16.9N 109.5E | 70 | 339 | -30 |
| 040600Z | 13.2N 121.0E | 35 | 13.1N 120.5E | 55 | 30 | 20 | 14.6N 114.9E | 75 | 105 | 30 | 15.8N 110.6E | 70 | 312 | -15 | --.- ---.- | -- | -- | -- |
| 041200Z | 13.9N 119.9E | 40 | 13.0N 119.9E | 60 | 54 | 20 | 14.6N 115.2E | 80 | 52 | 30 | 15.8N 110.9E | 75 | 276 | -15 | 16.8N 106.9E | 50 | 412 | -40 |
| 041800Z | 14.8N 119.0E | 40 | 14.4N 119.8E | 60 | 52 | 20 | 16.3N 114.7E | 80 | 108 | 15 | 17.4N 110.0E | 75 | 327 | -20 | --.- ---.- | -- | -- | -- |
| 050000Z | 14.9N 117.7E | 45 | 15.2N 117.9E | 65 | 21 | 20 | 16.8N 112.9E | 80 | 205 | 5 | 17.5N 108.4E | 70 | 405 | -30 | 19.0N 104.7E | 40 | 415 | -40 |
| 050600Z | 14.4N 116.7E | 45 | 14.8N 116.5E | 65 | 27 | 20 | 16.3N 112.0E | 75 | 238 | -10 | 17.4N 108.1E | 70 | 408 | -25 | --.- ---.- | -- | -- | -- |
| 051200Z | 14.5N 116.1E | 50 | 14.7N 116.0E | 60 | 13 | 10 | 16.0N 111.6E | 60 | 237 | -30 | 17.4N 107.8E | 55 | 359 | -35 | 19.2N 104.5E | 35 | 305 | -30 |
| 051800Z | 14.9N 115.9E | 65 | 14.5N 116.7E | 60 | 52 | -5 | 15.4N 113.5E | 60 | 119 | -35 | 16.5N 110.4E | 55 | 157 | -30 | --.- ---.- | -- | -- | -- |
| 060000Z | 15.1N 116.0E | 75 | 15.0N 116.0E | 85 | 6 | 10 | 15.2N 115.0E | 100 | 75 | 0 | 16.0N 111.8E | 95 | 102 | 15 | 17.0N 108.7E | 80 | 79 | 30 |
| 060600Z | 15.3N 116.0E | 85 | 15.1N 116.1E | 105 | 13 | 20 | 15.3N 114.8E | 105 | 87 | 10 | 16.0N 111.5E | 95 | 115 | 20 | --.- ---.- | -- | -- | -- |
| 061200Z | 15.6N 115.7E | 90 | 15.4N 115.8E | 105 | 13 | 15 | 15.7N 113.8E | 100 | 97 | 10 | 16.4N 110.6E | 90 | 103 | 25 | 17.5N 107.5E | 80 | 69 | 40 |
| 061800Z | 15.9N 115.5E | 95 | 16.0N 115.2E | 100 | 18 | 5 | 16.5N 112.4E | 95 | 72 | 10 | 17.4N 109.3E | 85 | 45 | 30 | --.- ---.- | -- | -- | -- |
| 070000Z | 16.4N 115.4E | 100 | 16.4N 115.4E | 100 | 0 | 0 | 17.3N 114.2E | 80 | 133 | 0 | 18.6N 112.7E | 70 | 280 | 20 | --.- ---.- | -- | -- | -- |
| 070600Z | 16.7N 115.2E | 95 | 16.6N 115.1E | 95 | 8 | 0 | 17.8N 113.7E | 85 | 165 | 10 | 19.1N 112.2E | 75 | 296 | 30 | --.- ---.- | -- | -- | -- |
| 071200Z | 17.3N 114.1E | 90 | 17.0N 114.8E | 95 | 44 | 5 | 18.2N 113.2E | 85 | 200 | 20 | 19.4N 111.6E | 75 | 306 | 35 | --.- ---.- | -- | -- | -- |
| 071800Z | 17.6N 112.9E | 85 | 17.4N 113.1E | 90 | 17 | 5 | 18.4N 109.0E | 70 | 34 | 15 | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 080000Z | 17.7N 111.9E | 80 | 17.4N 112.0E | 85 | 19 | 5 | 17.8N 107.9E | 65 | 13 | 15 | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 080600Z | 17.8N 110.8E | 75 | 17.7N 110.7E | 80 | 8 | 5 | 18.5N 106.6E | 60 | 41 | 15 | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 081200Z | 17.9N 109.7E | 65 | 17.9N 109.7E | 75 | 0 | 10 | 18.7N 105.7E | 50 | 58 | 10 | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 081800Z | 17.9N 108.7E | 55 | 17.9N 108.8E | 70 | 6 | 15 | --.- --.-.- | -- | -- | -- | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 090000Z | 18.0N 107.8E | 50 | 18.0N 107.8E | 65 | 0 | 15 | --.- --.-.- | -- | -- | -- | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 090600Z | 18.0N 107.1E | 45 | 18.1N 106.8E | 55 | 18 | 10 | --.- --.-.- | -- | -- | -- | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 091200Z | 18.0N 106.4E | 40 | 18.2N 106.2E | 45 | 16 | 5 | --.- --.-.- | -- | -- | -- | --.- --.-.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 22NM | 103NM | 227NM | 268NM | 22NM | 103NM | 227NM | 268NM |
| AVERAGE RIGHT ANGLE ERROR | 13NM | 63NM | 70NM | 69NM | 13NM | 63NM | 70NM | 69NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 11KTS | 15KTS | 22KTS | 32KTS | 11KTS | 15KTS | 22KTS | 32KTS |
| AVERAGE BIAS OF WIND ERROR | 9KTS | 8KTS | 2KTS | -12KTS | 9KTS | 8KTS | 2KTS | -12KTS |
| NUMBER OF FORECASTS | 26 | 22 | 17 | 7 | 26 | 22 | 17 | 7 |


BEST TRACK
TYPHOON FAYE
04-13 OCT 1971
CYCLONE 34
MAX SFC WND - 65kts
MINIMUM SLP - 984mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BLOW UP
10/00Z - 13/06Z OCT 71
DTG SPEED INTENSITY
10/00Z 8 35
10/06Z 8 40
10/12Z 9 45
10/18Z 10 55
11/00Z 10 65
11/06Z 8 65
11/12Z 6 60
11/18Z 5 60
12/00Z 4 55
12/06Z 6 55
12/12Z 9 45
12/18Z 12 55
13/00Z 13 30
13/06Z 10 30
VOLCANO ISLANDS
MARCUS ISLAND
WAKE ISLAND
MARIANAS ISLANDS
CAROLINE ISLANDS
MARSHALL ISLANDS

Faye was first sighted as a weak entity in satellite pictures south of Johnson Island as early as September 27th. Ill-defined, the system drifted west-northwest for a week making passage near Eniwetok on the 3rd as the U.S. Coast Guard station on the atoll reported a sharp wind shift. By the 4th, satellite pictures detected signs of organization in the cloudiness. An aircraft investigation early the following morning located a tropical storm with 50-kt peak winds some 700 n mi east of the Marianas (Figure 5-51).

As a high cell began to build north of Marcus Island, Faye sailed along at 16 to 21 kt, briefly reaching typhoon strength late on the 5th. Returned to tropical-storm classification, Faye passed just north of Saipan the following afternoon. A strong band of wind associated with the storm was located across the north semicircle. The U.S. Coast Guard station on Saipan, which was south of the center, recorded only southwesterly winds at 15 kt during passage.

Faye continued on a westerly heading during the next 24 hours gradually weakening and appearing to dissipate late on the 7th. With a rather complex circulation pattern in the Philippine Sea at this time, it is possible that the system may have been absorbed in a larger circulation to the south. However, for the two-day period of October 8th and 9th, all available reconnaissance, surface and satellite data indicate a considerable amount of uncertainty in this portion of Faye's track. Redevelopment over the Philippines may possibly not have been retraceable to the initial system.

After regaining minimal storm strength on the 9th in the Lamon Bay region, Faye crossed Luzon on a westerly track north of Manila. Once in the South China Sea, she intensified to typhoon strength (Figure 5-52) but then grinded to a halt on the 11th 45 n mi northeast of Scarborough Shoals. With the deepening of a trough in the westerlies extending from Korea to Taiwan, steering currents were initially weak, then as the northwesterly flow behind the trough began to take hold, Faye began to track southeastward.

Commencing a highly unusual track, Faye cut across Luzon for the second time, by then weakened to tropical-storm force. The storm passed south of Manila, then into Lamon Bay after being greatly modified by the northerly flow.

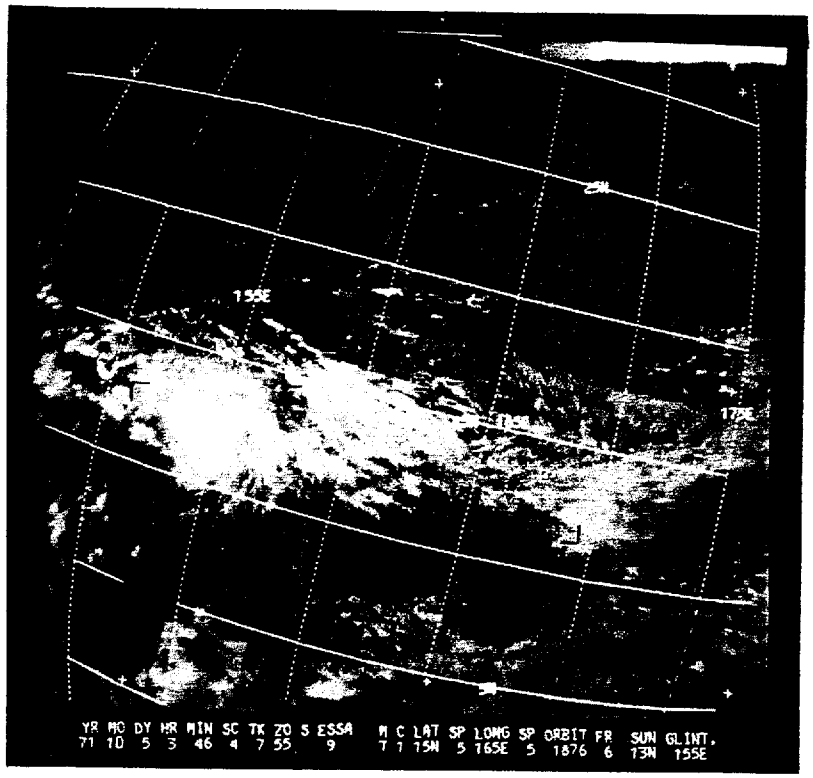



FIGURE 5-51. ESSA-9 PHOTO OF TROPICAL STORM FAYE EAST OF THE MARIANAS ON 5 OCTOBER.

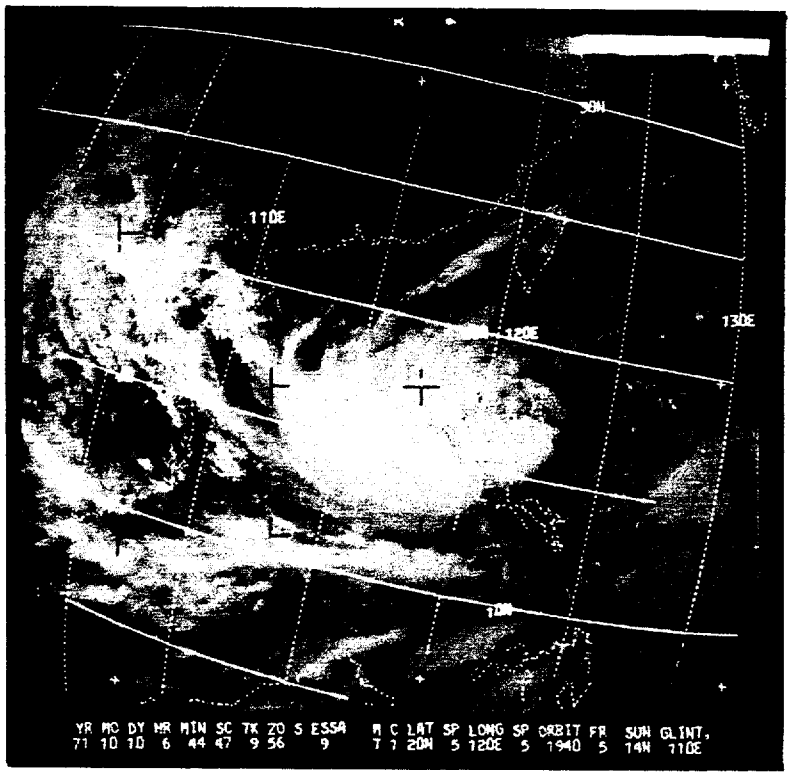



FIGURE 5-52. TYPHOON FAYE WEST OF LUZON ON 10 OCTOBER.

Highest winds reported during Faye's transit were 42 kt at Calapan on northern Mindoro. Now on the eastern side of the southern extension of the trough near the Taiwan Straits, the remains of Faye slowly moved northeastward acquiring extratropical characteristics as she merged with a weak frontal zone south of the Ryukyus.

The effect of Faye on the city of Manila was considerable as heavy rains flooded much of its low-lying areas. The torrential rainfall from Faye in combination with that of tropical storm Gloria, which struck northern Luzon late on the 10th, was responsible for measured 24-hour amounts up to 10.78 inches at Casiguran. Flooding caused evacuation of many towns in Luzon leaving thousands homeless. Streams already swollen by rains from typhoon Elaine overflowed their banks sweeping away bridges and submerging crops and homes. At least 13 deaths with an additional 80 persons counted as missing were reported in the aftermath of Gloria and Faye. Offshore, the heavy seas generated by Faye forced the inter-island vessel MV JOLO aground near Corregidor at the mouth of Manila Bay, while in Palawan Island a pump boat was reported to have sunk with one of its eleven crew men counted as missing.

TYPHOON EYE
EYE FIXES FOR CYCLONE NO. 34
04 OCT - 13 OCT 71

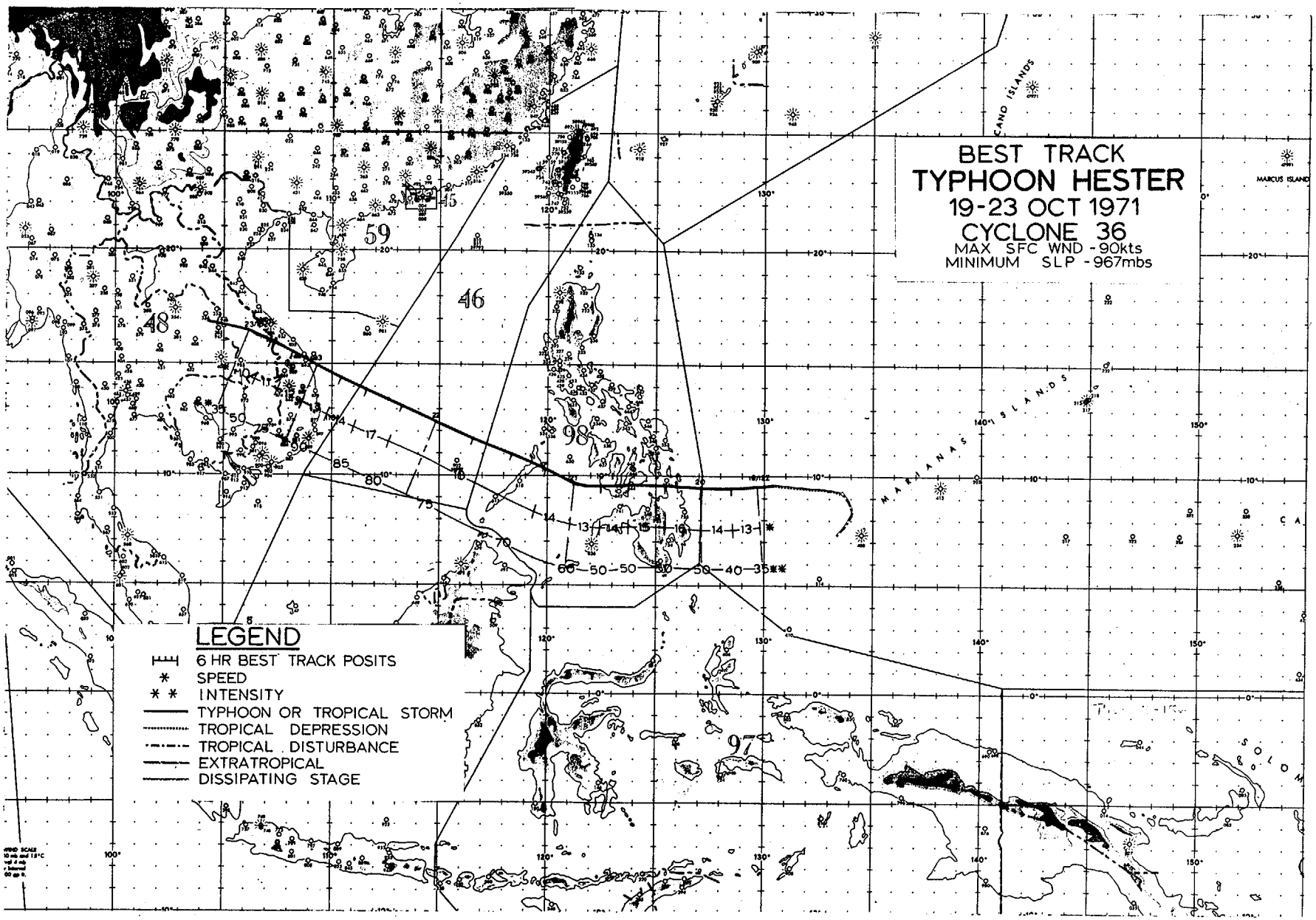
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL T1/T0 | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 040442Z | 12.0N 158.0E | SATELLI--- | STG C | | | | | | | | | | FIRST BLTN | |
| 2 | 041920Z | 12.9N 156.0E | VO-P- 5-10 | ----- | ---- | 55 | 992 | ---- | 26/24 | ELIP | SE-NW | 27X16 | 3 | WC OPEN NW | |
| 3 | 042315Z | 12.8N 155.5E | VO-W-15-10 | ----- | ---- | 65 | ---- | ---- | --/-- | CIRC | | 1 | 8 | POOR FIX | 13.6N 150.0E |
| 4 | 050346Z | 12.5N 155.0E | SATELLI--- | STG C | | | | | | | | | | STRONGER | |
| 5 | 050910Z | 13.3N 152.0E | 54-P- 5- 5 | 700MB | 32 | 60 | 981 | 3024 | 16/13 | CIRC | | 10 | -- | POORLY DEFINED | |
| 6 | 050910Z | 13.0N 151.0E | 54-P- 3- 7 | 700MB | 40 | 65 | 992 | 3060 | 15/12 | CIRC | | 10 | -- | POORLY DEFINED | |
| 7 | 051550Z | 14.3N 150.1E | VO-P- 5- 3 | ----- | ---- | 70 | 993 | ---- | 27/23 | CIRC | | 10 | 3 | SMALL WIND EYE | |
| 8 | 051900Z | 14.5N 149.5E | VO-W- 7- 2 | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | NO WC | 14.2N 148.7E |
| 9 | 052145Z | 14.7N 149.4E | VO-P- 5- 1 | ----- | ---- | 75 | 992 | ---- | 27/24 | CIRC | | 1 | -- | NO WC | |
| 10 | 060604Z | 15.5N 145.0E | SATELLI--- | STG C | | | | | | | | | | WEAKER | |
| 11 | 060033Z | 15.0N 144.4E | 54-P- 3- 5 | 400M | 40 | 60 | 994 | ---- | 25/23 | ---- | ----- | -- | -- | NO WC | |
| 12 | 060933Z | 15.9N 143.5E | VO-P-10- 3 | ----- | ---- | 55 | 990 | ---- | 28/24 | CIRC | | 8 | -- | NO WC | |
| 13 | 061521Z | 16.1N 141.5E | VO-P- 3--- | ----- | ---- | 55 | 990 | ---- | 27/24 | CIRC | | 5 | -- | | |
| 14 | 062230Z | 15.9N 139.2E | 54-P- 5-10 | 700MB | 30 | 40 | 1000 | 3069 | 14/11 | CIRC | | 30 | -- | POORLY DEFINED | |
| 15 | 070336Z | 16.3N 138.0E | 54-P- 3- 5 | 700MB | 20 | 30 | 994 | 3072 | 14/10 | CIRC | | 30 | -- | POORLY DEFINED | |
| 16 | 070943Z | 16.0N 136.0E | SATELLI--- | STG C | | | | | | | | | | | |
| 17 | 071530Z | 15.9N 135.0E | VO-W- 3- 2 | ----- | ---- | ---- | ---- | ---- | --/-- | CIRC | | 2 | 8 | CLSD WC | 16.3N 135.0E |
| 18 | 080643Z | 16.0N 131.0E | SATELLI--- | STG B | | | | | | | | | | WEAKER | |
| 19 | 090544Z | 16.5N 127.5E | SATELLI--- | STG C | | | | | | | | | | | |
| 20 | 100644Z | 17.0N 121.0E | SATELLI--- | STG C | | | | | | | | | | STRONGER | |
| 21 | 101600Z | 15.0N 119.5E | 54-P- 1--- | 500MB | 60 | ---- | ---- | 2709 | 00/01 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 22 | 102230Z | 15.7N 118.2E | 54-P-10- 5 | 700MB | 35 | 45 | 984 | 2920 | 18/16 | CIRC | | 25 | -- | POORLY DEFINED | |
| 23 | 110110Z | 15.3N 118.6E | 54-P- 5- 5 | 700MB | 60 | 70 | ---- | 2929 | 16/14 | ELIP | N-S | 40X25 | -- | 700 CNTR 10NM SW NO WC | |
| 24 | 110348Z | 15.0N 118.0E | SATELLI--- | STG B | | | | | | | | | | LITTLE CHANGE | |
| 25 | 110800Z | 15.0N 118.7E | 54-P- 2--- | 700MB | 30 | 35 | 984 | 2935 | 16/16 | ---- | ----- | -- | -- | NO WC-700 CNTR 10NM S | |
| 26 | 111209Z | 14.5N 119.2E | 54-P- 2-13 | 700MB | 55 | ---- | 985 | 2966 | 15/14 | ---- | ----- | -- | -- | NO WC | |
| 27 | 111600Z | 14.3N 119.6E | 54-P- 2- 8 | 700MB | 60 | ---- | 985 | 2954 | 16/13 | CIRC | | 20 | -- | POORLY DEFINED | |
| 28 | 111615Z | 14.5N 119.1E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 29 | 111800Z | 14.4N 119.7E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 30 | 111900Z | 14.4N 119.6E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 31 | 112000Z | 14.3N 119.7E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 32 | 112100Z | 14.2N 119.9E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 33 | 112140Z | 14.2N 119.9E | 54-P- 2- 5 | 700MB | 60 | ---- | 988 | 2963 | 14/12 | CIRC | | 20 | -- | POORLY DEFINED | |
| 34 | 112200Z | 14.2N 119.9E | SHP RDR--- | | | | | | | ---- | ----- | -- | -- | PSBL CNTR | |
| 35 | 120045Z | 14.0N 120.1E | 54-P- 2- 5 | 700MB | 38 | 40 | ---- | 2978 | 15/11 | CIRC | | 15 | -- | POORLY DEFINED | |
| 36 | 120300Z | 13.9N 120.6E | 54-P- 1- 4 | 700MB | 55 | 65 | 988 | 2984 | 15/09 | CIRC | | 20 | -- | 700 CNTR 6NM W WC FORMING-700 CNTR 5NM WNW | |
| 37 | 120646Z | 14.5N 120.0E | SATELLI--- | STG C | | | | | | | | | | LITTLE CHANGE | |
| 38 | 121000Z | 14.1N 119.7E | 54-P- 3-12 | 500MB | 60 | ---- | ---- | 2790 | 04/03 | CIRC | | 20 | -- | POORLY DEFINED | |
| 39 | 121615Z | 14.7N 119.6E | 54-P- 5-20 | 500MB | 40 | ---- | ---- | 2820 | 03/04 | CIRC | | 20 | -- | POORLY DEFINED | |

TYPHOON FAYE

1800Z 4 OCT TO 0600Z 13 OCT

| | BEST TRACK | | | WARNING | | | | | 24 HOUR FORECAST | | | | | 48 HOUR FORECAST | | | | | 72 HOUR FORECAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | | | | | ERRORS | |
| | POSIT | | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND | POSIT | | WIND | DST | WIND |
| 041800Z | 12.8N | 156.4E | 50 | 12.7N | 155.0E | 45 | 82 | -5 | 13.7N | 150.3E | 65 | 58 | 0 | 14.5N | 145.5E | 85 | 296 | 40 | --.- | ---.- | -- | -- | -- |
| 050000Z | 13.2N | 154.3E | 55 | 12.9N | 154.0E | 60 | 25 | 5 | 13.7N | 149.4E | 80 | 126 | 20 | 14.5N | 145.0E | 100 | 368 | 60 | --.- | ---.- | -- | -- | -- |
| 050600Z | 13.6N | 152.6E | 60 | 13.3N | 152.4E | 60 | 21 | 0 | 14.3N | 147.0E | 85 | 144 | 30 | 15.2N | 142.2E | 105 | 297 | 65 | --.- | ---.- | -- | -- | -- |
| 051200Z | 14.0N | 151.0E | 65 | 13.7N | 150.9E | 60 | 19 | -5 | 14.6N | 145.7E | 70 | 195 | 20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 051800Z | 14.4N | 149.6E | 65 | 14.4N | 149.7E | 65 | 6 | 0 | 15.9N | 144.5E | 80 | 224 | 35 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 060000Z | 14.9N | 147.6E | 60 | 14.9N | 147.8E | 70 | 12 | 10 | 17.0N | 142.0E | 90 | 193 | 50 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 060600Z | 15.6N | 144.9E | 55 | 15.6N | 144.3E | 50 | 35 | -5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 061200Z | 15.9N | 142.6E | 50 | 16.1N | 142.5E | 50 | 13 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 061800Z | 16.0N | 140.6E | 45 | 16.2N | 140.7E | 50 | 13 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 070000Z | 16.0N | 138.8E | 40 | 16.0N | 138.7E | 35 | 6 | -5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 070600Z | 16.0N | 137.1E | 40 | 16.3N | 137.4E | 30 | 25 | -10 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 100000Z | 14.9N | 121.8E | 35 | 15.3N | 121.8E | 40 | 24 | 5 | 15.6N | 117.3E | 70 | 58 | 5 | 16.1N | 113.2E | 80 | 410 | 25 | 16.8N | 109.4E | 70 | 817 | 40 |
| 100600Z | 14.8N | 121.0E | 40 | 15.3N | 121.2E | 35 | 32 | -5 | 15.6N | 117.0E | 70 | 112 | 5 | 16.1N | 113.3E | 80 | 447 | 25 | --.- | ---.- | -- | -- | -- |
| 101200Z | 14.9N | 120.1E | 45 | 15.4N | 119.9E | 55 | 32 | 10 | 15.8N | 115.8E | 80 | 216 | 20 | 16.2N | 112.1E | 90 | 562 | 45 | --.- | ---.- | -- | -- | -- |
| 101800Z | 15.3N | 119.1E | 55 | 15.1N | 119.2E | 60 | 13 | 5 | 15.4N | 115.0E | 85 | 275 | 25 | 15.8N | 111.3E | 90 | 654 | 55 | --.- | ---.- | -- | -- | -- |
| 110000Z | 15.6N | 118.3E | 65 | 15.5N | 118.0E | 60 | 18 | -5 | 15.9N | 113.9E | 85 | 368 | 30 | 16.6N | 110.2E | 75 | 771 | 45 | --.- | ---.- | -- | -- | -- |
| 110600Z | 14.9N | 118.8E | 65 | 15.6N | 116.9E | 65 | 117 | 0 | 16.1N | 112.9E | 85 | 469 | 30 | 16.8N | 109.2E | 70 | 858 | 40 | --.- | ---.- | -- | -- | -- |
| 111200Z | 14.5N | 119.3E | 60 | 15.0N | 118.7E | 60 | 46 | 0 | 15.2N | 117.7E | 50 | 235 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 111800Z | 14.2N | 119.6E | 60 | 14.3N | 119.9E | 55 | 18 | -5 | 16.1N | 122.4E | 40 | 84 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 120000Z | 14.1N | 120.0E | 55 | 14.2N | 120.0E | 55 | 6 | 0 | 14.6N | 120.1E | 50 | 212 | 20 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 120600Z | 13.9N | 120.7E | 55 | 13.9N | 120.6E | 60 | 6 | 5 | 14.5N | 120.6E | 45 | 239 | 15 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 121200Z | 14.1N | 121.6E | 45 | 14.2N | 120.7E | 45 | 52 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 121800Z | 14.7N | 122.6E | 35 | 14.6N | 121.6E | 40 | 58 | 5 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 130000Z | 15.7N | 123.6E | 30 | 15.5N | 123.3E | 30 | 21 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |
| 130600Z | 16.5N | 124.2E | 30 | 16.3N | 124.1E | 30 | 13 | 0 | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- | --.- | ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 30NM | 197NM | 434NM | 0NM | 29NM | 201NM | 518NM | 817NM |
| AVERAGE RIGHT ANGLE ERROR | 18NM | 106NM | 216NM | 0NM | 17NM | 97NM | 290NM | 515NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 4KTS | 20KTS | 45KTS | 0KTS | 4KTS | 20KTS | 44KTS | 40KTS |
| AVERAGE BIAS OF WIND ERROR | 0KTS | 20KTS | 45KTS | 0KTS | 0KTS | 20KTS | 44KTS | 40KTS |
| NUMBER OF FORECASTS | 23 | 14 | 7 | 0 | 25 | 16 | 9 | 1 |


BEST TRACK
TYPHOON HESTER
19-23 OCT 1971
CYCLONE 36
MAX SFC WND - 90kts
MINIMUM SLP - 967mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
MARIANAS ISLANDS
MARCUS ISLAND
59
46
48
98
97

## HESTER

One of the most devastating typhoons to strike Vietnam in over a decade developed from a circulation just west of the Palau Islands. Hester attained tropical-storm strength late on the 19th (Figure 5-53) about 250 miles east of northern Mindanao. The storm swung to the west-northwest crossing the Visayas and intensifying to typhoon force in the Sulu Sea on the 21st. Later that evening, Hester cut across northern Palawan Island and moved into the South China Sea, leaving behind some six persons killed and two missing in the southern Philippines. Winds of 50 kt were felt at Cebu City as the storm center passed 40 n mi south of the station during the evening of the 20th.

As a strong ridge built along the South China mainland, Hester accelerated to 18 kt in forward speed on her west-northwest course or twice the climatological average for typhoons in that region during October. Hester continued to intensify to 90 kt during her day-and-a-half track across the South China Sea (Figure 5-54). Arriving ashore on the Vietnamese coast during the morning of the 23rd, the typhoon's eye passed just south of Hue and diminished in strength. The storm rapidly dissipated over central Laos that evening.

Maximum sustained winds at DaNang were registered at 60 kt with gusts to 85 kt during Hester's passage. Maximum gusts of 70 and 71 kt were reported at Camp Eagle and Hue respectively. The lowest pressure of 971 mb was measured at Chu Lai where maximum winds of 70 kt gusting to 90 kt were estimated.* Heaviest rainfall measured was at Camp Eagle with 5.44 inches.

Extensive damage was suffered at American bases including Camp Eagle and the air and naval facilities at DaNang. Heaviest hit was Chu Lai with 75% of its structures receiving damage. Thirty-eight helicopters were destroyed, four hangers collapsed while eighty-seven other aircraft, mostly helicopters, received damage. Three American lives were lost due to the flying debris (Figures 5-55 and 5-56).

Over 200 n mi of coastal areas were flooded from Quang-tri to DaNang while 90% damage was sustained to houses in Quang Ngai. Severe damage to crops was reported

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*Based on data supplied by 1st Weather Group, USAF, Saigon, Vietnam.

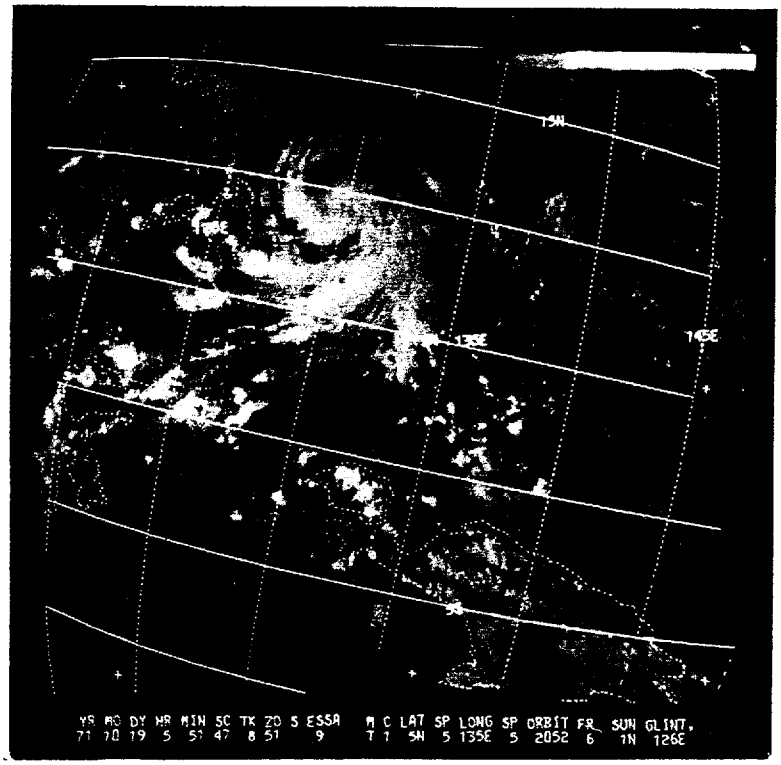



FIGURE 5-53. ESSA-9 PHOTO OF HESTER AS A DEVELOPING TROPICAL STORM EAST OF MINDANAO ON 19 OCTOBER.

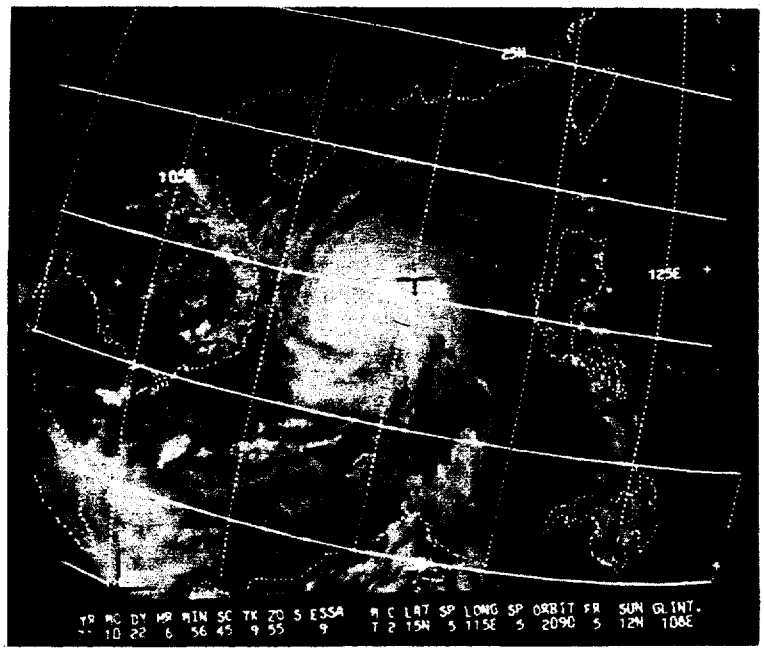



FIGURE 5-54. TYPHOON HESTER IN THE SOUTH CHINA SEA AS VIEWED BY ESSA-9 ON 22 OCTOBER.

and loss of cattle amounted to close to 900 head. Maritime casualties accounted for some 500 fishing boats reported sunk or destroyed and the 1,000-ton UNION PACIFIC run aground north of Chu Lai.

In total, newspaper reports indicate some 85 Vietnamese were killed and over 200,000 rendered homeless due to Hester. The Republic of Vietnam social welfare department regarded the typhoon as the worst to strike the country since 1944.

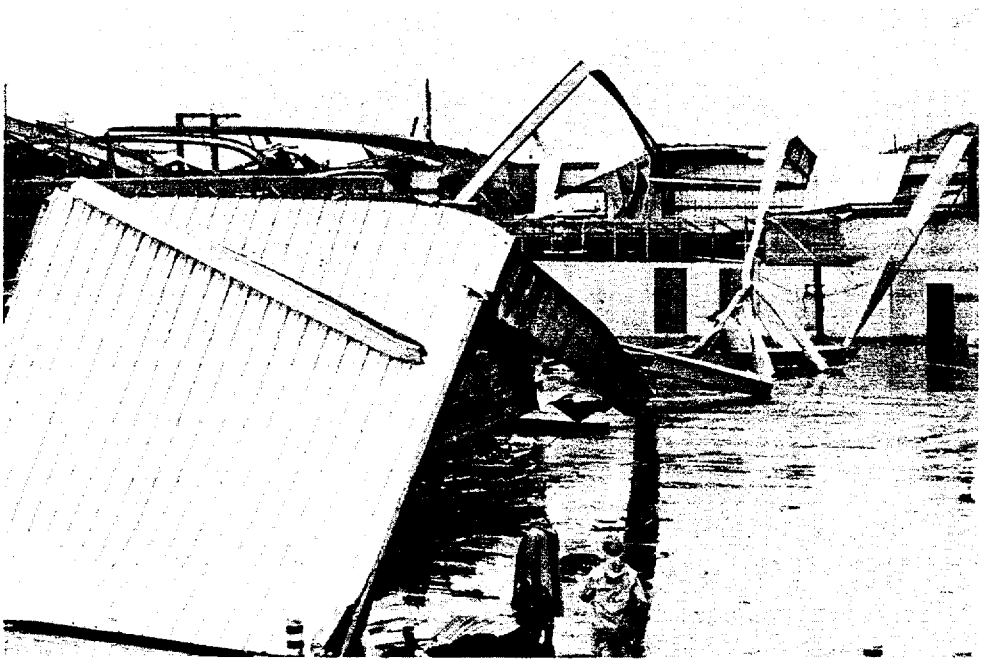


FIGURE 5-55. (TOP AND BOTTOM) DAMAGE SUSTAINED BY HANGERS AT THE CHU LAI INSTALLATION, VIETNAM--COURTESY CORPS OF ENGINEERS U.S.A.

FIGURE 5-56. (TOP) DAMAGE SUSTAINED TO BARRACKS AT THE CHU LAI ARMY INSTALLATION, VIETNAM--COURTESY CORPS OF ENGINEERS U.S.A. (BOTTOM) SMALL CRAFT WASHED AGROUND NEAR CHU LAI ARMY INSTALLATION--COURTESY CORPS OF ENGINEERS U.S.A.

TYPHOON HESTER

EYE FIXES FOR CYCLONE NO. 36

18 OCT - 23 OCT 71

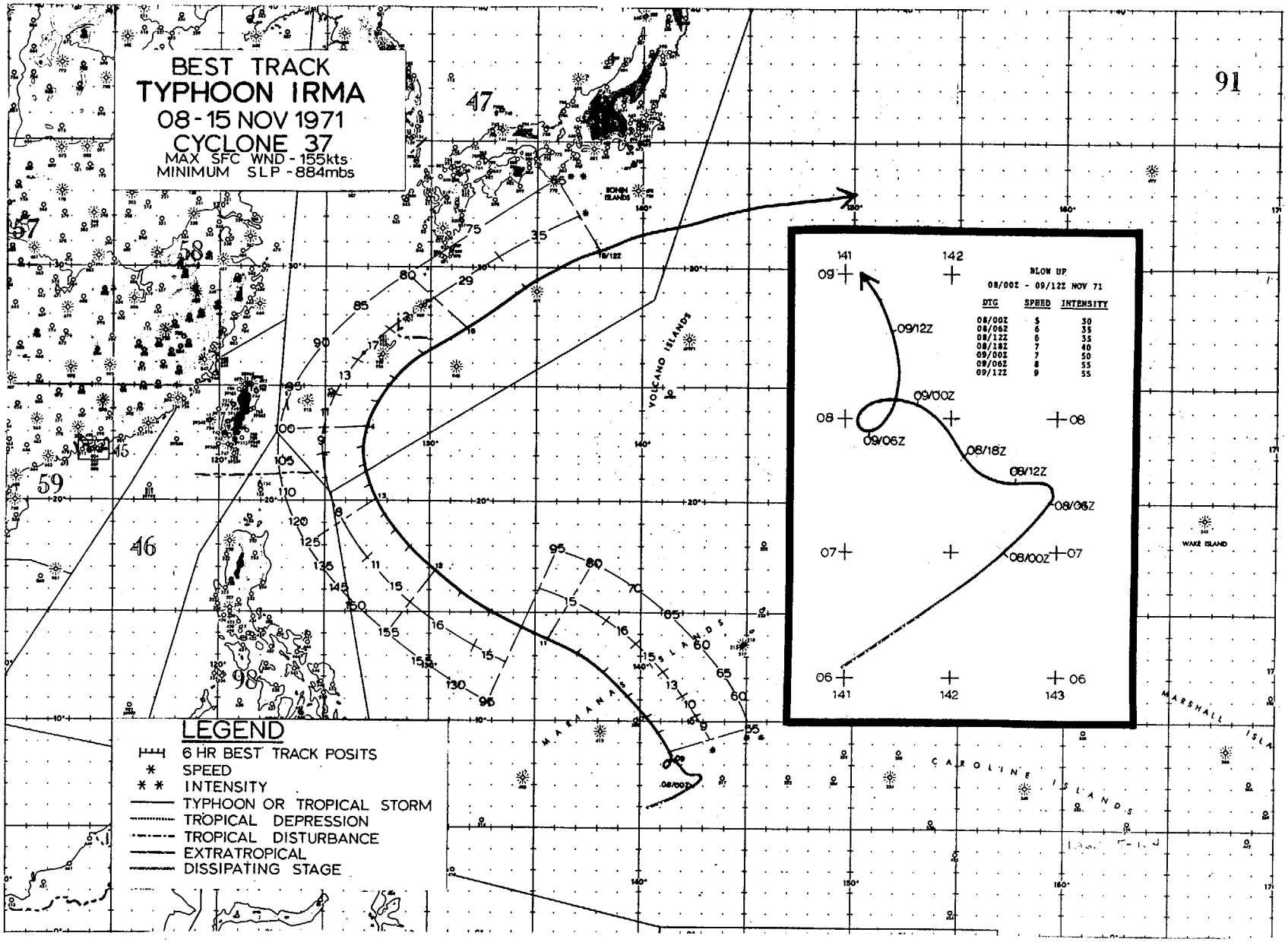
| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1803402 | 9.5N 133.7E | 54-P------ | 700MB | 20 | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | 700 MB WIND CNTR | |
| 2 | 1804572 | 8.5N 134.5E | SATELLIT--- | STG A | | | | | | | | | | FIRST BLTN | |
| 3 | 1905512 | 9.5N 130.5E | SATELLIT--- | STG C+ | | | | | | | | | | STRONGER | |
| 4 | 1923352 | 9.3N 127.0E | 54-P------ | ----- | ---- | 40 | ---- | ---- | --/-- | ---- | ----- | -- | -- | WIND CNTR | |
| 5 | 2000452 | 9.3N 126.9E | 54-P- 1-14 | 700MB | 35 | 40 | 990 | 2990 | 12/10 | CIRC | | 30 | -- | POORLY DEFINED | |
| 6 | 2004002 | 9.6N 126.0E | 54-P- 1-14 | 700MB | 60 | 40 | 987 | 2947 | 12/10 | CIRC | | 45 | -- | POORLY DEFINED | |
| 7 | 2006002 | 9.5N 125.5E | SATELLIT--- | STG C+ | | | | | | | | | | LITTLE CHANGE | |
| 8 | 2015002 | 9.8N 121.2E | VO-P- 5-10 | 700MB | ---- | ---- | 990 | 3075 | 10/08 | ---- | ----- | -- | -- | V POORLY DEFINED | |
| 9 | 2023452 | 9.7N 121.2E | VO-P------ | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | | |
| 10 | 2101102 | 9.8N 121.0E | 54-P- 1- 5 | 700MB | 45 | 75 | 987 | 2981 | 15/13 | ELIP | NE-SW | 30X20 | -- | CLSD WC-700 CNTR 15NM N | |
| 11 | 2104002 | 9.9N 120.5E | 54-P- 2- 5 | 700MB | 60 | 80 | 983 | 2954 | 17/11 | ELIP | NE-SW | 30X20 | -- | CLSD WC-700 CNTR 30NM N | |
| 12 | 2105572 | 10.0N 120.0E | SATELLIT--- | STG X | DIA | 3 | CAT 2.5 | | | | | | | STRONGER | |
| 13 | 2110002 | 10.8N 119.0E | 54-P- 1- 9 | 500MB | 60 | ---- | 984 | 2946 | -4/-9 | CIRC | | 30 | 5 | WC OPEN NF-700MB CNTR 3NM W-500MB CNTR 15NM W | |
| 14 | 2115452 | 11.4N 117.1E | 54-P- 2- 8 | 700MB | 40 | ---- | ---- | 2883 | 15/13 | CIRC | | 25 | 10 | CLSD WC | |
| 15 | 2206562 | 13.5N 112.5E | SATELLIT--- | STG X | DIA | 3 | CAT 3.5 | | | | | | | STRONGER | |
| 16 | 2207102 | 13.0N 113.0E | 54-P- 3- 5 | 700MB | 67 | 85 | ---- | 2862 | 16/10 | CIRC | | 50 | -- | POORLY DEFINED 700 CNTR 8NM WNW | |
| 17 | 2209442 | 13.0N 112.4E | 54-P- 4- 5 | 700MB | 61 | 85 | ---- | 2853 | 15/09 | ELIP | N-S | 20X12 | -- | WC OPEN SW-SFC CNTR 7NM F | |
| 18 | 2212302 | 14.9N 111.7E | 54-P- 5- 5 | 700MB | 81 | ---- | ---- | 2850 | 15/10 | CIRC | | 20 | 7 | V WEAK CLSD WC | |
| 19 | 2215502 | 14.1N 110.8E | 54-P- 2- 8 | 700MB | 95 | ---- | 972 | 2819 | 19/14 | CIRC | | 25 | 10 | WC OPEN F | |
| 20 | 2219002 | 14.3N 110.2E | 54-P- 2- 8 | 700MB | 80 | ---- | 967 | 2813 | 20/14 | CIRC | | 25 | 10 | WC OPEN SF | |
| 21 | 2219152 | 14.3N 110.2E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 22 | 2220452 | 14.4N 109.9E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 23 | 2221302 | 14.5N 109.7E | 54-P- 3- 7 | 700MB | 70 | ---- | 966 | 2816 | 20/14 | CIRC | | 25 | 10 | WC OPEN S-SE | |
| 24 | 2222452 | 14.8N 109.7E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 25 | 2223452 | 14.8N 109.5E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 26 | 2300152 | 14.0N 109.5E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 27 | 2300412 | 14.9N 109.5E | VO-P- 3--- | ----- | ---- | 100 | 973 | ---- | 26/21 | CIRC | | 28 | -- | WC OPEN S SEMIC | |
| 28 | 2301152 | 14.8N 109.3E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 29 | 2301452 | 14.9N 109.2E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 30 | 2302152 | 15.0N 109.0E | LNU RDR--- | | | | | | | ---- | ----- | -- | -- | STN VVVS | |
| 31 | 2307532 | 16.0N 108.0E | SATELLIT--- | STG X | DIA | 4 | CAT 2.0 | | | | | | | NO EYE VISIBLE | |

TYPHOON HESTER

1200Z 19 OCT TO 1800Z 23 OCT

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 191200Z | 9.6N 129.8E | 35 | 9.3N 129.7E | 30 | 19 | -5 | 9.3N 126.5E | 55 | 160 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 191800Z | 9.5N 128.5E | 40 | 9.3N 128.9E | 30 | 26 | -10 | 9.3N 125.7E | 50 | 195 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 200000Z | 9.5N 127.0E | 50 | 9.3N 126.9E | 40 | 13 | -10 | 9.3N 122.9E | 45 | 103 | -15 | 9.3N 119.2E | 60 | 316 | -15 | 9.7N 116.1E | 70 | 512 | -20 |
| 200600Z | 9.5N 125.4E | 50 | 9.5N 125.7E | 40 | 18 | -10 | 9.3N 121.6E | 55 | 114 | -15 | 9.4N 117.6E | 65 | 343 | -15 | --.- ---.- | -- | -- | -- |
| 201200Z | 9.6N 123.8E | 45 | 9.4N 124.7E | 45 | 54 | 0 | 9.3N 120.7E | 55 | 179 | -15 | 9.7N 116.7E | 65 | 386 | -20 | 10.6N 113.2E | 75 | 479 | 25 |
| 201800Z | 9.6N 122.4E | 50 | 9.9N 122.5E | 40 | 19 | -10 | 10.7N 116.9E | 65 | 64 | -10 | 11.9N 111.8E | 75 | 165 | -15 | --.- ---.- | -- | -- | -- |
| 210000Z | 9.7N 121.2E | 60 | 9.8N 121.0E | 70 | 13 | 10 | 10.3N 116.2E | 90 | 152 | 15 | 11.2N 111.8E | 95 | 273 | 5 | --.- ---.- | -- | -- | -- |
| 210600Z | 10.2N 119.9E | 70 | 9.9N 120.1E | 80 | 21 | 10 | 10.7N 115.4E | 95 | 197 | 15 | 11.9N 111.0E | 95 | 274 | 20 | --.- ---.- | -- | -- | -- |
| 211200Z | 11.0N 118.2E | 70 | 10.9N 118.6E | 85 | 24 | 15 | 11.7N 114.0E | 95 | 188 | 10 | 13.7N 110.1E | 85 | 220 | 35 | --.- ---.- | -- | -- | -- |
| 211800Z | 11.7N 116.5E | 75 | 11.7N 116.5E | 90 | 0 | 15 | 13.7N 109.8E | 85 | 50 | -5 | 15.4N 103.9E | 25 | 145 | -10 | --.- ---.- | -- | -- | -- |
| 220000Z | 12.5N 114.9E | 75 | 12.2N 115.0E | 90 | 19 | 15 | 14.1N 109.7E | 85 | 61 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 220600Z | 13.2N 113.2E | 80 | 13.2N 113.3E | 85 | 6 | 5 | 15.2N 107.7E | 40 | 37 | -35 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 221200Z | 13.8N 111.6E | 85 | 13.8N 111.9E | 80 | 17 | -5 | 15.5N 106.5E | 30 | 54 | -20 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 221800Z | 14.3N 110.4E | 90 | 14.3N 110.3E | 80 | 6 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 230000Z | 15.0N 109.2E | 90 | 14.7N 109.2E | 80 | 18 | -10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 230600Z | 15.6N 108.2E | 75 | 15.5N 108.2E | 75 | 6 | 0 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 231200Z | 16.1N 107.2E | 50 | 16.1N 107.3E | 60 | 6 | 10 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 231800Z | 16.4N 106.2E | 35 | 16.6N 106.5E | 40 | 21 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 17NM | 120NM | 265NM | 495NM | 17NM | 120NM | 265NM | 495NM |
| AVERAGE RIGHT ANGLE ERROR | 10NM | 41NM | 103NM | 131NM | 10NM | 41NM | 103NM | 131NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 9KTS | 13KTS | 17KTS | 23KTS | 9KTS | 13KTS | 17KTS | 23KTS |
| AVERAGE BIAS OF WIND ERROR | 1KTS | -5KTS | -2KTS | 3KTS | 1KTS | -5KTS | -2KTS | 3KTS |
| NUMBER OF FORECASTS | 18 | 13 | 8 | 2 | 18 | 13 | 8 | 2 |


BEST TRACK
TYPHOON IRMA
08-15 NOV 1971
CYCLONE 37
MAX SFC WND - 155kts
MINIMUM SLP - 884mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BLOW UP
08/00Z - 09/12Z NOV 71
DTG SPEED INTENSITY
08/00Z 5 30
08/06Z 6 35
08/12Z 6 35
08/18Z 7 40
09/00Z 7 50
09/06Z 8 55
09/12Z 9 55
09/12Z
09/00Z
09/06Z
08/18Z
08/12Z
08/06Z
08/00Z
VOLCANO ISLANDS
BONIN ISLANDS
MARIANA ISLANDS
CAROLINE ISLANDS
MARSHALL ISLA
WAKE ISLAND

## IRMA

The last and most intense typhoon of the year was first noted on synoptic charts as a quasi-stationary circulation in the western Carolines on the 2nd of November. By the 6th, a strong band of westerlies developed south of 5N. The long fetch of these winds resulted in increased seas which affected the atolls in the area. Early on the 8th, satellite data showed that the cloudiness associated with the system was showing increasing organization, and tropical storm Irma was born.

Later in the afternoon, Woleai Atoll reported 30 kt with gusts to 50 kt as the storm center was located by reconnaissance aircraft 50 n mi west of the station (Figure 5-57). Reports from Eauripik Atoll indicated that high seas had inundated 200 ft inland and several houses were washed away.

Irma's track was erratic for the next 24 hours until she began a northwestward heading, passing 30 n mi west of Ulithi the morning of the 10th. Reports from the atoll indicated 30 kt, gusts to 60 kt and a minimum sea level pressure of 996.3 mb. Of the Yap district only Fais and Ulithi atolls had appreciable damage and this was limited to crops.

Reaching typhoon force the evening of the 10th, Irma described a smooth northwesterly track, attaining super-typhoon status late on the 11th. Reaching peak winds in excess of 150 kt during the 12th and remaining in the 130-kt-plus classification for a 36-hour period, Irma began to recurve around the subtropical ridge at 127E. Paralleling the Ryukyu Island chain and accelerating in forward speed as she came under the influence of the westerlies, Irma transformed to extratropical characteristics as she sped south of Honshu on the 15th at 35 kt. During the passage of the eye 65 n mi east of Okinawa, highest winds experienced on the island were at Naha, which recorded 48 kt gusting to 80 kt, while Kadena AB reported 45 kt with gusts to 64 kt.

At sea, the 2,474-ton Panamanian HUALIEN was run aground at Peng Chia Hsu Island northeast of Taipei presumably by heavy swells. The 13,616-ton Liberian ore carrier BANALUNA bound from Leyte Island, Philippines to Tobata, Japan was reported missing and feared to have went down during Irma.

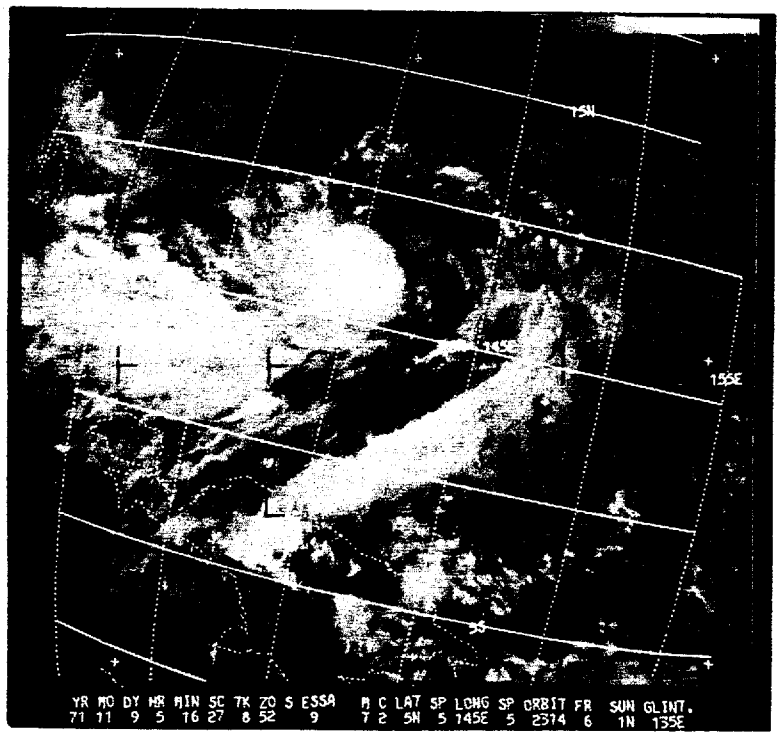



FIGURE 5-57. ESSA-9 PHOTO OF IRMA AS A TROPICAL STORM LOCATED WEST OF WOLEAI ATOLL ON 9 NOVEMBER.

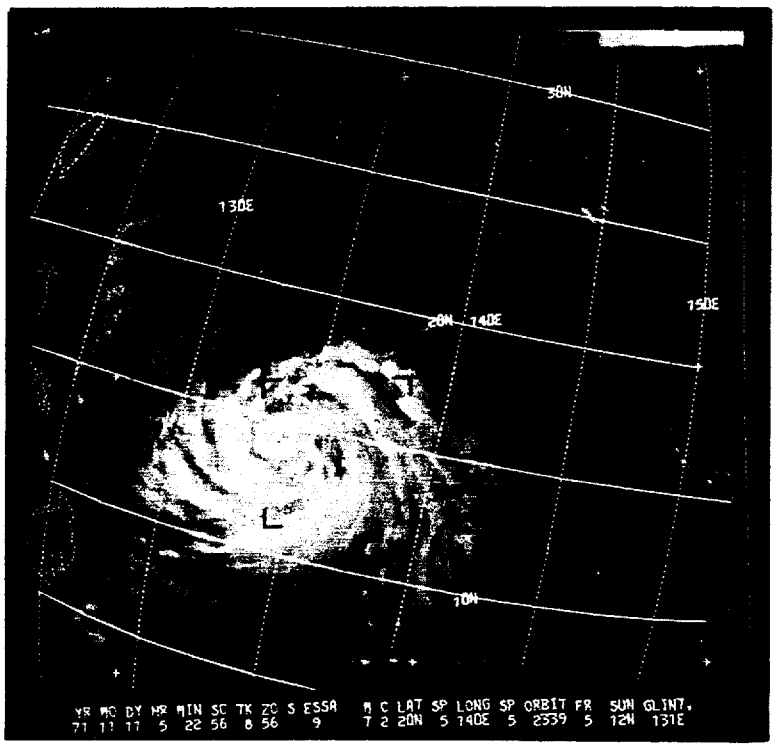



FIGURE 5-58. TYPHOON IRMA DURING HER RAPID DEEPENING STAGE IN THE PHILIPPINE SEA ON THE AFTERNOON OF 11 NOVEMBER.

The most significant aspect to typhoon Irma was the explosive deepening rate of 4 mb per hour which took place during a 24-hour period spanning the 10th and 11th of November (Figures 5-58 and 5-59). The deepening culminated in a dropsonde reading of 884 mb, which ranked the storm's central pressure among the lowest on record.*

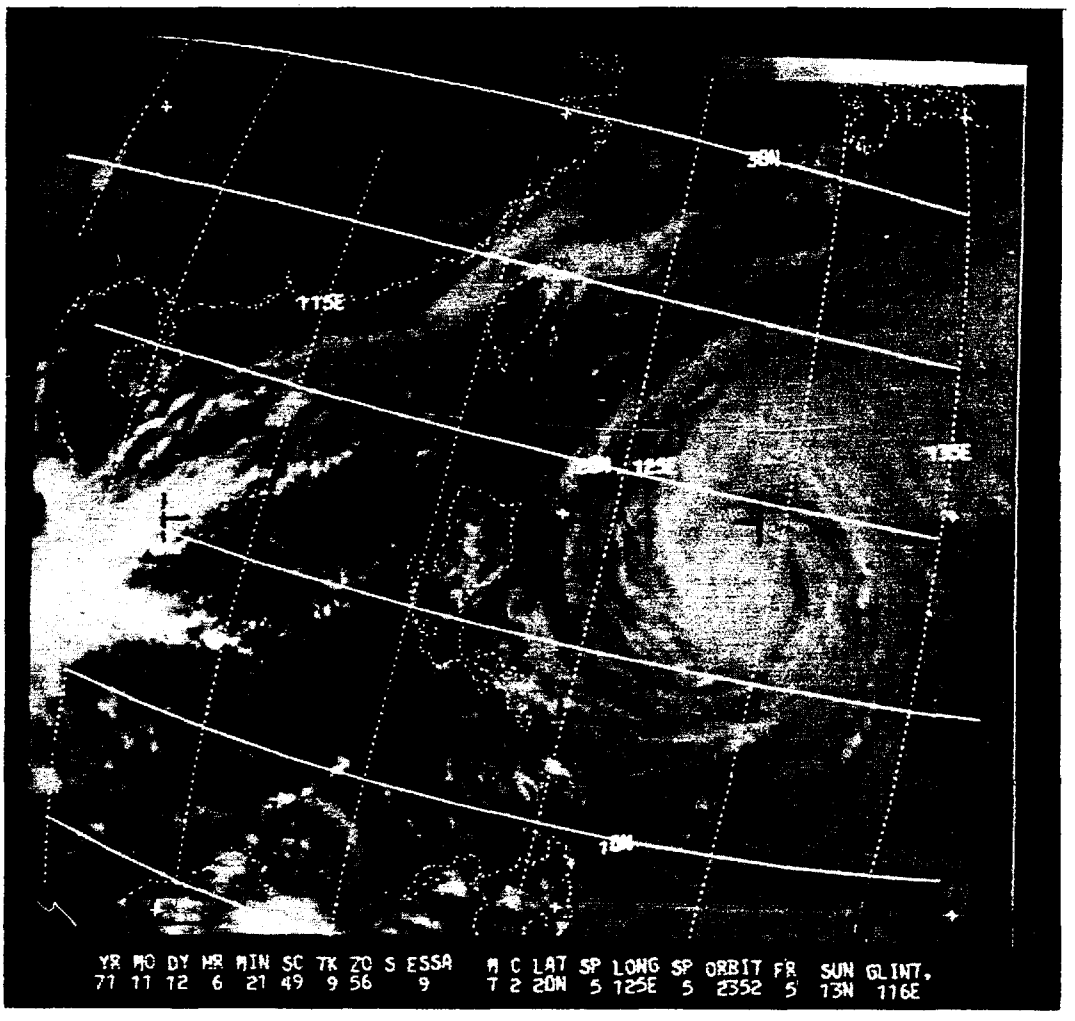



FIGURE 5-59. SUPER TYPHOON IRMA AS PHOTOGRAPHED BY ESSA-9 EAST OF LUZON ON 12 NOVEMBER.

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*Typhoon's Joan (Aug 59) - 884 mb, Nina (Aug 53) - 883 mb, Ida (Sep 58) - 877 mb (see Jordan, 1961).

TYPHOON IRMA
EYE FIXES FOR CYCLONE NO. 37
08 NOV - 15 NOV 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT. OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 080305Z | 7.2N 142.8E | 54-P- 5-15 | 700MB | 40 | 35 | 992 | 3008 | 12/11 | ---- | ----- | -- | -- | NO RDR PRES-700 CNTR 20NM E | |
| 2 | 081000Z | 7.4N 143.2E | 54-P- 5-10 | 700MB | 30 | ---- | 1003 | 3079 | 11/09 | ---- | ----- | -- | -- | NO RDR PRES | |
| 3 | 081600Z | 7.2N 142.4E | 54-P- 5-15 | 700MB | 30 | ---- | 1003 | 3082 | 10/09 | ---- | ----- | -- | -- | NO RDR PRES | |
| 4 | 082204Z | 8.1N 141.8E | 54-P-15--- | 700MB | 30 | 35 | 995 | 3054 | 13/12 | ---- | ----- | -- | -- | SFC CNTR TLL DEF | |
| 5 | 090400Z | 8.0N 141.1E | 54-P- 8- 2 | 700MB | 48 | 90 | 991 | 3030 | 13/12 | ---- | ----- | -- | -- | WC FRMG RAPIDLY | |
| 6 | 090517Z | 7.5N 141.0E | SATELIT--- | STG X | DIA | 5 CAT | 2.0 | | | | | | | FIRST BLTN | |
| 7 | 090955Z | 8.3N 141.4E | 54-P- 3- 3 | 700MB | 30 | ---- | 981 | 2941 | 15/11 | ELIP | E-W | 15X10 | 5 | WEAK CLSD WC | |
| 8 | 091243Z | 8.7N 141.4E | 54-P- 2-10 | 700MB | 35 | ---- | 983 | 2963 | 15/10 | ELIP | E-W | 15X10 | -- | WC OPEN NW-MDT FB | |
| 9 | 091526Z | 9.3N 141.0E | 54-P- 3- 9 | 700MB | 45 | ---- | 983 | 2954 | 14/10 | ELIP | E-W | 20X10 | 5 | CLSD WC | |
| 10 | 092147Z | 9.7N 140.5E | 54-P- 5- 5 | 700MB | 40 | 60 | 984 | 2947 | 12/11 | CIRC | | 20 | 10 | FAIR RDR PRES | |
| 11 | 100019Z | 10.2N 140.2E | 54-P- 8- 7 | 700MB | 45 | 85 | 987 | 2963 | 12/10 | CIRC | | 10 | 10 | CLSD WC | |
| 12 | 100311Z | 10.7N 139.7E | 54-P- 5- 5 | 700MB | 45 | 50 | 985 | 2947 | 13/09 | CIRC | | 20 | 10 | CLSD WC | |
| 13 | 100619Z | 11.0N 138.5E | SATELIT--- | STG C | | | | | | | | | | | |
| 14 | 101000Z | 11.9N 138.8E | 54-P- 2- 8 | 700MB | 50 | ---- | 983 | 2951 | 15/13 | ---- | ----- | -- | 5 | WC SE ONLY | |
| 15 | 101527Z | 12.8N 137.4E | 54-P- 2- 3 | 700MB | 60 | ---- | 981 | 2932 | 15/13 | ---- | ----- | -- | -- | POORLY DEFINED | |
| 16 | 102205Z | 13.6N 136.1E | 54-P- 2--- | 700MB | 60 | 70 | 969 | 2840 | 18/16 | CIRC | | 15 | 10 | 700MB FIX | |
| 17 | 110340Z | 14.2N 134.8E | 54-P- 3--- | 700MB | 80 | 70 | 961 | 2752 | 18/13 | CIRC | | 15 | 8 | 700MB FIX | |
| 18 | 110523Z | 14.2N 134.0E | SATELIT--- | STG X | DIA | 4 CAT | 3.0 | | | | | | | STRONGER | |
| 19 | 111155Z | 14.9N 132.8E | 54-P- 2- 1 | 700MB | 80 | 100 | 910 | 2295 | 21/11 | CIRC | | 6 | 5 | CLSD WC | |
| 20 | 111555Z | 15.6N 132.3E | 54-P- 3- 1 | 700MB | 80 | 120 | 884 | 2060 | 24/11 | CONC | - | 40X 7 | 5 | SFC WIND OBSERVED DUE TO INT LTNG | |
| 21 | 112200Z | 16.6N 130.7E | 54-P- 6- 2 | 700MB | 70 | 130 | 884 | 2040 | 26/11 | CIRC | | 5 | -- | CLSD WC | |
| 22 | 120300Z | 17.5N 129.6E | 54-P- 3- 2 | 700MB | 80 | 130 | 893 | 2120 | 20/12 | CIRC | | 5 | 2 | CLSD WC | |
| 23 | 120622Z | 17.7N 129.2E | SATELIT--- | STG X | DIA | 4 CAT | 4.0 | | | | | | | | |
| 24 | 120934Z | 18.4N 128.7E | 54-P- 2- 2 | 700MB | 107 | ---- | ---- | 2131 | 26/11 | CIRC | | 10 | 4 | CLSD WC | |
| 25 | 121505Z | 19.0N 128.0E | 54-P- 2- 2 | 700MB | 127 | ---- | ---- | 2158 | 21/18 | CIRC | | 12 | 5 | CLSD WC | |
| 26 | 122220Z | 19.8N 127.7E | 54-P- 2- 4 | 700MB | 115 | 130 | 913 | 2313 | 16/13 | CIRC | | 10 | 5 | CLSD WC | |
| 27 | 130110Z | 20.1N 127.4E | 54-P- 2- 5 | 700MB | 110 | 120 | 926 | 2423 | 17/11 | CIRC | | 10 | 6 | WC OPEN E | |
| 28 | 130310Z | 20.4N 127.3E | 54-P- 2- 5 | 700MB | 110 | 130 | 925 | 2442 | 17/15 | CIRC | | 10 | -- | WC OPEN E-S | |
| 29 | 130525Z | 20.5N 127.1E | SATELIT--- | STG X | DIA | 3 CAT | 4.0 | | | | | | | SML EYE VISIBLE | |
| 30 | 130700Z | 21.0N 127.1E | 54-P- 2--- | 700MB | 110 | 90 | 929 | 2478 | 16/13 | CIRC | | 15 | 8 | WC OPEN SW | |
| 31 | 131000Z | 21.4N 127.0E | 54-P- 2--- | 700MB | 80 | ---- | 938 | 2518 | 18/15 | CIRC | | 6 | 10 | | |
| 32 | 131200Z | 21.7N 127.0E | 54-P- 7--- | 700MB | 95 | ---- | 938 | 2557 | 18/14 | CIRC | | 5 | -- | NO WC | |
| 33 | 131532Z | 22.0N 126.8E | 54-P- 2- 3 | 700MB | 73 | ---- | ---- | 2597 | 19/18 | ---- | ----- | -- | -- | NO RDR PRES | |
| 34 | 131844Z | 22.5N 126.8E | 54-P- 3- 4 | 700MB | 85 | ---- | ---* | 2612 | 18/17 | CIRC | | 12 | 2 | WK RDR PRES | |
| 35 | 131845Z | 22.7N 127.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN MIYAKO JIMA | |
| 36 | 132000Z | 22.6N 126.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 37 | 132143Z | 23.0N 127.0E | 54-P- 2- 3 | 700MB | 81 | ---- | ---* | 2643 | 16/16 | CIRC | | 12 | 2 | CLSD WC-WEAK | |
| 38 | 140100Z | 23.4N 127.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 39 | 140200Z | 23.6N 127.2E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 40 | 140350Z | 23.9N 127.3E | 54-P------ | ----- | ---- | ---- | ---* | ---- | --/-- | ---- | ----- | -- | -- | | |
| 41 | 140400Z | 23.9N 127.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 42 | 140400Z | 23.7N 127.3E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 43 | 140400Z | 23.8N 127.3E | 54-P- 2- 5 | 700MB | 85 | 100 | 954 | 2673 | 16/15 | CIRC | | 40 | -- | POORLY DEFINED | |
| 44 | 140500Z | 23.9N 127.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 45 | 140500Z | 24.0N 127.4E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 46 | 140600Z | 24.2N 127.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 47 | 140600Z | 24.2N 127.5E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 48 | 140624Z | 24.3N 128.0E | SATELIT--- | STG X | DIA | 4 CAT | 3.0 | | | | | | | SML EYE VISIBLE | |

TYPHOON IRMA
EYE FIXES FOR CYCLONE NO. 37
08 NOV - 15 NOV 71

| FIX NO. | TIME | POSIT | UNIT-METHOD -ACCY | FLT LVL | FLT LVL WND | OBS SFC WND | OBS MIN SLP | MIN 700MB HGT | FLT LVL TI/TO | EYE FORM | ORIEN-TATION | EYE DIA | THKN WALL CLD | REMARKS | POSIT OF RADAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 140700Z | 24.4N 127.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 50 | 140700Z | 24.3N 127.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 51 | 140800Z | 24.9N 127.7E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN YOZE DAKE | |
| 52 | 140900Z | 24.9N 127.9E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 53 | 140900Z | 24.9N 128.1E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 54 | 140935Z | 25.0N 128.0E | 54-P- 2-10 | 700MB | 85 | 130 | 960 | 2694 | 15/19 | ---- | ----- | -- | -- | NO WC | |
| 55 | 141000Z | 25.0N 128.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 56 | 141000Z | 25.3N 128.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47927 | |
| 57 | 141100Z | 25.2N 128.0E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 58 | 141200Z | 25.3N 128.6E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 59 | 141725Z | 26.2N 129.5E | 54-P- 7--- | 700MB | 70 | ---- | 960 | 2731 | 15/12 | CIRC | | 10 | -- | POORLY DEFINED | |
| 60 | 141800Z | 26.4N 129.8E | LND RDR--- | | | | | | | ---- | ----- | -- | -- | STN 47936 | |
| 61 | 142000Z | 26.8N 130.5E | VQ-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STN 47909 | |
| 62 | 142100Z | 26.9N 131.0E | VQ-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STN 47909 | |
| 63 | 142145Z | 27.0N 130.9E | 54-P- 5--- | 700MB | 85 | 60 | 960 | 2783 | 13/15 | ---- | ----- | -- | -- | POOR RDR PRES | |
| 64 | 142200Z | 27.1N 131.2E | VQ-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STN 47909 | |
| 65 | 142300Z | 27.7N 131.8E | VQ-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STN 47909 | |
| 66 | 150000Z | 27.7N 132.5E | VQ-------- | ----- | ---- | ---- | ---- | ---- | --/-- | ---- | ----- | -- | -- | STN 47909 | |
| 67 | 150405Z | 28.6N 133.7E | 54-P- 4- 5 | 700MB | 100 | 95 | 965 | 2758 | 16/14 | ---- | ----- | -- | -- | NO RDR PRES | |
| 68 | 150531Z | 28.5N 134.8E | SATELLI--- | STG X | DIA | 4 | CAT 2.5 | | | | | | | | |
| 69 | 150907Z | 30.0N 136.2E | 54-P- 5- 5 | 700MB | 70 | ---- | 967 | 2774 | 13/13 | ---- | ----- | -- | -- | NO RDR PRES | |

TYPHOON IRMA

0000Z 08 NOV TO 1200Z 15 NOV

| | BEST TRACK | | WARNING | | | | 24 HOUR FORECAST | | | | 48 HOUR FORECAST | | | | 72 HOUR FORECAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ERRORS | | | | ERRORS | | | | ERRORS | | | | ERRORS | |
| | POSIT | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND | POSIT | WIND | DST | WIND |
| 080000Z | 6.9N 142.6E | 30 | 6.9N 142.7E | 30 | 6 | 0 | 8.1N 142.6E | 45 | 59 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 080600Z | 7.3N 143.0E | 35 | 7.4N 142.8E | 35 | 13 | 0 | 9.2N 142.1E | 55 | 94 | 0 | 11.1N 138.8E | 70 | 36 | 10 | --.- ---.- | -- | -- | -- |
| 081200Z | 7.4N 142.6E | 35 | 7.6N 143.1E | 40 | 32 | 5 | 9.7N 142.5E | 55 | 92 | 0 | 11.3N 139.0E | 70 | 72 | 5 | 12.4N 134.2E | 85 | 178 | -45 |
| 081800Z | 7.8N 142.1E | 40 | 7.4N 142.6E | 40 | 38 | 0 | 8.2N 142.6E | 55 | 123 | -5 | 10.3N 140.9E | 65 | 283 | -5 | --.- ---.- | -- | -- | -- |
| 090000Z | 8.2N 141.6E | 50 | 8.2N 142.3E | 40 | 41 | -10 | 10.0N 141.0E | 55 | 42 | -10 | 11.7N 137.3E | 70 | 160 | -10 | 12.6N 132.6E | 85 | 289 | -10 |
| 090600Z | 7.9N 141.2E | 55 | 8.2N 140.9E | 70 | 25 | 15 | 8.3N 137.4E | 90 | 209 | 30 | 9.7N 133.2E | 120 | 288 | 25 | --.- ---.- | -- | -- | -- |
| 091200Z | 8.6N 141.4E | 55 | 8.2N 140.9E | 70 | 38 | 15 | 8.2N 138.3E | 90 | 245 | 25 | 9.2N 134.4E | 115 | 363 | -15 | 10.8N 130.7E | 125 | 496 | -20 |
| 091800Z | 9.4N 140.9E | 60 | 9.4N 140.7E | 75 | 12 | 15 | 10.2N 137.8E | 95 | 179 | 25 | 11.2N 133.9E | 120 | 316 | -35 | --.- ---.- | -- | -- | -- |
| 100000Z | 10.1N 140.3E | 65 | 9.9N 140.3E | 75 | 12 | 10 | 10.7N 137.0E | 95 | 202 | 15 | 11.5N 133.0E | 120 | 358 | -35 | 13.2N 129.4E | 125 | 426 | 0 |
| 100600Z | 11.2N 139.4E | 60 | 11.1N 139.4E | 75 | 6 | 15 | 12.5N 135.6E | 95 | 136 | 0 | 13.4N 131.6E | 120 | 302 | -30 | --.- ---.- | -- | -- | -- |
| 101200Z | 12.3N 138.3E | 65 | 12.3N 138.3E | 75 | 0 | 10 | 15.0N 134.0E | 85 | 64 | -45 | 16.8N 129.8E | 90 | 144 | -55 | 19.3N 127.3E | 90 | 139 | -20 |
| 101800Z | 13.1N 137.0E | 70 | 13.3N 136.9E | 75 | 13 | 5 | 15.9N 131.7E | 85 | 8 | -70 | 18.0N 128.3E | 85 | 87 | -50 | --.- ---.- | -- | -- | -- |
| 110000Z | 13.8N 135.6E | 80 | 13.8N 135.6E | 80 | 0 | 0 | 16.0N 130.8E | 100 | 61 | -55 | 18.1N 127.2E | 110 | 121 | -15 | 21.4N 126.0E | 95 | 121 | -5 |
| 110600Z | 14.4N 134.3E | 95 | 14.5N 134.4E | 90 | 8 | -5 | 16.6N 129.5E | 110 | 80 | -40 | 19.1N 126.3E | 115 | 111 | -5 | --.- ---.- | -- | -- | -- |
| 111200Z | 15.1N 132.9E | 130 | 14.9N 132.8E | 130 | 13 | 0 | 17.4N 127.9E | 125 | 88 | -20 | 20.4N 126.0E | 95 | 87 | -15 | 26.1N 130.2E | 65 | 110 | -25 |
| 111800Z | 16.0N 131.6E | 155 | 15.7N 131.8E | 155 | 21 | 0 | 18.6N 127.7E | 125 | 49 | -10 | 22.3N 127.3E | 100 | 28 | -5 | --.- ---.- | -- | -- | -- |
| 120000Z | 16.9N 130.3E | 155 | 16.9N 130.2E | 155 | 6 | 0 | 20.8N 126.7E | 110 | 61 | -15 | 25.7N 129.7E | 85 | 209 | -15 | --.- ---.- | -- | -- | -- |
| 120600Z | 17.9N 129.2E | 150 | 18.0N 129.0E | 140 | 13 | -10 | 22.2N 127.2E | 100 | 84 | -20 | 27.3N 132.0E | 55 | 305 | -40 | --.- ---.- | -- | -- | -- |
| 121200Z | 18.8N 128.4E | 145 | 18.7N 128.4E | 135 | 6 | -10 | 22.4N 127.0E | 100 | 48 | -10 | 27.3N 131.0E | 60 | 184 | -30 | --.- ---.- | -- | -- | -- |
| 121800Z | 19.4N 127.9E | 135 | 19.4N 127.8E | 135 | 6 | 0 | 23.0N 127.1E | 100 | 45 | -5 | 27.9N 132.2E | 60 | 156 | -25 | --.- ---.- | -- | -- | -- |
| 130000Z | 20.1N 127.5E | 125 | 20.0N 127.5E | 130 | 6 | 5 | 24.3N 127.8E | 100 | 79 | 0 | 29.6N 135.5E | 40 | 228 | -40 | --.- ---.- | -- | -- | -- |
| 130600Z | 20.8N 127.1E | 120 | 21.0N 127.2E | 125 | 13 | 5 | 26.1N 129.4E | 85 | 153 | -10 | 30.9N 138.5E | 40 | 238 | -35 | --.- ---.- | -- | -- | -- |
| 131200Z | 21.6N 126.9E | 110 | 21.7N 127.1E | 110 | 13 | 0 | 27.3N 130.4E | 75 | 160 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 131800Z | 22.3N 126.8E | 105 | 22.4N 126.7E | 100 | 8 | -5 | 27.7N 130.3E | 70 | 82 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 140000Z | 23.2N 127.0E | 100 | 23.4N 127.2E | 90 | 16 | -10 | 28.8N 132.9E | 50 | 92 | -30 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 140600Z | 24.2N 127.5E | 95 | 24.1N 127.5E | 95 | 6 | 0 | 29.2N 133.7E | 50 | 37 | -25 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 141200Z | 25.4N 128.3E | 90 | 25.6N 128.5E | 95 | 16 | 5 | 30.7N 136.7E | 50 | 67 | -15 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 141800Z | 26.4N 129.8E | 85 | 26.3N 129.6E | 90 | 12 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 150000Z | 27.6N 131.8E | 80 | 27.5N 131.8E | 75 | 6 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 150600Z | 29.1N 134.4E | 75 | 29.0N 134.7E | 80 | 17 | 5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |
| 151200Z | 30.7N 138.0E | 65 | 30.9N 137.6E | 60 | 24 | -5 | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- | --.- ---.- | -- | -- | -- |

| | TYPHOONS WHILE WIND OVER 35KTS | | | | ALL FORECASTS | | | |
|---|---|---|---|---|---|---|---|---|
| | WARNING | 24-HR | 48-HR | 72-HR | WARNING | 24-HR | 48-HR | 72-HR |
| AVERAGE FORECAST ERROR | 15NM | 98NM | 194NM | 251NM | 14NM | 98NM | 194NM | 251NM |
| AVERAGE RIGHT ANGLE ERROR | 9NM | 50NM | 78NM | 123NM | 9NM | 50NM | 78NM | 123NM |
| AVERAGE MAGNITUDE OF WIND ERROR | 6KTS | 19KTS | 24KTS | 26KTS | 6KTS | 19KTS | 24KTS | 26KTS |
| AVERAGE BIAS OF WIND ERROR | 2KTS | -12KTS | -20KTS | -26KTS | 2KTS | -12KTS | -20KTS | -26KTS |
| NUMBER OF FORECASTS | 30 | 27 | 21 | 7 | 31 | 27 | 21 | 7 |

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DEFINITIONS OF TERMS AND ABBREVIATIONS IN CHAPTER 5

1. Units

Distance - nautical miles
Speed - knots
Geopotential height - meters
Flight level - meters or standard pressure level
Pressure - millibars
Temperature - degrees Celsius

2. With reference to summaries of fix data, the following terms and abbreviations apply:

a. UNIT - Reconnaissance unit that made the fix
54WRS - 54th Weather Reconnaissance Squadron
VQ-1 - Fleet Air Reconnaissance Squadron One
LND RDR - Land radar site
SHP RDR - Ship radar
SATELIT - Satellite bulletin from National Environmental Satellite Service

b. METHOD

P - Penetration
R - Airborne radar

c. ACCY - Estimated navigational (1st number) and meteorological (2nd) accuracy

d. OBS SFC WND - Maximum observed surface wind

e. FLT LVL WND - Maximum observed wind at flight level

f. FLT LVL TI/TO - Temperature inside/outside the eye or center at flight level

g. EYE FORM - Shape of eye

CIRC - Circular
ELIP - Elliptical
CONC - Concentric

h. ORIENTATION - Orientation of major axis of elliptical eye

ABBREVIATIONS

| | |
|---|---|
| ABT | About |
| ACFT | Aircraft |
| ANAL | Analysis |
| BCMG | Becoming |
| BGNG | Beginning |
| BLTN | Bulletin |
| BRKS | Breaks |
| BRLY | Barely |
| BRT | Bright |
| BSD | Based |
| CHG | Change |
| CI | Cirrus |
| CIRC | Circulation |
| CLD | Cloud |
| CLSD | Closed |
| CONC | Concentric |
| CONT | Continuous |
| CONV | Convective |
| CS | Cirrostratus |
| DEF | Defined |
| DEVEL | Developed |
| DIA | Diameter |
| DISORG | Disorganized |
| DSPTG | Dissipating |
| ELSW | Elsewhere |
| EST | Estimated |
| EXC | Excellent |
| FBS | Feeder Bands |
| FL | Flight Level |
| FNTL | Frontal |
| FRMG | Forming |
| FWC | Fleet Weather Central |
| GRAD | Gradient |
| HK | Hong Kong |
| HR | Hour |
| HVY | Heavy |
| IRREG | Irregular |
| K | Thousand |
| KT | Knots |
| LGT | Light |
| LND | Land |
| LRG | Large |
| LTL | Little |
| LTNG | Lightning |
| MDT | Moderate |
| MSLP | Minimum Sea Level Pressure |
| NM | Nautical Miles |
| NEG | Negative |
| ORGANIZ | Organized |
| OVC | Overcast |
| OVR | Over |
| PIREP | Pilot Report |
| POSIT | Position |
| PRES | Presentation |
| PRESS | Pressure |
| PRELIM | Preliminary |
| PSBL | Possible |
| PSG | Passage |
| QUAD | Quadrant |
| RDR | Radar |
| REP PHIL | Republic of the Philippines |
| RETRN | Return |
| RMR | Remark |
| SAT | Satellite |
| SC | Stratocumulus |
| SEMIC | Semicircle |
| SEV | Severe |
| SFC | Surface |
| SML | Small |
| SST | Sea Surface Temperature |
| STG | Strong |
| STN | Station |
| STRM | Storm |
| TEMPS | Temperatures |
| TURB | Turbulence |
| UKN | Unknown |
| V | Very |
| VIS | Visable |
| VSBL | Visable |
| WC | Wall Cloud |
| WK | Weak |
| WKR | Weaker |
| WND | Wind |
| YSTY | Yesterday |